



## CLIMATE RESILIENCE GUIDE FOR PORTS

MarCom

### TERMS OF REFERENCE

#### 1. Historical Background Definition of the problem

PIANC's Working Group 178 guidance on climate change adaptation planning and Permanent Task Group group on Climate Change Technical Note No.1 on accommodating climate change uncertainties set out some broad guiding principles on climate change adaptation for port and navigation infrastructure design. However, the focus of WG 178 is mainly on planning to adapt existing infrastructure and operations, and the content on risk assessment is very generic. Where significant investment in new infrastructure with a design life of decades is involved, a more comprehensive approach, particularly to stress testing for climate-resilience, will often be needed.

For ports it is imperative to be able to be resilient to ensure a free flow of goods and be able to play its role in the Broad Prosperity and therefore there is a need to be able to bounce back to a good state after getting hit by an event.

In 2019, the International Hydropower Association published a Climate Resilience Guide for the Hydropower Sector. For hydropower operators, failure to adequately consider climate risks may lead to shortcomings in technical and financial performance, safety aspects, and environmental functions. The Guide therefore responds to the need for clarity on good international industry practice for project owners, financial institutions, governments and private developers to consider climate risks in hydropower development and operations.

For port operators, climate change is also a key business risk. Failure to adequately consider the changing climate may have significant consequences. PIANC PTGCC's Technical Note No.2 [due for publication early in 2024] highlights the potential risks of failing to take action to strengthen resilience: damage to infrastructure and/or disruption to port operations can incur significant costs, impacting not only the port itself, but national and regional supply chains. A failure to properly consider climate change may result in stranded assets, or may have wider unintended consequences for health and safety, society or the environment. Furthermore, demonstrating climate resilience may be a pre-requisite for access to finance or insurance.

A sector-specific, international, industry good practice climate resilience guide for port development is therefore needed. IFC (international Finance Corporation, World Bank) has asked PIANC if PIANC is interested to take the lead in this. It will be of great importance to make this together with our Sister Organisations, like IAPH and others. There is also a strong need to connect with institutes like WSPS and ECCLIPSE and others to ensure that this will become a well-supported document.



## 2. Objectives

The objective of this Working Group report will be to develop a clear, consistent and comprehensive approach to analysing and demonstrating the climate-resilience of (new and existing) port infrastructure. E.g., incorporation of climate risk considerations into project and asset design and operations that address financial and/or environmental & social underperformance that may result from direct and indirect climate change impacts on the project.

This port-focused good practice guide will draw on, rather than duplicate, content that already exists in relevant PIANC publications (see Section 3) and develop additional content as needed. It should also contain impacts already shown and lessons learned how to mitigate these impacts, including monitoring solutions and impact management and preventive adaptation.

## 3. Earlier reports to be reviewed

Relevant PIANC EnviCom/PTGCC and MarCom reports include at least:

- Climate change adaptation planning for ports and waterways (WG 178)
- Managing Climate Change Uncertainties in Selecting, Designing and Evaluating Options for Resilient Navigation Infrastructure (PTGCC Technical Note No.1)
- Resilience of the Maritime and Inland Waterborne Transport System (TG 193)
- Waterborne Transport, Ports and Waterways: A 2023 Update of Climate Change Drivers and Impact (TG 3)
- WG 185 Ports on Greenfield Sites – Guidelines for Site Selection and Master planning
- WG 158 Masterplans for the Development of existing ports
- Climate Risk and Business Port, IFC document

## 4. Scope of work

The Working Group will collate and review information in relation to the following (based on hydropower guide but to be critically reviewed and amended as appropriate by WG):

- *Understanding climate risks and resilience*
- *Stakeholder engagement and management support*
- *Climate risk screening, climate data collection, identifying uncertainties*
- Risk and opportunity register creation; performance criteria and metrics
- Initial analysis
- Climate stress testing methodologies
- *Resilience measures identification, options for modified design*
- Resilience analysis, climate risk management plan
- *Monitoring, evaluation and reporting*
- Climate resilience monitoring plan; evaluation and reassessment of climate risks
- [Hydropower Sector Climate Resilience Guide](#)

Content shown in *italics* can likely be cross-referenced or further-developed from existing PIANC and other publications. Normal font indicates new content to be developed

Collecting and reviewing good practice case studies will also be an important activity. See Annex 1 and the reference document for Hydropower Sector Climate Resilience Guide.



# PIANC

The World Association for Waterborne  
Transport Infrastructure

## 5. Intended product

A clear, consistent and comprehensive good practice industry approach to analysing and demonstrating the climate-resilience of (new) port infrastructure.

## 6. Working Group membership

Desirable disciplines and experience amongst WG membership will include:

- Port managers
- Port planners and engineers
- Port designers
- Climate scientists
- Risk assessment experts
- Scientists/academics
- Project owners (public and private)
- Representatives from MarCom and PTGCC
- Representatives from World Bank Group

## 7. Target audience

- Port authorities
- Port engineers and designers
- Investors
- Government and regulators

## 8. Relevance

### 8.1. Relevance to countries in transition, etc.

Analysing/demonstrating climate-resilience is becoming increasingly important to developing countries, both in terms of delivering on Paris Agreement commitments to adapt to the changing climate, and to leverage finance for such investments.

### 8.2. Climate Change and Adaptation

Climate change is the focus of this WG. As such, it will make an important contribution to meeting the objectives set out in the PIANC Declaration on Climate Change ()

### 8.3. Working with Nature

Working with Nature / Nature-based Solutions and similar that capitalise on the natural resilience of healthy physical and biological systems are often a key element in adaptation and resilience in coastal environments, both directly, and in terms of the ecosystem service functions they provide (i.e. related to co-benefits).



# PIANC

The World Association for Waterborne  
Transport Infrastructure

## 8.4. UN Sustainable Development Goals

The WG report would contribute directly to the achievement of the UN Sustainable Development Goals 13 (Climate action) and 9 (Infrastructure, innovation, industry)

## 9. References

In addition to the PIANC publications mentioned above, reference will be made to the International Hydropower Association, 2019. Hydropower Sector Climate Resilience Guide. London, United Kingdom. Available from: [www.hydropower.org](http://www.hydropower.org)



# PIANC

The World Association for Waterborne  
Transport Infrastructure

## Appendix 1: possible table of Contents based on contents of Hydropower Sector Climate Resilience Guide [Hydropower Sector Climate Resilience Guide](#)

Requirement 1. Understanding what climate resilience means for thePort infrastructure sector

Requirement 2. Management support

Requirement 3. Stakeholder engagement

### Phase 1 – Project climate risks screening

Step 1.1. Port project characteristics and context

Step 1.2. Hydro-meteorological data collection

Step 1.3. Identifying uncertainties

Step 1.4. Options for project adaptation

Step 1.5. Risk and opportunity register creation

Step 1.6. Performance criteria and metrics

Step 1.7. Stakeholder engagement

Step 1.8. Need for a climate risk assessment?

### Phase 2 – Initial analysis

Step 2.1. Data collection and analysis

Step 2.2. Baseline definition

Step 2.3. Determining approach for Phase 3

Step 2.4. Stakeholder engagement

Step 2.5. Risk and opportunity register update

### Phase 3 – Climate stress test

Step 3.1. Comprehensive approach

Step 3.2. Semi-comprehensive approach

Step 3.3. Limited approach

Step 3.4. Stakeholder engagement

Step 3.5. Risk and opportunity register update

### Phase 4 – Climate risk management

Step 4.1. Resilience measures identification

Step 4.2. Options for modified design

Step 4.3. Resilience analysis

Step 4.4. Risk and opportunity register update

Step 4.5. Stakeholder engagement

Step 4.6. Climate Risk Management Plan

### Phase 5 – Monitoring, evaluation and reporting

Step 5.1. Climate resilience monitoring plan

Step 5.2. Evaluation and reassessment of climate risks

Step 5.3. Stakeholder engagement