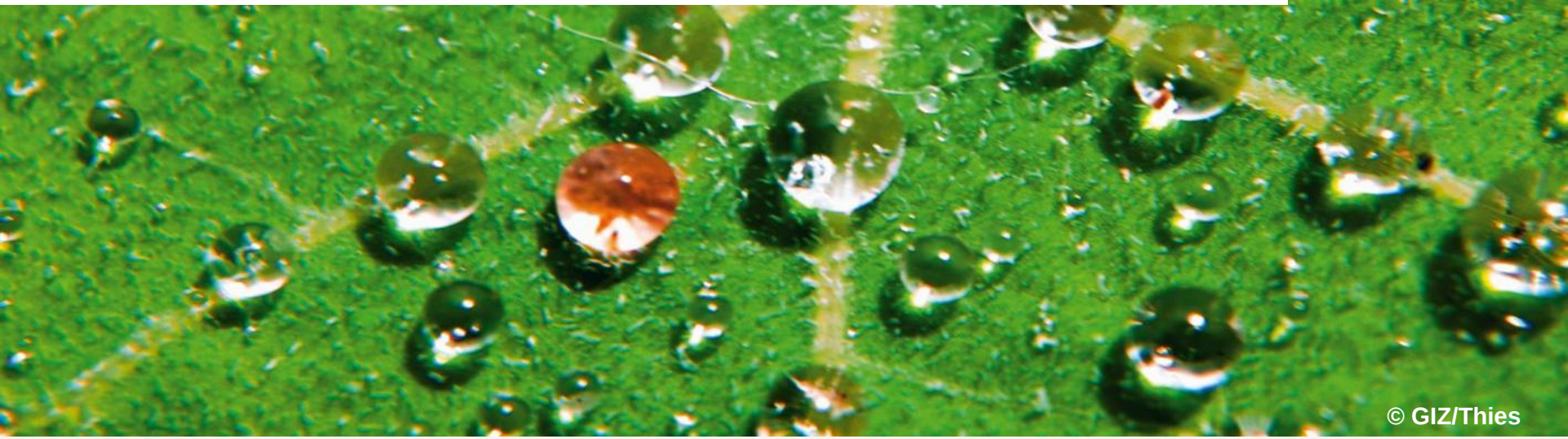
Ecosystem-based Adaptation in the Water Sector



1. Definition, Measures and Benefits

Ecosystem-based Adaptation (Eba) in the Water Sector

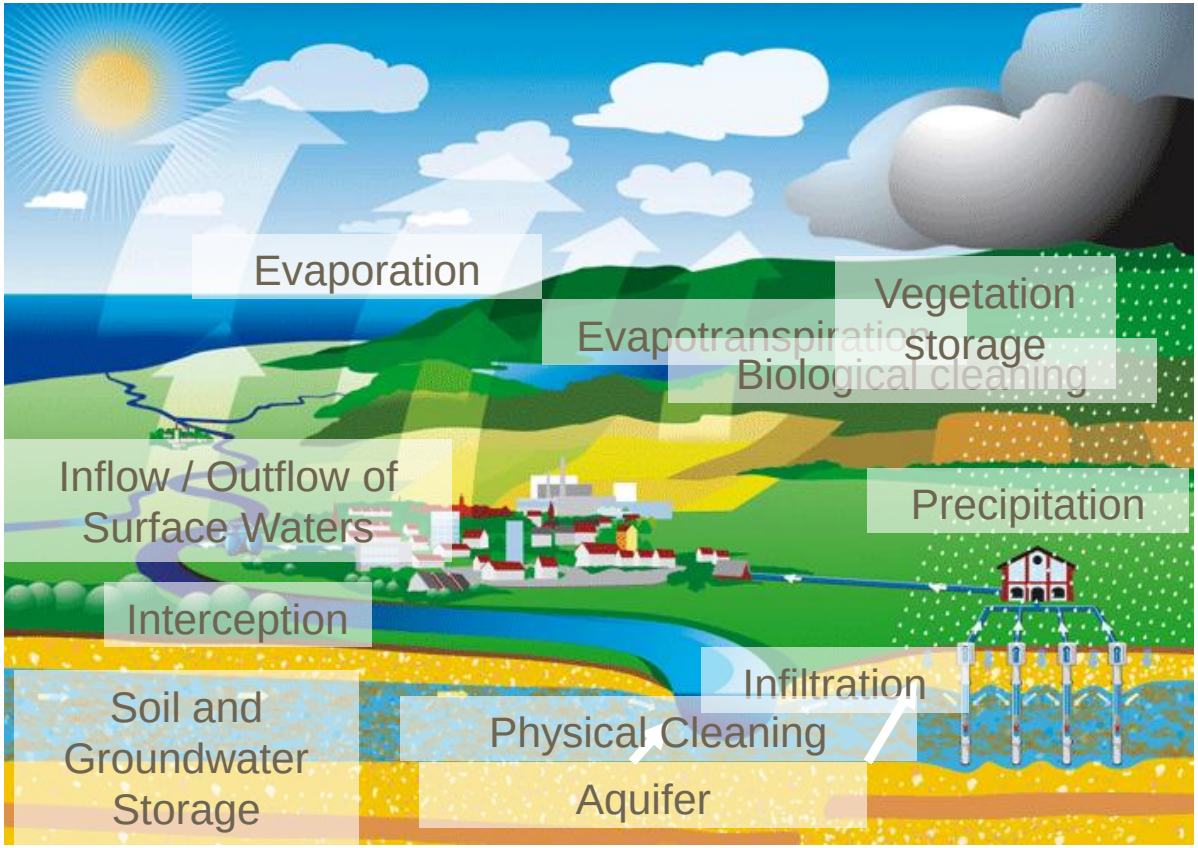
Definition:

"*Ecosystem-based adaptation is the* ***use of biodiversity and ecosystem services*** *as part of an overall adaptation strategy to help people to adapt to the adverse effects of climate change"* - Convention on Biological Diversity 2009

Goal in the Water Sector:

Protection or restoration of ecosystem services in watersheds in order to use them for the adaptation of people while contributing to the long-term conservation of water resources.

Which ecosystem services relate to water?



Providing Services

Regulating Services

Cleaning Services

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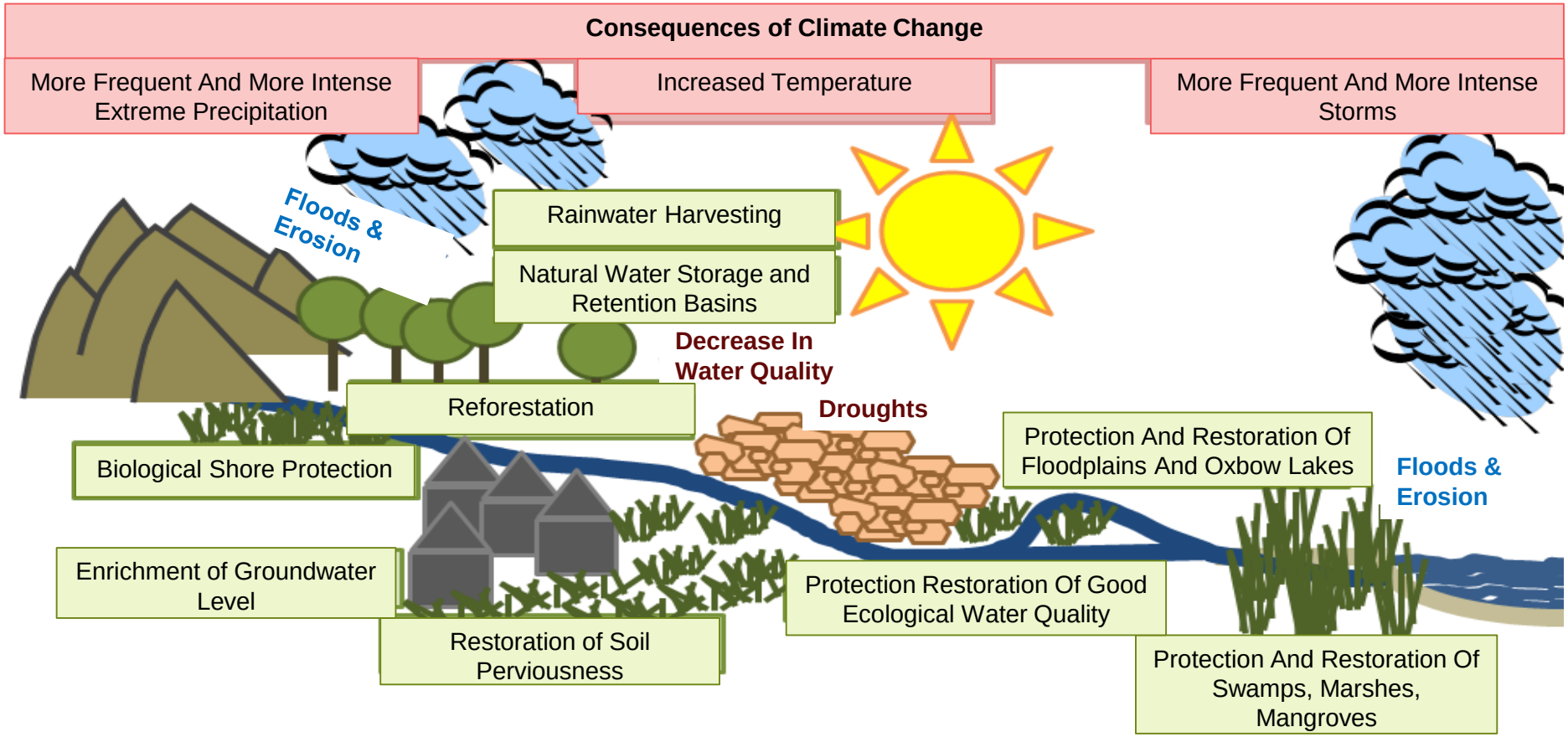


EbA in the Water Sector: Strutural Measures

Floods

- Floodplain, Oxbow Restoration
- Artificially Created Retention Basins And Wetlands
- Erosion Control Through River Bank Vegetation

Water Scarcity/ Droughts

- Rainwater Harvesting
- Artificially Created Retention Basins And Wetlands
- Artificial Groundwater Recharge
- Conservation Agriculture

Positive Side Effect: Protection of Biodiversity

EbA in the Water Sector: Capacity-Development Measures

- Integration of water sector needs and water sector expertise in national climate change strategies and action plans
- Institutional capacity building for integrated (cross-border) water resource management
- Further education, training, dialogues and networking (Human Capacity Development) in the EbA context

3. Examples

Examples for EbA Measurements I

Ecosystem	Examples of Ecosystem services	Examples of EbA Measures and resulting benefits
Agricultural and grasslands	› Provisioning (e.g. food, medicine) › Reduced runoff (flood retention) › Erosion prevention › Maintenance of soil fertility (incl. soil formation)	› Techniques of sustainable agriculture (soil and water conservation, rainwater harvesting, crop diversification), agro-forestry, rangeland rehabilitation, agrobiodiversity promotion » Improving groundwater recharge » Maintaining productivity, prevented soil salinity
Coast	› Buffering of inundation and storms › Shoreline stabilisation › Habitats and nurseries › Provisioning (e.g. firewood, food)	› Beach nourishment, dune rehabilitation, construction and flood proofing › Bush mattressing, revegetation with native flora » Increasing dune stability, reduced turbidity and dune and shoreline erosion » Restoration and conservation of habitats » Storm and flood protection
Forests	› Provisioning (e.g. construction material, energy) › Water storage/retention › Air and water quality regulation › Erosion prevention, maintenance of soil fertility and soil formation	› Community-based forest management » Buffering of perturbations to maintain productivity

Examples for EbA Measurements II

Ecosystem	Examples of Ecosystem services	Examples of EbA Measures and resulting benefits
Lakes, Rivers	› Groundwater recharge › Provisioning (e.g. food, fresh water) › Habitats and nurseries	› Natural water retention measures, catchment thinning, vegetative erosion control for river banks, artificial recharge of groundwater resources, renaturation of flood plains » Improvement of ability to retain water, groundwater recharge » Buffering of dry spells
Mountainous areas	› Water provision › Erosion prevention, maintenance of soil fertility and soil formation › Reduced risk of flash floods, avalanches and landslides	› Community-based forest management, restoring wetlands/terraces » Reducing risk from avalanches and land slides » Improvement of ability to retain water
Peatlands	› Water storage, groundwater recharge › Flood retention › Climate regulation (i.e. storage/sequestration of GHG)	› Renaturation, water logging, natural water retention measures, construction of artificial wetlands » Increasing abruption of rainwater, decreasing runoff and flood mitigation » Increasing water storage capacity

Germany Brandenburg (Source: Matthias Freude, Land Brandenburg)

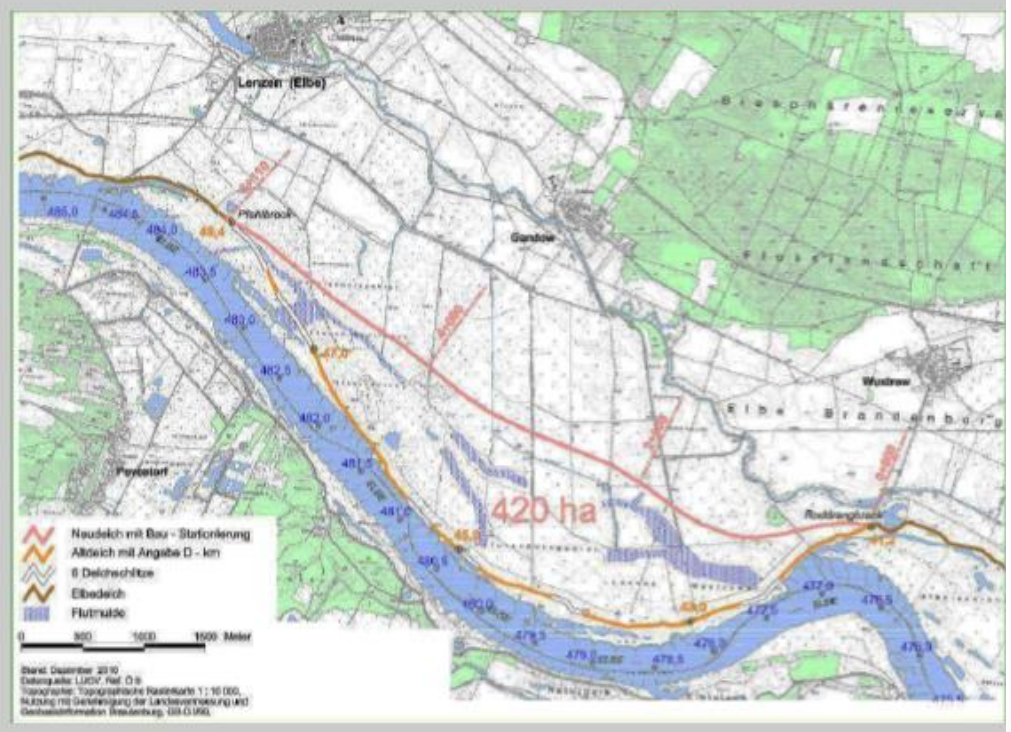
LAND BRANDENBURG

Natural Retention Areas

Dike relocation river Elbe : 420 ha gained foreshore area

Technical Data Dike Relocation:

- Stream Kilometers 476,7 – 483,8
- New Dike Route 6.110 M
- Old Dike Route 7.189
- Max. Relocation 1.300 M
- Dike Crest 8,15 M + Freeboard



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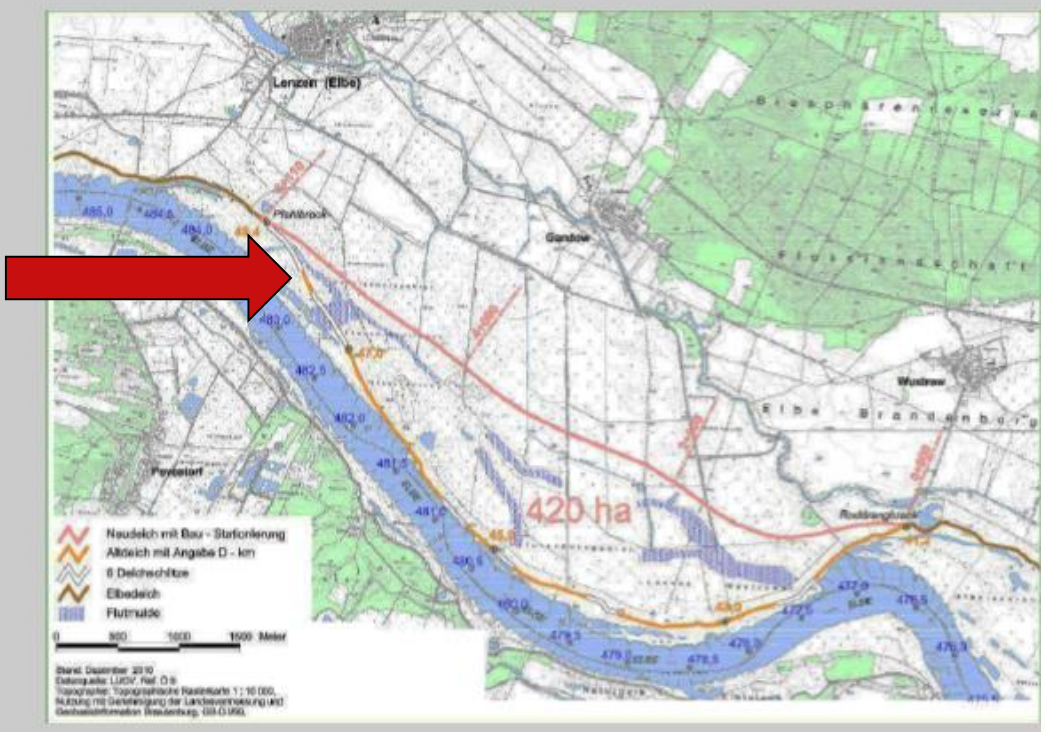

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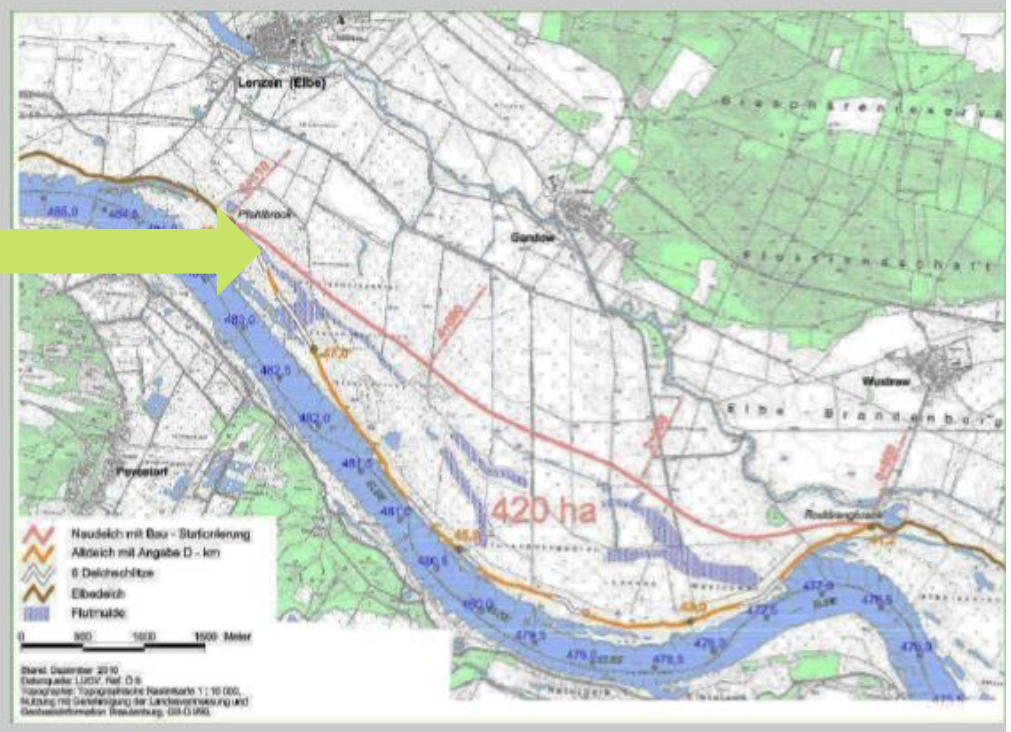

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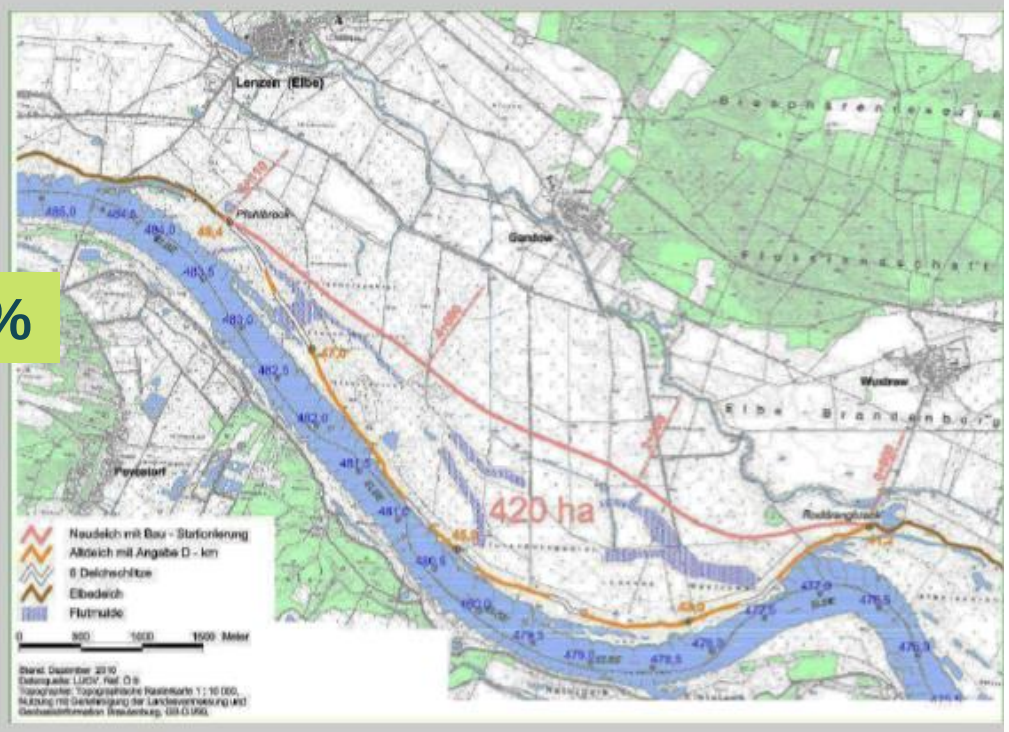
-15%



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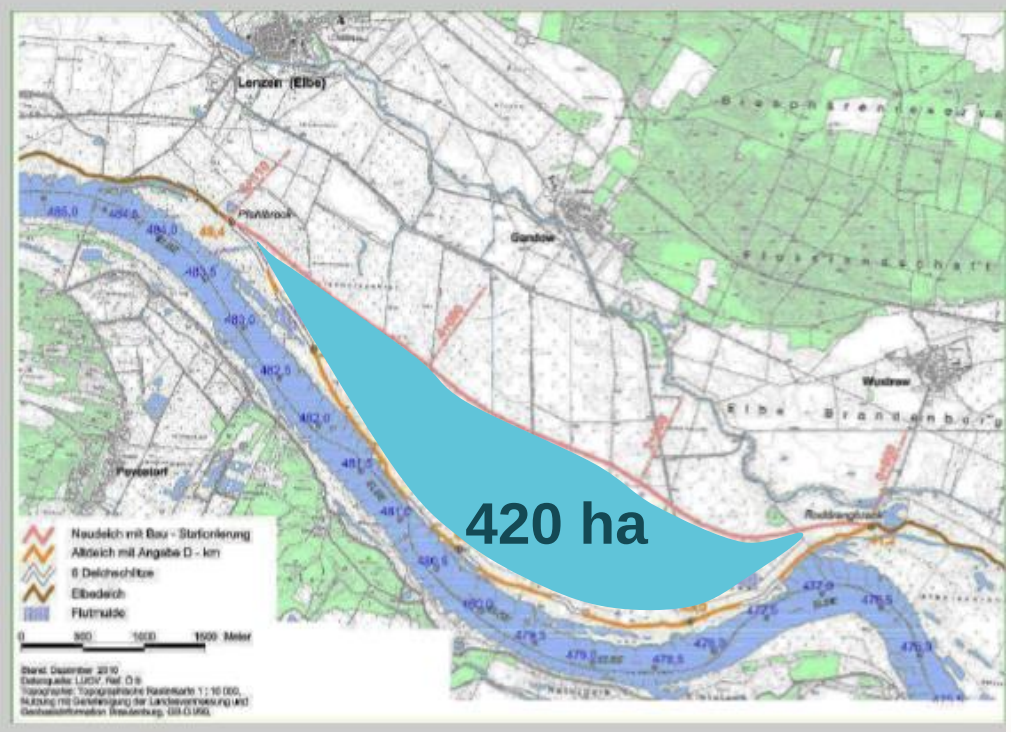

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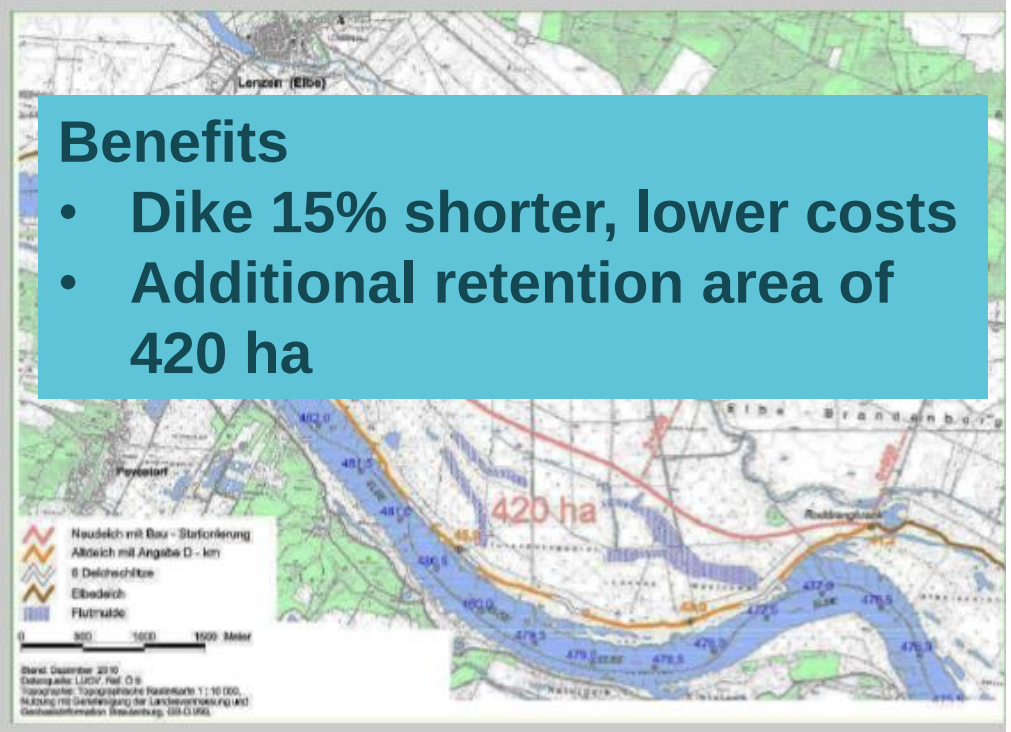

Benefits

- **Dike 15% shorter, lower costs**
- **Additional retention area of 420 ha**

On behalf of:

Federal Ministry
for the Environment, Nature Conservation,
Building and Nuclear Safety

of the Federal Republic of Germany

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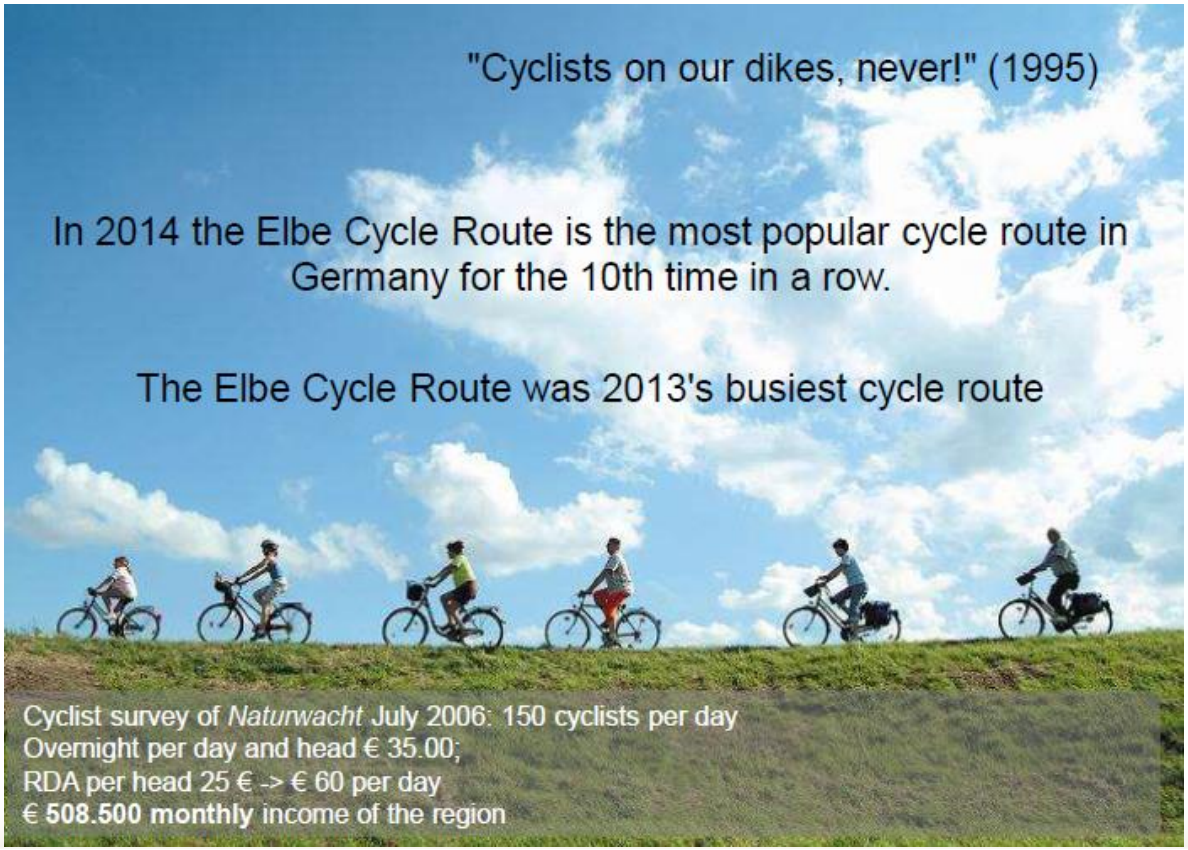
Additional benefit: near recreation area



4. Improved Management of Extreme Events through Ecosystem-based Adaptation in Watersheds, Thailand (ECOSWat)

ECOSWat

Objective: The responsible authorities prevent increased flood and drought damage through the implementation of ecosystem adaptation measures in the catchment areas of Thailand

Expected Results:

1. The local water departments of the Chi and Tha Di basin plan ecosystem-based adaptation measures for the protection against the effects of extreme events based on data and with the involvement of relevant stakeholders (pilot river basin level).

2. Ecosystem-based adaptation measures for the prevention of flooding and drought are implemented in the Chi and Tha Di catchment (pilot river basin level).

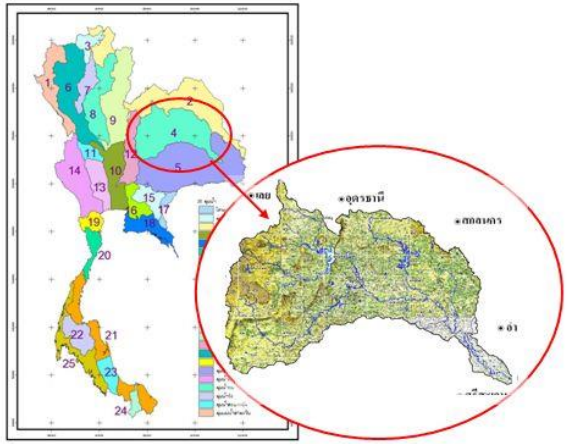
3. Project experience gained from the pilot catchments is fed into the national adaptation strategy for the water sector (national level).

4. Staff of the relevant national water authorities is able to design and evaluate ecosystem-based adaptation measures for the prevention of floods and droughts (national level).

ECOSWat

Approach:

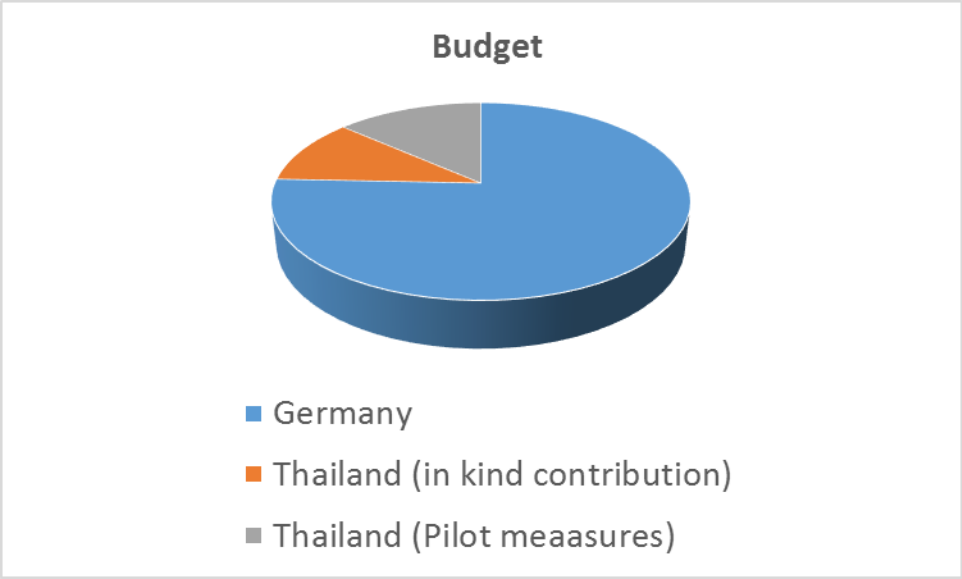
- two pilot watersheds threatened by the impacts of climate change
- Guidance of relevant professionals (government, universities)
- Inclusion of Thai population through stakeholder platforms
- Implementation of innovative EbA approaches for demonstration purposes
- Inclusion of local EbA experience into national adaptation strategy
- Anchoring of EbA education and training formats in pilot watersheds and national level



Budget

Thai contribution

- Budget for pilot measures
- In kind contribution
  - Personal
  - Meet the ensuing in-country personnel and ongoing operation (i.e. Per diem, travel,



Thank you for your attention