

Implementation of the Dubai Action Plan



Report on the Implementation of the Dubai Action Plan

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Introduction

Every four years, the International Telecommunication Union (ITU) convenes the [World Telecommunication Development Conference](#) (WTDC). The last conference (WTDC-14), held in Dubai (United Arab Emirates), from 30 March to 10 April 2014, adopted the [Dubai Action Plan](#) (DuAP), setting out the priority areas and related activities of the ITU Telecommunication Development Sector (ITU-D) for the period 2015 to 2018.

In October-November 2014, the Plenipotentiary Conference (PP) in its Resolution 77 (Rev. Busan, 2014), decided, among other things, the holding of WTDC-17 in the last quarter of 2017, with the understanding that future WTDC action plans will cover four-year periods. In line with Resolution 77, DuAP implementation covers the three-year period 2015 to 2017.

The DuAP contains a comprehensive package of measures aimed at fostering equitable, affordable, inclusive and sustainable development of telecommunication/information and communication technology (ICT) networks, applications and services. It comprises five strategic objectives supported by 15 outputs, in line with ITU's results-based management (RBM) approach.

The DuAP implementation framework encompasses programmes, regional initiatives, study group Questions, resolutions and recommendations, as well as the facilitation of the [World Summit on the Information Society](#) (WSIS) action lines. The DuAP structure follows that of the ITU strategic plan, thus ensuring a consistent planning hierarchy and linkage across the different planning tools and instruments within ITU (strategic, financial and operational planning).

The Telecommunication Development Bureau (BDT) began implementing the RBM approach in 2011 to be consistent with the United Nations-wide reform involving a move from activity-based to results-based strategic planning and management, as described in Resolution 151 (Rev. Busan, 2014). The adoption of RBM by BDT is aimed at improving accountability and transparency and at identifying measures to further enhance the long-term delivery of ITU activities and results thereof.

In keeping with RBM principles, this report provides an overview of the main outcomes of BDT's activities since the beginning of DuAP implementation and emphasizes the linkage between expected results and actual achievements. It also details the implementation of the regional initiatives (Appendix 1) and financial implementation by region (Annex 1).



In September 2015, the United Nations General Assembly adopted 17 core Sustainable Development Goals (SDGs) and set 169 related targets (see [here](#)). Shortly thereafter, BDT began mainstreaming the SDGs into its work.

The structure of this report follows that of the DuAP, as shown in the table below.

Objectives	1	2	3	4	5
	Foster international cooperation on telecommunication/ICT development issues	Foster an enabling environment for ICT development and foster the development of telecommunication/ICT networks as well as relevant applications and services, including bridging the standardization gap	Enhance confidence and security in the use of telecommunications/ICTs, and roll-out of relevant applications and services	Build human and institutional capacity, provide data and statistics, promote digital inclusion and provide concentrated assistance to countries in special need	Enhance environmental protection, climate-change adaptation and mitigation, and disaster-management efforts through telecommunications/ICTs
Outputs	1.1 WTDC	2.1 Policy and regulatory frameworks	3.1 Building confidence and security in the use of ICTs	4.1 Capacity-building	5.1 ICTs and climate-change adaptation and Mitigation
	1.2 Regional preparatory meetings (RPMs)	2.2 Telecommunication/ICT networks, including conformance and interoperability and bridging the standardization gap	3.2 ICT applications and services	4.2 Telecommunication/ICT statistics	5.2 Emergency telecommunications
	1.3 Telecommunication Development Advisory Group (TDAG)	2.3 Innovation and partnership		4.3 Digital inclusion of people with specific needs	
	1.4 Study groups			4.4 Concentrated assistance to LDCs, SIDS and LLDC	

Implementation of the action plan by objectives and respective outputs

Objective 1 Foster international cooperation on telecommunication/ICT development issues

The purpose of Objective 1 is to develop, agree and review the work plan for the four-year development cycle through: the preparation and approval by WTDC of the action plan and draft strategic plan; the preparatory process undertaken through the regional preparatory meetings (RPMs); and the advisory role of the Telecommunication Development Advisory Group (TDAG). Objective 1 guides the implementation of the work programmes for the study groups and Questions concerned to ensure that they are executed in accordance with the corresponding WTDC decisions. It also aims to enhance dialogue, knowledge-sharing and consensus-building among Member States, ITU-D Sector Members, Associates and Academia on emerging telecommunication/ICT issues in relation to sustainable development.

1.1 World Telecommunication Development Conference (WTDC)

Meeting every four years, WTDC is a forum for discussion among ITU Member State administrations and ITU-D Sector Members. It establishes the priority areas and the guidelines for the following four-year cycle, assesses the results achieved during the previous cycle and reviews work programmes and projects. The last WTDC was held in March-April 2014.



1.1.1 Activities undertaken and results achieved during the preparation of WTDC-17

WTDC-17 will be held in Buenos Aires (Argentina) from 9 to 20 October 2017, at the kind invitation of the Government of Argentina and with the approval of the ITU Council and concurrence of a majority of ITU Member States. The theme of WTDC-17 is *ICT for Sustainable Development Goals* (ICT4SDGs). Its draft agenda was approved by the Council at its 2016 session with the support of a majority of Member States. The WTDC-17 website was launched to facilitate the dissemination to Member States and Sector Members of information (including circulars, documents, reports and contributions) of relevance to the event.



The WTDC-17 preparatory process has taken due account of the RBM principles in order to ensure a strong and coherent linkage between the Union's strategic, financial and operational planning, as required by PP Resolution 72 (Rev. Busan, 2014).

Since July 2016, invitation letters and various information circulars, including on the preparations being made for the 25th Anniversary of ITU-D, have been sent to the ITU membership to ensure a high level of participation in WTDC-17.

Established in 1992 by the Additional Plenipotentiary Conference held in Geneva, ITU-D has over the past 25 years spearheaded the rapid growth and expansion of telecommunication and ICT networks and services.

Output 1.1 contributed to the implementation of WTDC-14 and other relevant conference and assembly resolutions, recommendations and decisions.

WTDC and other relevant conferences and assembly resolutions, recommendations, and decisions	
WTDC	Resolutions 1, 2, 5, 30, 33, 37, 50, 53, 59, 81, 82
Plenipotentiary Conference (Busan, 2014)	Decisions 5, 13 Resolutions 25, 71, 72, 77, 111, 131, 133, 135, 139, 140, 151, 154, 165, 167, 172
WSIS Action Lines	C1 (The role of public governance authorities and all stakeholders in the promotion of ICTs for development), and C11 (International and regional cooperation) of the Geneva Plan of Action and Tunis Agenda for the Information Society contributed to Output 1.1
Contribution to SDGs	1, 3, 5, 10, 16, 17

1.2 Regional preparatory meetings (RPMs)

In accordance with WTDC Resolution 31 (Rev. Hyderabad, 2010), BDT organized one regional preparatory meeting (RPM) per region¹, as follows: Commonwealth of Independent States (CIS), in the Kyrgyz Republic in November 2016; Africa, in Rwanda in December 2016; Arab States, in Sudan in January-February 2017; Americas, in Paraguay in February-March 2017; Asia-Pacific, in Indonesia in March 2017; and Europe, in Lithuania in April 2017.



Regional Preparatory Meeting for Africa, Rwanda, December 2016

1.2.1 Activities undertaken and results achieved

The six RPMs and their associated regional development forums served to secure the timely engagement of the ITU membership in the WTDC-17 process through consideration, at the regional level, of appropriate ICT development strategies. To that end, the meetings and forums sought to identify priority areas and related regional initiatives, as well as study group Questions to be addressed in the

¹ Africa (AFR), Americas (AMS), Arab States (ARB), Asia-Pacific (ASP), Commonwealth of Independent States (CIS), Europe (EUR).

interests of telecommunication/ICT development. Throughout the preparatory process, full use was made of the ITU regional offices. The respective RPM websites were developed in July 2016 to support the exchange of relevant information (including circulars, documents, reports and contributions) with Member States and Sector Members.

All six RPMs discussed regional initiatives and developed draft proposals to WTDC-17. Subsequent meetings of the regional groups pursued their work on the drafts and approved consolidated regional proposals to WTDC-17. The text of all the agreed regional initiatives now forms an integral part of the regional common proposals to WTDC-17.



Regional Preparatory Meeting for Commonwealth of Independent States (CIS),
Kyrgyz Republic, November 2016

All RPMs welcomed the preliminary draft of the ITU-D contribution to the ITU Strategic Plan for 2020-2023 and the preliminary draft ITU-D Action Plan for 2018-2021, and agreed that more discussion was required at the regional level in order to prepare regional contributions to TDAG and WTDC-17 on those two documents.

The preliminary draft WTDC-17 Declaration was prepared using language that reflects a broader perspective and that will be easily understood not only by Member States and Sector Members, but also by people outside ITU. It focuses on the essential role that telecommunications/ICTs will play in achieving the SDGs and related targets, and on their transformative role in fostering sustainable development.



Regional Preparatory Meeting for Europe, Lithuania, April 2017

RPM-AFR, RPM-ARB and RPM-EUR each agreed that more discussions on the preliminary draft WTDC-17 Declaration were required in order to prepare their regional contributions on the draft to both TDAG and WTDC-17.

RPM-CIS revised the preliminary draft WTDC-17 Declaration as set out in Document RPM-CIS16/26 and agreed to prepare, on the basis thereof, a regional common proposal to WTDC-17.

RPM-AMS, which created an ad-hoc group on the preliminary draft WTDC-17 Declaration, reached a consensus on its revision of the draft as contained in Annex 2 to the Report of the RPM-AMS Chairman.



Regional Preparatory Meeting for Americas, Paraguay, February-March 2017

RPM-ASP, which likewise created an ad-hoc group on the preliminary draft WTDC-17 Declaration, noted the report of the group's chairman and agreed to use it as the basis for further work towards

developing a consolidated contribution from the region. The report is contained in Annex 2 to the Report of the RPM-ASP Chairman.

RPM-CIS agreed on a number of changes to WTDC Resolution 1, including the proposed merger of Resolutions 1 and 31. The resulting proposed text for Resolution 1 is contained in Document TDAG17-22/38.

RPM-AFR, RPM-ARB, RPM-AMS, RPM-ASP and RPM-EUR each agreed that more discussions on Resolution 1 were required in order to prepare regional contributions on that resolution to TDAG and WTDC-17.



Regional Preparatory Meeting for Arab States, Sudan, January-February 2017

Concerning the streamlining of resolutions, the RPMs produced the outcomes outlined below.

RPM-CIS supported the proposed merger of Resolutions 17 and 32 and of Resolutions 37 and 50, and agreed to prepare a regional common proposal to that end. The resulting proposed texts for Resolutions 17 and 37 are contained in Document TDAG17-22/38.

RPM-AFR supported the streamlining of resolutions and decided to consider inputs at a later stage in the region's preparatory process.

RPM-ARB noted that while the draft guiding principles could be used by regional groups in developing their common proposals, they need not be discussed and adopted as a rule in WTDC.

RPM-AMS discussed specific proposals on merging resolutions and agreed that those proposals would be discussed in greater detail within the region in preparation for WTDC-17.

RPM-ASP supported the resolution-streamlining exercise, at the same time noting that it should not lead to a loss of substance in existing resolutions. The meeting discussed specific proposals for the merging of resolutions and took note of the contributions.



Regional Preparatory Meeting for Asia-Pacific, Indonesia, March 2017

RPM-EUR also supported the exercise. It welcomed and noted the contribution that had been submitted on that topic.

The RPMs also agreed that the draft new or revised resolutions tabled at the RPMs can be submitted directly by members to WTDC-17.

Output 1.2 contributed to the implementation of WTDC-14 and other relevant conference and assembly resolutions, recommendations and decisions.

WTDC and other relevant conferences and assembly resolutions, recommendations, and decisions	
WTDC	Resolutions 1, 5, 17, 25, 30, 31, 33, 37, 48, 50, 59, 61, 81
Plenipotentiary Conference (Busan, 2014)	Decisions 5, 13 Resolutions 25, 71, 111, 135, 140, 165, 167, 172
WSIS Action Lines	C1 (The role of public governance authorities and all stakeholders in the promotion of ICTs for development), and C 11 (International and regional cooperation) of the Geneva Plan of Action and Tunis Agenda for the Information Society contributed to Output 1.2
Contribution to SDGs	1, 3, 5, 10, 16 and 17

1.3 Telecommunication Development Advisory Group (TDAG)

TDAG provided strategic guidance on key issues related to the fulfilment of the mission, objectives, outputs and expected results of BDT's work since WTDC-14.

1.3.1 Activities undertaken and results achieved

The 19th meeting of TDAG took place at ITU headquarters in Geneva from 29 September to 1 October 2014. It provided a summary report on the conclusions of WTDC-14 held in Dubai. The main results of the meeting were:

- the establishment of correspondence groups for three key areas;
- definition of the specific roles of vice-chairmen;
- the review of outcome indicators and key performance indicators (KPIs) for the ITU-D operational plan for 2015-2018.



19th meeting of TDAG, held from 29 September to 1 October 2014

TDAG held its 20th meeting at ITU headquarters in Geneva from 28 to 30 April 2015. It reviewed the Plenipotentiary Conference (Busan, 2014) outcomes and resolutions and their implications for

the work of ITU-D; reviewed the implementation of the ITU-D strategic plan and operational plan for 2014, including WTDC-14 resolutions and regional initiatives; considered the draft operational plan for 2016-2019; and convened the first meetings of:

- the Correspondence Group on WTDC Resolution 1 (Rev. Dubai, 2014), on rules of procedure of the ITU Telecommunication Development Sector, (CG-Res.1), which mainly studied and reviewed Resolution 1 and related matters;
- the Correspondence Group on the Strategic Plan, Operational Plan and Declaration (CG-SPOPD), which reviewed the strategic plan, operational plan and DuAP, and proposed elements for the draft Declaration;
- the Inter-Sector Coordination Team on Issues of Mutual Interest to ITU Sectors (ISCT), which identified subjects common to two or all of the three ITU Sectors and necessary mechanisms for strengthening cooperation and joint activities between them.

A significant outcome is that these discussions resulted in the very timely preparation of key documents for WTDC-17, enabling the ITU membership to build consensus at an early stage and thus freeing more time for policy discussion during WTDC-17.

The 21st meeting of TDAG took place from 16 to 18 March 2016 at ITU headquarters in Geneva. At this meeting, TDAG reviewed:

- the preparations for WTDC-17;
- the implementation of the ITU-D strategic plan and operational plan;
- the ITU-D four-year rolling operational plan 2017-2020;
- the ITU-D contribution to the implementation of the WSIS Plan of Action, including the overall review and the SDGs;
- ITU-D's working methods;
- collaboration with the other Sectors;
- matters relating to the ITU-D study groups;
- matters relating to membership, partnership and innovation;
- the outcomes of the 2015 Radiocommunication Assembly and 2015 World Radiocommunication Conference.

Meetings of the following took place on 15 March 2016:

- the Correspondence Group on Rules of Procedure (WTDC Resolution 1).
- the Correspondence Group on the Strategic Plan, Operational Plan and Declaration.
- the Inter-Sector Coordination Team on Issues of Mutual Interest.

The 21st meeting of TDAG endorsed the creation of the Correspondence Group on Streamlining WTDC Resolutions (CG-SR), agreed on the group's terms of reference and appointed its chairman. The first CG-SR meeting took place on 17 March 2016 and agreed on its working methods. Preliminary draft guidelines for streamlining WTDC resolutions and for the mapping and clustering of WTDC resolutions and recommendations were presented for discussion and review during the second CG-SR meeting, held on 28 September 2016.

TDAG correspondence groups provided tangible inputs to key WTDC-17 documents. The outcomes of TDAG discussions provided a clear picture on ITU-D specific priorities for the period 2017-2020.



22nd meeting of TDAG, held from 9 to 12 May 2017

The 22nd meeting of TDAG, held from 9 to 12 May 2017 at ITU headquarters in Geneva, reviewed the preparations for WTDC-17, the outcomes of the six RPMs via the RPM Coordination Meeting held on 8 May 2017, the conclusions of the work of the three correspondence groups and the outcomes of the work of the Inter-Sector Coordination Team on Issues of Mutual Interest.

Concerning the draft versions of the ITU-D contribution to the ITU Strategic Plan for 2020-2023, the ITU-D Action Plan for 2018-2021 and the WTDC-17 Declaration, TDAG welcomed the results achieved by CG-SPOPD and expressed appreciation to its chairman, Dr Fabio Bigi, for the work undertaken. TDAG requested the BDT Director to submit to WTDC-17 the versions of the preliminary draft ITU-D contribution to the ITU Strategic Plan for 2020-2023, the preliminary draft ITU-D Action Plan for 2018-2021 and the preliminary draft WTDC-17 Declaration that had been submitted to each RPM. TDAG invited members to make their proposals to WTDC-17 based on those documents. TDAG drew attention to Documents TDAG17-22/7, TDAG17-22/8 and TDAG17-22/9, containing the compilation of RPM outcomes and contributions to TDAG-17, and invited members to use those documents in their preparations for WTDC-17.

Documents were discussed during the meeting of TDAG's CG-Res.1, held on 10 May 2017. TDAG welcomed the results achieved by the group and expressed appreciation to its chairman, Ms Roxanne McElvane Webber, for the work undertaken. TDAG advised members to use the compilation Document TDAG17-22/10 in their preparations for WTDC-17.

Documents were considered by the meeting of TDAG's CG-SR, held on 10 May 2017. TDAG welcomed the results achieved by CG-SR and expressed appreciation to its chairman, Dr Ahmad Reza Sharafat, for the work undertaken. TDAG noted that representatives from three regions had expressed their wish to work on common proposals for streamlining Resolutions 17 and 32 and Resolutions 37 and 50. TDAG endorsed the guidelines for streamlining WTDC resolutions in Annex 1 to Document TDAG17-22/11 and recommended that that material be used in the preparations for WTDC-17.

Documents were considered by the meeting of ISCT, held on 10 May 2017. TDAG noted the report with appreciation and thanked the chairman, Dr Fabio Bigi, for the work undertaken. It was proposed that gender aspects be considered for inclusion in the areas of mutual interest, it being noted that gender is a cross-cutting issue. TDAG expressed its appreciation for the mapping tables provided in the two attachments to the report: Attachment 1 on matching of ITU-D Study Groups 1 and 2 Questions of interest to ITU-T study groups; and Attachment 2 on matching of ITU-R working parties of interest to ITU-T study groups. These mapping tables were considered very useful when preparing proposals on ITU-D study Questions. It was also proposed to add, in Appendix 2, a reference to ITU-R Study Group 1 Question 1/239 on electromagnetic field (EMF) measurements.

Output 1.3 contributed to the implementation of WTDC-14 and other relevant conference and assembly resolutions, recommendations and decisions.

WTDC and other relevant conferences and assembly resolutions, recommendations, and decisions	
WTDC	Resolutions 1, 5, 17, 24, 30, 33, 37, 50, 59, 61, 81
Plenipotentiary Conference (Busan, 2014)	Decisions 5, 13 Resolutions 25, 71, 111, 135, 140, 151, 154, 165, 166, 167, 172
WSIS Action Lines	C1 (The role of public governance authorities and all stakeholders in the promotion of ICTs for development), and C 11 (International and regional cooperation) of the Geneva Plan of Action and Tunis Agenda for the Information Society contributed to Output 1.3
Contribution to SDGs	1, 3, 5, 10 and 16

1.4 Study groups

The ITU-D study groups follow the process set out in Resolution 1 (Rev. Dubai, 2014) and work in accordance with the work plans adopted by WTDC-14. Study Group 1 examines issues relating to the enabling environment for the development of telecommunications/ICTs. Study Group 2 examines matters relating to ICT applications, cybersecurity, emergency telecommunications and climate-change adaptation. At WTDC-14, 23 chairmen and vice-chairmen were appointed to lead the work.

1.4.1 Activities undertaken and results achieved

The two ITU-D study groups successfully held their first meetings for the new period, from 15 to 26 September 2014. Study Group 1 welcomed almost 160 participants from 58 Member States, while Study Group 2 was attended by 158 participants from 63 Member States. The key results were as follows:

- Establishment of work plans for each study topic and of specific working methods to enable the study groups to achieve the results set by WTDC. Preparation of initial tables of contents and overviews for specific deliverables for the 2014-2017 study period.
- Appointment of 111 rapporteurs and vice-rapporteurs to manage and organize the work of all study Questions in order to achieve the expected outcomes. A significant number of contributions (69 for Study Group 1 and 96 for Study Group 2), including liaison statements, were received for consideration by the groups.

From 7 to 18 September 2015, the two ITU-D study groups held their second meetings for the 2014-2017 study period to progress the work items agreed by WTDC-14. Study Group 2 welcomed almost 190 participants from 52 Member States, while Study Group 1 was attended by almost 220 participants from 65 Member States. Study Groups 1 and 2 considered 136 and 121 contributions, respectively. Following agreement at these meetings, a number of surveys were conducted to gather specific information in the interests of progressing the work on study group Questions. Both study groups agreed on preliminary draft outlines for the WTDC expected outputs for all Questions and for Resolution 9. Five additional vice-rapporteurs were appointed for Questions 5/1, 7/1, 2/2, 3/2 and 7/2.

Three associated events were held during the meetings:

- A joint ITU-T Study Group 17 and ITU-D Study Group 2 Question 3/2 cybersecurity workshop.

- The ITU global dialogue on international mobile roaming: Let's roam the world.
- The first ITU-D academia network meeting.

The ITU-D study groups held their third meetings for the 2014-2017 study period from 19 to 30 September 2016. ITU-D Study Group 1 welcomed 180 participants from 57 Member States, while Study Group 2 brought together 160 participants from 45 Member States. Study Groups 1 and 2 considered 137 and 116 contributions, respectively. The meetings reviewed the draft reports and other deliverables requested by WTDC-14, consisting of practical guidance, checklists, toolkits, guidelines and training material, and exchanged preliminary thoughts on the future of the study Questions and possible study topics. As a result of the meetings, the groups made significant progress on their expected deliverables. Three additional vice-rapporteurs were appointed for Questions 2/1, 5/1 and 8/1, and two co-rapporteurs for Question 8/2. A new vice-chairman for the ITU-D/ITU-R joint group on Resolution 9 was also appointed. An emergency telecommunications and disaster relief workshop was held in conjunction with the Study Group 2 meetings. For the first time, sponsorship opportunities were made available for activities, such as exhibits, side events and social events, around the September 2016 Study Group 1 and 2 meetings. Additional funds for fellowships were also raised, thanks to sponsors.



ITU-D Study Group 1, 2017, final meeting of the study period 2014-2018

The final Study Group 1 and 2 meetings for the 2014-2017 study cycle took place from 27 March to 7 April 2017. Study Group 1 welcomed 155 participants from 47 Member States, while Study Group 2 also attracted 155 participants, from 50 Member States. Study Group 1 considered 66 contributions and Study Group 2 examined 58 contributions, including the draft deliverables. The Study Group 1 and 2 meetings agreed to 18 final reports containing the deliverables called for by WTDC-14 for all the study Questions for the two groups. The groups also continued discussing the future of those Questions, which in turn served to inform Member States as they prepared for WTDC-17. Sponsorship opportunities were again made available for activities, such as exhibits, side events and social events, around Study Group 1 and 2 meetings, including rapporteur group meetings, in 2017.

The ITU-D study groups held their first set of rapporteur group meetings for the new study period in April-May 2015. Those meetings reviewed contributions and tables of contents for each Question, and determined where further contributions were needed. They also refined the methodology to be used in achieving the expected results for each Question, revised the work plans for each Question taking into consideration the new scheduling of the next WTDC, and drafted text for the deliverables.

The ITU-D study groups held their second set of rapporteur group meetings in April 2016. High-quality contributions were received for consideration, enabling the rapporteur group meetings to make good progress in drafting texts for their deliverables.

The ITU-D study groups held their third set of rapporteur group meetings for the 2014-2017 study period in January 2017. Study Group 1 rapporteur groups, including the Joint ITU-D/ITU-R Group for WTDC Resolution 9, met in Geneva from 9 to 18 January 2017, followed by Study Group 2 rapporteur group meetings from 18 to 27 January 2017. The rapporteur group meetings were an important milestone towards completion of the expected deliverables under all the study Questions for the study period. Significant progress was made on the expected deliverables, and the groups also brainstormed on possible future directions and related activities for their specific study Questions. Such reflection on the future of study Questions was useful to members as they debated and formulated proposals on those matters in preparation for WTDC-17.



ITU-D Study Group 2, 2017, final meeting of the study period 2014-2018

On 26 January 2017, in conjunction with the rapporteur group meeting for Question 3/2 (cybersecurity), an open workshop was held on the topic of cybersecurity and risk assessment in practice. Experts gathered to share their knowledge and experience regarding the practical assessment of cyber-risks at the national level, in large organizations and in critical infrastructure sectors. Supply chain risks and the role of standards in the management of cyber-risks in organizations were also debated. The results of the workshop were incorporated into the final report of Question 3/2.

In addition, expert meetings for Question 8/1 (Examination of strategies and methods of migration from analogue to digital terrestrial broadcasting and implementation of new services) and WTDC Resolution 9 (Participation of countries, particularly developing countries, in spectrum management) were held from 15 to 19 February 2016 in Budapest (Hungary) in conjunction with a workshop on spectrum management and digital terrestrial television (DTTV) broadcasting. The meetings made significant progress on the draft deliverables of Question 8/1 and WTDC Resolution 9, and also benefited from additional contributions and content through the holding of an associated workshop.

Two regional workshops on consumer protection were held, in Chongqing (People's Republic of China) in November 2016 and Cotonou (Benin) in March 2017, to raise awareness on consumer protection issues in a digital collaborative economy. The workshop held in China took place in conjunction with an expert meeting for Question 6/1 (Consumer information, protection and rights: laws, regulation, economic bases, consumer networks).

The expert meetings and workshops provided the ITU-D study groups with rich content and ideas to be explored in the future as possible study topics.

Output 1.4 contributed to the implementation of WTDC-14 and other relevant conference and assembly resolutions, recommendations and decisions.

WTDC and other relevant conferences and assembly resolutions, recommendations, and decisions	
WTDC	Resolutions 1, 2, 5, 9, 17, 21, 30, 33, 50, 59, 61, 80, 81
ITU-D	Recommendations 15, 16, 17, 19, 20, 21, 22
Plenipotentiary Conference (Busan, 2014)	Decisions 5, 13
	Resolutions 25, 71, 133, 135, 140, 154, 165, 166, 167, 172
WSIS Action Lines	C1 (The role of public governance authorities and all stakeholders in the promotion of ICTs for development), and C11 (International and regional cooperation) of the Geneva Plan of Action and Tunis Agenda for the Information Society contributed to Output 1.4

Objective 2 Foster an enabling environment for ICT development and foster the development of telecommunication/ICT networks as well as relevant applications and services, including bridging the standardization gap

The main purpose of Objective 2 is to assist the ITU membership in creating and maintaining an enabling telecommunication/ICT policy and regulatory environment by promoting dialogue and co-operation among policy-makers, regulators and other telecommunication/ICT stakeholders, in developing and implementing effective financing policies and strategies; to assist the ITU membership in maximizing the utilization of new and sustainable technologies as well as relevant applications and services for the development and maintenance of resilient telecommunication/ICT networks; and to strengthen ITU membership capabilities to integrate ICT-centric innovation in their national development agendas and promote a culture of innovation through enhanced partnership and cooperation with multi-stakeholders in a converged ICT ecosystem.

2.1 Policy and regulatory frameworks

This output seeks to achieve enhanced dialogue and cooperation among national regulators, policy-makers and other telecommunication/ICT stakeholders on topical policy, legal and regulatory issues to help countries achieve their goals of creating an enabling environment for a more inclusive information society through improved decision-making on an effective policy, legal and regulatory environment for the ICT sector.

2.1.1 Results achieved

ITU-D convenes global and regional forums to discuss global trends in regulation for Sector Members and other national and international stakeholders, including the [Global Symposium for Regulators \(GSR\)](#) and strategic dialogues on topical policy, legal and regulatory issues, as well as on economic and financial issues and market developments. GSR (see [here](#) for GSR meeting reports and outputs), which is the annual global venue at which regulators share their views and experiences, culminates in the adoption of [best-practice guidelines](#). In 2014, the Bahrain Telecommunications Regulatory Authority hosted [GSR-14](#), attracting some 700 participants from over 60 countries, under the theme *Capitalizing on the potential of the digital world*; [GSR-15](#), *Mind the Digital Gap - Regulatory Incentives to achieve digital opportunities*, was hosted by the Gabonese Regulatory Authority for Electronic Communication and Posts, drawing some 400 participants from over 60 countries; [GSR-16](#), with over 540 participants from 64 countries, was hosted by the National Telecommunications Regulatory Authority of Egypt under the theme *Building Blocks for Smart Societies in a Connected World*; and [GSR-17](#) attracted more than 400 participants from 68 countries, and was hosted by the Government of Bahamas and by the Utilities Regulation and Competition Authority of the Bahamas, from 11 to 14 July 2017, under the theme *Living in a World of Digital Opportunities*.



Global Symposium for Regulators (GSR), 2017

A series of pre-events precede each GSR, including the Regional Regulatory Associations Meeting and Private Sector Chief Regulatory Officers Meeting. In 2016, the ITU Global Dialogue on Digital Financial Inclusion was held as a thematic pre-event, with the support of the Bill & Melinda Gates Foundation, attracting over 500 participants from the telecommunication and financial services sectors.

Regional economic and financial forums attracted over 200 participants from 60 countries in 2014 and 2015, and over 275 participants from 50 countries in 2016. The *Let's Roam the World Initiative* on international mobile roaming (IMR), launched in 2015 by the Director of BDT, included a September 2015 [high-level workshop on IMR](#), which welcomed over 50 participants; a September 2016 [IMR consultation meeting](#), which attracted over 15 regional regulatory associations, consumer associations and other international and regional organizations; and a discussion during the GSR-17 Regulatory Associations Meeting and during GSR-17 itself, where a [consultation on draft guidelines](#) was launched. The *Let's Roam the World Initiative* aims to support members in the definition and adaptation of best IMR practices and guidelines for all stakeholders worldwide.



ITU-D continues to provide high-quality data, research and analysis, as well as tools (such as reports, discussion papers, publications, portals and databases) to support the ITU membership in defining, elaborating, implementing and reviewing transparent, coherent and forward-looking strategies and policy, legal and regulatory frameworks, while moving towards evidence-based decision-making.

The series of [Trends in Telecommunication Reform](#) reports includes *Regulatory incentives to achieve digital opportunities* (2016); *Getting ready for the digital economy* (2015); and *Fourth-generation regulation: Driving digital communications ahead* (2014).

Various thematic studies on cutting-edge policy, regulatory and economic issues, including ten broadband reports and economic and financial reports, have been published. In 2017, ITU-D launched the [2017 Global Regulatory Outlook Report](#), the first report in a new annual series tracking market and regulatory trends in the ICT sector and their implications across the economy.

Annual ITU-D questionnaires are distributed to the membership to gather information on [regulatory and policy issues](#) and [tariff policy issues](#). Through the use of quantitative methods, the regulatory and policy data collected facilitate both the benchmarking and evolution of trends in legal and regulatory frameworks, under four key topics: regulatory authority, regulatory mandate, regulatory regime and competition framework. On the basis of such concrete data, ITU-D has developed the [ICT Regulatory Tracker](#) that covers over 186 countries for a period of nine years, showcasing national, regional and global regulatory progress. The Tariff Policy Survey addresses developments in the application of tariff policies, tariff models and calculation methods for national telecommunication service rates in different countries, the results of which are published in the [ICT-Eye](#).

ITU-D 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. Website views and downloads of regulatory and financial data from May 2014 to June 2017 generated the following figures for membership and public outreach:

- ICT Regulation Toolkit: 478 411 page views
- Online knowledge centre: 599 717 page views
- Annual GSR websites: 219 272 page views
- Trends in Telecommunication Reform 2014 (free-of-charge edition): 35 679 downloads
- Telecommunication Regulation Handbook: 138 204 downloads
- ITU regulatory and market environment thematic reports: 162 829 downloads
- ICT-Eye: 720 912 page views.



In addition, a new ITU intersectoral web portal on [International Mobile Roaming \(IMR\) Resources](#) has been developed to bring together all ITU IMR resources and activities, as well as activities and initiatives by regulatory associations, regional and international organizations and other stakeholders. It also highlights key findings from ITU publications, studies, research, ITU study groups and IMR data and analysis from the ICT-Eye.

Since 2015, direct assistance has been provided to over 20 countries and regions to help them achieve a more inclusive information society and to raise national and regional awareness on the importance of an environment that enables digital empowerment and inclusion in a smart connected society.

In the Africa region

The ITU Regional Office for Africa annually convenes the [Forum on Telecommunications/ICT Regulation and Partnership in Africa](#) (FTRA) and Working Party on Private Sector Issues, which are platforms for interaction between regulators, policy-makers and the private sector, resulting in a better understanding of key regulatory issues. The FTRA and Working Party on Private Sector Issues events held in Abidjan (Côte d'Ivoire) from 23 to 25 March 2016, under the theme "Challenges of regulating in an information society with no boundaries", attracted 262 participants from 23 countries and 18 private-sector entities. The meetings concluded with a series of recommendations to all telecommunication/ICT players, and called on ministers in charge of the digital economy to put those recommendations into practice by, among other things, finding ways to develop the digital economy within the continent through adequate training and innovation and by fostering a culture of entrepreneurship. The regulators were requested to work on harmonizing roaming in the interests of limiting the additional call charges it generated, and to set a limit on retail costs. In 2015, FTRA was not convened because GSR was held in Africa.

A workshop on universal service/access policies and regulations was co-organized in 2014 with the Universal Service Obligation (USO) Fund of Tanzania to further elaborate the guidelines developed under the ITU/European Commission (EC) “Harmonization of the ICT Policies in Sub-Saharan Africa” (HIPSSA) project. It was attended by all eastern and southern African countries. A similar workshop, attended by 77 participants from 12 countries, was held for countries in western and central Africa in 2015. Both workshops enabled participating countries to streamline their regulatory and legal frameworks pertaining to USO funds.

A forum on economics and finance in telecommunications/ICTs for Africa, held back to back with ITU-T’s Study Group 3 regional meeting for Africa from 30 January to 2 February 2017 at Victoria Falls (Zimbabwe), was attended by 91 participants from 25 countries and five institutions. The forum examined the impact of over-the-top (OTT) and digital services in Africa as well as best practices for collaborative regulations to maximize the benefits of the digital economy in the region.



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

The ITU Regional Forum on Consumer Information, Protection and Rights for Africa, held in Cotonou (Benin) from 14 to 16 March 2017, attracted 131 participants from 21 countries, including Sector Members, Academia and a number of African consumer associations. The forum provided a platform for sharing experiences and adopted a set of guidelines and recommendations aimed at strengthening partnerships between stakeholders at the national and regional levels.

The quality of service (QoS) and quality of experience (QoE) training for the SADC region, co-organized with the Communications Regulators Association of Southern Africa and hosted by the Botswana Communications Regulatory Authority (BOCRA) in May 2017, attracted 104 participants from eight of the twelve SADC countries. A set of guidelines and recommendations for harmonizing regulatory practices and tools for QoS and QoE for the SADC region were adopted.

Swaziland implemented its new laws on ICT and established a new regulatory authority, Swaziland Communications Commission, with the assistance of ITU experts. This has resulted in the establishment of an independent ICT regulator in Swaziland.



Through technical assistance provided by ITU, Gambia adopted a new ICT market and competition assessment framework that will be the driver for an enhanced level of market efficiency and growth in the ICT sector.

Three workshops were successfully conducted for the National Telecommunications Commission of Sierra Leone (NATCOM): the first, on operators’ business efficiency, competition and market, pricing and costing; the second, on spectrum management; and the third, on training in telecommunication law.

A workshop successfully organized for the *Autorité de Régulation des Communications Electroniques et des Postes* of Burkina Faso (ARCEP) focused on possible interference issues between aviation and

telecommunication frequency bands and highlighted possible safeguards for those concerned. The workshop, which brought together stakeholders from the regulator, national operators, civil aviation, radio and television broadcasting and national defence, resulted in a better appreciation of the frequency management role across the various sectors.

A broadband universal access study and household survey was conducted for Lesotho, in partnership with Research ICT Africa and the regulatory authority, to guide the country in reviewing its broadband universal access policy and ICT investment strategies. Based on the outcome of the workshop, the Government of Lesotho proceeded with the necessary updating of its broadband universal access policy and ICT investment strategies, previously prepared with ITU assistance.

The Regional Initiative on Strengthening and Harmonizing Policy and Regulatory Frameworks for the Integration of African Telecommunication/ICT Markets has achieved the following results:

- Harmonized national ICT policies and regulatory frameworks in the Economic Community for Central African States.
- Establishment of the National Communications Authority of South Sudan.
- Development of a national broadband plan model for SADC countries, which are gradually transposing the model into their respective national plans.
- ITU assistance for Namibia and Swaziland with development of their respective national broadband plans, using the SADC national broadband model.
- Studies for wireless networks in Madagascar were launched in 2016.



In the Americas region

In 2015, a total of 25 participants from ITU Member States and 59 from 44 private organizations benefited from a workshop at which discussions on telecommunication service quality, e-applications and visions and strategies for the ICT sector were jointly promoted by ITU and Brazil's National Telecommunications Agency (Anatel) during Futurecom, one of the main ICT events in Latin America.

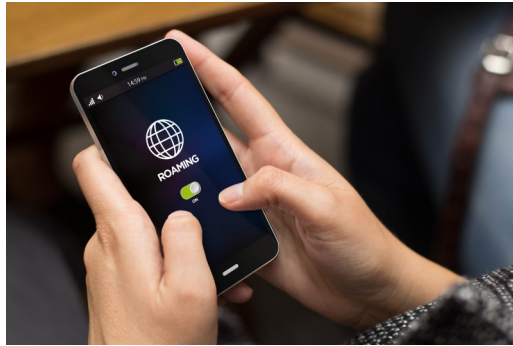
The Regional Initiative on the Development of Broadband Access and Adoption of Broadband has achieved the following results in the Americas region:

- Provision of assistance for the development of guidelines for sustainable broadband infrastructure in rural areas.
Sharing of broadband studies.
- Formulation and development of national broadband policies for implementation of a broadband technology framework.

The Regional Initiative on the Reduction of Telecommunication Service Prices and Internet Access Costs has achieved the following results:

- Support to Paraguay for the deployment of a national Internet exchange point (IXP) that was brought into service in August 2016.
- Capacity-building for the Administration of Paraguay and management of a national IXP, as well as training on the planning, design and future implementation of the government wide-area network (G-WAN).
- Development of draft model policies and laws for e-waste.

- Improved awareness and enhanced capacity within the countries of the region through the delivery of several training courses, workshops, seminars and forums focusing on ICT development, broadband infrastructure, applications and services, infrastructure development, spectrum management and related issues (including frequency coordination in border areas), satellite coordination, IPv6 implementation, Internet access and conformity and interoperability.



In the Arab States region

In 2015, over 40 participants from seven countries in the Arab States region benefited from an overview, provided during an IP interconnection workshop held in Khartoum (Sudan), of the issues involved in establishing interconnection in an IP-based environment, the technical challenges of IP interconnection, and charges and cost modelling for IP interconnection.

A regional workshop on “Mobile roaming: national and international practices”, also held in Khartoum (Sudan) in 2015, increased the knowledge and understanding of more than 50 participants from 11 countries in the Arab region on roaming principles, models, processes, national roaming and IMR, ITU Recommendations on IMR, building roaming relationships, and the regulatory and commercial aspects of roaming.

Over 45 participants from seven countries in the Arab region attended the regional workshop on competition in telecommunication markets, held in Sudan from 24 to 26 May 2016, gaining a deeper understanding of the principles of competition in telecommunication/ICT markets, the types and structures of telecommunication/ICT markets, competition as an economic growth factor and how to regulate and manage telecommunication/ICT competition.



During the regional workshop for Arab States on digital financial inclusion, held in Sudan on 24 and 25 August 2016, over 100 participants from telecommunication and financial services regulators from the Arab region (of which two-thirds from financial institutions) built a platform for dialogue on the challenges facing their respective sectors in terms of regulation in the area of mobile money. The opportunities raised and challenges posed by mobile payments in the context of financial service stimulation and financial inclusion were discussed.

Participants from countries in the Arab region were able to broaden their skills and experiences in regard to changes in regulatory and operational frameworks, and to boost their understanding of the impact of technological evaluation on the ICT sector, through a regional training entitled Big Challenges for Telecom Operators and Regulators, held in Morocco from 2 to 4 November 2016.

Eighty participants from 14 countries attended workshops, held during the 2015 and 2016 annual meetings of the Arab Regulators Network (AREGNET), which broadened their understanding of OTT content and Internet-of-Things (IoT) regulatory and technical issues.

The ITU Regional Economic and Financial Forum of Telecommunications/ICTs for the Arab States, held in Muscat (Oman) on 6 and 7 December 2016, promoted dialogue on affordable access to broadband services, economic and financial issues in a converged broadband environment, and challenges in the digital ecosystem.

In addition to the above:

- Cooperation on conformity and interoperability (C&I) between countries in the Arab region was promoted through mutual recognition agreements.
- The Arab ICT Organization (AICTO) was supported in a study on the impact of OTT content and services on Arab telecommunication markets.
- Training in the field of terrestrial and space radiocommunication services was provided to 65 specialists from the Arab region.
- Experts from the ITU Radiocommunication Bureau gave presentations on terrestrial and space matters aimed at enabling their specialist audience to deepen their understanding of ITU tools and procedures, including notification procedures, the preparation of frequency assignment notices and ITU/BR software.
- A review was carried out on assistance for developing Djibouti's legal and regulatory framework instruments for its telecommunication sector.
- Knowledge and best practices were shared on how ICTs contribute to achievement of the SDGs and 2030 Agenda for Sustainable Development during an ITU/BDT Regional Economic and Financial Forum of Telecommunications/ICTs for the Arab States, held in Nouakchott (Mauritania) on 17 and 18 May 2017 and attended by 85 participants from six countries.

In the Asia-Pacific region



A strengthened regulatory environment with greater exchange and information-sharing was achieved through the annual Regulators' Round Table and International Training Programme, which reached over 300 participants from more than 25 countries over the period 2014 to 2016.

Decision-making skills in regard to policy and regulatory issues were enhanced through awareness building and specialized advice provided during the course of several forums, seminars, workshops and training events on topics relating to an enabling environment for a smart society, smart sustainable cities, OTT services, compliance testing of mobile base stations and broadcast stations, regulation in the broadband and converged era, spectrum management, costing, licensing, QoS and other regulatory issues. In addition, specialized assistance, including direct country assistance, was provided to the following 20 countries in the areas of policy, legislation and regulatory frameworks: Afghanistan, Bangladesh, Bhutan, Brunei Darussalam, Cambodia, Fiji, India, Lao P.D.R., Maldives, Mongolia, Myanmar, Nepal (Republic of), Pakistan, Papua New Guinea, the Philippines, Samoa, Sri Lanka, Timor-Leste, Thailand and Viet Nam.

The Regional Initiative on Policy and Regulation has improved policy, regulatory and legislative frameworks through direct country action in the areas of ICT laws and regulatory institutional strengthening, as well as through policy and regulatory assistance in areas such as licensing, liberalization, sector review, numbering, tariffs, national frequency table updates and dispute resolution.

Direct country assistance has also been provided in priority areas such as DTTV, affordable Internet access, transmission technology mapping, strategic plan on telecommunication infrastructure, compliance testing of mobile base stations, C&I and type approvals, and development of spectrum management master plans (for Bangladesh, Brunei Darussalam, Thailand, Pakistan and Fiji, from 2014 to 2016).

The region has gained enhanced capacity thanks to training events, workshops, seminars, forums and direct country assistance provided to over 800 participants from 38 Member States between June 2014 and December 2016.

In the Commonwealth of Independent States

Satellite communication development in Armenia improved following the ITU expert assistance provided in August 2015.

Regional collaboration on radiocommunication and satellite issues has increased. In particular, 55 participants from eight CIS countries gained a deeper understanding, during an ITU regional workshop held in Yerevan (Armenia) from 27 to 29 June 2016, of how the decisions of the 2015 World Radiocommunication Conference (WRC-15) and Radiocommunication Assembly (RA-15) should be implemented in the CIS countries.



With regard to the Regional Initiative on the Development of Broadband Access and Adoption of Broadband, ITU established a framework for its implementation, identified prospective partners and estimated the required funds.

Awareness of the results achieved within the framework of the WTDC-14 CIS regional initiatives led to greater commitments – particularly as expressed during the Regional Development Forum for the CIS, held in Bishkek (Kyrgyz Republic) on 8 November 2016 and attended by over 100 representatives from 11 countries – to participate in ITU activities.

The ITU Regional Forum for the CIS and Europe, held in Chisinau (Moldova) on 28 and 29 March 2017 with 54 participants from 12 countries, saw strengthened regional cooperation, information-sharing and discussion on innovation and start-ups in the field of ICT, as well as constructive dialogue between international, regional and national stakeholders.

In the Europe region

The capacity of 225 stakeholders from some 20 countries was enhanced through the exchange of regulatory practices during the annual regional regulatory conference hosted in 2015, 2016 and 2017 by the Agency for Electronic Communications and Postal Services of Montenegro. Stakeholders also benefited from the opportunity to review priorities for future actions in the region.

The Regional Initiative on the Development of Broadband Access and Adoption of Broadband resulted in the strengthening of regional cooperation among relevant stakeholders in the region and in capacity-building for over 1 000 professionals on broadband access technologies, QoS and QoE, network planning, spectrum management and broadcasting. Best practices were shared across the region on the establishment of IXPs and national approaches to broadband development. In addition, bilateral cooperation was strengthened through twinning programmes with the participation of four countries (Albania, Poland, Slovenia and Hungary), under which technical specifications for the development of QoS and broadband mapping systems were developed and capacities on spectrum management enhanced. Specific studies and benchmarks were also developed, including a review of broadband plans in central and south-eastern European countries. The broadband infrastructure in Europe was mapped in the ITU Interactive Terrestrial Transmission Map.

The regional initiative also resulted in the following:

- A series of meetings and online training events provided an opportunity for sharing best practices across the region.
- A national IXP was established in Montenegro and is now fully operational.
- A special initiative leading towards elaboration of the Master Plan for Transition from Internet protocol version 4 (IPv4) to IPv6 was initiated for Montenegro and neighbouring countries.
- The terrestrial broadband infrastructure of over 90 per cent of the countries of the Europe region was reflected on the global ITU map.
- The 2015 Regional Development Forum for Europe, hosted by the Ministry for Information Society of Romania and the National Authority for Management and Regulation in Communications, focused on broadband for sustainable development.

In addition, more than ten countries exchanged national approaches on QoS and peer reviewed the ITU Academy Quality of Service Training Programme during the European Regional Workshop on New Issues in QoS Measuring and Monitoring, held in Bologna (Italy) on 25 and 26 November 2015 in collaboration with the Italian Ministry of Economic Development and hosted by the Foundation Ugo Bordoni.



IXP center in Montenegro

Cooperation with the European Commission in the field of broadband development included the organization of a joint ITU-European Commission Regional Conference for Europe on Broadband Services and Infrastructure Mapping, hosted by the Office for Electronic Communication on 11 and 12 April 2016 in Poland, and the submission of contributions to the Steering Committee and Technical Review Panel of the European Monitoring Platform for Mapping of QoS and QoE (which meets on a regular basis in Brussels). Those actions have resulted in a strengthening of cooperative relations with the European Commission.



In addition, an expert 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 in line with Sustainable Development Goal 7 (SDG7) “Affordable and clean energy”, which has set targets in respect of access to affordable, reliable, sustainable and modern energy for all.

2.1.2 Study group Questions

The following study group Questions contributed to WTDC-14 Output 2.1: Policy and regulatory frameworks:

Question 4/1: Economic policies and methods of determining the costs of services related to national telecommunication/ICT networks, including next-generation networks.

Question 6/1: Consumer information, protection and rights: Laws, regulation, economic bases, consumer networks.

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 3/1: Access to cloud computing: Challenges and opportunities for developing countries.

Output 2.1 contributed to the implementation of WTDC-14 and other relevant conference and assembly resolutions, recommendations and decisions.

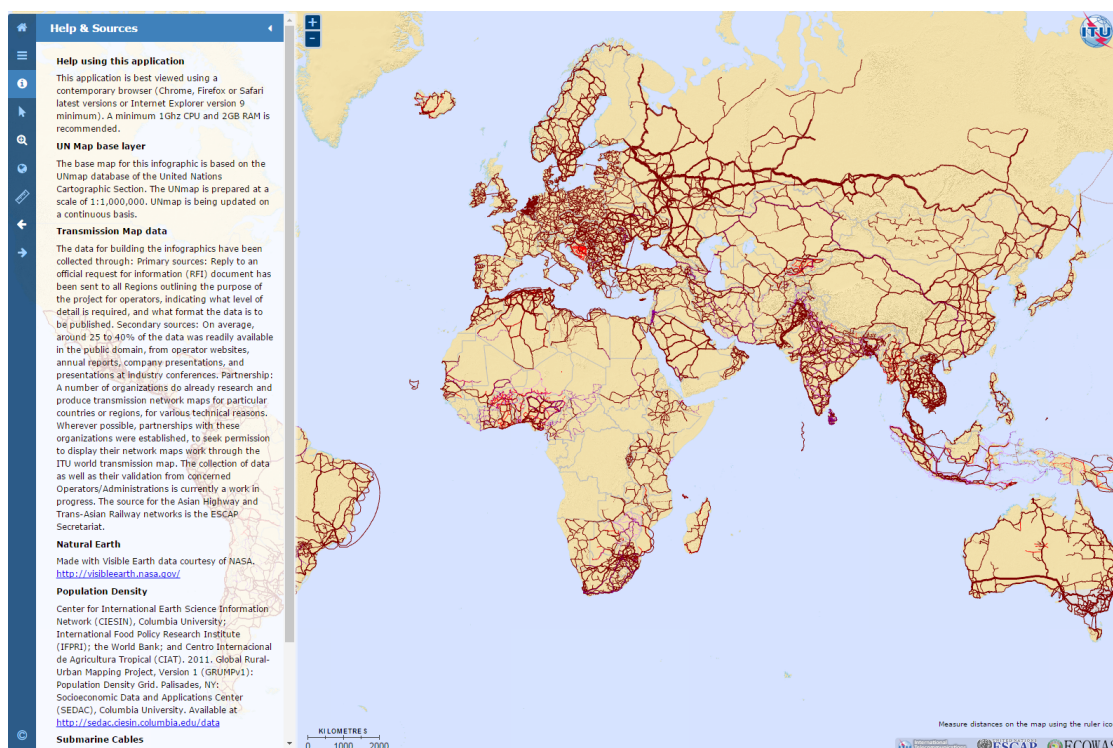
WTDC and other relevant conferences and assembly resolutions, recommendations, and decisions	
WTDC	Resolutions 1, 9, 17, 21, 23, 30, 32, 43, 48, 62
Plenipotentiary Conference (Busan, 2014)	Decisions 5, 13 Resolutions 25, 71, 102, 135, 138, 154, 165
WSIS Action Lines	C6 of the Geneva Plan of Action and §§ 112-119 of the Tunis Agenda for the Information Society contributed to Output 2.1
Contribution to SDGs	2, 4, 5, 8, 9, 10, 11, 16, 17

2.2 Telecommunication/ICT networks, including conformance and interoperability and bridging the standardization gap

Infrastructure is central for enabling universal, sustainable, ubiquitous and affordable access to ICTs and services for all. The ICT sector is characterized by rapid technological change and by convergence of technological platforms for telecommunications, information delivery, broadcasting and computing. The deployment of common broadband technology and network infrastructure for multiple telecommunication services and applications and the evolution to all IP-based wireless and wired next-generation networks and their successors open up opportunities, but also imply significant challenges for developing countries. The rapid deployment of wireless and mobile technologies highlights the growing importance of radio spectrum management and the role it plays in the socio-economic development of countries. Also notable is the worldwide transition from analogue to digital broadcasting, enabling the more efficient use of spectrum and higher quality audio and video delivery.

Conformity with international standards and interoperability (i.e. the ability of devices from different vendors to successfully communicate between themselves) can help avoid costly market battles over different technologies. International standards are essential to development of the global ICT infrastructure. For companies from emerging economies, international standards create a level playing field, enabling access to new markets and offering economies of scale that can reduce costs for manufacturers, operators and consumers. The rapid growth of personal wireless devices, especially cellular phones and tablet computers, has raised new challenges, given the ease with which such devices are carried across national borders and conformance regimes.

ITU-D worked closely with ITU-R and ITU-T in all regions to develop infrastructure and services. Several countries were assisted in preparing wireless broadband master plans, spectrum management master plans and national broadband policies for their transition from public switched telecommunication networks to next-generation networks.



ITU interactive terrestrial transmission maps, July 2017

2.2.1 Results achieved

ITU-D continues to implement and update the [ITU interactive terrestrial transmission maps online](#) (for broadband backbone optical fibre, microwave links and satellite earth stations, as well as submarine cables) in all regions. This tool presents information on 400 operator networks, 27 407 transmission links and 18 461 nodes located in 167 countries. The research on the transmission links covers 10 251 263 km of routes, of which 2 630 172 km had been imported to the map (as of mid-August 2017).

A [report on the implementation of evolving telecommunication/ICT infrastructure for developing countries](#) was published. It includes economic and policy aspects supporting effective adoption of next-generation networks. The report makes reference to more than 200 ITU publications (for example, ITU-D *study group* reports, ITU guidelines and ITU Recommendations from all Sectors).

Awareness on the role of governments in creating an enabling environment for the establishment and development of IXPs was raised through a workshop dedicated to the Arab IXP Group, organized in collaboration with the League of Arab States, Internet Society (ISOC) and African Network Information Center, and held in Tunis in November 2014.

In accordance with WTDC Resolution 47 (Rev. Dubai, 2014), [regional forums and training courses on conformity and interoperability \(C&I\)](#) were held in collaboration with ITU-T and ITU-R, focusing on conformity assessment procedures, type approval testing for mobile terminals and different C&I testing domains for the Africa, Americas, Arab States, Asia-Pacific and CIS regions. In 2016, these capacity-building events were provided to 130 participants from 60 countries in real testing facilities through the [collaboration of laboratory partners](#) in the C&I programme, namely the China Academy of Telecommunication Research under the Ministry of Industry and Information Technology (MIIT), Telecommunication Study and Research Centre, Telecommunication Research and Development Centre (CPqD, Brazil) and Telecom Italia Lab (TiLab).

Online training on C&I for packet transport networks, mobile terminals and electromagnetic compatibility (EMC) requirements was delivered, building the capacity of 52 participants.

All training materials and case studies reported by participants on the current national C&I status are available on the [ITU conformity and interoperability portal](#) to promote further capacity building and knowledge sharing.

In 2015, new [guidelines on establishing conformity and interoperability regimes](#) were published online and shared with members. They address challenges faced by developing countries as they plan and review their C&I regimes, including conformity assessment procedures, legislation to promote an orderly equipment marketplace, surveillance, coordination across regulatory agencies and relevant international standards. Other related reports cover the [creation of local or regional testing laboratories](#) and [establishment of mutual recognition agreements \(MRAs\)](#) for promoting the efficiency of C&I programmes for telecommunication/ICT equipment.



Spectrum Management System for Developing Countries (SMS4DC) subscribers to versions 4.0, 4.1 and 5.0

Regional integration has increased thanks to the establishment of harmonized C&I programmes and the development of MRAs between countries. As a follow-up to ITU-D studies, the secretariats of the Arab Maghreb Union (UMA), East African Community (EAC), Regional Technical Telecommunication Commission (COMTELCA) and Caribbean Telecommunications Union (CTU) have conducted expert and ministerial meetings to finalize MRAs.

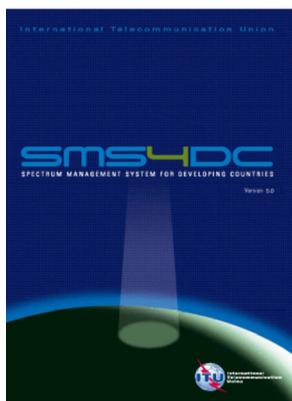
Spectrum management master plans have been drafted within the framework of an ITU-MSIP (Ministry of Science ICT & Future Planning, Republic of Korea) project, for six Asia-Pacific countries (Fiji, Brunei Darussalam, Bangladesh, Pakistan, Thailand and Mongolia) and three countries in the Caribbean (Grenada, Jamaica and Saint Vincent and the Grenadines). Assistance was provided to Sri Lanka on issues related to radio-frequency interference mitigation on aeronautical frequencies. Technical and advisory information was also provided on island-wide radio-frequency monitoring system updates. Samoa was assisted in aligning its national allocation policies with the outcomes of WRC-15.

The [Spectrum Management System for Developing Countries \(SMS4DC\)](#) is now in use in over 40 countries in the Africa, Americas, Arab States and Asia-Pacific regions.

Training on SMS4DC:

- enhanced the capacity of participants in Timor-Leste and in the British Virgin Islands;
- helped Yemen in its frequency management coordination with Sudan;

- improved the management of SMS4DC in Venezuela and Guinea and its dissemination within the region, having trained many participants.



The [International Meeting of Users of the Spectrum Management System for Developing Countries](#) was held on 8 and 9 December 2016 in Geneva (Switzerland). The meeting summarized the need for computerized spectrum management, analysed the main functions of SMS4DC and examined the proposals and experiences of targeted users in order to meet their requirements. [Version 5 of the software](#) was released. It contains modules for additional propagation models and a method for importing data from external sources, and is now also available in Spanish.

Guidelines have been prepared to assist countries in developing their national table of frequency allocations and national spectrum management assessments, for tendering for their national spectrum monitoring system and for developing spectrum fee regimes. In addition, a digital switchover database was developed, with information from some 192 countries being entered into the database and shared with ITU members (see [here](#)).

The capacity of ITU members was also enhanced on a range of network issues through several activities, including:

- the ITU Arab States Regional Training Workshop on SMS4DC, held in Djibouti from 14 to 18 June 2015 (training participants from eight countries);
- the ITU-NBTC (National Broadcasting and Telecommunications Commission, Thailand) Workshop on Cross-Border Frequency Coordination, held in Bangkok (Thailand) from 29 June to 1 July 2015 (training over 60 participants from seven countries);
- the Asia-Pacific Regional Workshop on Satellite Coordination, held from 25 to 30 May 2015 in Manila (Philippines) in collaboration with ITU-R (training participants from 15 countries);
- a seminar and training event for Pacific island countries on broadcasting and spectrum management issues, held from 6 to 10 July 2015 in Fiji (training participants from 14 countries);
- the 2015 ITU Regional Radiocommunication Seminar for CIS/Eastern Europe countries, organized in collaboration with ITU-R;
- the CIS/Europe Regional Workshop on Spectrum Management and the Transition from Analogue to Digital Terrestrial Television Broadcasting, held from 5 to 7 May 2015 in Budapest (Hungary) (training over 50 participants from 16 countries).

Direct assistance was provided to more than 30 countries from all regions in frequency planning, spectrum management master plans, the transition from analogue to DTTV broadcasting and other technical issues.

In the Africa region

Training workshops on C&I for Africa were held in Tunis in June 2014, December 2015, June 2016 and May 2017, building the capacity to establish C&I regimes at the regional and subregional levels in 14 Member States. The May 2017 workshop was entitled Regulatory Framework and Practical EMC Tests. Participants understood and appreciated the effective approval process to be implemented in their countries.

Those workshops were followed by C&I assessment studies and validation workshops that resulted in the establishment of MRAs in the SADC and EAC. The MRAs will facilitate the establishment and sharing of C&I laboratories in those regional economic communities.

ITU assisted countries with implementing the SMART Africa Manifesto, facilitated the Smart Africa Steering Committee and Board meetings and provided expertise to the sub-committee on the Smart Africa Scholarship Fund. This expertise facilitated the structuring of the fund and establishment of rules and procedures. The fund has generated seven scholarships, all of which were awarded to students pursuing Masters degrees.

Expertise was also provided in respect of studies for establishment of the One Africa Network, which is intended to create a free roaming zone throughout Africa, making it easier to communicate across borders and boosting economic growth. Under the Smart Africa initiative, a free mobile roaming framework has been implemented between Kenya, Rwanda, South Sudan and Uganda; between Gabon and Rwanda; and between Burkina Faso, Côte d'Ivoire, Gabon, Guinea, Mali, Senegal, Sierra Leone and Togo.



An IPv6 testbed was implemented in Côte d'Ivoire, in partnership with the Côte d'Ivoire Telecommunication/ICT Regulatory Authority, and equipment was purchased for Uganda for similar testbed simulations with a view to deploying the IPv6 network. The IPv6 network simulations will serve to minimize errors during actual deployment.

The Regional Initiative on the Development of Broadband Access and Adoption of Broadband has resulted in:

- a harmonized approach to infrastructure-sharing as a mechanism for reducing investment costs in underserved areas;
- development of broadband wireless networks in Burundi, Burkina Faso and Rwanda, providing access to schools and hospitals.

“Since the Internet has been installed, we are experiencing many advantages. Students, teachers, school administration and all the community benefit from access to the Internet. From preparing school classes to learning new agricultural techniques, it is useful for everyone.”

School Director in Tare, Rulindo district, Rwanda

In addition, the development of broadband wireless master plans for the Republic of the Congo and Malawi laid the foundation for broadband adoption and usage.

The Regional Initiative on Spectrum Management and Transition to Digital Broadcasting has resulted in:

- more countries being willing to sign the Harmonized Calculation Method for Africa (HCM4A) agreement for cross-border spectrum coordination;
- 15 countries launching their migration processes in 2015;
- four countries implementing DTTV broadcasting road maps in 2016.

In the Americas region

Following assessment studies already developed for the Caribbean and Central American countries, the Americas region carried out capacity building and knowledge sharing on C&I and MRAs during

training workshops held in Brazil in 2014 (12 to 16 May), 2015 (8 to 12 June), 2016 (27 June to 1 July) and 2017 (3 to 7 July). Follow-up C&I assessment studies and validation workshops supported this training to facilitate the establishment of MRAs for laboratory sharing.

Ten countries were assisted with the legal and regulatory framework through regional IXP implementation guidelines for the Americas that highlighted the efficiency gained and impact on Internet interconnection rates.



The fourth Regional Forum on Interconnectivity and Reduction of Telecommunication Service Prices and Internet Costs, organized with the collaboration of ISOC and the Latin American and Caribbean Network Information Center, represented an opportunity for Latin American countries to enhance capacity and understanding through case studies of Argentina, Honduras, Mexico and Paraguay focusing on the launching of national IXPs. Further support

and technical assistance resulted in Paraguay launching a national IXP.

Agreement to continue efforts towards the deployment of national IXPs and fibre-optic networks, with the emphasis on borders and international interconnection, was reached through the work of three regional events on connectivity for countries in the Americas (Paraguay and Dominican Republic).

Digital broadcasting road maps were developed for eight countries (Bolivia, Colombia, Costa Rica, Dominican Republic, Jamaica, Panama, Paraguay and Venezuela) within the framework of the ITU-CAF (Development Bank of Latin America) project. Other countries (El Salvador, Guatemala, Honduras and Nicaragua) were assisted within the framework of the yearly ITU-D operational plan. Guidelines for the development of a digital broadcasting road map are also available in Spanish.

The Regional Initiative on Spectrum Management and Transition to Digital Broadcasting has resulted in:

- support to countries in their transition to digital broadcasting as a result of applying ITU guidelines;
- promotion of capacity-building activities related to spectrum management and digital broadcasting, cost modelling and pricing for Latin American countries;
- guidelines on the policy and economic aspects of spectrum assignment;
- promotion of events on optimization and efficient use of spectrum and on digital television and the digital dividend.

The Regional Initiative on Development of Broadband Access and Adoption of Broadband has resulted in:

- capacity-building activities;
- support for the establishment of community ICT centres;
- support to Latin American countries in regard to terrestrial optical cable systems.

In the Arab States region

With ITU support, broadband connectivity in Djibouti has been increased to 19 towns and sites across the country, including secondary towns and rural areas.

Data collection and validation were coordinated to enhance the Interactive Terrestrial Transmission Map in the Arab States, with a view to promoting network interconnection and traffic exchange in the region.

Lebanon, Mauritania, Palestine and Sudan were assisted in developing their national master plans for the transition from analogue to digital broadcasting and in frequency planning.

Workshops, training events and direct assistance served to build capacity and understanding regarding the latest developments in digital terrestrial television, IPv6 and SMS4DC. In addition, specialized training on IPv6 development and deployment was provided to Arab least developed countries (LDCs) and to Palestine.

Cooperation agreements on C&I between countries in the Arab States region through MRAs were promoted and resulted in the elaboration, in the UMA countries, of the Common C&I Regime Action Plan.

National broadband plans were drafted for selected countries, and capacity building was provided on technical, economic and financial aspects of broadband deployment and adoption. An IXP feasibility study was also drafted for Djibouti. In addition, the Forum on New Technologies (including 5G, Cloud Computing, Big Data and IoT) held in Egypt on 23 and 24 November 2016 highlighted the opportunities, benefits and challenges arising from the application of those technologies for country development in the Arab States region.

Over 260 delegates from the Arab States region benefited from capacity building in the fields of spectrum management and frequency planning and coordination, through the third Annual MENA Spectrum Management Conference, held on 24 and 25 January 2017 in Dubai in partnership with Forum Global and the United Arab Emirates' Telecommunications Regulatory Authority (TRA). This conference was followed, on 26 January 2017 in Dubai, by the ITU Workshop on Cross-Border Frequency Management in the Arab States.



Over 80 delegates from seven Arab States deepened their understanding of technical, regulatory and policy issues relating to “broadband networks in the era of the app economy” during the ITU Arab Forum on Future Networks, held in Tunis (Tunisia) on 21 and 22 February 2017.

In the Asia-Pacific region

Forums, workshops, seminars and training events, organized by ITU, have contributed to enhancing the membership's capacity in areas including broadband networks and services, wireless security practices, wireless network planning, IPv6 deployment and related infrastructure security, smart technologies and services, ICT applications, cloud computing, cloud forensics and security, IoT, satellite network registration procedures, broadband QoS, new-generation network project planning and costing, and policy and regulatory implications of new technologies. Specialized assistance was also provided to Afghanistan, Bhutan, Cambodia, Laos P.D.R., Mongolia, Sri Lanka and Timor-Leste, resulting in improved planning for ICT networks and services.

In June 2017, the Bangladesh Telecommunication Regulatory Commission received assistance in the development of cost models. This helped it with setting cost-based wholesale and retail rates for both voice and data services.

In July 2017, the Department of Information Technology and Telecom of the Ministry of Information and Communications of Bhutan received assistance in establishing a consumer protection framework for its ICT sector.

The ITU Asia-Pacific Centre of Excellence (CoE) conducted four training courses on C&I. In addition, assistance on C&I was provided to the Islamic Republic of Iran, Mongolia and Sri Lanka, with support

also having been provided through seminars, held in Indonesia in cooperation with the Asia-Pacific Telecommunity (APT) and ITU-T, on bridging the standardization gap.



Capacity was enhanced and awareness raised through forums, workshops, seminars and training in the fields of frequency planning and assignment, spectrum management and radio monitoring, as well as in the efficient utilization of spectrum management tools and in measurement and regulation related to human exposure to electromagnetic fields (EMF). Specialized assistance was provided to develop spectrum management master plans for Bangladesh, Brunei Darussalam and Fiji, in partnership with the Republic of Korea's MSIP. Pakistan, Samoa and Thailand benefited from similar assistance

through additional funding received from MSIP to improve their frequency planning. Under the same project, and in cooperation with Australia's Department of Communications and the Arts (DOCA), a Regional Workshop on Economic Aspects of Spectrum Management was held in Tehran (Islamic Republic of Iran) in 2016, attracting 54 participants. In a separate project with MSIP, assistance has, in 2017, been provided to Nepal (Republic of) to update its radio law, while assistance has also been provided to Mongolia for preparation of a spectrum management master plan. Under the same project, assistance was provided to Cambodia and Lao P.D.R to develop national frameworks for the management of cross border radio-frequency interference.

Specialized assistance was provided to Timor-Leste to develop its radio frequency monitoring capability for the capital and the international airport in Dili. Also carried out, in March 2017, was a National Workshop on Technical Skills Development of Technical Staff.

A Regional Workshop on Managing Spectrum in the Age of Wireless Communication was held in Bangkok (Thailand) on 3 and 4 May 2017 and attended by 83 participants. It took place back to back with the third Annual Asia-Pacific Spectrum Management Conference.

The Guidelines on the Transition from Analogue to Digital Terrestrial Television Broadcasting have been updated. Case studies on DTTV broadcasting implementation in Australia, Japan and Thailand have been completed.

A report on interactive multimedia services in the Asia-Pacific region (trends and insights) was produced and has increased awareness of the new technologies being deployed in the broadcasting sector. Several forums, seminars, workshops and training events have been implemented in the area of digital broadcasting, resulting in stronger partnerships with regional organizations such as the Asia-Pacific Broadcasting Union (ABU) and Asia-Pacific Institute for Broadcasting Development (AIBD).

In addition, specialized country expertise support has been provided to Thailand's NBTC, Papua New Guinea and the Philippines. Fiji implemented DTTV broadcasting through a national trial on 1 August 2016 and is targeting analogue switch-off in 2017.

The Regional Initiative on Harnessing the Benefits of New Technologies enhanced capacity and understanding through training events, seminars and forums in the areas of spectrum management, cloud computing, mobile application development, green ICTs, smart grids and smart sustainable cities and societies.

ITU partnered with the Food and Agriculture Organization (FAO) in raising awareness and building capacities in regard to the strategic use of ICTs for agriculture for Bhutan, Fiji, Papua New Guinea, the Philippines and Sri Lanka (2015-2017). Training of trainers was conducted to transfer skills, and the FAO-ITU e-Agriculture Solutions Forum, held in 2016, raised awareness and provided a platform

for solution-providers and users to engage and develop partnerships. In addition to the above, the following results were achieved:

- An assessment was conducted and delivered on the potential use of mobile applications in the health sector of Bangladesh.
- Cybersecurity readiness solutions were offered for Fiji and Vanuatu.
- Awareness on m-health in India and the Philippines was increased through joint activities involving the World Health Organization (WHO), ITU, and government authorities.
- Over 1 400 participants representing multiple disciplines within the region's policy-makers, regulators and industry acquired enhanced awareness and understanding in many areas, including DTTV broadcasting, interactive multimedia technologies, mobile applications, cloud computing, satellite coordination and planning and IoT.

The Regional Initiative on Development of Broadband Access and Adoption of Broadband has resulted in:

- the preparation of national broadband policies for Bhutan, Brunei Darussalam, Cambodia, Marshall Islands, the Philippines, Sri Lanka and Vanuatu. Brunei Darussalam has since adopted its policy, in 2015;
- direct country assistance that has enabled Member States to address key priority areas such as DTTV broadcasting, affordable Internet access, top level domain name management, strategic planning on telecommunication infrastructure, compliance testing of mobile base stations and development of spectrum management plans;
- development of online interactive transmission maps for the Asia-Pacific region, in collaboration with UNESCAP (2014-2016);
- improved awareness and enhanced capacities in regard to ICT development and other topics through training events, workshops, seminars, forums and conferences for over 1 000 participants from the region;
- capacity enhancement for over 270 delegates from Asia-Pacific countries in the fields of spectrum management and broadcasting through the third Annual Asia-Pacific Spectrum Management Conference, held on 2 and 3 May 2017 in Bangkok (Thailand) in partnership with Forum Global and NBTC, and followed by the ITU Workshop on Managing Spectrum in the Age of Wireless Communication on 3 and 4 May 2017.



In the Commonwealth of Independent States

Efforts to further the ITU-wide goal of bridging the digital divide and providing broadband for all resulted in new Internet access centres that improved ICT inclusiveness for over 500 pupils, with at least 2 Mbit/s access in rural schools in the Odessa region of Ukraine and in 16 rural settlements in Moldova in 2015 alone. Twenty-eight workstations in these settlements enabled access to the Internet for 17 742 households and 51 575 people. The provision of broadband access in small and medium-sized settlements was also furthered through ITU regional workshops held in the Russian Federation from 17 to 19 February 2015 and attended by 62 participants from eight CIS countries. ICT inclusiveness was also expanded in the Kyrgyz Republic through the creation of three Internet access centres in rural settlements in October 2016, each providing ten workstations.

Thanks to the CIS common vision and interregional cooperation, the Regional Development Forum for the CIS and Georgia was held in Moldova from 31 March to 1 April 2015, attracting 66 participants from ten CIS and three European Union countries.



ITU further facilitated professional exchanges and enhanced capacity between experts from CIS countries in the area of digital transition. For example, the ITU regional workshop held in the Russian Federation from 16 to 18 February 2016, with 63 participants from six CIS countries, ensured a better understanding of key challenges and existing solutions for completing the digital switchover. In the areas of C&I and mobile number portability, the capacity of participants from eight CIS countries was enhanced during a workshop held in the Russian Federation from 22 to 24 March 2016.

In addition, ITU-D efforts resulted in:

- improved sustainability of power supplies and advancement of green technologies in Central Asia in 2015, in cooperation with the Communication Administration of Uzbekistan and in partnership with Uzbektelecom;
- the self-sustaining telecommunication hub “Zambar”, consuming around 8 kWh and supplied by a fully autonomous hybrid power source, based on renewables;
- increased regional collaboration on regulatory, economic and technical aspects of post-NGN, IMT-Advanced systems;
- facilitation of dialogue between policy-makers, regulators and the private sector during an ITU regional workshop held in Ukraine on 28 and 29 November 2016 and attended by 100 participants from five CIS countries and three European Union countries
- further improvement of regional collaboration on regulatory, economic and technical aspects of post-NGN, 4G and 5G, and facilitation of dialogue between policy-makers, regulators and the private sector during an ITU regional conference held in Kiev (Ukraine) from 7 to 9 June 2017 and attended by 125 participants from seven countries.

In the Europe region

ITU coordinated the collection and validation of data for the Interactive Terrestrial Transmission Map that now covers more than 90 per cent of the Europe region. In addition, a pan-European overview of the transition from analogue to digital terrestrial broadcasting was developed and information was recorded in the ITU Digital Switchover Overview Database, demonstrating the global status of the transition.

More than 200 spectrum experts were informed about the workings of the ITU (BDT and BR) software tools relating to spectrum management and ITU notification procedures, through contributions to the International Symposium and Exhibition on Electromagnetic Compatibility, held from 5 to 9 September 2016 in Wroclaw (Poland).

Assistance to Serbia was provided in 2015, in line with Resolution 33 (Rev. Dubai, 2014). This included an annual review of the national priorities and provision of broadcasting equipment (gap fillers), ensuring that several municipalities were reached by digital television.

The Regional Initiative on Spectrum Management and Transition to Digital Broadcasting resulted in:

- strengthened regional cooperation;

- enhanced capacity and deeper understanding on the part of more than 250 professionals from over 16 countries in the field of spectrum management and digital broadcasting;
- a series of annual meetings being supplemented by direct assistance, twinning programmes, elaboration of benchmarks, national assessments and training.

The Regional Initiative on Development of Broadband Access and Adoption of Broadband has resulted in:

- enhanced capacity of over 1 000 professionals in the field of high-speed network development in Europe;
- a series of meetings and online training events, sharing best practices across the region;
- substantive work being done on the establishment of IXPs and transition from IPv4 to IPv6.

The Regional Initiative on Spectrum Management and Transition to Digital Broadcasting saw the organization of three annual workshops, held jointly with the CIS region (2015 in Romania, with 51 participants representing 17 countries; 2016 in Hungary, with 40 participants representing 14 countries; and 2017 in Italy, with 70 participants representing 17 countries).

2.2.2 Study group Questions

The following study group Questions contributed to Output 2.2:

Study Group 1 Questions

Resolution 9: Participation of countries, particularly developing countries, in spectrum management.

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 8/1: Examination of strategies and methods of migration from analogue to digital terrestrial broadcasting and implementation of new services.

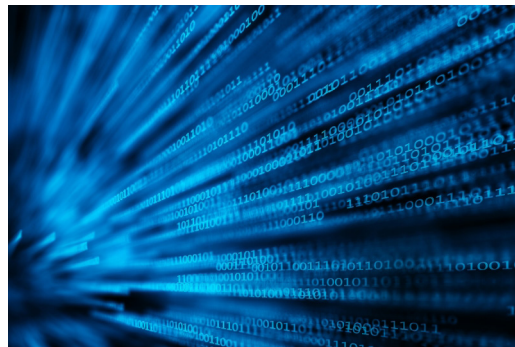
Question 5/1: Telecommunications/ICTs for rural and remote areas.

Question 2/1: Broadband access technologies, including IMT, for developing countries.

Study Group 2 Questions

Question 4/2: Assistance to developing countries for implementing conformance and interoperability programmes.

Question 7/2: Strategies and policies concerning human exposure to electromagnetic fields.



Output 2.2 contributed to the implementation of WTDC-14 and other relevant conference and assembly resolutions, recommendations and decisions.

WTDC and other relevant conferences and assembly resolutions, recommendations, and decisions	
WTDC	Resolutions 1, 9, 10, 11, 13, 17, 18, 20, 21, 22, 23, 25, 30, 32, 35, 37, 39, 43, 47, 48, 50, 51, 52, 57, 62, 63, 77 Recommendations 17, 19, 22
Plenipotentiary Conference (Busan, 2014)	Decisions 5, 13 Resolutions 25, 71, 101, 123, 176, 177, 178, 203 WRC Resolutions: see RPM Document 4
WSIS Action Lines	C2 on information and communication infrastructure C3 (Access) C7 (e-science); and C9 (Media) of the Geneva Plan of Action and the section "Financial mechanism for meeting the challenges of ICT for development" of the Tunis Agenda for the Information Society contributed to Output 2.2.
Contribution to SDGs	1, 8, 9, 11

2.3 Innovation and partnership



Innovation has been recognized as a powerful engine for promoting development, addressing socio-economic challenges and increasing the overall competitiveness of countries, while telecommunications/ICTs have been recognized as a key enabler for fostering innovation across sectors, especially in a converged ICT ecosystem. Although the world's population is connected more than ever before thanks to telecommunications/ICTs, more progress is still

required to enable everyone to enjoy fully the benefits of ICTs, especially by leveraging innovation. Fostering inclusive growth thus requires an understanding of the challenges facing ICT-centric innovation ecosystems, for which the development of innovation policies, guidelines, recommendations and initiatives for building capacity is critical to bridging the growing innovation divide.

2.3.1 Results achieved

To contribute to bridging the innovation divide, several innovation dialogues have built knowledge and capacity for ICT-centric innovation at the national, regional and global levels:

- Annual innovation sessions during ITU Telecom World 2015 and 2016, with innovation dialogues on the various challenges facing the innovation ecosystems; and a multi-stakeholder workshop at ITU Telecom World 2017.
- Annual innovation sessions during WSIS (2015 and 2016), where over six innovation dialogues were organized on ICT-centric innovation ecosystems, serving as knowledge and networking platforms for experts and non-experts, and with over 200 participants, on the challenges of and opportunities for strengthening the innovation capacity of the ITU membership and addressing the need for an ITU-D innovation framework.



Innovation workshops

- National innovation workshops conducted during country reviews have brought together multi-stakeholders and multi-sectors to co-create contributions to foster national digital innovation policies for the countries participating in the reviews. During consultations in Rwanda, Kenya, Moldova, Thailand, Albania, over 300 experts contributed to the process.

As a result of extensive consultations and dialogues from various regions and global events, an innovation framework was developed identifying key pillars essential for monitoring, diagnosing, developing and impacting ICT-centric innovation ecosystems. The ITU-D innovation framework will serve as a core model for a self-assessment toolkit that the membership can use as a basis for developing programmes, policy recommendations, initiatives and projects to strengthen their ICT-centric innovation ecosystems at the local, national, regional and global levels.

- The framework and methodology for national reviews of ICT-centric innovation ecosystems was developed through a partnership between ITU, the United Nations Conference on Trade and Development (UNCTAD) and the United Nations Industrial Development Organization (UNIDO).
- This framework was the subject of consultation and revision with the membership at the WSIS Forum 2016 in Geneva (Switzerland), with over 75 participants in three sessions.
- The framework was also validated and revised at the ITU-OECD (Organisation for Economic Co-operation and Development) Innovation Dialogue at the OECD Ministerial Event on the Digital Economy, held on 23 June 2016 in Cancún (Mexico) and led by 20 high-level global experts on innovation.



- A national workshop and innovation ecosystem stakeholder consultations were held throughout the process of the country reviews for Kenya to help strengthen the ICT-centric innovation ecosystems. ITU-D presented the preliminary outcome of the study in Nairobi (Kenya) in March 2017.
- ITU-D held a national ICT innovation ecosystem stakeholder consultation in March 2017 in Buenos Aires (Argentina). This technical assistance is being provided to Argentina with the aim of strengthening the start-up ecosystem and ICT SMEs and improving their competitiveness.
- The first regional innovation forum was held in March 2017 in Chisinau (Moldova) as a joint initiative between the Europe and CIS regions to share challenges and opportunities, discuss best practices and offer a platform for the twinning and networking of ongoing and planned country-level initiatives on innovation.

An ICT-centric innovation country review was conducted for Albania, with over 50 participants from the key stakeholders representing 40 organizations participating through a global innovation project developed and funded by the Republic of Korea. Other country reviews using the same multi-stakeholder consultation methodology were conducted for Rwanda and Thailand in 2016. These reviews develop grassroots-driven policy and project recommendations and pilot and develop the methodology, in partnership with UNCTAD and UNIDO.

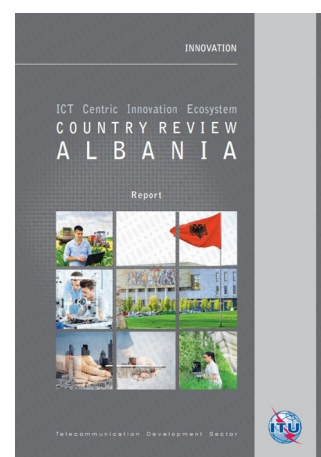
The following tools and processes have been developed to help scale up results in ICT innovation:

- An [innovation platform](#) designed to promote knowledge-sharing and communication between ICT-centric innovation ecosystem stakeholders.
- A co-creation tool ([cocreate.itu.int](#)), which serves to facilitate co-creation for the membership. This has been used for several idea-management exercises within BDT, including co-creation of the theme for WTDC-17 and soliciting contributions from ITU-D study groups through a pilot process examining what constitutes a smart society.
- A design-thinking methodology (creativity process) has been developed around delivery of innovation dialogues, assessment and development of digital innovation frameworks.
- A new toolkit, “[Bridging the Digital Innovation Divide](#)”, was developed to help countries create their digital innovation frameworks, and a set of policies and projects that foster national innovation.

In accordance with the WTDC-14 mandate for internal innovation within ITU, and in ITU-D in particular, a series of activities has been undertaken in order to better serve the membership and partners:

- A brainstorming session aimed at retaining and attracting new ITU-D members, held in April 2015 in Geneva, where participants shared insights on challenges and opportunities that ITU can leverage to increase membership.
- A dialogue on how to enhance private-sector participation in ITU-D activities, held in May 2015 in Geneva, where participants shared recommendations on strengthening private-sector work for ITU-D.
- Presentation and introduction of the co-create tool for enhancing ITU-D study groups, from December 2015 to February 2016, at which study group members joined the co-create tool activity.

The concept of public-private partnerships to promote the development of telecommunications/ICTs was fostered, including through a series of [Private-Sector Chief Regulatory Officer \(CRO\) meetings](#) that bring together senior industry executives to share experiences and exchange ideas on how to



strengthen private-sector involvement and engagement in global, regional and national initiatives and identify mechanisms for better fostering an enabling environment for future development of the sector. From 2014 to 2017, some 150 representatives from over 50 entities and associations, ranging from operators to service providers and manufacturers, participated in CRO meetings.

- At the third CRO Meeting, held on 2 June 2014 as a pre-event of the GSR in Manama (Bahrain), participants discussed ways and means for ITU-D members to be more involved in the work of the Development Sector in partnership with BDT (i.e. projects, joint initiatives, study groups), and proposed topics for GSR-15.
- As part of the pre-event programme of GSR-15, the fourth CRO Meeting was held on 8 June 2015 in Libreville (Gabon). Among other outcomes, consensus was reached on two main topics of interest – achieving the optimal regulatory environment and promoting market access and infrastructure – for further elaboration by CRO participants.
- The fifth CRO Meeting was held on 11 October 2015 in Budapest (Hungary), as a pre-event of ITU Telecom World. Delegates explored additional opportunities for exchanging experiences with regulators and policy-makers on areas of joint collaboration identified by the industry. Among the main outcomes, it was agreed to include a track for the private sector on the last day of GSR-16, in parallel with the regulators track.
- At the sixth CRO Meeting, held in Sharm el-Sheikh (Egypt) on 11 May 2016 as a pre-event of GSR-16, participants reaffirmed the need for a selected portfolio of agreed proposals to be shared and piloted with interested regulators.
- In addition, an Industry Leaders’ Debate was held on 14 May 2016, in parallel with the regulators track during the last day of GSR-16. Participants from the private sector debated the impact of open innovation and new business models on collaborative regulation, and the importance of regulatory key performance indicators (KPIs).
- The seventh CRO meeting was held in Bangkok (Thailand) on 13 November 2016, as part of a pre-event of ITU Telecom World. In particular, a Universal Financial Access (UFA) 2020 proposal presented by MasterCard under the CRO platform was supported by the participants, who agreed to create a CRO Working Group on Digital Financial Inclusion (CRO WG on DFI), the first meeting of which was held on 15 November 2016, attended by public- and private-sector executives who explored ways in which to use CRO and other ITU neutral multi-stakeholder platforms to serve the goal of connecting the unconnected and the financially excluded through Digital Financial Services. They also discussed the designing and sharing of legal and regulatory frameworks at the regional and national levels; developing frameworks for expanding public-private partnerships; and implementing pilot projects at the national level with partners as a contribution to achieving the SDGs, particularly Goals 8, 9, 10, 11 and 17.
- The eighth CRO and its CRO Working Group on Digital Financial Inclusion was held in conjunction with GSR-17 in the Bahamas from 11 to 14 July 2017, with high-level industry representatives from the private sector. Progress on multi-stakeholder DFI pilot assessments in selected countries (Mongolia and Sudan) was shared, demonstrating the need for enhanced collaboration between financial and ICT/telecommunication regulators to achieve UFA. The CRO meeting also agreed on a set of principles for the achievement of an optimal regulatory environment; promotion of market access and infrastructure; and support for and creation of value-added ICT applications.
- A Private-Sector Roundtable led by CRO industry members is being organized as a pre-event of WTDC-17. It will, among other things, review CRO’s progress and outcomes, collect inputs and recommendations to further promote the private sector’s engagement in the work of ITU-D in areas of common interest, and foster enhanced cooperation between Member States, Sector Members, Associates and Academia. Partnerships have been, and continue to be, fostered with Academia to promote the development of telecommunications/ICTs, in particular the introduction of new technologies and promotion of ICT innovation, including through the

development of studies and platforms for increased engagement with Academia. Examples include:

- an [ITU-D Academia Network Meeting](#), held on 11 September 2015, as a side event to the ITU-D Study Group 2 meeting, where participants shared priorities and proposals, including the development of an ITU Journal and a study on the impact of ICTs on socio-economic development;
- an Impact Study on ICTs for SDGs focusing on new and innovative business developments and job creation to accelerate achievement of the SDGs with significant contributions from the academic sector and other stakeholders;
- the ITU Academy Event on Fostering Innovation and Partnerships in Human Capacity Building, held on 28 and 29 April 2014 to help enhance the engagement of Academia in ITU. This event strengthened cooperation between the ITU Academy, Academia and other stakeholders from the private and public sectors and opened the door for further collaboration.



First ITU-D Academia Network meeting, 11 September 2015

In addition, to support BDT resource mobilization efforts and to facilitate the identification of potential partners for ITU-D projects and initiatives requiring partners, BDT has created various products and tools:

Internal tools

- The funding partners database, which contains some 110 profiles of existing and potential partners from administrations, multilateral and bilateral agencies, development banks, foundations and private-sector companies.
- The partnership agreements database, which contains over 940 agreements signed by BDT with various stakeholders.

External tools

- The [Partnership Opportunities Website](#), which serves as a preliminary repository of information on BDT projects and initiatives for potential partners to consider and review, and as a guide for discussion.
- The [Sponsorship Opportunities Website](#): In 2017, a new interactive platform available in the six ITU official languages was launched for social and side-event activities organized around ITU-D events. This website proposes opportunities to entities to enhance their visibility, promote their brands, or showcase their ICT products and solutions. Discounts are offered to ITU-D membership for open events and meetings as well as for multi-sponsored activities. All resources mobilized are used to implement activities, projects and initiatives, including regional initiatives within the scope of the WTDC-14 Action Plans.

Development and implementation of the various tools, services and networking opportunities outlined above to enhance partnership with the ITU-D membership and potential partners has enabled progress to be made. For example:

- 42 new partnership agreements were signed in 2014, 68 in 2015, 29 in 2016 and 24 in 2017 (by mid-August 2017).
- From 2014 to July 2017, 40 new Sector Members, 5 Associates and over 90 Academia have joined the ITU-D sector. By July 2017, the ITU-D Sector was comprised of 321 sector members, 11 associates and 144 Academia members.

In the Africa region



ITU facilitated a multi-stakeholder consultation on 4 August 2016 in Kigali (Rwanda), with participants from 15 different organizations representing the innovation ecosystem. The consultation was undertaken within the framework of a national review of the ICT-centric innovation ecosystem for Rwanda. This provided the basis for planning and implementing future activities aimed at building a digital innovation framework for Rwanda.

ITU provided technical assistance to the SMART Africa secretariat for the design of a new website. This resulted in easier and more timely dissemination of information.

In the Americas region

During a C&I training workshop in 2016, negotiations were held with COMTELCA and CPqD, an ITU Academia entity, on the signature of an agreement for a pilot project on virtual testing laboratories to help increase the C&I of ICT equipment in the Americas region and provide capacity-building opportunities through access to specialized testing facilities and highly qualified professionals. The project is of great significance to Central America and the Parties are discussing the general terms for the signature of this agreement.

ITU is working with WHO/PAHO (Pan American Health Organization) to update the study on successful e-health experiences in Latin America originally conducted in 2015, while replicating the experiences in other countries. (See [here](#)).

Since 2015 a regional mobile apps competition is annually organized in partnership with SAMSUNG to motivate the development of innovative and creative solutions to benefit Persons with Disabilities (PwD).



In the Arab States region

ITU helped to establish the Arab Technology Incubators and Technoparks Network (ARTECNET) to promote cooperation on innovation and entrepreneurship between technology parks in countries of the Arab region, and helped to identify priority projects to be presented to donors for implementation.

An ITU Workshop on Promoting Youth Employment and Entrepreneurship was held in Cairo (Egypt) from 7 to 9 April 2015, enhancing the capacity and knowledge of participants regarding the challenges facing stakeholders seeking to foster ICT-centric innovation.



ITU Workshop on Promoting Youth Employment and Entrepreneurship held in Cairo, Egypt, 7 to 9 April 2015

Efforts to provide guidance to research and academic institutions in Egypt on the subject of ITU activities were instrumental in attracting new members.

In the Asia-Pacific region

Partnerships were forged with the Asian Development Bank and the Department of Information and Communication Technology of the Philippines to organize the Digital Strategy of Development Summit 2015 and Innovative Strategies for Development Summit, as well as with the Association of Southeast Asian Nations (ASEAN) to organize the Asia-Pacific Regional Forum on Universal Access and Service and Broadband Deployment (2015), and the ITU-ASEAN Forum on Child Online Protection (2016).

A series of Young ICT Leaders' Forums were held in collaboration with Busan City (Republic of Korea) from 2014 to 2016. The forums aimed at connecting, sharing and empowering youth in the ICT sector to enhance their capacity to create innovation and secure a competitive position in their professional sphere.

In the Commonwealth of Independent States

Remote participation facilities were improved in the CIS in 2015, increasing the involvement of stakeholders through connecting the most active ITU-D Sector Members in the region to the videoconferencing network hosted by the ITU Area Office for the CIS.

ITU participated in the integration of ICT in education in the Kyrgyz Republic in 2015 by supplying LCD television monitors as technical assistance to the Institute of Electronics and Telecommunications under the Kyrgyz State Technical University named after Iskhak Razzakov.

In the Europe region

Annual summits on digital payments, co-organized by ITU in Athens (Greece) in 2015 and 2016, attracted more than 200 European stakeholders engaged in building a digital payment ecosystem. The summits provided a unique opportunity for capacity building through the exchange of best practices and fostering of innovation towards a cashless environment.

The Regional Development Forum held in Bucharest (Romania) on 20 April 2015 adopted the ITU-Agora initiative, and was followed by a workshop in Athens on 9 and 10 December 2015 at which the Athens Manifesto was developed for the ITU-Agora pan-European Innovation Platform, including inputs from participants from six key stakeholder groups representing the Greek ICT ecosystem and from experts from Bulgaria, Hungary, Poland and Romania.

During ITU Telecom World in Budapest (Hungary) in October 2015, an expert competition was held on the subject of youth, entrepreneurship and innovation, in which a group of over 50 experts and innovators contributed to a workshop addressing the innovation framework. Forum sessions on fostering technology champions and government start-ups (public service innovation) were also organized, with over 200 participants from around the world.

Activities related to the Regional Initiative on Entrepreneurship, Innovation and Youth resulted in strengthened regional cooperation in the field of entrepreneurship and innovation. More than 700 professionals from over 25 countries took part in actions, including a series of knowledge exchanges, ecosystem reviews and country reviews. The development of a tailor-made ITU methodology for use by ITU Member States for national review of ICT-centric innovation ecosystems was also fostered. In addition:

- The national review was carried out in 2016 in Albania.
- The expert group meetings on mobile identification provided an opportunity for strengthening regional capacities on innovation in governmental transformation.
- Cooperation and partnership were developed and strengthened with UNIDO and UNCTAD.

A Regional Forum for CIS and Europe on Strengthening Innovation Capabilities in the ICT-Centric Ecosystem and Fostering the Growth of ICT Start-ups was held in early 2017. It concluded with the elaboration of a manifesto calling on countries to engage further in ICT innovation.

An innovation track was established for the WSIS Forum 2016 and 2017. The toolkit for strengthening ICT-centric ecosystems was launched during a session in the WSIS 2017 innovation track.

2.3.2 Study group Questions

The following study group Questions contributed to Output 2.3:

Study Group 1 Questions

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 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.

Study Group 2 Questions

Question 1/2: Creating the smart society: Social and economic development through ICT applications.

Question 2/2: Information and telecommunications/ICTs for e-health.

Question 5/2: Utilization of telecommunications/ICTs for disaster preparedness, mitigation and response.

Question 6/2: ICT and climate change.

Output 2.3 contributed to the implementation of WTDC-14 and other relevant conference and assembly resolutions, recommendations and decisions.

WTDC and other relevant conferences and assembly resolutions, recommendations, and decisions	
WTDC	Resolutions 1, 5, 30, 33, 50, 59, 71
Plenipotentiary Conference (Busan, 2014)	Decisions 5, 13 Resolutions 25, 71, 72, 172 WRC Resolutions: see RPM Document 4
WSIS Action Lines	Lines 3, 4, 5, 6 and 7 of the Geneva Plan of Action and the section "Financial mechanism for meeting the challenges of ICT for development" of the Tunis Agenda for the Information Society contributed to Output 2.3.
Contribution to SDGs	1, 2, 3, 4, 5, 9, 10, 12, 16, and 17

Objective 3 Enhance confidence and security in the use of telecommunications/ICTs, and roll-out of relevant applications and services

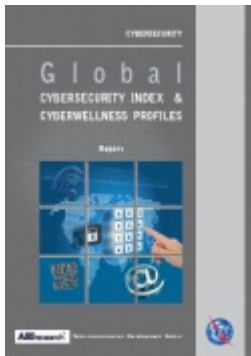
The purpose of Objective 3 is to support the ITU membership in facilitating the development of, and improving access to, ICT-based applications and services, particularly in underserved and rural areas, achieving trust and confidence in the safe use of ICTs, and increasing the robustness of networks.

3.1 Building confidence and security in the use of ICTs

With universal and affordable access to ICTs being recognized as pivotal for taking the 2030 Sustainable Development Agenda forward, increasing ICT uptake and Internet connectivity will not be sufficient or sustainable if the underlying infrastructure and the devices connected to it are not safe and secure. Member States need to take a strategic view of cybersecurity where the country's socio-economic vision is aligned with its digital security agenda. The cybersecurity capacity of a Member State is strengthened through a well thought out strategy that includes having effective legislation to punish cyberattackers, adequate technical and human resources, and a sustainable win-win collaboration on both the local and international fronts to respond to cyberthreats in a timely manner.



3.1.1 Results achieved



According to the [2014 Global Cybersecurity Index \(GCI\)](#) and other reliable sources, in 2014 there were 103 countries with a national computer incident response team (CIRT) and 72 with a national cybersecurity strategy that were helping to reduce the cybersecurity divide. [The second iteration of the GCI was completed in 2016](#), with 134 responses received from Member States, representing a 25 per cent increase over 2014. The work on the GCI 2014 and 2016 has served to help countries identify areas for improvement, motivate actions to improve cybersecurity, raise the level of cybersecurity worldwide, contribute to identifying and promoting best practices, and foster a global culture of cybersecurity.

"At ITU, we are committed to making the Internet more secure, safer and trustworthy, for the benefit of all."

Houlin Zhao, ITU Secretary General

ITU's cybersecurity activities have helped to strengthen the capacity of Member States to incorporate and implement cybersecurity policies and strategies into nationwide plans, and have also resulted in enhanced organizational capacity, including through the following:

- CIRT assessments², conducted during the reporting period, that entailed in-country missions for information gathering and resulted in capacity building and in nine countries³ being equipped with a national CIRT. These projects took between one and three years to be implemented, depending on the prevailing circumstances.
- Ten regional cyberdrills conducted with 1 456 participants from 146 countries.
- Fifteen technical workshops, which enhanced the capacity of the 170 participants.
- The dissemination to Member States of three ITU [publications](#), together with 20 other publications from partners to increase understanding of cybersecurity challenges.
- Six WSIS workshops and four pre-study group workshops have been held to enable the 350 participants to exchange expertise and build their capacity.

In addition, a National Cybersecurity Strategy Guide, drafted through a 15-member partnership, is being used by ITU and other national cybersecurity strategy partners to assist Member States in pursuing a standard, coordinated approach. Through various global partnerships in cybersecurity, ITU has enhanced cooperation and best practice exchange among Member States and relevant players, helping them to find synergies and optimize resources.



In the Africa region

In September 2014, a cyberdrill was conducted in Zambia for countries from the Africa region in which more than 100 participants, from 16 countries, took part. A similar regional cyberdrill was conducted in Rwanda in May 2015, attended by 150 participants from 18 countries. The drills enabled Member States in the Africa region to share experiences and assess their cybersecurity readiness.

In April 2016, a cyberdrill, organized in Mauritius, was attended by 150 participants from 15 countries. It resulted in the enhancement of the national capacity of the participating countries.

The Regional Initiative on Building Confidence and Security in the Use of Telecommunications/ICT resulted in more African countries implementing CIRTs and building capacity and awareness through expert training and cyberdrills. In July 2016 and October 2016, respectively, a joint Arab States and Africa Regional Workshop on Cybersecurity Strategy, co-organized by ITU and ATU (African Telecommunications Union) and the Arab States and Africa Regional Symposium on Cybersecurity, laid the foundation for the harmonization of cybersecurity legal frameworks in Africa.

In the Americas region

ITU increased awareness and enhanced the capacity of Member States in the region to respond to cyberthreats in a timely manner by delivering, from 2014 to 2016, three regional cyberdrills: in Peru in 2014 (attended by participants from nine countries); Colombia in 2015 (attended by participants from 13 countries); and Ecuador in 2016 (attended by 60 participants from 15 countries).

² In 2014: Angola, Bolivia, Comoros, Congo, Cyprus, Fiji, Jordan, Lebanon, Liberia, Monaco, Palestine, Swaziland, Vanuatu, Zimbabwe. In 2015: Republic of Congo.

³ In 2014: Côte d'Ivoire, Ghana, Tanzania. In 2015: Cyprus. In 2016: Barbados, Burundi, Gambia, Jamaica, Trinidad and Tobago.

The Regional Initiative on Capacity Building to Engage in Global ICT Policy, with special focus on improving cybersecurity and developing countries' participation in the existing Internet governance institutions, has achieved the following results:

- Countries have greater confidence and security in the use of telecommunications through ICT workshops and cyberdrills for computer emergency response teams (CIRTs and CERTs).
- Countries have established national CIRTs and have signed and implemented technical cooperation projects.
- Events have been organized to increase understanding and capacity building in the areas of interconnection, cybersecurity, IPv6 and cybersecurity issues, including Child Online Protection (COP).
- Assistance has been provided to ministries of education through the Caribbean School Cyber Security Awareness Programme.



In the Arab States region

The annual regional cyberdrill, organized since 2014, enhanced the communication and incident response capabilities of the participating teams from the Arab States region and ensured an ongoing collective effort on the part of the national CIRTs to mitigate cyberthreats. In addition, the cybersecurity, technical and management capacity in computer incident response was increased through strong attendance at the 2016 Arab States and Africa Regional Symposium on Cybersecurity, held in Egypt.

Skills, awareness and capacity in cybersecurity were increased through the Regional Cybersecurity Summit organized by the Arab Regional Cybersecurity Centre (ARCC) and held annually since 2014. The 2016 theme – Boundless Collaboration, Boundless Protection – focused on cooperation in cybersecurity as one of the key pillars in tackling the complexity and scalability found in the main cyberthreat challenges. The summit provided a platform for senior ICT and cybersecurity officials from the Arab States and Africa regions to discuss and formulate strategic directions and plans for tackling emerging threats to the global and regional security sector. The panel discussion on data privacy and policy frameworks to secure cloud services, for example, was particularly well attended.

Advocacy support was also provided for the formulation of national and regional regulatory and technical policies and frameworks and legal measures to ensure data privacy, cloud service privacy, data protection and security at the ITU-AICTO Regional Workshop on Policy Advocacy on Data Privacy and CyberSecurity, held in Tunisia in 2016, which attracted 70 participants from the Arab region. Other events that together served to inform and increase understanding of the cybersecurity challenges included the following:

- A Joint Arab/Africa Regional Workshop on Cybersecurity Strategy, co-organized by ITU and ATU in Sudan in 2016.
- The “Regional Legal Framework on Child Online Protection (COP): Guidelines for the Arab States Region” were developed in 2015.
- National COP Challenges were conducted and awareness raised among children, teachers and parents in Egypt, in cooperation with the Ministry of Communications and Information Technology (MCIT) and local stakeholders.

- The fifth edition of the Regional ALERT (Applied Learning for Emergency Response Teams) cyberdrill was organized in Doha (Qatar) from 5 to 9 March 2017, in collaboration with ARCC. Some 100 participants from over 11 countries attended the drill, which was followed by two days of training, conducted by the Cyber Wellness Center (CWC) of the EC-Council, to improve the skills of Arab CIRT members. The training comprised two tracks: a technical track covering web vulnerability modules (SQAP), and a management track covering chief information security officer (CISO) modules. Training sessions were preceded by pre-assessment tests and followed by post-assessment tests.
- The Gaming Booklet, containing a detailed description of the games that were applied during the COP Challenges held in Egypt in 2015, 2016 and 2017, was launched in partnership with MCIT.
- To further raise awareness regarding Internet safety, 100 school pupils took part in the COP Challenge in Port Said (Egypt) on 4 March 2017, held in partnership with Egypt's COP National Committee and other stakeholders.



"Today was a great day for me. I played new internet games and made new friends. But most importantly, I have learnt that although the Internet is a good thing, I have to be very careful, not to share information including pictures about myself or my family."

Hassan, an Egypt Internet Safety Ambassador

The Regional Initiative on Building Confidence and Security in the Use of Telecommunications/ICTs raised awareness, helped in the development of COP guidelines and assisted selected countries with establishing national CIRTs, in addition to which regional cybersecurity drills were conducted to test CIRT readiness. Coordination between Arab State CIRTs was also strengthened. In terms of technical and policy frameworks, a regional study was conducted entitled "Cloud Computing in Arab Countries: Legal and Legislative Aspects, Facts and Horizons" in order to help define legal measures that ensure data privacy and secure the use of the Internet and its various applications.

The workshop on National Child Online Protection Strategy for Sudan, organized in Khartoum (Sudan) on 14 and 15 December 2016, analysed the COP landscape that led to the development of a national COP strategy framework for Sudan in 2017. The workshop was preceded by a COP Challenge conducted in one school on 13 December 2016.

Following a workshop to assess the cybersecurity status through consultation with the national stakeholders, and with work foreseen on CIRT implementation, ITU developed a national cybersecurity strategy for Mauritania for 2017-2022.

The capacity of cybersecurity professionals in Djibouti was enhanced through the ARCC by the holding of two training courses covering web security attacks and solutions, held from 14 to 18 May 2017, and of a training event on vulnerability assessment penetration testing from 21 to 25 May 2017.

In the Asia-Pacific region

ITU developed a national cybersecurity strategy, including on COP, for Nepal (Republic of) between 2015 and 2016. This enhanced the awareness and capacity of some 100 government, regulatory



and private stakeholders. A successful cybersecurity simulation was carried out within the framework of enhanced cooperation with the Nepal Telecommunication Authority, which is continuing the work on cybercrime legislation. ITU also assisted Lao P.D.R. with its cybersecurity policy in 2015, and with the related capacity-building to foster an ICT enabling environment. In 2014, national guidelines for COP were prepared for Vanuatu and Brunei Darussalam.

Skills and awareness in the areas of cybersecurity and COP were developed and strengthened through training courses and other events for Afghanistan, Cambodia, Indonesia, Lao P.D.R., Myanmar, the Philippines, Sri Lanka and Thailand. In addition, country CIRT assessments for Fiji and Lao P.D.R. generated recommendations for the establishment of national CIRTs, the LaoCERT having been established on the basis of those assessments. Cyberdrills were also organized with Cambodia, Lao P.D.R., Myanmar, Sri Lanka and Viet Nam.

Through cooperative partnerships with the Asia Pacific Network Information Centre (APNIC), Ministry of Information and Communication Technology (MICT) of Thailand, Globeron and NBTC Thailand, the regional ITU CoEs strengthened skills and understanding of Internet and IPv6 infrastructure security, cloud forensics and security and wireless security. In collaboration with Oxford University, ITU assisted Thailand in a national critical information infrastructure protection assessment through a workshop held in Bangkok. ITU also developed the technical skills required to assist cybersecurity incident responders in Myanmar, Viet Nam, Lao P.D.R. and Cambodia.

In addition, the Regional Initiative on Harnessing the Benefits of New Technologies resulted in:

- the building and strengthening of capacity and skills in cybersecurity, COP and network readiness in Nepal (Republic of);
- a draft national cybersecurity law for Lao P.D.R.;
- a network security assessment for Afghanistan;
- a draft national strategy/policy, laws, and institutional cybersecurity mechanisms for Nepal (Republic of).

In the Commonwealth of Independent States

A number of recommendations were drafted during the ITU regional seminar in Baku (Azerbaijan), supported by 68 participants from 14 countries, on promoting the development of mobile payments in the CIS region through cooperation between regulators and other stakeholders.

Cybersecurity capacity-building mechanisms in the CIS region were strengthened in 2015 by creating an ICT Research and Training Centre for professionals, in partnership with the Moscow Technical University of Communications and Informatics (Russian Federation).



The Regional Initiative on Creating a Child Online Protection Centre for the CIS Region resulted in:

- the development of an online course on Safe Use of Internet Resources with three modules (Basic: for pre-schoolers and primary school pupils; Intermediate: for five to nine-year olds; Advanced: for senior students, informatics teachers and parents);
- the development of a database of over 70 technical COP solutions and software that helps with choosing the most appropriate solution;
- the promotion of an automated distribution system of *unsafe* and *safe* lists of Internet resources;
- exchanges of experience between cybersecurity professionals.

An overview of the results of the implementation of this regional initiative were presented at an ITU regional workshop, held in Ukraine, to 70 participants from 12 countries, with a view to generating further actions and involvement.

The Regional Initiative on Building Confidence and Security in the Use of Telecommunications/ICTs has resulted in:

- ongoing analysis of the status of confidence and security in the CIS;
- recommendations on assessing the level of confidence and security in the use of ICTs, and training for professionals.

In the Europe region

The 2015 ITU ALERT international cybedrill exercise for the Europe region, held in Montenegro, attracted over 50 participants from ten European countries to enhance their human capacity. Assistance and technical advice on establishing and strengthening the capabilities of national CIRTs was provided to Albania, Bosnia and Herzegovina, the Former Yugoslav Republic of Macedonia and Serbia.



The ITU COP guidelines for parents and educators, as well as the guidelines for children, were updated in 2015 and are being used as practical guides for implementation at the national level, such as in the national COP communication campaigns that have increased awareness among children, teachers and parents in Bosnia and Herzegovina, Croatia, Italy, Montenegro, Romania and Serbia.

The Regional Initiative on Building Confidence and Security in the Use of Telecommunications/ICTs resulted in strengthened regional cooperation among

stakeholders engaged in building trust and confidence in the use of ICTs among children and young people. The expertise of over 2 500 professionals was enhanced as a result of CIS region activities and the following-up of requests from Member States. For example:

- The updated COP guidelines have served as a basis for national campaigns.
- A series of meetings have served as the platform for collecting and exchanging best practices.
- A regional review of national approaches to COP has been elaborated and published.
- Three annual (2015, 2016 and 2017) international conferences on keeping children and young people safe online.
- A digital youth forum held in Poland in 2017.
- Three annual (2015, 2016 and 2017) Central European public-private cybersecurity dialogues held in Romania.

- A public-private cybersecurity dialogue to be held in Switzerland in December 2017.

In addition, cooperation was strengthened through the following:

- A special contribution to Operation Uncool, prepared on the basis of the survey conducted during the Digital Youth Forum (Poland, 2017) and presented to ITU's Council Working Group on Child Online Protection in October 2017.
- Collaboration among the European Union Agency for Network and Information Security (ENISA), the European Commission and the Council of Europe.
- The Regional Cybersecurity Forum for Europe, jointly organized by ITU and ENISA in 2016 and hosted by the Ministry of Transport, Information Technology and Communications of the Republic of Bulgaria.
- The special high-level dialogues on COP held during the jointly organized ITU/Council of Europe meeting to highlight the European Cyber Security Month.

Following the successful implementation of the Cyprus Government CIRT in collaboration with ITU in 2015, Cyprus, represented by the Office of the Commissioner of Electronic Communications and Postal Regulation (OCECPR), sought ITU assistance to establish a national CIRT to serve as a trusted, central coordination point of contact for cybersecurity, aimed at identifying, defending against, responding to and managing cyberthreats. ITU is assisting OCECPR in building and deploying the technical capabilities and related training exercises necessary to establish the Cyprus national CIRT.

3.1.2 Study group Questions

The following Study Group 2 Question contributed to Output 3.1:

Question 3/2: Securing information and communication networks: Best practices for developing a culture of cybersecurity

Output 3.1 contributed to the implementation of WTDC-14 and other relevant conference and assembly resolutions, recommendations and decisions.

WTDC and other relevant conferences and assembly resolutions, recommendations, and decisions	
WTDC	Resolutions 1, 5, 9, 15, 30, 33, 37, 45, 50, 59, 64, 67, 69, 78, 79
Plenipotentiary Conference (Busan, 2014)	Decisions 5, 13 Resolutions 25, 71, 72, 130, 172, 179, 181
WSIS Action Lines	C5 of the Geneva Plan of Action contributed to Output 3.1
Contribution to SDGs	1, 4, 5, 7, 8, 9, 11, 16, 17

3.2 ICT applications and services

ICT applications and services are an important demand-side driver that can encourage the adoption of broadband services. There is a need to facilitate the development and use of ICT applications and services that support sustainable development, including in the fields of public administration, business, education and training, health, employment, environment, agriculture and science within the overall context of national e-strategies. Related needs include elaborating national strategic planning frameworks and toolkits for ICT applications and services; promoting development of cross-domain mobile application frameworks to improve delivery of value-added services using mobile communications, such as mobile health and mobile banking; facilitating access to ICT-based government services; improving agriculture and healthcare; enhancing access to quality education and environment

management; and assisting developing countries to adapt to new application environments such as cloud computing, machine-to-machine communications and the IoT, high-volume data exchange, intelligent terminals and the adoption of public consumer applications such as social networks.

3.2.1 Results achieved

The capacity of ITU Member States to develop national e-strategies to foster an enabling environment for upscaling ICT applications was enhanced through the following:

For e-health:

- Raised awareness about digital health policies through the organization of a high-level joint ITU-WHO digital health policy dialogue, held in Geneva on 23 and 24 May 2016, during which experiences were shared and strategies identified among the 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.

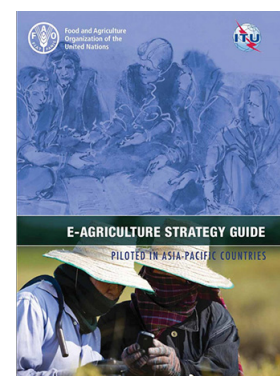


ITU-WHO high level digital health policy dialogue, 23-24 May 2016

- The enhancement, in Benin, Mali, Tunisia and Senegal, of the technical capacities needed to develop and validate their national e-health strategies.
- The provision to decision-makers and health planners of strengthened guidance needed to design and implement digital health platforms.

For e-agriculture:

- Provision to countries of strengthened guidance through the development of a framework to elaborate national e-agriculture strategies. A joint **FAO-ITU E-agriculture Strategy Guide** (main report and executive summary) was published in 2016. E-agriculture strategies will help to rationalize both financial and human resources and to address ICT opportunities for the agricultural sector in a more holistic and efficient manner.
- Country capacities to develop e-agriculture strategies were enhanced through the organization with FAO of two regional workshops, in



Bangkok (Thailand) from 9 to 11 February 2015 and Budapest (Hungary) from 22 to 24 June 2015, which supported 80 delegates from ministries of agriculture in 15 countries.

For e-learning:

- Awareness in the area of mobile learning policies was raised through a joint ITU-UNESCO (United Nations Educational, Scientific and Cultural Organization) policy forum on mobile learning, held on 11 March 2016, which focused on capacity building for the 250 participants, including four ministers and two vice-ministers of ICT and two ministers and three vice-ministers of education, in regard to the ways in which new, more affordable digital devices can help address urgent educational challenges and meet the needs of students, teachers and administrators.

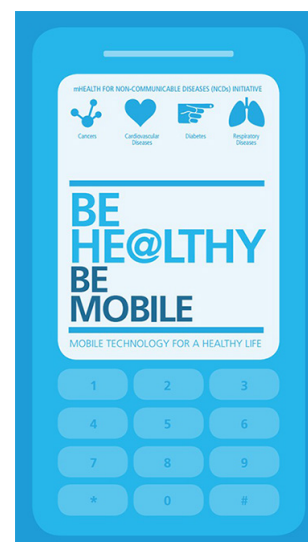


ITU-UNESCO policy forum on mobile learning, 11 March 2016

- Awareness in the area of mobile learning policies was also raised through the publication in three languages (English, French and Spanish) of a joint [ITU-UNESCO policy note on mobile learning](#) setting out ten fundamental policy recommendations for creating an enabling environment and using it as a lever for quality learning for all.

The capacity of countries to leverage ICT/mobile applications to improve the delivery of value-added services was improved through the public-private deployment of innovative ICT applications that provide effective solutions for a variety of sustainable development challenges:

- Be He@lthy, Be Mobile is a global joint 2012 initiative between ITU and WHO to work with governments to identify and scale up evidence-based interventions in order to use m-health to address non-communicable diseases and their associated risk factors. It currently provides technical and financial support to programmes in nine countries (Costa Rica, Egypt, India, Norway, the Philippines, Senegal, Tunisia, the United Kingdom and Zambia) across a range of income groups and disease areas, including mSmokingCessation, mDiabetes, mCervicalCancer and mCOPD (COPD: chronic obstructive pulmonary disease). It also promotes a highly multisectoral approach to ensure that the programmes are sustainable. This is achieved through encouraging partnerships between ministries of health and ministries of ICT, together with



support from other groups such as academia, multilateral agencies and partners from the private sector.

- Within the context of this initiative, three different mDiabetes programmes were launched, in Egypt, India and Senegal, in collaboration between the health and ICT ministries, to help diabetic patients safely manage their illness, thereby reducing the number of emergency hospitalizations. Currently more than 100 000 users are subscribed in India, and 150 000 and 50 000, respectively, in Senegal and Egypt, all of whom receive regular messages about diabetes prevention and control.
- Three mSmokingCessation programmes were launched in India, the Philippines and Tunisia, with mobile applications being used to help smokers quit smoking. Close to 2 000 000 users are subscribed in India, and the pilot phase was launched in Tunisia and the Philippines.
- Strengthened guidance has been provided to countries through the development, in collaboration with WHO, of handbooks on the use of mobile applications for giving up smoking, preventing and controlling diabetes and for cervical cancer.
- A workshop held in Islamabad (Pakistan) from 16 to 26 February 2016 served to strengthen the human and institutional capacity of participants from Afghanistan in the area of mobile application development, as a means of addressing the lack of skilled professionals in that sphere.

Awareness was raised among ITU members and advocacy conducted in regard to best practices in ICT for development:

- A joint FAO-ITU E-agriculture Solutions Forum, held in Bangkok (Thailand) from 29 to 31 August 2016 and attended by over 120 participants from 29 countries, served to enhance awareness and build country capacities in regard to the development, deployment and organization of shared e-agriculture solutions. An expert group of e-agriculture solution providers was established. In addition, a training event held after the forum, on 1 and 2 September 2016, served to build capacity in the area of e-agriculture strategy development.
- Knowledge about e-Agriculture solutions was enhanced through the publication of an FAO-ITU compilation of case studies entitled [E-agriculture in Action](#).
- An ITU-TRAI (Telecom Regulatory Authority of India) training on Leveraging ICTs for Smart Sustainable Cities, together with a national symposium on ICT Regulatory Challenges in Indian Smart Cities, held from 24 to 26 March 2015, raised awareness among more than 190 participants on the latest trends in smart city developments.
- The BDT thematic pavilion at ITU Telecom World in Budapest, held from 12 to 15 October 2015 under the theme of Smart ICTs for Sustainable Development, raised awareness by featuring more than 25 ICT applications that are relevant to the SDGs.

In the Africa region

A Regional Workshop for West Africa on National e-Health Strategy Implementation, held on 26 and 27 April 2016 in Abuja (Nigeria), enhanced the ability of 50 participants from the health and ICT ministries of 15 countries from the region to develop and implement national e-health strategies.

The Zambian Department of Health, in cooperation with Be He@lthy Be Mobile, developed a mobile-based system to alert and educate women in the age group most at risk of developing the disease – those between 25 and 45 years old.

A Regional Workshop on National E-health Strategy Development, held in Cotonou (Benin) from 24 to 26 November 2015, enhanced the ability of 30 delegates from the health and ICT ministries of six French-speaking countries to develop national e-health strategies.

Assistance and training was provided to Zimbabwe through an infrastructure and equipment audit to extend telemedicine services to remote areas of the country. Medical professionals in Zimbabwe are readily embracing telemedicine.



mDiabetes campaign, Senegal

An e-Health workshop was organized in Harare (Zimbabwe), within the framework of the ITU/WHO partnership and through the Commission of Information and Accountability, to foster the use of ICT to support healthcare for children and women.

The Be Healthy Be mobile initiative, through the m-Diabetes project for Senegal, has continued to grow, with the number of persons registered in the project database increasing from 2 000 in 2014 to 12 000 in 2015, 52 000 in 2016, and over 117 000 in 2017. A second dimension, m-HTA (hypertension), was added to the m-Diabetes project since the two non-communicable diseases are often related.

In the Americas region

Two successful editions of a regional competition were held to select innovative and creative mobile application solutions to benefit persons with disabilities, bringing more social inclusion and interaction, comfort and quality of life to their daily routine through mobile technologies. The 2015 edition attracted 42 competitors (27 proposals passed the first screening), and in 2016, on the ITU platform, 18 out of 32 proposals passed the two categories of the competition, namely: ideas, solutions or projects still to be developed or currently under development, and solutions that are already developed or available in the market.

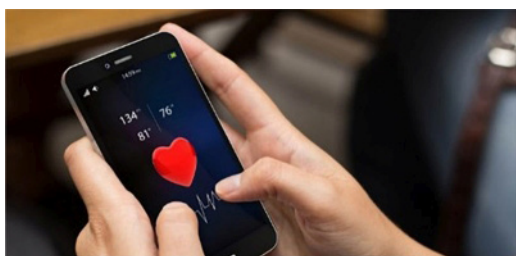
In the Arab States region

The establishment, in 2015 and in collaboration with the Ministries of Communication of Egypt, Palestine, Oman and Lebanon, of the first Arab Network for Free and Open Source Software (FOSS) has served to promote collaboration between interested stakeholders to increase the quantity and quality of FOSS in the Arab region. The network is now being run by the membership, with occasional support from the ITU Regional Office in Cairo.



The Regional Initiative on the Use of Telecommunications/ICTs for Smart and Sustainable

Development and Protection of the Environment raised awareness in the area of smart, sustainable cities. A report was drafted, with support from ITU-T, which identifies a road map for leveraging ICTs for the transition to smart and sustainable cities in the Arab States region.



Another important event was the ITU Regional Forum on the Use of ICTs for the Transition to Smart and Sustainable Development, held in Khartoum (Sudan) on 12 and 13 December 2016 in partnership with the Sudatel Telecommunications Academy (SUDACAD). This forum enhanced the capacity and strengthened the understanding of more than 160 participants from Arab countries on how to use telecommunications/ICTs for the transition to different

aspects of sustainable development, including the digital economy, e-waste management, emergency telecommunication plans, smart and sustainable cities, IoT and climate change. In addition:

- Through the ITU Arab CoE Network, the capacity of ITU members was enhanced in regard to various telecommunication/ICT applications and services, including project management for ICT implementation, business analysis of ICT projects, digital archiving and marketing, and sales of ICT applications and services.
- Two forums raised awareness of the opportunities and challenges of smart learning and digital transformation in the Arab region.
- The capacities of policy-makers were enhanced through the formulation of national strategies for smart learning through implementation of the cooperation agreement signed with the Telecommunication Regulatory Authority of the United Arab Emirates and the Mohamed Bin Rashid Smart Learning Programme. The first capacity building workshop was held in Dubai from 26 to 28 February 2017, attended by participants from ten countries.

In the Asia-Pacific region

ITU work in the Asia-Pacific region improved the capacity of countries in planning national sectoral e-strategies to foster an enabling environment to upscale ICT applications.

Technical assistance was provided to develop an e-government policy for Bhutan.

In partnership with FAO, technical assistance was provided for the development of an e-agriculture strategy for Fiji, the Philippines, Papua New Guinea and Sri Lanka, and of a national e-renewable natural resources master plan for Bhutan. The m-health programme was strengthened in India and the Philippines, in partnership with WHO.

The capacity of the Information Communication Technology Institute (ICTI) of Afghanistan was enhanced through training in mobile apps development, in collaboration with Pakistan.

The Regional Initiative on Harnessing the Benefits of New Technologies raised awareness on new technologies through training events, seminars and forums in the areas of spectrum management, cloud computing, mobile application development, green ICTs, smart grids, harnessing the IoT, e-government and smart sustainable cities/societies. Several forums, seminars, workshops and training events (on e-agriculture, e/m-health, e-government, smart sustainable cities, postal e-strategies, green ICTs, smart grids, telecommunication strategy for the Pacific and digital financial services) were carried out in the Asia-Pacific region, enhancing the capacity of countries to leverage ICT/mobile applications to improve service delivery in high priority areas within the region.

An assessment of the potential uses of mobile applications in the health sector in Bangladesh (2014) and a survey on cybersecurity readiness for a number of countries in Asia-Pacific (2015) served to identify further assistance and capacity-building needs.

Capacity-building in multiple disciplines and emerging technical issues (digital terrestrial television broadcasting, interactive multimedia technologies, cloud computing, satellite coordination and planning, e-applications, IPv6 transition, infrastructure and security and C&I) for policy-makers, regulators and industry raised the awareness and strengthened the capacity of over 1 400 participants from the region.

A series of Asia-Pacific Regional Forums on e-Government and Smart Cities were held in 2015 and 2016 in Thailand, in collaboration with multiple partners including the United Nations Project Office on Governance, the World e-Governments Organization of Cities and Local Governments, MICT Thailand and the private sector.

The Lao P.D.R. Ministry of Post and Telecommunications was assisted in the development of a regulatory framework for OTT services, and capacity was built for stakeholders through the sharing of international best practices and key regulatory challenges and opportunities in the area of OTT services (19 to 23 June 2017).

In June 2017, assistance was also provided to Mongolia on issues relating to digital financial services.

In the Commonwealth of Independent States

To facilitate an exchange of experience and enhance cooperation within the region on the issues of telemedicine, an ITU regional workshop was held in Tashkent (Uzbekistan) from 7 to 9 October 2015, and attracting participants from six countries.

In order to raise stakeholder awareness of how to implement and develop mobile applications, an ITU regional workshop was held on Issyk Kul Lake (Kyrgyz Republic) from 6 to 8 September 2016.

An ITU regional workshop held in Samarkand (Uzbekistan) on 1 and 2 June 2017 resulted in regional collaboration on smart cities and an improved understanding of the underlying technologies and related challenges.

An ITU regional workshop held in Saint Petersburg (Russian Federation) from 19 to 20 June 2017 and attended by 69 participants from 11 countries, generated exchanges of experience and discussions on innovative solutions based on the IoT and future network technologies.



ITU regional workshop held in Saint Petersburg, 19-20 June 2017

In the Europe region

WHO-ITU initiated an “m-Health Knowledge and Innovation Hub” project (2017-2021) with financial support and links to existing m-health research networks from the European Commission. The

hub will enable, on the one hand, the development of national m-health interventions in selected European Union member countries to champion the uptake of m-health, and, on the other hand, the foundation and maintenance of a centralized “Knowledge and Innovation Hub for m-Health” to monitor and enable m-health adoption and innovation.

3.2.2 Study group Questions

The following study group Questions contributed to Output 3.2:

Question 1/2: Creating the smart society: Social and economic development through ICT applications

Question 2/2: Information and telecommunications/ICTs for e-health

Two study group meetings for the new ITU-D Question 1/2 on “smart society” were held in 2016. Two study group meetings for ITU-D Question 2/2 on “e-health” were held in 2016.

Output 3.2 contributed to the implementation of WTDC-14 and other relevant conference and assembly resolutions, recommendations and decisions

WTDC and other relevant conferences and assembly resolutions, recommendations, and decisions	
WTDC	Resolutions 1, 5, 30, 54
Plenipotentiary Conference (Busan, 2014)	Decisions 5, 13
	Resolutions 25, 71, 72, 139, 140, 183, 202
WSIS Action Lines	C7 of the Geneva Plan of Action for the Information Society contributed to Output 3.2
Contribution to SDGs	2, 3, 4, 6, 7, 11

Objective 4 Build human and institutional capacity, provide data and statistics, promote digital inclusion and provide concentrated assistance to countries in special need

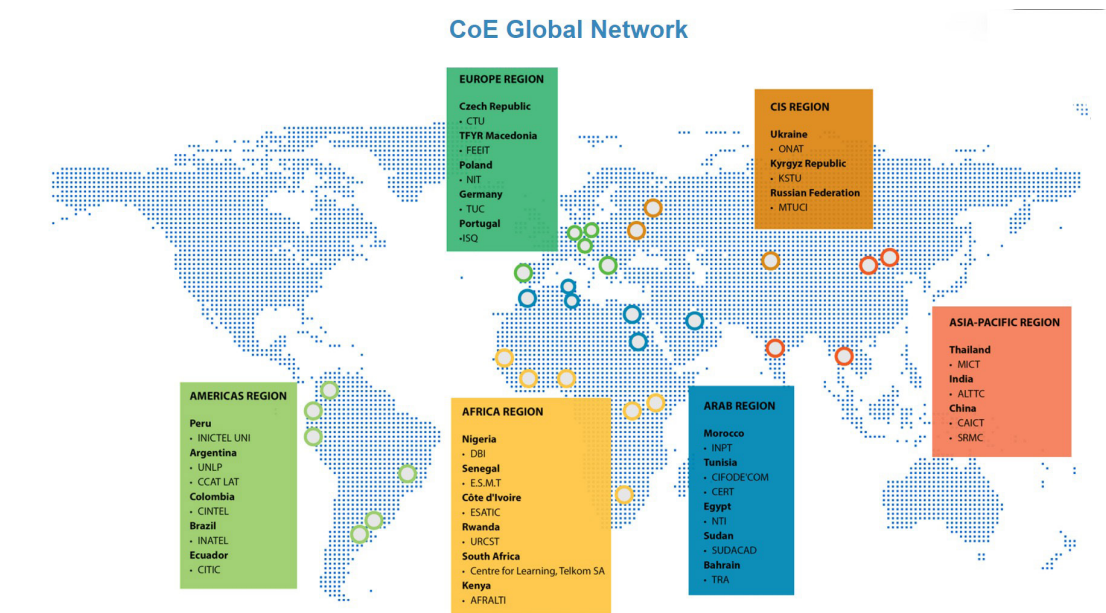
The purpose of Objective 4 is to: assist the ITU membership in building human and institutional capacity in the field of telecommunications/ICTs, including through the use of study group Questions of priority to developing countries; fostering digital inclusion that promotes telecommunication/ICT accessibility; making informed and effective decisions on ICT policies and strategies based on high-quality, internationally comparable ICT data and statistics; and providing concentrated assistance to countries in special need.

4.1 Capacity building

Decision-makers need to ensure that the digital divide, which remains a key concern for developing countries, does not also become a knowledge divide. There is a need to provide assistance in the kind of human and institutional capacity building that will serve to improve the skills required to support the development and use of ICTs. In so doing, it is important to take advantage of the most up-to-date methods and means of delivery that leverage the use of ICTs, ranging from training for government policy-makers and regulators to professional business-focused curricula for senior ICT executives and managers, and to specialized programmes for technical and operational staff.

4.1.1 Results achieved

ITU-D contributed to strengthening the capacities of ITU Member States by implementing a [new ITU CoE Strategy](#). In line with WTDC Resolution 73 (Rev. Dubai, 2014), the CoE project was reviewed in 2014. A new CoE strategy, including new operational processes and procedures, was developed. The launch of this new phase resulted in a total of 99 applications being received from 65 institutions from around the world, expressing their interest to be a part of the CoE network.



Centers of Excellence (CoE) Global Network, 2017

Thirty-two CoEs were selected, each of which signed a cooperation agreement with ITU. Steering committees with representatives of the selected institutions were established for each region to manage implementation of the CoE strategy. Those committees successfully conducted their annual

meetings for 2015. Five regions held their steering committee meetings for 2016, while the one for Europe was held in January 2017. The CoEs strengthened capacities in Member States by conducting training programmes in policy and regulation, broadband access, cybersecurity, C&I, spectrum management, digital broadcasting, ICT applications and services, emergency telecommunications, Internet governance, e-waste and climate change mitigation and adaptation. Twenty-five training activities, across all the regions, were conducted through the CoE network in 2015, with a total of 820 participants. In 2016, 51 training activities were implemented, with a total of 1 167 participants.

The engagement of the academic community in the work of ITU was increased through a meeting held in 2014, in Prague (Czech Republic). The event, entitled “Fostering Innovation and Partnerships in Human Capacity Building: Enhanced Engagement of Academia in the International Telecommunication Union”, attracted some 80 participants, strengthening the cooperation between the ITU Academy, academic institutions and other stakeholders from the private and public sectors, and opening the door for further collaboration.



ITU continued to strengthen capacities in Member States by developing standardized training materials, which were made available through the CoEs and through other cooperating partners from academia. The development of training materials in the area of spectrum management was concluded in 2015, and in the area of QoS in 2016. Training materials relating to ICTs and climate change, and to the IoT, are currently being developed. Training activities on international Internet governance started in 2017, with the first of a series of regional workshops held in Brazil in July 2017.

BDT Director Brahima Sanou and Professor Petr Konvalinka, Rector of the Czech Technical University, sign a cooperation agreement

Activities under Output 4.1 contributed to greater cooperation between ITU and relevant partners in the field of capacity building. In December 2015, ITU signed a cooperation agreement with the Czech Technical University to deliver the Spectrum Management Training Programme (SMTP).

Delivery of the SMTP as stand-alone modules has already started, and ITU certificates are being awarded to successful students upon completion. In June 2015, ITU signed an agreement with the United Kingdom Telecommunications Academy for the delivery of a joint Online Master of Communications Management (eMCM) training programme. Delivery of the eMCM is ongoing, with students enrolled at different levels of completion. In April 2016, a cooperation agreement was signed with the African Advanced Level Telecommunications Institute (AFRALTI) for the delivery of basic and advanced-level training in spectrum management. In February 2017, ITU and the Association of Communications and Telecommunications Regulators of the Community of Portuguese Speaking Countries signed a cooperation agreement to implement joint activities focusing on capacity building and education.

In May 2016, ITU upgraded the QoS on the ITU academy platform, thereby enhancing user experience. The upgrade included the addition to the platform of new features and functionalities such as secure online course payments through the use of debit and credit cards, enhanced features for generation of invoices for payments through wire transfer, automatic generation of certificates at the end of a training course, and a plagiarism detector to support essay-type assignments.

Under this output, ITU enhanced the dialogue between key stakeholders by organizing the global ICT Capacity Building Symposium in Kenya, from 6 to 8 September 2016. The Symposium was preceded by two pre-events, on “Capacity building in Internet governance” and “Regulators as enablers and consumers of capacity building”, attracting over 400 participants. The Symposium, which focused on new skills requirements in a digital era, brought together high-level officials, CEOs of private-sector

companies and training providers such as universities and CoEs. Its outcomes provide strategic guidance to the national and international community, including ITU, on capacity building in the field of ICT, and on strengthening collaboration among the global ICT capacity-building community. This will contribute directly to achievement of the SDGs across all development sectors. For universities and other training providers, the Symposium serves as a forum for gauging the needs of the market in terms of training and capacity building in the field of ICT, and helps in shaping future training and delivery programmes.



Capacity Building Symposium (CBS), 2016

In the Africa region (AFR)

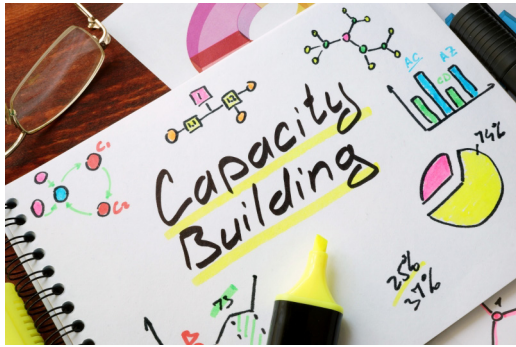
To strengthen the capacity of least developed countries in Africa in the area of telecommunication/ ICT standardization and statistics, for which ITU is a global leader, workshops were held in Madagascar and Gabon in 2016, providing an understanding of ICT indicators and data collection, and of emerging trends in telecommunications/ICTs. A similar workshop for all African countries was held in Ethiopia in 2015, with the attendance of 140 participants representing 14 African countries. In addition, through a National Workshop on ICT Statistics held in April 2017, ITU strengthened Rwanda's capacity to produce administrative and survey-based national statistics on telecommunications and ICTs that are internationally comparable, timely and accurate.

A workshop held in Niamey (Niger) in June 2014 brought together 102 participants, representing 33 countries, to raise awareness of and discuss possible solutions to regional challenges and issues relating to human capital development and the digital economy in sub-Saharan Africa.

Two high-level capacity-building workshops on cost modelling and pricing for next-generation networks and the quad-play environment in Africa, one held in Yaoundé (Cameroon) for French-speaking countries and the other in Namibia for English-speaking countries, increased the understanding of 85 participants representing 22 countries, thereby improving the level and outreach scope of market competition knowledge in the region.

In addition, the following annual capacity-building workshops were organized: in 2015 in Abidjan (Côte d'Ivoire), under the theme "The role of human resources in the migration to DTTB and digital

economy”, with 161 participants from 21 countries; in 2016 in Lilongwe (Malawi), under the theme “Ensuring Child Online Safety (COS) in a digital world: building human capacity in COS policy formulation and implementation”, with 116 participants from 17 countries; and, also in 2016, in Mon Trésor, Plaine Magnien (Mauritius), under the theme “Developing the ICT ecosystem to harness the Internet-of-Things”, with 161 participants from 21 countries and six international/regional organizations, of which 61 foreigners and the remainder from Mauritius. The participants included professionals from governments, regulatory authorities and the ICT industry (public and private sectors and academia) (see [here](#)).



In addition to the ITU-facilitated regional and national workshop referred to above, the Regional Initiative on Strengthening Human and Institutional Capacity Building was successfully implemented within the framework of the ITU CoE network and ITU Academy, providing training to a number of professionals from Africa on various priority ICT-related subjects. In 2015, 21 face-to-face training courses delivered by the ITU CoE network served to strengthen the capacity of 113 participants from six African countries in the fields of cybersecurity, telecommunication regulation and 4G LTE. Other

notable achievements include the co-founding of the Smart Africa Scholarship Fund, whose first group of Masters Degree students will graduate in 2017 from Carnegie Mellon University.

A feasibility study for the Ministry of ICT of Burkina Faso, involving the drafting of a directory of national ICT competences and mapping the competence requirements of Burkina Faso’s ICT sector, was conducted in order to identify gaps and make proposals on how to bridge them.

In the Americas region

In an effort to enhance and develop spectrum management expertise for Member States in the region, an online training course was delivered in 2015 to participants from Colombia, Dominican Republic, Ecuador, Mexico, Uruguay and Venezuela.

The regional event “Communication for ALL” became a landmark for the Americas region in terms of ICT accessibility for persons with disabilities. ITU provided training on concepts and principles relating to ICT accessibility (across web, television, mobile and public access platforms) in order to promote accessibility in public ICT spaces (telecentres), an ICT accessibility policy framework, implementation of ICT accessibility policies, web accessibility and public-sector web requirements that comply with web accessibility standards.

ITU developed a face-to-face train-the-trainer course on web accessibility in line with the Web Content Accessibility Guidelines (WCAG) 2.0 web accessibility standards. This course was delivered to the University of Costa Rica, which will replicate it to ensure that the country’s governmental websites are made accessible to all citizens, including persons with disabilities, by the end of 2017. This web accessibility training includes a presentation of a self-sustainable partnership model so that all national entities involved can benefit from the training.

Capacity building in the area of satellite communications was provided to over 30 participants through the delivery of a training jointly prepared by ITU, CTU and the International Telecommunications Satellite Organization (ITSO).

In cooperation with Fondo Indígena, and every year since 2005, ITU has provided, through the ITU Academy, a training programme that each year benefits almost 300 indigenous leaders in the Americas by building their capacity to use telecommunications/ICTs for social and economic development. The current programme cycle (2014-2017) consists of three online training courses on digital tools

for the development of indigenous communities, as well as related web tools for the development, management and operation of local network radio stations. In the early part of 2017, the programme had over 290 registrations for the first course, beginning in April.

In addition, professionals from Argentina, Costa Rica, Colombia and Honduras were trained on advanced communication networks; other professionals from Argentina, Bolivia and Uruguay were trained on regulation trends in spectrum management; and, in cooperation with Colombia's National Spectrum Agency, experts from Colombia and Paraguay received training on spectrum assignment and methods.

The Regional Initiative on Capacity Building to Engage in Global ICT Policy, with special focus on improving cybersecurity and developing-country participation in the existing Internet governance institutions, has resulted in:

- enhanced Member State confidence and security in the use of telecommunications through the delivery of three ICT workshops and cyberdrills for CERTs, and also through the effective implementation of cybersecurity strategies involving assistance to countries in the establishment of national CIRTs;
- support for a specifically designed technical cooperation project to develop knowledge in several technology-related topics for the staff of the Costa Rican Electricity Institute;
- the organization of discussion forums for the sharing of experience and enhancement of knowledge on interconnectivity and cybersecurity issues, including COP and IPv6;
- the provision by ITU, through a successful partnership with the Caribbean School Cyber Security Awareness Programme, of technical assistance to the education ministries of Barbados, Belize, Grenada and Saint Kitts and Nevis.

In the Arab States region

Within the approved ITU Arab States CoE network activities for 2016 and 2017, the following training events have resulted in enhanced capacities of the participants and provided access to a range of academic information, resources and subject matters:

- The training on Business Analysis for ICT Projects, organized in cooperation with SUDACAD was held from 14 to 16 March 2016 with the aim of teaching participants from the Arab region about the role of ICT applications in business analysis and business environment enhancement.
- The training on Project Management for ICT Implementation, also organized in cooperation with SUDACAD was held from 18 to 20 April 2016 for the purpose of educating participants on the project management cycle and the process for ICT project management.
- Owing to high demand, an additional training session on Business Analysis for ICT Implementation was organized in cooperation with SUDACAD from 9 to 11 May 2016, with the aim, as in the first session, of teaching participants from the Arab States region about the role of ICT applications in business analysis and business environment enhancement.
- The training on Certified IPv6 Network Engineering – Level 1 (CNE6 Level 1), organized in cooperation with SUDACAD, was held from 24 to 26 May 2016 with the aim, on the one hand, of sharing information on current and future wireless broadband technologies and services and, on the other, explaining the Internet ecosystem and its resource management framework, the limitations in the current version of the Internet protocol and the features of IPv6.
- The training on Spectrum Engineering Techniques, organized in cooperation with Egypt's National Telecommunication Institute, was held from 16 to 18 August 2016 with the aim of providing the participants with tools and techniques for ensuring efficient spectrum management.
- The training entitled The Big Challenges for Telecom Operators and Regulators, organized in cooperation with the National Institute of Posts and Telecommunications (INPT), Rabat

(Morocco), was held from 2 to 4 November 2016 with the aim of providing operator managers and regulators with useful knowledge for improving the implementation of future operator and regulator projects in the light of the rapid changes taking place in the sector; giving an insight into the changes in the regulatory and operational frameworks; and providing an understanding of the impact of technological evaluation on the ICT sector.

- Third versions of the training events on Business Analysis for ICT Implementation and Project Management for ICT Projects were organized in Nouakchott (Mauritania) from 7 to 9 November 2016 and 5 to 7 December 2016, respectively. They were attended by participants from the Arab States region.
- The training on Practices for PKI, Digital Proofs and Security of Electronic Transactions was organized in cooperation with the Centre for Information, Training, Documentation and Studies in Communication Technologies (CIFODECOM), Tunis (Tunisia). The training on Fundamentals of Fibre and Optical Networks was organized in cooperation with CIFODECOM from 30 January to 2 February 2017.
- The training on Engineering, Installation and Deployment of Optical Networks was organized in cooperation with CIFODECOM from 13 to 15 April 2017. The training on Planning and Deployment of 4G/5G was organized in cooperation with CIFODECOM from 16 to 18 May 2017.
- The training on Risk Management for ICT Implementation, organized in cooperation with SUDACAD was held from 30 April to 2 May 2017 with the aim of identifying ICT project and business risks and providing a structured process for ICT risk management. Owing to the high demand for this training, a second session was organized from 23 to 25 May 2017.
- The training on IPv6 Certified Network Engineering, organized in cooperation with SUDACAD was held from 7 to 9 May 2017 with the aim of exploring the current and future IP technologies and their infrastructure.
- The training on Business Analysis for ICT Projects, organized in cooperation with SUDACAD, was held from 23 to 25 May 2017 with the aim of training participants from the Arab region on the role of ICT applications in business analysis and business environment enhancement.
- A regional training on VSAT (very small aperture terminal) and satellite systems was held in Tunisia from 6 to 10 December 2015. The objective of the training was to provide participants with an in-depth knowledge of policies and regulations associated with satellite systems and the corresponding spectrum and technologies. A regional training on VSAT and satellite systems was held in Oman from 13 to 17 March 2016. It provided the 90 participants from 11 Arab countries with knowledge regarding the use of satellite systems for the delivery of broadband services, broadband connectivity and associated broadband technologies.
- Within the framework of the partnership initiative with TRA (United Arab Emirates), a regional project was established on Human Capacity Building on IPv6 for least developed countries in the Arab States region and Palestine. Implementation of the project, which aims to build human and institutional capacity to improve technical skills in the development and use of IPv6, as well as assist in the better deployment of IPv6, began in 2016, and two professional training events were carried out, in December 2016 and April 2017. Twenty-eight participants from least developed countries in the Arab States region and Palestine received IPv6 certification.
- The ITU Arab States regional office developed, together with TRA (United Arab Emirates), a human capacity building project on regulatory and policy related issues which seeks to enhance the skills of TRA staff in regard to different regulatory trends and aspects.



- The first and second meetings of the steering committee of the ITU Arab States CoE network took place in Sudan and Tunisia in 2014 and 2015. The meetings discussed operational matters and how to mobilize the network's resources. Both meetings were attended by representatives of selected CoEs. The committee's third meeting, held in 2016 in Rabat (Morocco), discussed network challenges and opportunities and approved the activities for 2017. All three meetings resulted in enhanced dialogue among members.
- ARTECNET, sponsored by ITU, has promoted youth employment and entrepreneurship in the Arab States through an annual conference that shares and develops good regional and international incubation practices as well as national and international experiences from the membership. Two training sessions on Business Incubation Management (InfoDev Course) were held, in Egypt and Morocco. InfoDev certificates for the selected modules were delivered to participants.

In the Asia-Pacific region

The regional initiatives for the Asia-Pacific region are all linked in one way or another with capacity building and skills development. This is reflected in the work of the ITU Asia-Pacific CoEs, which enhanced the skills of some 475 participants in 2014 (11 regional training events), some 300 in 2015 (eight regional training events), some 375 in 2016 (nine regional training events) and some 175 up until June 2017 (two out of three training events), as well as of some 300 participants who received on-line training on spectrum management in February 2017 under the auspices of the Regional CoE on



Spectrum Management, i.e. the State Radio Monitoring Centre in China. The training events also received support from partners such as DOCA (Australia), NBTC (Thailand), APNIC, MSIP (Republic of Korea), the Telecom Regulatory Authority of India, the Ministry of Internal Affairs and Communications (Japan), Faculty of ICT of the Ministry of Information and Communication Technology of the (Islamic Republic of Iran), ABU, Globeron, TOT Public Company Ltd., Busan Metropolitan City, Pacific Islands Telecommunications Association (PITA), India's National Telecommunications Institute for Policy Research, Innovation and Training, China's State Radio Monitoring Centre, as well as many other companies that have provided speakers for training programmes.

ITU also strengthened the capacity of the Internet Training Centre Initiative in Samoa through a train-the-trainer programme that is intended to generate improved instructional and institutional sustainability.

ITU partnered with APT to build capacity in regard to the preparation of participants for international ICT-related conferences. The two-stage (online and face-to-face) training was attended by 50 online participants, and 28 joined the face-to-face training in 2016. In 2017, the partnership went on to organize training on Preparing for International Conferences, with 39 participants from 22 countries having been trained in this area and successfully completed the online course, while 30 participants enhanced their skills through face-to-face training.

In partnership with the Asian-Pacific Postal Union, capacity was built in the area of postal e-strategies that will foster the enabling environment and support the implementation of ICT applications and services by leveraging existing infrastructure (2016 and 2017).

Three meetings of the ITU Asia-Pacific CoE steering committee were also held, strengthening the Asia-Pacific CoE framework and enhancing existing partnerships.

In the Commonwealth of Independent States

The Regional Initiative on the Introduction of Training Technologies and Methods Using Telecommunications/ICTs for Human Capacity Building resulted directly in the development of:

- software to assess human susceptibility to different channels of information perception
- best practices in e-learning resources and a glossary of terms
- methodological requirements for e-learning resources.

In the Kyrgyz Republic, gaps in the national legislation relating to e-learning were identified and recommendations prepared for the development of e-learning resources.



The Operation of Centres of Excellence Initiative was supported, during the third CIS CoE steering committee meeting, held in Odessa (Ukraine) and attended by representatives of six CIS countries, by addressing challenges related to the collection and distribution of training fees and improved cooperation and coordination.

As a further contribution to safe and active participation in the information society, the skills of over 80 school directors and teachers from four CIS countries were improved through a Workshop on Using

Telecommunications/ICTs for Quality and Safe Education, held in Odessa (Ukraine) in 2016.

An exchange of experiences between capacity-building professionals at an ITU regional workshop in Odessa (Ukraine) from 12 to 14 April 2017 attracted 62 participants from nine countries.

In the Europe region

To further human capacity building in the Europe region, ITU provided a series of trainings through the Europe region CoE network in the fields of broadband, cybersecurity, Internet governance and e-waste. In addition, more than 600 participants have been trained both online, through the ITU Academy, and at face-to-face meetings in the Czech Republic, Germany, Former Yugoslav Republic of Macedonia, Poland and Portugal. This has, since 2015, resulted in an enhancement of the capacities of public and private-sector professionals.

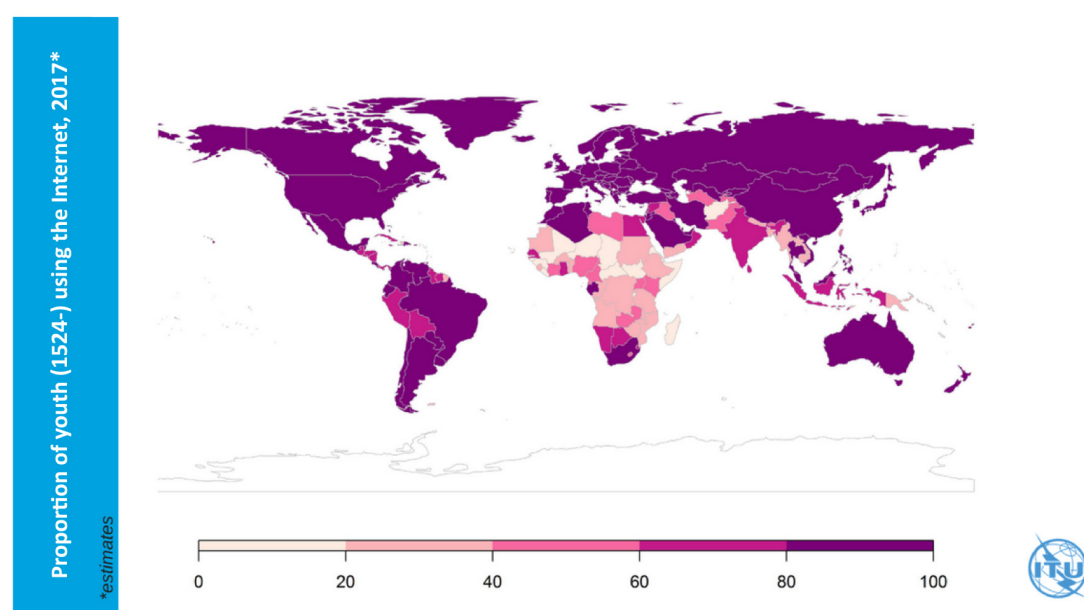
A catalogue of training courses offered by the ITU CoEs in Europe has been elaborated and circulated to all ITU Member States.

Output 4.1 contributed to the implementation of WTDC-14 and other relevant conference and assembly resolutions, recommendations and decisions

WTDC and other relevant conferences and assembly resolutions, recommendations, and decisions	
WTDC	Resolutions 1, 5, 9, 15, 20, 21, 22, 30, 32, 33, 36, 40, 50, 59, 73, 77
Plenipotentiary Conference (Busan, 2014)	Decisions 5, 13 Resolutions 25, 71, 72, 137, 139, 140, 172, 176, 188, 189, 197, 199, 202
WSIS Action Lines	The activities implemented under Output 4.1 contributed to the implementation of WSIS Action Line C4 of the Geneva Plan of Action and §§ 8, 22, 23a, 26g, 49, 51, 65, 72h, 86, 87, 90c, d, f, 95, 114b of the Tunis Agenda for the Information Society
Contribution to SDGs	1, 2, 3, 4, 5, 6, 12, 13, 14, 16, 17, 18

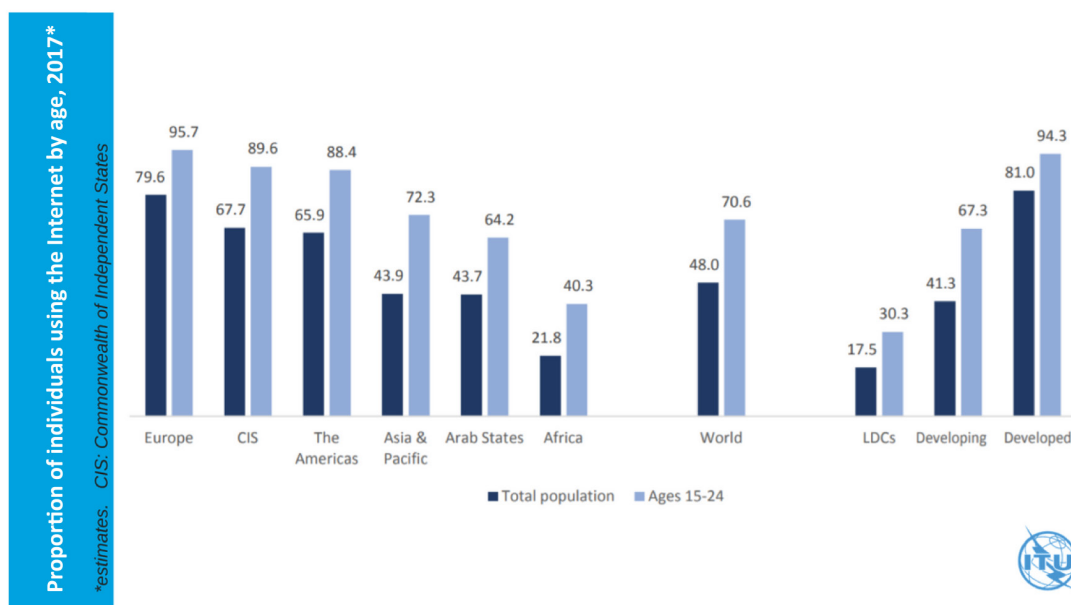
4.2 Telecommunication/ICT statistics

With the growing recognition of ICTs as a driver for social development and economic growth, and as more and more people join the global information society and high-speed communication networks become an indispensable infrastructure, the tracking and measurement of developments in the telecommunication/ICT field remain as relevant as ever. The statistical standards, definitions and methodologies developed by ITU are now used extensively by countries for their production of ICT statistics. The preparation of reliable, comprehensive and comparable telecommunication/ICT statistics by ITU is indispensable in order to identify progress and gaps, track information society developments at the national and global levels and enable government and industry to make informed and strategic decisions to ensure equal access to, and the equal use and impact of, ICTs. The collection and dissemination of high-quality data and statistics that measure, and provide comparative analyses of, advancements in the use and adoption of ICTs globally are essential in order to support developing economies.



Source: ICT Facts and Figures, 2017

The main outcomes achieved under this output are: enhanced information and knowledge at the disposal of policy-makers and other stakeholders on current telecommunication/ICT trends and developments, based on high-quality, internationally comparable telecommunication/ICT statistics and data analysis; and enhanced dialogue between telecommunication/ICT data producers and users, together with increased capacity and skills on the part of producers of telecommunication/ICT statistics for carrying out data collection at the national level on the basis of international standards and methodologies.



Source: ICT Facts and Figures, 2017

4.2.1 Results achieved

ITU hosts the world's most comprehensive and up-to-date collection of ICT data and statistics relating to ICT infrastructure, access and usage, policy and regulation, and cost and tariff policy issues. The work of ITU under this output has resulted in the enhanced availability and dissemination of internationally comparable ICT statistical databases.

"Behind these numbers and statistics are real human stories. The stories of people whose lives have improved thanks to ICTs. Our mission is to bring ICTs into the hands of ordinary people, wherever they live. By measuring the information society, we can track progress, or identify gaps, towards achieving socio-economic development for all."

Brahima Sanou, Director of the ITU Telecommunication Development Bureau

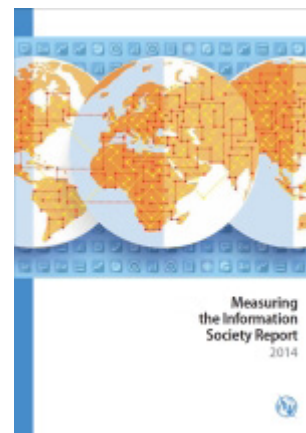
In 2014, 2015, 2016 and 2017, a number of statistical products, based on high-quality statistics,⁴ were released to enhance the information and knowledge available to policy-makers and other stakeholders on current telecommunication/ICT trends and developments. The ITU flagship publication,

⁴ ICT Facts and Figures 2014, 2015 and 2016; the World Telecommunication/ICT Indicators Database (June and December 2014, 2015 and 2016); the Little Data Book on ICT 2014 and 2015; and the Yearbook of Statistics 2014, 2015 and 2016.



the [Measuring the Information Society Report](#), supports policy-makers, investors, and business people in terms of current ICT market trends, enabling them to make evidence-based decisions by providing an accurate analysis of telecommunication/ICT development at the national, regional and global levels. The most recent report features, among other things, the annual results of the ICT Development Index (IDI), the role of ICTs in monitoring the SDGs, new data on ICT prices, analysis of mobile uptake, and an analysis of Internet user and activity trends. Each launch of the report receives wide media coverage, averaging over 1600 news articles that reach a broad target audience, thereby promoting the exchange of information, raising public and consumer awareness and expanding public access to expert knowledge.

ITU also contributed to enhanced knowledge on the part of policy-makers and other ICT community stakeholders by publishing, in 2014, the [Final WSIS Targets Review: Achievements, Challenges and the Way Forward](#) (published jointly with the Partnership on Measuring ICT for Development). The report provides a comprehensive evaluation of the achievements made towards the WSIS Targets that governments agreed upon at the WSIS events. It reviews progress made on each WSIS Target, ranging from the connection of villages, schools and health centres to content development and ICT access provision, and makes recommendations in regard to policies that have the most relevant impact on the WSIS Targets. The report also reviews the relevance of the targets and indicators used to track the information society and draws attention to the availability (and lack) of data to track that progress.



By organizing the annual [World Telecommunication/ICT Indicators Symposium \(WTIS\)](#)⁵, which is the main global forum for discussing ICT statistics, ITU has enhanced both the dialogue between ICT data producers and users and the awareness and capacity needed by countries in order to produce telecommunication/ICT statistics. To guide countries and ITU in future work on ICT measurement, WTIS adopted a number of conclusions and recommendations.

ITU contributed to strengthening Member States' capacity in regard to ICT data collection by publishing the [Manual for Measuring ICT Access and Use by Households and Individuals 2014](#). The manual, available in six languages, has become the main reference document for national statistical organizations in their work on producing household ICT statistics, and has contributed to the harmonization of definitions, indicators and collection methodologies.

⁵ The 12th WTIS was held from 24 to 26 November 2014 in Tbilisi (Georgia); the 13th was held from 30 November to 2 December 2015 in Hiroshima (Japan), with over 600 participants; and the 14th was held from 21 to 23 November 2016 in Gaborone (Botswana).



World Telecommunication/ICT Indicators Symposium (WTIS), 2016

ITU activities under this output have contributed to increased cooperation and to improved methodologies and international standards in respect of ICT statistics through the work of the Expert Group on Telecommunication/ICT Indicators and the Expert Group on ICT Household Indicators. These two expert groups met in September 2014, September 2015 and October 2016, in Geneva. They then held an extraordinary meeting in March 2017 to review the indicators included in the IDI. The meetings were attended by around 120 participants from over 50 countries, as well as from regional and international organizations, the private sector, the academic world and civil society. Where future work on ICT statistics was concerned, the meetings agreed on a number of decisions that were presented to, and adopted by, the 12th, 13th and 14th World Telecommunication/ICT Indicators Symposium.



Activities under this output also contributed to the monitoring of international development goals by providing inputs to the annual Millennium Development Goals (MDGs) Indicators Report and the MDG Gap Report concerning ICT developments, as well as to the partnership on measuring ICT for development proposal for ICT indicators for the SDG indicators framework. As a result of these activities, the latest version of the SDG indicators framework adopted by the UN Statistical Commission in March 2016 includes seven ICT indicators, covering six targets under Goals 4, 5, 9, and 17.



The skills and abilities of producers of ICT statistics in the area of data collection and the production and analysis of comparable international ICT indicators was enhanced through a number of capacity-building activities: a multi-country training workshop for national focal points on ICT indicators was held from 8 to 15 March 2016 in Nay Pyi Taw (Myanmar), attended by delegates from Indonesia, Lao P.D.R., Myanmar, Timor-Leste and Viet Nam. Country assistance and training on developing a national ICT indicators and statistical framework was provided to Albania, Angola, Comoros, Gabon, Mongolia, Myanmar, Pakistan and Rwanda.

In the Africa region

An ICT observatory was launched in Madagascar in 2016, in collaboration with the Telecommunication Regulatory Authority. This will enable policy-makers to collect and analyse ICT data for improved policy-making.

Several media events were organized in Addis Ababa (Ethiopia) to promote the Measuring the Information Society report.

In the Americas region

Member States were given the opportunity, through the Caribbean Training Workshops on ICT Indicators delivered in 2015 and 2016, to address improved data gathering and measures to determine access to broadband infrastructure, services and applications. During both workshops, training enhanced the capacity of 16 Caribbean countries to produce national telecommunication and ICT statistics and indicators.

Press conferences were organized in Barbados, Brazil, Chile y Honduras to promote the Measuring the Information Society (MIS) report in 2015 and 2016.

In the Arab States region

Progress was made by countries, particularly in the Arab States region, in their efforts to improve their telecommunication/ICT development, and this was highlighted through the launch of the Measuring the Information Society (MIS) reports in 2015 and 2016 in two press conferences organized in collaboration with Egypt's MCIT.

The ITU Regional Forum on ICT Measurement, held in Dubai (United Arab Emirates) in 2016 strengthened the capacity of countries in the region to produce national telecommunication/ICT indicators and statistics based on internationally agreed standards and methodologies. The forum was attended by officials and national experts from ministries, regulatory agencies, national statistical offices, service providers and regional and international organizations, as well as other relevant stakeholders.



ITU Regional Forum on ICT Measurement, Dubai, United Arab Emirates, 13-15 December 2016

In the Asia-Pacific region

ITU provided assistance in developing robust national ICT indicators and statistical frameworks in the Philippines, Lao P.D.R., Myanmar and Viet Nam, thereby increasing the use, and raising awareness, of the importance of the production and dissemination of high-quality data for national policy purposes.



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



The collection of ICT statistics in Lao P.D.R. and Myanmar was improved following an assessment, the development of a national ICT database and the associated capacity building. In 2016, ITU strengthened the skills and capacities of some 50 national focal points for ICT statistics from national statistics offices, ministries and regulators in Indonesia, Lao P.D.R., Myanmar, Timor Leste and Viet Nam, while 45 delegates from ten countries participated in the Training Workshop for National Focal Points on ICT Indicators and Measurements held in Myanmar. ITU also organized the National ICT Indicators Symposium on 25 July 2016 in Islamabad (Pakistan), and the Mongolia National Training Workshop on ICT Statistics on 22 and 23 May 2017 in Mongolia.

In 2014, a workshop for ASEAN and Pacific island countries on ICT indicators and statistics raised the awareness of 80 participants from 20 countries, and ITU partnered with ASEAN in organizing a workshop on ICT Indicators and Measuring ICT Adoption in Thailand.

In coordination with the Pakistan Telecommunication Authority (PTA), the 2016 ICT Indicators Symposium enhanced the understanding of stakeholders in Pakistan in regard to the international ICT rankings methodology, identification gaps in ICT data collection and ways to remove impediments to ICT data collection and dissemination in Pakistan.

A National Training Workshop on ICT Statistics was held in Mongolia on 22 and 23 May 2017, organized by the Communications and Information Technology Authority (CITA) and hosted by the Ministry of Foreign Affairs. It was attended by 130 participants, representatives and experts from various government agencies involved in the collection of ICT-related statistics, including the National Statistics Office of Mongolia, CITA and the Communications Regulatory Commission of Mongolia, as well as telecommunication operators and service providers. The workshop strengthened the country's capacity to produce internationally comparable, high-quality telecommunication and ICT statistics and indicators.

17 PARTNERSHIPS FOR THE GOALS



In the Commonwealth of Independent States



The 12th World Telecommunication/ICT Indicators Symposium (WTIS-14) took place from 24 to 26 November 2014, in Tbilisi, Georgia. WTIS-14 brought together ICT ministers, heads of national telecom/ICT regulatory authorities and national statistical offices, heads of international organizations, chief executive officers of private-sector companies, and statistical experts from around the world. It serves as the main international forum to discuss international ICT statistics. The ITU annual flagship report, Measuring the Information Society, was launched at WTIS-14 on 24 November.

In the Europe region

A press conference was held to launch the MIS Report, with a regional focus on Europe, in November 2015, and a similar launch is planned for 2017 in Brussels in November.

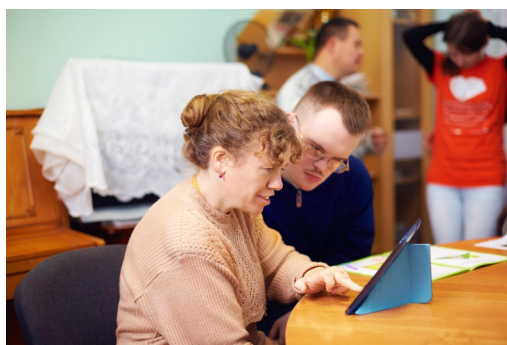
Output 4.2 contributed to the implementation of WTDC-14 and other relevant conference and assembly resolutions, recommendations and decisions.

WTDC and other relevant conferences and assembly resolutions, recommendations, and decisions	
WTDC	Resolutions 1, 5, 8, 30, 33, 37, 43, 50, 51, 52, 57, 59, 60
Plenipotentiary Conference (Busan, 2014)	Decisions 5, 13 Resolutions 25, 71, 72, 137, 139, 140, 172, 176, 188, 189, 197, 199, 202
WSIS Action Lines	ICT statistics are relevant to monitoring the implementation of all WSIS action lines of the Geneva Plan of Action and are referred to in §§ 112-119 of the Tunis Agenda for the Information Society
Contribution to SDGs	4, 5, 9, 17

4.3 Digital inclusion of people with specific needs

Digital inclusion means ensuring ICT accessibility and the use of ICTs for the social and economic development of people with specific needs. Despite the expanding deployment of telecommunication/ICT networks, many women and girls, persons with disabilities, young people, children and indigenous people remain excluded from the information society. People with specific needs often face barriers to using telecommunications/ICTs. Persons with disabilities, depending on their disability, may not be able to see screens, hear sound on a phone or input commands to a mouse, computer or touchscreen phone. These barriers can be overcome where accessible and affordable ICTs are available. Women, young people and indigenous peoples who are not online often require basic and advanced digital literacy training along with an understanding of how to use ICTs for their social and economic empowerment.

Barriers faced by people with specific needs can be removed through effective laws, policies, national broadband plans, regulations and business practices, as well as through ICT training and development strategies which take into account the specific needs of women, girls, indigenous peoples and persons with disabilities to ensure an inclusive information society.

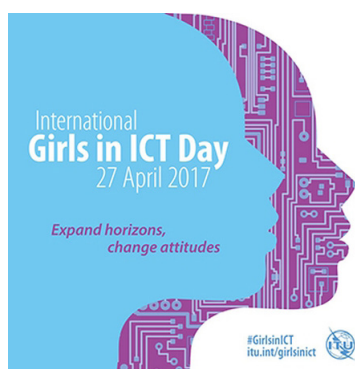
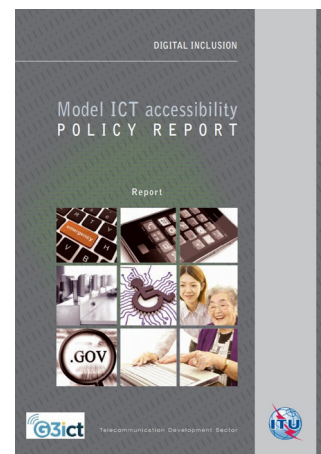


4.3.1 Results achieved

The strengthening of Member States' capacities to develop and implement digital inclusion policies, strategies and guidelines to ensure telecommunication/ICT accessibility for persons with disabilities resulted in the following:

- The capacity of over 350 ITU members was enhanced in regard to ICT accessibility policies and practices during ITU-D rapporteur group and Study Group Question 7/1 meetings in 2015, 2016 and 2017.
- Over 186 people attended the regional event [Accessible Americas II: Information and Communication for ALL](#), held in Colombia in 2015, and 188 participants attended [Accessible Americas III: Information and Communication for ALL](#), held in Mexico in 2016, and benefited from training on ICT accessibility policies in particular, and from the guidelines for accessible websites to be implemented at the regional level.

- Recognizing the important role that is played by public procurement in ensuring that accessible ICTs are widely available to persons with disabilities, an extensive set of online training materials on [Public procurement of accessible ICT products and services](#) was delivered to 75 participants in two online training courses, one in 2015 and one in 2016, through the ITU Academy and also during Accessible Americas III: Information and Communication for ALL.
- The [Model ICT Accessibility Policy Report](#), which is available in all the six official ITU languages to facilitate its use by countries around the world, serves both to raise awareness on the types of ICT accessibility policies *that* ITU members can adopt and to build their capacity to implement such policies.
- Guidance was provided in 2016 to Peru’s Supervisory Body for Private Investment in Telecommunications to promote a web accessibility policy in Peru, and to Egypt to develop a national ICT accessibility policy.
- In April 2017, during its annual ICT accessibility conference, Egypt released its national ICT accessibility policy for persons with disabilities. The policy includes recommendations on additions to Egypt’s draft Disability Act, as well as its ICT and broadcasting laws and regulations covering web, TV, mobile and public access terminal accessibility and public procurement of accessible ICTs.
- ITU developed a national training programme on web accessibility comprising two face-to-face train-the-trainer courses on “Accessible web content and design” and “Development of accessible websites”, in line with the WCAG 2.0 web accessibility standards. The national training programme on web accessibility also included a decision-maker’s buy-in, raising awareness on the part of the regulator, the Superintendency of Telecommunications (SUTEL), the Ministry of Science, Technologies and Telecommunications, the University of Costa Rica and its National Council for Persons with Disabilities (CONAPDIS), as well as presenting a self-sustaining model which, as a result of national certification for these two training events, will also generate funds for capacity building for persons with disabilities in regard to accessible websites.
- ITU trained and provided corresponding certification to trainers on Accessible Web Content and in Design and Development of Accessible Websites. These courses were delivered at the University of Costa Rica, which has taken the national lead on this topic and is replicating the courses in the interests of ensuring that Costa Rica’s governmental websites are made accessible for persons with visual disabilities by the end of 2017.



Since WTDC-14, awareness has been raised for almost 2 000 participants around the world on the type of ICT accessibility policies ITU members can adopt and implement to ensure telecommunication/ICT accessibility for persons with disabilities. This was achieved through meetings and workshops, such as Accessible Americas I in Brazil in 2014, Accessible Americas II in Colombia and Accessible Americas III in Mexico; the M-Enabling Summit in Washington, DC in 2014, 2015 and 2016; the 2016 Asia-Pacific Economic Cooperation Telecommunications and Information Working Group seminar on Social Inclusion of People with Disabilities Through Access to Telecommunications/ICTs; the 2016 European Foundation Forum for Inclusion; a series of Europe region regional initiative meetings in 2015 in Spain, Belgium, Italy, Serbia and Slovenia, organized with key European partners including the European Commission, the European Broadcasting Union (EBU), and academic institutions from the Europe region; Arab States region and CIS regional initiative meetings in 2015 and 2016.

In addition, a 2015 United Nations Department of Economic and Social Affairs/United Nations Human Settlements Programme meeting on disability and development for Africa, a 2016 WSIS Forum session on public procurement of accessible ICTs, organized within the framework of Europe's regional initiative and in partnership with ITU-T, and the ITU Regional Office for Africa in partnership with EAC have developed a draft Information and Communication Technology (ICT) Accessibility Policy for the EAC countries that was adopted by the participants in the E-accessibility Policy for East Africa Region Workshop held in Nairobi (Kenya) on 6 and 7 October 2016. Participants from five EAC countries recommended that once the policy is adopted, the use of universal service and access funds should be considered as one of the sources to funding and that monitoring and evaluation mechanisms for a five-year period should be developed.



In 2017, the European Workshop on Accessibility, held on 2 and 3 February 2017 in Brussels (Belgium), raised the awareness of over 150 participants in regard to public procurement. In Costa Rica in March 2017, around 100 decision-makers participated in a political buy-in on the topic of ICT accessibility related to web accessibility. In May 2017, during the closing stage of the "International Week – I Am Accessible" event held by the Government of Spain through Ceapat-Imsero, ITU also raised the awareness of over 200 participants on opportunities for promoting accessible ICTs from a global development perspective.

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. More than 66 600 girls and young women from 133 countries took part in the 1 800 events held to celebrate International Girls in ICT Day 2015. In 2016, more than 66 000 girls from 138 countries participated in over 1 900 events. 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. The ITU [Girls in ICT Portal](#) received 487 000 page views 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.

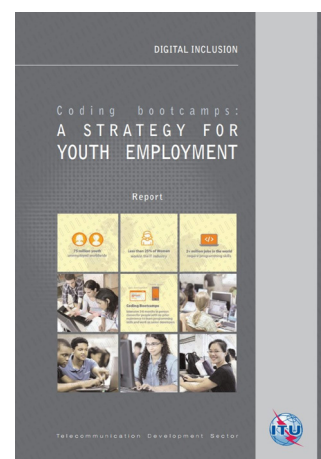
Awareness about Girls in ICT Day has been raised among tens of millions worldwide. Not only was it covered by BBC World Service TV in 2017, the #GirlsInICT hashtag reached over 63 million Twitter accounts for 255 057 360 timeline deliveries this year.

In 2017, the flagship Girls in ICT Day event organized in Geneva was connected with the Girls in ICT Day event organized in Vilnius (Lithuania), during RPM-EUR, and the event organized by Alfa Telecom in Beirut (Lebanon). These, and other events from around the world were posted on the Girls in ICT Portal, which also hosts the Girls in ICT Facebook page and #girlsiniict Twitter feed.

During a WSIS workshop held on 15 June 2017, 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.

The capacity of members in using telecommunications/ICTs for the social and economic development of people with specific needs, including telecommunication/ICT programmes to promote youth employment and entrepreneurship, was improved through the following:

- The joint [ITU-ILO Digital Skills for Decent Jobs for Youth](#) campaign, launched by the two United Nations agencies during the WSIS Forum in June 2017 with the aim of training five million young people worldwide in job-ready digital skills by 2030, raised awareness of the importance of training young people in such skills and incentivized nearly 200 stakeholders to provide such training to young people. The campaign is in support of the Global Initiative on Decent Jobs for Youth (GIDJ4Y), a coalition of 22 United Nations agencies created to address the global youth unemployment crisis. ITU is leading the digital skills thematic area for this initiative, which seeks to scale up country action. More information about the campaign is available [here](#).
- The publication of research and guidelines in the ITU report [Digital Opportunities: Innovative ICT Solutions for Youth Employment](#), that was provided to all ITU members.
- The publication of a report on [Coding bootcamps: A strategy for youth employment](#), that was provided to all ITU members.
- The Coding Bootcamps report was also provided as a contribution from ITU to GIDJ4Y, ITU having committed to leading the digital skills and tech hubs thematic area of GIDJ4Y.
- In October 2016 in the Philippines, two courses to support ITU members with the launch of coding bootcamps in their countries were developed and delivered to some 50 participants from over 20 state universities and colleges, in order to promote youth employment and ensure that graduates of university computer science programmes acquire job-ready skills. The training, provided by a successful coding bootcamp in Australia, was hosted by the Lyceum University of the Philippines and organized by ITU in partnership with the Philippines Administration, the Department of Information and Communication Technology.
- The creation and online posting of a database of ICT-enabled resources, available to all ITU members, young job seekers and entrepreneurs. This database includes links to training opportunities, crowdfunding for start-up capital, mentoring networks and job-matching services, to enable members and young people to leverage digital opportunities to enhance their employment and entrepreneurship opportunities.
- Awareness was raised and best practices shared among ITU members through the weekly publication of innovative digital inclusion practices and strategies on the ITU-D Digital Inclusion newslog, such as digital literacy, coding training, initiatives to encourage more girls and women to take up ICT studies and careers, and ICT accessibility practices for persons with disabilities.



In the Africa region

Girls in ICT Day celebrations were organized in Addis Ababa (Ethiopia) for the years 2014, 2015, 2016 and 2017 with the collaboration of United Nations agencies such as the United Nations Economic Commission for Africa, the United Nations Development Programme and UN Women, and the African Union Commission. At least 200 high school girls from Addis Ababa participated at each event. Other African countries were also supported with resources from the Girls in ICT Portal, some of them also having received financial assistance for the organization of their national events.



In 2016, a draft policy for digital inclusion for East Africa was drawn up in collaboration with the EAC secretariat, for adoption by the EAC Member States. The meeting to draft this policy, held in Nairobi and hosted by the Communications Authority of Kenya, was attended by organizations for people with disabilities from the Member States of the region and beyond.

In 2014 and 2015, Zimbabwe benefited from a Training for Trainers in ICT Skills on the use of ICTs in community information centres. This included training for persons with disabilities. A total of 52 trainers were trained, and persons with disabilities and special needs can visit the community information centres to access internet services.

In the Americas region

Support was provided for the establishment of community centres in Belize, Barbados, Saint Kitts and Nevis and Grenada. The centres provide Internet access to the communities and form part of the effort to reduce the digital divide in those countries.

At the past three editions of the Accessible Americas: Information and Communication for ALL event, discussions were held on the identification of principles to guide the implementation of practices for the work of stakeholders seeking to ensure the rights of persons with disabilities, having regard to equality and affordability. During the three events, ITU delivered, to the over 400 participating stakeholders, training on concepts and principles relating to ICT accessibility across the web (including requirements to comply with web accessibility standards), television, mobile and public-access platforms (ICT spaces/telecentres), and shared success stories concerning the regional implementation of ICT accessibility policies and practices.

Two successful editions of a mobile apps regional competition to select innovative and creative solutions to benefit persons with disabilities were organized in partnership with Samsung. The main objective is to award and promote those initiatives that can bring, through mobile technologies, more social inclusion and interaction, comfort and quality of life to the daily routine of persons with disabilities. The third edition of this competition is ongoing and will award winners in two categories: (1) ideas, solutions or projects still to be developed or currently under development, so that the target public can enjoy them; and (2) solutions to benefit persons with disabilities that are already developed or available in the market.

From 21 to 23 November 2017, the IV Accessible Americas event will be held in Costa Rica.



In cooperation with Fondo Indígena, and every year since 2005, BDT has provided, through the ITU Academy, a training programme which benefits almost 300 indigenous leaders in the Americas region by building their capacity to use telecommunications/ICTs for social and economic development. The programme 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. Awareness of these tools was raised among members of indigenous communities through the BDT Indigenous Peoples website, which enjoyed almost 17 000 views in 2016. An ongoing effort will now be made to ensure that future training events respond to the capacity-building requirements of the indigenous communities and interests expressed by them.

In the Arab States region

The Regional Initiative on Ensuring Access to Telecommunications/ICTs, in particular for persons with disabilities, focused on upscaling regional efforts to create enabling environments for, and build capacities to promote, ICT accessibility.

ITU increased its efforts to make ICTs accessible to persons with disabilities through the establishment of a regional innovation centre following the signature of an agreement with MCIT Egypt in 2016, and a national ICT accessibility policy for Egypt was formulated to create an enabling environment for accessible ICTs.



BDT Director Brahima Sanou with visually impaired boy in Egypt

Awareness was raised through the organization of events on the opportunities and challenges of ICT accessibility, and regional organizations were made aware of the resources needed to organize accessible events, in the interests of boosting the number of participants with disabilities.

Since 2014, direct assistance has been provided to 13 Arab countries in the organization of their Girls in ICT Day celebrations. Throughout these years, Girls in ICT Day celebrations have also been held in Mauritania and Egypt, in collaboration with the Member States and other private companies. Over 700 high school girls from Egypt's various governorates participated in the events.

A cooperation agreement was signed in April 2017 with the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), represented by the Employment Promotion Project, for the organization of Girls in ICT Day events in Egypt until 2019.

Through a co-organized Girls in ICT Day event in Aswan (Egypt) on 27 April 2017, in collaboration with GIZ, Continuing Educational Centre and International Development Research Centre, over 60 girls were trained on infographic and Canva application principles.

In the Asia-Pacific region

Working for the social and economic empowerment of people with specific needs, ITU experts strengthened Member State capabilities:

- by developing and implementing digital inclusion policies, strategies and guidelines to ensure accessibility and use of telecommunications/ICTs;
- by launching a trial interactive online curriculum in the Philippines, in coordination with the Philippines Administration and the Tinder Foundation, to test its relevance to English-speaking developing countries in terms of the provision of digital literacy training and training on the use of telecommunications/ICTs;
- by assisting Lao P.D.R., in collaboration with NECTEC Thailand, in the development of text-to-speech software in the Lao language.



International Scientific and Technical Conference of Students and Young on Information Technologies and Communication Systems

The Regional Initiative on Harnessing the Benefits of New Technologies resulted in improved skills and enhanced awareness in regard to digital literacy for children in rural areas, and promoted the awareness of children, teachers and persons with disabilities on how to stay safe online. ITU also provided assistance with text-to-speech development to assist persons with disabilities (Lao P.D.R., 2016), encouraged the use of ICTs by women and girls through the Women with the Wave (2014-2015) and Girls in ICT Day (2014-2017) programmes, and organized the Coding Bootcamp for Youth Employment to foster the employment of young people within the region. In addition, the Coding Bootcamp Operators Course and the Coding Bootcamp Trainers Course were attended by participants from several state universities and colleges in the Philippines, thereby demonstrating the value of coding boot camps as a youth employment strategy.

As part of the Girls in ICT Day initiative, a capacity-building programme was launched with Thailand's Ministry of Digital Economy and Society, in partnership with CISCO, Microsoft and FAO, with the aim of imparting employable digital skills to over 100 female university students in Thailand in 2017.

ITU also collaborated with the Global Initiative for Inclusive ICTs (G3ICT) and Centre for Internet and Society, and prepared a report on ICT-enabled disaster management for the Asia-Pacific region, entitled Realizing Inclusive Disaster Management with ICTs in Asia-Pacific.

In the Commonwealth of Independent States

The Inclusion of the Rural Population in the Kyrgyz Republic activity promoted telecommunication/ICT access and use through the training of informatics teachers in rural areas. The interactive electronic textbook, provided within the scope of the Connect a School Initiative, for self-study of Internet and web technology basics also improved inclusiveness in the Kyrgyz Republic.

The above activity also contributed to reducing the gender gap thanks to the majority of women teachers trained. Annual training events are jointly organized each spring by ITU and the Institute of Electronics and Telecommunications under the Kyrgyz State Technical University (IET-KSTU). In 2015, the training courses were completed by 137 rural teachers, 114 of them women, and in 2016 by 107 rural teachers, 83 of them women. In addition, young women were encouraged to embark upon careers in ICT through regional videoconferences dedicated to Girls in ICT Day and ITU's 150th Anniversary, celebrated in ITU's Area Office for the CIS and attended by 93 participants from six CIS countries. In 2017, courses were completed by 95 rural teachers, 75 of them women.

Young CIS researchers were encouraged to get involved in ICT development at the International Scientific and Technical Conference of Students and Young on Information Technologies and Communication Systems, held in the Russian Federation from 11 to 16 May 2015.

Further to analysis of the ICT gender gap in the CIS, opportunities for building ICT careers for women were promoted at a regional ITU videoconference workshop held in ITU's Area Office for the CIS on 28 April 2016 and attended by 68 participants from eight CIS countries.

The Regional Initiative on Ensuring Access to Telecommunication/ICT Services for Persons with Disabilities resulted in the establishment of Information and Training Centres for Persons with Disabilities in the Kyrgyz Republic, Republic of Belarus, Republic of Moldova and Russian Federation, and the development and adaptation of online resources for persons with disabilities. This work included the following:

- Broadening ICT inclusiveness in Belarus through the establishment of an Internet Access and Training Centre for persons with hearing disabilities in Vitebsk in March 2017. The centre has five workstations.
- Enhancing the capacity of teachers at two Internet Access and Training Centres for persons with hearing disabilities through a joint ITU-IITE UNESCO training event held in Minsk (Belarus) on 15 and 16 May 2017.
- Discussions, at the ITU Regional Videoconference Seminar held in Moscow (Russian Federation) on 27 April 2017, with 60 participants from six countries, around the results of the Girls in ICT Day initiative in the CIS, and outlining of future directions for its development.

In the Europe region

In 2015, 2016 and 2017, a special campaign was carried out at the regional level to encourage European stakeholders to organize celebrations for the Girls in ICT Day initiative. Several activities were carried out by governments, civil society, academic institutions and private-sector entities in at least 36 countries in the Europe region, and a stocktaking report has been drafted and broadly shared with the aim of highlighting good practice.

ITU and the CEPT (European Conference of Postal and Telecommunications Administrations) Committee for ITU Policy (Com-ITU) jointly celebrated Girls in ICT Day in Bucharest (Romania) in 2015 and Lucerne (Switzerland) in 2016 to raise awareness among European administrations of the issue

of gender mainstreaming and the importance of creating new career opportunities for women in the ICT sector. Girls in ICT Day also coincided with the Europe Regional Preparatory Meeting (RPM), and ITU celebrated the Day in cooperation with the Kaunas University of Technology in Vilnius (Lithuania).



Girls in ICT Day 2017, Vilnius, Lithuania

The Regional Initiative on Ensuring Access to Telecommunications/ICTs, in particular for persons with disabilities, resulted in strengthened regional cooperation among relevant stakeholders in the field of accessibility. The capacity of over 500 professionals was enhanced through the activities carried out under the regional initiative. A series of physical meetings and online training sessions enabled the sharing of best practices across the region, as well as the provision of guidance on the policies and regulatory frameworks that serve to promote e-accessibility, including television/ICT applications, for persons with disabilities.

Special attention was given to accessible ICTs, and two online courses provided a unique opportunity for public procurement professionals to build their expertise while advancing their national e-accessibility agendas.

A Special Curriculum on ICT Accessibility Policy was developed and serves as a basis for national executive training events currently under implementation in Serbia, Bosnia and Herzegovina and Montenegro.

In addition, cooperation with diverse European accessibility organizations, including the European Disability Forum, European Commission, EBU and G3ICT, was strengthened.

4.3.2 Study group Questions

The following Study Group 1 Question contributed to Output 4.3:

Question 7/1: Access to telecommunication/ICT services by persons with disabilities and with specific needs

Output 4.3 contributed to the implementation of WTDC-14 and other relevant conference and assembly resolutions, recommendations and decisions

WTDC and other relevant conferences and assembly resolutions, recommendations, and decisions	
WTDC	Resolutions 1, 5, 9, 11, 15, 20, 21, 22, 23, 30, 32, 55, 58, 68, 76, 77
Plenipotentiary Conference (Busan, 2014)	Decisions 5, 13 Resolutions 25, 30, 32, 33, 34, 36, 37, 64, 70, 71, 131, 139, 140, 175, 184, 198, 202
WSIS Action Lines	C2, C4 and C7 and C8 of the Geneva Plan of Action and § 90 of Tunis Agenda for the Information Society contributed to Output 4.3
Contribution to SDGs	4, 5, 8, 10, 17

4.4 Concentrated assistance to LDCs, SIDS and LLDCs

The needs of the least developed countries (LDCs), small island developing states (SIDS) and land-locked developing countries (LLDCs) have been mainstreamed in all ITU-D activities, programmes and projects. The assistance encompasses climate change, e-waste, emergency telecommunications, disaster risk management, universal access, human and institutional capacity, infrastructure, enabling policies and regulatory reforms, and fostering public-private partnership.



ITU has provided direct assistance for emergency responses in disaster situations and improved communications in a total of 15 countries

Despite the progress that has been made over the last decades, the number of countries with special needs remains very high. LDCs, SIDS and LLDCs in particular remain vulnerable and face a number of development challenges that require special attention. Given the opportunities that ICTs provide for social and economic development and the consequent need to deliver access to ICT services and applications, concentrated assistance to these countries is particularly important, as highlighted by the call made in the 2030 Agenda for Sustainable Development to “leave no one behind”.

ITU is committed to discharging its mandate and is striving to fulfil its commitments in regard to ICTs for LDCs under the Istanbul Programme of Action, the Small Island Developing States Accelerated Modalities of Action (Samoa Pathway), and the Vienna Programme of Action for Landlocked Developing Countries for the Decade 2014-2024.

4.4.1 Results achieved

ITU has raised awareness of the importance of ICTs for sustainable development and provided concentrated assistance as well as enhanced capacity to LDCs, LLDCs and SIDS in regard to ICT-related activities, initiatives, programmes and projects, including: market regulatory reforms, emergency telecommunications, disaster response, gender equality, ICT infrastructure, spectrum management and climate change adaptation. This push for greater awareness has served to mitigate adverse impacts and enhance human capacity.

In terms of support for disaster relief, ITU has provided direct assistance for emergency responses in disaster situations and improved communications in a total of 15 countries, including developing countries, LDCs, SIDS and LLDCs, by re-establishing communication networks, delivering direct assistance in the form of equipment and infrastructure damage assessments, and reconstructing and rehabilitating telecommunication infrastructure. During these deployments, over 150 users were trained, by means of ten capacity-building workshops, in the use of satellite telecommunication equipment. ITU is also strengthening the capacity of LDCs to address disasters by developing and establishing early warning systems.

ITU has led the way in harmonizing telecom/ICT policies in the Pacific region, resulting in the adoption of a number of national strategies, policies and regulations on, among other things, ICTs, cybersecurity and universal access and service.

Efforts have been ongoing to promote infrastructure development with multiple stakeholders and partnerships by providing seed money to connect rural/outer islands in the Pacific, develop ICT applications and build human capacity in ICT development.

On 1 October 2014, an agreement to launch the Pacific Connectivity Project was signed by ITU and 11 Pacific Islands and with industry partners on the Development of Satellite Communications Capacity and Emergency Communications Solutions for the Pacific, to make broadband accessible and affordable to all citizens in the Pacific Islands.

In the Africa region

ITU is helping blind school pupils in Zambia: in 2016, it provided the Zambia regulatory authority, ZICTA, with equipment including Braille printers for the blind, desktop computers and software, for use in educational institutions for persons with visual impairments. This project represents a significant effort on the part of ITU to provide technical support to schools for the blind and concentrated assistance to Zambia. The grants will help blind students to achieve more in their educational endeavours and empower them in the digital world.



The Information and Communications Commission of Tanzania developed its Corporate Strategic Plan with technical assistance provided by ITU in 2016 and 2017.

Mozambique and Zambia also benefited from technical assistance in 2016.

South Sudan implemented its National Communications Act (2012) through, among other things, the technical assistance provided by ITU in 2014 and 2015.

In 2015, Seychelles, a SIDS Member State, benefited from concentrated assistance in the form of frequency-management training, and is now able to manage the challenges posed by its isolated island status.

In 2016, Seychelles continued to benefit from concentrated assistance, with ITU conducting feasibility studies for a suitable frequency-monitoring station. The feasibility-study report has enabled Seychelles to make informed decisions as to the most suitable type of monitoring station.

In the Americas region

Ongoing assistance with emergency radiocommunication equipment in Haiti will help the National Telecommunication Council (CONATEL) to respond to disasters and ensure that disaster-resilient response features are incorporated into the national emergency telecommunication operations network and infrastructure so as to improve the capacity to respond to and mitigate the consequences of a disaster.

The Bahamas Smart Island initiative, launched in February 2016, will be a blueprint for other Caribbean countries that will serve to improve urban infrastructure, systems and governance and help save lives by better preparing to meet the challenges of climate change, including disruption in the wake of a disaster. It will also contribute to social equality by ensuring universal access to public services, healthcare, security and intelligent traffic systems.

The restructuring of the Barbados regulatory authority in the interests of efficiency and streamlining of the regulatory functions in the local environment was successfully carried out with ITU support, and 21 persons were trained during a workshop held from 4 to 6 May 2016.

The establishment of community centres in Belize, Barbados, Saint Kitts and Nevis and Grenada served to bridge the digital divide in those countries by providing Internet access to the communities.

ITU introduced the Caribbean School Cyber Security Awareness Programme to assist ministries of education in promoting the safe use of ICTs, anti-cyberbullying and general cybersecurity awareness in secondary schools in the Caribbean, starting with Belize, Grenada and Saint Kitts and Nevis.

A workshop entitled The Role of Education in Cyber Security: Developing Digital Citizenship was held in Belize with over 105 participants, on 27 and 28 June 2016.

Additional documentation and legislation has been developed with the help of ITU expertise including:

- the current drafting of an ITU manual for educators and parents to help confront the issue of cyberbullying, together with a regional policy document;
- the drafting of national broadband policies for Dominica to help implement a broadband technological framework;
- the drafting of a model roaming bill in Saint Lucia and its adoption by the Eastern Caribbean Telecommunications Authority (ECTEL), a first workshop relating to this subject having been held in Saint Vincent and the Grenadines on 24 June 2016, with participants from the ECTEL group.

In the Arab States region

A regional capacity-building project on IPv6 development and deployment for Arab LDCs was signed, and the subsequent training, held from 25 to 29 December 2016 and attended by 14 participants representing all Arab States region LDCs and Palestine, enhanced the technical skills of participants from each country to the level of IPv6 certification. In addition, Comoros, Djibouti and Yemen each

received a national strategic report on IPv6 development and deployment that promoted capacity building in IPv6 transition and adoption.

In 2016, ITU assisted Palestine in assessing its ICT market as well as current licence renewals and the issuance of new licences.

Comoros received expert assistance, delivered in part via a dedicated workshop for Comoros organized jointly in collaboration with the World Bank in 2016, on how to liberalize its ICT market and develop national guidelines on infrastructure sharing. Thirty participants from Comoros, Morocco, Mauritius and Tunisia attended the workshop, together with other ICT stakeholders. Support to Djibouti on the development of the legal and regulatory requirements for establishing an independent ICT regulator was drafted in 2016. Subsequent ITU assistance to Djibouti reviewed and developed the legal instruments and regulatory framework for the transition of the telecommunication sector.

In the Asia-Pacific region

The Regional Initiative on Special Consideration for Least Developed Countries, Small Island Developing States, including Pacific Island Countries, and Landlocked Developing Countries resulted in improved human, policy and regulatory capacity in the areas of licensing and spectrum management, including the development of national tables of frequency allocations, legislative frameworks, cybersecurity, broadband, broadcasting, ICT applications, satellite coordination, Internet transit planning, IXPs, pricing, licensing, numbering, converged regulations and other regulatory assistance. In addition, capacity building was encouraged and increased in many other areas, including:

- spectrum management licensing and service regulation;
- measurement of EMF radiation;
- development of mobile applications;
- cybersecurity awareness;
- digital literacy for children;
- COP and promotion of child and teacher awareness of how to stay safe online.

Implementation of the Pacific Connectivity Project was initiated, and the Pacific Regional Project Framework on the Development of Satellite Communications Capacity and Emergency Communications Solutions for the Pacific Islands is in progress. ITU organized the first ITU Training Workshop on VSAT Fundamentals and Installation, held from 15 to 18 May 2017.



ITU Training Workshop on VSAT Fundamentals and Installation, 15-18 May 2017

A project on capacity building in regard to countering the misappropriation of telephone numbers in Pacific island countries, supported by DOCA (Australia), was launched in 2017 and is currently in progress.

In the Commonwealth of Independent States

By supplying, in April 2017, remote education facilities through technical assistance to the Institute of Electronics and Telecommunications under Kyrgyz State Technical University named after Iskhak Razzakov, ITU supported the integration of ICT in education in the Kyrgyz Republic.

Output 4.4 contributed to the implementation of WTDC-14 and other relevant conference and assembly resolutions, recommendations and decisions.

WTDC and other relevant conferences and assembly resolutions, recommendations, and decisions	
WTDC	Resolutions 16, 17, 18, 21, 25, 26, 30, 33, 36, 37, 50, 51, 52, 53, 57, 60
Plenipotentiary Conference (Busan, 2014)	Decisions 5, 13 Resolutions 25, 30, 32, 33, 34, 36, 70, 71, 123, 124, 125, 126, 127, 135, 159, 160, 161, 172, 193, 202
WSIS Action Lines	C4 and C7 of the Geneva Plan of Action and § 9, 23, 26, 49, 59, 87 and 95 of the Tunis Agenda for the Information Society contributed to Output 4.4
Contribution to SDGs	1, 3, 4, 5, 6, 9, 11, 12, 13, 14, 15, 16, 17

Objective 5 Enhance environmental protection, climate change adaptation and mitigation and disaster management efforts through telecommunications/ICTs

The purpose of Objective 5 is to assist the ITU membership by providing assistance in the field of climate-change adaptation and mitigation, and disaster management. Efforts are focused on identifying opportunities for using ICTs, and then using them, to address the adverse impacts of climate change and to prepare for and respond to disasters.

5.1 ICTs and climate-change adaptation and mitigation

Climate change is one of the key development challenges facing the world. It is a crucial matter of concern within the current policy debate, including the Paris Agreement adopted by the climate change conference in December 2015, the Sendai Declaration and Framework for Disaster Risk Reduction 2015-2030, and the 2030 Agenda for Sustainable Development. Climate change severely affects sustainable socio-economic development and exacerbates disaster risk, since it causes climate and weather-related events to occur more frequently and with greater intensity, impacting water resources, land use and marine ecosystems. Although the most vulnerable countries, in particular the LDCs, face particular risks since the resulting mortality rates and economic losses are proportionally higher, climate change affects the economies of all ITU Member States.

ICTs play an important role in limiting climate change, and in mitigating its effects and enabling us to adapt to them, by providing important and innovative tools. ICTs can curb greenhouse gas emissions by providing more efficient equipment and tools and by delivering innovative services and networks. ICTs also increase the exchange of information and knowledge, help monitor climate-related changes and support disaster management, including through the provision of early-warning systems. At the same time, a growing ICT industry and increasing uptake of ICTs is producing more e-waste, calling for guidance on how to reduce the environmental footprint.

5.1.1 Results achieved

ITU contributed to climate change mitigation and adaptation through the development of satellite communication capacity for use with clean power generation systems and by providing emergency communications solutions with the implementation of the Climate Change Adaptation Component of the Satellite Communications, Capacity, and Emergency Communications Solutions Project for the Small Island Developing States of the Pacific, which has also helped to reduce greenhouse gas emissions through the setting up of solar power-based systems to supply some 20 computer centres.



Flood early warning system in Uganda

ITU enhanced the understanding among Member States of the ways in which telecommunications/ ICTs are used for climate change adaptation, and stressed the importance of green ICT strategies through workshops held in the 15 countries having received ICT equipment and training in the aftermath of disasters.

ITU also contributed to the development of an environmentally friendly early-warning system by setting up solar-powered sirens and control centres in eastern Uganda, thereby helping the country to deploy a sustainable response to the growing risk of flooding.

ITU, in collaboration with the United Nations University and the International Solid Waste Association, have set up the Global E-waste Statistics Partnership, the main objectives of which are to provide countries with the capacity they need in order to produce reliable and comparable e-waste statistics, collect country data and build a global e-waste database to track developments over time and provide the information thus gathered to policy-makers and industry.

In the Asia-Pacific region

The Asia-Pacific region, through forums, workshops and trainings, further deepened its level of understanding in regard to smart sustainable cities, green ICTs and e-waste management. It also developed training materials that will facilitate the development of policy and regulatory frameworks and enhance skills and capacities.

The challenge of enabling efficiency in energy management through ICTs was addressed through a report prepared for Pakistan's Ministry of Information and Technology, which resulted in capacity building for over 50 participants in Pakistan in 2014.

5.1.2 Study group Questions

The following Study Group 2 Questions contributed to Output 4.3:

Question 6/2: ICT and climate change.

Question 8/2: Strategies and policies for the proper disposal or reuse of telecommunication/ICT waste material.

Output 5.1 contributed to the implementation of WTDC-14 and other relevant conference and assembly resolutions, recommendations and decisions.

WTDC and other relevant conferences and assembly resolutions, recommendations, and decisions	
WTDC	Resolutions 17, 21, 30, 32, 37, 50, 52, 53, 66
Plenipotentiary Conference (Busan, 2014)	Decisions 5, 13 Resolutions 25, 71, 172, 182
WSIS Action Lines	C7 (e-environment) of the Geneva Action Plan is closely linked to Output 5.1. In close cooperation with the World Meteorological Organization (WMO), ITU has continuously raised awareness among participants through various events and talks organized during WSIS forums and during its preparatory phase. This has enabled stakeholders from various countries and organizations to connect and to share their experiences. ITU has encouraged various stakeholders to submit their projects through the WSIS platform and share with other participants. Many projects that contributed to Output 5.1 have won WSIS awards.
Contribution to SDGs	19, 11, 13, 14, 15

5.2 Emergency telecommunications

Countries throughout the world are experiencing increasing numbers of natural disasters and disasters associated with human activity. Disasters have a devastating impact on human lives and a significant negative effect on sustainable development by disrupting the economy and destroying critical infrastructure and services. LDCs, SIDS, LLDCs and low-lying coastal countries, many of which are not well prepared and lack the capacity to respond, are particularly vulnerable to the impact of disasters.

The critical importance of using telecommunications/ICTs to respond to these devastating phenomena is widely recognized. Because of the role that telecommunications/ICTs play in the various phases of disaster prediction, detection, mitigation and relief, it is important to develop disaster telecommunication preparedness plans and strategies that take into account, among other things, the need for resilient and redundant infrastructure and systems as part of disaster risk reduction and early warning.

Because disasters often extend beyond the borders of a Member State, effective disaster management may involve the deployment of efforts by more than one country in order not only to prevent loss of life but also to reduce the potential for the development of a regional crisis. Prior coordination and collaboration among disaster-management experts, including governments, the private sector, international organizations and non-governmental (including humanitarian) organizations, can limit the risks associated with disasters and emergencies and increase the probability of saving lives.



ITU is working to raise Member States' awareness of the diverse range of appropriate telecommunication/ICT solutions that are commonly available for disaster response and mitigation, especially those

provided by amateur radio services and satellite and terrestrial network services/facilities, as well as of the importance of taking into account the needs of persons with disabilities and specific needs.

5.2.1 Results achieved

ITU has facilitated emergency disaster response, strengthened capacity and improved communications for disaster relief, and has helped 17 Member States affected by disasters to re-establish their communication networks by delivering direct assistance through the provision of equipment and infrastructure damage assessments and helping in the reconstruction and rehabilitation of telecommunication infrastructure. During these deployments, over 350 users attended 17 capacity-building workshops and received training in the use of satellite telecommunication equipment.



ITU's Second Global Forum on Emergency Telecommunications (GET-2016): Saving lives, held in Kuwait from 26 to 28 January 2016, increased the awareness and capacity of countries to take advantage of ICTs for emergency telecommunication and enhanced the dialogue between disaster-management experts, including governments, the private sector, international organizations and non-governmental organizations, as well as humanitarian organizations. The forum was attended by more than 500 participants from ITU Member States, industry, United Nations agencies, non-governmental organizations, academia and humanitarian organizations. The event highlighted the important role of telecommunications/ICTs in the implementation of the Sendai Framework, and made concrete recommendations on how to use ICTs to support countries in attaining the agreed SDGs.

A Workshop on Emergency Telecommunications and Disaster Relief was organized during the ITU-D Study Group 2 Rapporteur Group meetings, as part of Question 5/2 on the utilization of telecommunications/ICT for disaster preparedness, mitigation and response. The event served as an opportunity to hold detailed discussions on new technologies and applications for disaster mitigation and response, as well as to identify lessons learned based on the experiences of a diverse group of stakeholders.

In the Africa region

ITU responded to flooding in Kenya, Malawi, Mozambique and Zimbabwe by enhancing the capability of those countries through the deployment of emergency telecommunication equipment and by building their capacity to use disaster recovery related equipment and services. The ITU response also resulted in national disaster preparedness plans and strategies. Disaster management and early warning systems were likewise implemented in Zambia and Uganda. In addition, natural disaster early

warning system projects were implemented that disseminate flood alerts, public safety alerts and related information in designated areas.

ITU raised awareness, increased cooperation and demonstrated the value of ICTs, including big data, for development in the area of health-related emergencies. In 2015, it organized a high-level ministerial meeting in Sierra Leone, attended by 15 ministers from both the ICT and health sectors, which resulted in a declaration calling for continued efforts to use big data to combat Ebola and other epidemics.

ITU also launched big-data projects in Sierra Leone, Guinea and Liberia in order to demonstrate how governments can use big data from mobile operators to help contain infectious diseases spread by humans.

In the Americas region

The Regional Initiative on Emergency Telecommunications supported Member States in the Americas region in responding to emergencies in a timely manner, resulting in the development of national emergency telecommunication plans for seven countries in the region, namely Costa Rica, the Dominican Republic, El Salvador, Guatemala, Honduras, Nicaragua and Panama, and helping to improve the effectiveness of the Emergency Operations Centre in Guyana.

ITU organized activities related to the development and capacity building of national CIRTs, with the aim of enhancing regional capacity in the areas of emergency communications, climate change, smart sustainable cities and e-waste.

Emergency telecommunications assistance was provided to Ecuador following the powerful earthquake that hit the country in April 2016. Assistance was also provided to Haiti in response to the huge devastation caused by Category 5 Hurricane Matthew that hit the country in October 2016. The assistance included the provision of satellite phones and satellite terminals, enabling voice and data communications.

ITU, the Ministry of Telecommunications and Information Society of Ecuador and Peru's INICTEL-UNI (National Institute of Telecommunication Research and Training of the National Engineering University) jointly organized a Workshop on Technologies to Mitigate the Effects of Earthquakes and Tsunamis, which was held in Ecuador on 12 and 13 September 2016. The main purpose of the event was to raise awareness of the importance of establishing early warning broadcasting systems (EWBS) for alerting populations to warnings of tsunamis and/or other types of natural hazard. There was much discussion on how to incorporate EWBS into the current analogue to digital transition, and different prototypes were demonstrated and displayed during the event. The workshop was attended by over 100 participants from different national humanitarian agencies, such as firefighters, the Red Cross and civil defence bodies, as well as Ecuador's National Secretariat for Disaster Risk Reduction, the Integrated National Security Service (ECU 911) of Ecuador, the Pacific Tsunami Warning Center, the Embassy of Japan and academic institutions.



In the Asia-Pacific region

The Regional Initiative on Emergency Telecommunications supported Member States in the Asia-Pacific region by building capacity and capability through emergency telecommunications training

and by raising awareness through seminars, workshops, meetings and forums on climate change adaptation, disaster risk management and mitigation and emergency telecommunications.

Emergency telecommunication assistance was provided to the Philippines following Typhoon Ruby in 2014, to Vanuatu following Tropical Cyclone Pam in 2015, to the Federated States of Micronesia following Typhoon Maysak in 2015, to Nepal (Republic of) following the major earthquake in 2015, to Myanmar following severe flooding in 2015, to Fiji following Tropical Cyclone Winston, and to Sri Lanka following severe flooding in 2016.

In order to further enhance disaster preparedness, including early warning and disaster response arrangements, relief activities and the rehabilitation of telecommunication networks, ITU provided:

- direct country assistance to the Pakistan Telecommunication Authority in preparing the country's emergency telecommunication regulatory framework in 2016;
- technical assistance for the formulation of a Mobile Network Disaster Restoration Plan (Nepal (Republic of), 2015) and an Emergency Communications Plan (Timor-Leste, 2015);
- assistance to restore basic telecommunication infrastructure in the post-disaster periods on the Philippine island of Cebu, resulting in the installation of a movable and deployable ICT resource unit (MDRU).



ITU provides emergency telecommunications assistance to Sri Lanka, 2016

MDRU installation forms part of the wider study on rapid infrastructure restoration and its usefulness. Thanks to this project, which was implemented with support from Japan's Ministry of Internal Affairs and Communications (MIC), Cebu Island is now better prepared in terms of post-disaster communications.

5.2.2 Study group Questions

The following Study Group 2 Question contributed to Output 5.2:

Question 5/2: Utilization of telecommunications/ICTs for disaster preparedness, mitigation and response.

Output 5.2 contributed to the implementation of WTDC-14 and other relevant conference and assembly resolutions, recommendations and decisions

WTDC and other relevant conferences and assembly resolutions, recommendations, and decisions	
WTDC	Resolutions 1, 5, 17, 21, 30, 32, 34, 37, 50, 52, 53, 69
Plenipotentiary Conference (Busan, 2014)	Decisions 5, 13 Resolutions 25, 37, 71, 98, 136, 140, 182, 202
WSIS Action Lines	C7 (e-environment) of the Geneva Action Plan is closely linked to Output 5.1. In close cooperation with WMO, ITU has continuously raised awareness among participants through various events and talks organized during WSIS forums and during its preparatory phase. This has enabled stakeholders from various countries and organizations to connect and to share their experiences. ITU has encouraged various stakeholders to submit their projects through the WSIS platform and to share with other participants. Many projects that contributed to Output 5.1 have won WSIS awards.
Contribution to SDGs	9, 11, 13, 14, 15

Appendix 1: Details of the implementation of the Regional initiatives

Africa Region

AFR RI 1: Strengthening human and institutional capacity building

- The Regional Initiative on Strengthening Human and Institutional Capacity Building was extensively implemented within the framework of the ITU CoE network and ITU Academy.
- The first CoE network for Africa steering committee meeting was successfully held in Cape Town (South Africa) in February 2015. The six training institutions selected to serve as ITU CoEs for the period 2015-2018 (Centre for Learning, Telkom SA, South Africa; University of Rwanda, College of Science and Technology, Rwanda; Digital Bridge Institute, Nigeria; Higher Multinational School of Telecommunications (ESMT), Senegal; Higher African School of Information and Communication Technologies, Côte d'Ivoire; African Advanced Level Telecommunications Institute (AFRALTI), Kenya) coordinated and agreed on an overall training strategy, individual plans, shared opportunities and ways to resolve potential challenges.
- The second CoE network steering committee meeting, held in Mauritius in December 2015, coordinated the delivery of the courses planned for 2016. Participants from six CoE training institutions and from Mauritius attended the meeting, along with ITU experts.
- The third CoE network steering committee meeting was held in Abuja (Nigeria) in November 2016. It was attended by participants from ITU CoEs, ITU, cooperating partner CISCO, and Member States.
- Professionals were trained in ICT-related subjects using the CoE nodes and ITU Academy, improving the level of knowledge and skills and increasing the number of ICT-educated professionals in the region.
- The CoE network delivered 21 capacity-enhancing face-to-face training courses in 2015. The 113 participants from six African countries received training in cybersecurity, telecommunication regulation and 4G LTE. During the same period, face-to-face training was delivered to 73 participants from eight African countries through ITU-ITSO (International Telecommunications Satellite Organization) cooperation in the field of satellite communication. Similarly, in 2016, 34 face-to-face courses were delivered to 142 trainees from six countries, and ITSO face-to-face satellite courses were delivered through AFRALTI and ESMT for English- and French-speaking countries, respectively.
- The Smart Africa Scholarship Fund was established with seed funding from ITU and initial contributions from Rwanda and South Sudan. The fund awarded seven scholarships to students, enabling them to pursue ICT/Engineering Masters programmes at Carnegie Mellon University, which will strengthen Africa's ICT-related human capacity. Additional scholarships were awarded for ESMT in Dakar (Senegal).
- To enhance awareness, direct assistance was provided to 15 African countries for the organization of Girls in ICT Day celebrations in 2014, 2015 and 2016. In collaboration with the African Union Commission and other United Nations agencies, Girls in ICT Day celebrations were also organized in Addis Ababa (Ethiopia), where hundreds of high school girls participated (265, 250, and 230, respectively).

AFR RI 2: Strengthening and harmonizing policy and regulatory frameworks for the integration of African telecommunication/ICT markets

- Guidelines for the development of a national broadband plan and a model national broadband plan were elaborated for countries of the Southern African Development Community (SADC). Following recommendations from the validation workshop (Namibia, 2015), the SADC countries adopted the proposed national broadband plan guidelines and model during the SADC ICT ministerial meeting held in Namibia from 23 to 26 June 2015.
- Namibia and Swaziland also developed national broadband plans using the ITU guidelines and model, which were adopted following the validation exercise conducted in the two countries in 2016.
- From 2014 to 2015, direct assistance to the South Sudan National Communications Authority for the setting up of a new board strengthened the role and capacity of the national regulator.
- Least developed country (LDC) capacities were increased in the area of telecommunication/ICT standardization and statistics, through national workshops held in Gabon and Madagascar which provided a deeper understanding of ICT indicators and data collection to the 25 participants in each workshop.
- Workshops were conducted in the Economic Community of Central African States on harmonizing national ICT policies and regulatory frameworks. This resulted in the drafting of a model set of laws that are awaiting transposition into the national legislation of requesting countries.
- ITU assistance to Rwanda laid the foundation for new ICT bills, a secondary legislation and the creation of new specialized regulatory agencies (for frequencies and ICT). Similar assistance has also been provided to Cameroon, Equatorial Guinea and Togo.

AFR RI 3: Development of broadband access and adoption of broadband

- Wireless broadband infrastructure projects under the ITU/Craig and Susan McCaw Broadband Wireless Network Project for Africa are being implemented in six countries (Burkina Faso, Burundi, Lesotho, Mali, Rwanda and Swaziland) to develop wireless broadband infrastructure and applications and enhance capacity. The projects in Lesotho, Mali, Rwanda and Swaziland are ongoing, while the projects in Burkina Faso and Burundi have already succeeded in bringing broadband access to hospitals and schools.
- Under the ITU/MSIP (Ministry of Science, ICT and Future Planning, Republic of Korea) wireless broadband access master plan project, the groundwork has been completed for the adoption and use of broadband in the Republic of the Congo and Malawi.
- A memorandum of understanding between China, ITU and East African Community (EAC) countries on joint partnership and cooperation on the acceleration of development of infrastructure for ICT in East Africa has provided a strong basis for future implementation of ICT projects.
- In 2017, a feasibility study was commissioned in regard to implementation of the Joint Partnership and Cooperation on the Acceleration of Development of Infrastructure for ICT in East Africa project that looked at three components: 1) Enhanced broadband and connectivity infrastructure in the EAC, 2) Regional e-transactions platform for e-government and e-commerce, and 3) Centre of excellence in ICT research and innovation.
- The continuous effort being put into development of the ITU interactive terrestrial transmission map for Africa will result in increased business potential and improved infrastructure planning (sharing of passive telecommunication infrastructure and power supply) in the region.

- The ICT infrastructure-sharing and access framework and guidelines (adopted by SADC members in March 2016) that support countries in the implementation of their infrastructure-sharing policies was developed and distributed.
- ITU prepared and shared a case study of the One Network Area roaming framework for the East Africa Northern Corridor countries, which was adopted as a benchmark for roaming in Africa.
- Burundi was assisted in the development of a broadband policy, strategy and regulatory framework that will result in an improved regulatory environment to help meet the growing demand for broadband connectivity.
- A broadband universal access study was conducted for Lesotho that provided strategic guidance for implementation of the universal broadband strategy and overall development of the ICT sector in Lesotho.
- In addition assistance was given for:
 - o the development of ITU Interactive Terrestrial Transmission Maps for the Economic Community of West African States (ECOWAS) subregion;
 - o RASCOM, in its technical auditing;
 - o ECOWAS, in the feasibility study of its SIGTEL (a repository for telecom/ICT projects and activities in West Africa);
 - o a feasibility study conducted for EACO countries (East Africa) for the setting up of a subregional Internet exchange point (IXP);
 - o setting up of an Internet protocol version 6 (IPv6) testbed in Côte d'Ivoire and Uganda, to be used as subregional test beds for IPv4 to IPv6 migration in Western and Eastern Africa, respectively;
 - o the implementation of phase one of the ITU/McCaw Foundation broadband wireless network in Burkina Faso, and a review of the scope and planning of the same project for Mali;
 - o setting up of an IPv6 testbed in Zimbabwe (under way), to be used as a subregional testbed for IPv4 to IPv6 migration in Southern Africa;
 - o setting up of an IPv6 testbed in Cameroon, to be used as a subregional testbed for IPv4 to IPv6 migration in Central Africa.

AFR RI 4: Spectrum management and transition to digital broadcasting

- In 2014, assistance was provided to Swaziland to draft a roadmap that included calculations for their broadcasting network that will bring about a reduction in interference.
- In 2015, assistance provided to Equatorial Guinea resulted in the elaboration of its digital migration plan and network design.
- Drafting of the road map and migration strategy for Burkina Faso resulted in the launch of a tender for the 2015 implementation of the transition from analogue to digital terrestrial television broadcasting.
- Technical assistance was provided in 2015 and 2016 to 19 countries having launched their digital migration process.
- In 2016, a cross-border frequency coordination workshop was conducted for the SADC region, attended by participants from Angola, Botswana, Lesotho, Malawi, Namibia and South Africa, as well as by partners and private-sector stakeholders such as Ericsson and LS telcom. This resulted in enhanced cross-border frequency coordination among these countries, the establishment

of a task force, and renewed interest in implementing the Harmonized Calculation Method for Africa (HCM4A) agreement.

AFR RI 5: Building confidence and security in the use of telecommunications/ICT

- A methodology and action plan for implementing the COP guidelines in Africa was developed and shared with all countries in the region. To raise awareness on COP matters, a successful regional conference was held on 15 and 16 December 2014, with over 200 participants from 21 African countries. A COP country-development action framework was also developed.
- To enhance information and knowledge, national stakeholder workshops on COP matters were organized in 2015 for Gabon and Chad. Drafts of national policies and strategic frameworks for three countries (Chad, Gabon, Rwanda) were completed. Regional and national projects on the creation of an enabling environment for the effective development of COP were identified. Improved technical expertise within the ITU Regional Office for Africa will result in improved implementation of COP in the region.
- A computer incident response team (CIRT) project was implemented in Tanzania in 2014, and an assessment for the establishment of a CIRT in Angola was carried out in 2015. A second phase of the CIRT project was initiated in Kenya to facilitate more advanced protection against cyberattacks.
- In 2014, a cyberdrill for the Africa region, attended by over 100 participants from 16 countries, was conducted in Zambia. This was repeated in 2015, with 150 participants from 18 countries. A cyberdrill was conducted in Mauritius, attended by 150 participants from 15 countries. These cyberdrills have enabled countries in the Africa region to share experiences and assess their cybersecurity readiness, resulting in the enhancement of their national cybersecurity capacity.
- In 2015, the annual regional capacity-building workshop for Africa was held in Abidjan, Côte d'Ivoire, under the theme Digital Migration and Human Capacity Building. This workshop succeeded in raising the awareness and building the capacity of 161 participants from 21 countries and eight organizations.
- A joint ITU-ATU (African Telecommunications Union) Workshop on Cybersecurity Strategy in the Africa region, as well as the Arab States and Africa Regional Cybersecurity Symposium (Sudan, 2016), increased understanding for more than 110 participants from 18 countries, private-sector stakeholders and international organizations. The outcomes of those meetings laid the foundations for the harmonization of cybersecurity legal frameworks in Africa.
- In 2015, assistance was provided to Sierra Leone in finalizing its national cybersecurity policy and road map and in ensuring its preparedness for a national CIRT implementation.
- In 2017, CIRT readiness assessment workshops were conducted for Mali and Namibia, in March and April, respectively.

Americas Region

AMS RI 1: Emergency telecommunications

- ITU experts developed a draft national emergency telecommunication plan in 2014 that was used in developing the national legislation for Costa Rica, El Salvador, Dominican Republic, Guatemala, Honduras, Nicaragua and Panama. In 2015 and 2016, ITU, in cooperation with those countries, developed a project document entitled Technical Solutions for Communications during Emergencies, and in 2015 it supported a national workshop, attended by some 100 people, on an emergency telecommunication plan for the Dominican Republic.

- ITU supported Dominica with its emergency operations centre through the delivery of emergency equipment to support government response to the devastation caused by Tropical Storm Erika in 2015.
- ITU also provided Guyana with emergency radiocommunication equipment for the Guyana National Emergency Operations Network, thereby enhancing the country's ability to respond to disasters, and ensured that disaster-resilient response features are incorporated into the Guyana National Emergency Operations Network and its infrastructure.
- Assistance was provided to Haiti in 2016 in the area of emergency radiocommunications to support CONATEL in its response to disasters.
- The second Regional Workshop on Emergency Communications and Climate Change was delivered in Guayaquil (Ecuador).
- ITU supported the Joint Training on Emergency Telecommunications for First Responders, organized by the Coordination Centre for the Prevention of Natural Disasters in Central America (CEPRENAC) and the Regional Technical Telecommunication Commission (COMTELCA), for Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua, with the participation of five emergency first-response agencies (COE (Emergency Operations Centre), Costa Rica; Civil Protection, El Salvador; CONRED (National Coordination for Disaster Reduction), Guatemala; COPECO (Permanent Contingency Commission), Honduras; and SINAPRED (National System for Disaster, Prevention, Mitigation and Response), Nicaragua). In addition, Costa Rica was represented by the Costa Rican Electricity Institute, SUTEL and the Ministry of Science, Technology and Telecommunications. Participants received training on emergency telecommunications.

AMS RI 2: Spectrum management and transition to digital broadcasting

- With the aim of enhancing awareness and capabilities in the areas of frequency planning and assignment, spectrum management, radio monitoring and the transition from analogue to digital broadcasting, ITU/CAF provided support to eight countries: Bolivia, Colombia, Costa Rica, Dominican Republic, Jamaica, Panama, Paraguay and Venezuela.
- Road maps for the transition to digital broadcasting were prepared and submitted to Honduras and Nicaragua in 2015, and to Guatemala and El Salvador in 2016.
- The ITU/Republic of Korea project on the development of master plans for spectrum management for Caribbean countries (Grenada, Jamaica, Saint Vincent and the Grenadines) was implemented in 2016. ITU carried out a survey to understand the situation and the spectrum-management needs, and conducted a capacity-building workshop. The assessment reports gave key recommendations for the development of spectrum-management master plans for the three beneficiary countries.
- From 2014 to 2016, ITU delivered online training courses in the fields of spectrum management and digital broadcasting for the benefit of Latin American countries. In particular, online training courses through the ITU Academy platform and face-to-face capacity building were delivered in Bolivia, bringing together theoretical and practical knowledge on the new trends and facilities offered by the latest generation of radio-frequency engineering tools used in the control and verification process, with the aim of ensuring more efficient use of the radio spectrum and of providing a practical response to the challenges posed by the liberalization of new spectrum bands for terrestrial mobile communications (IMT).
- In 2016, also in the field of spectrum management, training courses focusing on spectrum management regulation trends, spectrum assignment and radio electric spectrum were provided. In addition, online training courses in the field of digital broadcasting were carried out to enhance capacity on digital broadcasting systems. Some 100 professionals from Latin America received training.

- An advanced training on Cost Modelling and Pricing for Latin American Countries, including guidelines on policy and economic aspects of assignment and use of radio-frequency spectrum, was delivered in Nicaragua in 2015. It was attended by some 60 participants from eight countries (Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Mexico, Nicaragua and Panama).
- In 2015 in Mexico, ITU organized a Regional Forum on Optimization and Efficient Use of Spectrum, with the participation of 120 participants from 14 countries (Bolivia, Brazil, Colombia, Costa Rica, Ecuador, Mexico, Guatemala, Haiti, Honduras, Nicaragua, Paraguay, Peru, United States and Uruguay). The forum highlighted best practices for radio-spectrum utilization and business plans, creating capacity for future activities related to spectrum management and bidding processes in the Americas region.
- Online courses on radio-spectrum management and new-generation networks were conducted for Colombia and Paraguay.
- ITU and COMTELCA organized the Central America Summit on Digital Television and the Digital Dividend in El Salvador in July 2016, presenting various scenarios for analogue to digital broadcasting migration, and the development of the El Salvador Declaration stipulating the next steps in the transition process for each country.
- In 2016, ITU, in collaboration with CAF, SCT (Mexico's Secretariat of Communications and Transport) and Forum Global, organized a series of events within the framework of the Americas Region Week on Digital Broadcasting and Regional Conference on Spectrum Management, including on spectrum planning and digital dividend policies, results of the ITU/CAF Project on Support for Transition from Analogue to Digital Broadcasting, spectrum management master plans, cross-border coordination, and the third annual Latin America Spectrum Management Conference.
- In 2017, ITU launched a border-area frequency coordination process for Caribbean basin and Central American countries (a total of 27 countries and territories). The first meeting was held in Nicaragua in March, and the second took place in Guatemala at the end of August 2017. Meanwhile, most of the countries have contributed the spectrum assignment data needed in order to run the frequency coordination simulation iterations. The whole process is expected to be concluded in 2018.
- Guidelines on the policy and economic aspects of radio-frequency spectrum assignment and use were delivered in 2015 to Argentina, Bolivia, Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Mexico, Nicaragua and Panama.

AMS RI 3: Development of broadband access and adoption of broadband

- In 2014, ITU partnered with the Republic of Korea's MSIP to establish spectrum management masterplans for Saint Vincent and the Grenadines, Grenada and Jamaica.
- ITU delivered a study on broadband focusing on technology, market and regulation aspects, and analysing the status of broadband development in the Andean subregion (Bolivia, Colombia, Ecuador, Peru and Venezuela).
- Training on C&I was delivered to countries in 2014, 2015, 2016 and 2017.
- Training on C&I for the Americas region within the framework of the global C&I programme was provided in 2014, 2015 and 2016, as follows: in 2014 to participants from ten countries (Argentina, Brazil, Costa Rica, Cuba, Ecuador, El Salvador, Haiti, Paraguay, Peru, Venezuela); in 2015 to participants from six countries (Brazil, Costa Rica, Jamaica, Paraguay, Suriname, Trinidad and Tobago); and in 2016 to participants from ten countries (Brazil, Costa Rica, Cuba, El Salvador, Haiti, Honduras, Mexico, Nicaragua, Paraguay, Venezuela). The training increased understanding

and awareness of the role and importance of mutual recognition agreements (MRAs) in this area.

- Assessments of C&I regimes and MRAs have been specifically conducted for Central American countries (Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama) and Cuba.
- An assessment of C&I regimes and MRAs has been specifically conducted for South American countries (Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay and Venezuela). ITU presented assessment reports to countries during a workshop in July 2017.
- A workshop to enhance capacity for the establishment of a common C&I regime and MRAs for Central American countries (Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama) presented the progress made on draft MRAs and the establishment of a virtual test laboratory.
- ITU performed a risk assessment and demand and feasibility study to determine the need for national or regional testing facilities to support C&I regimes in the Caribbean in 2015, and to support Caribbean countries in establishing a plan for the development of Caribbean in-country testing laboratories. One of the main outcomes from the C&I validation workshop was the need to develop a general framework for conformity assessment regimes, as well as a specific framework for ICT C&I for the Caribbean. ITU, together with CTU (Caribbean Telecommunications Union) and CROSQ (Regional Organization for Standards and Quality), will jointly implement MRAs with selected Member States. Six senior executives from the Caribbean visited CPqD (Telecommunication Research and Development Centre) premises during the C&I training course, held from 8 to 12 June 2015 in Brazil, in order to see first-hand the testing-laboratory good practices.
- From 2014 to 2016, a series of case studies on the massification of ICTs and the digital ecosystem were prepared for selected Latin America countries. The objective was to analyse the use of ICTs from a regulatory and institutional structure perspective, as well as to look at the status of development and implementation of telecommunication policies and broadband plans. Case studies were carried out in Bolivia, Dominican Republic, Nicaragua, Panama and Paraguay, resulting in strategic recommendations for bringing about the more effective use and application of ICTs.
- The collection of data for the ITU Interactive Terrestrial Transmission Maps project in the Americas region is ongoing, and has been completed for 47 stakeholders from Latin America and the Caribbean. It will assist members in resource and network planning.
- Forums aimed at creating capacity and best practices related to interconnectivity in the Americas region were held on the subjects of interconnectivity, cybersecurity and IPv6, as follows: in 2014 in Paraguay and the Dominican Republic, with over 90 participants from 11 countries; in 2015 in Panama, with over 80 participants from 17 countries; and in 2016 in Honduras, with 112 participants from ten countries.
- In 2014 and 2015, ITU helped to establish community centres in Barbados, Belize, Grenada and Saint Kitts and Nevis, providing the benefits of Internet access and bridging the digital divide between rural and urban areas.
- A regional workshop on Strategic Broadband Infrastructure for Development for the Americas Region was jointly organized in Sao Paulo (Brazil) in 2015 by ITU and Anatel, in collaboration with Futurecom, resulting in a deeper understanding of issues relating to C&I, market competition, quality of telecommunication services and use of ICT applications.
- ITU supported South American countries in mapping long-distance terrestrial optical cable systems, a tool that helps administrations and regulators in their work of building and reviewing policies.
- Support was provided to Dominica in 2014 with the formulation and development of national broadband policies to implement a broadband technological framework in Roseau (Dominica). From 18 to 22 April 2016, ITU assisted in the formation of working groups on policy, law and

regulation, infrastructure, connectivity and devices, capacity building, applications, finance and investment, implementation, monitoring and evaluation. Assistance was also given for the development of a national broadband policy and sectoral strategy.

- Case studies were drafted for Panama in 2015 and Nicaragua in 2016 that considered the regulatory framework, institutional structure and development and implementation status of telecommunication policies and broadband plans, resulting in a better understanding of the overall ICT environment in those countries.
- The project document to support the Bahamas Smart Island initiative has been drafted.
- ITU supported the restructuring of the Barbados Regulatory Authority to foster efficiency and streamlining of regulatory functions in the local environment. Twenty-one officials benefited from the training carried out in 2016.
- ITU supported the preparation of a model roaming bill and regulations for Saint Lucia and the future adoption thereof in other Eastern Caribbean Telecommunications Authority (ECTEL) contracting States. An initial workshop on roaming issues was held in Saint Vincent and the Grenadines on 24 June 2016, attended by participants from ECTEL.
- ITU participated in the Futurecom 2014, 2015 and 2016 congresses held in Brazil, highlighting ITU's role in enhancing awareness on ICT infrastructure. Side events on C&I were organized in close collaboration with Anatel (Brazil's National Telecommunications Agency).

AMS RI 4: Reduction of telecommunication service prices and Internet access costs

- Forums on interconnectivity, cybersecurity and IPv6 were held in Paraguay and the Dominican Republic in 2014, with over 90 participants from 11 countries; in Panama in 2015, with 81 participants from 17 countries; and in Honduras in 2016, with 112 participants from ten countries. The discussions focused on best practices for interconnectivity, cybersecurity and IPv6, creating capacity for future interconnectivity activities in the Americas region.
- Assistance was provided in 2015 to members of the Organization of Eastern Caribbean States in the drafting of a roaming policy, legislation and regulatory guidelines.
- The Regional Training Workshop on Number Portability was held from 28 to 30 April 2015 in Paramaribo (Suriname), attended by participants from the Bahamas, Guyana, Haiti, Saint Kitts and Nevis, Saint Lucia, Trinidad and Tobago and ECTEL. Suriname's participants came from the Suriname Ministry of Transport, Communications and Tourism, UNIQA Telecommunications Suriname and various departments of the Telecommunications Authority of Suriname. The workshop provided participants with an appropriate forum for capacity building in number portability and for discussing the critical technical, regulatory, commercial/cost, application and implementation issues of number portability, types of number portability, and the impact of number portability in terms of stimulating innovation and competitive intensity. Regional telecommunication regulators, policy-makers, legislators and other technical staff involved in number portability, interconnection and related issues were able to acquire a better understanding of the cost, benefits and opportunities of number portability.
- ITU supported enhanced dialogue to promote a broadband connection between Paraguay and Bolivia (ENTEL Bolivia and the Paraguay Telecommunication Company (COPACO)), the only two landlocked countries in the Americas region.
- ITU supported the Paraguayan Administration in the deployment of a national IXP in 2014, and has developed three models. With the help of ITU, the Paraguay regulatory body also presented recommendations on the internal regulation and on the structure and organization of the selected models.

- The Regional Economic and Financial Forum for Latin America and the Caribbean and the ITU-T SG3RG-LAC Group (regional group of ITU-T Study Group 3 – Tariffs) meetings were held in Chile in 2015.
- As a follow-up to the outcomes of the ITU/European Commission HIPCAR (Enhancing competitiveness in the Caribbean through the harmonization of ICT policies, legislation and regulatory procedures) project, concluded in 2013, ITU formulated e-waste model policies and laws for the Caribbean in the areas of environmental standards, e-waste management and recycling of televisions, mobile phones and computers. The model policies will also include anti-dumping regulations for televisions that do not conform to regional requirements and international standards.
- In addition, the Caribbean government wide area networks (G-WAN) project seeks to assist three Caribbean governments (Dominica, Grenada and Saint Kitts and Nevis) in the planning, design and implementation of a comprehensive, secure IP-based G-WAN in order to provide a platform on which other major initiatives, including e-government services, may be built. In 2015, ITU and CTU teams conducted kick-off meetings in Dominica, Grenada and Saint Kitts and Nevis with participants from ministries, departments and public sector agencies. G-WAN (web server) site assessments were conducted as well as a workshop for capacity building and knowledge transfer, including training on aspects of planning and design and future G-WAN implementation.

AMS RI 5: Capacity building to engage in global ICT policy, with special focus on improving cybersecurity and developing countries' participation in the existing Internet governance institutions

- From 2014 to 2016, ITU delivered three regional cyberdrills: in 2014 in Peru, with participants from nine countries; in 2015 in Colombia, with participants from 13 countries; and in 2016 in Ecuador, with 60 participants from 15 countries. The objective of the drills was to enhance the capacity of Member States to respond rapidly to cyberthreats.
- In Bogota (Colombia), ITU delivered the 2015 Regional Forum on Cybersecurity and third Cyberdrill for Emergency Response Teams in the Americas Region, with over 500 participants from 13 countries attending the forum, and some 50 participants attending the cyberdrill, from Antigua and Barbuda, Argentina, Barbados, Bolivia, Colombia, Costa Rica, Cuba, Ecuador, Guatemala, Honduras, Mexico, Paraguay and Venezuela.
- The Forum on Interconnectivity, Cybersecurity and IPv6 was held in Paraguay and in the Dominican Republic in 2014, with over 90 participants from 11 countries in each case. In 2015, the forum was held in Panama, attended by over 80 representatives from 17 countries, in 2016 it was held in Honduras, with 112 participants from ten countries. The forum highlighted best practices in interconnectivity, cybersecurity and IPv6, creating capacity for future interconnectivity activities in the Americas countries.
- A CIRT assessment and workshop was conducted in Bolivia in 2014, with participants from government ministries, private-sector stakeholders, including banks and public and private ISPs, academic institutions, the police, governmental cybersecurity working groups, and the army.
- From 2014 to 2016, ITU assisted countries in the establishment of national CIRTs, and technical cooperation projects were signed and implemented in Barbados, Jamaica and Trinidad and Tobago to identify, defend against, respond to and manage cyberthreats. CIRT and cybersecurity posture assessments were also conducted in Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama.
- To improve capacity in ICT mobile applications, subregional assessments were delivered to Americas region countries on the potential of mobile technologies and on the evolution of, policies for and challenges arising from m-government as well as tools for addressing those

challenges, together with recommendations on how to promote the rapid implementation of m-government.

- Technical assistance was provided to Trinidad and Tobago to develop its national cybersecurity data protection and classification policy, as well as two workshops on data classification and retention.
- In cooperation with ITU, countries in the Americas region participated in the seventh and eighth editions of the South School on Internet Governance, which is a capacity-building event aimed at training new leaders in the most important aspects of Internet governance, from a global perspective and with special focus on Latin America and the Caribbean.
- An online meeting was organized for all Spanish-speaking countries in the Americas region to discuss Internet policy issues with regional representatives of the Internet Society (ISOC), Latin American and Caribbean Network Information Center and ICANN (Internet Corporation for Assigned Names and Numbers).
- A Caribbean Regional Seminar on Cybersecurity Issues, including Child Online Protection was organized in 2016.
- ITU introduced the School Cybersecurity Awareness Programme in 2016, with the aim of assisting Caribbean ministries of education in promoting the safe use of ICTs, anti-cyberbullying and general cybersecurity awareness in secondary schools, initially in Belize, Grenada and Saint Kitts and Nevis. The first workshop was held in Belize on 27 and 28 June 2016, with over 105 participants. An ITU manual intended to help educators and parents to deal with cyberbullying, and a regional policy document, have also been drafted.

Arab Region

ARB RI 1: Development of broadband access and adoption of broadband

- Assistance was provided to Iraq, Libya, Palestine, Sudan and Yemen to establish their national broadband master plans for broadband infrastructure and adoption of broadband services.
- Training was conducted in Tunisia in 2016 for participants from 11 Arab States on the implementation and management of IXPs. The objective of the training was to provide participants with the tools needed to lower the costs and improve the quality of national Internet traffic.
- Training was conducted in 2015 and 2016 for technicians from eight Arab States on C&I, with the aim of enhancing the awareness and capabilities of countries in regard to relevant standards and procedures used in the control and type approval of equipment. C&I training was also provided in 2015 to technicians from SYTRA, the Syrian Regulatory Authority, to support the country in implementing its own C&I laboratory. Participants from five Arab States were trained in 2016 on organizational and administrative aspects of conformity assessment.
- An assessment study for Maghreb countries was developed and circulated in 2014, resulting in the development of an MRA to foster cooperation on C&I.
- Guidelines were shared in 2016 with ten Arab States on developing innovative investment models to minimize barriers to broadband adoption, including adoption of infrastructure sharing and market competition.
- The first draft of guidelines on cloud computing for education was issued and discussed during an experts meeting organized in collaboration with the Arab League Educational, Cultural and Scientific Organization (ALECSO). These guidelines will support policy-makers in Arab countries in their selection of an appropriate and cost-effective cloud platform model.
- In 2016, the participation of ten Arab States in the ITU Regional Forum on New Technologies for Development, held in Cairo (Egypt) and hosted by the Nile University in collaboration with Egypt's National Telecommunications Regulatory Authority, increased their capacity to identify

policy, regulatory and technical measures to be implemented in order to benefit fully from new technologies such as big data, cloud computing, IoT and 5G.

- Training was provided in 2015 to eight Palestinian participants on cloud computing technology, and expertise was provided to design a data centre.
- An assessment study was also drafted for Palestine on establishment of a satellite earth station.
- Recommendations were developed and guidance was provided on alternative calling procedures and digital financial inclusion issues during the Forum on Building and Financing Broadband, held in Bahrain in 2015. The objective of the forum was to support the Arab States in effectively addressing alternative telephone call traffic and preparing the environment for digital financial services.
- In 2015, training was provided to 60 participants from Arab States countries on new trends for promoting broadband services in the context of over-the-top (OTT) services, as a support for the development by policy-makers in Arab States of effective OTT service policies.
- ITU expertise was provided to Djibouti to expand the Djibouti Telecom broadband network through WiMAX broadband wireless networks. In addition, an ITU feasibility study was carried out to assist Djibouti in its consideration of the establishment of a regional IXP.
- A dedicated workshop, the contents of which included network design and national guidelines on infrastructure sharing, supported the work being done by Comoros on liberalization and infrastructure-sharing issues and local-loop unbundling.
- A project on human capacity building in relation to IPv6 was implemented under the framework cooperation agreement signed between the United Arab Emirates' Telecommunications Regulatory Authority (TRA) and ITU.
- Arab States countries were also assisted in identifying policy, regulatory, technical and commercial measures for achieving affordable broadband access and services.
- During the ITU Regional Economic and Financial Forum of Telecommunications/ICTs for the Arab States, held in Muscat (Oman) on 6 and 7 December 2016, a platform was developed for creating a dialogue on affordable access to broadband services, economic and financial issues in a converged broadband environment, and challenges in the digital ecosystem.
- AICTO was assisted in its study on the impact of OTT services on the Arab States telecommunication markets.
- Selected countries were assisted in developing national broadband plans, as well as in raising awareness and building capacities on technical, economic and financial aspects of broadband deployment and adoption.
- The ITU Regional Forum on New Technologies, such as 5G, cloud computing, big data and IoT, held in Cairo (Egypt) on 23 and 24 November 2016, discussed the opportunities, benefits and challenges in relation to the application of those technologies in the development of the countries of the Arab region.
- ITU promoted regional cooperation through an MRA on C&I between the Arab Maghreb Union (UMA) countries, following an expert meeting at UMA headquarters in December 2016.
- The training provided during the ITU Regional Workshop on Terrestrial and Space Radiocommunication Services for the Arab States, held in Amman (Jordan) from 29 November to 1 December 2016, served to deepen the expertise of the 65 attending specialists from the Arab States region.
- The Arab Regional Office co-organized the third annual Middle East and North Africa Spectrum Management Conference on 24 and 25 January 2017, in partnership with Forum Global and the United Arab Emirates' TRA (over 200 registrations). The event was followed by the ITU Workshop

on Cross-Border Frequency Management in Arab States, held in Dubai (United Arab Emirates) on 26 January 2017 and attended by 60 participants.

- 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 the app economy were enhanced during the ITU Arab Forum on Future Networks, held in Tunis (Tunisia) on 21 and 22 February 2017.
- During the ITU/BDT Regional Economic and Financial Forum of Telecommunications/ICTs for Arab States, held in Nouakchott (Mauritania) on 17 and 18 May 2017, the 85 participants from six countries shared knowledge and best practices in relation to the contribution of ICTs to the achievement of SDGs set out in the United Nations 2030 Agenda for Sustainable Development.

ARB RI 2: Building confidence and security in the use of telecommunications/ICTs

- Capacity was built and awareness raised through the organization of summits, forums, seminars, workshops and training events covering different areas of cybersecurity to meet the expected results of this regional initiative. Guidelines on COP were also developed.
- In addition, selected countries were assisted in establishing their national CIRTs, and regional cybersecurity drills were conducted annually to test CIRT readiness, improve capabilities and ensure optimal coordination between Arab CIRTs.
- In the area of technical and policy frameworks, a regional study entitled Cloud Computing in Arab Countries: Legal and Legislative Aspects, Facts and Horizons was carried out to help define the legal measures that ensure data privacy and secure use of the Internet and its various applications.
- Selected countries were assisted in the development of their national cybersecurity strategy and COP strategy.
- In 2015, cybersecurity readiness assessments were carried out for Comoros, Djibouti, Jordan, Lebanon, Mauritania and Palestine, as part of the establishment of national CIRTs.
- Within the framework of the Least Developed Countries Infrastructure Protection Project, assistance was provided in 2015 and 2016 to almost 50 participants from Comoros, Djibouti and Mauritania to strengthen their cybersecurity capabilities, including in the area of infrastructure risk management issues.
- Guidelines on a regional legal framework on COP and a model law for countries in the Arab region were developed in 2015 for the purpose of providing support for the development and amendment of national laws.
- The capacity of participants in regard to COP issues was enhanced during the Child Online Protection Strategy Framework Workshop and COP Challenge, held in Bahrain from 14 to 16 September 2014, in partnership with that country's TRA and under the umbrella of the Regional Cybersecurity Centre.
- Awareness was raised on cybersafety issues among the 500 Egyptian children, parents and schools participating in the COP Challenge held in Aswan on 21 February 2015, Damanhour on 27 February 2016 and Port Said on 4 March 2017, in partnership with Egypt's Ministry of Communications and Information Technology (MCIT) and Ministry of Education, as well as mobile operators and private-sector companies.
- The Cybersecurity Regional Summit held in March 2015 in Oman, attended by 125 participants from eight Arab States and by international experts, served to foster regional cooperation among cybersecurity experts and raise awareness of new cybersecurity trends and threats.

- In Hurghada (Egypt), a regional cyberdrill was held from 17 to 19 May 2015, followed, on 20 and 21 May, by a capacity-building exercise on protection of critical infrastructure in the Arab States. Cooperation was enhanced among participants from seven countries in the Arab region, including between Arab States national CIRTs. In addition knowledge was shared with attending countries that do not have CIRTs.
- During the ITU Arab States Regional COP Strategy Workshop on Empowering the Future Digital Citizens, held in Egypt on 25 and 26 October 2015 under the umbrella of the League of Arab States in cooperation with Egypt's MCIT, ideas, knowledge and best practice on issues related to child safety were exchanged among the 65 participants from ten Arab States. In addition, inter-institutional networking and dialogue was promoted with a view to the establishment of a pan-Arab network of experts.
- Assistance was provided to Mauritania in 2015 to develop its national cybersecurity strategy, followed by a workshop in 2016 for local stakeholders on the way forward.
- At an event held in Djibouti, assistance was provided to 50 participants on strengthening cybersecurity capabilities within the framework of the Least Developed Countries Infrastructure Protection Project. This included technical cybersecurity training conducted from 1 to 5 November 2015 and management training conducted from 22 to 26 November 2015.
- A study on the benchmarking of cloud security legislation in the Arab States region and Europe was conducted in November 2015 and subsequently published in 2016 and circulated to the membership to help countries in the region to understand the legal and regulatory aspects of cloud computing.
- A regional cyberdrill, held in Tunisia in May 2016 for the Arab States to foster the exchange of experience between cybersecurity professionals and strengthen their collaboration with regard to cybersecurity, served to enhance the capacity and cybersecurity readiness of the 70 participants from 11 countries.
- A joint ITU-ATU Workshop on Cybersecurity Strategy in African countries, held in Sudan from 24 to 26 July 2016, enhanced the capacity of the over 100 participants through the sharing of experiences and best practices, and through the provision of information regarding the implementation status of existing cybersecurity strategies in order to identify gaps and to find a way forward. The workshop was hosted by Sudan's National Telecommunication Corporation.
- A workshop for Arab national CIRTs, organized during the Regional Cybersecurity Summit in Egypt on 3 November, served to strengthen regional cooperation on cybersecurity among the 150 participants.
- The ITU/AICTO Regional Workshop on Policy Advocacy on Data Privacy and Cybersecurity, held in Tunis (Tunisia) on 5 and 6 December 2016 with 70 participants from the Arab States region, discussed the formulation of national and regional regulatory and technical policies, frameworks and legal measures to ensure data privacy, cloud service privacy, data protection and data security.
- The Workshop on Child Online Protection Strategy for Sudan, organized in Khartoum (Sudan) on 14 and 15 December 2016, analysed the COP landscape and facilitated the development of a national strategy for Sudan. Prior to the workshop, on 13 December 2016, a COP Challenge was organized in a school in Khartoum, raising awareness among 50 pupils.
- Sudan was assisted in 2017 with the development of its national COP strategy framework.
- In cooperation with ARCC, the fifth edition of the ALERT regional cyberdrill was held in Doha (Qatar) from 5 to 9 March 2017.
- Training was provided to improve the technical and management skills of Arab CIRTs in the fields of web vulnerability modules (SQAP) and chief information security officer (CISO) modules.
- Mauritania was assisted in April 2017 in the development of its national cybersecurity strategy.

- Djibouti was assisted, through the ARCC in May 2017, with building its technical capacity in the areas of web security attacks and vulnerability assessment penetration tests.

ARB RI 3: Use of telecommunications/ICTs for smart and sustainable development and protection of the environment

- An event organized in Manama (Bahrain) on 6 May 2015, in cooperation with the United Nations Economic and Social Commission for Western Asia, League of Arab of States and United Nations Environment Programme, on the importance of using ICTs in sustainable development and environmental protection in order to achieve smart and sustainable development, served to raise the awareness of participants from different organizations, who attended the kick-off meeting to launch this initiative.
- A regional forum for the Arab States region on the ways in which ICTs can be leveraged, and the roles that the various stakeholders can play, in regard to smart sustainable cities, organized in cooperation with TSB and hosted by the United Arab Emirates' TRA in Abu Dhabi on 3 and 4 May 2015, adopted an ICT road map for the transition to smart sustainable cities in the Arab States region and deepened the awareness and understanding of the more than 60 participants.
- The Regional Forum on the Use of ICTs for the Transition to Smart and Sustainable Development for the Arab States region, organized in cooperation with the Sudatel Telecommunications Academy (SUDACAD) and held in Khartoum (Sudan) on 12 and 13 December 2016, served to raise the awareness of the ten participating countries of the importance of telecommunications/ICTs in smart and sustainable development, the role of national ICT strategies on sustainable development, and the ways in which ICTs can be used for climate change and disaster risk mitigation and adaptation.
- A model policy and legislation for the management of ICT e-waste was drafted that will help to develop national policies in the Arab States region.
- A project document on smart groundwater management, signed by Egypt's MCIT in 2016, seeks to showcase the opportunities for utilizing ICTs in the efficient management of groundwater resources. The two-year project began with a site visit for all stakeholders to Marashdah (Egypt).
- To support countries in the development of their national policies, a model policy and case study reports on ICT e-waste in the Arab States region have been drafted.
- A regional study on the regulatory framework of ICTs for the transition to smart and sustainable development in the Arab States resulted in a model regulatory framework that will help to define national frameworks in those States.
- To support the elaboration of national telecommunication emergency plans, a model national emergency telecommunication plan for the Arab States was drafted.

ARB RI 4: Smart learning

- Awareness was raised on smart learning issues among the 200 participants who attended the ITU/ALECSO Smart Learning Forum from 14 to 16 December 2015, hosted by the United Arab Emirates' TRA in collaboration with Intel and Millennium@EDU.
- A series of four capacity-building workshops, organized over two years with the aim of building the capacity of policy-makers and planners in the education and ICT sectors in countries of the Arab States region, as well as that of the region's governments in the field of smart learning, were developed through a cooperation agreement signed with the United Arab Emirates' TRA. The first workshop, attended by participants from ten countries, was held in Dubai from 26 to 28 February 2017.

- An advanced draft set of guidelines aimed at assisting Arab region policy-makers in formulating their national strategies on smart learning was presented during the ITU/ALECSO Smart Learning Forum held in Dubai from 14 to 16 December 2015.
- A forum held in Rabat (Morocco) from 8 to 10 November 2016 in collaboration with Intel served to raise awareness of the opportunities and challenges of digital transformation.

ARB RI 5: Ensuring access to telecommunications/ICTs, in particular for persons with disabilities

- During the kick-off workshop for the Arab States Regional Initiative on ICT Accessibility, held in Cairo (Egypt) on 20 and 21 April 2015, awareness was raised among the almost 200 participants regarding the importance of ICT accessibility for persons with disabilities and the goals of the regional initiative to promote, buy in, seek comments on and adopt the implementation framework.
- In an effort to support countries in the Arab States in the development of their own national policies, the ITU model ICT accessibility policy report was translated and published in Arabic for the 22 Member States from the region.
- In an effort to support regional organizations in their efforts to hold events (meetings, workshops, conferences, etc.) that are accessible for persons with disabilities, an advanced draft of a manual on ICT accessibility in meetings, workshops and conferences was developed and presented during the fifth ICT Accessibility Conference, organized by ALECSO and held from 21 to 23 December 2015 in Marrakesh (Morocco).
- Countries in the region have been assisted in promoting innovations in ICT accessibility for persons with disabilities through a regional innovation centre on ICT, under a project that was signed by Egypt's Ministry of Communication and Information Technology on 27 November 2016.
- Egypt formulated, with ITU support, its national policy on ICT accessibility, with the aim of creating an enabling environment for persons with disabilities, and encouraged other countries in the Arab region to follow suit by showcasing Egypt's transformed national policy framework in this domain.

Asia-Pacific Region

ASP RI 1: Special consideration for least developed countries, small island developing states, including Pacific island countries, and landlocked developing countries

- The first ITU Asia-Pacific Regional Initiative (ASP RI 1) calls for special consideration for LDCs, small island developing states (SIDS), including Pacific island countries, and LLDCs, in order to meet their priority ICT requirements. ITU carried out the following actions in support of this objective:
- In a partnership with the Republic of Korea's MSIP, ITU provided assistance to selected countries in the Asia-Pacific region to establish national spectrum management master plans (see also ASP RI 3).
- The project to further develop the spectrum management system for developing countries (SMS4DC) started in 2014 with support also from MSIP, when more than ten countries were assisted with higher-resolution terrain data and software testing.
- Capacity-building training on SMS4DC was provided from 11 to 21 August 2014 to Samoa, Solomon Islands, Timor-Leste, Tonga and Vanuatu, which currently use the system to manage their national spectrum.

- Additional training provided in February 2016 for participants from ten Member States enhanced capacities in the field of spectrum management.
- ITU supported Lao P.D.R. on drafting a tariff policy and regulations and, from 2014 to 2016, the staff of the Ministry of Posts and Telecommunications (MPT) were involved in the work of the expert, thereby benefiting from expert knowledge transfer.
- In 2014, ITU carried out a competition regulation and a universal service fund mechanism review for the ICT sector for Bhutan InfoCom and Media Authority (BICMA), Bhutan.
- In 2016, ITU provided Bhutan's BICMA with expert support on EMF radiation measurement from mobile and broadcasting stations and on the drafting of standard operating procedures.
- ITU facilitated capacity building for five experts from the Afghanistan Computer Emergency Response Team (AfCERT), provided under an EC-Council information security bootcamp programme in November 2014.
- From 2014 to 2016, Timor-Leste benefited from a licensing framework, a sector development strategy, an Internet exchange and a converged regulatory framework, the latter based on a post-liberalization review.
- ITU developed a national ICT statistics and indicators framework in 2014 and a cybersecurity policy in 2015 for Lao P.D.R. to foster an ICT-enabling environment.
- In Myanmar, ITU supported the development of telecommunication regulatory dispute resolution in 2014 and a national ICT statistics and indicators framework in 2016.
- Licensing rules and regulations were developed for Cambodia in 2014, enhancing the telecommunication regulatory environment and institutional capacity in the area of licensing.
- ITU/PTA (Pakistan Telecommunication Authority) regulatory training on licensing and service regulation benefited trainees from regulatory authorities from Afghanistan and Pakistan from 20 to 23 July 2015.
- Assistance was provided to Mongolia on regulatory and technical matters such as: in 2014, satellite coordination and planning; in 2015, transit traffic planning, licensing and IPv6; and in 2017, digital financial services, spectrum management and ICT statistics. This assistance enhanced the capacity of stakeholders in Mongolia.
- In November 2015, capacity building benefited 50 participants from nine Pacific Member States through the ITU Asia-Pacific CoE Training on Telecommunication Strategy for the Pacific. This was carried out in partnership with the Pacific Islands Telecommunications Association (PITA) and Australia's Department of Communications and the Arts (DOCA), as well as with the Internet Training Centre in Samoa, through a train-the-trainer programme.
- The National Cybersecurity Strategy for Nepal (Republic of) was drafted in 2016, enhancing the awareness and capacity of some 100 government, regulatory and private-sector stakeholders. Successful cybersecurity simulation demonstrations were held, and cooperation with the Nepal Telecommunication Authority for continued work on cybercrime legislation was enhanced.
- In addition, ITU developed compliance testing of mobile base stations and broadcast stations for Bhutan's BICMA in 2016.
- The ITU/PTA (Pakistan) training on mobile application development was delivered to Afghanistan's Information Communication Technology Institute (ICTI) in February 2016 to enhance capacity.
- Within the framework of the Pacific regional project on the development of satellite communication capacity and emergency communication solutions for the Pacific Islands, cooperation agreements were signed with Pacific island Member States as beneficiaries. The project has a climate change adaptation component with the master service agreement being finalized with Intelsat for implementation in 2016.

- The enabling environment for ICT applications was improved through development of an e-agriculture strategy (e-renewable natural resources (E-RNR) master plan) for Bhutan with support from FAO, ITU and other partners.
- ITU and FAO assisted Fiji and Papua New Guinea in developing e-agriculture strategies, and Bhutan and Sri Lanka in strategy implementation.
- A project on capacity building on countering misappropriation of telephone numbers in Pacific island countries was launched in 2017, supported by Australia's DOCA.
- In 2017, assistance was provided to Bhutan on an IPv6 roadmap and IPv6 infrastructure security.

ASP RI 2: Emergency telecommunications

- The moveable and deployable ICT resources unit (MDRU) project was initiated in 2014 after Typhoon Yolanda had ravaged the Philippines in 2013. The project, implemented in partnership with Japan's Ministry of Internal Affairs and Communications (MIC), the Philippines Department of Science and Technology ICT Office (DOST-ICTO) and ITU, was launched and handed over to the Philippines DOST-ICTO in February 2015, enhancing the country's capacity and readiness on disaster preparedness. Other partners engaged in the MDRU project include Nippon Telegraph and Telephone Corporation in Japan and the Central Visayas Information Sharing Network Foundation, Inc. in the Philippines. The MDRU project can be replicated in other municipalities in the Philippines, and in other Member States. MIC Japan is currently developing future GSM/LTE models for ease of deployment.
- From 2014 to 2016, ITU continued to support the region during disaster situations with the appropriate and timely deployment of satellite communication equipment. The equipment deployed during these emergency situations has included: satellite phones, B-GAN satellite terminals, very small aperture terminals (VSATs) and QUALCOMM deployable base stations. Assistance was provided to the Philippines following Typhoon Yolanda in 2013 and Typhoon Ruby in 2014; to Vanuatu following Cyclone Pam in 2015; to Micronesia following Typhoon Maysak in 2015; to Nepal (Republic of) following an earthquake in 2015; to Myanmar following severe flooding in 2015; and to Fiji following Cyclone Winston in 2016.
- ITU provided technical assistance to Nepal (Republic of) and enhanced capacity in emergency preparedness by developing the Nepal Emergency Telecommunication Continuity Management System (NETCOMS) in 2015.
- Assistance to the National Communications Authority of Timor-Leste in the development of its emergency communications plan was provided in 2015.
- ITU contributed to the Asia-Pacific Broadcasting Union (ABU) Media Summit on Climate Change, ICTs and Disaster Risk Reduction in 2014, and to the sixth Asia-Pacific Telecommunity (APT) Workshop on Disaster Management/Communications (WDMC-6) in 2015 in Fiji, through the sharing of information on ITU standardization and development activities in the area of emergency response in the Asia-Pacific region, as well as through presentations and contributions to discussions at the Emergency Telecommunications Cluster Workshop held in Samoa in 2016.
- The region has seen improved capacity and awareness on the part of its Member States in addressing emergency telecommunication issues through various activities, including the sharing of best practices on emergency communications.
- ITU supported Pakistan in drafting the Pakistan Emergency Telecommunication Regulatory Framework (PETRF) in 2016.

ASP RI 3: Harnessing the benefits of new technologies

- ITU developed spectrum management master plans for Bangladesh, Brunei Darussalam, Fiji, Pakistan, Samoa and Thailand in partnership with the Republic of Korea's MSIP, from 2014 to 2016.
- Twenty-four ITU Member States in the region have since been assisted in developing their national road maps for the transition from analogue to digital terrestrial television (DTTV) broadcasting: Afghanistan, Bangladesh, Bhutan, Cambodia, Fiji, Indonesia, Kiribati, Lao P.D.R., the Maldives, Micronesia, Mongolia, Myanmar, Nepal (Republic of), Nauru, Papua New Guinea, the Philippines, Samoa, Solomon Islands, Sri Lanka, Thailand, Tonga, Timor-Leste, Vanuatu and Viet Nam. This was made possible through the support of the Republic of Korea's MSIP, MIC Japan, Australia's DOCA and ITU operational programmes. ITU is also working closely with ABU and the Asia-Pacific Institute for Broadcasting Development (AIBD) to further the analogue to digital broadcasting transition and post-transition activities.
- Guidelines on the transition from analogue to DTTV broadcasting have been updated and case studies on completed DTTV broadcasting implementation were published for Australia, Japan and Thailand between 2013 and 2015. A report on interactive multimedia services in the Asia-Pacific region (Trends and Insights 2015) increased the awareness of new technology deployment in the Asia-Pacific broadcasting sector.
- From 2014 to 2016, ITU also implemented a number of projects that included digital broadcasting (television and radio) with the National Broadcasting and Telecommunications Commission of Thailand (NBTC). The projects, while focused on Thailand, have also benefited other countries in the Asia-Pacific region.
- Analogue switch-off (ASO) and DTTV broadcasting regulations were reviewed for Papua New Guinea in August 2015 to enable a smooth migration.
- ITU also reviewed the ASO road map and status and the DTTV broadcasting plan for the Philippines in 2015. Under the current plan, the Philippines are targeting 2020 for ASO implementation.
- Fiji implemented its DTTV broadcasting through a national trial in 2016, following the ITU transition roadmap, with ASO following in 2017.
- In partnership with ABU and AIBD, the fourth Regional Workshop on Over-the-Top and Integrated Broadcast Broadband Technologies and Services for Media resulted in increased awareness of around 60 participants from 20 countries.
- In 2014, support was provided to Vanuatu in the updating of its National Table of Frequency Allocations. Capacity-building assistance was also provided to Bhutan in 2015 to review its national spectrum management framework in the interests of efficient resource utilization, through delivery of a national workshop attended by participants from 12 organizations.
- ITU expertise to improve frameworks and capability in the areas of conformity, interoperability and type approval was provided to several countries in the region through the following actions:
 - In Ulaanbaatar (Mongolia), participants attended a review meeting on the type approval regime that improved understanding and built capacity.
 - In 2015, support for ITU Member States (38 countries) was provided to APT in C&I programmes, increasing capacity in the region.
- In addition, from 2014 to 2015, enhanced awareness on new technologies was provided through the following seminars and forums:
 - The Forum on Positive Use of Internet and Social Media in Public Service was carried out in 2014 in Jakarta (Indonesia), in partnership with the Association of Southeast Asian Nations (ASEAN) and the Malaysian Communication and Multimedia Commission (MCMC), improving the skills and awareness of participants from the ASEAN countries.

- ITU Asia-Pacific Regional Seminar on IMT towards 2020 and beyond (Technology and Spectrum) was delivered in Viet Nam 2014, supported by the Ministry of Information and Communication. Over 150 experts and senior officials from 24 Member States (including officials from outside the Asia-Pacific region), as well as several worldwide ITU recognized operating agencies and scientific or industrial organizations, benefited from the discussions.
- A regional workshop which enhanced the DTTV broadcasting expertise of participants from 20 countries was delivered in Malaysia in 2015 in collaboration with AIBD and ABU.
 - At the Pacific Media Partnership Conference (Partnering for Broadcasting), held in Samoa in 2015 and jointly organized by ABU, ITU and Pacific Media Partners with the support of the Australian Government's DOCA and Samoa Broadcasting Corporation, over 50 participants shared knowledge and expertise in the interests of enhancing and promoting broadcasting within the region.
 - The Asia-Pacific Regional Workshop on Satellite Coordination, held in 2015 at the invitation of the Philippines' DOST-ICTO and in cooperation with ITU-R, APT and Australia's DOCA, was attended by 70 experts from 20 countries.
 - The first Asia-Pacific Regional Forum on e-Government and Smart Cities, held in Thailand in 2015, deepened the understanding and awareness of 333 participants through the sharing of experiences from 39 countries.
 - A National Workshop on New Technologies and Policy and Regulatory Implications, held in 2016 in Lao P.D.R., was attended by over 60 national government officials from the Ministry of Posts and Telecommunications, other concerned ministries and local government agencies.
- From 2014 to 2017, members were assisted in the development of applications and cloud computing through:
 - Assessment and potential use of mobile applications in the health sector in Bangladesh (2014).
 - A National Workshop on Cloud Computing, held in Colombo (Sri Lanka) in 2015, which enhanced the capacity of the 60 participants from government, the regulator, industry and academia.
 - Tailored training to build capacity and skill sets on mobile-application development and mobile-mediated solutions for trainees from Afghanistan's ICTI, in 2016. The training was facilitated by Pakistan's PTA.
 - In 2015, in Nonthaburi (Thailand), participants from four countries had their capacity enhanced in the area of green ICTs and e-waste solutions through the development of training materials and receipt of training in the areas of smart sustainable cities, green ICTs and smart grids.
 - From 10 to 14 November 2014 in Islamabad (Pakistan), an event on Enabling Efficiency in Energy Management through ICTs enhanced the capacity of over 50 participants from Pakistan, and a report was drafted for the country's Ministry of Information and Technology.
 - During the period 2014 to 2016, in partnership with the Food and Agriculture Organization (FAO), ITU enhanced the capability of FAO and ITU members and stakeholders to use ICTs for agriculture in a strategic manner. FAO and ITU developed a National e-Agriculture Strategy Guide to assist countries in developing their own national strategies. In 2015 and 2016, assistance was also provided to develop an e-renewable natural resources (E-RNR) master plan for Bhutan and a national e-agriculture strategy for Sri Lanka. Several new partners (including Technical Centre for Agricultural and Rural Cooperation and CAB International) have been engaged in this area since 2014. FAO and ITU assistance is ongoing to Fiji, the Philippines and Papua New Guinea to develop their e-agriculture strategies, and to Bhutan and Sri Lanka for implementation of that strategy.

- In 2015, capacity was built for participants from policy-makers, regulators and industry in Mongolia, in the area of Internet transit traffic planning.
- Assistance was provided to Lao P.D.R (2014), Mongolia (2015), Cambodia (2016) and Bhutan (2017) in the area of IPv6 deployment. The work was implemented through strong partnerships between national governments, the Asia-Pacific Network Information Centre (APNIC) Australia's DOCA.
- Assistance was provided to Timor-Leste on Internet exchange, in partnership with APNIC.
- Governments, regulators and industry, through various training events, received training or capacity building in the following areas:
 - Digital broadcasting technologies and their implementation, with 77 participants from 16 countries (2014, India).
 - Wireless security practices for policy-makers and regulators, with participants from 13 countries (2014, ITU Academy online).
 - Smart technologies and services in the LTE-advanced era, with participants from ten countries (2014, Busan (Republic of Korea)).
 - Internet and IPv6 infrastructure security for telecommunication networks in 2014 and 2015, with participants from eight countries in June and July 2014; ten countries in May 2016 (Nonthaburi (Thailand)); and 11 countries in May 2017 (Thailand).
 - Spectrum monitoring, with close to 50 participants from 14 countries (2015, Beijing (China)).
 - Interactive multimedia services and pay TV with 65 participants from six countries, (Hanoi (Viet Nam)).
 - Mobile cloud computing applications for developing value-added services, with 73 participants from seven countries (2014, Hanoi (Viet Nam)).
 - Cloud forensics and security, with participants from nine countries (2014, Nonthaburi (Thailand)).
 - Satellite network registration procedures and international regulations, organized jointly with ITU-R, with 66 participants from 25 countries (2015, ITU Academy online), under the umbrella of the ITU Asia-Pacific CoEs and partners.
 - Broadband access network planning, with participants from four countries, (2015, Ghaziabad (India)).
 - Conformity and interoperability, with participants from seven countries (2015, Beijing (China)).
 - Broadband quality of service, with 51 participants from seven countries (2015, Bangkok (Thailand)).
 - Developing the ICT ecosystem to harness the Internet-of-things, with close to 50 participants, under the umbrella of the ITU Asia-Pacific CoEs and partners (2016).
 - Broadband access network planning (21 November to 16 December 2016).
 - Spectrum management (online, with 143 participants, 13 to 26 February 2017).
 - Conformity and interoperability for 4G LTE (online, 17 April to 15 May 2017).
 - IoT: technology, standards and planning (with 71 participants, 8 to 11 July 2017, Tehran (Islamic Republic of Iran)).

Training and expert cybersecurity and COP events improved skills and enhanced national and regional awareness:

- Training provided to CERT staff from Cambodia, Lao P.D.R., Myanmar and Sri Lanka (Lao P.D.R., 2014).
- Experts from AfCERT trained through the EC-Council Information Security bootcamp programme (Afghanistan, 2014).
- A cyberincident simulation and the Conference on National Critical Infrastructure Protection took place on 23 November 2015 in Bangkok (Thailand), in collaboration with the Ministry of Defense of Thailand, with over 200 participants.
- A report was prepared for the Nepal (Republic of) on cybersecurity and COP, and a national workshop was organized with 60 participants.
- Thirty incident responders from 20 Philippines government agencies were trained in cyberincident handling (2016).
- ITU supported around 70 teachers and students from local elementary schools in three rural villages in Indonesia, through participation in ICT-related teaching activities in partnership with Intel Indonesia.
- ITU assisted in development of the national cybersecurity strategy for Nepal (Republic of) in 2016, and built capacity for over 50 participants.
- In order to build capacity, raise awareness and strengthen the engagement of participants from governments, regulators and industry, ITU invested in the following areas:
 - Training for senior management on the development of a telecommunication sector strategy for the Pacific served to increase awareness, and a roadmap was drafted for the next five years. Over 50 participants from nine countries took part (2015, Fiji).
 - ITU provided the Communications Regulatory Authority of Maldives with assistance on affordable Internet access.
 - Events focusing on next-generation network project planning and costing increased the understanding of participants from six countries (2016, India).
 - Through strengthened engagement in m-health in India, discussions were held with stakeholders and partners (2016, India), including participants from the Ministry of Health and Family Welfare, Ministry of Communications & Information Technology, Telecom Regulatory Authority of India, National Standardization Organization, National Health Portal, insurance companies, telecom service providers, hospitals, ITU APT Foundation, Advanced Level Telecom Training Centre (ASP CoE), Academia, experts, WHO and ITU.
 - ITU-supported training on spectrum management and monitoring, which helped increase the capacity of participants from 14 countries (China).
 - Online training through the ITU CoEs and China Academy of Information and Communication Technology deepened the understanding of C&I in telecommunication networks, mobile terminals and electromagnetic compatibility for 52 participants from 15 countries.
 - ITU-supported training on C&I for IMS (IP multimedia subsystem) and 4G-LTE (Long Term Evolution) was provided to 39 participants from ten countries (China, 2016).
 - An assessment on cybersecurity and critical infrastructure protection, in collaboration with the Global Cyber Security Capacity Centre, Oxford University and NBTC Thailand, improved the cybersecurity framework in Thailand.
 - Training in partnership with the Asian-Pacific Postal Union developed an understanding of postal e-strategies among participants (Thailand, June 2016 and June 2017).

- Understanding and shared experience in the area of smart cities and e-government was increased through the second Asia-Pacific Regional Forum (Thailand, 2016).
- A forum on e-agriculture solutions was organized to establish a community of e-agriculture solution providers and enhance the engagement of the ICT and agriculture community in the Asia-Pacific region. The forum raised the awareness of 120 participants from 29 countries in the area of e-agriculture. It also enhanced the engagement of policy-makers, regulators and industry players from the agriculture and ICT sectors (Thailand, 2016).
- Train-the-trainer programmes, conducted jointly with FAO, served to train stakeholders in the development of national e-agriculture strategies (Thailand, 2016).

ASP RI 4: Development of broadband access and adoption of broadband

- National broadband policies were drafted for Bhutan (2012-2014, 2015), Brunei Darussalam (2013-2014), Marshall Islands (2014), Philippines (2014), Vanuatu (2014), Cambodia (2016) and Sri Lanka (2016). Brunei Darussalam adopted its policy in 2015.
- Understanding of broadband infrastructure was deepened through improvements made to the online interactive transmission map for the Asia-Pacific region, in collaboration with the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP).
- Studies were drafted on national broadband policies (Smartly Digital Asia-Pacific2020), affordable access to the Internet and a broadband feasibility study, and were presented to the Papua New Guinea National Information and Communication Technology Authority (2015).
- Awareness of the need for improved access to broadband infrastructure, applications and services was enhanced through the following events:
- The Asia-Pacific Digital Societies Policy Forums were attended by over 200 participants from more than 20 countries (Thailand, 2015 and 2016).
- The Asia-Pacific Regional Forums on e-Government, Smart Cities and Digital Societies for Sustainable Development were attended by over 200 participants (Thailand, 2015 and 2016).
- The Asia-Pacific Regional Forum on Reshaping Policy and Regulatory Landscape for Accelerating Broadband Access was attended by 115 participants from 19 countries (Indonesia, 2015).
- During ITU Telecom World 2016, the Asia-Pacific Exchange on Broadband Regulation and Policy launched a joint ITU-Huawei white paper on broadband regulation and policy.
- In addition, training was organized to build capacity in:
 - Broadband policy for universal access, with 51 participants from 30 countries, through the ITU Academy online (2014).
 - Smart sustainable cities, jointly organized by ITU-T and ITU-D, with 50 participants from 11 countries (Bangkok, 2014), and 107 participants from 12 countries (India, 2015).
 - Wireless broadband roadmap development, with 55 participants from nine countries (Islamic Republic of Iran, 2016).
 - Quadplay: costing and pricing infrastructure access, with some 60 participants from 14 countries (Thailand, 2016).
 - Broadband access technologies (online, 2016).

ASP RI 5: Policy and regulation

- National telecommunication and ICT policy, regulatory and legislative frameworks have been strengthened through direct country actions:

- An amended telecommunications law was drafted for the Philippines (2015).
- A tariff policy and regulations were drafted for Lao P.D.R. by an ITU expert and eight MPT staff members.
- A licensing framework (2014), a post-liberalization review and a sector development strategy (2015) and a converged regulation framework (2016) were drafted for Timor-Leste.
- A national ICT statistics and indicators framework (2014), a numbering plan (2015), a cybersecurity policy (2015) and tariff regulations (2016) were developed for Lao P.D.R.
- A telecommunication regulatory dispute resolution mechanism (2014) and a national ICT statistics and indicators framework (2016) were developed for Myanmar.
- Draft licensing rules were developed for Cambodia under direct country action in 2014. In addition, staff from different ministries benefited from capacity building.
- Countries also improved their regulatory frameworks through direct assistance:
 - A detailed report on policy and regulatory aspects was provided to Mongolia (2014) for the introduction of next generation mobile networks in the country, and assistance was also provided on unified licensing (2015), thereby enhancing the awareness of telecommunication sector stakeholders in general and the regulator in particular. Assistance on digital financial services is ongoing (2017).
 - Assistance on interconnection cost modelling was provided for the Communications Regulatory Authority of the Islamic Republic of Iran (2014).
 - Guidelines were drafted for the Nepal Telecommunications Authority on how to foster growth in the telecommunication sector (2014).
 - Expert assistance was provided on the numbering plan and introduction of number portability (Timor-Leste, 2015).
 - Expert assistance on drafting a domain name management and operation report was provided to the Communications Authority of the Maldives (2016).
 - Expert assistance through the TRAI-ITU Symposium on ICT Regulatory Challenges in Indian Smart Cities strengthened national frameworks and raised awareness for the more than 90 participants (March 2015).
- Enhanced and exchanged information on regulatory matters, through top-level regulatory dialogue at the following events:
 - The Asia-Pacific Regulators Roundtable brought together 55 participants from 24 countries in Australia (2014); 52 participants from 19 countries in Malaysia (2015); and 48 participants from 17 countries in Malaysia, (2015).
 - The International Training Programme brought together 56 participants from 26 countries in Australia (2014); 62 participants from 18 countries in Malaysia (2015); and 66 participants from 18 countries in Pakistan (2016).
 - The ITU-IDA Executive Training Programme in Singapore brought together participants from 14 countries (2014); senior delegates from ten countries (2015); and participants from 22 countries (2016).
 - ITU and Malaysia's MCMC coorganized the Asia-Pacific Regional Forum for Telecommunication/ ICT and Financial Regulators on Digital Financial Inclusion (Malaysia 2015), supported by the Malaysian Ministry of Communications and Multimedia, Australia's DOCA and the Bill and Melinda Gates Foundation. More than 70 delegates from 17 countries participated in the forum.
- Enhanced awareness for policy-makers in China through annual ITU/MIIT (Chinese Ministry of Industry and Information Technology) seminars:

- Broadband development and innovation using the Internet (2014).
- ICT Development in Internet+ Age, with more than 100 participants (2015).
- Regulation in the New Era, with more than 150 participants (2016).
- Improved policy and regulatory skills gained by participants from governments, regulators, industry and academia:
 - A training event on Strategic Costing and Business Planning for Quadplay, with 60 participants from 18 countries (Thailand, 2014).
 - Strategic Costing and Convergence Planning for the Pacific, with participants from five countries (Fiji, 2014).
 - Online training on Broadband Quality of Service – a Regulatory Perspective, with participants from 17 countries (2014).
 - A workshop on ICT Indicators in Statistics for ASEAN and Pacific island countries, with 80 participants from 20 countries (Thailand, 2014).
 - ITU/PTA Regulatory Training on Licensing and Service Regulation, for trainees from the Afghanistan Telecommunication Regulatory Authority (Pakistan, 2015).
 - A licensing regime review for Sri Lanka (2015-2016).
- Improved collaboration with APT by partnering, through the following activities:
 - A Seminar on Spectrum Management and Terrestrial TV Broadcasting, preceded by a Training Programme on Radio-Spectrum Management and Services, was organized by APT in collaboration with ITU (Fiji, 2015), bringing together participants representing ten ITU Pacific islands, two regional organizations (APT and PITA), three ITU Member States from outside the Asia-Pacific region and four ICT industry organizations.
 - ITU built capacity in preparing for ICT international conferences in general, and those of APT and ITU in particular, through a two-stage, online and face-to-face, training (2016). Participants from 22 countries successfully completed the online course, while others advanced their skills through the face-to-face training.
- Other actions to strengthen national frameworks included:
 - Direct country assistance in ICT-sector growth (Nepal (Republic of)); enabling efficiency in energy management through ICTs (Pakistan); licensing (Cambodia and Timor-Leste); national ICT indicators and statistics framework (Lao P.D.R.); telecommunication regulatory dispute resolution (Myanmar); improving the interoperability framework (Mongolia); e-agriculture (Bhutan, Fiji, Papua New Guinea, the Philippines, Sri Lanka); competition framework (Bhutan); improved awareness and skills towards the deployment of IPv6 (Lao P.D.R., Cambodia, Mongolia).
 - The outcomes of WRC-15 were communicated in 2016 through multiple regional, subregional and national workshops, to ensure the harmonization of spectrum usage.

CIS Region

CIS RI 1: Creating a child online protection centre for the CIS region

- CIS RI 1 is being implemented in partnership with the A.S. Popov Odessa National Academy of Telecommunications (ONAT), an ITU-D Sector Member, and with the support of the Administration of Ukraine.
- Confidence and security in the use of ICTs was improved through the development of a multimedia distance-learning course on the safe use of Internet resources, which was organized into three modules: basic (for pre-schoolers and primary school pupils), intermediate (for five to nine year

olds) and advanced (for senior school pupils, informatics teachers and parents). The course is available, in Russian, at <https://onlinesafety.info> and on DVD. The project, implemented by ONAT, was recognized by a WSIS Prize 2016 in the category of Building Confidence and Security in the Use of ICTs.

- The course was promoted through a meeting with over 200 school directors in Odessa (Ukraine) and Bishkek (Kyrgyz Republic) in December 2015. It was also presented at a roundtable in Bishkek on 9 December 2015, with the participation of ITU, UNESCO, government officials, the private sector and academia.
- Another targeted promotion was made during the 2016 summer school holidays, when ONAT organized a series of lectures for children attending summer camps in Odessa. The lectures were interactive and attracted the participation of over 100 children.
- It is a well-developed course, and the strong promotional efforts resulted in over 13 500 users from more than 60 countries during the first six months since its launch in December 2015.
- To further contribute to online safety, ITU and ONAT developed a database to store data on technical solutions for COP and software for choosing optimal technical solutions. More than 70 existing technical solutions for COP were tested by experts and included in the database. The software and database are available in Russian at <https://contentfiltering.info>.
- Finally, to facilitate the identification and management of unsafe web resources, an automated system for the distribution of black (unsafe) and white (reliable) lists of Internet resources was developed. It includes modules for administrators, experts and users and can be used by educational institutions, telecommunication operators and other interested stakeholders. The system is populated with Internet resources and templates that are specific to the CIS countries. The system is available, in Russian, at <http://bwld.online>

CIS RI 2: Ensuring access to telecommunication/ICT services for persons with disabilities

- CIS RI 2 is being implemented in partnership with:
 - o the Belarusian State Academy of Communications, with the support of the Administration of Belarus
 - o the Institute of Electronics and Telecommunications under Kyrgyz State Technical University named after Iskhak Razzakov (IET-KSTU), an ITU-D Sector Member, with the support of the Administration of Kyrgyzstan
 - o the Ministry of Information Technology and Communications of Moldova
 - o the Government of the Republic of Sakha, with the support of the Administration of the Russian Federation
 - o the UNESCO Institute for Information Technologies in Education (IITE UNESCO), Moscow (Russian Federation).
- The Information and Training Centre for Persons with Disabilities in the Kyrgyz Republic, opened on 22 October 2015, provides six workstations for motor-impaired users and six for visually-impaired users. The centre provides all the necessary conditions for the continuation of school education and mastering of different professions by persons with disabilities. The opening ceremony was attended by the Vice Prime Minister, Minister of Education, members of parliament and other senior government officials of the Kyrgyz Republic.
- In recognition of the centre's successful operation, ITU supported, in 2016, an upgrade of its facilities, adding four more workstations: two for persons with hearing impairments and two for persons with speech impairments.

- The project on Creation of an Internet Access and Training Centre for Persons with Disabilities in Bishkek won the WSIS Prize 2016 for access to information and knowledge.
- In order to create the human capacity required to train persons with disabilities in the Internet Access and Training Centre, ITU, in cooperation with IITE UNESCO and IET-KSTU, conducted training on 8 October 2015 and a seminar on 7 and 8 December 2015 to teach staff of the IET-KSTU.
- Project outcomes and next steps were discussed at a roundtable in Bishkek (Kyrgyz Republic) on 9 December 2015, attracting representatives from regulators, policy-makers, academic institutions and civil society in five CIS countries, as well as representatives from UNESCO.
- In November 2015, an Internet access and training centre for the visually impaired (three workstations) was established in a suburb of Chisinau (Moldova).
- Public web resources in the Kyrgyz Republic were tested using the Web Content Accessibility Guidelines (WCAG) 2.0 on accessibility for persons with disabilities.
- An information and education portal for persons with disabilities was designed and has been managed by IET-KSTU. Mostly used thus far by the Kyrgyz Republic, the portal is expected to be of future benefit to other countries in the CIS.
- A methodology for adapting university curricula to the needs of persons with disabilities was drafted, and multimedia training resources (audio materials) for visually-impaired users and audio and video materials for users with musculoskeletal disorders were developed.
- Government website developers were trained in web accessibility. The IET-KSTU web portal was adapted to reflect the special needs of persons with disabilities. An online testing system for visually-impaired users and for users with musculoskeletal disorders, and a web portal designed to provide employment assistance to persons with disabilities, were elaborated.
- In close cooperation with IITE UNESCO, an Internet Access and Training Centre for users with motor and speech disabilities was established in August 2016 in the Republic of Sakha (Russian Federation). The centre has two workstations for blind users, three for visually-impaired users and five for users with musculoskeletal disorders and speech impairments.
- An Internet Access and Training Centre for persons with hearing disabilities was established in Minsk (Belarus) in September 2016. It has five workstations.
- The outcomes of CIS RI 2 were shared at a meeting with the Chairman of the Government of the Republic of Sakha (Russian Federation), Ms Galina Danchikova. The meeting, which took place on 17 August 2016 under the auspices of the Lensky Education Forum in Yakutia, was also attended by several other high-level government officials. The Government of the Republic of Sakha is encouraged by the regional initiatives and by the prospect of future cooperation with ITU.

CIS RI 3: Introduction of training technologies and methods using telecommunications/ICTs for human capacity building

- CIS RI 3 is being implemented in partnership with:
 - o IET-KSTU, an ITU-D Sector Member, with the support of the Administration of Kyrgyzstan.
 - o ONAT, an ITU-D Sector Member, with the support of the Administration of Ukraine.
- Software (an automated system) for the diagnosis of human susceptibility to one or more channels of information perception was developed and tested as a pilot by Ukraine. The software allows users to determine their predominant perception channel and provides valuable recommendations for improving the quality of their educational process through the use of ICTs. The main purpose of the system is to identify the learning process and ways in which pupils

achieve good results, as well as to define the optimal forms and methods of supplying materials for training through the application of telecommunications/ICTs.

- A study of best practices in the use of e-learning resources was conducted and the results presented on 31 May 2016 at a roundtable meeting in Bishkek (Kyrgyz Republic), co-funded by the Tempus Programme of the European Union. An e-learning resource glossary of terms was created and posted on the IET-KSTU website: www.iet.kg.
- Methodological requirements for e-learning resources were elaborated and gaps in the national legislation of the Kyrgyz Republic were highlighted. Recommendations for the creation of an e-learning resource were drafted and published on the IET website for sharing with other countries in the CIS region: www.iet.kg.
- The outcomes of the CIS RI 3 were shared at a meeting with the Chair of the Government of the Republic of Sakha (Russian Federation), Ms Galina Danchikova. The meeting, which took place on 17 August 2016 under the auspices of the Lensky Education Forum in Yakutia, was also attended by several other high-level government officials. The Government of the Republic of Sakha is encouraged by the regional initiatives and by the prospect of future cooperation with ITU.

CIS RI 4: Development of broadband access and adoption of broadband

- In 2016, as part of the planning process, ITU established a strategy for the implementation of the regional initiative by identifying prospective partners for its implementation and the estimated funds required.

CIS RI 5: Building confidence and security in the use of telecommunications/ICTs

- CIS RI 5 is being implemented in partnership with Moscow Technical University of Communications and Informatics, with the support of the Administration of the Russian Federation.
- The current situation in the CIS where the building of confidence and security in the use of ICTs is concerned is being analysed.
- Recommendations containing general indications are being developed on how to evaluate the level of confidence and security in the use of ICTs. They will be shared in the future with CIS countries.
- Training materials are being developed for “Forpost” lab-based intrusion detection/prevention systems, including profession-oriented modules, training aids and test materials for information security engineers.

Europe Region

EUR RI 1: Spectrum management and transition to digital broadcasting

EUR RI 1 is being implemented in partnership with several stakeholders, including:

- National Media and Infocommunications Authority of Hungary
- National Authority for Management and Regulation in Communications, Romania
- Ministry of Communications and Information Society, Romania
- Information and Communication Technologies Authority of Turkey
- Electronic and Postal Communications Authority (AKEP), Albania

- ETV (Emisiona Tehnika i Veze) and [Ministry of Trade, Tourism and Telecommunications](#), Serbia.

Implementation of this initiative has resulted in strengthened regional cooperation. Human capacities in the fields of spectrum management and digital broadcasting were built for more than 250 professionals from over 16 countries. Annual meetings on spectrum management and broadcasting were supplemented by direct assistance, twinning programmes, elaboration of benchmarks, national assessments and training events.

- Technical specifications for the establishment of a spectrum monitoring centre in Albania were elaborated in 2014, addressing the requirements and facilitating creation of the station.
- A Regional Workshop for Europe and the CIS on Spectrum Management and Transition to Digital Terrestrial Television Broadcasting, held from 5 to 7 May 2015 in Budapest (Hungary) and organized in collaboration with the National Media and Infocommunications Authority of Hungary, provided a unique opportunity for more than 15 European administrations to build the human capacity of over 80 professionals while raising awareness of the digital switch-off process and exchanging best practices.
- Training on spectrum management (Turkey, 2015), organized in collaboration with the Information and Communication Technologies Authority of Turkey, was aimed at building the capacity of more than 50 national professionals.
- A twinning programme in 2016 improved understanding and information exchanges between Albania and Hungary in the area of spectrum management and strategy.
- ITU contributed to the International Symposium and Exhibition on Electromagnetic Compatibility, EMC Europe 2016, Wroclaw (Poland) (2016).
- A knowledge exchange on the transition to digital broadcasting led an innovative digital terrestrial television monitoring network to assess signal integrity in real time across a country (Turkey, 2014).
- A pan-European overview of the transition from analogue to digital terrestrial broadcasting was completed in 2015 and information was provided to the ITU digital switchover overview database that compiles and makes available to the membership the global status of transition.
- Assistance to Serbia has included annual spectrum management related reviews, and in 2015 ITU provided broadcasting equipment (gap fillers) that increased digital TV reception to several more municipalities.
- A regional workshop for Europe and CIS on spectrum management and broadcasting (Italy 2017) identified issues and implementation actions that will maximize the economic and social benefits of the digital dividend. It also considered the future challenges to be addressed in broadcasting and in spectrum management to ensure that Europe and CIS regions are equipped with relevant measures and effective tools.

EUR RI 2: Development of broadband access and adoption of broadband

EUR RI 2 is being implemented in partnership with several stakeholders including:

- Office for Electronic Communications (UKE), Poland
- Agency for Electronic Communications and Postal Services, Montenegro
- Ministry for Information Society and Telecommunications, Montenegro
- AKEP, Albania
- Agency for Communication Networks and Services, Slovenia
- Ministry of Economic Development, Italy

- Foundation Ugo Bordoni, Italy Communications Regulatory Authority, Italy
- European Commission
- ISOC.

Implementation of this initiative has resulted in strengthened regional cooperation. The human capacity of over 1 000 professionals from more than 30 countries in the field of the development of high-speed networks in Europe was enhanced. Events, meetings and online training events provided an opportunity for sharing best practices across the region. In addition, bilateral cooperation was strengthened through a twinning programme with the participation of four countries. Specific studies and benchmarks have also been developed. Direct assistance was provided to some countries, e.g. the establishment of a national IXP in Montenegro has resulted in enhanced regional capacities in this field.

- The Regulatory Conference for Europe on Expanding Broadband Access and Adoption (Montenegro, 2015), organized in collaboration with Montenegro's Agency for Electronic Communications and Postal Services, provided over 150 experts from more than 15 European countries with an opportunity to review national broadband strategies and regional challenges as well as a series of concrete actions in the field of QoS.
- In 2015, ITU carried out reviews of national broadband strategies and roll-out plans with a focus on southern and eastern Europe, reflecting information on 12 European countries.
- In addition to enhancing awareness through the discussion of international roaming and related subregional actions, the Regulatory Conference for Europe on Regulation of Electronic Communication Markets (Montenegro, 2016), organized in collaboration with Montenegro's Agency for Electronic Communications and Postal Services, provided a unique opportunity for over 150 experts from more than 15 European countries to identify concrete steps to support regulatory harmonization, taking into account the ongoing European Union regulatory framework review.
- The Regional Workshop for Europe on New Issues in QoS Measuring and Monitoring (Italy, 2015), co-organized by ITU, the Ministry of Economic Development and the Foundation Ugo Bordoni, examined best practices in the field of quality of service and quality of experience (QoS/QoE). Over 50 experts from 12 countries provided exhaustive case studies, and a workshop provided an opportunity for peer-reviewing of the new curriculum of the ITU QoS training programme. The meeting also created an opportunity for strengthening cooperation with the European Commission in the field of broadband.
- Since 2015, ITU has been preparing a collection of best practices on QoS and consumer protection on the basis of inputs from Member States, in the interests of enhanced knowledge and information sharing.
- Since 2015, ITU has been contributing to the Steering Committee and Technical Review Panel of the European Monitoring Platform for Mapping of QoS/QoE, a European Commission-led project that has resulted in strengthened cooperation with the European Commission in the field of broadband development.
- The ITU-EC Regional Conference on Mapping Broadband Infrastructure and Service (Poland, 2016), organized in partnership with the Office for Electronic Communications, Poland, gave the opportunity to over 120 professionals from 25 European countries to harmonize national approaches to QoS/QoE mapping and monitoring. The meeting resulted in the launch of two twinning programmes.
- A twinning programme was carried out between Albania and Slovenia for broadband infrastructure mapping in 2016, resulting in technical specifications for the setting up of an infrastructure mapping system in Albania.

- A twinning programme between Albania and Poland in 2016 resulted in technical specifications for a national monitoring system for QoS/QoE.
- From 2014 to 2016, the ITU interactive terrestrial transmission maps continued to be developed, presenting information on core broadband infrastructure in more than 60 per cent of European countries.
- ITU developed case studies for Montenegro (national IXP) and Portugal (new legislative paradigms) in 2015.
- A subregional workshop on setting up a national IXP was held in 2015 in Montenegro, attracting more than 100 professionals from eight countries.
- Through direct assistance, a national IXP was established in Montenegro in 2015. It was extended in 2016 in response to the gradually increasing demand for IXP services at the national level.
- More than ten training events were delivered, enhancing the capacity and knowledge of over 600 professionals, through the ITU CoE network training events on NGN, mobile broadband, broadband access, software quality control and testing, compliance assessment of telecommunication and data communication cables and devices, strategic aspects of Internet governance, and innovations in end-to-end quality of service network design.
- Future smart grid roll-outs was the topic of an expert group meeting in 2017, which identified future work on collaborative regulation between telecommunication and energy sectors and possible actions on ICT for Energy towards SDG 7 “Affordable and clean energy: Ensure access to affordable, reliable, sustainable and modern energy for all”.

EUR RI 3: Ensuring access to telecommunications/ICTs, in particular for persons with disabilities

EUR RI 3 is being implemented in partnership with several stakeholders including:

- Ministry of Transport, Information Technology and Communications, Bulgaria
- Ministry of Culture and Information of Serbia
- Ministry of Trade, Tourism and Telecommunications of Serbia
- United Nations Development Programme
- European Commission
- European Broadcasting Union (EBU)
- Autonomous University of Barcelona (AUB)
- Rome Three University
- ProForma
- Mercato Internazionale Audiovisivo
- SUB-TI Access
- International Chamber of Commerce.

Implementation of this initiative resulted in strengthened regional cooperation of the relevant stakeholders in the field of accessibility, and human capacity was built for over 500 professionals from more than 30 countries. A series of events, meetings and online training activities provided an opportunity for sharing best practices across the region, as well as advice on policies and regulatory frameworks conducive to e-accessibility, including television/ICT applications for persons with disabilities. Particular attention was focused on public procurement of accessible ICTs, where a special online course provided a unique opportunity for procurement professionals to build their capacities, while

advancing relevant national e-accessibility agendas. In addition, cooperation with diverse European accessibility organizations was strengthened, including the European Disability Forum, European Commission, EBU and Global Initiative for Inclusive ICTs (G3ICT).

- ITU, together with AUB and the European Commission, jointly delivered a Regional Workshop on Smart Accessibility on Connected TV (Barcelona (Spain), March 2015). The event gathered more than 70 relevant European stakeholders active in the field of e-accessibility, and resulted in the identification of top challenges for broadcasters while demonstrating possible technical solutions for broadcasting.
- The ITU Experts Group Meeting on Accessibility, held back to back with the International Symposium on Respeaking, Live Subtitling and Accessibility (Italy, 2015) and attended by over 30 accessibility experts, provided proposals for actions within the framework of the regional initiative. It also provided peer reviews of the curriculum for the online course on accessibility.
- ITU co-organized a conference with Mercato Internazionale Audiovisivo and SUB-TI Access on “Cinema and Accessibility” at the Rome International Film Festival (Italy, 2015). The event brought together over 70 accessibility experts, including film producers, with the aim of discussing the need for incorporation of an accessibility component in film production.
- ITU contributed to the EUROVISION/EBU expert group meeting (Brussels 2015) that gathered more than 80 representatives of European broadcasters engaged in implementation of accessibility in broadcasting. The meeting resulted in strengthened coordination with EBU and closer cooperation, in particular on possible stocktaking exercises on accessibility in IPTV, to be carried out within the framework of this regional initiative.
- A Regional Conference for Europe on the Role of ICT in Development of an Inclusive Society (Serbia, 2015) enhanced the capacity of over 80 accessibility professionals and representatives from relevant organizations in over 16 countries, and resulted in the development of a series of recommendations for stakeholders proactively involved in the implementation of accessibility solutions.
- In 2015, The ITU Academy held an Online Training on Public Procurement of Accessible ICT Products and Services that provided an opportunity for building the capacity of procurement professionals from six European countries. It also delivered, in 2016, online training for broadcasters on audio description and closed captioning.
- In 2015, in cooperation with the Bulgarian Post and the Ministry of Transport, Information Technology and Communication of Bulgaria, ITU implemented the Pilot Project for Border Municipalities (Zlatograd (Bulgaria)) to set up Wi-Fi access points to train adults with impaired vision and hearing problems, and to increase digital literacy.
- More than 50 accessibility experts benefited from the Knowledge Exchanges on ICT Accessibility entitled “Making ICTs Accessible and Inclusive for All” and “Public Procurement of Accessible ICTs” (Geneva, 2016), which fostered the exchange of best practices and innovative solutions in the field of e-accessibility and provided a platform for discussion on the standardization of public policies for procurement of accessible ICTs.
- ITU contributed to the National Workshop on Accessibility (Slovenia, 2015) that was attended by more than 80 experts from ten countries and resulted in a review of country policy-making practices related to ICT accessibility, and in the building of awareness in regard to challenges requiring action at the regional level.
- Based on the ITU Report on Model ICT Accessibility Policy, a Subregional Project on ICT Accessibility is being jointly developed by ITU, ProForma, relevant ministries and the United Nations Development Programme. It aims to target professionals in the field and to enhance capacity in at least four European countries, including Serbia, Bosnia and Herzegovina, Montenegro and Croatia.

- The ITU Regional Benchmark on Accessibility Services in IPTV is being launched in 2016, with the aim of developing a unique dataset for comparing the level of accessibility in traditional broadcasting systems with that in IPTV.
- With the aim of promoting international standards and practices in line with the ITU-D guidelines referred to in the [ITU Model ICT Accessibility Policy Report](#), and of informing and educating national experts in that regard, the National Executive Training held in Serbia in 2016 addressed the challenge of making TV programmes accessible to persons with disabilities. Similar executive training events are planned for Bosnia and Herzegovina, Montenegro and Croatia.

EUR RI 4: Building confidence and security in the use of telecommunication/ICTs

EUR RI 4 is being implemented in partnership with:

- Ministry of Transport, Information Technology and Communication of Bulgaria
- Agency for Electronic Communications and Postal Services, Montenegro
- Ministry for Information Society and Telecommunications, Montenegro
- Information and Communication Technologies Authority of Turkey
- [Ministry of Trade, Tourism and Telecommunications](#), Serbia
- European Union Agency for Network and Information Security (ENISA)
- Council of Europe
- Swiss Web Academy.

Implementation of this initiative resulted in enhanced regional cooperation between relevant stakeholders in the field of building trust and confidence in the use of ICTs among children and young people, and in enhanced human capacity for more than 2500 professionals. Updated COP guidelines constituted the basis for the national campaigns supported by more than five countries. A series of events and meetings served as the platform for the collection and exchange of best practices. A regional review of the national approaches on COP provided good reference points for discussion on regional actions and for the development of the Model Policy Guide on COP. Special attention was focused on strengthening cooperation with ENISA, the European Commission and the Council of Europe.

- ITU co-organized annual international Conferences for Europe on Keeping Children and Young People Safe Online (Poland, 2015 and 2016), with over 600 participants from over 20 countries, providing a platform for sharing experiences and fostering cooperation.
- ITU co-organized annual Central European Cybersecurity Public-Private Dialogue Platform conferences (Romania, 2014, 2015 and 2016), which gathered over 500 cybersecurity experts and provided a unique environment for discussing challenges in the field of cybersecurity, including COP, and fostered collaboration between different stakeholders, potentially, in some case, through public-private partnerships.
- Since 2014, assistance to strengthen national CIRT capabilities has been provided to Albania, Bosnia and Herzegovina, The Former Yugoslav Republic of Macedonia and Serbia.
- An ITU ALERT international cyberdrill for the European region was held in 2015, in Montenegro. Gathering more than 50 participants from ten European countries, it facilitated development of the human capacity of national CIRT teams.
- ITU contributed to the official kick-off of the 2015 October Awareness Month, organized by ENISA in Brussels, and in 2016 it organized a high-level panel on the occasion of the 2016 October Awareness Month, which engaged key European partners relevant to implementation of the regional initiative.

- The ITU-ENISA Regional Cybersecurity Forum for Europe (Bulgaria, 2016), in collaboration with the Council of Europe, provided a unique platform for high-level discussion on regional challenges in regard to, and concrete actions for, the building of confidence in the use of ICTs.
- At the request of the membership in 2015, the COP guidelines for parents and educators and the COP guidelines for children were updated. The updated versions of the guidelines served as the basis for a series of actions carried out at the national level, including ITU-facilitated national communication campaigns on COP which raised the awareness of children, teachers and parents in some of the European countries, including Bosnia and Herzegovina, Croatia, Italy, Montenegro, Romania and Serbia.
- The ITU 2015 twinning programme between Poland and Romania facilitated the transfer of materials for national campaigns to be rolled out in schools, targeting children and teachers.
- A regional review of national COP approaches in Europe was elaborated in 2016, with particular focus on 19 Central Eastern European countries, reflecting the diversity that exists across the region and providing direction for possible actions in the future to address emerging trends.
- Following the successful implementation of the Cyprus government CIRT in collaboration with ITU in 2015, Cyprus, represented by the Office of the Commissioner of Electronic Communications and Postal Regulation (OCECPR), sought assistance to establish a national CIRT to serve as a trusted, central coordination point of contact for cybersecurity, aimed at identifying, defending against, responding to and managing cyberthreats. ITU will assist OCECPR in building and deploying the technical capabilities and related training necessary to establish the Cyprus national CIRT. The project was signed in December 2016 with completion expected by March 2018.
- The annual International Conference on Keeping Children and Young People Safe Online (2015, 2016 and 2017) and a Digital Youth Forum (2017) have been held in Poland, and the annual Central European Cybersecurity Public-Private Dialogues (2015, 2016 and 2017) have been held in Romania. New public-private dialogues on cybersecurity will be held in Switzerland in December 2017.
- A special contribution to Operation Uncool, prepared on the basis of the survey conducted during the Digital Youth Forum (Poland, 2017), presented to ITU's Council Working Group on Child Online Protection in October 2017.

EUR RI 5: Entrepreneurship, innovation and youth

EUR RI 5 is being implemented in partnership with:

- Ministry of Infrastructure, Transport and Networks, Greece
- Ministry of National Development, Hungary
- Office for Electronic Communications, Poland
- Ministry for Digital Affairs, Poland
- Ministry of Trade, Tourism and Telecommunications, Serbia
- Technical Chamber of Greece
- Hellenic Association of Mobile Application Companies, Greece
- Hellenic Association of Computer Engineers, Greece
- United Nations Industrial Development Organization (UNIDO)
- United Nations Conference on Trade and Development (UNCTAD).

Implementation of this initiative resulted in strengthened regional cooperation in the fields of entrepreneurship and innovation. More than 700 professionals from over 25 countries took part in diverse actions within the framework of the initiative. A series of knowledge exchanges in Hungary and Switzerland, ecosystem reviews in Greece, as well as a country review in Albania, have enabled the development of a unique methodology applied by ITU for the national review of ICT-centric innovation ecosystems. In addition, regional actions such as annual digital payment summits, co-organized by ITU and ITU expert group meetings on mobile ID, have been providing a unique opportunity to strengthen regional capacity on innovation in governmental transformation. Strengthened cooperation has been developed with UNIDO and UNCTAD.

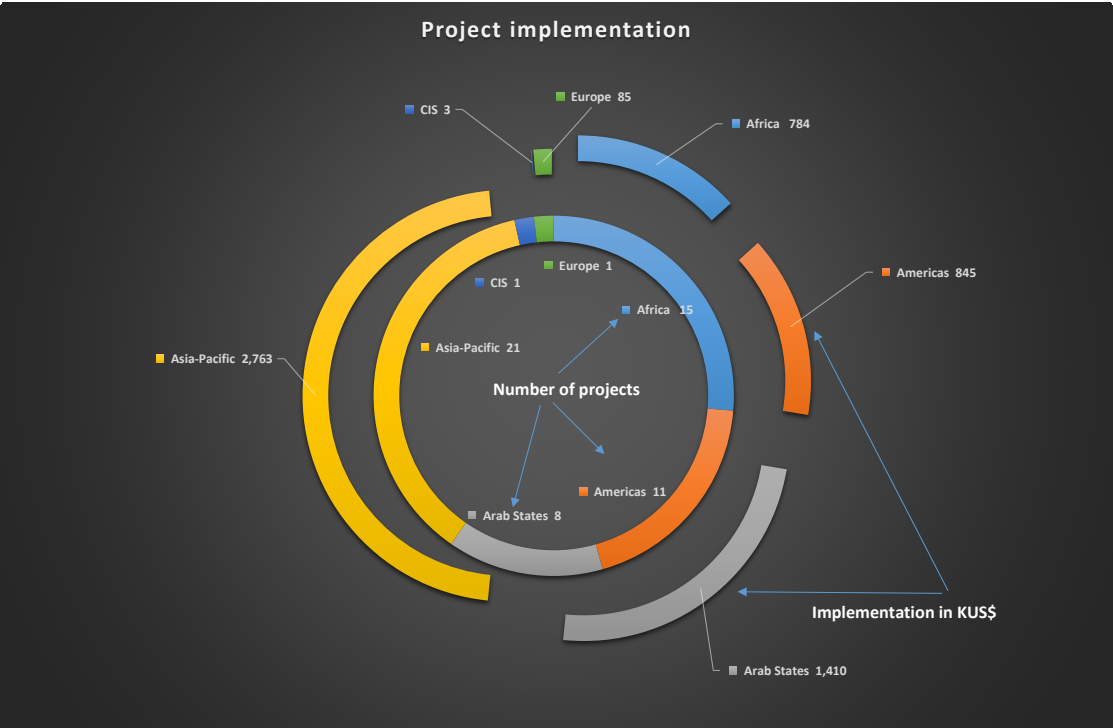
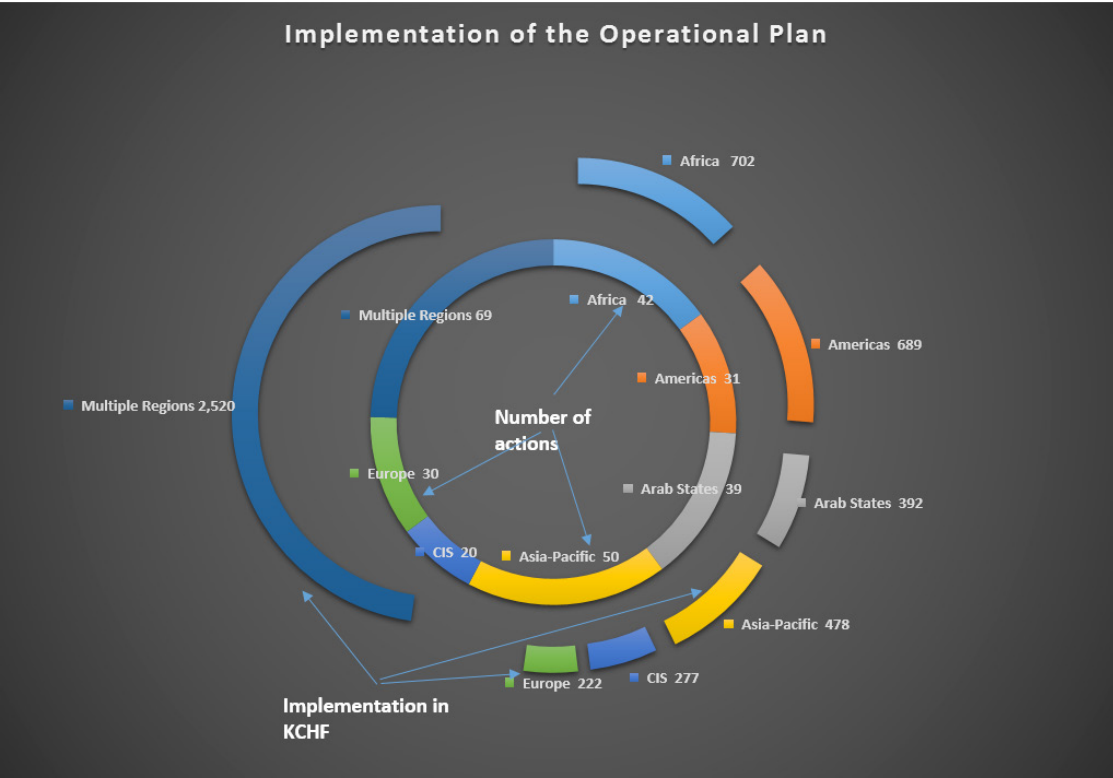
- The WSIS Forum (Geneva, 2015 and 2016) provided a platform for more than 50 stakeholders to discuss challenges in relation to, and opportunities and concrete actions for, the fostering of ICT-centric innovation.
- Digital payment summits (2015 and 2016) were co-organized by ITU and the General Secretariat of Telecommunications and Posts of Greece, Hellenic Association of Computer Engineers, Technical Chamber of Greece, Hellenic Association of Mobile Application Companies, in Athens (Greece), on both occasions attracting more than 200 professionals engaged in the building of a digital payment ecosystem. The event was also an opportunity to exchange views on necessary steps to foster the development of a cashless environment.
- A national ecosystem review was carried out in Greece in 2015. It gathered information from 70 Greek innovation ecosystem stakeholders and provided an opportunity for taking initial stock of the strengths and weaknesses of the national ICT-centric ecosystem. Building on this result, the ITU Expert Group Meeting on Entrepreneurship, Innovation and Youth (Greece, 2015) agreed upon the Athens Manifesto as the guiding tool for future enabling environment actions.
- The Onsite Expert Challenge on Innovation and Entrepreneurship Ecosystem, held during Telecom World 2015 in Hungary, attracted more than 50 diverse stakeholders and provided guidance on the requirements and necessary steps for the development of ITU-ICT-Agora.
- The partnership established between ITU, UNCTAD and UNIDO led to the development of a unique ITU methodology for the national reviews of the ICT-centric innovation ecosystem that were carried out in Europe in 2016.
- A review of the ICT-centric innovation ecosystem was carried out in Albania in 2016 through three national workshops and over 50 interviews were conducted with key stakeholders driving innovation at the national level. It resulted in a comprehensive study, including policy options and proposals for implementation actions at the national level.
- Innovation Week in Albania in 2016, supported by ITU, attracted more than 100 stakeholders from the ICT sector and benefited from the contributions of the representatives from Greece and Hungary. It provided an opportunity for development of a partnership between diverse stakeholders, while addressing the outcomes and proposals of the national review.
- The ITU Expert Group Meeting on Mobile ID (Poland, 2016) reviewed technical solutions for mobile ID at the country level. A compilation of national implementations of mobile ID was prepared in partnership with the Office for Electronic Communications of Poland, using the responses provided by experts from Austria, Azerbaijan, Estonia, Latvia, Malaysia, Oman, Poland, Spain and GSMA. The report puts forward, for consideration, a set of practical proposals for furthering the discussions and information sharing.
- The Ecosystem Review in Hungary (2016) recorded the national challenges and possible actions at the regional level and considered how to address them.
- A Regional Forum for Europe and the CIS on Strengthening Innovation Capabilities in the ICT-centric Ecosystem and Fostering the Growth of ICT Start-ups was held in Moldova, with 50 participants from 12 countries. It resulted in the production of a manifesto recognizing the critical role of ICTs across all sectors of the economy and the particular contribution of ICT-

centric innovation and entrepreneurship to sustainable development, in particular in terms of the advancement of achievements in pursuance of SDG9 (Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation), where stakeholders share a set of common goals.

- The annual Girls in ICT Day coincided with the ITU-D regional preparatory meeting held in Vilnius on 27 April 2017, giving ITU the opportunity to increase regional awareness by joining with Kaunas University of Technology to celebrate the event.
- An innovation track has been established for WSIS Forum 2016 and 2017. A toolkit for strengthening the ICT-centric ecosystem was launched during a session of the WSIS 2017 innovation track.
- A training-of-trainers event, based on the Innovation Toolkit with the aim of rolling out ICT-centric innovation ecosystem reviews in the region while creating an enabling environment for project generation in the field of innovation, was held in September 2017.

Annex 1: Financial implementation by region

The tables and charts below provide detailed information on the 2015 budget implementation for the Operational Plan and Projects, by Region.



Implementation of the Operational Plan

	Objective 1		Objective 2		Objective 3		Objective 4		Objective 5		TOTAL	
	Number of actions	Impl. Level CHF(000)	Number of actions	Impl. Level CHF(000)	Number of actions	Impl. Level CHF(000)	Number of actions	Impl. Level CHF(000)	Number of actions	Impl. Level CHF(000)	Number of actions	Impl. Level CHF(000)
Africa			19	459	5	70	16	157	2	16	42	702
Americas			17	421	5	117	8	135	1	16	31	689
Arab States			14	186	11	77	12	104	2	25	39	392
Asia-Pacific			23	178	10	120	13	137	4	43	50	478
CIS			8	61	3	83	9	133			20	277
Europe			13	108	7	59	10	55			30	222
Multiple Regions	6	456	25	738	6	177	26	952	6	197	69	2,520
Total	6	456	119	2,151	47	703	94	1,673	15	297	281	5,280

Project implementation

	FIT		ICT-DF		Operation Plan		UNDP		TOTAL	
Region	Number of projects	Impl. Level US\$(000)	Number of projects	Impl. Level US\$(000)	Number of projects	Impl. Level US\$(000)	Number of projects	Impl. Level US\$(000)	Number of projects	Impl. Level US\$(000)
Africa	4	283	9	495	2	6			15	784
Americas	10	662			1	183			11	845
Arab States	1	0	3	407	3		1	1,003	8	1,410
Asia-Pacific	20	2,571	1	192					21	2,763
CIS					1	3			1	3
Europe	1	85							1	85
Total	36	3,601	13	1,094	7	192	1	1,003	57	5,890

List of abbreviations

ABU	Asia-Pacific Broadcasting Union
AfCERT	Afghanistan computer emergency response team
AFRALTI	African Advanced Level Telecommunications Institute
AIBD	Asia-Pacific Institute for Broadcasting Development
AICTO	Arab ICT Organization
AKEP	Electronic and Postal Communications Authority, Albania
ALECSO	Arab League Educational, Cultural and Scientific Organization
ALERT	Applied Learning for Emergency Response Teams
Anatel	National Telecommunications Agency, Brazil
APNIC	Asia Pacific Network Information Centre
APT	Asia-Pacific Telecommunity
ARCC	Arab Regional Cybersecurity Centre
ARTECNET	Arab Incubators and Technoparks Network
ASEAN	Association of South East Asian Nations
ATU	African Telecommunications Union
AUB	Autonomous University of Barcelona
BDT	Telecommunication Development Bureau
C&I	conformity and interoperability
CAF	Development Bank of Latin America
CERT	computer emergency response team
CG-SPOPD	Correspondence Group on the Strategic Plan, Operational Plan and Declaration
CG-SR	Correspondence Group on Streamlining WTDC Resolutions
CIFODECOM	Centre for Information, Training, Documentation and Studies in Communication Technologies, Tunisia
CIRT	computer incident response team
CIS	Commonwealth of Independent States
CITA	Communications and Information Technology Authority, Mongolia
CoE	centre of excellence
COMTELCA	Regional Technical Telecommunication Commission
CONATEL	National Telecommunication Council, Haiti
COP	child online protection

CPqD	Telecommunication Research and Development Centre, Brazil
CRO	chief regulatory officer
CTU	Caribbean Telecommunications Union
DOCA	Department of Communications and the Arts, Australia
DOST-ICTO	Philippines Department of Science and Technology ICT Office
DTTV	digital terrestrial television
DuAP	Dubai Action Plan
EAC	East African Community
EBU	European Broadcasting Union
ECOWAS	Economic Community of West African States
ECTEL	Eastern Caribbean Telecommunications Authority
EMC	electromagnetic compatibility
EMF	electromagnetic field
ENISA	European Union Agency for Network and Information Security
ESMT	Higher Multinational School of Telecommunications, Senegal
FAO	Food and Agriculture Organization
G3ICT	Global Initiative for Inclusive ICTs
GSR	Global Symposium for Regulators
G-WAN	government wide-area network
ICT	information and communication technology
ICTI	Information Communication Technology Institute, Afghanistan
IDI	ICT Development Index
IET-KSTU University	Institute of Electronics and Telecommunications under the Kyrgyz State Technical
IITE UNESCO	UNESCO Institute for Information Technologies in Education
IMR	international mobile roaming
IoT	Internet of Things
IPv4	Internet protocol version 4
Ipv6	Internet protocol version 6
ISCT	Inter-Sector Coordination Team on Issues of Mutual Interest to ITU Sectors
ISOC	Internet Society
ITSO	International Telecommunications Satellite Organization

ITU	International Telecommunication Union
ITU-D	ITU Telecommunication Development Sector
IXP	Internet exchange point
KPI	key performance indicator
LDC	least developed country
LLDC	landlocked developing country
MDGs	Millennium Development Goals
MCIT	Ministry of Communications and Information Technology, Egypt
MCMC	Malaysian Communication and Multimedia Commission
MDRU	movable and deployable ICT resource unit
MIC	Ministry of Internal Affairs and Communications, Japan
MICT	Ministry of Information and Communication Technology, Thailand
MIS	measuring the information society
MPT	Ministry of Posts and Telecommunications, Lao P.D.R.
MRA	mutual recognition agreement
MSIP	Ministry of Science ICT & Future Planning, Republic of Korea
NBTC	National Broadcasting and Telecommunications Commission, Thailand
NGN	next-generation network
OCECPR Cyprus	Office of the Commissioner of Electronic Communications and Postal Regulation, Cyprus
ONAT	A.S. Popov Odessa National Academy of Telecommunications, Ukraine
OTT	over-the-top
PITA	Pacific Islands Telecommunications Association
PP	Plenipotentiary Conference
PTA	Pakistan Telecommunication Authority
QoE	quality of experience
QoS	quality of service
RBM	results-based management
RPM	regional preparatory meeting
SADC	Southern African Development Community
SDG	Sustainable Development Goal
SIDS	small island developing State

SUDACAD	Sudatel Telecommunications Academy, Sudan
SUTEL	Superintendency of Telecommunications, Costa Rica
TDAG	Telecommunication Development Advisory Group
TRA	Telecommunications Regulatory Authority, United Arab Emirates
UMA	Arab Maghreb Union
UNCTAD	United Nations Conference on Trade and Development
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNIDO	United Nations Industrial Development Organization
VSAT	very small aperture terminal
WCAG	Web Content Accessibility Guidelines
WHO	World Health Organization
WMO	World Meteorological Organization
WSIS	World Summit on the Information Society
WTDC	World Telecommunication Development Conference

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