



## Briefing for Water Supply and Sanitation Sector

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### Mainstreaming aquatic restoration using Nature-based Solutions: Supporting Transformation

A collaborative approach with key economic sectors is essential to enable the H2020 MERLIN project to promote systemic transformative change. We will co-develop transformation strategies with different sectors to **mainstream restoration as a Nature-based Solution (NbS)**. Working with nature at landscape scale can contribute to the EU Green Deal objectives (climate resilience, improved biodiversity, zero pollution, sustainable food systems, health, and wellbeing).

NbS has been defined by the International Union for Conservation of Nature (IUCN) as “actions to **protect, sustainably manage, and restore** natural or modified ecosystems, that address **societal challenges** effectively and adaptively, simultaneously providing **human well-being and biodiversity benefits**”.<sup>1</sup>

This briefing focuses on the **Water Supply and Sanitation (WSS) Sector**. It summarises MERLIN’s understanding of the sector’s current connection with rivers and wetlands, and how Nature-based Solutions (NbS) are viewed within the sector at the start of the collaboration. The briefing proposes how MERLIN (for more information visit [www.project-merlin.eu](http://www.project-merlin.eu)) can support the WSS Sector to implement NbS.

### How can MERLIN support transformation?

The Water Supply and Sanitation Sector (WSS) can play a crucial role in responding to Europe’s Green Deal objectives, particularly secure supply of clean water. Transformation whereby NbS becomes the new normal will only happen through multiple actions involving government, markets, and citizens. MERLIN will support this through understanding how and why the WSS Sector is already making positive changes, sharing good practice between European countries, and exploring how NbS could help overcome some of the challenges faced by the sector. The briefing is based on a range of insights from involving individuals actively engaged in the WSS Sector (using Round Table Discussions (RTDs), questionnaires, interviews) and a desktop review of formal documents. We are very grateful for the insights shared to date, which have helped us understand the different positions. The synthesis provided in this briefing reflects the views of the authors and does not imply consensus within our developing Community of Practice. Our **Community of Practice** concerns EU and Member State level policy and commercial actors of the WSS Sector who share a common interest in improving their practices better through regular interaction and sharing information.



## Relationship of the WSS Sector with freshwater restoration and NbS

### Brief description of the sector

The WSS Sector oversees drinking water and wastewater activities (including wastewater treatment) for households, industrial, agriculture and commercial customers. In Europe, public utilities and private operators are in charge of Water Supply and Sanitation and sewage networks and wastewater treatment plants. **MERLIN's focus** is on **upstream restoration** to preserve water supply and will therefore entail working together with the sector on the availability of drinking water **in a landscape context, mainly in rural areas**. To represent the perspective of the public and private operators from the WSS Sector and the sector relationship with NbS, it was important to involve a group of sector leaders who were invited to participate in the first roundtable organised by the MERLIN team. The group consists of representatives from Aquafed and Aqualia (representing the views of private operators), Aqua Publica Europea (the European association of public water operators and representatives), and representatives from the European Water Managers Association (EUWMA).



Figure 1:  
NbS for lowering flood risk in different river sections. Adapted from the Norwegian Environment Agency<sup>2</sup>

There are many different types of NbS that can be used in the water sector, as seen in Figure 1.<sup>2</sup> However, to address some of the main environmental and socio-economic challenges that the sector is facing (such as water scarcity, flooding, water quality, etc.) some of the proposed NbS are the following:

- **Development of freshwater wetland and restoration efforts** that focus on improving flood management capacity while providing water treatment services such as filtration and pollutant trapping. These actions aim to renew sediment profiles, introducing and creating conditions for autochtone species and return of natural habitats. This can in turn address the impact of soil and water conditions on nutrient dynamics and ecosystem services.
- To reduce flood infrastructure risks, **restoring wetland forests**<sup>3</sup> in areas with low flood waves is suggested. Combining wetland trees and shrubs with traditional levees and embankments made from earthen barriers<sup>4</sup> can reduce wave heights, provide habitat value, and support biodiversity.



- Developing **inland buffer zones** within regional water systems to buffer both floods and drought conditions and allow flexible stormwater capacity.
- **Creating freshwater habitats** through conservation and restoration of wetlands to increase the biodiversity net gain. Conserving and restoring wetlands also increases the buffering and filtering capacity of adjacent land, improving both water quality and quantity.
- **Using NbS for water storage** combined with **integrated watershed management** for stormwater or wastewater allows improved infiltration in the ground. The potential to link urban water resources may have the potential to ease water pressures and promote biodiversity.

### **NbS and their potential for supporting the sector; how the sector currently understands NbS**

The sector often addresses the NbS as “green” solutions to solve the current challenges. Water managers are increasingly asked to integrate ‘green’ approaches into WSS and treatment practices. “Green” technologies – which are believed to offer environmentally conscientious, energy-efficient, and/ or increasingly economically viable solutions to address challenges – are generally understood to complement and sometimes replace more traditional ‘grey technologies’.

The most common application of NbS in the WSS Sector is to handle water overflows during intense rainfall events, when the current infrastructure cannot cope.

The sector seems interested in NbS upstream to protect resources, particularly with increased potential for drought under climate change, but this is often large-scale ecosystem intervention that is difficult for water companies to deliver on their own.

It is important to mention that public and private operators look at water management and implementation of NbS in a different perspective. Public operators believe that the management of water belongs in the public domain and that all the revenues generated from water management services should be reinvested in the water cycle, while private operators advocate for the benefits of public-private partnerships. Even though both perspectives support sustainable use of water resources, MERLIN should aim to tackle all sides of the story so that investment decisions can be made with more certainty.

### **Good examples of NbS for the WSS Sector**

- **Anglian Water**<sup>5</sup> – A biodiverse wetland to treat effluents. Anglian Water is the largest water and water recycling company by geographic area in England and Wales, committed to solving environmental problems at source. Water quality threats prompted evaluation of nature-based approaches to water management, and explored how NbS projects can actually save money for business and customers. Their experience showcases the critical role of customer engagement and how strengthening the relationship between utilities and the general public can create avenues to prioritise natural capital approaches.
- **De Watergroep – Catchment protection through ecosystem restoration**<sup>6</sup> – De Watergroep is the largest drinking water supplier in the Flanders region of Belgium. In the densely populated and cultivated region of Flanders, investing in the long-term protection of these water supplies through nature-based solutions (NbS) is a means of addressing serious water quality issues stemming from agricultural and industrial pollution. De Watergroep tackles pollution threats from the increased threat of nutrient and pesticide leaching into surface water supplies and a diminished dilution of chloride coming from industrial discharges, by focusing NbS on the protection and enhancement of the ecosystems that surround their abstraction areas.
- **Skanderborg Forsyning – Climate Change adaptation using Nature-based Solutions**<sup>7</sup> – The Danish water utility Skanderborg Forsyning affirms that when it comes to water security in a changing climate, using nature-based solutions at the local level was never a question. In recent years, the municipality of Skanderborg, has experienced increasing and more frequent rainfall resulting in extensive flooding of urban areas. Rainwater accumulation can lead to sewage overflow and surface water quality degradation, impacts that will be exacerbated by the onset of climate change. Climate change projects are an opportunity to adapt using nature to deal with increased rainfalls and prevent the flooding of urban areas.



## Challenges and Opportunities of the WSS Sector

The WSS Sector grasps the potential of NbS but would like to have more specific cases as examples to illustrate how NbS can preserve resources, reduce investment (NbS can be cheaper in the long term than traditional engineering) and also reduce energy and carbon footprints. There are certain barriers in mainstreaming restoration and NbS in the sector, consisting of challenges such as:

- Knowledge and information gaps: limited data on river flows, as well as evidence on the value of freshwater and terrestrial ecosystems brings a lack of knowledge on the costs and benefits, technologies, markets, and financial products associated with NbS. The absence of available best practices and expertise for investors creates uncertainty related to bidding processes.
- Administrative: NbS often combine different scales in urban water management, from individual buildings to municipal and larger levels which require involvement of different authorities and institutions.
- Financial gaps: lack of funding resources for large scale restoration projects, construction, rehabilitation, or operation & maintenance.
- The opportunities that could promote NbS in the sector are related at first to understanding the benefits of NbS versus traditional engineering in urban water management. There is a green solution opportunity towards each urban management issue. To address the complexity of these issues – technical, financial, administrative; various policy, regulatory and financing opportunities have been developed.
- The socio-economic benefits of NbS may seem to outweigh its financial benefits,<sup>8</sup> but it is of utmost importance for the WSS Sector to additionally recognize the financial benefits in investing in NbS. In general, where NbS were implemented, successes were observed with generally less intensive capital outflow, and an appreciation in value over time with the regeneration of the ecosystem services.<sup>9</sup>
- NbS can also avoid or postpone the costs of building new (or extending existing) grey infrastructure.
- Policy and regulatory opportunities – The Water Framework Directive (WFD)<sup>10</sup> provides a series of technical directives for the EU member states. The compliance to WFD translates into clean and safe access to drinking water, healthy freshwater ecosystems, flood defence and flood risk assessment, disaster management, minimising treatment costs downstream etc. Furthermore, EU member states should rely on the EU Strategy on Green Infrastructure that promotes the use of nature-based green and blue infrastructure solutions.



## Cooperation (MERLIN & the WSS Sector)

MERLIN aims to base suggestions on transformation and mainstreaming on practical experience. Whilst many different aspects of how the WSS Sector might be transformed and mainstream NbS were discussed, we would like to focus on specific aspects (**possible low hanging fruits**) of how the WSS Sector might be transformed and explain how NbS might be mainstreamed. In the MERLIN project we will focus our work with the sector on the issues in bold:

Although MERLIN acknowledges that “sanitation” is an important topic for the sector and that many NbS solutions are based on wastewater treatment and water reuse, we see the priority cooperation opportunities are through raising awareness of the importance of **working upstream on restoration**. A 2020 study by Chausson et al.<sup>11</sup> has shown that upstream forests and water utilities’ conservation and restoration “in the world’s 534 largest cities could better regulate water flows and save up to \$890 million in treatment costs annually”, and this could be replicated if NbS gets widely implemented.



The Stakeholder analysis identified relevant water organisations to be contacted regarding NbS, restoration and transformation. These organisations, representing the private/public water sector, were part of the MERLIN sectoral RTDs, and are aware of the climate change challenges and the need for sustainable use of water resources. Some of them have existing projects surrounding responsible water management, reducing their carbon footprint and to protect biodiversity. Most of the public operators are responding to climate change by optimising energy management – use of renewable energy, generation of energy in water cycle management, reduction in electricity consumption in wastewater treatment plants etc.

Participants from the RTDs expressed interest in NbS upstream activities to protect resources, particularly with increased potential for drought under climate change, but this is often large-scale ecosystem intervention that is difficult for water operators to deliver on their own because of a lack of a clear legal mandate to intervene at river basin scale and/or administrative constraints. Instead, they rely on working in partnership with other stakeholders and this approach can increase the governance challenges. However, there are promising developments, such as the recent “Gestion des milieux aquatiques et prévention des inondations (GEMAPI)” law<sup>12</sup> in France, where water operators and municipalities can be granted the responsibility and financial means to also manage water resources upstream, with restoration-protection objectives. This example of a good practice initiative promotes a stronger connection between water management in the urban cycle and upstream management of water resources and inspires replication in other areas.

The WSS Sector acknowledges that strategic and innovative **finance solutions** are required to raise funds and meet investment needs. Such solutions may also finance green infrastructure and NbS. Some of the potential financial schemes associated with the sector are the following:

- External (commercial) finance (from outside the company): Relevant instruments could include green loans or green bonds, which exclusively finance ‘green projects’ that generate environmental benefits, while maintaining the basic characteristics of conventional loans or bonds. What constitutes a green project is not concretely or legally defined. However, the European Commission has been establishing guidelines and definitions based on the Sustainable Finance Taxonomy Regulation, with the aim to standardise and upscale green finance.
- Internal finance (from within the company): Following the principle of full cost-recovery, restoration could theoretically be funded through the share of revenues collected via water pricing mechanisms used by water service providers, as far as restoration measures can count as investments in the availability, replenishment, and quality of freshwater. Alternatively, the disposal of assets can provide financial means to invest in restoration.
- Blended finance (internal/external private + public funding): Public funding may leverage green infrastructure to correct for market failure, where such measures are less cost-effective (or riskier) than grey infrastructure but provide public or shared environmental benefits. Relevant instruments could include subsidies, tax rebates, grants, or guarantees for loans.

For **cross sectoral cooperation** we need to understand the relationship between the WSS Sector and freshwater NbS. In general, all the MERLIN sectors (Hydropower, Navigation, Peat Extraction, Agriculture, Insurance) rely on each other to better manage water resources to avoid floods and droughts, so their sectors can continue to operate profitably.

Water Supply relies on stable provision of water. With agriculture being the largest consumer of ground and surface water, water saving practices in the sector could help to reduce competition for resources in drought. The WSS Sector is also in conflict with Navigation and Hydropower in times of low river flows. However, upstream implementation of NbS by Peat Extraction and Agriculture businesses that enhance environmental flows can all help WSS retain access to water resources. Reducing agricultural pollution will reduce WSS treatment costs.



## Next Steps

Overall, we are building a Community of Practice to support understanding and uptake of NbS and how we can enable mainstreaming of NbS in the WSS Sector; as well as how the WSS Sector can work with other sectors.

### Together with participants from the six sectors, in the next year MERLIN will:

- Continue to engage with the sector to exchange ideas and develop understanding of their needs, challenges, and opportunities for NbS
- Examine the EU policy context and how in the future policy could better enable NbS.
- Incorporate issues of social justice alongside ecological and economic considerations in the process to mainstream NbS within the sector.

### In the longer term until the end of the project MERLIN will:

- Identify opportunities for cross sector partnerships by applying a value chain approach.
- Co-develop route maps for transforming the sector's relationship with NbS.

For more information on how we will collaborate with the sectors' representatives or to discuss how you can help MERLIN please contact Anna Bérczi-Siket ([Anna.Berczi-siket@wwf.hu](mailto:Anna.Berczi-siket@wwf.hu)) or Kirsty Blackstock ([Kirsty.Blackstock@hutton.ac.uk](mailto:Kirsty.Blackstock@hutton.ac.uk)).

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