

Recommendation

ITU-T L.1508 (01/2024)

SERIES L: Environment and ICTs, climate change, e-waste, energy efficiency; construction, installation and protection of cables and other elements of outside plant

Adaptation to climate change

Framework for climate change adaptation in coastal cities using information and communication technology and digital technologies

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Environment and ICTs, climate change, e-waste, energy efficiency; construction, installation and protection of cables and other elements of outside plant

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For further details, please refer to the list of ITU-T Recommendations.

Recommendation ITU-T L.1508

Framework for climate change adaptation in coastal cities using information and communication technology and digital technologies

Summary

Recommendation ITU-T L.1508 supports coastal cities and areas to adopt information and communication technologies, as well as digital transformation, to provide innovative solutions for accelerating climate adaptation and enhance climate resilience.

Coastal cities and areas are particularly vulnerable to the impacts of climate change, including flooding, rising sea level, storm surge, precipitation, and more. The frequency and intensity of these impacts continue to deepen, as a result of climate change. It is, therefore, imperative that coastal cities and areas proactively take climate adaptation actions to minimize these impacts.

History *

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Keywords

Climate change, climate change adaptation, information and communication technologies, resilience.

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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.

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Introduction

Development of the blue economy has been adopted by all countries as a next generation frontier. Different countries and economies have all intensified the need to commercialize their waterfront for tourism, water transport, water sports as well as fisheries and marine science.

While waterfronts provide the avenue for development of coastal cities for the aforementioned reasons, the cities are exposed to first hand effects of negative climate change. These include, but are not limited to, rising water levels, storms and extreme winds, flooding and extreme temperatures.

Climate change has therefore become a reality that can no longer be ignored by any sector.

The blue economy is sustainable use of ocean resources for economic growth, improved livelihoods and jobs, and ocean ecosystem health (see Figure 1). Further information can be found at [b-WB blue].

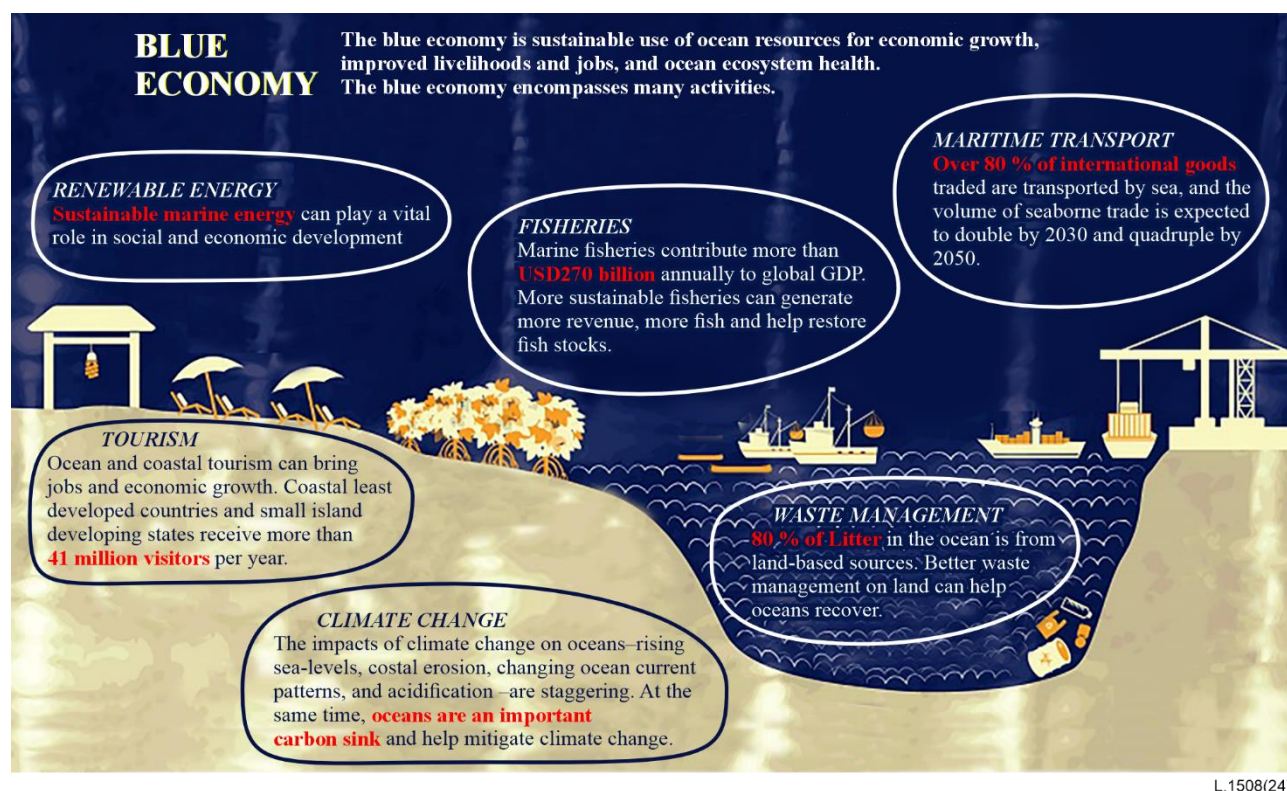


Figure 1 – Main areas of the blue economy (Source: [b-WB blue])

Recommendation ITU-T L.1508

Framework for climate change adaptation in coastal cities using information and communication technology and digital technologies

1 Scope

This Recommendation provides a high-level framework for climate change adaptation in coastal cities and areas. The framework includes a three-step methodology to enhance climate change resilience and accelerate climate change adaptation in coastal cities and areas, including carrying out a flood risk mapping exercise, implementation of information and communication technology (ICT) and digital solutions, and methodology on evaluation of the results.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

None.

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following term defined elsewhere:

3.1.1 climate change adaptation [b-ITU-T L.1500]: 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:

AI	Artificial Intelligence
ECLISEA	European advances on Climate services for coasts and Seas
FAIR	Flood infrastructure Asset management and Investment in Renovation, adaptation and maintenance
FRMP	Flood Risk Management Plan
GEF	Global Environment Facility
GIS	Geographic Information System
ICT	Information and Communication Technology
ICZM	Integrated Coastal Zone Management

INSeaPTION	Integrating Sea level Projections in climate services for coastal adaptation
LISCoAsT	Large scale Integrated Sea level and Coastal Assessment Tool
MAP	Mediterranean Action Plan
ML	Machine Learning
MSP	Maritime Spatial Planning
NbS	Nature-based Solution
NWRM	Natural Water Retention Measures
PAP	Priority Actions Programme
PESETA	Projection of Economic impacts of climate change in Sectors of the European Union based on bottom-up Analysis
RAC	Regional Activity Centre
RBMP	River Basin Management Plan
RECONNECT	Regenerating Ecosystems with Nature-based solutions for hydro-meteorological risk reduction
RISES-AM	Responses to coastal climate change: Innovative Strategies for high End Scenarios – Adaptation and Mitigation
SARCC	Sustainable And Resilient Coastal Cities
WFD	Water Framework Directive

5 Conventions

None.

6 Climate change and coastal area

Coastal cities and areas play an important role in society separating land activities from water bodies and fusing the elements generated from both.

Waterfronts provide the avenue for development of coastal cities for the blue economy, but are exposed to the negative effects of climate change (e.g., rising water levels, storms, extreme winds, flooding and extreme temperatures).

Earth's land and oceans can be monitored through sensors placed directly on the surface or remotely by satellite. The condition of the atmosphere can be checked for greenhouse gas emissions and wind currents that may presage a hurricane. Satellite images came into the public domain with the launch of LANDSAT 1 in 1972. However, meteorological satellites were used in the 1960s by the World Meteorological Organization (WMO) for its World Weather Watch programme – one of the most valued satellite applications, which is used every day throughout the world. WMO also operates the Global Observing System to monitor weather conditions and alert authorities (see Figure 2).

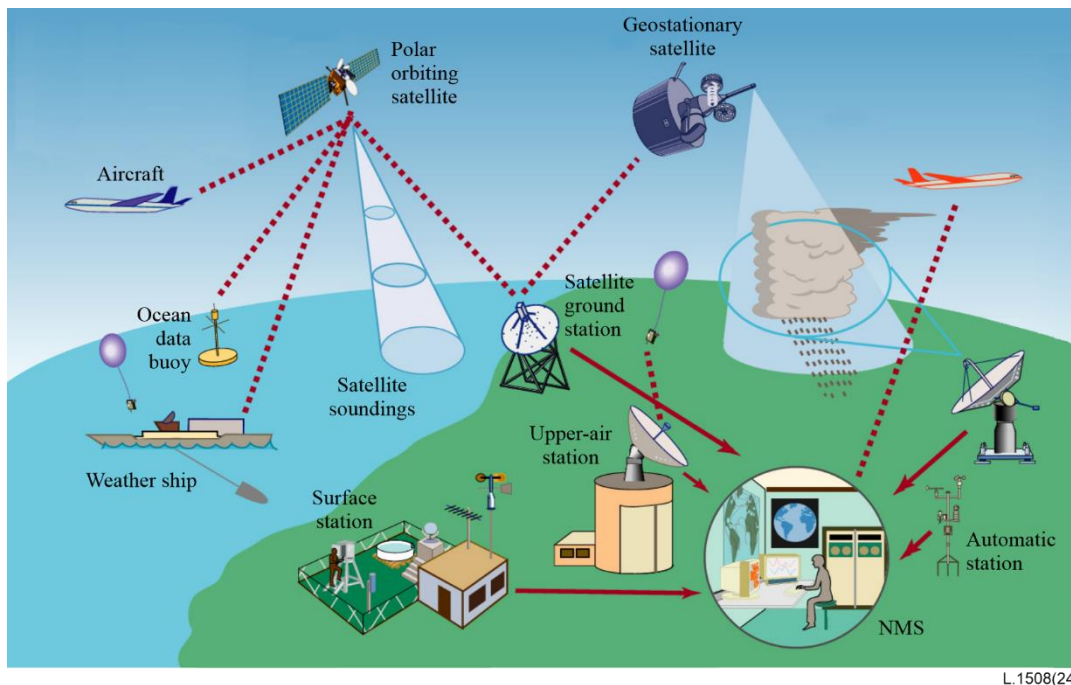


Figure 2 – The WMO Global Observing System (Source: [b-WMO GOS])

Appendix I provides an overview and information on climate change and coastal area in European Union (EU), New Zealand and Mediterranean coastal zones.

7 Climate change adaptation in coastal cities using ICT and digital technologies

This clause provides information about climate change adaptation in coastal cities using ICT and digital technologies.

7.1 The role of ICTs in tackling climate change

ICTs provide an unprecedented ability to collect and analyse environmental information that may encompass the entire terrestrial system, from the depths of the ocean to the upper reaches of the atmosphere. They enable users not only to assess the impact of humans on the environment, but also to manage use of energy and production of greenhouse gases (in the home and in industry). Thus, ICTs are an essential part of efforts to combat climate change and to mitigate its effects [b-ITU ICT].

The ICT tools that are available for mitigating climate change are listed as:

- computer-controlled systems can be used in a multitude of ways to make home, work and manufacturing more energy efficient;
- telecommunications are vital in responding to natural disasters that climate change may bring;
- monitoring vulnerable or dangerous environments is possible with sensor networks;
- satellite observations provide essential data on weather and vegetation patterns;
- ocean buoys communicate data on tsunami or sea level changes, via satellite;
- data can be interpreted and illustrated by geographic information systems (GISs);
- increasing computational power, as well as new algorithms, make for better analysis and modelling of complex environmental and climate systems;
- broadband Internet access makes it easier to share large amounts of data globally;
- distributed (grid) computing allows researchers to explore topics in unprecedented depth.