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SERIES L: CONSTRUCTION, INSTALLATION AND PROTECTION OF CABLES AND OTHER ELEMENTS OF OUTSIDE PLANT

Framework for information and communication technologies and adaptation to the effects of climate change

Recommendation ITU-T L.1500

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Framework for information and communication technologies and adaptation to the effects of climate change

Summary

Recommendation ITU-T L.1500 describes a framework for information and communication technologies (ICTs) and adaptation to the effects of climate change. This framework identifies and defines the basis for development of the following Recommendations:

- Recommendation ITU-T L.1501 on how countries can utilize ICTs to adapt to the effects of climate change. It will also provide a framework and a checklist for countries to integrate ICTs into their national strategies for adaptation to climate change. Examples of checklists, use-cases, best practices, guidelines, consideration points, etc. will be added when appropriate.

- A future Recommendation on how to adapt the ICT infrastructure to the effects of climate change. It will provide a set of guidelines, requirements and best practices to be referred to during operation, maintenance, upgrade and improvement of existing ICT infrastructure and when planning, designing and constructing ICT projects, goods, networks and services to adapt to the effects of climate change. Examples of checklists, use-cases, best practices, guidelines, consideration points, etc. will be added when appropriate.

- A future Recommendation on how ICTs can help cities to adapt to the effects of climate change. It will also provide a framework and a checklist to assist municipal authorities in the implementation of ICT-based solutions in cities' climate change adaptation strategies. Examples of checklists, use-cases, best practices, guidelines, consideration points, etc. will be added when appropriate.

History

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Adaptation, climate change, ICT.

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FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at http://www.itu.int/ITU-T/ipr/.

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Introduction

Information and communication technologies (ICTs) deliver innovative products and services which are transforming the way human societies live. At the same time, ICTs enable other sectors, such as manufacturing, logistics, buildings and electric grids, to develop and work more efficiently.

On the other hand, the adverse effects of climate change pose a threat to the development and sustainability of the ICT sector and related sectors. To ensure sustainability of the ICT sector and other sectors it is important to develop adaptation strategies to address the effects of climate change. There are key areas of action to be considered in the design of ICTs and climate change adaptation strategies, including policy development and the establishment of adequate structures and processes. At the sectoral level, sector-specific strategies need to be developed to ensure sustainable development in the face of climate variability and change.

ICTs therefore have a strategic role to play in ensuring the adaptability of other sectors. Furthermore, the ICTs themselves are is vulnerable to the effects of climate change and should strategically evolve to adapt infrastructure to such changes. This can be done at several levels, from the international, national, sectoral and community level, as shown in Figure 1.
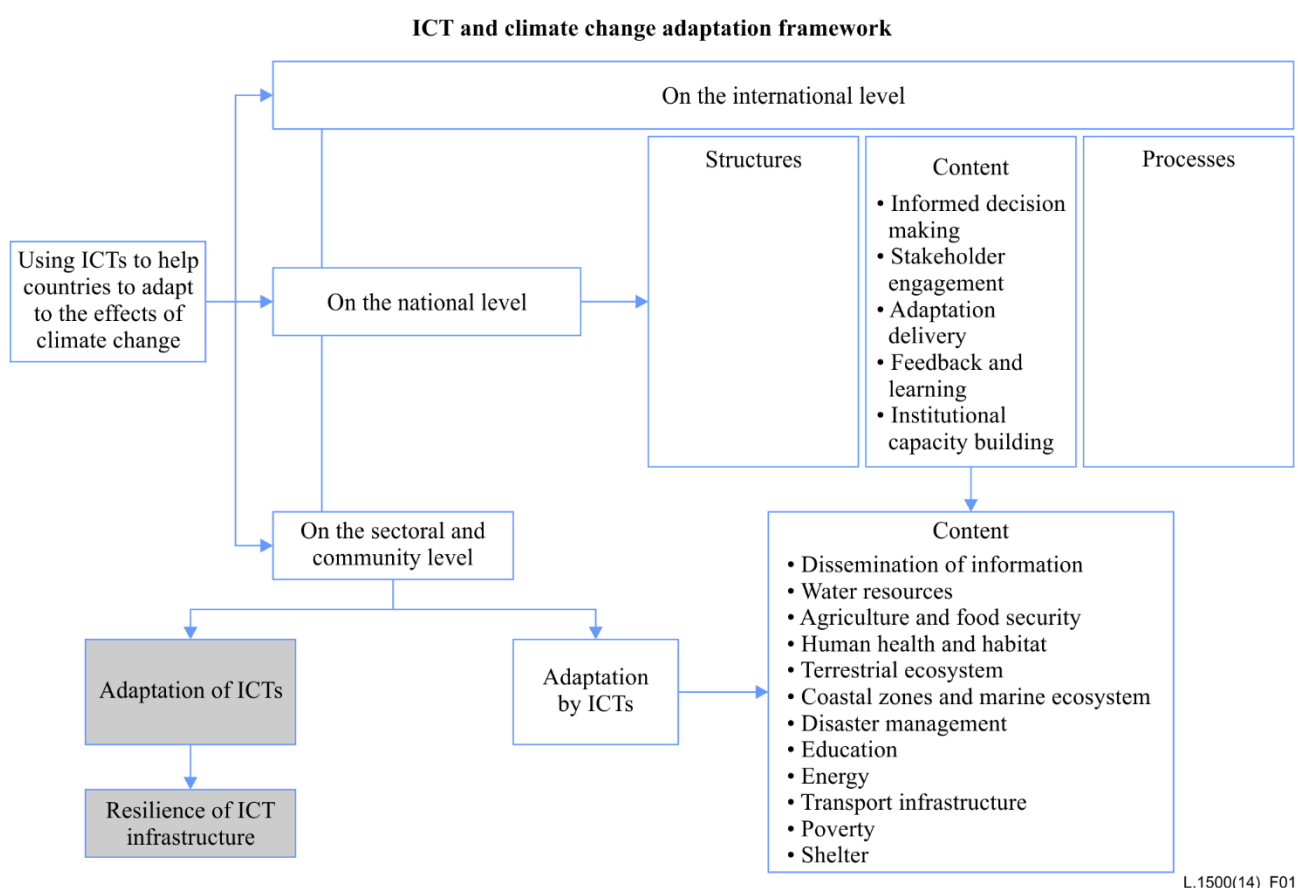

ICT and climate change adaptation framework

Figure 1 – ICTs and a framework for adaptation to climate change[1]

The differences in strategic approach at various levels, and between the ICT sector and other sectors, bring out a need for several adaptation approaches specific to the ICT sector and for countries to use.

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[1] The diagram is based on [b-ITU-T Ghana Case Study] ITU-T Report (2012), *Information and communication technologies (ICTs) and climate change adaptation and mitigation: The case of Ghana 2012*. http://www.itu.int/dms_pub/itu-t/oth/4B/01/T4B010000020001PDFE.pdf

Recommendation ITU-T L.1500

Framework for information and communication technologies and adaptation to the effects of climate change

1 Scope

This Recommendation describes the framework for using ICTs in adaptation to the effects of climate change. This Recommendation will define the scope of the subsequent three Recommendations to be published within this framework.

This Recommendation does not provide strategies or best practices for climate change adaptation as these will be provided in the Recommendations developed within this framework.

2 References

None.

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 climate change [b-IPCC 2007] and [b-IPPC SPM]: Climate change refers to any change in climate over time, whether due to natural variability or as a result of human activity. The Intergovernmental Panel on Climate Change (IPCC) uses a relatively broad definition, referring to a change in the state of the climate that can be identified (e.g., using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forces, or to persistent anthropogenic changes in the composition of the atmosphere or in land use.

The IPCC makes a distinction between climate change that is directly attributable to human activities, and climate variability that is attributable to natural causes. For the purposes of this report, either definition may be suitable depending on the context of analysis.

3.1.2 climate change adaptation [b-IPCC 2001]: Adaptation to climate change can be defined as the adjustment in ecological, social or economic systems in response to actual or expected climatic stimuli and their effects. It refers to changes in processes, practices and structures to moderate potential harm or benefit from opportunities associated with climate change.

3.2 Terms defined in this Recommendation

None.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

ICT Information and Communication Technology

IPCC Intergovernmental Panel on Climate Change

MDG Millennium Development Goal

UNFCCC United Nations Framework Convention on Climate Change

5 Climate change adaptation

While climate change mitigation aims at tackling and reducing the causes of climate changes, the climate change adaptation aims at adapting to the effects of climate changes by reducing social infrastructure damages and natural disasters and/or facilitating opportunities (for example, a flood can cause a natural disaster but can also provide a water resource supply opportunity). As the effects of climate change are felt with varying degrees of intensity across the globe, the need to foster actions aimed at adjusting and adapting to new climatic conditions is taking precedence in the international, national and sectoral policy agendas. Evidence from the field indicates that climatic changes such as variations in rainfall or temperature patterns are having an impact on development dimensions such as food production, local livelihoods and finance, water supply, health and disease proliferation, human habitat and migrations, among others, adversely affecting those countries and groups of populations that are more dependent on climate-sensitive sectors such as agriculture and natural resources. Especially vulnerable to those impacts are developing countries that possess limited resources and capacity to adapt and recover from the occurrence of climatic events. For them, climate change impacts aggravate the challenges faced in the achievement of the Millennium Development Goals (MDGs), and pose further barriers to overcoming poverty and marginalization. Climate change adaptation can take the form of anticipatory or reactive, spontaneous or planned actions that are undertaken by actors in response to climatic events. As climate change science predicts an increase of 2°C in the average temperature of the planet above the pre-industrial level in the 21st century, efforts aimed at designing and implementing strategies to moderate, cope with and take advantage of the impacts of climate change are more urgent than ever before.

Adaptation measures can be planned or autonomous and take multiple forms, ranging from strengthening local ICT infrastructure to withstand more severe periods of precipitation and floods, improving the management of water resources to ensure sufficient supply during dry seasons, adopting more resistant seed varieties, and improving the dissemination of information as part of disaster preparedness and response programmes, among others.

Ultimately, the severity of climate change impacts is closely linked to the levels of exposure and vulnerability that prevail within a given context. For the objectives of this Recommendation, adverse impacts are considered disasters when they produce widespread damage and cause severe alterations in the normal functioning of communities or societies. Thus, disaster risk management and adaptation to climate change focus on reducing exposure and vulnerability, while contributing to increasing the resilience of vulnerable contexts to face the impacts of climatic events. According to the UNFCCC, "Most methods of adaptation involve some form of technology, which in the broadest sense includes not just material and equipment but also diverse forms of knowledge. Promoting the development and diffusion of technologies, know-how, and practices for adaptation are important activities for improving and enabling adaptation to climate change" [b-UNFCCC AC].

Climate change adaptation is gaining momentum as an area of priority action, particularly for developing countries that are at the forefront of climate change impacts. These countries have recognized that the adoption of adaptation efforts must be intensified in order to cope with the unavoidable yet uncertain impacts of the changing global climate.

5.1 Description of Recommendation ITU-T L.1501 on how countries can utilize ICTs to adapt to the effects of climate change

The Recommendation describes how countries can utilize ICTs to adapt to the effects of climate change. It also provides a framework and a checklist for countries to integrate ICTs into their national strategies for adaptation to climate change.

This Recommendation has been designed to assist countries in integrating ICTs into their national climate change adaptation strategies. Recently, the effects of climate change seem to have grown quickly. In some cases it might already be too late or too costly to cope with the impact by improving the hardware, e.g., by making various social infrastructures physically strong, resilient and highly

durable. It is therefore extremely important to make the best use of ICTs in saving human lives and minimizing social damages and difficulties. Special attention should be given to remote and rural areas in developing countries here the social infrastructure and economic support are weak and thus effects and impacts of climate change could lead to worse damages than in cities and in developed countries.

5.2 Studies on how information and communication technology (ICT) can adapt to the effects of climate change

ITU-T is currently developing a Recommendation on how information and communication technology (ICT) can be adapted to the effects of climate change. The Recommendation will provide a set of guidelines, requirements and best practices to be referred to during operation, maintenance, upgrade and improvement of existing ICT infrastructure and when planning, designing and constructing ICT projects, networks, goods and services to adapt to the effects of climate change.

More intense and frequent climatic manifestations pose an obvious threat to any industry that relies on a physical infrastructure. Climate change means an increased risk of service disruption to all network infrastructures, including energy, transportation and telecommunications (and these effects are also inter-related given, for example, the dependence of the telecommunications sector on electrical power). Climate change will likely impact the design of the networks, raising the need for more robust infrastructures, greater technical knowledge and enhanced engineering capabilities.

5.3 Studies on how ICTs can help cities to adapt to the effects of climate change

ITU-T is currently developing a Recommendation on how ICTs can help cities to adapt to the effects of climate change. The Recommendation will also provide a framework and a checklist to assist municipal authorities in the implementation of ICT-based solutions in cities' climate change adaptation strategies.

This future Recommendation will be designed to assist municipal authorities in integrating ICTs into their climate change adaptation strategies. It will provide a framework that could be used by cities not only to adapt to climate change but also to build resilience. A checklist will also be provided to enable cities' policy makers to evaluate whether the climate change adaptation actions put in place in their cities are successful.

Cities are the main engine for growth and development. They drive all nations' economies and generate substantial wealth. Any abrupt disruption that can occur has the potential to negatively affect the productivity of the cities with an impact on public services and wealth. Furthermore, rapid urbanization and population growth will worsen the impact of climate change in cities. This high concentration of population and economic activity makes cities particularly vulnerable to climate change. Hence, cities need to take action to adjust and adapt to the changing climatic conditions.

ICT is a prerequisite for successful adaptation to climate change. It is therefore fundamental to make the best use of ICT tools and services in cities to save human lives and minimize social damages and economic loss.

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