

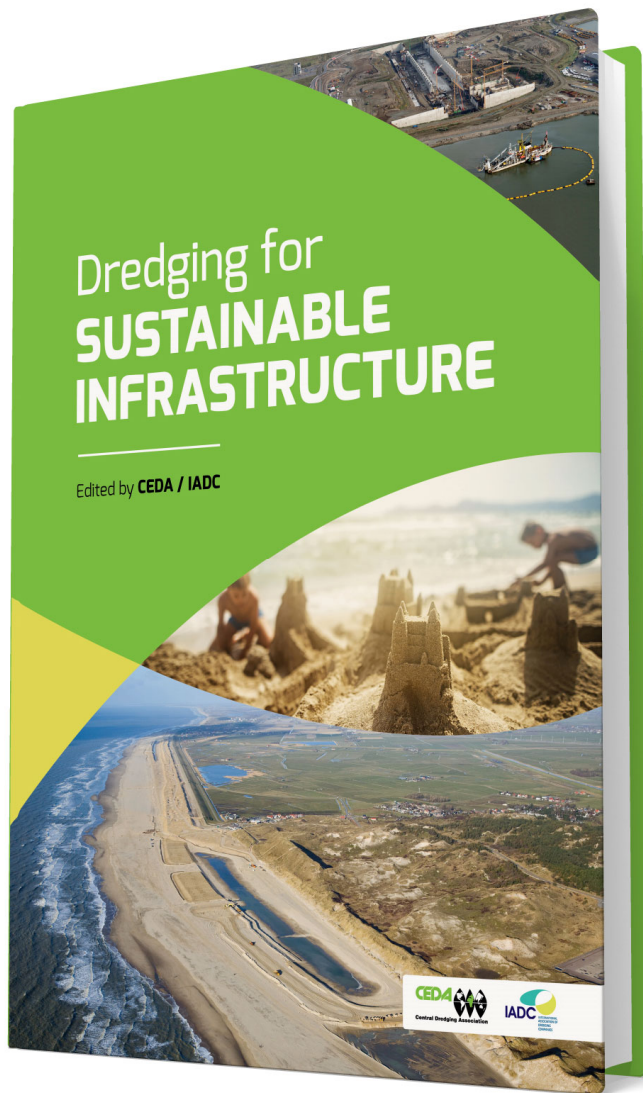


# Dredging for Sustainable Infrastructure A Holistic Approach

Stany Pensaert - DEME



INTERNATIONAL ASSOCIATION OF DREDGING COMPANIES



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

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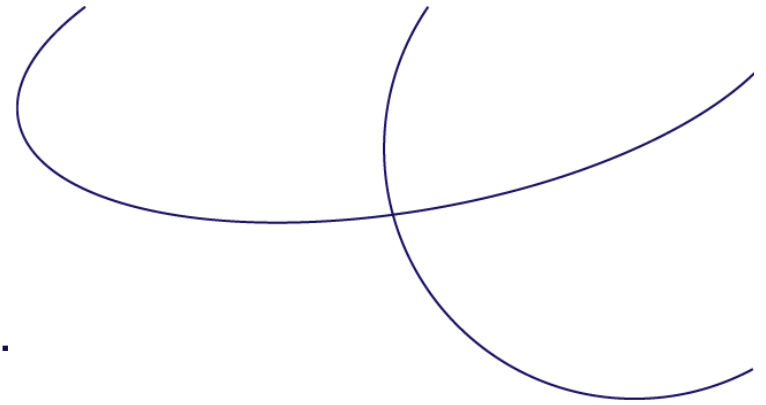


# DEME

Dredging, Environmental  
& Marine Engineering



# DREDGING IN THE PAST



Men...

- shaped the world against nature
- Destroyed ecosystems
- Driven by economic interests
- Focusing only on primary objectives

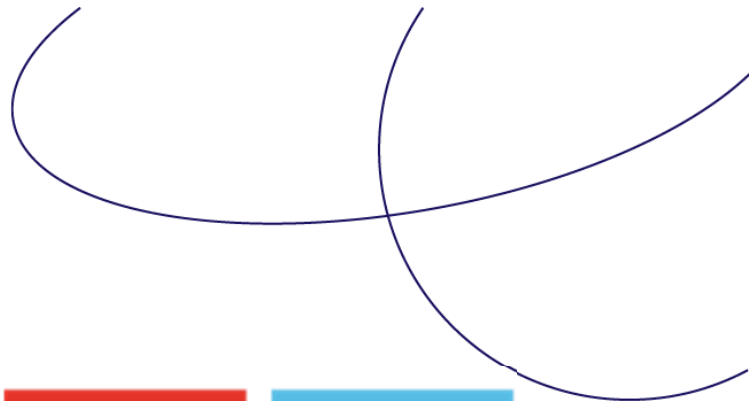
Then...

started to look at and minimize negative impacts

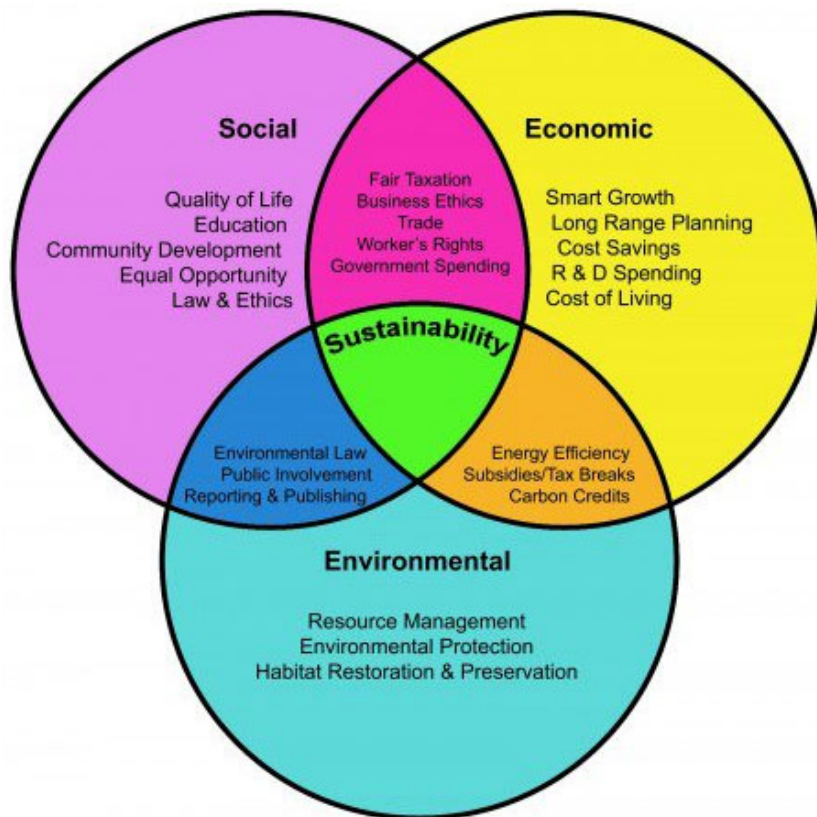
**A focus shift is needed !**



# THE GROWING FOCUS ON SUSTAINABILITY



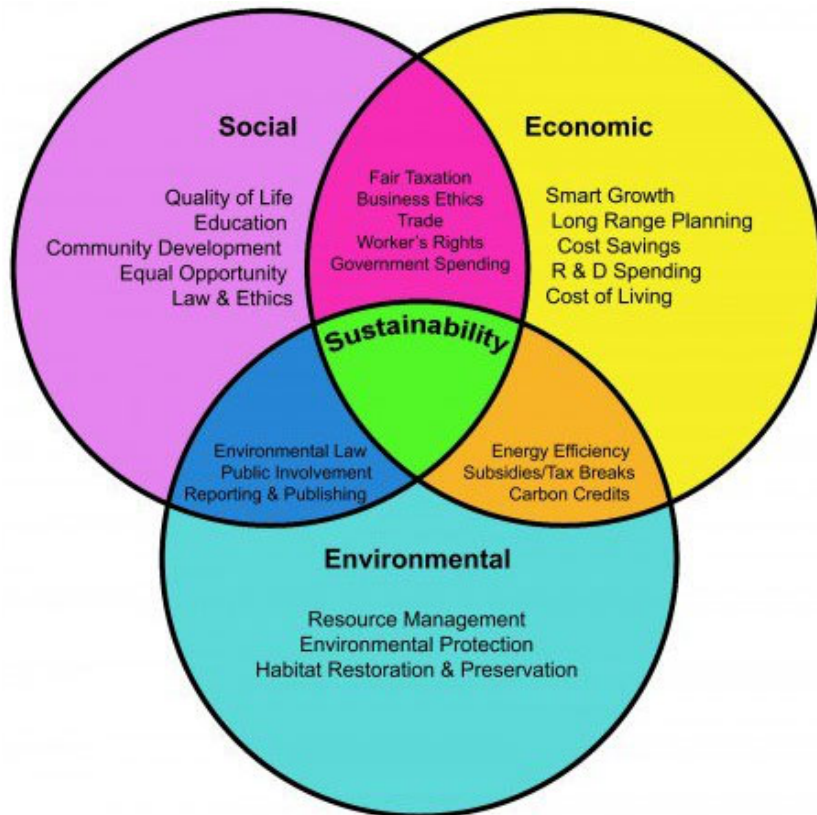
# PILLARS OF SUSTAINABILITY AND WATER INFRASTRUCTURE PROJECTS



Sustainability is achieved in the **development of infrastructure** by **efficiently** investing the resources needed to support the desired **social, environmental, and economic** services generated by infrastructure for the **benefit of current and future generations.**

(Brundtland et al, 1987)

# PILLARS OF SUSTAINABILITY AND WATER INFRASTRUCTURE PROJECTS



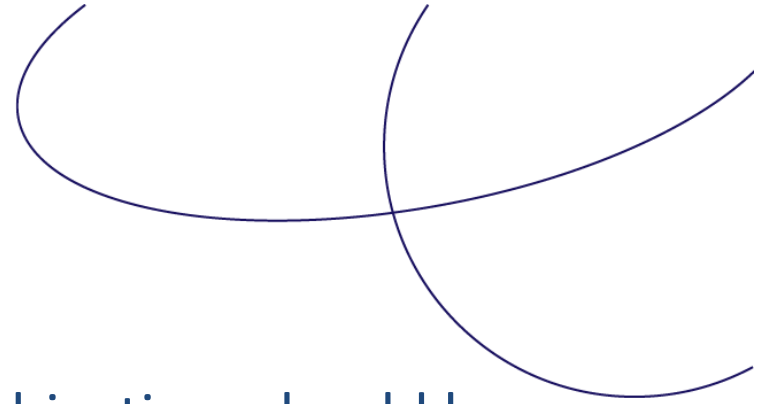
## Principles of sustainable dredging:

**Increase overall value** of the project through the range of services it provides.

**Reduce monetary and non-monetary costs** through efficiency with respect to resources, impacts,...

**Balance** distribution of values and costs among **the three sustainability pillars** over time.

# GUIDANCE TO SUSTAINABLE DREDGING

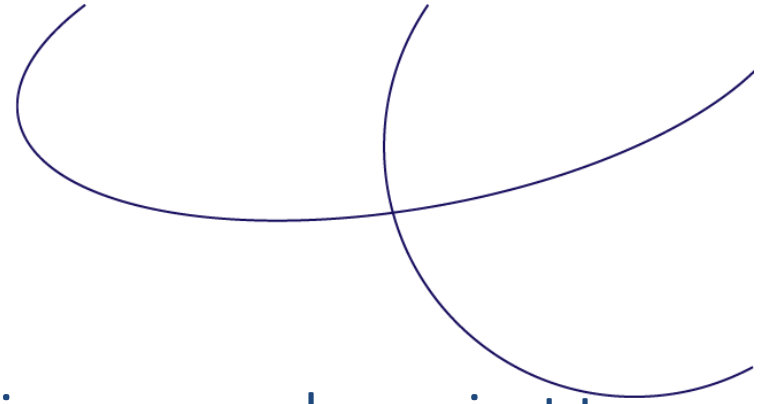


- Social, environmental, and economic objectives should be systematically considered and integrated.
- Work with natural processes
- Stakeholders should be engaged at the earliest conceptual stage
- Use scientifically based criteria and guidelines
- Beneficial use of dredged materials should be given priority
- Dredging can be a key solution for remediation and restoration
- monitoring and assessment information before, during and after project





# VISION AND VALUE CREATION



- Creating additional opportunities within or around a project to **diversify from only the primary economic objective** into the social and environmental pillars.
- Positive social values: recreational, educational, community resilience might create on its own new economic opportunities.
- Environmental values: ecosystem services, habitat resources,...

**Use the momentum of a project to create added values !**



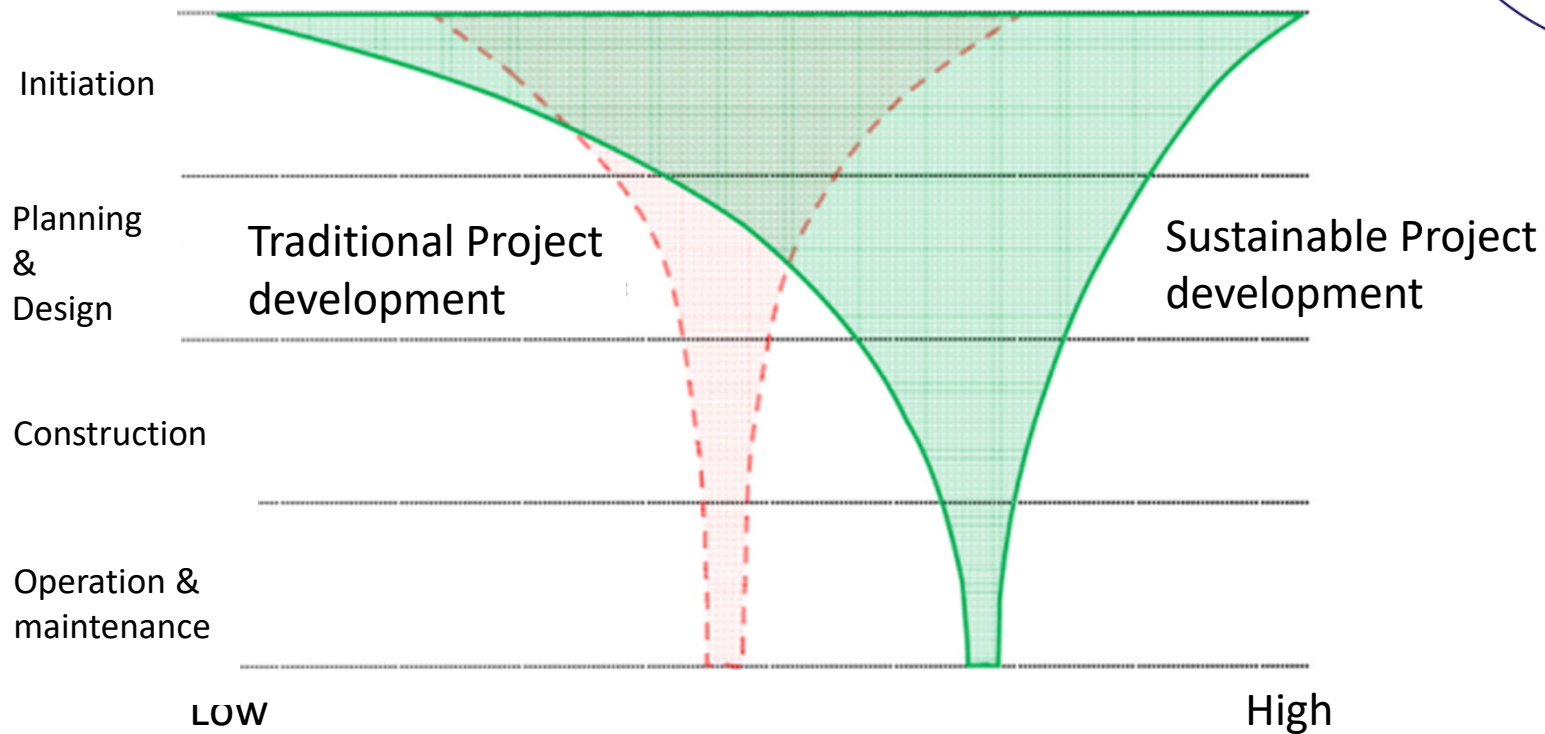
# STAKEHOLDER ENGAGEMENT TO INCREASE PROJECT VALUE



- Stakeholders involvement from the conceptual stage.
- Various disciplines
- Increase value of the projects
- Diversify the benefits over the three pillars of sustainability
- Create support of the population
- Risk reduction

► CO-CREATION

# STAKEHOLDER INVOLVEMENT & RISK REDUCTION



Succes of environmental and societal project implementation



# THE ROLE OF EQUIPMENT AND INNOVATION

The last decade dredging equipment have been optimized and redesigned from pure working vessels into environmental sound machines, resulting in continuous investment in modern fleet:

- Energy efficiency
- Production efficiency
- Clean fuel and low emissions
- Turbidity minimization



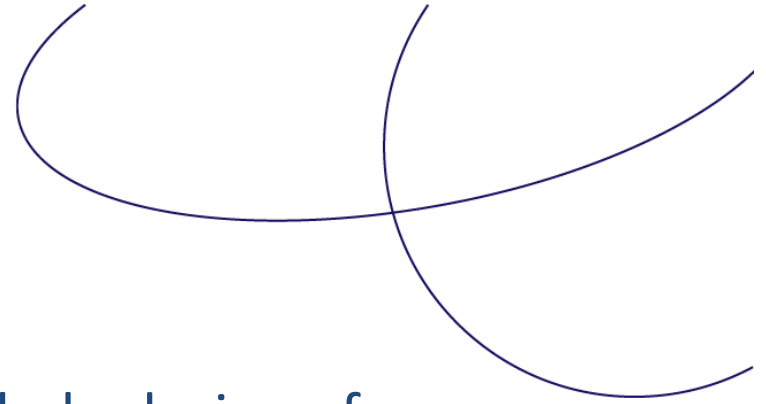
# WISE MANAGAMENT OF DREDGED MATERIAL

Creativity will find ways to manage the dredged material:

- Wetland creation
- Engineering uses: dykes, mudflats,...
- On-land engineered backfill



# MODELLING TOOLS HELP TO DESIGN



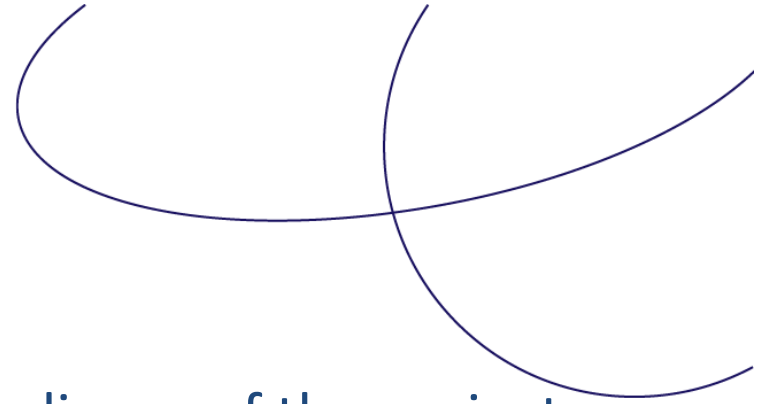
Modelling tools have been developed to help design of:

- Physical effects of dredging: sediment plumes, long-term effects such as re-deposition, consolidation of dredged materials.
- Chemical effects: effect on water quality.
- Biological effects: underwater sound nuisance, impact on plankton and coral reefs.

Modelling will also help to design the optimal working conditions (currents, weather,...) creating minimal impact .



# MONITORING



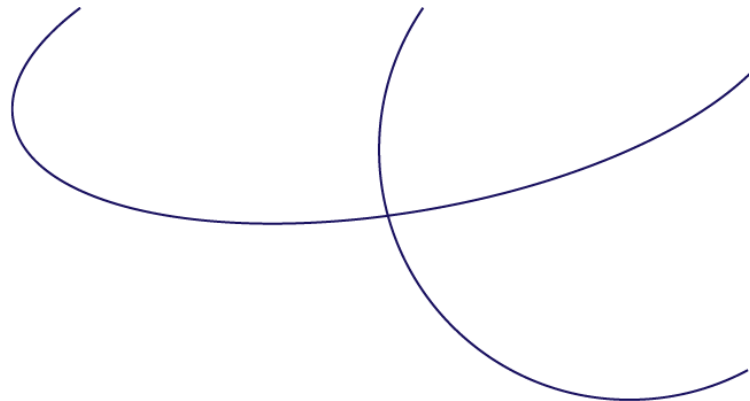
Monitoring support surveillance and compliance of the project during execution:

- Survey: bathymetry, suspended solids,...
- Meteorological parameters
- Water quality
- Production parameters !

Continuous feedback loop for the execution of the works.

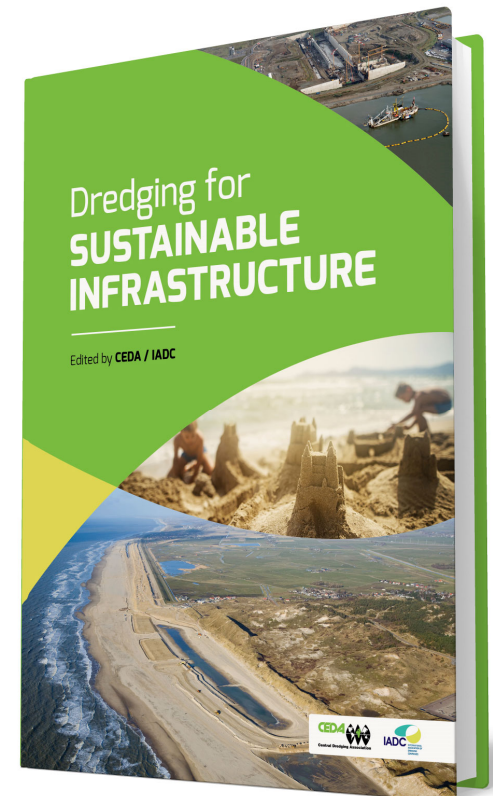


# THE BOOK



Our ambition is to achieve dredging projects that fulfil their **primary functional requirement**, while **adding value** to the (natural and socio-economic) system based on thorough understanding of the natural system and proactive engagement of stakeholders throughout.

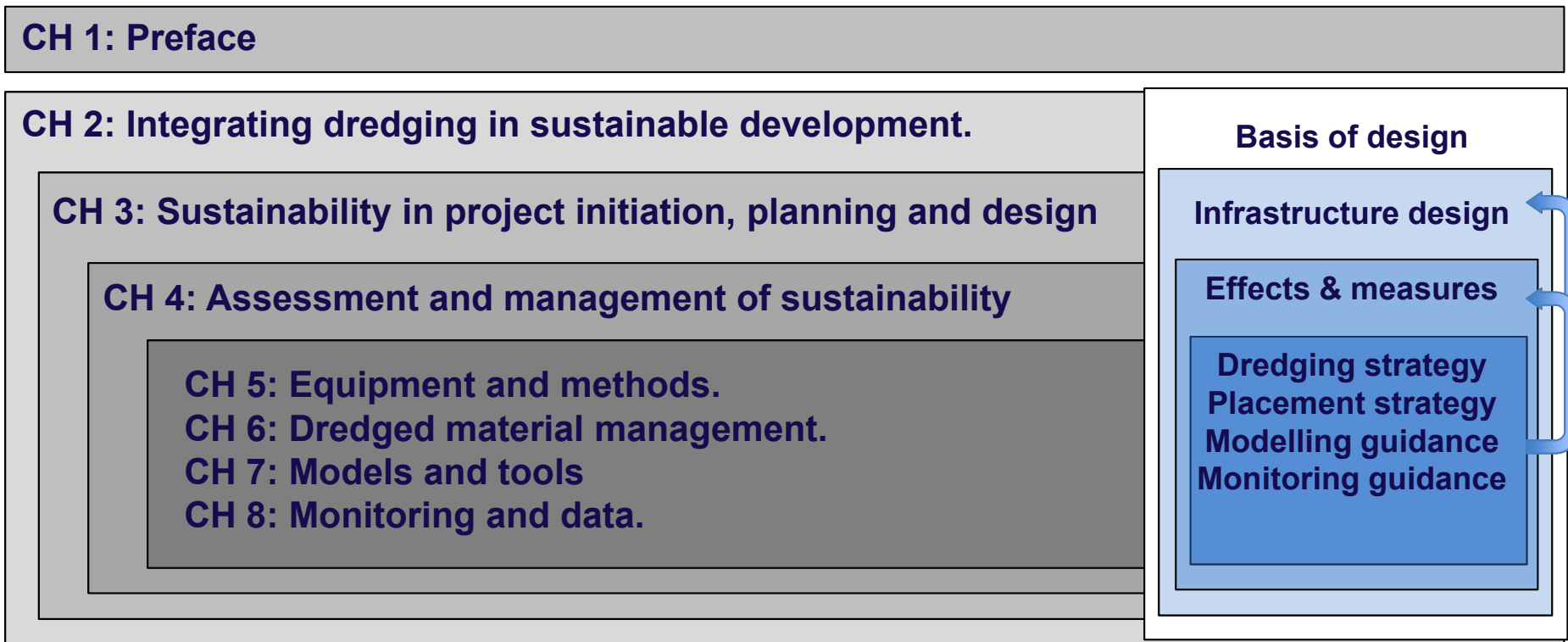
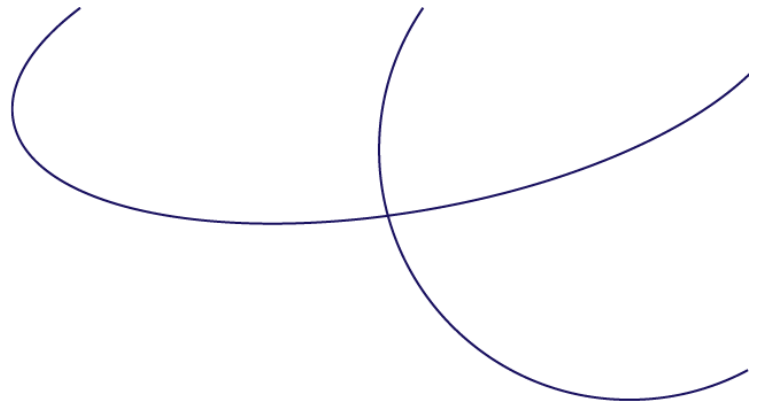
This book provides **guidance** to make this possible.



INTERNATIO



# STRUCTURE OF THE BOOK





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