Parco Fiume Brenta
LIFE BRENTA 2030

DRINKING WATER AND ENVIRONMENT: TOWARDS A ZERO IMPACT SERVICE

Alessandro Leonardi, Giuseppina Cristofani, Giulia Amato,
Juan Diego Restrepo, Carlo Zanetti

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Author, organization
Carlo Zanetti - LEAF Department, University of Padua
Alessandro Leonardi - Etifor · Valuing Nature
Giuseppina Cristofani - Consiglio di Bacino Brenta
Giulia Amato - Etifor · Valuing Nature
Juan Restrepo - Etifor · Valuing Nature

Contact
giulia.amato@etifor.com

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ABSTRACT

In the current context of climate crisis, the proper management of natural resources acquires strategic importance for adaptation. For this reason, in the drinking water sector, it is necessary to rethink how the Integrated Water Service is connected to the territory, and to follow up with the European principles of "full cost recovery" and "polluter/user pays" through the recognition in the tariff of the so-called Environmental and Resource Costs (ERCs). This is a political, cultural, and technical change that involves all the stages of the management, from the source points to the users. The Parco Fiume Brenta project carried out an experimentation at the basin level to integrate this new type of costs into the tariff: the first test was welcomed by ARERA and thus represents a pathfinder for other basins interested in developing this mechanism.

GLOSSARY

ARERA: Regulatory Authority for Energy, Networks and the Environment (Autorità di Regolazione per Energia Reti e Ambiente), i.e. the Italian Authority which carries out regulation and control activities in the electricity, natural gas, water services, and waste cycle sectors. For the water sector, it defines the tariff system at national level and controls the local arrangements of the tariff.

ATO: Ambito Territoriale Ottimale, i.e. a territory on which integrated public services such as water are organised. These areas are identified by the Regions with a specific regional law (in the case of the integrated water service, with reference to the river basins), and they are managed by the Enti di Governo dell'Ambito (EGA).

DSS: Decision Support System, which increases the effectiveness of the analysis as it provides support to all those who must make strategic decisions when faced with problems that cannot be solved with operational research models.

DWPA: Drinking Water Protected Areas, i.e. the areas in the vicinity of water abstraction wells in which limitations are imposed on certain activities according to Art. 94 of Legislative Decree 152/2006.

EGA: Enti di Governo dell'Ambito, i.e. the bodies identified by the Regions for each Ambito Territoriale Ottimale (ATO) in which all the Municipalities within the ATO must participate and to which the exercise of the Municipalities' competences in the management of water resources is transferred, including the planning of water infrastructure.

ERCs: environmental and resource costs, i.e. the costs necessary to reduce, compensate, and mitigate the impacts of water abstraction; they are divided into environmental costs (ENV) and resource costs (RES).

IWS: Integrated Water Service, consisting of all the public services of captation, adduction and distribution of water for civil use, sewerage and wastewater treatment, which must be managed according to principles of efficiency, effectiveness and economy, in compliance with national and UE standards.

PES: Payments for Ecosystem Services, i.e. innovative mechanisms for transferring economic resources from those who benefit from ecosystem services to those who provide them.

WFD: Water Framework Directive (2000/60/CE). It's the Directive that establishes a framework for European actions in the water policy sector.

1 INTRODUCTION

1.1 The integration of the environmental component into the Integrated Water Service

How many of us know where the tap water we drink comes from? According to a study by Ref Ricerche (Berardi D., *et al.,* 2020), most citizens do not really perceive what is happening downstream and upstream of their homes.

Water is an essential good for life, and although it is abundant on our planet, **less than 1% is freshwater potentially usable by humans** (Gleick, 1993). Moreover, **due to climate change, water will become an increasingly scarce commodity in the future**, especially during dry seasons, due to the reduction in the volume of precipitation and snow and glacial reserves (EEA, 2017; Spano *et al.*, 2020). Also, for these reasons, it is necessary to act promptly to adapt the Integrated Water Service (IWS) to climate change and make it more sustainable from an environmental point of view, protecting the territories from which the resource is taken and where waste is discharged.

The Integrated Water Service is a public service, introduced into the Italian legislation by the Galli Law (L. 36/94), and consisting of all the public services of captation, adduction and distribution of water for civil use, sewerage and wastewater treatment, "obtained from the vertical unification of the various segments of public services management." The concept of "integration" refers precisely to the need to consider the water sector not as a series of independent activities, from the collection to the discharge of wastewater, but as a chain of processes that are interconnected and directed towards the efficiency of the entire water service, with a perspective of sustainability.

The Integrated Water Service is already in itself an example of circular economy, as it is a process that aims at reintroducing the water resource into the environment in the same condition in which it was taken for its different uses, valuing the waste of the production process from the socio-economic and environmental point of view (Berardi D., *et al.,* 2020).

The Integrated Water Service is an example of circular economy.

However, some aspects of the IWS still do not meet the current needs for environmental protection. There are, in fact, some **negative environmental externalities produced by the water sector that are not fully internalized** and persist mainly in the catchment and discharge areas.

These issues are not yet perceived as threats by citizens, who tend to have the notion of an unlimited water resource and struggle to understand the concepts of integration and circularity of the water sector outside their houses (Berardi D., *et al.,* 2020).

The value of water, which is reflected in the operating cost of the IWS supported by the water tariff, is currently based only on the economic value associated with water, i.e. the value expressed in monetary terms to ensure complete coverage of production costs (investment, operating and financial costs), according to the principle of "full cost recovery". However, a full internalization of ecological and social costs is missing. The first ones are associated with environmental damage of the resource exploitation. The second ones are related to alterations in water availability and changes in the territorial context. These **hidden costs**, which **create a discrepancy between the value and the price of water**, can be quantified as the amount needed to implement actions to mitigate the ecological and social impacts of IWS (Berardi D., *et al.,* 2020).

There is a lack of full internalization of ecological and social costs related to water resource usage.

1.2 How much does it cost us not to take care of our water resources?

The integration in an environmental sense of the IWS can no longer be postponed: there are a number of increasingly evident threats.

The integration of environmental components within the IWS is an operation that allows to **protect the territory** and have a positive balance in terms of impact on ecosystems and on the quantity and quality of the water resource. **Natural resources** - including water, one of the essential resources for human life - are not available in unlimited amounts but are scarce goods and therefore **can vary in quantity and quality both in time and space**. The integration in an environmental sense of the IWS can no longer be postponed. There are a number of increasingly evident threats that compromise the possibility of sustainable exploitation of water resources:

1. CLIMATE CHANGE
which will lead to imbalances in the natural water cycle, **reducing the water stock of Alpine glaciers** and i**ncreasing the frequency and duration of droughts**:

- between 2070 and 2100, precipitation in Italy may be reduced by up to 30% during summer periods compared to the first decades of the last century, triggering droughts and water scarcity and exacerbating the conflict of use of resources both between different territories and between different water uses (EEA, 2017);
- alpine glaciers will experience a sharp decline, and by 2100 their mass could be reduced by more than 75%, creating a further deficit in downstream water availability (IPCC, 2019).

2. OVEREXPLOITATION OF WATER RESOURCES
which could result in a **reduced availability for future uses** if actions aimed at improving efficiency in water use and groundwater recharge are not taken:

- in the context of the Middle Brenta aquifer, new wells have been created for drinking water supply, covering most of the needs of Padua, Treviso, Rovigo, and Venice provinces, for a potential flow rate of 2.63 m^3/s. If the groundwater balance is negative, it would be necessary to intervene with groundwater recharge operations to ensure long-term sustainability (Veneto Region, 2010);
- an experimental groundwater recharge project in Veneto (LIFE Aquor) has proven that through Forested Infiltration Areas one million m^3/year of water per hectare

3. DAMAGE TO ECOSYSTEMS
caused by excessive water withdrawal and inadequate treatment of wastewater, resulting in a reduction of the ecosystem services:

- according to a study by Ref Ricerche (Berardi D., *et al.,* 2020), Italian citizens are willing to pay 20% more to consume water that is sustainably withdrawn and purified before it is returned to the environment. This indicates that **citizens are beginning to perceive the "hidden" costs produced by environmentally unsustainable IWS management**.

4. CONTAMINATION OF WATER SPRINGS AND INCREASE OF POLLUTANTS IN GROUNDWATER RESOURCES
resulting from an incomplete application of Drinking Water Protected Areas, monitoring and *Water Safety Plans*:

- the contamination of groundwater by pollutants from industrial, agricultural, or civil wastewater involves an economical cost due to increased purification costs. An extreme case of groundwater pollution is **PFAS pollution**, which has led to dramatic impacts in terms of public health for a basin of 350 thousand people in the Vicenza, Verona and Padua provinces, creating an estimated economic damage of 136.8 million euros (Ministero dell'Ambiente, 2019).

The implementation of measures aimed at mitigating the abovementioned risks involves the integration of the environment into the integrated water cycle to achieve the circularly of the whole process: extracting the resource from the environment without overexploiting it (quantitative balance), returning it to the environment in its initial conditions (qualitative balance), and mitigating and compensating the residual impact with active management and conservation interventions.

The implementation of measures aimed at the mitigation of the abovementioned risks would mean starting that path of integration of the environment in the integrated water cycle.

1.3 Water investments, how much are we paying for the environment today?

Current investments in IWS to reduce environmental impacts only refer to wastewater treatment interventions, which results in a reductive approach that only considers the downstream environment of the drinking water cycle. According to a study by Ref Ricerche (Berardi D., *et al.,* 2016), **in 2015 only 5% of the total water tariff was used to cover the operational and investment costs for wastewater treatment**, equivalent to less than €8 per inhabitant per year. Therefore, it is necessary to increase investments to reduce the environmental impacts of IWS and **implement the "polluter/user pays" principle** through the inclusion of the Environmental and Resource Costs (ERCs) in the tariff, i.e. the costs necessary to reduce, compensate, and mitigate the impacts of water withdrawal, which will be discussed below.

In 2015 only 5% of the total water tariff was used to cover the operational and investment costs for wastewater treatment.

Thus, it is **essential to broaden the current understanding of "environment" to implement interventions not only on discharges, but also aimed at reducing, compensating, and mitigating the impacts of IWS throughout the whole process**, from withdrawal to discharge. For example, it is critical to consider the impacts of withdrawals on biodiversity, climate change adaptation interventions, and the reduction of ecosystem services. This process requires an interdisciplinary approach to analyse environmental impacts, involving a wide range of professionals.

2 REGULATORY FRAMEWORK

2.1 The European legislation

The first acknowledgement of the need to integrate the environment into water services dates back to the adoption of the **Water Framework Directive (WFD)** by the European Parliament and Council in 2000 (2000/60/EC), which **establishes the "polluter/user pays principle"**. Article 9 also explicitly states that member states should strive to ensure the full coverage of water service costs ("full cost recovery" principle), including environmental and resource costs (ERC).

Environmental costs are defined as **"the costs referring to the damage that water uses cause to the environment, ecosystems, and other users of the environment** (e.g., a reduction in the ecological quality of aquatic ecosystems or the salinization and degradation of fertile soils)," while resource costs are **"the costs of lost opportunities that other water uses suffer due to exploitation of the resource** beyond its natural rate of recharge or recovery (e.g., over-abstraction of groundwater)" (WATECO, 2002).

Environmental costs are defined as "the costs referring to the damage that water uses cause to the environment, ecosystems, and other users of the environment.

Resource costs are "the costs of lost opportunities that other water uses suffer due to exploitation of the resource beyond its natural rate of recharge or recovery.

The Directive prescribes the application of environmental and resource costs to polluters/users but does not provide methodological guidance on calculating these costs. Specifically, there is considerable difficulty in distinguishing some resource costs from environmental costs since the former also includes the costs of damage to other users of the resource, and the latter refers to the costs of lost opportunities imposed on other water uses due to intensive exploitation.

Another critical aspect of calculating ERCs relates to **impacts on environmental assets that provide a non-use utility**: for example, the value that a citizen associates with the mere existence of a particular animal species (**existence value**) or the preservation of groundwater to ensure its use for future generations (**bequest value**), or the desire to preserve a forest to ensure its future use (**option value**). The value of these "non-use" assets is not readily quantifiable, and its calculation requires acquiring large amounts of data through interviews.

In addition to setting quality standards for water bodies, the technical documents of the Directive also define criteria for the proper analysis of pressures and impacts on water resources and aquatic ecosystems, based on which mitigation measures should be implemented. According to the Directive, **an essential concept for the protection of the water resource is that of "integration", which must take place on several levels**:

- integration of environmental objectives: qualitative, quantitative, and ecological;
- integration of different water resources: surface and groundwater bodies, wetlands and coastal areas;
- integration of different water uses: definition of policies for the optimal management of the resource, also based on the different value they bring to society;
- integration of scientific disciplines: the need for a wide range of knowledge for the assessment of pressures and impacts and related measures to be implemented;
- integration of different regulatory sources into an overarching and coherent framework;
- integration of managerial and ecological aspects for the definition of a sustainable plan at basin level;
- integration of economic instruments for environmental and resource protection;
- integration of stakeholders and civil society in decision-making processes;
- integration of different levels of government: local, regional and national;
- integration of different water resource management in transboundary territories.

With the Water Framework Directive (WFD) of 2000, the European Union has played a crucial role in shedding light on the hidden costs of IWS, creating the basis for a common strategy for environmental protection in the water sector and encouraging the exchange of experiences and best practices, pushing national governments to adopt measures for the protection of a precious asset such as water.

Nonetheless, at the moment there is no homogeneity among the various EU countries in defining the criteria for calculating and applying environmental and resource costs. The **European Commission** (EC) acknowledges the progress made by member countries in the theoretical definition of ERCs. **Still, it points out a lack of practical implementation of the measures necessary to reduce environmental impacts**. In addition, the EC notes a lack of shared approaches among countries for defining ERCs and of methodologies for their internalization (European Commission, 2019). For more information, see the following box.

ERCs implementation status at European level:
In implementing ERCs in Europe, countries have acted in contrasting ways, following different theoretical perspectives. An example of pragmatic approach can be found in the German wastewater tariff, recognized for substantially improving the state of the national water treatment system. Within this tariff, it is actually not necessary to calculate ERCs. This case is often used as precedent in the still ongoing debate on whether a concrete "calculation" for ERCs is realistic and desirable (e.g., Gawel, 2014). Some elements supporting this statement include the impossibility of translating ERCs into monetary terms due to the lack of accurate data on environmental and resource costs, and the difficulty of using the polluter pays principle to distribute costs among individual users. Proponents of this thesis argue that ERCs can be internalized without the challenging task of calculating them (Berbel & Expósito, 2020).
On the other hand, some countries such as France, Portugal, and Spain have introduced ecotaxes as instruments to promote the ERCs calculation and encourage their internalization. These taxes vary significantly between countries with regard to the entity that sets them (e.g., national, regional, or basin authority) and how they are calculated (e.g., area or volume-based). In practical terms, however, water taxation in Europe is still weak, struggling to be established especially in the agricultural sector, mainly due to past political decisions at the European level and to the sector's political solid influence (Berbel *et al.*, 2019).
Nevertheless, taxes should not be seen as the only way to internalize ERCs and cost recovery. There is evidence from the French and Spanish cases that the cost recovery rates tend to be higher when collective water management is implemented (Rey *et al.*, 2019). In this sense, the active involvement of all stakeholders (e.g., Water Users Associations) has proven to be an important way to provide further legitimacy to the rules of the game and increase their compliance. This is reflected in reducing adverse effects such as diffusive pollution and an improvement in water use efficiency (Berbel & Exposito, 2020).
In conclusion, even if some member states have made important steps towards the implementation of the WFD, an actual integration of ERCs in the Integrated Water Service is still missing, which places great importance into pilot tests like the one presented here about Brenta river in Italy.

2.2 The Italian regulatory context

Decree 39/2015 identifies the water uses and proposes a general methodology for applying the "user/polluter pays" principle for the several uses.

Fifteen years after the promulgation of the Water Framework Directive, the Italian legislation adopts the provisions of Article 9 through the **Decree 39/2015** of the Ministry for Environment, Land and Sea Protection (the current Ministry of Ecological Transition) - "Regulation containing the criteria for defining the environmental and resource costs for the different sectors of water use." This decree **identifies the water uses and proposes a general methodology for applying the "user/polluter pays" principle for the several uses** (drinking, hydroelectric, agricultural, industrial, mineral water extraction).
The decree identifies three categories of costs related to water uses and services:

1. FINANCIAL COSTS
Costs associated with the provision and management of water uses and services, attributable to an economic activity or transaction that makes use of the water resource as a consumption good or production factor. They include operating, maintenance, and capital costs.

2. ENVIRONMENTAL COSTS
Costs related to the damage that the use of water resources causes to the environment, the ecosystem, or other users. They are defined as the expenses, interventions and obligations for the restoration, reduction or containment of the damage produced by water uses and are to be charged directly to the party that uses the resource or benefits from a water service.

3. RESOURCE COSTS

Costs of lost opportunities imposed on other users due to intensive exploitation of resources beyond their restoration and natural replacement level. They must consider the opportunity cost on both a spatial and temporal scale. Thus, a resource cost exists if the economic value (current and future) that would result in the case of its best alternative use is greater than the economic value of the water in the activities in which it is currently allocated.

As defined by DM 39/15, the three cost items (financial, environmental and resource) have different calculation methodologies.

Financial costs are the most straightforward to identify, as they are directly detectable from the financial statements of multiutilities and are generally already included in the tariff system.

Environmental costs are quantifiable as the expense for interventions to reduce or remove the damage caused by water uses and services to maintain aquatic ecosystems' functionality and prevent water degradation in both qualitative and quantitative terms. Environmental costs must be charged directly to those who use the resource or a given water service, according to the "polluter/user pays" principle.

Instead, **more significant difficulties are attributed to the quantification of the resource costs** since such damage is generated by an intensive use of the resource that undermines the possibility of another use (e.g., if the water resource is scarce, there could be a conflict between drinking and irrigation use).

The scheme proposed by MATTM for the analysis of ERCs can be summarized as follows:

1. to **describe the Ministry of the environment** and the interactions between human activities and nature;
2. to **quantify the resource availability**, the current and future needs and the flows of withdrawal and restitution through the water balance;
3. to **estimate the management and financial costs** associated with the different uses of the resource;
4. to **quantify the environmental impacts** of human activities related to the water resource;
5. to **determine the environmental costs** resulting from the types of use;
6. to **carry out an economic assessment** of the best combination of measures to implement to achieve quality objectives;
7. to **verify the existence of resource costs** attributable to the existing context and quantify their value;
8. to **plan for sustainable uses**, including comparative analyses of possible use options that result in the least environmental, social and economic impact;
9. to **monitor the progress of policies and strategies** adopted for the conservation, restoration and protection of the environment and the resource.

The Regulatory Authority for Energy, Networks and the Environment (ARERA), which defines the tariff system at the national level, identifies, through the publication of **the *delibera* 580/2019/R/IDR, the criteria to explicit the Environmental and Resource Costs in the investment plans of *Enti di Governo d'Ambito*** and determines among the local charges "the implementation of specific measures related to the protection and production of water resources or the reduction/elimination of environmental damage." The tariff component to cover the ERCs for each year *a* is there defined as:

Delibera 580/2019/R/IDR identifies the criteria to explicit the Environmental and Resource Costs in the investment plans of Enti di Governo d'Ambito.

$$ERC^{a} = ERC^{a}_{Capex} + ERC^{a}_{Opex}$$

where:

- ERC^{a}_{Capex} is the tariff component referring to the **fixed asset costs** (the so-called Capex) attributable to environmental costs (Env^{a}_{Capex}) and resource costs (Res^{a}_{Capex}). All these are costs related to long-term investments, such as the construction of a new water treatment plant.
- ERC^{a}_{Opex} is the tariff component referring to **operating costs** (Opex) related to environmental costs (Env^{a}_{Opex}) and resource costs (Res^{a}_{Opex}). All these are costs related to continuous activities over time, such as hiring an employee to monitor environmental and water quality in the field.

Fixed asset costs explicit as ERCs (ERC^{a}_{Capex}) are then split between environmental costs and resource costs:

- Env^{a}_{Capex} is the component referring to the environmental costs relating to purification activities and, specifically, to their upgrading and adaptation to ensure adequate quality of the water returned to the environment.
- Res^{a}_{Capex} is the component referring to resource costs (cost for the incremental use of an additional unit of resource for a given service, subtracting it from alternative uses) relating to supply and drinking water activities. It mainly refers to interventions involving new water catchment works and the construction and upgrading of drinking water plants.

Similarly, operating costs (ERC^{a}_{Opex}) are further subdivided - without distinction between environmental and resource cost - into:

- ERC^{a}_{end} i.e. endogenous environmental and resource costs, including the operating costs of purification, drinking water treatment and remote monitoring to reduce network leakage.
- ERC^{a}_{al} i.e. upgradable environmental and resource costs, including local charges (water diversion/subtraction fees, contributions to *Consorzi di Bonifica* – the public bodies entitled to manage water for irrigation purposes, contributions to mountain communities, water restitution fees for the management of Drinking Water Protected Areas). This applies insofar as these are allocated to implementing specific measures related to water resources protection and production, the reduction/elimination of environmental damage or improving the opportunity cost of the resource.
- ERC^{a}_{tel} i.e. environmental and resource costs attributable to any operating costs associated with specific purposes, particularly actions to achieve the objectives related to the indicators of technical quality of the IWS.

The definitions given by the Authority seem to follow a pattern that refers the environmental costs only to the purification activities and the resource costs only to the supply activities.

Although the explanation of the fixed assets is a significant step forward for the inclusion in the water tariff of the ERCs component, **the definitions given by the Authority seem to follow a pattern that refers the environmental costs only to the purification activities and the resource costs only to the supply activities.** There is no mention of activities for the compensation and reduction of the damage caused to ecosystems by the IWS, provided, but not detailed, by DM 39/2015.

It is necessary to identify the types of costs to be expressed as ERCs.

It is, therefore, necessary to identify the types of costs to be expressed as ERCs, including some types of costs previously allocated in other components, such as the fixed assets, and ensuring that ERCs can be used to finance measures for the protection and preservation of drinking water sources, as well as interventions to prevent the reduction and alteration of the functionality of aquatic ecosystems and to restore the functioning of these ecosystems themselves.

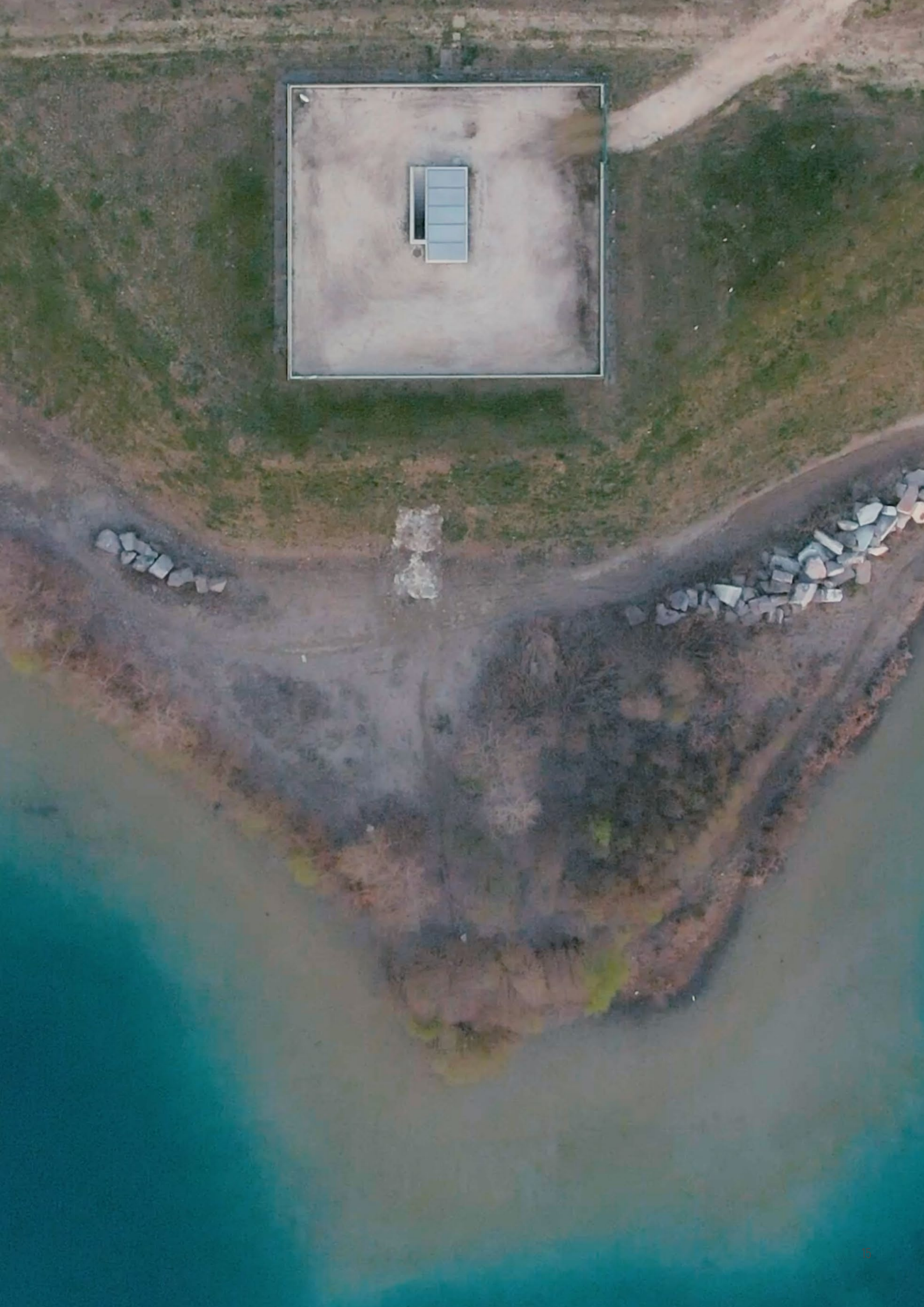
Thus, it is strategic to **distinguish new investments that fit into the definitions of environmental and resource costs and to reclassify those that have been recognized as assets but not included in environmental and resource costs in the past**. This identification, reclassification and characterization work is the basis for the possibility of having investment costs recognized in the tariff permanently.

Several representatives of ARERA have shown openness to discussion on what can actually be counted as ERCs; Professor Guerrini (member of ARERA board) stated that several interventions could actually be included among ERCs, such as groundwater recharge interventions and payments for ecosystem services (PES) to farmers. This suggests that ARERA is keen to interpret the type of interventions eligible under ERCs according to the definitions of *Delibera* 580/2019/R/IDR in an extensive sense.

Another unclear issue in the context of ERCs is the possibility of including among the environmental costs the investments aimed at reducing climate-changing emissions generated by IWS.

Another unclear issue in the context of ERCs is the possibility of including among the environmental costs the investments aimed at reducing climate-changing emissions generated by IWS, produced by the infrastructure construction and the use of electricity. According to the scheme of DM 39/2015, environmental costs are recognized if there is a "significant pressure on the water system": **climate change, caused precisely by climate-changing emissions, has direct impacts on the availability of the water resource** (IPCC, 2019). Therefore, **it would be possible to include among the environmental costs also the mitigation measures promoted by the IWS, in line with the reduction targets set by the European Commission to 2050**. By doing so, the IWS could become carbon neutral or even climate positive, if it will be able to improve the environment over time. **An objective limitation in the application of ERCs is the lack of incentives for their recognition.** Some costs that could be expressed as ERCs are currently not included in this item, contributing to the non-recognition of ERCs in the tariff. It would be worthwhile at this stage to implement an incentive mechanism for fixed assets attributable to ERCs, for example by acting on the depreciation rates of these investments. In any case, **a discussion with the Authority remains necessary** to agree on whether the infrastructure that aim to protect the ecosystems can be included within the ERCs component.

Climate change, caused precisely by climate-changing emissions, has direct impacts on the availability of the water resource.



3

THE PROCESS OF RECOVERING ENVIRONMENTAL COSTS THROUGH THE TARIFF SYSTEM

The "polluter/user pays" principle is the founding element of the entire IWS sustainability process, firstly proposed in the WFD and then implemented in the Italian legislation. All the actors that allow the application of this principle have a fundamental role. From the *Enti di Governo d'Ambito* (bodies that deal with the planning and management of the water resource at the basin level) and the multiutilities, that identify priorities for environmental remediation thanks to their knowledge of the territory, to citizens, that will have to bear the environmental and resource costs. The technical tools for defining investments, such as the River Basin Management Plan and the regulatory periods of ARERA, are also essential for long-term and effective time planning. Finally, it is crucial for the practical application of the "polluter/user pays" principle that the Environmental and Resource Costs are actually charged to those who use the water. In this regard, some considerations should be made in terms of territorial scale if some areas use water emitted from another territory.

The "polluter/user pays" principle is the founding element of the entire IWS sustainability process.

3.1 The involved actors

The actors involved in the process of including ERCs in the water tariff are multiple:

- The **Regulatory Authority for Energy, Networks and Environment (ARERA)**, which defines the criteria for identifying the costs in the tariff. It has materially allowed the *Enti di Governo d'Ambito* to include in the calculation tools for the definition of the water tariff the items of expenditure and investment aimed at environmental protection and the reduction/compensation of the damages of the IWS, albeit in a not entirely exhaustive manner.

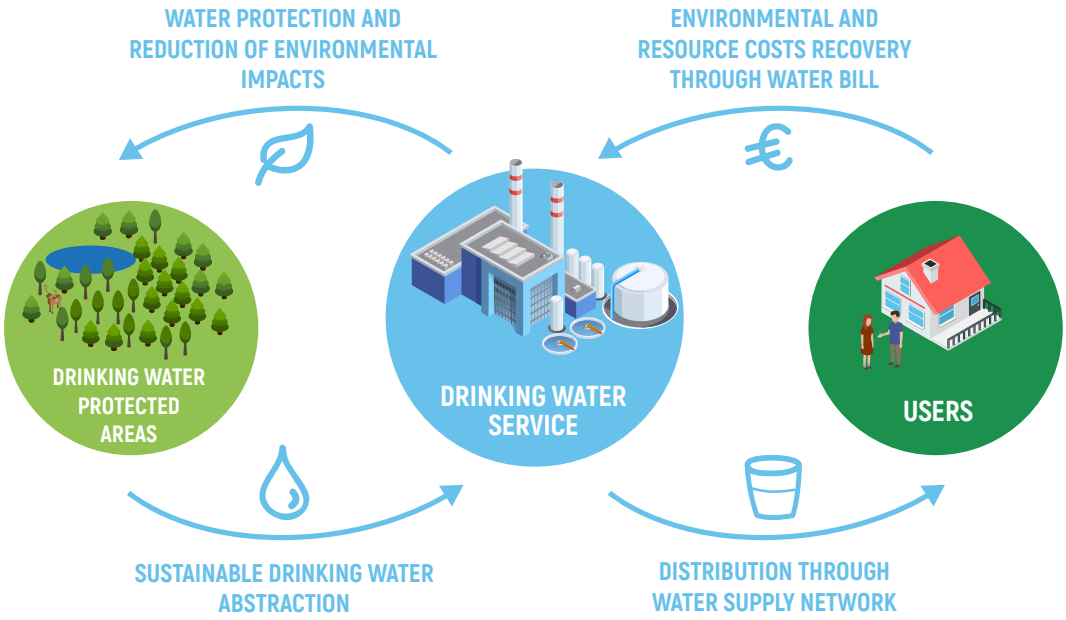
- The ***Enti di Governo d'Ambito*, which adapt the tariff provisions of ARERA in the local context** and are, therefore, responsible for the correct identification of ERCs and the necessary interventions to compensate and prevent them.

- **IWS managers (multiutility), who physically carry out environmental protection interventions and have a vital communication function with users**, necessary to make them understand how urgent it is to act to reduce the damage caused by the consumption of water resources, and how the interventions carried out are an investment for the territory, aimed at improving the quality of life and of the environment.

- **Universities and environmental consulting companies**, which play the role of concertation between the different actors of the IWS, provide scientific support to methodological development, and promote technology transfer and scalability of virtuous processes.

- **IWS users, who must be aware of the reason why there is a need to include environmental and resource protection in the water tariff**, with the hope that, with appropriate information and awareness raising campaigns, they can develop a willingness to pay for IWS compensation/damage reduction measures at least equal to the ERCs themselves. **Only in this way the integration of the environment into the IWS can become an added value also from a purely economic point of view**, i.e. aligning the price with the actual value attributed to the water resource and its protection.

IWS users must be aware of the reason why there is a need to include environmental and resource protection in the water tariff.



3.2 Regulatory periods

The regulatory period is a four-year time interval within which the methods for defining the IWS water tariff (*Metodo Tariffario Idrico*, MTI) are defined by ARERA. In December 2019, the already mentioned *Delibera* 580/2019/R/IDR established the calculation rules for the new regulatory period 2020-2023, based on which the *Enti di Governo d'Ambito* are called to structure the cost items to be included in the water tariff, aimed at ensuring the sustainability of the IWS according to the principle of full cost recovery. The new MTI-3 tariff model, in which the ERCs items are made explicit, was also the result of the opinions expressed by the EGA during the consultation launched with the document ARERA 402/2019/R/IDR. **The partnership of the LIFE Brenta 2030 project**, whose role will be discussed later, **proposed essential changes during the consultation phase**: all the suggestions were accepted by ARERA and included in the final document of the MTI-3. **Considerable emphasis was placed on climate change** as a risk to the sustainability of IWS, and **investing in green infrastructure was recognized as good practice for increasing the resilience of water sources**.

Investment in green infrastructure was recognized as good practice for increasing the resilience of water sources.

3.3 The River Basin Management Plan

The River Basin Management Plan is the planning tool used by the *Enti di Governo d'Ambito* to define the quality objectives of the Integrated Water Service and the interventions needed to meet them. Legislative Decree no. 152 of 03/04/2006 states that the River Basin Management Plan consists of the following acts:

- **verification of the state of infrastructure**: it identifies the state of consistency of the infrastructure to be entrusted with Integrated Water Service manager, specifying their state of operation;
- **programme of interventions**: it identifies the exceptional maintenance works and the new works to be realized, including the interventions of adaptation of existing infrastructure, necessary to reach at least the minimum service levels, as well as to satisfy the overall demand of users, considering the ones located in mountainous areas or with lower population density. The programme of interventions specifies the objectives to be achieved, the planned infrastructure and the time required for its realization;
- **management and organizational model**: it defines the operational structure through which the manager ensures the service to users and the implementation of the programme of interventions;
- **economic and financial plan:** it consists of the balance sheet and income and cash flow statements. It provides, on an annual basis, the trend in operating and investments costs net of any non-repayable public funding. It is supplemented by an annual forecast of income from tariffs, covering the entire reference period.

The plan must guarantee the achievement of the economic and financial balance and, in any case, the compliance with the principles of effectiveness, efficiency and economy of management, also in relation to planned investments.

According to the provisions of ARERA, **the investments that can be included under ERCs in the third regulatory period 2020-2023 must be interventions already present in the River Basin Management Plan and already implemented**. To have more certainties on the possibility of having ARERA's approval of the expenses to be included in the River Basin Management Plan as ERCs, **it would be appropriate for the managing bodies to ask ARERA in advance for some details on interventions not explicitly included in the definitions of *Delibera* 580/2019/R/IDR**. This would allow to update the River Basin Management Plan more effectively in terms of environmental protection, which is in line with the principle of *full cost recovery*.

As already mentioned, a further element that could **facilitate the large-scale application of investments to reduce environmental impacts is the possibility of providing rewarding mechanisms** for the *Enti di Governo d'Ambito* that include the fixed assets comprised in ERCs criteria in the River Basin Management Plan. Currently, there are no rewarding mechanisms for the inclusion of fixed assets in the ERC_{Capex} item. In fact, they are treated as any other fixed asset from an economic and financial point of view.

A further element that could facilitate the large-scale application of investments to reduce environmental impacts is the possibility of providing rewarding mechanisms for the Enti di Governo d'Ambito that include the fixed assets comprised in ERCs criteria in the River Basin Management Plan.

3.4 The territorial scale

The territorial scale of reference for the application of ERCs differs depending on the actors involved. The *Ente di Governo d'Ambito* has the task of identifying which investments and operating costs incurred in its reference territory (*Ambito Territoriale Ottimale*, ATO) are to be included in the ERCs component of the tariff. However, **the impacts of the IWS on the territory are not uniformly distributed**: water withdrawal is often localized in a specific area, like the points of spillage of wastewater. Damage reduction/compensation infrastructure should therefore be located in the specific areas where IWS is most impactful. **To be fully internalized, the environmental cost must "travel" along with the water: anyone using the resource (in its broadest sense) must contribute to environmental restoration in the area where the impact caused by the use occurred, regardless of geographic location** and even beyond the boundaries of the ATO where the withdrawal takes place. The resource costs, by their nature, can affect vast territories since, for example, inefficient use of the water resource of a river can generate significant costs downstream of the withdrawal. As envisaged by the WFD, **integration must take place on different territorial scales and must be a process involving different governmental levels**.

To be fully internalized, the environmental cost must "travel" along with the water.

4

THE TERRITORIAL CONTEXT OF IWS IN THE VENETO REGION

4.1 IWS in the Veneto Region

The territory of Veneto Region is divided into nine *Ambiti Territoriali Ottimali* (ATO - territories where integrated public services such as water or waste are organized), one of which is shared with Friuli Venezia-Giulia. The *Enti di Governo d'Ambito* have the task of planning services and infrastructural interventions within the ATOs. However, **the aqueduct network of the Region is interconnected,** combining small and medium aqueducts, and is aimed at reducing the fragmentation of water infrastructures to limit the sources of supply. This interconnected system is the *Modello Strutturale degli Acquedotti del Veneto* (MO.S.A.V. - Structural Model of the Aqueducts of Veneto Region). Such Model is gradually abandoning the classical "tree" approach for a "network" one, to guarantee the continuity of the water service a better and more efficient management from the withdrawal to the discharge. A subset of the MO.S.A.V. is the ***Schema Acquedottistico del Veneto Centrale*** **(S.A.VE.C. - Aqueduct scheme of Central Veneto)**, which includes a catchment area of about 600,000 inhabitants in the provinces of Venice, Padua, Vicenza, and Rovigo. The S.A.VE.C. is a central node for water distribution from the areas identified as suitable to **produce good quality water** in the piedmont area to those areas where there is a water deficit. For this reason, in the Middle-Brenta area, particularly **in Carmignano di Brenta** (PD)**, the water withdrawal capacity has been recently increased from the previous 800 l/s to the current 1750 l/s** through the realization of new wells (Consiglio di Bacino Brenta, 2011).

S.A.VE.C. - Aqueduct scheme of Central Veneto includes a catchment area of about 600,000 inhabitants in the provinces of Venice, Padua, Vicenza, and Rovigo.

4.2 Parco Fiume Brenta

The new wells are partially located in the Natura 2000 site "Grave e Zone Umide del Brenta" (ZSC/ZPS IT3260018). **This new infrastructure may involve many environmental impacts in a protected area: loss of wetland habitats and biodiversity, lowering of the water table and limitations for naturalistic and recreational use.**

Improve the management of the Brenta River and promote an economy based on a network of businesses, associations and organizations.

The *Parco Fiume Brenta* initiative (River Brenta Park) was created to **improve the management of the Brenta River and promote an economy based on a network of businesses, associations and organizations** that want to responsibly manage the synergies between territory and river.

Created in 2016, thanks to the efforts of Etifor, it started to make the headlines thanks to the crowdfunding *"Un parco per il Fiume Brenta"*, which was the most successful fundraiser dedicated to a Natura 2000 area ever in Italy. 10.000 euros were collected from about 100 private citizens, 47,000 euros from the municipalities along the river, 20,000 euros from local companies.

4.3 The LIFE Brenta 2030 project

To address coordinately the critical issues outlined above, the **LIFE Brenta 2030 project**, co-financed by the European Union's LIFE Programme, has been launched with the following consortium:

- **ETRA Spa**, multi-utility of ATO Brenta (coordinator);
- **Etifor | Valuing Nature**, spin-off of the University of Padua;
- **Consiglio di Bacino Brenta**, EGA of ATO Brenta;
- **Department of Land, Environment, Agriculture and Forestry** of the University of Padua.
- **Veneto Acque Spa**, concessionary of the S.A.VE.C.
- **Veneto Agricoltura**, Veneto Region Agency for the Primary Sector.
- **Municipality of Carmignano di Brenta**, where the new wells are located.

The LIFE Brenta 2030 project aims at promoting good governance and innovative payment schemes to maintain biodiversity and the water resource in the Brenta river.

The project aims at protecting the **Natura 2000 site "Grave e Zone Umide del Brenta"**, located in a highly anthropized territorial context: the lack of a clear governance for the Site and the new infrastructure for drinking water supply threaten a precious ecosystem for the Veneto Region.

The **three macro-objectives** of the project are:

1. to improve the environmental quality of the site, the biodiversity, and the quantitative and qualitative status of the water through the implementation of multifunctional interventions such as green and blue infrastructure for the restoration of wetlands and river ecosystems, and Forest Infiltration Areas for groundwater recharge;

2. to protect the resource and maintain interventions in the long term through the implementation of a pilot mechanism of payment for ecosystem services (PES) through the recovery of ERCs, in order to finance the management of the Natura 2000 site and the restoration/containment/mitigation of the impacts of water withdrawals;

3. to organise the territory and ensure participatory management, through the design and establishment of an innovative governance system aimed at ensuring the sustainability and replicability of conservation actions and interventions, with a view to integrated management.

4.4 Application of a pilot mechanism for the integration of ERCs in the tariff in the Brenta ATO

As described by the second objective above, a methodology for the recovery of ERCs in the ATO has been developed within the LIFE Brenta 2030 project. A first test of the inclusion of some interventions was also carried out, with the results described below.

In the LIFE Brenta 2030 project, a standard and replicable methodology was formulated for the inclusion of ERCs in the tariff.

4.4.1 Methodology

1 – Creation of a working group

Among project partners, a working group of experts from academia (University of Padova, Etifor | Valuing Nature) and the water sector (Consiglio di Bacino Brenta, Etra Spa, Veneto Acque) was established: the different skills and competencies and a multidisciplinary approach allowed to address the complexity of the innovative financing mechanism.

2 – Identification of impacts

The impacts of the Integrated Water Service are then identified and quantified in the Drinking Water Protected Areas (DWPA), i.e. the areas in the vicinity of water abstraction wells in which limitations are imposed on certain activities according to Art.94 of Legislative Decree 152/2006. The DWPA are identified through in-depth hydrogeological studies. The identified impacts are on:

- habitat and biodiversity (e.g., loss of wetlands);
- future availability of water resources (e.g., lowering of the water table);
- recreational use of the Natura 2000 site (e.g., bathing restrictions);
- land-use conflicts (e.g., limitations on agricultural activities).

3 – Development of a Decision Support System

All possible measures to reduce, compensate or mitigate the negative impacts of water abstraction are then identified, as provided by national and European legislation. These measures can be Nature-Based Solutions (NBS) or management ones. The costs and benefits of each measure are then quantified and, thanks to a Decision Support System (DSS) in a GIS environment, the most suitable areas for their implementation are identified according to the criteria of maximization of socio-environmental benefits and economic efficiency.

4 – Integration of the River Basin Management Plan and implementation of interventions

The types of intervention must then be traced back to the investment (ERC_{Capex}) or operational (ERC_{Opex}) components. In the first case, the cost categories of the different measures identified through the SSD are included in the Plan and, after the approval by the national authority (ARERA), these measures can be implemented and subsequently reversed in the tariff and then financed with the proceeds of the tariff system. In the second case, the operational costs can be passed on directly in the tariff.

4.4.2 Preliminary results

The first result obtained by the working group is to have **crucially contributed to the consultation initiated by ARERA in 2019** (402/2019/R/IDR) having proposed several changes which were fully approved: higher emphasis on the issue of climate change as a threat to IWS and recognition of investments in green infrastructure for the resilience of water sources.

The working group identified impacts and corrective measures related to the ERCs.

In addition, following the methodological framework outlined above, a first step that has been done within the working group was **the identification of all possible impacts caused by IWS that fall within the definitions of ERCs of DM 39/15 of MATTM and their association with IWS quality objectives** (Table 1); for each quality objective, **the possible measures to be implemented were then identified** (Table 2), which in turn were linked to the macro-indicators of the ARERA standards (Annex A to Resolution 477/20):

- M1: Water losses
- M2: Service interruptions
- M3: Quality of water supplied
- M4: Adequacy of the sewerage system
- M5: Sludge disposal in landfills
- M6: Quality of purified water

Impacts	Geographical area of impact	Type of cost (ENV/RES)	Description	IWS Quality Objective
Water table lowering	Brenta river basin, N2000, Water protection areas	RES	If the water table level lowers, there may be problems with the availability of the resource for other purposes (e.g., agricultural practices) and future uses.	Green and blue infrastructure, better withdrawal management
Water quality reduction caused by spillage	Brenta river basin, N2000	ENV	Spills can cause damage to the environment, to recreational activity in the discharge area, and fishing	Discharge quality improvement
Loss of habitat and biodiversity	N2000, Water protection areas	ENV	Water withdrawals can cause habitat loss (e.g., wetlands due to the lowering of surface water levels), creating damage to biodiversity	Green and blue infrastructure
Reduced recreational functions	N2000, Water protection areas	RES	Limitations are imposed on recreational use in the DWPA (horseback riding, cyclists, hunters, fishers, naturists, swimmers).	Management of DWPAaccording to criteria Art. 94 Dlgs 152/2006
Impact on the future development of the area	Aree salvaguardia	ENV	The water infrastructure and constraints in the preservation areas limit the potential for future development for different purposes, based on the types of restrictions imposed	Management of DWPA according to criteria Art. 94 Dlgs 152/2006
Impacts on farmers	N2000, Water protection areas	ENV	Limitations in the water protection areas create damage to the primary sector, limiting the possibility of wastewater discharge and chemical treatments.	Management of DWPA according to criteria Art. 94 Dlgs 152/2006

Table 1 - IWS impacts identified by the workgroup and IWS quality objectives.

IWS Quality Objective	Code	Measure	ENV/RES	ARERA Macro indicator
Improved withdrawal management	a	Fixed hydraulic aqueduct works	RES	M2, M3
	b	Aqueduct pipelines	RES	M1, M2
	c	Reservoirs	RES	M2
	d	Aqueduct lifting and pumping systems	RES	M3
Quality improvement of discharges	e	Siphons and flood drains and other fixed hydraulic sewage works	ENV	M4
	f	Purification plants - up to the secondary treatment	ENV	M6
	g	Sewerage pipelines	ENV	M6
	h	Sludge drying and sludge upgrading facilities (including mono-incineration, pyrolysis, gasification)	ENV	M5
Management of DWPA according to criteria Art. 94 Dlgs 152/2006	i	Removal or securing of prohibited activities and hazard centers in water protection areas	RES	M3
	l	Identification of DWPA	RES	M3, M4, M5, M6
Green and Blue Infrastructure (PES)	m	Planted forests	RES	M3
	n	Hedge planting	RES	M3
	o	Agri-environmental measures	RES	M3
	p	Organic in conversion	RES	M3
		Establishment of Forest Infiltration Areas	ENV	M2, M3

Table 2 - Macro measures identified by the Water Resource and Biodiversity Protection Working Group that can be funded through ERCs.

Finally, the most recent result of the workgroup was the inclusion of some **interventions valued as ERCs in the tariff for the 2020-2023 regulatory cycle** (Table 3). It should be noted that this identification will be recalculated in the tariff only after the work is put into operation (registration as an asset), even if the first effects will already be evident after the first two years (2020-2021). This would be based on the progress of the interventions that will be reported at the time of the intra-period tariff review, scheduled for March 2022. On that occasion, it will also be possible to expand the types of ERCs interventions to be carried out, on the basis of the indications that will be provided by the Decision Support System, in order to specify the item currently indicated as "Environmental mitigation interventions".

In February 2021 ARERA approved the regulatory scheme, which for the first time saw some costs valued as ERCs.

However, it should be pointed out as encouraging that ARERA did not consider it necessary to ask for clarification on the subject and **fully approved the proposed regulatory scheme** with Delibera (corsivo) n.35 of February 2nd, 2021.

	Measures	Planned gross investment value post 2023	Total gross investment value (including any pre-2018 shares)	Type of Asset
a	Fixed hydraulic aqueduct works	6.080.011,11 €	10.089.000,00 €	ENV/RES
b	Aqueduct pipelines	59.491.809,00 €	133.118.121,00 €	ENV/RES
c	Reservoirs	2.325.000,00 €	3.100.000,00 €	RES
d	Aqueduct lifting and pumping systems	- €	1.097.041,49 €	RES
e	Siphons and flood drains and other fixed hydraulic sewage works	31.548.571,40 €	41.800.000,00 €	ENV
f	Purification plants - up to the secondary treatment	22.068.700,00 €	72.654.990,65 €	ENV
g	Sewerage pipelines	12.811.461,00 €	14.672.000,00 €	ENV
h	Sludge drying and sludge upgrading facilities (including mono-incineration, pyrolysis, gasification)	14.450.000,00 €	26.000.000,00 €	ENV
i - q	**Environmental mitigation interventions**	**- €**	**1.000.000,00 €**	**ENV**
	Total	**- €**	**303.531.153,14 €**	

Table 3 - River Basin Management Plan interventions valued as ERCs during tariff preparation for the regulatory cycle 2020-2023.

4.5 Other financing sources

In addition to funding for measures to contain, eliminate, and reduce the impacts of IWS, other funds are needed to maintain the good ecological status of the Natura 2000 Site "Grave e Zone Umide del Brenta". In fact, ERCs can only be recognized in water tariffs for interventions directly aimed at reducing the impacts of IWS on the environment and other users of the resource. Other fundamental components of the mechanisms, such as the payments for ecosystem services (PES) for farmers, cannot be totally charged to IWS users. Therefore, **it is essential to find a synergy with other national or European programmes for environmental protection, which can be complementary to the funds coming from ERCs in the implementation of PES**. Table 4 identifies the main funds and related measures that can potentially complement funding from ERCs.

It is essential to find a synergy with other national or European programmes for environmental protection, which can be complementary to the funds coming from ERCs in the implementation of PES.

Fund	Macro Measure	Specific measure	Budget allocation* (M€)
Rural development programme (RDP) (referred to the 2014-2020 programme)	Measure 10 - Agri-environment-climate payments	Agronomic techniques with reduced environmental impact	5,7
		Environmental optimization of agronomic and irrigation techniques	39,2
		Active management of green infrastructure	58,2
		Sustainable management of meadows, semi-natural meadows, pastures, and grasslands	78,4
		Protection and increase of semi-natural habitats	5,5
	Measure 11 - Organic farming	Payment to convert to organic farming practices and methods	10,2
		Payment to maintain organic farming practices and methods	20,5
Eco-schemes (examples provided by the EU commission for the next common agricultural policy - CAP)	New practices eligible for funding through eco-schemes	Agroecology	-
		Agroforestry	-
		High Nature Value farming	-
		Carbon farming	-
		Precision farming	-
		Protection of water resources	-
		Practices beneficial to Soil	-
		Greenhouse gas emissions-related practices	-
Next generation EU	Environmental recovery and remediation	Encourage crops with reduced fertilizer and water use	200
		Installing phytodepuration pilot plants for the reduction of nitrogen load in water bodies	100

*Table 4 - Possible additional funding sources for the implementation of PES. *Financial allocation for the Veneto Region.*

4.6 Best practices

4.6.1 Forest Infiltration Areas (FIAs)

In the Veneto Region, there are already several project initiatives related to the sustainability of water resources: **the LIFE Aquor project**, that started in 2011 with the objective of implementing groundwater recharge interventions in the province of Vicenza in order to cope with an increase in water withdrawals, a decrease in inflows and a decrease in the resurgence flow. In the last 35 years, the water table level had decreased by 1.30 m, causing depressurization of artesian aquifers, the disappearance of river flow, habitat and biodiversity reduction, loss of recreational value and increase of water withdrawal costs. Seven recharge areas were created within the project, using different techniques to test which were the most effective, including two Forested Infiltration Areas (FIAs).

One of these FIAs, called Bosco Limite, was created near the lake of Camazzole, close to the Natura 2000 site "Grave e Zone Umide del Brenta", in an area previously dedicated to maize cultivation. **The establishment of this FIA**, consisting of 2,300 native trees in an area of 2.5 ha, **allows water infiltration into the water table** thanks to a network of channels derived from a nearby irrigation ditch, **for a total of one million m³ per year per hectare**. In addition to recharging the water tabel, this intervention allows to purify the incoming water, to fix 50 tons of CO2 in 30 years and to increase the local biodiversity. Moreover, thanks to agreements with the *Consorzio di Bonifica Brenta* and the Municipality of Carmignano di Brenta, the owners receive an annual compensation for FIA's ecosystem services to the community.

FIA allows the water infiltration into the water table for a total of one million m3 per year per hectare.

4.6.2 Drinking Water Protected Areas with a chronological method

The Consiglio Di Bacino Brenta approved, with resolution n° 19 of 18/12/2018, the new Drinking Water Protected Areas using the chronological method. This criterion for the identification of the safeguard areas of the water sources for drinking purposes is particularly innovative, as it consists in **delimiting the water protection areas based on the space covered by the groundwater flow in a time defined "safety time"**. The numerical value attributed to this time interval (e.g., 60, 180 or 365 days) considers the time needed to implement management measures and corrective actions concerning contamination events potentially impacting the aquifer intercepted by the wells. The DWPA are delimited on a cartographic basis by isochronous lines, which indicate the progressive timing of solutes' migration into the aquifer, thus identifying areas with different degrees of protection.

5
CONCLUSIONS

The Integrated Water Service is, by its very nature, an example of circular economy, as it is part of the natural water cycle and aims to return the resource to the environment in the same condition in which it was taken. **The missing piece to achieve full circularity of the process is the internalization of all negative externalities produced by IWS**, i.e. ecological costs (environmental costs) and social costs (resource costs) attributable to the consumption of drinking water. The European legislation on water sustainability is based on the "polluter/user pays" principle, which requires member states to implement a pricing system aimed at the full recovery of water consumption costs. These costs should be charged to end users to cover water protection costs both in terms of quality and quantity.

The opportunity offered by this eco-tax scheme is the **possibility to finance interventions to protect the resource and mitigate the impacts of water consumption with innovative proposals such as Nature-Based Solutions**, which have the advantage of being more resilient to the risks associated with climate change and bring co-benefits such as biodiversity protection and CO2 sequestration.

The involvement of all actors, public and private, which in various ways are involved in the internalization of environmental and resource costs, can activate synergies aimed at achieving economic, social and environmental sustainability objectives. **Payments for Ecosystem Services are market mechanisms that fit well with the purposes of water resource conservation, biodiversity protection, climate change mitigation and transition to a low environmental impact economy**. Therefore, they should play a central role in using funds from the ERCs portion of the water tariff.

The European policy framework offers a fertile ground to transform the IWS in a green direction. While the Green Deal sets neutrality targets to 2050, the Biodiversity and Farm to Fork Strategies set challenging goals in terms of pollutant reduction and green infrastructure development: will we be able to make the most of these policy synergies to improve the quality objectives of the sector?

The LIFE Brenta 2030 project is moving in this direction. Thanks to the plurality of stakeholders involved and the wide range of skills and professionalism present in the working group, it is taking the first steps towards **creating a pilot funding mechanism for Nature-Based Solutions and implementing a system of Payments for Ecosystem Services in the Middle Brenta basin**. These steps will allow to improve a critical area for drinking water supply and achieve the sustainable development goals of the UN Agenda 2030.

Through the pilot mechanism tested in the Middle Brenta basin, it would be possible to close the circle of sustainability of the Integrated Water Service, in accordance with recent European regulations.

6
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The LIFE Brenta 2030 project aims to increase biodiversity and improve the provision of water-related ecosystem services to river habitats, surrounding wetlands and agricultural areas of the Natura 2000 site called "Grave e Zone Umide del Brenta."

The project focuses primarily on the drinking water sector because it is the ecosystem service with the highest added value in economic terms and is a priority field of work for all institutions involved. To address several objectives, the project intends to promote good governance by creating positive synergies between drinking water and biodiversity conservation, mitigating, and transforming the main threats into funding opportunities for the conservation of the Natura 2000 site it addresses.

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