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**Chairman of the Council Working Group for the elaboration of the  
Strategic Plan and the Financial Plan for the Union 2016-2019**

ANNEX 1 TO RESOLUTION 71:

BACKGROUND ON THE STRATEGIC PLAN FOR THE UNION FOR 2016-2019

# Annex 1 to Resolution 71:

## Background on the Strategic Plan

This background information document includes an introduction to the International Telecommunications Union (ITU), its role as a Specialized United Nations (UN) Agency, and the role and mission of the ITU Sectors and governing bodies, as presented in Section 1.

The general assessment presented in Section 2, provides lessons learnt from the implementation of the Strategic Plan for 2012-2015, and sets out main broad trends shaping the telecommunication / Information and Communication Technology (ICT) environment/sector as relevant for the Strategic Plan 2016-2019.

Section 3 introduces Sector-specific situational analyses presenting the role and future of each of the ITU Sectors.

### 1 Introduction

In accordance with the purposes of ITU, as defined in the Convention and Constitution (Article 1, §1-2), ITU is committed to connecting the world. In order to achieve this, ITU works to ensure that the global communications infrastructure runs smoothly and efficiently to enable everybody to access the benefits of telecommunication/ICTs and assist in mitigating new risks. ITU oversees international spectrum allocation and satellite coordination; works to develop and gain consensus on new telecommunication/ICT standards; and carries out policy analysis and work on the development of an enabling environment as well as provides technical assistance to its Member States.

ITU's work, as determined and guided by its Member States and Sector Members, covers a broad range of issues: from the underlying standards for broadband to spectrum allocation; from basic access technologies to high-speed mobile broadband; from submarine cables to terrestrial optical fibre; from microwave links to satellites; from accessibility to e-health; and from gender empowerment to interoperability. The work accomplished in ITU in collaboration with governments, the private sector, academia and civil society helps ensure ubiquitous and efficient radio, telephone, television and Internet connectivity.

#### 1.1 ITU as a part of the United Nations system: contributing to a transformative post-2015 development agenda

As the MDG deadline approaches, and the UN Post-2015 Development Agenda and Sustainable Development Goals (SDGs) processes are well under way, UN Member States are engaged in the formulation of a single development framework embodying one coherent set of goals, which integrates in a balanced manner the three dimensions of sustainable development identified by the Rio+20 process (social development; economic development; and environmental protection).

Telecommunications/ICTs, including broadband, are essential in accelerating progress towards sustainable development. Such technologies are a key foundation for any development policy and a major enabling tool of any development plan at the national, regional and/or global levels.<sup>1</sup>

Since 2003, the World Summit on Information Society (WSIS) process has been an important instrument to drive global telecommunication/ICT development in support of the global development agenda. As part of its strategy to connect the world, ITU is striving to ensure that

<sup>1</sup> Broadband Commission (2013): The State of Broadband 2013: Universalizing Broadband

telecommunication/ICTs continue to receive the recognition they deserve in the international community and UN's new approach to ensuring sustainable and equitable development.

As part of the UN efforts, ITU is also committed to mainstreaming UN priorities in its strategic planning and work, in such areas as gender equality, youth, persons with disabilities, rural populations, older persons and disaster risk reduction, among others. The UN system has also been engaged in a reform process which, *inter alia*, requires business practices to be harmonized, in particular applying the results-based management (RBM) methodology. ITU's strategy takes into account these global priority efforts and reforms.

## **1.2 Governing bodies / Role of Sectors**

The Union comprises: a) the Plenipotentiary Conference, which is the supreme organ of the Union; b) the Council, which acts on behalf of the Plenipotentiary Conference; c) World Conferences on telecommunications; d) the Radiocommunication Sector (ITU-R), including world and regional radiocommunication conferences, radiocommunication assemblies and the Radio Regulations Board; e) the Telecommunication Standardization Sector (ITU-T), including world telecommunication standardization assemblies; f) the Telecommunication Development Sector (ITU-D), including world and regional telecommunication development conferences; and g) the General Secretariat. The three Bureaus (the Radiocommunication Bureau or BR; the Telecommunication Standardization Bureau or TSB; and the Telecommunication Development Bureau or BDT) serve as the Secretariat to each respective individual Sector.

### **1.2.1 ITU governing bodies**

#### **1.2.1.1 The Plenipotentiary Conference**

The ITU is governed by the Plenipotentiary Conference. The Plenipotentiary Conference is the supreme organ of the Union. It is the decision-making body which determines the direction of the Union and its activities.

#### **1.2.1.2 The Council**

The Council acts as the Union's governing body in the interval between Plenipotentiary Conferences. The Council takes all steps to facilitate the implementation of the provisions of the ITU Constitution, the ITU Convention, the Administrative Regulations (International Telecommunications Regulations and Radio Regulations), and the decisions of Plenipotentiary Conferences and; where appropriate, the decisions of other conferences and meetings of the Union. ITU Council also acts on the policy and strategic planning of the ITU and is responsible for ensuring the smooth day-to-day running of the Union, coordinating work programmes, approving budgets and controlling finances and expenditure. Its role is to consider broad telecommunication policy issues to ensure that the Union's activities, policies and strategies fully respond to today's dynamic, rapidly changing telecommunication/ICT environment/sector.

### **1.2.2 The role and missions of the ITU Sectors**

#### **1.2.2.1 The ITU Radiocommunication Sector (ITU-R)**

The ITU Radiocommunication Sector (ITU-R) plays a vital role in the global management of the radio-frequency spectrum and satellite orbits - limited natural resources which are increasingly in demand from a large and growing number of services such as fixed, mobile, broadcasting, amateur, space research, emergency telecommunications, meteorology, global positioning systems, environmental monitoring and communication services that ensure safety of life on land, at sea and in the skies.

The mission of ITU-R is to ensure the rational, equitable, efficient and economical use of the radio-frequency spectrum by all radiocommunication services, including those using satellite orbits, and to carry out studies and approve Recommendations on radiocommunication matters.

### *World Radiocommunication Conferences (WRC)*

World Radiocommunication Conferences (WRC) are held every three to four years. It is the mandate of WRC to review and, if necessary, revise the Radio Regulations, the international treaty governing the use of the radio-frequency spectrum and geostationary-satellite and non-geostationary-satellite orbits. Revisions are made on the basis of an agenda determined by the ITU Council, which takes into account recommendations made by previous world radiocommunication conferences.

### *Radiocommunication Assemblies (RA)*

Radiocommunication Assemblies (RA) are responsible for the structure, programme and approval of radiocommunication studies. The Assemblies:

- assign conference preparatory work and other questions to the Study Groups;
- respond to other requests from ITU conferences;
- suggest suitable topics for the agenda of future WRCs;
- approve and issue ITU-R Recommendations and ITU-R Questions developed by the Study Groups;
- set the programme for Study Groups, and disband or establish Study Groups according to need.

### *Radio Regulations Board (RRB)*

The twelve members of the Radio Regulations Board (RRB) are elected at the Plenipotentiary Conference. They perform their duties independently and on a part-time basis. The Board:

- approves Rules of Procedure, used by the Radiocommunication Bureau in applying the provisions of the Radio Regulations and registering frequency assignments made by the Member States;
- addresses matters referred by the Bureau which cannot be resolved through application of the Radio Regulations and Rules of Procedure;
- considers reports of unresolved interference investigations carried out by the Bureau at the request of one or more administrations and formulates Recommendations;
- provides advice to Radiocommunication Conferences and Radiocommunication Assemblies;
- considers appeals against decisions made by the Radiocommunication Bureau regarding frequency assignments;
- performs any additional duties prescribed by a competent conference or by the Council.

### *ITU-R Study Groups*

The ITU-R Study Groups, including the Special Committee, develop the technical, operational, regulatory and procedural bases for decisions taken by World Radiocommunication Conferences. These bases are consolidated by the Conference Preparatory Meeting (CPM). The ITU-R Study Groups also develop international standards (Recommendations), Reports, Opinions and Handbooks on radiocommunication matters.

### *Radiocommunication Advisory Group (RAG)*

According to Art 11A of the Convention, the RAG “shall: 1) review priorities, programmes, operations, financial matters and strategies related to radiocommunication assemblies, study groups and other groups and the preparation of radiocommunication conferences, and any specific matters as directed by a conference of the Union, a radiocommunication assembly or the Council; 1bis) review the implementation of the operational plan of the preceding period in order to identify areas in which the Bureau has not achieved or was not able to achieve the objectives laid down in that plan, and advise the Director on the necessary corrective measures; 2) review progress in the implementation of the programme of work [...]; 3) provide guidelines for the work of study groups;

4) recommend measures, inter alia, to foster cooperation and coordination with other standards bodies, with the Telecommunication Standardization Sector, the Telecommunication Development Sector and the General Secretariat; [...] 6) prepare a report for the Director of the Radiocommunication Bureau indicating action in respect of the above items; 7) prepare a report for the Radiocommunication Assembly on the matters assigned to it in accordance with No.137A of this Convention and transmit it to the Director for submission to the assembly [...].”

### **1.2.2.2 The ITU Telecommunication Standardization Sector (ITU-T)**

The mission of the ITU Telecommunication Standardization Sector (ITU-T) is to provide a unique forum for industry and government to work together to foster the development and use of interoperable, non-discriminatory and demand-driven international standards. These standards are based on openness and take into account needs of users, in order to create an environment where users can access affordable services worldwide regardless of underlying technology, particularly in developing countries, while establishing links between the activities of ITU-T and the relevant WSIS outcomes.

#### *World Telecommunication Standardization Assembly*

The World Telecommunication Standardization Assembly (WTSA) sets the overall direction and structure for ITU-T. It meets every four years and defines the general policy for the Sector, establishes study groups, approves their expected work programme for the next four-year period, and appoints their chairmen and vice-chairmen.

#### *Telecommunication Standardization Advisory Group (TSAG)*

According to Article 14A of the Convention, TSAG “shall 1) review ITU-T priorities, programmes, operations, financial matters and strategies for activities in the Telecommunication Standardization Sector; 1bis) review the implementation of the operational plan [...]; 2) review progress in the implementation of the programme of work [...]; 3) provide guidelines for the work of study groups; 4) recommend measures, inter alia, to foster cooperation and coordination with other relevant bodies, with the Radiocommunication Sector, the Telecommunication Development Sector and the General Secretariat; [...] 6) prepare a report for the Director of the Telecommunication Standardization Bureau indicating action in respect of the above items; 7) prepare a report for the world telecommunication standardization assembly on the matters assigned to it [...].”

#### *The ITU-T Study Groups*

ITU-T’s Study Groups assemble experts from around the world to develop international standards known as ITU-T Recommendations, which act as defining elements in the global infrastructure of telecommunication/ICTs. They enable global communications by ensuring that countries’ telecommunication/ICT networks and devices are interoperable.

### **1.2.2.3 The ITU Telecommunication Development Sector (ITU-D)**

The core mission of the Telecommunication Development Sector (ITU-D) is to foster international cooperation and solidarity in the delivery of technical assistance and in the creation, development and improvement of telecommunication/ICT equipment and networks in developing countries. ITU-D is required to discharge the Union’s dual responsibility as a UN specialized agency and also as an executing agency for implementing projects under the UN development system or other funding arrangements, so as to facilitate and enhance telecommunication/ICT development by offering, organizing and coordinating technical cooperation and assistance activities.

### *World Telecommunication Development Conferences*

The World Telecommunication Development Conference (WTDC) sets the agenda and guidelines for the ITU-D Sector for the following four-year cycle, while Regional Conferences review “work-in-progress” towards the overall objectives and ensure that goals are met. The Telecommunication Development Conferences serve as forums for the discussion of the digital divide, telecommunications and development by all stakeholders involved in and concerned with ITU-D’s work. In addition, they review the numerous programmes and projects of the Sector and Telecommunication Development Bureau (BDT). Results are reported and new projects are launched.

Each Regional Preparatory Meeting brings together the countries in its region to explore and discuss their needs and the present and future projects of the Sector.

### *Telecommunication Development Advisory Group (TDAG)*

According to Article 17A of the Convention, the TDAG “shall: 1) review priorities, programmes, operations, financial matters and strategies for activities in the Telecommunication Development Sector; 1bis) review the implementation of the operational plan of the preceding period in order to identify areas in which the Bureau has not achieved or was not able to achieve the objectives laid down in that plan, and advise the Director on the necessary corrective measures; 2) review progress in the implementation of the programme of work [...]; 3) provide guidelines for the work of study groups; 4) recommend measures, inter alia, to foster cooperation and coordination with the Radiocommunication Sector, the Telecommunication Standardization Sector and the General Secretariat, as well as with other relevant development and financial institutions; [...] 6) prepare a report for the Director of the Telecommunication Development Bureau indicating action in respect of the above items; 6bis) prepare a report for the world telecommunication development conference on the matters assigned to it in accordance with No.213A of this Convention and transmit it to the Director for submission to the conference [...]”

### *ITU-D Study Groups*

In support of the knowledge-sharing and capacity-building agenda of the BDT, the ITU-D study groups study and analyze specific task-oriented telecommunication/ICT questions of priority to developing countries. ITU-D has two Study Groups, providing a neutral forum for governments, industry and academia to address priority issues for the telecommunication/ICT Sector: Study Group 1 addresses issues related to the enabling environment, cybersecurity, ICT applications and Internet-related issues; Study Group 2 addresses issues related to information and communication infrastructure and technology development, emergency telecommunications and climate change adaptation.

#### **1.2.2.4 Intersectoral activities**

Plenipotentiary Resolutions and Decisions of the Council foresee other intersectoral events, fora and conferences, in accordance with the mandate of the Union.

### *World Conference on International Telecommunications*

A world conference on international telecommunications may partially or in exceptional cases, completely revise the International Telecommunication Regulations and may deal with any question of a worldwide character within its competence and related to its agenda.

## 2 General assessment

The general assessment briefly reviews the implementation of the 2012-2015 Strategic Plan of the Union and identifies main trends and challenges of the telecommunication/ICT environment/sector that will influence and shape ITU's work in future. It specifically recognizes that:

1. Telecommunications/ICTs are growing strongly, and becoming more widely available and pervasive.
2. As telecommunications/ICTs become more widespread, the challenges of inequalities and exclusion are becoming greater – special attention must be given to bridging the digital divide and ensuring inclusion.
3. New risks and challenges emerge with increasing growth and use of telecommunications /ICTs.
4. Convergence is occurring on different levels, breaking down silos between different technological sectors. Technologies are evolving rapidly, with accelerating rates of innovation, while becoming more pervasive. Telecommunication/ICT environment/sector is becoming increasingly complex. The evolution and convergence of telecommunication/ICTs will also impact the changing telecommunication/ICT environment/sector.

### 2.1 Brief review of the implementation of Strategic Plan for the Union for 2012-2015

The ITU Strategic Plan for 2012-2015 was adopted in 2010 by the Plenipotentiary Conference in Guadalajara (Mexico). It is structured with a view, *inter alia*, to facilitating implementation of the results-based management (RBM) methodology and linking the strategic goals to ITU's core activities.

The strategic plan for 2012-2015 has allowed ITU to progress towards fulfilling its mission and achieving its goals. A comprehensive overview of its results from 2011<sup>2</sup> to 2014 can be found in the "Report on the Implementation of the Strategic Plan and on the Activities of the Union 2011-2014" (Doc PP14/20).

#### *Lessons learned*

On the basis of analysis of the implementation of the current strategic plan and a thorough review of the practices of other UN organizations, key needed adjustments to the Strategic Plan for 2016-2019 have been identified, as follows:

- **One vision, mission and set of core values:** The common vision and mission of the Union, and the core values that drive priorities and guide decision-making processes, shall be defined and stated up front in the strategic plan.
- **Strong results-based framework:** Strategic planning and operational planning shall follow the same results-based framework, but in a different level of detail. To drill down the principles of RBM, the components of the ITU results-based framework shall include:
  - **ITU strategic goals and targets:** there is a need to define Union-wide strategic goals, to which the three Sectors, the corresponding Bureaux and the General Secretariat all contribute. Global telecommunication/ICT targets may serve as the indicators of achievement at the level of strategic goals, providing baselines and targets for the period of the strategic plan.

<sup>2</sup> ITU management decided to put the strategic plan for 2012-2015 into place as from 2011, by starting to evaluate and report the activities of the Union according to the structure of the new plan.



- **Objectives/outcomes:** The Sector and intersectoral objectives/outcomes shall be set in order to achieve the strategic goals of the Union.
- **Outputs** and corresponding **activities:** Final products or services delivered by ITU and the corresponding activities that need to be undertaken to produce them shall be defined within the operational planning process. This will ensure proper alignment with the ITU strategic goals and objectives/outcomes and will allow for any corrective actions during the four-year period of the strategic plan, permitting proper adjustments required by the rapidly changing telecommunication/ICT environment/sector.
- **Clear Implementation criteria:** appropriate criteria shall be defined to strengthen the linkage between strategic and operational planning, and provide the criteria for prioritizing among different activities of the Union
- Strengthening **RBM methodology:** In order to further improve monitoring of the implementation of the strategic plan and allow for any corrective actions during the four-year period, a comprehensive ITU results framework shall be developed, and shall be supported by the enhancement of the following frameworks:
  - **Performance-management framework:** The performance-management framework shall serve to evaluate not only performance with respect to ITU's activities, but also progress towards achievement of the strategic goals by meeting the global telecommunication/ICT targets.
  - **Risk-management framework:** The risk-management framework shall serve to identify, analyse, evaluate and address risks that might have an impact on the performance of the Union in pursuit of its goals and objectives. Risk-mitigation measures defined within the framework shall be considered, planned and implemented via the operational planning process.

## 2.2 The telecommunication/ICT environment/sector

Telecommunications/ICTs are transforming virtually every facet of modern life – in work, business, social and cultural life, and entertainment. According to ITU estimates, there were 6.8 billion mobile-cellular subscriptions by the end of 2013 or almost as many as there were people on the planet, giving a mobile-cellular penetration rate of 96 per cent. There were close to five billion people with access to television, and 2.4 billion Internet users by the end of 2013. New telecommunication/ICTs continue to penetrate countries in all regions of the world, as more and more people get connected.

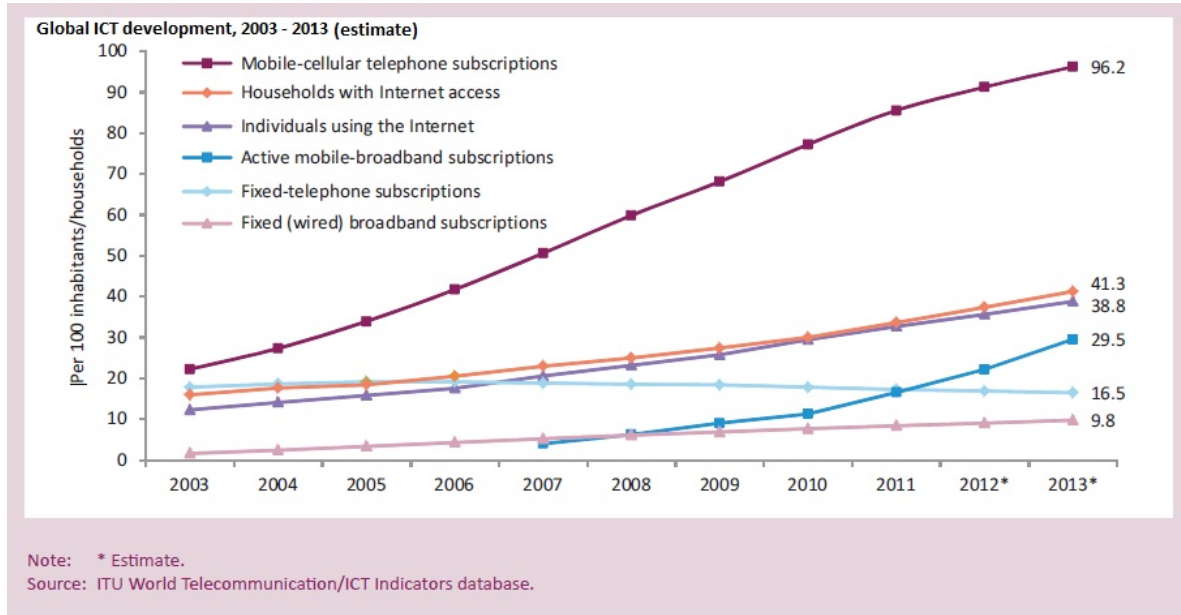
### 2.2.1 Growth in and evolution of telecommunications/ICTs

Telecommunications/ICTs are evolving rapidly, and have become more widespread and pervasive. Figure 1 shows global telecommunication/ICT development, i.e. increase in levels of access for different types of telecommunication/ICTs, over the last decade. They have become critical infrastructure, supporting not only communications for citizens and organizations, but also other integral services, such as power supply, healthcare and financial services.

The uptake of both fixed (wired)-broadband and, in particular, mobile-broadband services has continued to grow worldwide. Currently, there are three times as many mobile-broadband as fixed-broadband subscriptions (2.1 billion, as against 700 million). Indeed, mobile broadband is the telecommunication/ICT service displaying the sharpest growth rates globally (Figure 1 below), and is contributing to changes in telecommunication/ICT use and uptake and in the type of services that the industry is providing.



Figure 1. Global telecommunication/ICT development 2003-2013



These rapid growth rates will continue and accelerate in the future. For example, Ericsson predicts that the number of smartphone subscriptions is expected to exceed 4 billion by 2018, while mobile broadband subscriptions are projected to reach 7 billion subscriptions in 2018.<sup>3</sup> Other analysts project that, globally, 4G subscriptions will grow tenfold over five years, from 88 million in 2012 to 864 million in 2017.<sup>4</sup>

As a result of the growth in users, traffic and applications, overall revenues in the telecommunication/ICT sector are expected to continue to rise, but new industry participants seem poised to take an increasing share. Total revenues from traditional telecommunication operators are likely to grow, even though they may lose up to 6.9 per cent in cumulative voice revenues (representing USD 479 billion) to Over-the-Top (OTT) VoIP services by 2020.<sup>5</sup> In another closely related area, the cloud computing market was worth USD 18 billion in 2011, and was estimated to reach USD 32 billion by 2013,<sup>6</sup> driven by big data stored in the cloud now accounting for two-thirds of data centre traffic worldwide.<sup>7</sup>

Annual global IP traffic is expected to surpass the zettabyte threshold (1.4 zettabytes) by the end of 2017, driven by the diversification of pay-TV and video streaming services, and other media-rich content.<sup>8</sup> More than 4 billion hours of video are watched on YouTube each month, 30 billion pieces of content are shared on Facebook every month, and some 400 million tweets are sent per day by about 200 million monthly active users.<sup>9</sup>

The Internet of Things (IoT) is rapidly becoming a reality, and machine-to-machine (M2M) communications are expected to grow significantly in the near future. By 2017, televisions, tablets, smartphones and business Internet M2M modules will register growth rates of 42 per cent, 116 per

<sup>3</sup> Ericsson Traffic Mobility Report

<sup>4</sup> Pyramid Research quarterly mobile data forecast, February 2013

<sup>5</sup> Emeka Obiodu and Jeremy Green (2012): The Future of Voice, OVUM

<sup>6</sup> Saul Berman, Lynn Kesterson-Townes, Anthony Marshall and Robini Srivathsa (2012): The power of Cloud: Driving business model innovation. IBM Global Business Services

<sup>7</sup> ITU and CISCO Visual networking index (VNI)

<sup>8</sup> Cisco Visual Networking Index: Forecast and Methodology, 2011-2016

<sup>9</sup> Sources: McKinsey Global Institute, Twitter, Cisco, Gartner, EMC, SAS, IBM, MEPEEC, QAS

cent, 119 per cent and 86 per cent, respectively. Traffic from wireless devices will already exceed traffic from wired devices by 2014.<sup>10</sup>

The term of “big data” is used to define high-volume, -velocity and -variety information assets that demand cost-effective, innovative forms of information processing for enhanced insight and decision making<sup>11</sup>. It is estimated that 40 Zettabytes of data will be created by 2020, an increase of 300 times from 2005. It is estimated that currently, 2.5 Quintillion bytes of data are created each day. Most companies in the U.S. have at least 100 Terabytes of data stored. Depending on the industry and the organization, big data encompasses information from multiple internal and external sources such as transactions, social media, enterprise content, sensors and mobile devices. As of 2011, the global size of data in healthcare was estimated to be 150 Exabytes, and in 2014, it’s anticipated that there are 420 million wearable, wireless health monitors.<sup>12</sup>

Telecommunications/ICTs increasingly contribute to social and economic development by enabling access to and the exchange of information and services anywhere and anytime, as well as rapid processing and vast storage of such information, making provision of public and private services more effective, efficient, accessible and affordable. Telecommunication/ICTs are also expanding access to markets, improving disaster management and facilitating democratic participation in governance processes. Telecommunication/ICTs provide more cost-efficient and effective ways to preserve and promote local culture. They are bringing down the costs of economic and social activities (for example by replacing transport and postal services), and opening up entirely new business opportunities (such as cloud-based services, mobile applications and services, business process outsourcing and content-related businesses).

In the modern world, telecommunications/ICTs, and broadband networks and services in particular, are vital to countries’ economic growth (Box 1) and national competitiveness in the global digital economy. Telecommunication/ICT and broadband networks support rapid and efficient communications across different countries and continents. Not only that, but telecommunication/ICT products and services are part of the higher-value high-tech sector in their own right – the sector which is growing fastest in terms of international trade<sup>13</sup>, and which can sustain even faster growth in incomes. Telecommunication/ICTs are today an economic sector in their own right, as well as enablers leveraging technological competitiveness across other sectors. Broadband is essential for generating new skills and fuelling economic growth and technological change throughout the economy – from agriculture to finance, education, healthcare and modern services.

#### **Box 1: The contribution of telecommunication/ICTs to national development**

Widely cited research from the World Bank<sup>14</sup> shows that ICTs, and in particular fast access to the Internet, accelerate economic growth, especially in less developed countries. Examples of the impact of utilization of telecommunication/ICTs include:

- It is estimated that by 2025, ICTs could have a global economic impact of the order of trillions of USD<sup>15</sup>. The annual economic benefit of the mobile Internet will be between USD 3.7 trillion and USD 10.8 trillion globally by 2025. Bringing broadband penetration levels in emerging markets up to

<sup>10</sup> Cisco Visual Networking Index: Forecast and Methodology, 2011-2016

<sup>11</sup> Definition by Gartner

<sup>12</sup> Sources: McKinsey Global Institute, Twitter, Cisco, Gartner, EMC, SAS, IBM, MEPTec, QAS

<sup>13</sup> World Trade Organization (2013): World Trade Report 2013

<sup>14</sup> Qiang (2009), as referred to in World Bank (2009): Information and Communications for Development 2009

<sup>15</sup> McKinsey Global Institute (2013): “Disruptive technologies: Advances that will transform life, business, and the global economy”

today's Western European levels could potentially add USD 300 - 420 billion in GDP and generate 10 - 14 million jobs.<sup>16</sup>

- A report by the Broadband Commission<sup>17</sup> forecasts that health applications available via mobile broadband will reduce costs, e.g. by allowing physicians to provide care remotely via remote monitoring and diagnosis, or by supporting preventive care. It is estimated that mobile health could save developed countries USD 400 billion in 2017 and save a million lives over five years in Sub-Saharan Africa.<sup>18</sup>
- It is estimated that 2.5 billion individuals are unbanked worldwide. ICT financial services represent an opportunity for many nations to achieve financial inclusion of the poor.
- Small- and medium-sized enterprises (SMEs) which spend more than 30 per cent of their budget on web technologies grow their revenue nine times as fast as SMEs spending less than 10 per cent.<sup>19</sup>
- ICT solutions represent one of the most innovative and high-potential means of tackling environmental challenges. The ICT sector has been estimated to contribute 2-2.5 per cent of GHG emissions. However, at the same time the smart use of ICTs can reduce greenhouse gas (GHG) emissions by up to 25 per cent.<sup>20</sup>

Source: Various

## 2.2.2 Inequality and Digital Exclusion

### 2.2.2.1 The digital divide

Despite this rapid growth in access to and use of telecommunication/ICTs, around 4.4 billion people still do not have regular access to the Internet - nearly two-thirds of the world population. Furthermore, 92 per cent of the population of the 49 UN-designated least developed countries (LDCs) (which are home to some 890 million people) are still unable to access the world's biggest and most valuable library and marketplace on a regular basis. With 53 per cent of the population in developing countries living in rural areas, the infrastructure challenge to connect all of these people to high-speed Internet is enormous.

Even more importantly, telecommunication/ICT networks and ICT skills are the foundations on which tomorrow's digital economy will be built. Two-thirds of the global population are therefore currently unable to access or develop the digital skills, which shall determine future national competitiveness. Box 2 shows the significance of the gap between the developed and developing world.

<sup>16</sup> *Ibid*

<sup>17</sup> Broadband Commission (2013): The State of Broadband 2013: Universalizing Broadband

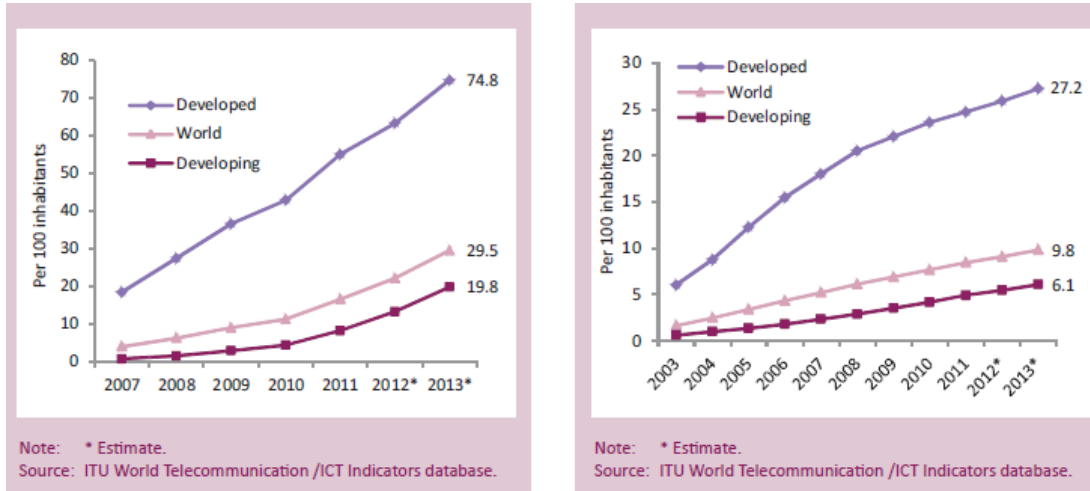
<sup>18</sup> GSMA/PwC (2012): Touching Lives through Mobile Health: Assessment of the Global Market Opportunity

<sup>19</sup> McKinsey & Company (2009): Mobile broadband for the masses

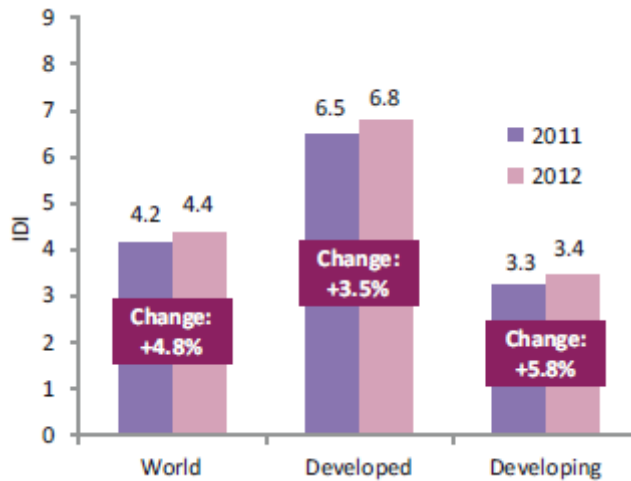
<sup>20</sup> The Broadband Commission (2012): The Broadband Bridge: Linking ICT with Climate Action for a Low-Carbon Economy

**Box 2: Tracking the Digital Divide with the ICT Development Index**

*Box Figure 1: The digital divide: Active mobile-broadband (left graph) and fixed (wired)-broadband subscriptions (right graph)*



*Box Figure 2: IDI, world and by level of development*



The ITU ICT Development Index (IDI) is a useful tool for comparing differences in the telecommunication/ICT development since, as a composite index, it consolidates several telecommunication/ICT indicators into one single value. An analysis of the IDI points to a significant divide between the developed and developing world. In 2012, the average developed-country IDI value was exactly twice as high as the developing-country average. At the same time, the developing-country average IDI value is growing faster, at a rate of 5.8 per cent, as against 3.5 per cent for developed countries. While developed countries are starting to reach saturation levels, in particular in terms of mobile-cellular subscriptions and household telecommunication/ICT access, developing countries, where penetration levels remain much lower, have ample potential for growth.

Source: ITU Measuring the Information Society Report 2013

**2.2.2.2 The gender digital divide**

Women in many countries suffer from a “gender gap” in regard to telecommunication/ICTs – lacking access to related skills, education, technology, networks and capital. A woman in the developing world is 21 per cent less likely to own a mobile phone than her male counterpart.<sup>21</sup> In the developing

<sup>21</sup> GSMA/Cherie Blair Foundation for Women (2010)

world, 16 per cent fewer women than men use the Internet (as against only 2 per cent in the developed world), suggesting that, in many countries, women are coming online more slowly and later than men. This has serious implications for the ability of women to use the Internet to access information and develop the vital telecommunication/ICT skills needed to participate and work in today's digital economy.

Closing the gender gap would bring the benefits of wireless to an additional 300 million women,<sup>22</sup> enabling them to fully participate in the economy and unlock their potential. 1.3 billion Internet users are women (37 per cent of all women worldwide) and 1.5 billion are men (41 per cent of all men), i.e. the current global Internet gender gap is about 200 million fewer women online.<sup>23</sup> Without action, the global Internet gender gap would be about 350 million in three years' time. Bringing women online is beneficial to the society overall – e.g., bringing 600 million additional women and girls online could raise GDP by up to USD 13-18 billion.<sup>24</sup>

### **2.2.2.3 Telecommunications/ICTs and persons with disabilities**

There are around 1 billion persons with disabilities in the world (or some 15 per cent of the global population), 80 per cent of whom live in developing countries. This important group of people still faces significant barriers that limit their social and economic inclusion. While telecommunication/ICTs have become a fundamental technology to support the independent living of persons with disabilities, important challenges still need to be addressed, namely: (a) bringing down the high cost of assistive technologies (including the cost of the technology, as well as the cost of assessment, training and support services); (b) lack of access to telecommunication/ICTs for persons with disabilities, as well as the lack of policies which would foster widespread availability of such technologies; and (c) limited availability and use of telecommunication/ICTs in general.<sup>25</sup>

## **2.2.3 Risks and challenges accompanying the growth of telecommunications/ICTs**

The growing role of telecommunication/ICTs holds great promise, but the development of the environment has spawned some “collateral” issues. Breakthroughs in communications bring tremendous benefits, but also create new risks.

### **2.2.3.1 Building confidence and security in the use of telecommunications/ICTs**

With the increasing volume of e-commerce and online financial transactions, the availability of government services, and the popularity of collaborative and social networks, building confidence and maintaining trust in the use of telecommunications/ICTs will continue to be a major challenge. As telecommunications/ICTs continue to be further integrated into the economy and our societies, their continuous availability, reliability and security will be increasingly vital to governments, businesses and individuals. Promoting cybersecurity and international cooperation and coordination in this domain remains a key priority.

The cost of global cyber-criminal activity is estimated at up to \$1 trillion,<sup>26</sup> a figure that could triple by 2020 unless companies step up their defences.<sup>27</sup> Proliferation of threats continue to rise – for

<sup>22</sup> Broadband Commission (2013): The State of Broadband 2013: Universalizing Broadband

<sup>23</sup> ITU (2013): ICT Facts and Figures

<sup>24</sup> Intel, “Women and the Web” report, January 2013

<sup>25</sup> Synthesis report of the ICT Consultation in support of the High-Level Meeting on Disability and Development of the sixty-eighth session of the UN General Assembly (2013): The ICT Opportunity for a Disability-inclusive Development framework

<sup>26</sup> McAfee, Center for Strategic and International Studies (2013): The economic impact of cybercrime and cyber espionage, July 2013

<sup>27</sup> World Economic Forum in collaboration with McKinsey & Company: Risk and Responsibility in a Hyperconnected World, January 2014

example, new malware is being discovered every day, hundreds of times more frequently than in the past decade. No fewer than 6.5 million new malwares have been discovered in 2013.<sup>28</sup>

Some 69 per cent of the executives interviewed by the World Economic Forum<sup>29</sup> feared that cyber attackers would remain more sophisticated and efficient than their companies' defence mechanisms. With a large multinational company expecting up to 10,000 cyber-attacks per day, nearly 40 per cent of firms surveyed thought their spending on defences was "significantly too little".

Currently, there is a shift from standard forms of cyber-attacks and related crimes to more sophisticated ones, exploiting new technological paradigms (e.g. cloud, big and open data, web 2.0, social networks, etc.). Yet countries are still trying to curb the current threats, and therefore will have difficulties in trying to catch up with the rapid evolution of the telecommunication/ICT environment/sector.

Future projections are difficult to acquire on account of the dynamic and fluid nature of cyberspace. However, it is clear that the growth and evolution of the telecommunication/ICT environment/sector is directly proportional to the growth and evolution of the risks and challenges related to its use. Therefore, cybersecurity — or rather building confidence and security in the use of telecommunication/ICTs — will remain at the top of the national, regional and international agendas.

### 2.2.3.2 Protection of most vulnerable

Young people all over the world are the most active users of telecommunication/ICTs. 30 per cent of the youth population are "digital natives" today (a term broadly used to characterise the young people with solid telecommunication/ICT experience who are drivers of the information society). ITU's "Measuring the Information Society 2013" report<sup>30</sup> shows that within the next five years, the digital native population in the developing world is expected to double. However, young people and children are also vulnerable to novel forms of risks presented by telecommunication/ICTs, especially when they are ill-prepared to meet these challenges and inadequately protected by legislation. Young people and especially children encounter a range of risks online, including child pornography, grooming, cyberbullying, exposure to harmful content and privacy violations.

A Consumer Reports magazine survey found that one million children were harassed, threatened or subjected to other forms of cyberbullying on Facebook in 2011.<sup>31</sup> Other statistics and studies are showing that 72 per cent of teens have a social networking profile. Nearly half (47 per cent)<sup>32</sup> have a public profile viewable by anyone, and only the 15 per cent<sup>33</sup> have checked the security and privacy settings on their social media account.

Recent initiatives on child online protection focus not only on combating and reducing risks, but also on empowering young people to participate actively in civic and social life online responsibly and ethically as digital citizens. A comprehensive protection and empowerment response requires a multi-stakeholder approach involving a diverse range of governmental and non-governmental actors.

<sup>28</sup> Symantec Intelligence Report: January 2013

<sup>29</sup> World Economic Forum in collaboration with McKinsey & Company: Risk and Responsibility in a Hyperconnected World, January 2014

<sup>30</sup> ITU (2013): Measuring the Information Society

<sup>31</sup> Consumer Reports Magazine survey June 2011

<sup>32</sup> Teen Online & Wireless Safety Survey: Cyberbullying, Sexting and Parental Controls. Cox Communications Teen Online and Wireless Safety Survey in Partnership with the National Center for Missing and Exploited Children, 2009

<sup>33</sup> National Cyber Security Alliance (NCSA)-MacAfee Online Safety Study, 2011



While significant investments have been made in North America, Europe and parts of Asia to understand children's online behaviour and implement strategies to protect children online, there are still many gaps in our knowledge of the vulnerabilities and needs of young online users in other parts of the world, especially in countries where Internet penetration remains low.

### **2.2.3.3 Telecommunications/ICTs and climate change**

Central to the climate-change issue is the continuing production of greenhouse gas (GHG) emissions as a by-product of industrial and commercial life. While the telecommunication/ICT industry is a key in addressing climate change, it also accounts for 2 to 2.5 per cent of global GHG emissions or 1 Gigatonne of carbon dioxide (CO<sub>2</sub>) annually. Experts estimate that personal computers and other end-user devices are responsible for around 40 per cent of the GHG emissions from ICT, while telecommunication networks and data centres generate 24 per cent and 23 per cent, respectively. This is supported by the SMART 2020 report<sup>34</sup>, which further suggests that the growth rate of GHG emissions from the telecommunication/ICT industry was 6.1 per cent from 2002 to 2011, although it is expected to slow to 3.8 per cent from 2011 to 2020. The International Energy Agency (IEA) indicates that consumption related to ICT is already more than 5 per cent of total final global electricity consumption and total ICT consumption could double by 2022 and be three times the 2010 rate by 2030.<sup>35</sup> In addition, United Nation University indicates that in 2013 alone, 67 million metric tons of electrical and electronic equipment have been put on the market and 53 million metric tons of e-waste has been disposed of worldwide.

### **2.2.4 Changing telecommunication/ICT environment/sector**

Fuelled by the evolution to all IP-based wired and wireless Next Generation Networks (NGNs), convergence is transforming the telecommunication/ICT sector and providing major opportunities, as well as challenges to industry operators, regulators and policy-makers alike, on both the national and international scale. Convergence is reshaping relations between previously disparate telecommunication and media platforms, enabling separate vertical services to be provided over unified horizontal platforms. As a result, previously siloed (service-specific) technology platforms are now supporting multiple voice, data and video services and applications. Convergence is blurring boundaries between previously separate service markets and giving rise to a need to review traditional policy and regulatory regimes, including reinforcing public safety issues. The boundaries between fixed and mobile, wireline and wireless are blurring, as telecommunication moves towards hybrid networks, where devices will be able to transfer seamlessly and smoothly from network to another, without any interruption in service.

New telecommunication/ICT developments such as the combination of mobile Internet and the Internet of Things (IoT) are heralded as some of the most disruptive technologies of the coming decade.<sup>36</sup> In fact, the advent of new digital devices, networks, services and applications represent a profound change that is reshaping major industries.

<sup>34</sup> SMART 2020: Enabling the low carbon economy in the information age

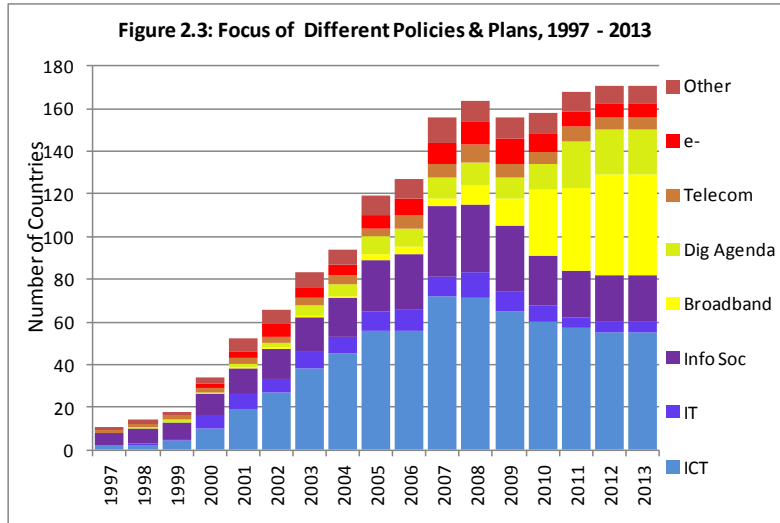
<sup>35</sup> International Energy Agency: Powering down to save energy need not be a turn-off, January 2013

<sup>36</sup> McKinsey Global Institute (2013): Disruptive technologies: Advances that will transform life, business, and the global economy



Countries are updating and adapting their policies to accommodate and reflect the changes in technologies and markets. As a consequence, national telecommunication/ICT policies are increasingly focusing on broader, cross-sectoral considerations<sup>37</sup> (Figure 2).

Figure 2. Evolution in Countries' telecommunication/ICT Policies over time, 1997-2013



Source: Broadband Commission (2013): Planning for Progress; Why National Broadband Plans Matter

Adopting appropriate regulatory tools to respond to new market behaviours and the growing need for consumer protection is becoming an increasingly complex proposition for regulators in today's converged environment. Such environment is becoming increasingly complex with multiple players operating in the same markets, but under different regimes: in the provision of voice services, for example, traditional telecommunication operators are not only competing with players in adjacent markets, such as Internet service providers (ISPs) and cable operators, but with players in the layers above, such as OTT content and application providers.

The nature of telecommunication/ICT as cross-sectoral and pervasive infrastructure means that telecommunication/ICT regulators are today forced to look beyond traditional models of regulation, which have historically consisted mainly of regulating access to networks and services, ensuring fair competition, protecting the interests of consumers and advancing universal access. More recently, electronic services, cybersecurity, data protection, privacy and environmental issues have entered into the purview of regulators.<sup>38</sup> The increased use of online applications and services to communicate and do business (such as social media, cloud services, e-payment and other m-banking services) brings a host of new regulatory issues to the fore.

In this highly dynamic digital environment, regulators need to consider whether they are sufficiently equipped to ensure appropriate operation of markets. They also need to identify if additional measures should be adopted to help ensure a level playing field among operators. In addition, where public funds are requested, clear policies should be adopted with regard to how these should be used.

<sup>37</sup> Examples include Chile's Digital Agenda 2004, Digital Czech Republic 2011, Estrategia Ecuador Digital 2.0 in 2011, France's Digital Plan 2010, Digital Gabon 2011, Greece's Digital Strategy 2006, Hungary's Digital Renewal Action Plan 2010, Italy's *Italia Digitale* plan 2010, Mexico's Digital Agenda 2011, Oman's Digital Strategy, United Kingdom 2005, Uruguay Digital Agenda 2008-2010

<sup>38</sup> ITU (2012): Trends in telecommunication reform 2012: Smart regulation in a broadband world

To adapt to the changing telecommunication/ICT environment/sector, some governments have continued the move towards reform of their institutional and organizational structures by considering merging multiple, separate regulatory authorities, covering different areas of telecommunications and broadcasting, into converged communication/ICT authorities.<sup>39</sup>

As many of the services carried over telecommunication/ICT networks are today transnational and borderless in nature, strengthening cross-border, regional and international cooperation will remain key in ensuring that all citizens of the world can benefit from affordable, secure and safe access anytime, anywhere.

Reviewing existing telecommunication/ICT policy and regulatory frameworks to adapt to the fast-changing digital environment is an ongoing process that requires coordination with multiple stakeholders so as to develop forward-looking approaches to attract and secure the huge and sustained investment in networks which is still needed.

Various international organizations, non-governmental organizations, civil society, multinational companies, academia and foundations, are taking a role in this increasingly complex telecommunication/ICT environment/sector. For example, the World Bank Group's new ICT Strategy aims at helping developing countries use telecommunication/ICT to transform delivery of basic services, drive innovations and productivity gains, and improve competitiveness.<sup>40</sup> Other emerging initiatives, such as public-private and multi-stakeholder partnerships can potentially significantly contribute to the changing telecommunication/ICT environment/sector. Therefore collaboration among various established and new players will be important for the future of the telecommunication/ICT environment/sector.

### 3 Situational analysis of ITU Sectors

#### 3.1 Situational analysis of ITU-R Sector

The biggest challenge for ITU-R is to remain abreast of the rapid and complex changes occurring in the world of international radiocommunications, coupled with a timely response to the needs of the radiocommunication and broadcasting industry in particular and to the membership as a whole. In an environment undergoing constant change and with ever greater demands from its members for products and services, the Sector should ensure that it remains as adaptable and responsive as possible to meet these challenges.

Pursuant to Article 1 of the ITU Constitution, ITU-R is committed to building an enabling environment through management of the international radio-frequency spectrum and satellite-orbit resources. Since the global management of frequencies and orbit resources requires a high level of international cooperation, one of the principal tasks in ITU-R is to facilitate the complex intergovernmental negotiations needed to develop legally binding agreements between sovereign states. These agreements are embodied in the Radio Regulations and in world and regional plans adopted for different space and terrestrial services.

The field of radiocommunications addresses terrestrial and space services that are critical and increasingly important for the development of the global economy in the twenty-first century. The world is witnessing a phenomenal increase in the use of wireless systems in a myriad of applications. International radiocommunication standards (such as those contained in ITU-R Recommendations)

<sup>39</sup> ITU (2013): Regulation and consumer protection in a converging environment

<sup>40</sup> The World Bank Group (2012): ICT for Greater Development Impact, Sector Strategy

underpin the entire global communications framework – and will continue to serve as the platform for a whole range of new wireless applications.

The domain of radiocommunications also includes aeronautical telemetry and telecommand systems, satellite services, mobile communications, maritime distress and safety signals, digital broadcasting, satellites for meteorology, and the prediction and detection of natural disasters.

In line with Radio Regulations, the recording of space and terrestrial notices and their associated publications are central to ITU-R's mission.

The need for continuing development of radiocommunication systems used in disaster mitigation and relief operations has increased and will be a key challenge for the future. Telecommunications are critical at all phases of disaster management. Aspects of emergency radiocommunication services associated with disasters include, inter alia, disaster prediction, detection, alerting and relief.

In the area of climate change, the work of ITU-R focuses on the use of telecommunication/ICT (different radio and telecommunication technologies and equipment) for weather and climate-change monitoring and for prediction, detection and mitigation of hurricanes, typhoons, thunderstorms, earthquakes, tsunamis, man-made disasters, etc.

Stakeholders, such as government agencies, public and private telecommunication operators, manufacturers, scientific or industrial bodies, international organizations, consultancies, universities, technical institutions, etc., through the processes linked with world radiocommunication conferences and study groups, will need to continue to make decisions on the most profitable and efficient ways to exploit the limited resource of the radio-frequency spectrum and satellite orbits, which will be critical and of increasing economic value for the development of the global economy in the twenty-first century.

In conducting its activities, the ITU-R should ensure to cast a proper balance:

- between the need for worldwide harmonization (to benefit from economies of scale, connectivity and interoperability) and the need for flexibility in spectrum allocations,
- between the need to accommodate new systems, applications and technologies as they arise and the need to protect existing radiocommunication services.

### **3.2 Situational analysis of ITU-T Sector**

ITU-T operates in a competitive, complex and rapidly evolving environment and ecosystem.

There is a need for high-quality, demand-driven international standards, which should be developed rapidly in line with the principles of global connectivity, openness, affordability, reliability, interoperability and security. Key technologies, enabling new services and applications and promoting the building of the information society are emerging and should be taken into account in the work of ITU-T.

While retaining current ITU-T members, new members from industry and academia need to be attracted and encouraged, and the participation of developing countries in the standardization process (“Bridging the standardization gap”) needs to be boosted.

Cooperation and collaboration with other standardization bodies and relevant consortia and fora are key to avoiding duplication of work and achieving efficient use of resources, as well as incorporating expertise from outside ITU.

The review of the International Telecommunication Regulations will set a renewed worldwide framework for ITU-T activities

### **3.3 Situational analysis of ITU-D Sector**

Telecommunications/ICTs are increasingly being recognized by governments around the world as the key engine for economic growth and social development. Furthering development of telecommunications/ICTs around the world has long been at the core of the work of ITU, as a United Nations specialized agency, but has become even more vital over recent years, when technological developments have given telecommunications/ICTs an essential role in every aspect of human lives. Telecommunications/ICTs are not just an end in themselves, but are the key enablers of the other sectors.

The progress that has been made since the establishment of the Millennium Development Goals (MDGs) in 2000 and of the telecommunication/ICT connectivity targets set by WSIS in 2003 and 2005 has been extremely important. Providing the right conditions is key to fully meeting these goals. The priority shall be the development of infrastructure, in particular for broadband communications, and the provision of telecommunication/ICT applications and services. The enhancement of human capacity building and a robust, predictable, enabling regulatory environment will ensure that technological development is sustainable.

Having regard to the importance of local content and its role in developing the use of broadband, countries with language and cultural barriers should pay adequate attention to the significant proportion of local content. Therefore, generating local content as an enabler for developing deployment of broadband services and enhancing its penetration, developing e-health, e-learning and e-commerce to satisfy demand for local content and encouraging countries with similar or common culture and language to construct local content could help speed up continuing access to broadband services.

In view of the borderless nature of the cyberspace community, ITU-D acknowledges the importance of international cooperation in enhancing reliability, availability and security in the use of ICTs. Therefore, ITU-D recognizes that there is an urgent need to support countries in developing specific measures in the implementation of their national cybersecurity frameworks to address the concerns of different stakeholders in this regard and to enable and assist in the sharing of best practices at the global level. Accordingly, ITU will play a key role in facilitating the above-mentioned cooperation.

Among those standing to derive the greatest benefit from telecommunications/ICTs are least developed countries (LDCs), small island developing states (SIDS), landlocked developing countries (LLDCs) and countries with economies in transition, all of which deserve special attention. Emergency telecommunications and gender issues are also priority areas in ITU-D work. Given the magnitude of the task, success will depend on working closely with ITU members and mobilizing resources through public-private partnerships.

There is a need to encourage a culture of innovation in ITU-D. Constantly examining BDT's activities under the lens of how products and services can be more innovative leads to critical consideration of its competitive position among telecommunication/ICT development agencies and provides the motivation to pursue new opportunities for improvement. The growing importance of innovation is recognized worldwide. Innovation is essential if countries and firms are to recover from the global economic downturn and thrive in today's highly competitive and connected global economy. Innovation is a powerful engine for development and for addressing social and economic challenges. Innovative broadband-fuelled services such as m-payments, m-health and m-education can be

literally “life-changing” for individuals, communities and societies at large. Access to telecommunications/ICTs can empower hundreds of millions of people in developing countries to directly enhance their own social and economic well-being.

The ITU-D mission is not just about connectivity for connectivity’s sake, but is more to aim at seeing innovative uses of telecommunications/ICTs that fundamentally improve people’s lives for the better.