

Discussion Highlights: Workshop on Water investment planning and financing

Thematic workshop on 15th – 16th February 2022

These discussion highlights present the key messages and possible next steps mentioned during the thematic workshop.

The workshop was co-convened by the OECD and the European Commission's Directorate-General for Environment. It is part of a series aimed to facilitate the implementation of the economics of the Water Framework Directive in European Member States.

These discussion highlights may not reflect the opinion of the OECD, the European Commission or their Member States.

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Water investment planning and financing

Thematic workshop, 15 - 16 February 2022

Discussion highlights

The thematic workshop on Water investment planning and financing gathered around 140 participants, including government representatives, water utilities, associations of water utilities and regulators, research institutions, NGOs and financiers. The workshop is part of a series aimed to facilitate the implementation of the economics of the Water Framework Directive in European Member States. It was co-convened by the European Commission and the OECD and focussed on topics that can support decisions about water investment planning and financing.

In three distinct sessions, it discussed the following topics:

- **Investment planning for uncertainty**, particularly related to climate change
- **From investing in projects to investment pathways** and the use of analytical frameworks; and
- **Harnessing multiple sources of commercial finance.**

It addressed challenges faced by Member States and provided a platform to share best practices. Highlights of the discussions are provided below. The agenda, a background note and speakers' slides are available on the meeting webpage.

Key messages

Session 1: Investment planning for uncertainty, particularly related to climate change

- Member States are already integrating climate change in their river basin management planning processes and are increasingly making use of multi-criteria analysis and scenario approaches.
- They would benefit from further guidance on methodologies for scenario analysis related to uncertain future climate conditions and on how to reflect impacts and benefits from 'external' actors (notably other sectors and other spatial areas, e.g. transboundary settings). A better use of existing and new data on climate impacts on the local scale could be further integrated in Member States' planning processes.
- Better communication of risks and uncertainties to policy makers, as well as capacity building to support the use of new tools and analyses would be beneficial.

Session 2: From investing in projects to investment pathways

- Strategically sequencing projects can help build resilience and create synergies between individual interventions. A more strategic approach could support Member States to select appropriate measures to meet several objectives simultaneously and to manage trade-offs over longer timeframes.
- Some countries are already using investment pathways and specific tools to account for synergies across measures along different time scales and uncertainty. Further research and guidance on such tools and frameworks would be valuable. Applying complex analysis also requires increased efforts and capacity building to achieve stakeholder engagement.

Session 3: Harnessing multiple sources of private finance

- Member States voiced interest in nature-based solutions (NbS) for water security. A number of successful financing examples of multi-stakeholder arrangements for NbS exist. Conducive regulatory frameworks, better coordination across stakeholders and further methods and data can support the valorisation of benefits from water-related projects and support a funding stream.
- Strategic risk-sharing arrangements as well as proven compliance with additional policy objectives (e.g. climate objectives) can help attract private finance and new types of investors (e.g. climate/sustainable finance).

Session 1: Investment planning for uncertainty, particularly related to climate change

Climate change has significant effects on water security and brings high levels of uncertainty related to its impacts on water bodies on a local level and over different time scales. Water management can mitigate these effects. Hence, decision-making tools and flexible, resilience-based planning approaches are vital to ensure that the measures of the river basin management plans (RBMP) are robust, given the climatic, as well as environmental and societal conditions in the near and further future.

Experiences and best practices in Member States

Many European Member states incorporate climate change in their water management planning and most countries refer to the CIS Guidance Document No. 24. For example, a new legislation in Spain corroborates the interlinkages between national adaptation strategies and water management planning and requires more detailed climate change studies for the RBMPs. Through diversified water supply sources, particularly in the Spanish Mediterranean region, they strengthen resilience for varying levels of water availability. Similarly, Spain has a specific licencing system in place that provides 'ad hoc' water rights, dependent on water availability. This allocation arrangement creates flexibility for the water system for varying levels of water supply and according to seasonal changes.

In Ireland, the national adaptation strategy requires a specific climate adaptation plan for water services and water quality since 2019. Further, RBMPs are circled back and inform national adaptation plans.

The Netherlands deploy a scenario planning approach for water and flood management under the Delta programme and the associated Delta fund. This approach requires selecting measures that are sufficient in each of the elaborate scenarios. The level of ambition for flood protection is determined in terms of a national standard of individual fatality due to flooding of 1 in 100 000 per annum. Further, the prioritisation and decision on individual projects are based on the principal of technical urgency¹ (for more information, see link in 'Resources'). The programme and schedule of measures are re-evaluated and adjusted each year, which allows for an 'on-rolling' and adaptive programme. Measures might include land reservation for possible future flood defence interventions. The latter is a complex political decision, which includes trade-offs between land use and flood defence as well as compensation of land owners.

Overall, Member States deploy a wide array of tools to assess and prioritise the measures under their RBMP. Some countries combine cost-benefit analysis (CBA) with multi-criteria analysis (MCA) (e.g. Bulgaria, Finland, Ireland or Romania). Increasingly, Member States are exploring new tools to account for raising uncertainty, including related to risks of extreme events and to account for longer time horizons. For example, Ireland is exploring alternative tools that reflect risk opportunity analysis. The Netherlands consider combining a risk-orientated approach with stress testing at interregional levels.

Challenges and next steps

During the session, participants voiced the **need for further guidance on such tools and scenario approaches**. More explicit support on methodologies for scenario planning would be required, particularly on planning approaches that incorporate longer planning horizons. Specific guidance could be sued on which types of scenarios can be used, how reference conditions can be determined, how impacts can be measured and how the sensitivity of the scenarios can be tested.

¹ Technical urgency is determined as the distance between the current probability of failure of the barrier and the standard applicable to that barrier.

Additionally, participants raised the **need for available climate change data** on the local level and the access to water data. There is room to better identify and mainstream the use of existing climate modelling tools (e.g. Copernicus) for robust water management. Further, digital technologies could help improve water databases.

Further, participants highlighted the challenges around **how to integrate impacts caused by other actors** in their planning approaches, including in transboundary, as well as cross-sectoral contexts. Currently, the attention is given to pressures and states, while there is a lack of comprehensive assessment on drivers and impacts. Similarly, a **better integration of co-benefits** among different actors and sectors would be needed for robust planning and prioritisation processes. Difficulties exist when it comes to justifying expenditures for measures which deliver benefits elsewhere (for example in another country, or for another sector or policy domain). The assessment and selection of sustainable measures would benefit from better and more strategic integration of different sectors, including agriculture, energy, urban planning and navigation at early stages.

A last point raised during the session was the challenge of **effective communication on uncertainties and risks to policy makers**. Similarly, while CBA might not be the appropriate tool for decision-making under uncertainty, policy makers are familiar with it. Participants mentioned that **introducing new tools or concepts raises difficulties**. These insights highlight the importance of explicit guidelines on appropriate tools and approaches to allow their mainstreaming, as well as the need for capacity building or awareness raising among policy makers, water managers and project developers.

Resources shared by participants:

- Information on the Dutch Delta Programme <https://englich.deltaprogramma.nl>
- Information on Dutch Delta scenarios and adaptive delta management [Delta scenarios and adaptive Delta Management | STOWA](#)
- Dutch portal for flood safety program <https://waterveiligheidsportaal.nl>
"If you click on "Landelijk veiligheidsbeeld" ("national safety overview") you can see the standards for each part of the dyke, if it is judged against that standard (and if so; you can see the results and download the report that belongs with it) and the reinforcement program for the next years. Water authorities communicate with the national coordinating flood safety program using that portal, so the information is as real time as we can get it."
- Dutch report 'Exploring the costs and benefits of the WFD' (on how benefits are expressed in qualitative terms and in descriptive texts and illustrations by expressing them in terms of ecosystem services)
<https://www.tweedekamer.nl/kamerstukken/detail?id=2021D43941&did=2021D43941> (available only in Dutch)
- Information on the Taskforce Agricultural Water Management which establishes cooperation between agricultural entrepreneurs, public bodies and water managers
<https://agrarischwaterbeheer.nl/content/task-force-agricultural-water-management>
- United Nations Economic Commission for Europe (UNECE) Handbook on Water allocation in a transboundary context
<https://unece.org/environment-policy/publications/handbook-water-allocation-transboundary-context>

Session 2: From investing in projects to Strategic Investment Pathways

Water systems are complex and interconnected systems across various spatial and temporal scales and with interdependencies among different users. Water management interventions hence have impacts on a variety of users and across different time horizons, potentially creating externalities and co-benefits. Therefore, water-related projects should be considered as elements of a sequence of strategically linked interventions. Such Strategic Investment Pathways (SIPs) need to be flexible to deal with prevailing and increasing uncertainties and adapt to new conditions as they develop.

Country examples and best practices

Professors Boltz and Brown presented an analytical framework for the design of Strategic Investment Pathways and application in various contexts. The framework deploys existing planning and analysis tools in a systemic approach to ensure optimal investment planning and sequencing of projects to capture synergies across investment value chains. In the first step of the framework, the analyst defines the system's scope as well as the performance objectives and key uncertainties to be addressed. In a European context, such objectives could be defined by the WFD.

The framework's next steps consist of option analyses, under which different possible measures are stress-tested for a variety of possible features (scenarios) and in connection with possible follow-on measures. This analysis does not only take into account the short term effects of a measure but also its effect on follow-on investments and the water system in the future. For example, in Mexico City, this analysis identified the following measures as optimal solutions for the problem set: measures to connect existing reservoirs and to increase rainwater harvesting, and policies to foster cooperation and increase efficiency. The analysis also found that 'transformation'² in water management is the key element to achieve the objective of increased and stable water supply in the Mexico City context. Such a strategic analysis could also support the needed transformation in European country contexts, for example in Spain, which will face increasing pressures due to flood and drought events.

Similar pathway methods are deployed in the Netherlands, where real option analysis is used for flood protection to assess the significance of an investment over longer time horizons (e.g. longer than 35 years) (see link under 'Resources'). Further, Deltares uses adaptation pathways to assess the climate change robustness of interventions over long time horizons. For example, this method allows to anticipate interventions that might be necessary in the future (e.g. land conversion for flood defence), and hence prevents measures that might preclude those interventions. This rationale allows to create synergies between measures that are taken now and measures that are likely to be taken in the future.

Challenges and next steps

In the European context, participants voiced that current planning schemes are robust to solve one problem/ achieve one single objective but that they fail when attempting to combine and achieve several objectives simultaneously. The latter, however, would be key to ensure the optimal choice of measures when addressing the various objectives under the WFD and the challenges related to climate change and other societal and policy objectives. The SIPs framework includes a multi-objective optimisation by design and allows identifying optimal measures according to select priorities among economic, societal and

² Transformation is required when exogenous conditions are changed to an extent where the system cannot maintain the same level of functions without a complete change of the system. Transformation can be achieved through additional connectivity to new supplies, restoring or resupply of water resources, changes in user consumptive behaviour, etc.

environmental objectives. The integrated multi-criteria analysis allows to visualise and manage arising trade-offs, while including future constraints and development in the consideration.

While the presented framework can offer valuable methods in theory, its contextualisation in Europe could be challenging and might require further research. Distinctive WFD objectives, e.g. good ecological status and objectives under other directives, e.g. linked to energy efficiency and resilience are more complex to grasp and assess. Overall, the session highlighted the **need for further research and guidance on appropriate tools and methods** to evaluate and chose individual projects as part of strategic pathways.

Another challenge raised by Member States was **limited capacity of local stakeholders and water authorities to conduct complex analysis** (- while the use of CBA seems to be mainstreamed, already MCA has been difficult to implement in some contexts). Experiences from Mexico City and Deltare's work have shown that strong engagement with relevant stakeholders is needed to launch complex analyses and attract participation in these endeavours. Additionally, a stepwise approach, starting with easiest pathways without a full optimisation process could be appropriate.

Resources shared by participants:

- Paper on 'Investment under non-stationarity: economic evaluation of adaptation pathways' <https://link.springer.com/article/10.1007/s10584-019-02409-6>
- Paper on 'Benefits and Limitations of Real Options Analysis for the Practice of River Flood Risk Management' <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/2017WR022402>

Session 3: Harnessing multiple sources of private finance

The session highlighted opportunities and challenges to mobilise different sources of finance in order to bridge the investment gap for achieving the objectives of the WFD. The session discussed examples and challenges related to the valuation of water and the generation of revenues streams. It then highlighted opportunities to tap into sustainable finance in relation to the EU taxonomy. Lastly, it discussed the importance of adequate risk-return profiles to attract private investment.

Valuing water and generating revenue streams

Water-related investments and particularly nature-based solutions for water security deliver multiple benefits for a range of stakeholders. When monetised, these benefits can generate a revenue stream and mobilise additional private finance sources. Member States signalled high interest in these solutions.

The Nature Conservancy (TNC) supports analysis on how to monetise these benefits and sets up water funds to coordinate and pool the various stakeholders. Water funds can operate as coordination platforms and as collective investment mechanisms to mobilise upfront repayable finance as well as to generate continuous revenue streams to pay back investment in NbS for water security.

The Greater Cape Town Water Fund, for instance, financed the removal of invasive plant species, which lead to increased water supply that yielded in water savings two months worth of water. Other financing examples include the performance-based Environmental Impact Bond in Washington DC for storm water runoff, and the Netherland's Sovereign Green Bond for Natural Flood Management (see PowerPoint slides and resources further below). The Sustainable Water Impact Fund is another financing model that invests in rewetting measures in failing farms in the Western United States, Australia and Chile, hence contributing to groundwater recharge. In California, recharging groundwater is valorised and financially remunerated, and thus provides a funding stream to repay the upfront investment cost. This example highlights the importance of a **conducive regulatory framework that supports the valorisation of accruing benefits**, which is the basis of effective financing. In this context, biodiversity credit markets were mentioned as another example of a regulatory setting that can help monetise benefits of NbS for water security.

TNC is currently preparing the first water fund in Europe in East Anglia, United Kingdom. First analyses on potential funding sources for the intervention found that more than 50 sources were assigned to NbS in a fragmented manner. **There is hence potential for better coordination of the funding sources into a single funding structure.** In the EU, for example, farmers need to apply for funding for environmental practices on an individual basis, whereas landscape level interventions (in coordination with other farmers) would be more effective. A more strategic coordination among actors and stakeholders to finance landscape-based interventions is hence vital.

Further, it was reported that stakeholders need reliable estimates on potential benefits before they commit to such a financing structure. **There is a need for methods and data to assess the benefits** relevant to a stakeholder, as well as performance records of successful examples.

While numerous successful examples exist, transaction costs of such platforms and financing models can be high. **Further efforts are needed to reduce transaction costs over time** and to establish mechanisms that do not only cover the initial investment but also serve as operational investment platform in the long run.

Attracting sustainable finance

Water-related investments have the potential to attract finance from private investors with an interest in sustainable investment opportunities. One example is the Austrian wastewater treatment plant upgrade, financed by EIB's Climate Awareness Bonds. The project proved compliance with climate objectives due

to energy efficiency gains and renewable energy production, and was hence able to attract a dedicated EIB loan and commercial finance.

The EU taxonomy on sustainable finance is a framework that defines thresholds for projects and interventions to be considered sustainable. Water-related projects could gain visibility to new types of investors if they comply with the EU taxonomy's criteria. On the one hand, this could allow tapping into new sources of finance (e.g. climate finance). On the other hand, it might increase the administrative burden of reporting. While some participants were active in the consultation process of the taxonomy development, others were not familiar with the regulation and criteria related to water. **This highlights the need for better communication** of the taxonomy, better integration of all sectors in these endeavours as well as **capacity building for project developers and water managers to demonstrate compliance** with such criteria or contributions to other policy objectives (e.g. renewable energy production).

Improving the risk-return profile

The last topic discussed investment in water-related projects from an investor's view point. Private investors are primarily concerned with the risk-return profile of an investment and it is hence essential to 'build a narrative' for the investors – to prepare bankable projects with well-documented risks and returns. While finance is available for infrastructure, there might be limited investors' willingness to take on residual risk. In Romania, for example, private investors tend to not have an interest in investing in water-related projects. In order to attract private investors with varying risk appetites, **a combination of specific financing mechanisms, contractual arrangements and well-prepared projects is required**. Pooling mechanisms or de-risking arrangements can help improve the risk-return profile and render projects more attractive. Ring-fencing income flows can also provide investors security on predictable and stable revenues flows. Overall, there is a need for a better understanding and communication between the water and private investor community, and intermediaries can play a role in connecting these.

Resources shared by participants

Links on NbS for water security - The Nature Conservancy:

- Report: NbS for European Water Security
<https://www.nature.org/en-us/what-we-do/our-insights/perspectives/nature-based-solutions-for-european-water-security/>
- Biodiversity Net Gain in England, Developing Effective Market Mechanisms
https://www.nature.org/content/dam/tnc/nature/en/documents/TNC_BiodiversityNetGain_England.pdf
- Report: Resilient European Cities: NbS for Clean Water:
<https://www.nature.org/en-us/what-we-do/our-insights/perspectives/resilient-european-cities-clean-water/>
- United Kingdom Payments for Ecosystem Services: Best practice guide
<https://www.gov.uk/government/publications/payments-for-ecosystem-services-pes-best-practice-guide>
- And Pilot projects
<https://www.gov.uk/government/publications/payments-for-ecosystem-services-review-of-pilot-projects-2011-to-2013>
- Overview of UK Consultation on Biodiversity Net Gain Regulations and Implementations
<https://consult.defra.gov.uk/defra-net-gain-consultation-team/consultation-on-biodiversity-net-gain-regulations/>

- Information on UK Environmental Bill including conservation covenants
<https://www.gov.uk/government/publications/environment-bill-2020/10-march-2020-nature-and-conservation-covenants-parts-6-and-7>
- Policy Paper: Environmental land management schemes: payment principles (UK)
<https://www.gov.uk/government/publications/environmental-land-management-schemes-payment-principles>
<https://www.gov.uk/government/publications/environmental-land-management-tests-and-trials>
- Paper on Water Catchment management, abstraction and flooding: the case for a catchment system operator and coordinated competition (Professor Dieter Helm CBE)
<http://www.dieterhelm.co.uk/natural-capital/water/water-catchment/>
- Vienna Wastewater Treatment upgrade: <https://www.ebswien.at/klimaschutz/> (*available in German only*)
- Report 'The European environment – state and outlook 2020: knowledge for transition to a sustainable Europe' EEA <https://www.eea.europa.eu/soer/2020>
- Background information on EU Taxonomy: https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance/eu-taxonomy-sustainable-activities_en