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Economic benefits of nature-based solutions: instruments to support decision-making

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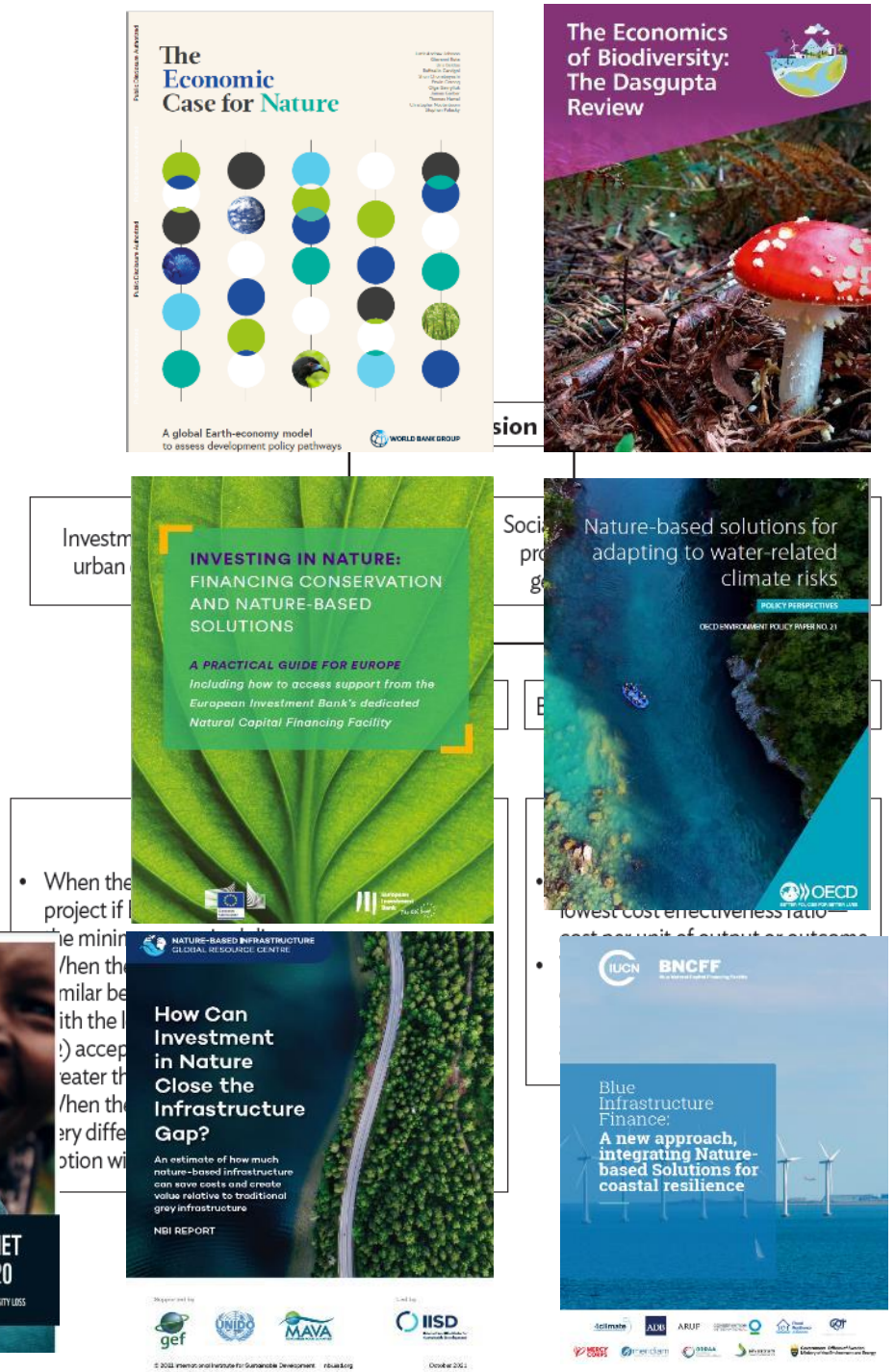
Introduction

- NBS = panacea?
- Increasing attention + flood of reports about their economic value
  - Dasgupta review (2021): value nature should be at heart of economics
  - WWF living planet (2018): nature's value estimated US$125 trillion
  - IISD (2021): investment gap development = USD 489 bln w/ grey infra; only 50,7% with NBS
- But do NBS always make economic sense and (how) can we substantiate that?
- This presentation:
  - What is 'economic sense? > depends on the context
  - Tools to support valuation
  - Value of NBS benefits on water quality



NBS: cost-effective?

- Cost effectiveness: how costly a measure is in relation to a single goal
- When to use?
  - Identify least-cost alternative to achieve single goal (cost minimization)
  - Quite common
- How is it calculated?
  - Amount of ‘effect’ expected with measure
  - Costs per unit effect
- Example tool: toolbox resilient cities

cm water table lowered

T carbon/ha stored

# of pollution removed

% soil moisture increased

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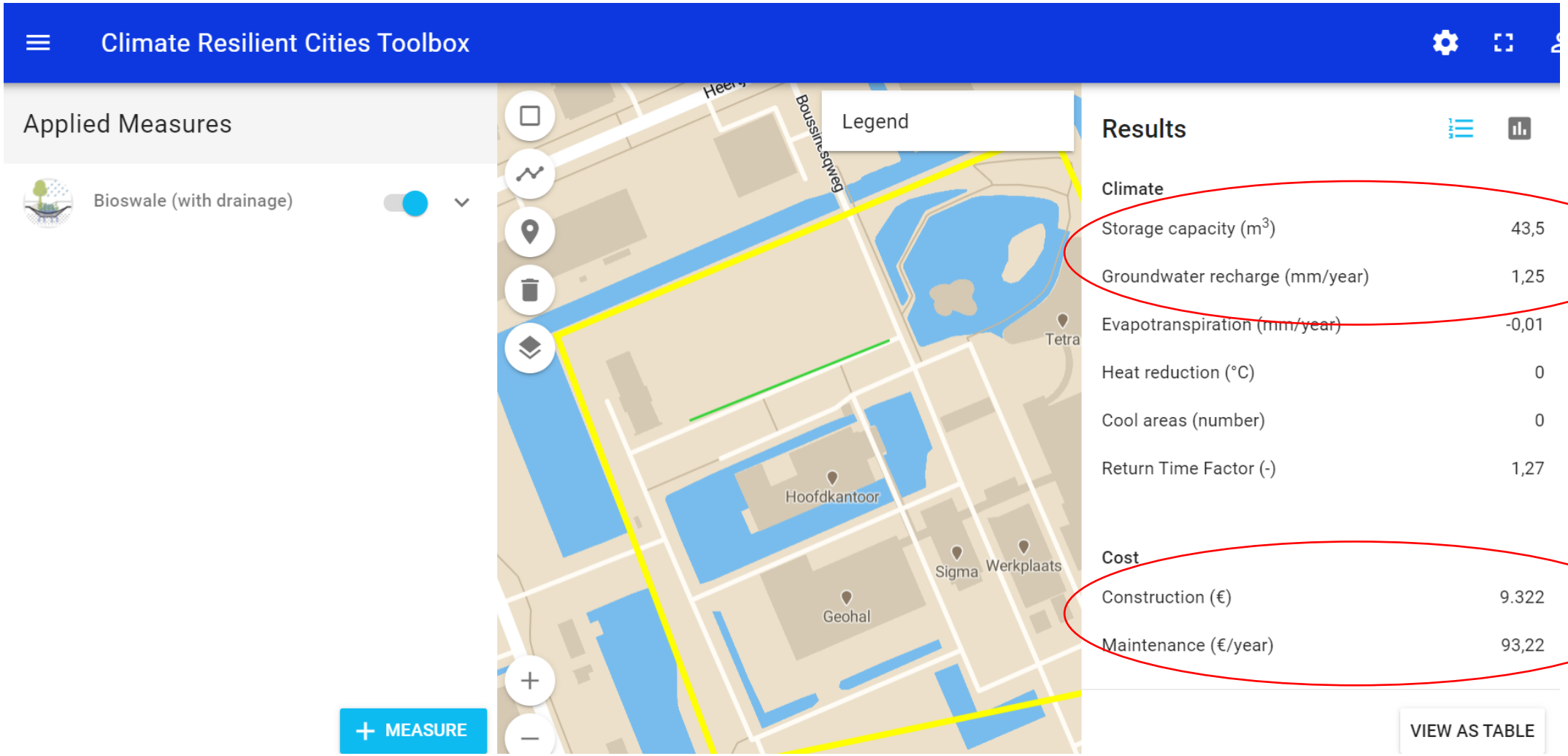

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- CE of NBS affected by …
- But: key benefit of NBS is that they are multifunctional.

Local physical setting

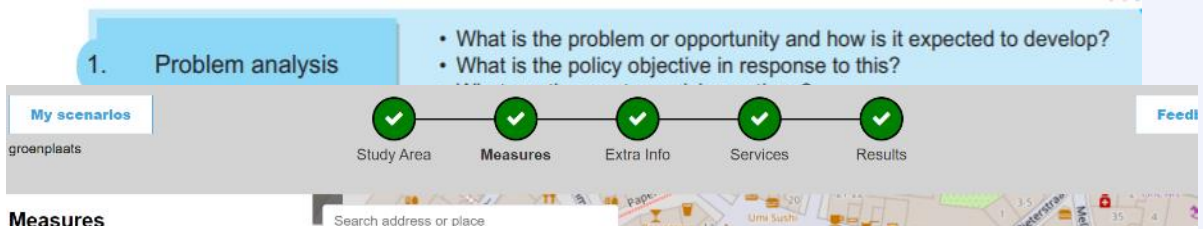
Required performance level

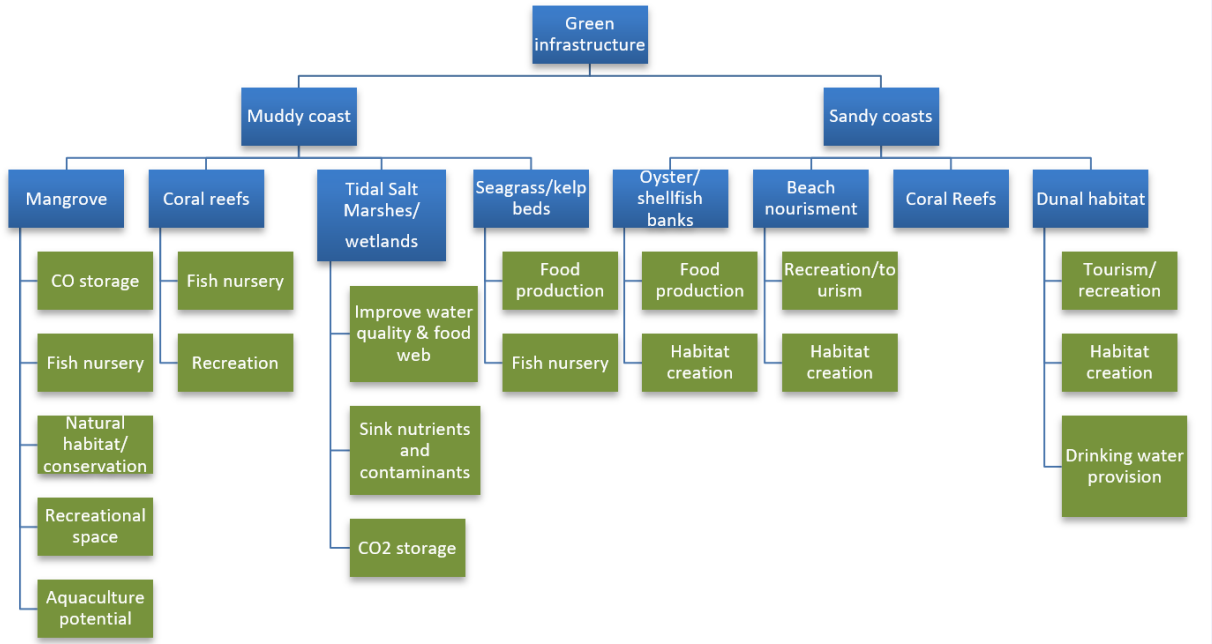
Already infrastructure present?

Innovation > higher risk premiums in costs

NBS: the economic rationale for investment

- What: Cost-benefit analysis
- Investment costs are compared against welfare effects, in monetary terms (€).
- Socio- economic rationale for investment
  - Benefit-cost ratio > 1
  - Balance = positive
- Often mandatory for public investments of certain scale
- Wide array of guidelines and databases to support; increasing number for NBS
- Quick-scan tools
  - CNT Value calculator
  - BEST (sustainable urban drainage)
  - TEEB City
  - **Nature Value Explorer**





Regional and local climate regulation	€/year	-	-
Physical and experiential interactions - recreation and tourism	€/year	0	0
Extra value houses in the neighbourhood	€/year	78	78
Total	**€/year**	**1057**	**1468**

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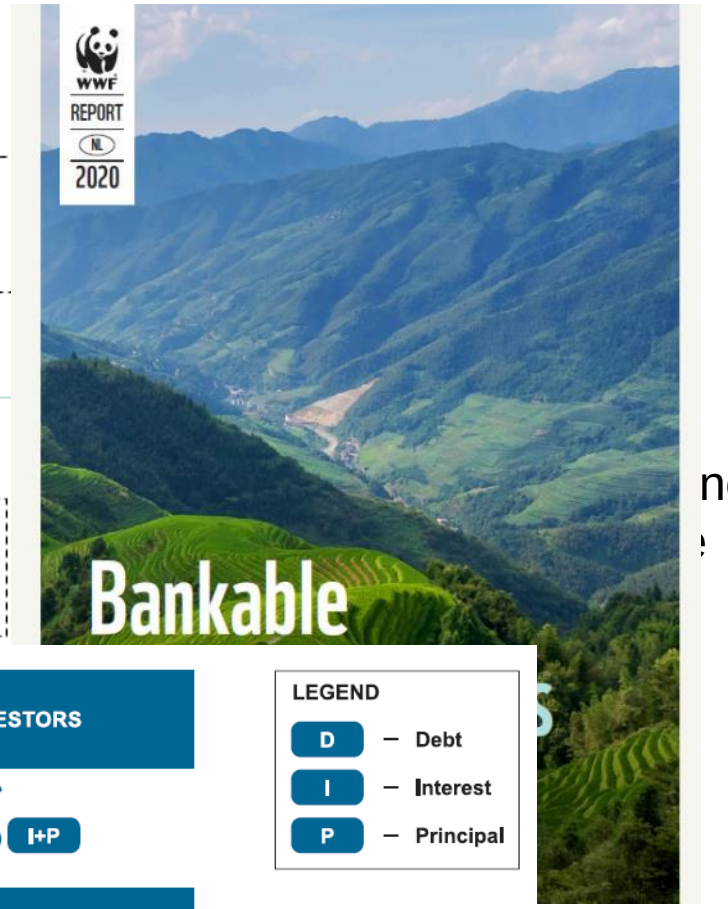
NBS: a business case?

- Business case = private/ cash flow perspective
- Private actor:
  - Revenu (cash flow) > costs
  - Cost-effective solution
- Example: wetland project to increase water quality

Public good/ service: public investment

Revenues < cost

No rationale for investment; no initiators



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7. INGOLDISTHORPE WETLAND

(Estimated) Impacts

- 53% water consumption savings
- Natural filtering of millions of liters of water a day
- 89% reduction in CO_2e emissions

Activities

- Lowering costs through power savings
- Lowering costs through water consumption savings
- Lowering costs through chemical usage savings

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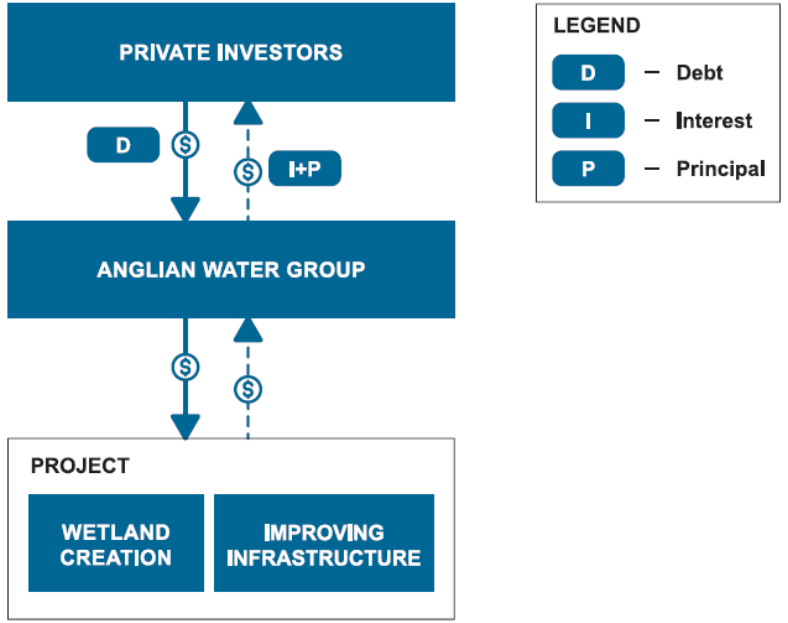
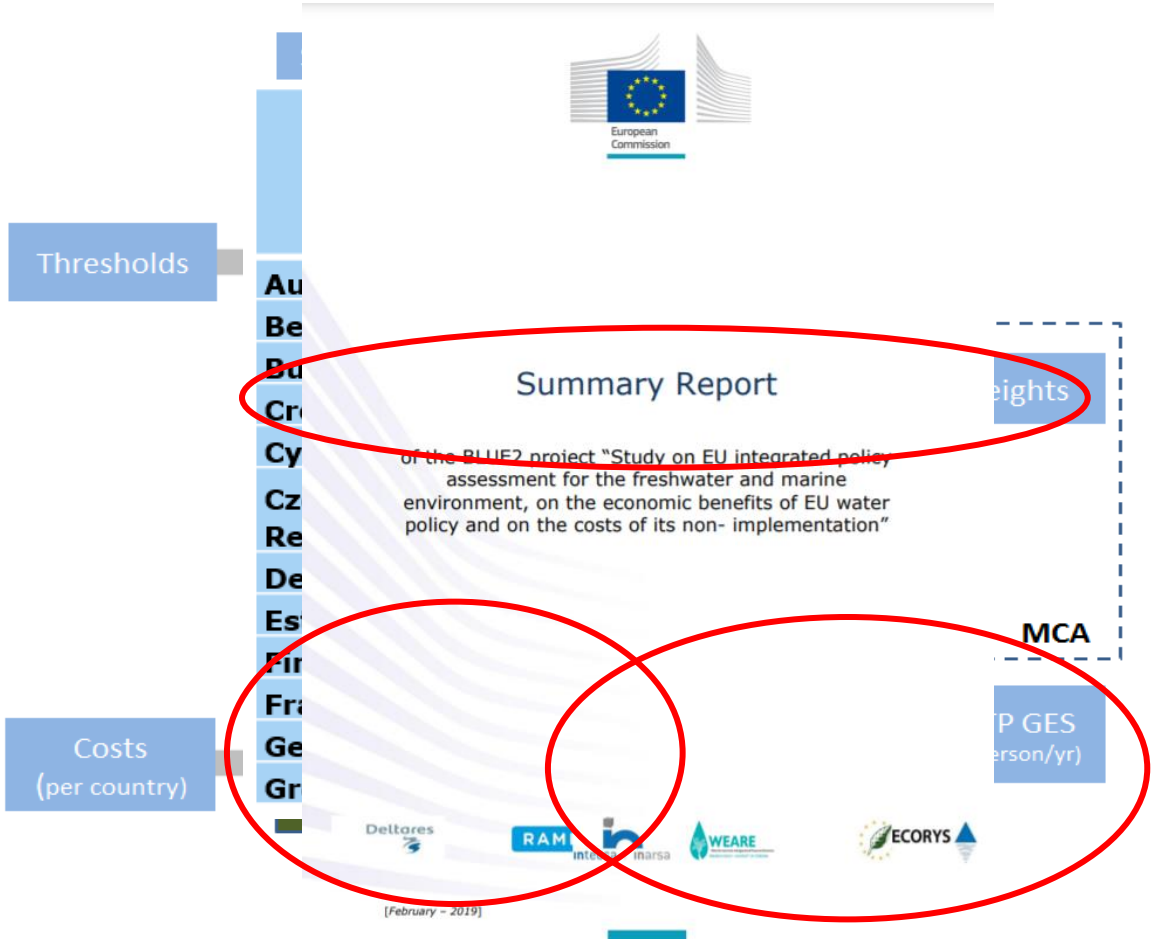
Figure 15: Anglian Water issued a first ever Class A £250 million green bond in the UK water sector with a tenor of 8 years. £500 thousand was used to fund the Ingoldisthorpe Wetland project.



Economic valuation of water quality

- EC Blue2 study (2017-2018): socio-economic assessment of policies for water quality
- Approach # 1 Valuation methods based on MSFD/WFD indicators:
  - Cost-effectiveness
  - Goal: achieve good status (UWWT not included)
- Approach # 2 Valuation methods based on changes in ecosystem services:
  - Cost-benefit analysis (based on TEV/Ecosystem service accounting)
  - E.g. Contingent valuation: Willingness to pay

Other options: E.g. water purification > cost savings in drinking water production, fish production (# fish * price), health impacts (# less disease * health care costs), recreation (travel time)



Evidence on impact NBS on water quality

- Analysis of EU funded NBS projects on water quality & waterbody conditions (2020)
- Some highlights:
  - Point sources (e.g. combined sewer flows) > integration of NBS like constructed wetlands, green roofs etc can lead to cost-savings reduced stormwater flow, decreased CSO spills
  - Urban diffuse pollution control: NBS only viable solutions (green roofs, bioswales, attentuation ponds)
  - Many case studies with positive benefit-outcome on water quality & other grounds

Key Take-aways

- NBS or hybrid infrastructure can be cost-effective;
- But economic value especially clear in broader CBA > NBS = multifunctional;
- Mounting evidence on economic rationale, including for water quality;
- But at the same time difficult, due to lack of data & limited monitoring;
- next up: H2020 Green deal Merlin project (2021-2025)

17 restoration case-studies

Restoration opportunities across Europe

Restoration benefits for pilot regions

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