

Biodiversity & climate change

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IAIA Special Symposium
Climate Change and Impact Assessment
Biodiversity and Ecology Section

Provisioning Services

Goods produced or provided by ecosystems

- Food
 - Crops, livestock
 - Capture Fisheries
 - Aquaculture, wild foods
- Fiber
 - Timber
 - Cotton, hemp, silk
 - Wood Fuel
- Genetic resources
- Biochemicals
- Freshwater



Regulating Services

Benefits obtained from regulation of ecosystem processes

- Air Quality Regulation
- **Climate Regulation**
 - Global (CO₂ sequestration)
 - Regional and local
- Erosion regulation
- Water purification
- Pest regulation
- Pollination
- **Natural Hazard regulation**



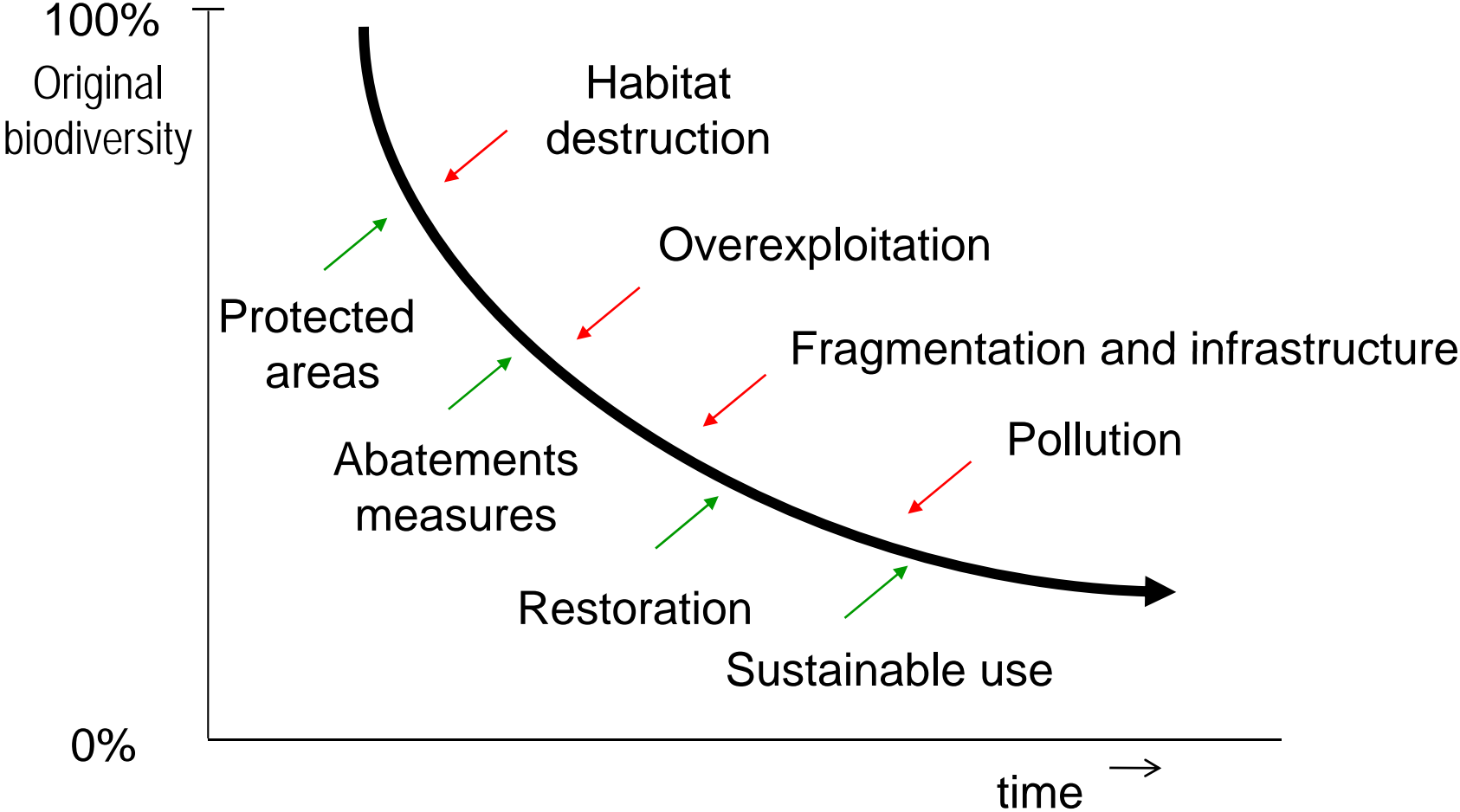
Cultural Services

Non-material benefits obtained from ecosystems

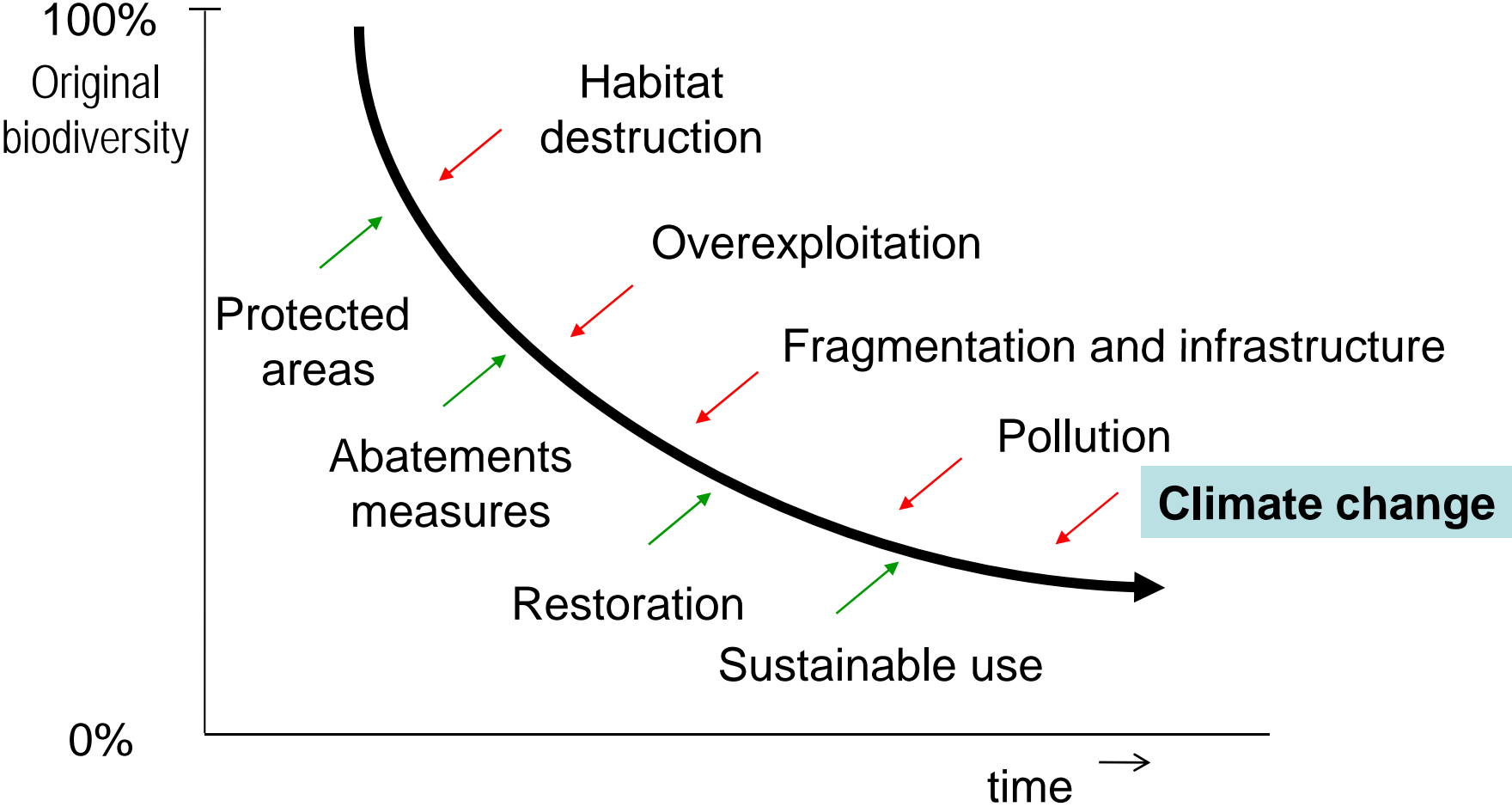
- Spiritual & Religious Values
- Knowledge Systems
- Educational values
- **Inspiration**
- Aesthetic Values
- Social Relations
- Sense of Place
- Recreation and Ecotourism



Provision of services under stress due to...



Provision of services under stress due to...



Conclusion

- Ecosystems provide free services
- Services are under stress due to many factors amongst others climate change
- Solutions
 - Incorporate value of ecosystem services into cost-benefit analyses
 - Mitigation; maintain and rehabilitate forests
 - Green adaptation

Mangrove ecosystem provides “free” services



Mangrove Services:

- nursery and adult fishery habitat
- fuelwood & timber
- carbon sequestration
- traps sediment
- detoxifies pollutants
- protection from erosion & disaster

sump



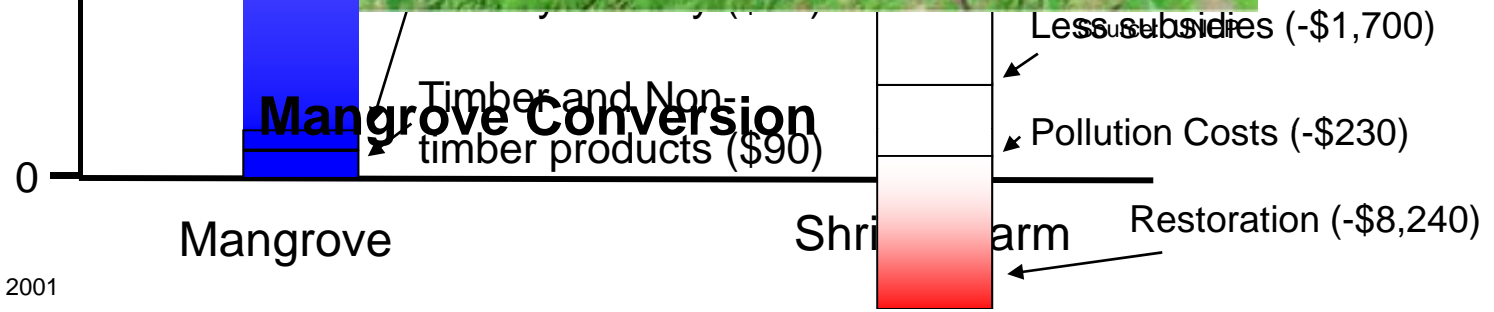
crops

Value
(per hectare)

\$4000



Private Net Present Value per hectare 1987
Mangrove: \$9,100 to \$3,600
Shrimp Farm: \$20,400 to \$200



Source: Millennium Ecosystem Assessment; Sathirathai and Barbier 2001

Value of mangroves in Vietnam

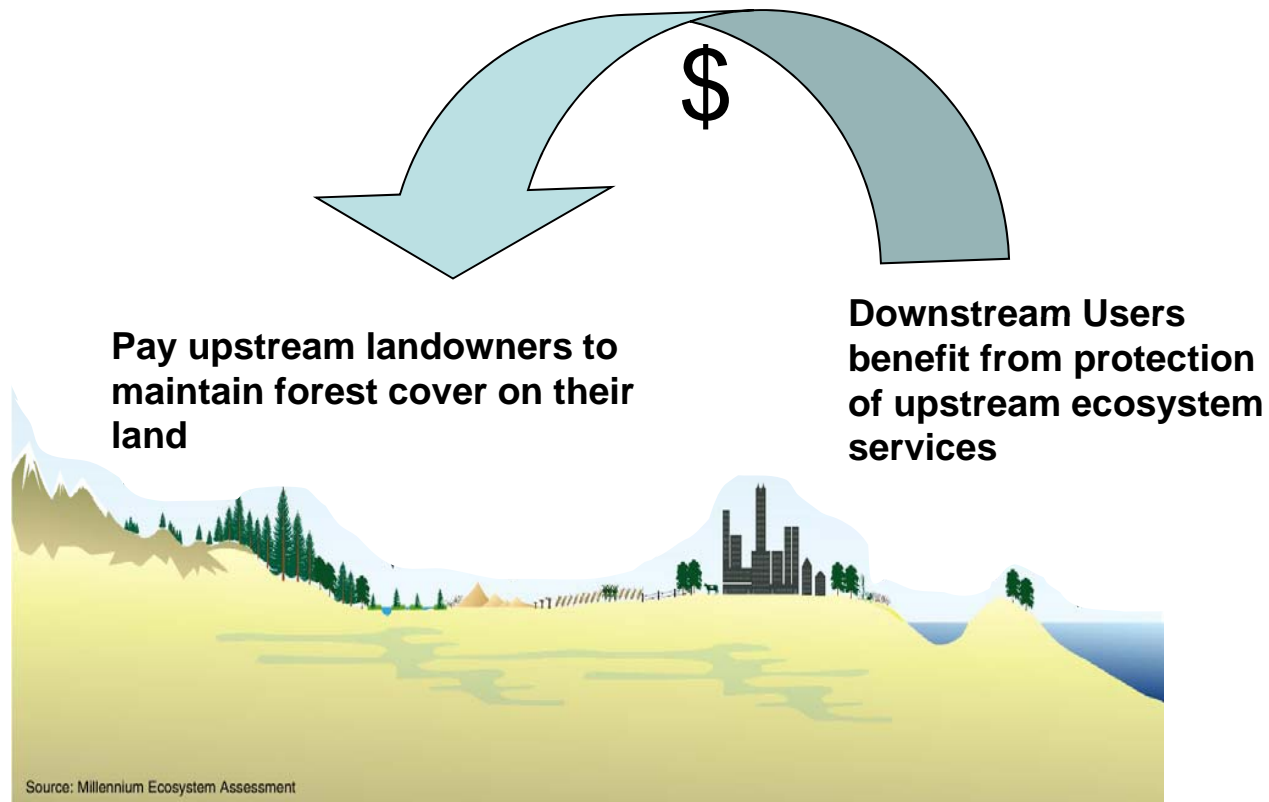
- Planting and protecting nearly 12,000 hectares of mangroves
- Cost US\$ 1.1 million but
- Saved annual expenditures on dyke maintenance of US\$ 7.3 million
(Tallis 2008)

Payments for Ecosystem Services

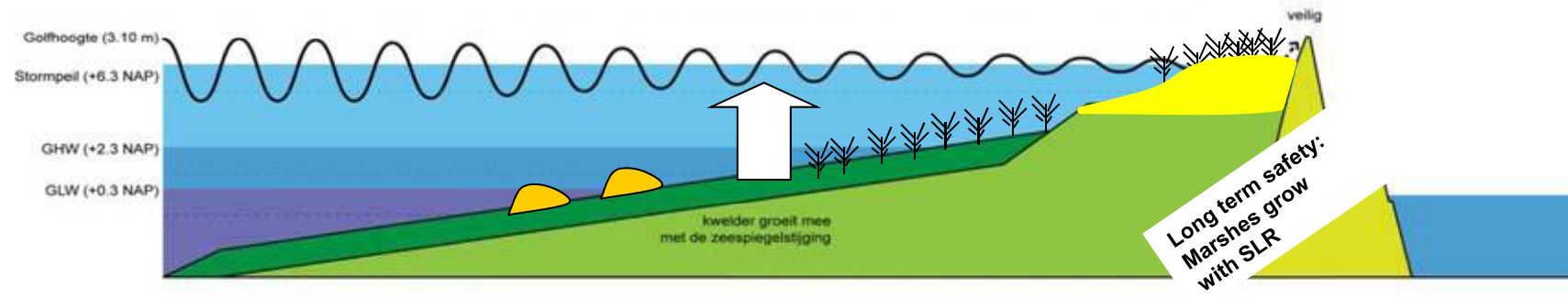
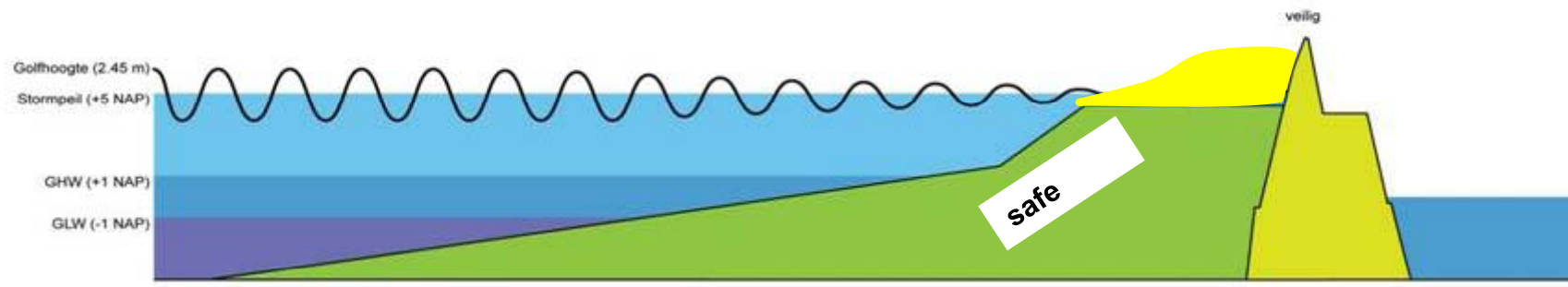
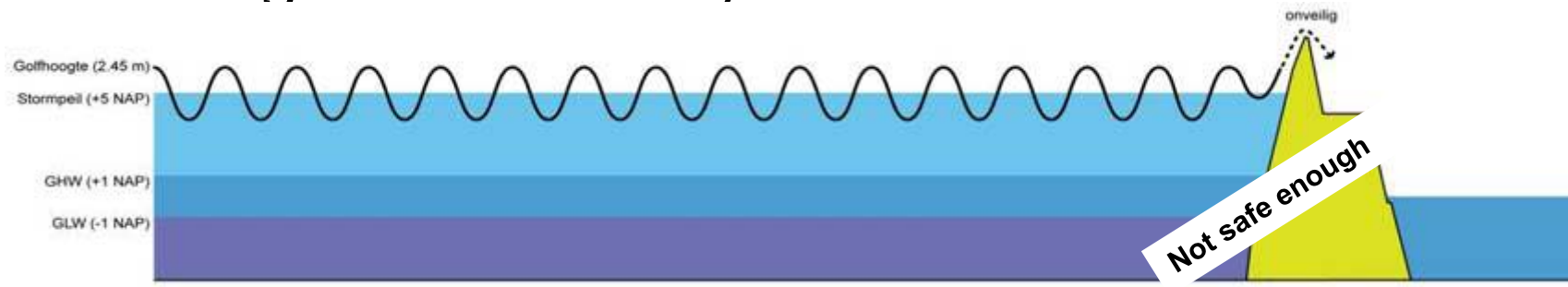
Program established 1997

By 2001: 280,000 ha enrolled at cost of \$30 million

Typical payments: \$35 to \$45 per hectare

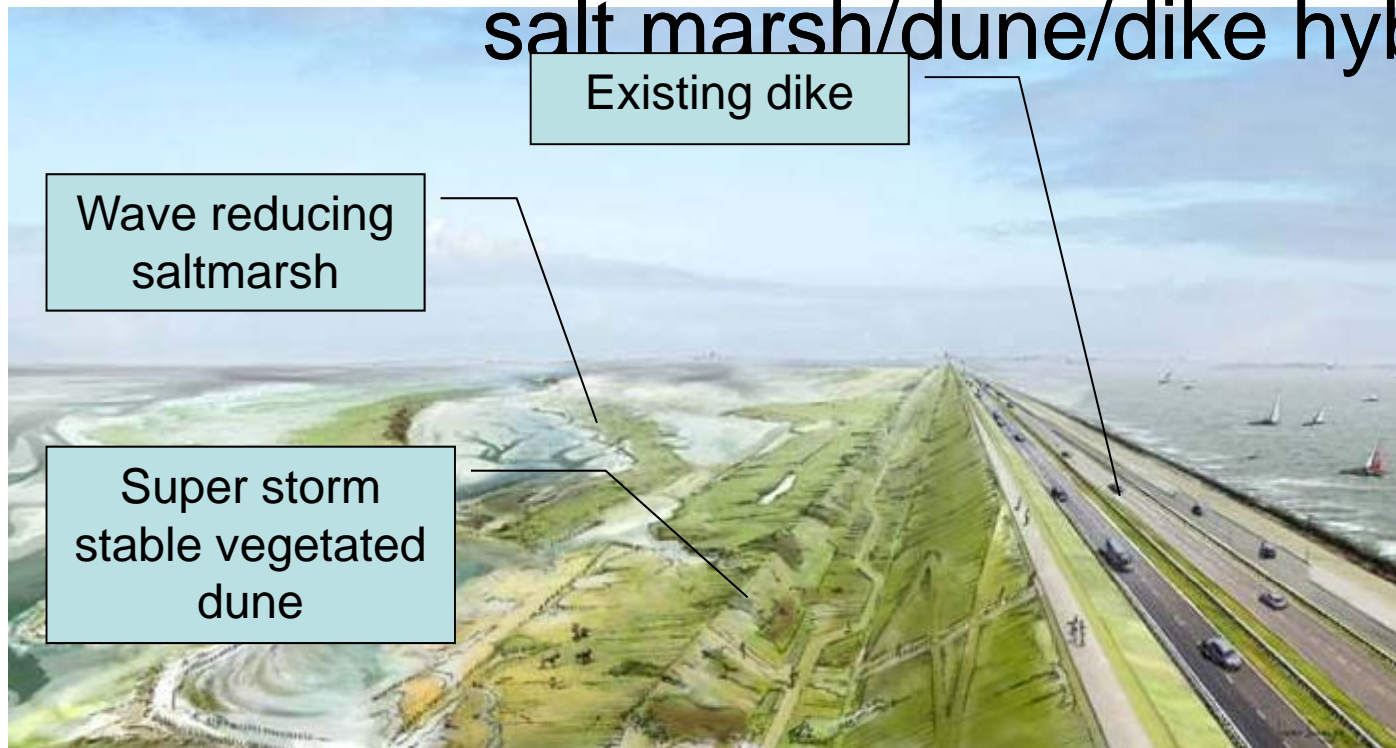


Green Adaptation: Building with nature by marsh and reef creation



Situatie bij een superstorm, 1x per 10.000 jaar

Wadden Sea Dyke: salt marsh/dune/dike hybrid



Debate:

- Technical feasibility
- Cost-benefit
- Conflict with Natura 2000

Scale 500m wide
30km long

Saltmarsh grows with sea level and maintains stability and safety
Flexible, low tech, low maintenance cost, longshore connectivity



Questions – a call to work

- What are the opportunities for green adaptation?
- What opportunities for the enhancement of natural carbon storage can be identified?
- What are opportunities to apply PES?

Proposal for action by the B&E section

- Reviewing the existing scientific literature;
- Taking stock of presently available good practice in and outside the IA community; Disseminate this information to the climate change community.
- Develop guidance on how to deal with climate change in strategic environmental assessment of policies, plans and programmes for a number of priority sectors
- Disseminate this information to relevant international bodies and practitioners fora. Publicise the role of biodiversity inclusive impact assessment in the climate change debate.