

# Climate Change Adaptation Planning for Ports and Inland Waterways – EnviCom WG 178 Report 2020

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## Summary

In January 2020 PIANC's EnviCom Working Group 178 published the 'Climate Change and Adaptation Planning for Ports and Inland Waterways' guideline. The guideline discusses the potential impacts of climate change on ports and navigational infrastructure and provides a stepwise process to climate change adaptation planning. This presentation provides an overview of the report contents and case studies presented therein. An overview of the PIANC initiatives relating to climate resilience and adaptation is also provided.

*Keywords: climate change adaptation, risk management*

## Background

Ports provide access to global markets and supply chains, as well as supporting maritime transport, fisheries and other economic activities. For example, over 80% of world trade volume is transported by sea and developing states account for around 60% of goods loaded and unloaded globally<sup>[1]</sup>.

Ports and waterways around the world are already experiencing air and water temperature increases, rising sea levels, and changes in parameters such as seasonal precipitation, wind and wave conditions. Many are also seeing more frequent and severe extreme events including storms, heatwaves and droughts.

Climate change represents a significant risk to business, operations, safety and infrastructure – and hence to local, national and global economies. Waterborne transport infrastructure will be adversely affected. The IPCC Sixth Assessment Report Impacts, Adaptation and Vulnerability<sup>[2]</sup> identifies the urgent need to adapt critical infrastructure such as ports to ensure they are resilient to climate change, and noting the high levels of infrastructure interdependencies, which increase climate risks by creating other potential avenues for infrastructure downtime. Port and waterway operators need to take urgent action to strengthen resilience and adapt.

## Introduction

This paper reports on the guideline prepared by EnviCom WG 178: Climate Change Adaptation Planning for Ports and Inland Waterways<sup>[3]</sup>, which:

- Provides a methodological support to the PIANC Declaration on Climate Change, assisting PIANC's members and the broader industry to take timely action to strengthen resilience and adapt port and waterway infrastructure and operations to climate change; and

- Fulfills an action in the Navigating a Changing Climate partnership's Action Plan, to deliver technical guidance on climate change adaptation.

This good practice technical guideline is targeted primarily at port managers and practitioners from developing countries and countries in transition that have less experience in (and resources for) adaptation planning and can benefit from learning from what has been done elsewhere in the world. With this in mind, it has been made available as a free download from the PIANC webpage.

The guideline includes an introduction to the potential consequences of climate change and some of the challenges to be addressed if ports and waterways are to adapt effectively.

This presentation will provide an overview of the working group membership and guideline contents, along with an update on PIANC's relevant activities since publication.

## Working Group Membership

The Working Group membership comprised PIANC members from around the world with expertise in:

- Climate science and the application of climate change projections;
- Designing, managing and operating ports and navigational infrastructure for both maritime and inland navigational infrastructure;
- Stakeholder engagement; and
- Adaptation planning and delivery.

The countries represented by these members included Australia, Austria, Belgium, Canada, France, Germany, Ireland, Italy, Norway, South Africa, Spain, Sweden, the UK and the USA.

The broad range of geographies and professional experiences of the membership was invaluable in ensuring consideration of the diverse needs of the guideline's end-users.

It is also important to acknowledge the role of the independent reviewers who assisted in editing and finalising the guideline for publication by PIANC, as well as the various professionals and organisations who contributed case studies.

### **The Climate Change Adaptation Guideline**

The guideline introduces a four-stage methodology to help port and waterway owners and operators plan to adapt infrastructure and improve resilience. Sixteen international good practice case studies are appended to the guidance, along with templates to be used for data collection and record keeping.

A brief overview of each of these four stages is provided below. Further detail will be provided during the presentation.

#### **Stage 1: Context and Objectives**

Stage 1 describes the preparatory steps needed to understand which assets, operations and systems are critical and might be affected by the changing climate, to highlight interdependencies, and to identify relevant stakeholders. This understanding enables climate change adaptation objectives to be agreed with key stakeholders.

#### **Stage 2: Climate Information**

Future changes in the climate will affect many of the critical maritime and inland navigation infrastructure assets, operations and systems identified in Stage 1. The steps in Stage 2 help the user identify which climate parameters and processes are relevant and how these are projected to change under different climate change scenarios.

Data needs to be collated and reviewed to understand both slow onset changes and the expected changes in extreme events. Comparisons can then be made with baseline conditions, taking into account existing patterns or trends, and any uncertainties or limitations in the data.

#### **Stage 3: Vulnerabilities and Risks**

Stage 3 brings together the information collated in Stage 1 and Stage 2 to identify and assess potential vulnerabilities and risks associated with climate change.

In order to make informed choices about adaptation options, it is important to understand how climate change is likely to affect existing risks or introduce new ones. This includes how climate hazards can be identified, quantified, and compared to the baseline situation, in turn highlighting future changes in the vulnerability of critical assets, operations or systems.

#### **Stage 4: Adaptation Options**

Stage 4 sets out a series of steps to identify, screen, and evaluate possible adaptation and resilience options. Options comprise measures or groups of measures to control the risks identified in Stage 3. These steps culminate in the development of 'adaptation pathways', a sequence of actions (measures, modifications or other interventions) that are implemented in response to changes in meteorological, hydrographic or oceanographic conditions.

The overall approach to climate change adaptation can then be presented as an adaptation strategy. The implementation of measures on the adaptation pathways, and their subsequent performance in meeting the objectives of the strategy, are informed by monitoring.

#### **Progress on Climate Change**

PIANC continues to provide support to the inland and maritime navigation infrastructure sector to respond to climate change through the Navigating a Changing Climate Partnership ([navclimate.pianc.org](http://navclimate.pianc.org)). This initiative provides technical support to build capacity to:

- Reduce greenhouse gas emissions and shift to low carbon maritime and inland navigation infrastructure; and
- Act urgently to strengthen resilience and improve preparedness to adapt to the changing climate.

Under their Action Plan, other working groups have prepared guidance on carbon management, working with nature, and sustainable ports.

EnviCom also has a Permanent Task Group on Climate Change, which recently published Technical Note 1: Managing Climate Change Uncertainties in Selecting, Designing and Evaluating Options for Resilient Navigation Infrastructure.

#### **References**

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