Multi-year Expert Meeting
on Transport, Trade Logistics and
Trade Facilitation
8th Session

Climate Change Adaptation for Seaports in Support of the 2030 Agenda for Sustainable Development

27–28 October 2020

Recent Developments in Climate Change Adaptation for Ports

Presentation by

Ms. Jan Brooke
Focal Point
World Association for Waterborne Transport Infrastructure

Recent developments in climate change adaptation for ports

Jan Brooke
World Association for Waterborne Transport Infrastructure (PIANC)

UNCTAD MYEM October 2020

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PIANC Permanent Task Group on Climate Change (PTGCC)

- PIANC: The World Association for Waterborne Transport Infrastructure
- PTGCC: responsible for PIANC's technical climate change content
- Members from PIANC National Sections, sister associations
- Recent and ongoing PTGCC activities:
  - Draft PIANC **Declaration** on Climate Change launched at COP25
  - Oversee technical Working Group reports on climate change **adaptation planning**, on carbon management and on resilience …
  - Position paper on dealing with uncertainty in investment decision making (*response to NavClimate **Gap Analysis**)
  - Provide PIANC's input to **Navigating a Changing Climate initiative**

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PIANC Declaration on Climate Change

https://www.pianc.org/navigating-a-changing-climate

The climate is changing. The evidence is unequivocal. Climate change represents a significant risk to business, operations, safety and infrastructure – and hence to local, national and global economies. However, a positive, proactive response, now and into the future, can both reduce these risks and bring business opportunities. Uncertainties remain, but these can be addressed and are not reasons for delay. It is time to reinforce the message and upscale prudent action.

Waterborne transport infrastructure will be adversely affected by climate change. In addition to playing their role in decarbonisation (i.e. moving to 'net zero' greenhouse gas emissions), owners and operators need to take urgent action to strengthen resilience and adapt – both to gradual changes in parameters such as temperature and sea level, and to the expected increase in the frequency and severity of extreme meteorological, hydrological or oceanographic events.

PIANC recognises the importance of the climate change challenge and will actively pursue the sustainable future of the waterborne transport industry by supporting its members in addressing this challenge. PIANC and its members will strive to:

- **develop** approaches to decarbonise the operation of port and navigation infrastructure (i.e. move to net zero emissions), whilst at the same time enabling the reduction of greenhouse gas emissions from vessels by providing the necessary facilities, infrastructure and, where appropriate,

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- **prioritise** inspection and maintenance to optimise the resilience of existing infrastructure
- **apply** monitoring systems and effective data management to inform and support timely climate change action
- **strengthen** operational resilience by developing risk assessments, contingency plans and warning systems
- **collaborate** with energy and water suppliers, onward transport providers and others involved in the supply chain to understand interdependencies and reduce exposure to associated risks
- **seek** win-win opportunities, including through nature-based solutions such as PIANC's Working with Nature programme
- **consider** a range of climate change scenarios when developing adaptation strategies and include an appropriate combination of structural, operational and institutional measures set out in phased adaptation investment pathways
- **focus** on flexible and adaptive infrastructure, systems and operations to allow for future modification and to avoid 'locking in' to solutions that prove inappropriate as conditions change
- **promote** engineered redundancy to improve resilience.

PIANC will continue to support ports, harbours, marinas and inland waterways by facilitating knowledge sharing and preparing practical technical guidance to help them manage the climate change challenge through effective risk management.

PIANC will also contribute to the global discussion to ensure that waterborne transport infrastructure interests are properly acknowledged, and to disseminate key messages to its members and the wider port and navigation community, through implementation guidelines where appropriate.

PIANC and its members will join forces with other waterborne transport infrastructure stakeholders to meet these new challenges, explore opportunities and contribute to a responsible, informed and sustainable way forward.

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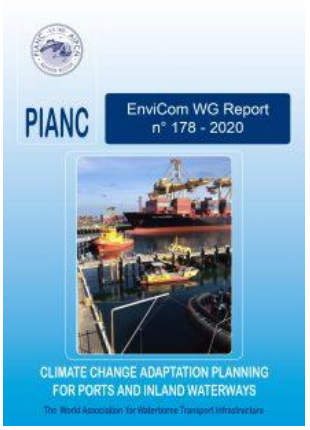
PIANC
Adaptation Working Group Report

- Four-step methodological framework for planning to adapt ports and waterways to the changing climate
  1. Understand context and objectives (e.g. asset inventory, stakeholders)
  2. Collate climate information (e.g. baseline, projections, scenarios)
  3. Risk/vulnerability assessments
  4. Identify and evaluation options (e.g. adaptation pathways)
- Generic/impact-specific measure **portfolios**
- 16 port and waterway case studies
- Freely available to download: PIANC WG 178



https://www.pianc.org/publications/envicom/wg178

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Physical measures Structures, systems, technologies, services	Social measures People, behaviour, operations, information	Institutional measures Governance, economics, regulation, policy
Prioritise **maintenance** to maximise operational resilience and improve adaptive capacity	Undertake climate change **risk assessment**, prepare **risk maps**	Prepare strategic level climate change **adaptation strategies**
Install **real-time monitoring** infrastructure	**Prepare** and **raise awareness** of contingency, emergency or disaster response **plans**	Review and revise relevant **codes of practice, standards, specifications** or **guidelines** to accommodate changing conditions
Use **Cloud** (back-up) for data storage to reduce physical risks to systems	Introduce and regularly review **warning systems**	Review **health and safety** requirements and revise if needed
Relocate vulnerable assets and equipment out of high-risk areas	Prioritise **asset inspection**	Introduce **penalties** for non-compliance with standards
Revert to **phased array** for radar	**Educate** workforce, stakeholders, local communities	Require **zoning** of assets, operations or activities based on risk
Invest in **redundancy**, temporary infrastructure or other physical back-up provision for critical assets (including power and water supply)	Liaise and **coordinate with utilities** and other service providers; develop **information-sharing** protocols	Use local regulations (e.g. **byelaws**) to reduce risks, especially in multi-use locations
Reinforce, raise, strengthen or otherwise protect or modify critical assets	Improve (or instigate) **monitoring, record keeping** and **data management**, consider cybersecurity issues	Policies to encourage **relocation** out of high-risk areas
Install or develop new, **responsive** or **demountable infrastructure** or equipment	Undertake trend analysis or **forecasting**	Collaborate with **land-use planning** systems e.g. to introduce **set back** or **buffer areas**
Install **warning equipment**	Develop **revised operational protocols**; modify **working practices** as conditions change	**Limit new infrastructure development** in high-risk areas
Nominate or provide physical **sanctuaries**	Introduce and implement **adaptive management** procedures, base operations or working arrangements on monitoring outputs	Identify, secure and coordinate **alternative transport routes** or **modes**
Increase **storage capacity**	Allow for **flexibility** and responsiveness in programming (increase operational **hours**, modify staffing **rotas**, vessel **scheduling**, lock operation, etc.)	Promote **reduced insurance premiums** if improved resilience is demonstrated
Install **multi-modal equipment**	Revert to **traditional, low tech,** ways of operating; ensure binoculars, telephone, paper charts, two-way radios are available	Set up **contingency** or disaster response **fund**
Apply **nature-based solutions,** Working with Nature, soft engineering	Ensure availability of **transport** and **accommodation** for personnel during an incident	Introduce and enforce **build-back-better** or build-out-of-harm's-way policy
Install **treatment** or **reception facilities**	**Temporarily** or **permanently restrict** activities in high-risk areas	Facilitate **diversification** in facilities and employment as conditions change
Incorporate **flexibility** in new or replacement infrastructure design to allow for modification as conditions change	Nominate **safe routes** and **areas**, identify **diversions**	Improve **legal protection** for vulnerable habitats with risk reduction role (e.g. absorbing wave energy, providing erosion protection)
Modify **material** or **equipment selection** to accommodate changing conditions	Identify and exploit **interconnectivity** and **intermodal options** to maintain business continuity during events	Provide **grants** or **incentives** e.g. for development or maintenance of resilient infrastructure
Invest in **SMART** technology	Provide **training** on new tools, codes of practice, procedures or **protocols**, ensure importance of **redundancy** is understood	**Research** and develop novel tools and methods
	Facilitate **technology transfer**	

Table 1: Generic measures for strengthening resilience or adapting assets, operations or systems

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Use **Cloud** (back-up) for data storage to reduce physical risks to systems	Introduce and regularly review **warning systems**
Relocate vulnerable assets and equipment out of high-risk areas	Prioritise **asset inspection**
Revert to **phased array** for radar	**Educate** workforce, stakeholders, local communities
Invest in **redundancy**, temporary infrastructure or other physical back-up provision for critical assets (including power and water supply)	Liaise and **coordinate with utilities** and other service providers; develop **information-sharing** protocols
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Install **warning equipment**	Develop **revised operational protocols**; modify **working practices** as conditions change
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Increase **storage capacity**	Allow for **flexibility** and responsiveness in programming (increase operational **hours**, modify staffing **rotas**, vessel **scheduling**, lock operation, etc.)
Install **multi-modal equipment**	Revert to **traditional, low tech,** ways of operating; ensure binoculars, telephone, paper charts, two-way radios are available
Apply **nature-based solutions,** Working with Nature, soft engineering	Ensure availability of **transport** and **accommodation** for personnel during an incident

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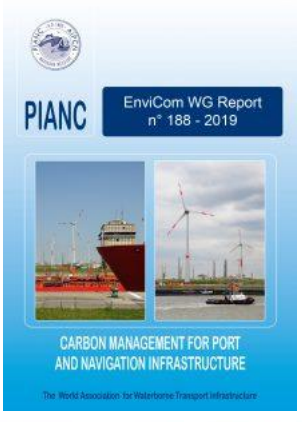
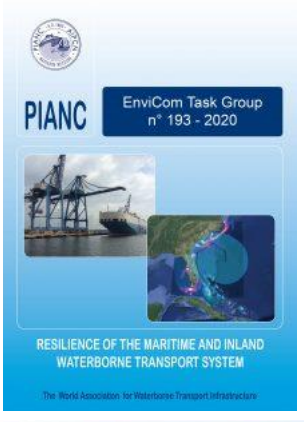
PIANC
Other Working Group Reports





➢Free to download for PIANC members

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Navigating a Changing Climate Initiative

- A Marrakech Partnership 'Global Climate Action' Initiative
- Led by PIANC
- Partners:
  - International Association of Ports and Harbors (IAPH)
  - International Harbour Masters' Association (IHMA)
  - International Maritime Pilots' Association (IMPA)
  - Smart Freight Centre (SFC)
  - European Dredging Association (EuDA)
  - European Sea Ports Organisation (ESPO)
  - Institute of Marine Engineering, Science and Technology (IMarEST)
  - Inland Waterways International (IWI)
- 55 'Supporter' organisations including UNCTAD Trade and Logistics Branch

https://navclimate.pianc.org/

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Navigating a Changing Climate Objectives

- To improve sector-wide **awareness … *still a significant challenge!***
- To create and facilitate knowledge networks to share experiences and identify/**address gaps**
- To develop **technical good practice guidance**, training opportunities and web-based resources
- To provide a coordinated, global **focal point** for waterborne transport infrastructure owners, operators and users
- To contribute to the UNFCCC Marrakech Partnership **non-state actor process** e.g. to the Climate Action Pathways

See our Action Plan at http://navclimate.pianc.org

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Navigating a Changing Climate
Extreme Weather Survey

- Climate change means design/operational thresholds will be exceeded …
  - Regularly due to slow onset changes, or
  - Occasionally – and potentially catastrophically – because of extreme meteorological, hydrographical or oceanographic events
- Changes represent risks to business, life, property and the environment
- **Gap analysis**: **lack of data on consequences of inaction may be a barrier to justifying investment in improving climate-resilience**
- Survey therefore developed and piloted to gather high-level data on costs and consequences of extreme weather events
- Covers not only damage, clean-up and additional maintenance costs, but also the consequences of closures, downtime and delays
- Considers wider issues, for example role of warning systems
- 67 responses; parallel data collection exercise identified further 47 events

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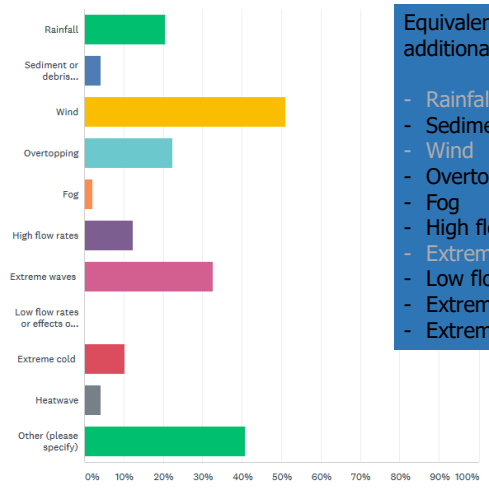
Main characteristics of this event that caused problems for your port or waterway (select all that apply)

Answered: 49 Skipped: 18



Equivalent characteristics for the additional 47 extreme events

- Rainfall 23%
- Sediment 2%
- Wind 83%
- Overtopping 10%
- Fog 0
- High flow/water level 0
- Extreme waves 45%
- Low flow 0
- Extreme cold 10%
- Extreme heat 0

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NAVIGATING A CHANGING CLIMATE

Extreme Weather Survey
Initial outcomes

- >40% responses involved a closure/downtime of 24 hours or more
- Closure/downtime costs were difficult to quantify, but 45% responses considered closure/downtime effects 'significant or critical'
- >30% of survey responses had experienced damage and clean up costs considered 'significant or critical'
- Events causing closures or delays did not always result in damage
- 41% of respondents had experienced an event that was 'unprecedented'
- 53% of survey responses highlighted that this type of event is being experienced more frequently
- Only 15% respondents have an extreme weather risk assessment, contingency plan and warning system in place
- 23% have no procedures in place to deal with extreme events
- **The waterborne transport sector needs to prepare!**

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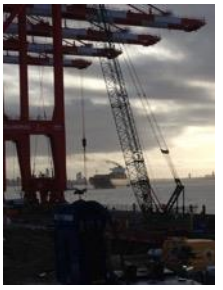
Marrakech Partnership
Climate Action Pathways

- Marrakech Partnership enables collaboration between UNFCCC governments and initiatives representing non-state-actors e.g. cities, regions, businesses and investors
- Transport one of seven themes (also Oceans/Coasts, Water, Energy, Industry, Land-use, Human Settlements)
- Plus cross-cutting Adaptation and Resilience Pathway
- Climate Action Pathways are guided by long-term goals of Paris Agreement and undertaken in the context of SDGs
- Actions for policy, finance, business, research, civil society
- Deadlines to 2021, 2025, 2030 and 2040
- First Pathways prepared in 2019; now being updated
- Attention to adaptation in Transport theme has been limited, but now at least on the agenda …



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Thanks for listening!

http://navclimate.pianc.org/

jan@janbrooke.co.uk

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