



**Boudewijn van de Veire**  
**Jan De Nul (Australia) Pty Ltd**

29 August 2024

# Sand as a resource

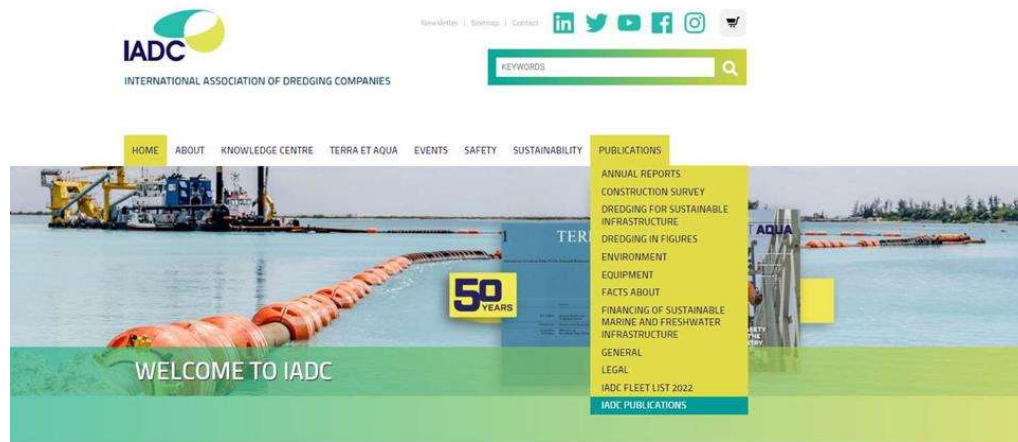
## Best practices to conduct responsible dredging projects



# ABOUT IADC



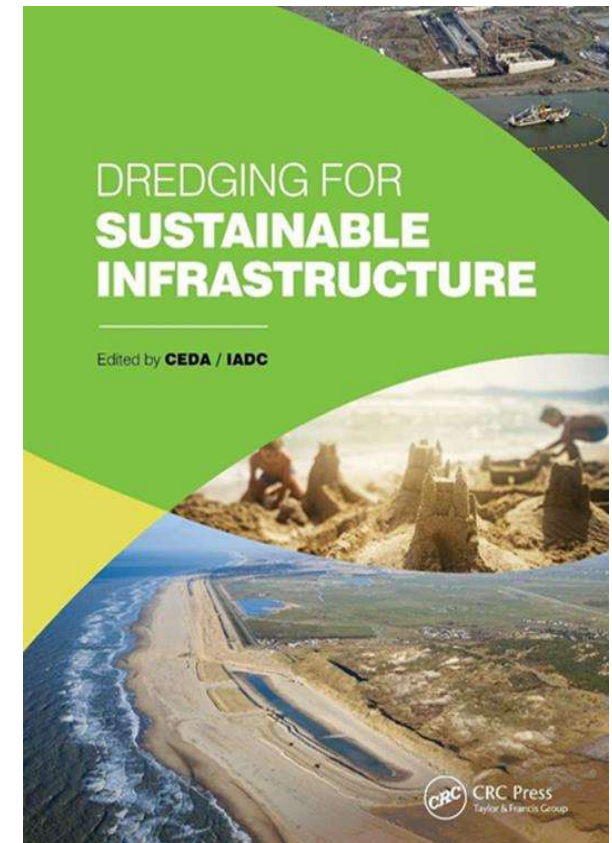
# ABOUT IADC



HOME

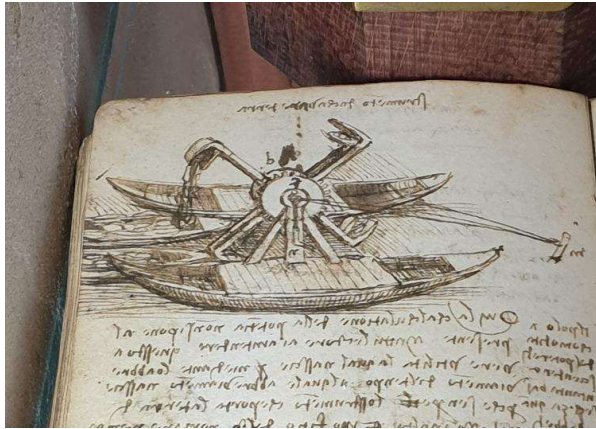
The International Association of Dredging Companies (IADC) is the global umbrella organisation for contractors in the private dredging industry: an industry that makes the world a safer, better and more sustainable place to live. IADC is driven to help that industry move forward with a variety of activities and publications, all of which can be found on this website.

[www.iadc-dredging.com](http://www.iadc-dredging.com)

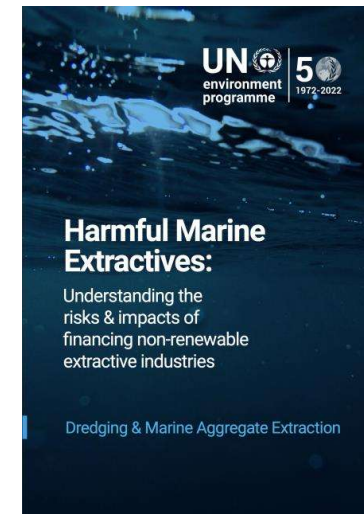
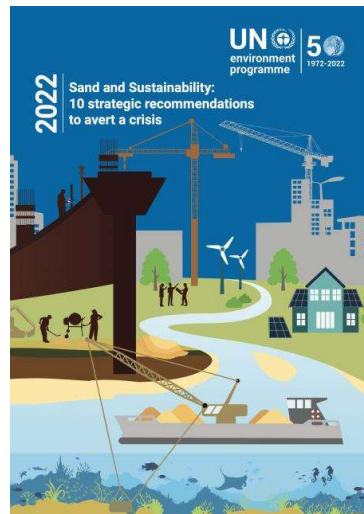
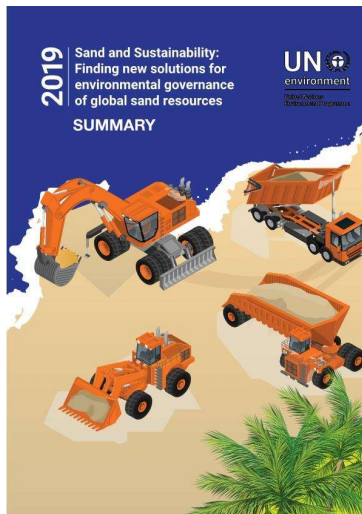




# DREDGING FOR CENTURIES



## REASON FOR THE PAPER



- UNEP, Sand and sustainability (2019, 2022)
- UNEP FI, Turning the Tide (2021)
- UNEP FI, Harmful Marine Extractives (2022)



Overview of Dredging sector efforts to reduce impacts for the general public

## UNEP 2022 SAND AND SUSTAINABILITY



“Sand, gravel, crushed stone and aggregates (hereinafter **sand resources**) are the **second most exploited** natural resource in the world after water, and their use has tripled in the last two decades to reach an estimated **40-50 billion metric tons** per year, driven by factors such as urbanisation, population growth economic growth, and climate change. Sand resources play a **strategic role** in delivering ecosystem services, vital infrastructure for economic development, securing livelihoods within communities as well as maintaining biodiversity. Sand is the **key raw material** in concrete, asphalt and glass that built our infrastructure. **Sand is also used** for land reclamation as well as flood protection in coastal areas, part of the efforts to protect eroding coasts and address climate change impacts such as sea-level rise and increasingly severe storms. **Satisfying a growing sand demand without transgressing planetary boundaries represents an important and insufficiently recognized sustainability frontier.**”

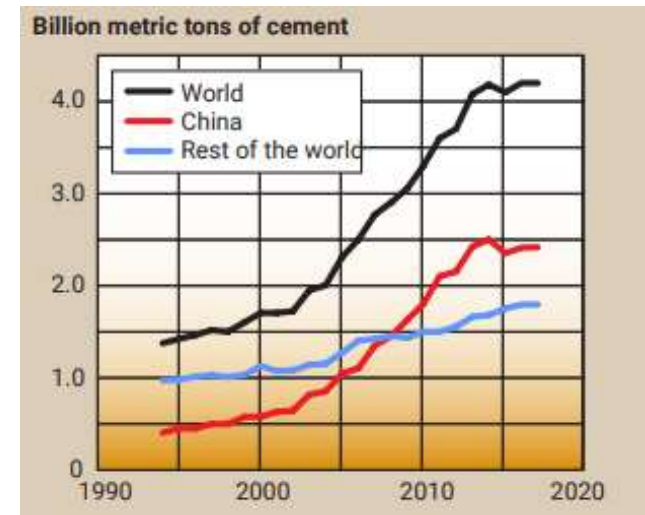
# UNEP RECOMMENDATIONS

<b>Recommendation 1</b>	<b>Recognise sand as a strategic resource</b> that delivers critical ecosystem services and underpins the construction of vital infrastructure in expanding towns and cities globally.
<b>Recommendation 2</b>	<b>Include place-based perspectives for just sand transitions</b> , ensuring the voices of all impacted people are part of decision-making, agenda-setting and action.
<b>Recommendation 3</b>	<b>Enable a paradigm shift to a regenerative and circular future.</b>
<b>Recommendation 4</b>	<b>Adopt strategic and integrated policy and legal frameworks</b> horizontally, vertically and intersectionally, in tune with local, national, and regional realities.
<b>Recommendation 5</b>	<b>Establish ownership and access to sand resources</b> through mineral rights and consenting.
<b>Recommendation 6</b>	<b>Map, monitor and report sand resources</b> for transparent, science-based and data-driven decision-making.
<b>Recommendation 7</b>	<b>Establish best practices and national standards, and a coherent international framework</b>
<b>Recommendation 8</b>	<b>Promote resource efficiency &amp; circularity</b> by reducing the use of sand, substituting with viable alternatives and recycling products made of sand when possible.
<b>Recommendation 9</b>	<b>Source responsibly</b> by actively and consciously procuring sand in an ethical, sustainable, and socially conscious way.
<b>Recommendation 10</b>	<b>Restore ecosystems and compensate for remaining losses</b> by advancing knowledge, mainstreaming the mitigation hierarchy, and promoting nature-based solutions.



## FACTS

- The use has tripled in the last 2 decades to reach an estimated **50 billion metric tons per year**
- 2-4% originates from dredging by IADC members = 1-2 billion tons
- Recommendation 7: ***Establish best practices and national standards, and a coherent international framework***



Data sources: Minerals commodities, USGS, 2018.  
Graphs: UNEP/GRID-Geneva, 2018



# THE GROWING FOCUS ON SUSTAINABILITY



World Organisation of Dredging Associations  
CENTRAL DREDGING ASSOCIATION  
EASTERN DREDGING ASSOCIATION  
WESTERN DREDGING ASSOCIATION

## WODA PRINCIPLES OF SUSTAINABLE DREDGING

Dredging and dredged material management are essential if we are to maintain and improve our quality of life and economic well-being. This is achieved through the creation and maintenance of water-based infrastructure by navigation dredging and reclamation; enhancing environmental quality by beach nourishment or environmental dredging to remove contaminated sediments; providing flood control; producing minerals and construction materials, and supporting offshore energy production, including renewable energy.

By adhering to principles of sustainability that include working with natural systems to integrate these actions, the goals of environmental quality and economic prosperity can both be achieved.

WODA's objective is to achieve sustainable dredging through implementation of the following principles:

1. From the start and throughout each stage of a dredging project, social, environmental, and economic objectives should be systematically considered and integrated.
2. Development of a project design should identify how to work with natural processes and the site-specific characteristics of ecosystems to achieve the project's objectives, including understanding of the carbon footprint of a dredging project.
3. Project proponents, regulatory authorities and the broad range of stakeholders should be engaged at the earliest conceptual stage in the development of dredging projects. Active collaboration in the development of projects is the key to achieving maximum social, environmental, and economic benefits.
4. Scientifically based criteria, performance guidelines and environmental safeguards for dredging and dredged material management are essential to provide clear directions to project owners, planners and executing companies.
5. Dredged material management should be based upon a holistic and systematic understanding of the ecosystem and natural processes. Beneficial use of dredged materials, such as placement of sediment to nourish shorelines or to enhance or restore wetland ecosystems/marshes and upland habitat, should be given priority.
6. Dredging can be a key solution for remediation and restoration at historically contaminated aquatic sites.
7. Analysis of monitoring and assessment information before, during and after project implementation provides a basis for effective and sustainable project management.

Through the application of these principles of sustainable dredging, WODA believes that dredging will contribute to sound solutions that improve our well-being and protect our aquatic environment for future generations.

Anders Jensen  
Chairman WODA Board of Directors

6 June 2013  
Brussels, Belgium



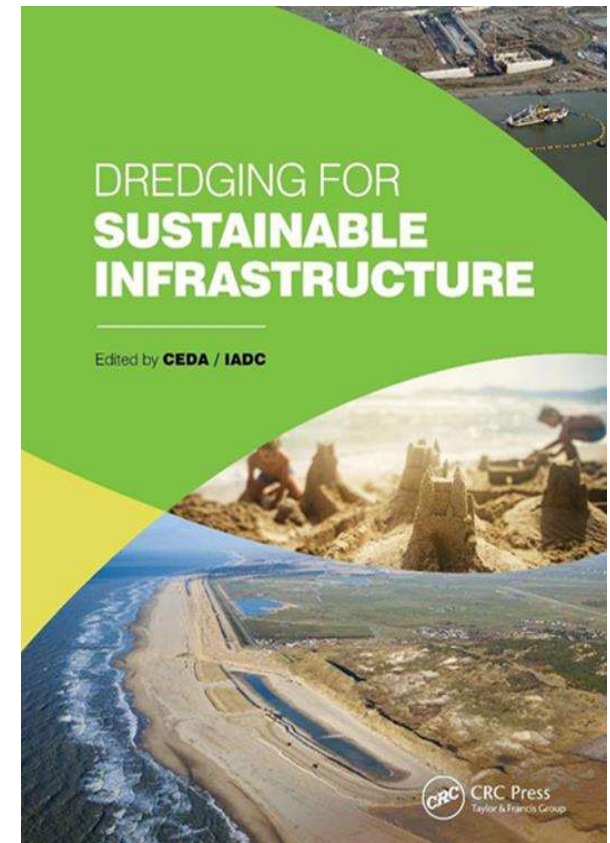
PIANC  
*'Setting the course'*

Report n° 100 - 2009



Dredging Management Practices  
for the Environment  
A Structured Selection Approach

The World Association for Waterborne Transport Infrastructure








DREDGING FOR  
**SUSTAINABLE  
INFRASTRUCTURE**




Edited by CEDA / IADC

CRC CRC Press  
Taylor & Francis Group

# RECOGNISED IMPACTS OF DREDGING

Environmental impacts	
	Loss or reduction in marine biodiversity including loss of endangered, threatened and protected species
	Loss of ecosystem resilience and provision of ecosystem services
	Loss or degradation of coastal and marine habitats
	Reduction in animal welfare
	Increased GHG concentrations

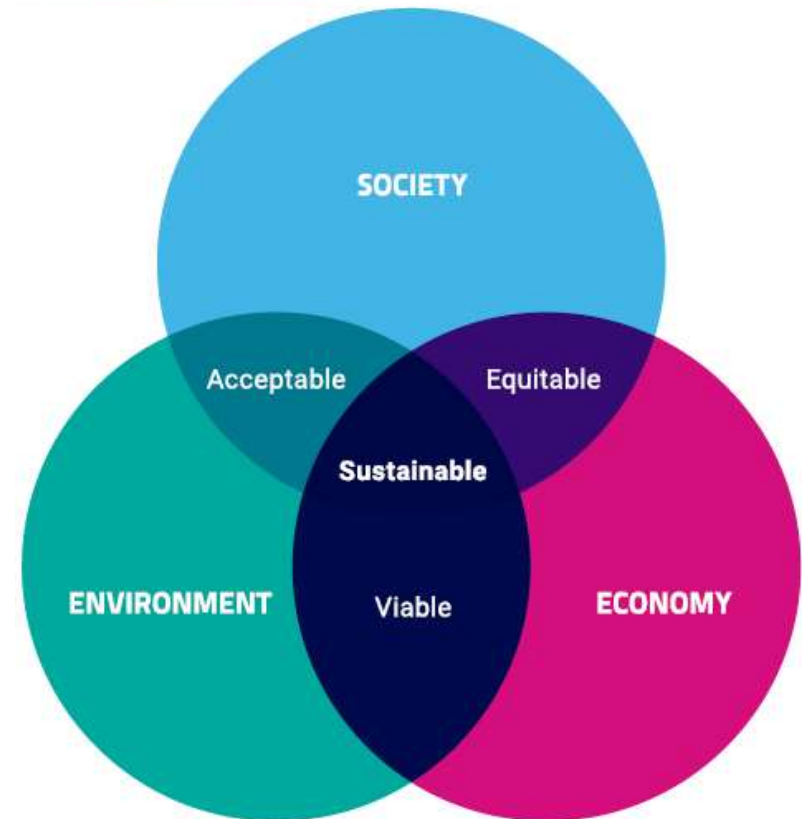
	Changes to marine biological, chemical and geological cycles
Social impacts	
	Violation of human rights including rights of indigenous communities
	Reduction or loss of access to sustainable and inclusive livelihoods
	Increased likelihood of injury, disease or loss of life

	Economic damage and loss of productivity
	Inequality of opportunities on the basis of age, sex, disability, race, ethnicity, origin, religion or economic or other status
	Perceived degradation in cultural value of the environment

## ADDRESSING SOCIETAL CONCERNS

- Project Level
  - Reducing impacts before construction starts
- Operational Level
  - Reducing impacts during the construction of a project

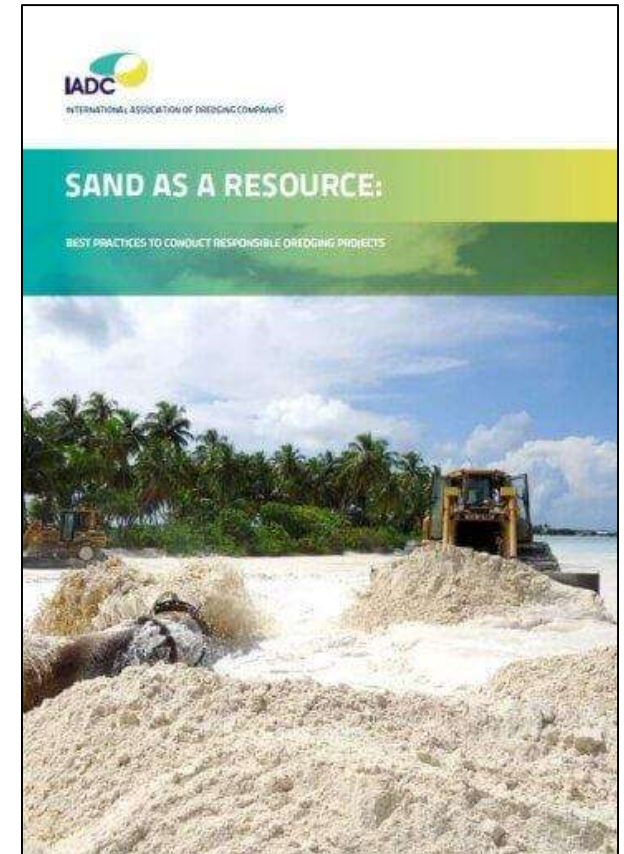
The three pillars of sustainability.





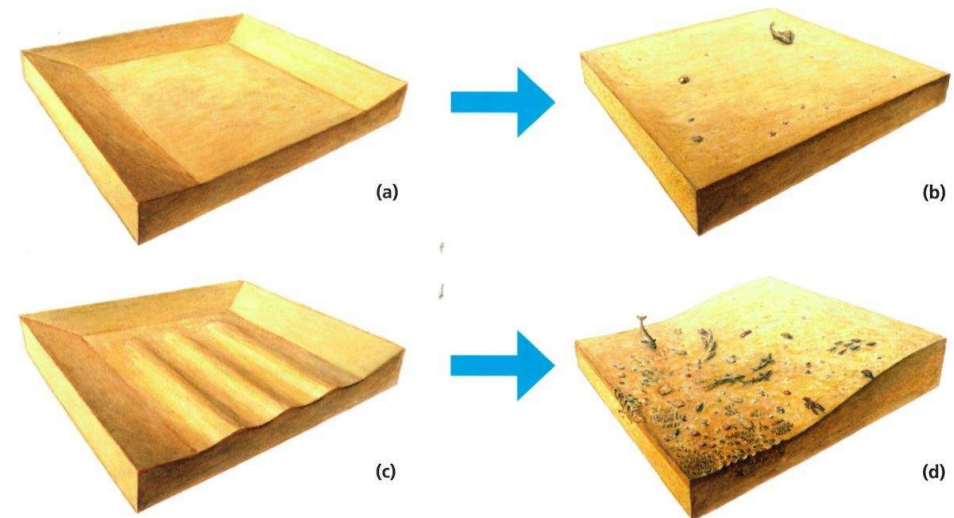
## PROJECT LEVEL APPROACHES

- Quantity of Sand Extracted
- Regional Effects of Sand Extraction
- Regulation and Due Diligence
- Stakeholder Engagement
- **Local Effects** of Sand Extraction



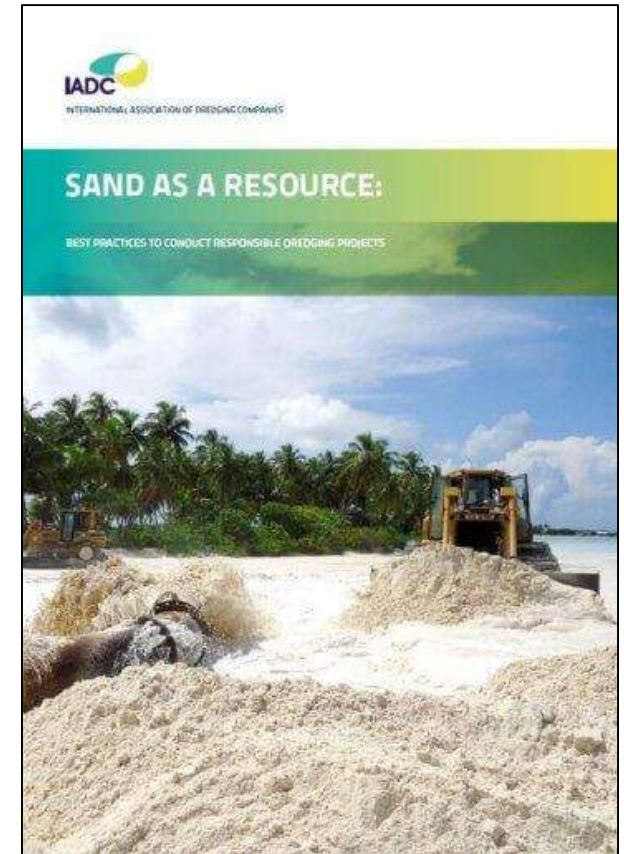
## EXAMPLES: ROTTERDAM

- 220 milion m3 sand
- Maximum extraction depth is 20 m below seabed – reducing foot print



## PROJECT LEVEL APPROACHES

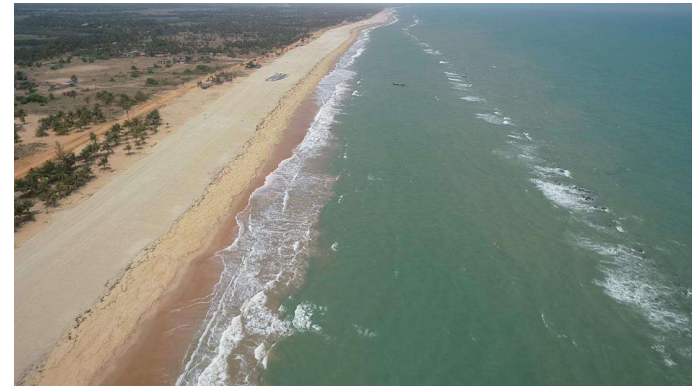
- Adaptive Management
- Early Contractor Involvement
- **Procurement** Process
- Socio-economic Contribution
- Innovation and Contribution
- **Nature inspired** design





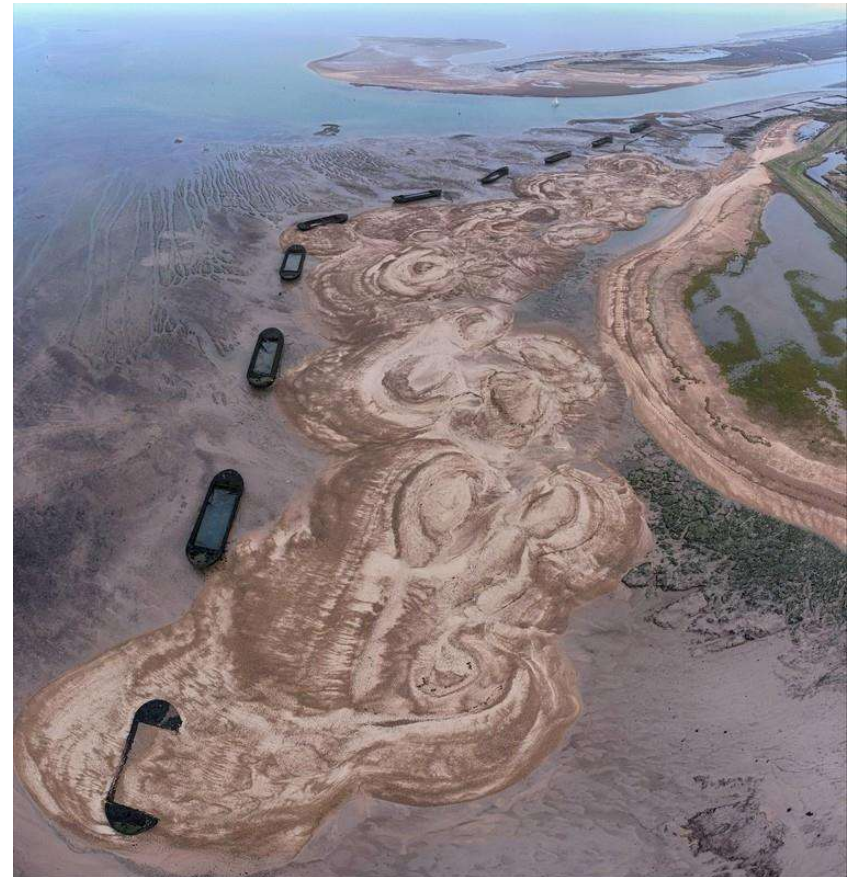
## EXAMPLE: BENIN

- Coastal erosion Benin
- Inspired on coral reefs
- 5 km long underwater breakwater in front coast
- Energy reduction 60%
- Environmental study 2024, 6 years after installation
- Valuable marine habitat
- Visible increase in marine biodiversity



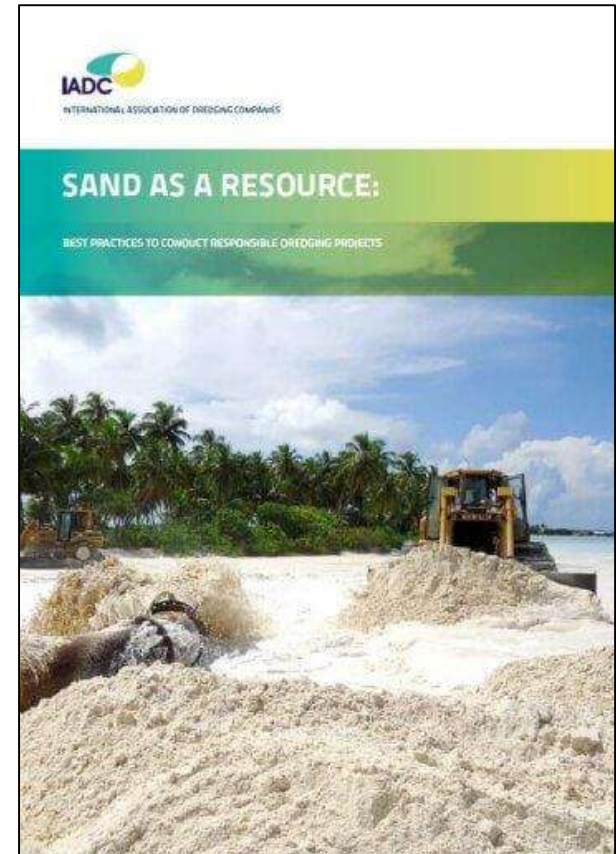
## EXAMPLE: BENEFICIAL USE OF SEDIMENTS

- Beneficial use of dredged sediments
- Example: Horsey Island (UK)
- The sand and shingle from Harwich Haven Channel Deepening was used to create mudflat, marsh and shingle pit habitats.



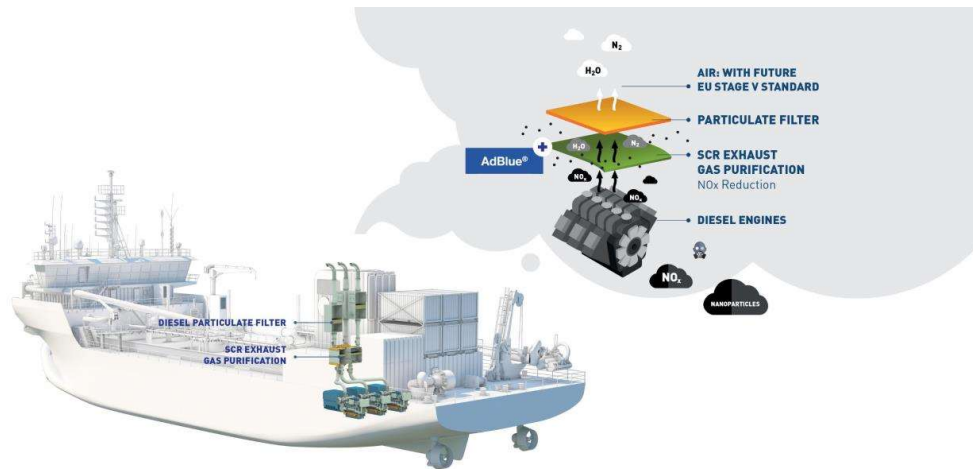
## OPERATIONAL LEVEL APPROACHES

- Accidental Impacts
- Sediments Spreading
- Sound and Light
- Greenhouse Gas Emissions
- **Air Pollution**





## EXAMPLE: AIR POLLUTION



- Cleaner Fuels:
  - LNG
  - Methanol / Ammonia
  - Use of Bio fuel

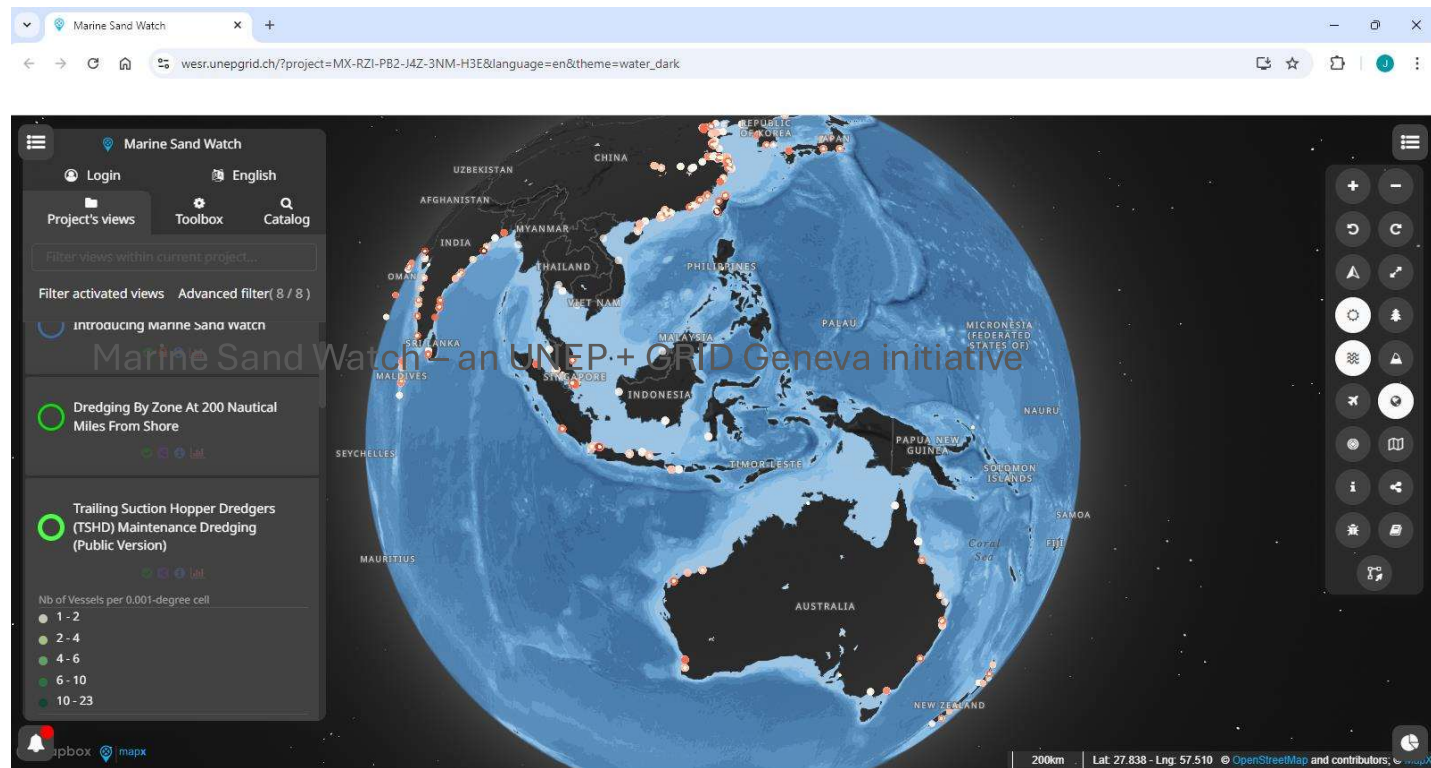


## KEY TAKEAWAYS OF PAPER

- Do and adhere to an ESIA
- Monitor and understand the system
- Strict limits and adequate supervision
- Beneficial use of sediment
- Stakeholder engagement
- Adaptive management
- Appropriate procurement processes
- Invest in innovation and safety culture
- Local socio-economic community
- Transparency about activities

## EXAMPLE: MARINE SAND WATCH

- An UNEP + GRID Geneva initiative



## COMMITMENT

IADC members commit to:

- Responsible dredging by disseminating best practices
- Contribute to new standards and regulations
- Engage in dialogue with a wide group of stakeholders
- Invest in Innovations







INTERNATIONAL ASSOCIATION OF DREDGING COMPANIES



<https://www.iadc-dredging.com/publication/paper-sand-as-a-resource/>

**THANK YOU**

