Interreg - IPA CBC
Italy - Albania - Montenegro
CrossWater

CROSS WATER
EVERY ACTION COUNTS

SHORT VERSION

Cross Border Policy Paper

06/22

REGIONE PUGLIA
BASHKIA TIRANË
acquedotto pugliese
Regionalni vodovod Crnogorsko primorje
UKT

16/5/2022

DISCLAIMER

The hereby short version of the Cross Border Policy Paper (shortly "**CBPP**") concerns the results of a strategic analysis carried out by a competent working group over a period of almost three months, based upon a baseline methodology adopted at the onset and the subsequent adjustments made thereto in accordance with the progression of project work.

The working group comprises experts from each of the Project Partners as well as their respective technical and legal consultants: therefore, it may be deemed to be the outcome of an integrated work addressing the issue of water management in the four concerned territories: Puglia and Molise Regions in Italy, Albania and Montenegro.

The views expressed in this Policy paper are those of the partners and should not be reported as or attributed to the governments of any of the partner countries.

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LIST OF ACRONYM

AQP	Acquedotto Pugliese (Puglia Region acqueduct)
ATO	Ambito Territoriale Ottimale
CBWMS	Cross Border Water Management System
CBPP	Cross Border Policy Paper
CW	CrossWater project
EC	European Commission
EU	Europe / European
EUSAIR	European Strategy for the Adriatic and Ionian Region
GWD	Groundwater Directive
SDGs	Sustainable Development Goals
TSS	Total suspended solids
PNRR	National Recovery and Resilience Plan
WFD	Water Framework Directory
WMS	Water Management System
WWTP	Waste Water Treatment Plans

CROSSWATER

SHORT VERSION OF THE CROSS BORDER POLICY PAPER

1. EXECUTIVE SUMMARY

1.1. Aims and objectives of the CBWMS project

The main objective of the "Interreg IPA CBC Italy-Albania-Montenegro" Programme is to intensify cooperation in the eligible area, addressing common challenges and promoting integrated territorial development.

The result of the cross-border action policy Analysis of WPT 1 2 3 in particular

- critical issues and problems,
- choices of strategies and the theme to be developed
- concrete actions put in place.

Developing and sharing an integrated Cross-Border Policy Plan to enhance the management and the development of strategies for the management of water resources of each territory is the priority objective of the CBWMS project. It is very important to specify that the six CBWMS project partners represent the different institutional levels involved in the water management sector, such as regions, municipalities and aqueducts, as listed below per Country:

Italy:

Puglia Region

1. Dipartimento dell'Agricoltura e dello Sviluppo Rurale ed Ambientale, Sezione Risorse Idriche – Department of Agriculture and Rural and Environmental Development, Water Resources Section;
2. Acquedotto Pugliese S.p.A. - Apulian Public Aqueduct;

Molise Region

3. Regione Molise - Molise Region;

Albania;

4. Bashkia Tirane - Municipality of Tirana;
5. Ujësjellës Kanalizime Tiranë - Tirana Water and Wastewater Utility;

Montenegro

6. Javno preduzeće Regionalni vodovod crnogorsko primorje – Budva - "Regional waterworks for Montenegreen cost"– Budva.

The integrated cross-border plan on water management and the criteria for an integrated approach to water problems, land protection and the environment provide for a "definition of the physical-environmental system" and a "programme of additional measures".

Fundamental for the establishment of a program of structural interventions is the **diagnosis of water conditions in order to protect this precious resource**, its uses and the balance of ecosystems.
The overall objective is to promote economic growth and intensify cooperation in the Southern Adriatic area, implementing joint actions between national and regional institutional and non-profit actors and promoting smart, inclusive and sustainable development.

The aim of the project is to improve cross-border framework conditions through a common integrated plan, starting from the analysis of best practices and aiming to improve techniques and institutions.

1.2. Cross Border Policy Paper

The **Cross Border Policy Paper** lays down specific *commitments* that need to be undertaken by the partners involved in the CBWMS project, together with concrete actions, and includes also specific *recommendations* for the regions/countries in the cooperation area.

The purpose of the Policy Paper is to establish the policies, measures and timetables for the establishment of such CBIWMS and the basic governance rules, as well as the monitoring of progress in its implementation, with a view to improving institutional capacity and creating the conditions for establishing an efficient and effective water management system.

2. ANALYSIS OF THE INTERNATIONAL COMMITTMENTS RELATED TO THE COOPERATION AREA

2.1. Global perspective

Freshwater is a fundamental resource for human and environmental activities, which impact the natural developments of these dynamics by exploiting this resource and often altering its quality, determining an overall remodulation of physical processes and hydrological cycle, by introducing pollutants or determining an unbalance of resource at basin scale, causing a crisis of ecosystems and activities.

Aim of this synthetic introduction is to recall that **water is not a problem of the single** country/basin, but is a **global and shared resource which, due to its importance, need to be shared and preserved by all. A common approach to its management is then necessary and advisable.** Its importance has been recognized and underlined in the Agenda 2030[1] of United Nations, which describes the so-called *Sustainable Development Goals (SDGs)*, a set of seventeen interconnected objectives to be pursued before 2030 for ensuring sustainable development, declined in a comprehensive way which includes fight against poverty,

Among these goals, the n. 6 is *"Ensure availability and sustainable management of water and sanitation for all"*, which should represent a guide for all actions and commitments to be undertaken in this sector. Several targets have been set, which are particularly in line with aims of CrossWater project, as:

i. improving water quality by reducing pollution,
ii. halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally,
iii. increasing water-use efficiency across all sectors,
iv. ensuring sustainable withdrawals and supply of freshwater,
v. implementing integrated water resources management,
vi. expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes.

[1] https://www.un.org/sustainabledevelopment/development-agenda/

2.1.1 EU Strategy

Importance of environmental issues at EU level has been recognized since the enactment of the *Treaty on the Functioning of the European Union*[2] that, at article 11, says: *«Environmental protection requirements must be integrated into the definition and implementation of the Union's policies and activities, in particular with a view to promoting sustainable development»*.

At the same time, Title XX is fully concerned with the Environment and clearly states that the objectives of EU policies are aimed in:

- *«preserving, protecting and improving the quality of the environment;*
- *protecting human health;*
- *prudent and rational utilisation of natural resources;*
- *promoting measures at international level to deal with regional or worldwide environmental problems, and in particular combating climate change»*.

Furthermore, all actions undertaken by European Union will be based on a series of principles, as (i) precautionary, (ii) carrying out preventive actions, (iii) remedy at source of environmental damages and (iv) assuming that the polluter has to pay for his actions.

European Union recognizes the importance of water in human, social and environmental activities, identifying its protection as a pillar for its policies. Several key legislative acts were enacted in the field of water protection, which are here listed.

The EU Directive 2020/2184[3]

The European Green Deal represents the starting point for transforming the European economy and making it suitable for a sustainable future and represents a functional document for the implementation of the Agenda 2030 and the Sustainable Development Goals.

[2] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A12012E%2FTXT
[3] https://eur-lex.europa.eu/eli/dir/2020/2184/oj

EU Water Framework Directive 2000/60/EC[4]

Europe has a relatively long tradition on legal assets on water, which can be assumed started with the Council Directive 75/440/EEC of 16 June 1975 concerning the quality required of surface water intended for the abstraction of drinking water in the Member States. However, the main step in water legislation dates back to 2000, when the **Directive 2000/60/EC** (also called Water Framework Directory, WFD) was enacted. This directive represents an important pillar in European policies on fresh, transitional and coastal water and establishes the framework for Community action in the field of water based on an integrated and ecosystem-based approach to water resource planning and management.

Groundwater Directive 2006/118/EC[5]

Groundwater Directive 2006/118/EC (hereinafter GWD) arises from Article 17 of WFD, which requires specific measures for preventing and controlling groundwater pollution. GWD defines EU-wide groundwater quality standards for nitrates and pesticides, while for all pollutants putting groundwater bodies at risk of failing to meet good chemical status, due to high environmental variability and number at EU level, limits were left to be set by Member states at national, river basin district or water body level. A revised version of GWD was provided in 2014. An important step of this updated consists in the opportunity of establishing a **specific approach for increasing the monitoring and the knowledge of particular pollutants or substances that can damage the status of groundwater**.

Water Scarcity and Droughts

Water scarcity and Droughts are two different statuses with respect to water lack. In particular, *droughts* occurs when there is a chronologically restricted period with poor water availability, while the term *water scarcity* should be used when a long-term unbalance occurs if there aren't enough water resources for compelling with needs. In DG Environment European Commission (2007) has been depicted how these events are expected to increase in frequency and magnitude in the future, and

[4] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32000L0060
[5] Groundwater Directive 2006/118/EC

causes of this possible phenomenology can be linked to climate and land use change and the increasing of population.

Next Generation EU

COVID-19 pandemic hit all the world, causing a health emergency which had a strong influence also on social and economic sectors. With the goal of provide new energies to people and economy, European Union launched *NextGenerationEU*[6], an ambitious recovery plan aimed also in guaranteeing resources for a future Europe, with a vision oriented to a sustainable approach. To this, an investment of 806.9 billion of Euros has been granted.

Several fields of actions have been identified in this programme, among which a heading is dedicated to "natural resources and environment", with specific actions in "Agriculture and maritime policy" and "Environment and climate action". This programme, however, has been modified for each single funded Country in specific sources and topics.

The Italian National Recovery and Resilience Plan[7] (PNRR) is articulated in six main missions in order to achieve a more robust, sustainable and inclusive economic growth. Among these missions there is that called "Green revolution and ecological transition", which in is structure presents investments for land and water resource protection. In particular, there are funds dedicated to the reduction of losses in water distribution networks, including digitization and monitoring of networks and investments in primary water infrastructure for the security of water supply and sewage systems.

EU and Climate Change

Climate Change is one of the main actual topics in environmental analyses. As stated when a global perspective has been proposed, variability in climate and atmospheric phenomena can have a strong influence on spatiotemporal water availability, with potential impacts on society, ecosystems and financial assets. The need of copying with climate change has also been addressed in Article 191 of *Treaty on the Functioning of the European Union*.

[6] https://europa.eu/next-generation-eu/index_en

[7] https://www.mef.gov.it/en/focus/The-National-Recovery-and-Resilience-Plan-NRRP/

Climate change and therefore the increase in global temperature represent an existential threat to Europe and the whole world that spares no country. The EU together with global partners is supporting international climate efforts and agreements such as the Paris Agreement in order to ensure their implementation and consolidate international climate engagement.

2.1.2. EUSAIR Startegy

The EU Strategy for the Adriatic and Ionian Region involves 9 countries, four EU Member States (Croatia, Greece, Italy, Slovenia) and five Accession Countries (Albania, Bosnia and Herzegovina, Montenegro, North Macedonia Serbia). The EU Strategy for the Adriatic and Ionian Region (EUSAIR)[8] is a macro-regional strategy adopted by the European Commission and endorsed by the European Council in 2014. The Strategy was jointly developed by the Commission and the Adriatic-Ionian Region countries and stakeholders, which agreed to work together on the areas of common interest for the benefit of each country and the whole region.

Since 2013 until April 2020, half of the countries in the Adriatic and Ionian region have been EU countries. Currently the EUSAIR includes 4 EU Member States and 5 accession countries. Many of the problems are covered by EU policies and as an independent player with respected authority, the EU is in a good position to facilitate cooperation.

The EU already runs programmes in the region and so can provide opportunities for cooperation.

[8] https://www.adriatic-ionian.eu/about-eusair/

3. ANALYSIS OF TERRITORIAL CONTEXT AND PRIORITIES IN THE COOPERATION AREA

3.1. CW project and Integrated WMS

The main Objective of the ***Cross Water project (CW)*** is to establish an efficient and effective **cross border Water Management System (WMS)**.

To reach this objective, the project foresees three specific objectives (OS):

OS1-WPT 1: Improving the cross-border framework conditions for the WMS through a common integrated plan, starting from best practices analyses and aiming to improve technical and institutional. The integrated plan will be realized through the implementation of n. 4 pilot actions, one for each project area.

OS2-WP T2: Pilot projects to implement integrated plan for WMS:

1. APULIA "Water resource protection and energy optimization";
2. MOLISE "Strategies and techniques for optimization of Water supply management";
3. TIRANA "Water supply network in Kasalla Village";
4. MONTENEGRO "Monitoring, control and protection of the Bolje sestre spring".

Thanks to the project results and the improvement of policy makers competences (AT 3.2 Institutional capacity building on WMS for policy maker) it will be possible to issue a Cross Border Policy Paper (OS3-WT3) on WMS including specific recommendations for each country.

3.2. Partners' needs and priorities

3.2.1. Molise Region

In order to promote the sustainable vision of water resources, the following are necessary:

- effective utility management practices
- sustainable water infrastructure planning (reduction of water losses, energy efficiency, etc.)
- wastewater reuse
- recovery of energy and raw materials
- reduction of consumption.

The ATO identified in the Molise Region for the management of the integrated water system coincides according to Regional Law n.4/1997 with the entire regional territory, therefore, identifies: population: 308,493, provinces: 2, municipalities: 136,area:4,438 km2.

3.2.2. Puglia Region

With respect to the availability of water resources within the regional territory, it should be noted (Fig. 1) how this climatological framework is intertwined with a characteristic geomorphological structure, the combination of which has allowed a modest development of the surface hydrographic network, concentrated more in the northern area of the region: In the central part of the region (the so-called *Murgia*), on the other hand, there are ephemeral watercourses (known as *lame*) whose flows are activated in correspondence with particularly intense and short-term rainfall events.

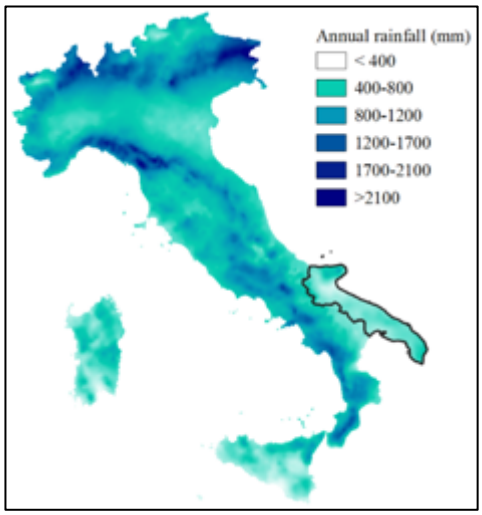

Fig 1: Annual rainfall over the Italian territory (Braca et al., 2021)

It follows that the main source of regional water resources is represented by groundwater aquifers.

As a consequence, an intense activity of planning and realization of works for the transfer of water resources from neighboring regions began at the beginning of the twentieth century (Calò Carducci et al., 2014). However, there are still considerable efforts to be made for improving the overall efficiency of the system, aimed at containing the expenditure of a precious and high-quality resource. In this sense, activities aimed at research, identification and remediation of leakages represent an

essential activity for safeguarding the water resource and the environment, as well as optimizing the management of the service.

Given the peculiar situation of the Apulian context in terms of water supply sources, an important role can be played by wastewater reuse. The benefits that can derive from the implementation of wastewater reuse techniques and projects are many:

- reduction of the environmental impact on the receiving waters: this aspect must in any case be accompanied by analyzes aimed at not modifying the total amount of water necessary to ensure the good quality of the systems;
- aquifers protection: thanks to the reduction of volumes taken from the aquifer (for example for irrigation use);
- reduction in the use of fertilizers in agriculture: this is because from the treatments to which the wastewater is subjected for this purpose it is possible to obtain a product rich in nutrients suitable for promoting agricultural production;
- limitation of the impact on tourism: the discharge into the sea of wastewater during the tourist season is avoided;
- regeneration of areas with high environmental value: the availability of a high-quality water resource can lead to high environmental value of areas subject to particular criticalities.

3.2.3. Montenegro

About 44% of the population in Montenegro is found in settlements that use water from a single source (water of karst nature), while the rest of the population is located in settlements where water is supplied from sources of different types.

The water supply of the Montenegrin coast has been improved overall with the creation of the Regional Water Supply System, thanks to which the deficiencies in the quantity of water required and the total shortage of which the territory suffers especially in the summer period are eliminated.

Since 2010 the towns of Tivat, Kotor and Budva have been connected to the regional water system, since 2011 there has been the connection of the city of Bar, while in 2012 it was the turn of the territory of Ulcinj.

The regional water system consists of the continental part and the coastal part, i.e. the northern and southern branches. The continental part was designed and built with a connection from the source "Bolje Sestre" to the Đurmani reservoir, the northern branch from the Đurmani reservoir, to the PK Zelenika and the southern one from the Đurmani reservoir to Ulcinj (Bulevar Teuta).

As for the municipalities of the coast, after the creation of the regional water supply, Bar and Budva were supplied with sufficient quantities of water; further water supplies will be supplied to Ulcinj, which will thus be reached by regional water from the water supply from the water purification of the Lisna Bori spring. Finally, with regard to the municipalities of the Bay of Kotor, the second phase of the

Regional Water System project must be carried out, in order to be able to provide this geographical area with a sufficient amount of water until 2021, or until 2040.

The system management policy, in the future, will imply the following principles:

- distribution solution trying to reduce water losses to a minimum;
- reduction of water consumption by aligning them with real needs and according to the recommendations of the European Union;
- increasing the energy efficiency of water supply systems using the water of this system;
- introduction of metering based on real consumption;
- implement price policy reforms, so as to raise the share of borrowings to solve financial problems.

3.2.4. Albania

In line with the National Water Supply and Sewerage Service Sector Strategy 2019 – 2030 designed by the Ministry of Infrastructure and energy with the support of German Government through GIZ Albania, the national strategy envisages 7 Strategic Objectives:

1. Improve Water Sector Data Quality, Accuracy, and Consistency
2. Expand and improve access to water supply and sewerage services.
3. Improve efficiency and quality of water supply and sewerage service provision

4. Strengthen the financial sustainability and affordability of water supply and sewerage services towards the principles of cost control and full cost recovery
5. Enhance the capacities of the sector work force.
6. Improve governance and regulation in the sector.
7. Design and implement a program to aggregate water utilities

Fulfilment of these strategic objectives shall target to achieve a wide mission of "*Provide safe, reliable, sufficient and proper quality of water supply services for the entire population of Albania, in full compliance with the legal and regulatory framework. Ensure quality collection, treatment and disposal to safeguard public health and in compliance with national environmental regulations*".

Local level Needs and priorities:

- Identifies relevant water bodies that need protection;
- Prepares investment planning needs for construction / rehabilitation / expansion of water supply and sewerage systems based in governmental programmes and national master plans for the sector;
- Reducing NRW (unbilled water);
- Establish a water supply that is accessible 24 hours a day, seven days a week;
- Investment planning based on hydraulic modeling;
- Accurate evaluation of the utilized water system's condition.

3.3. Results and perspectives of the Cross Border WMS Plan

One of the aim of the Cross Border Policy Paper is to make a comparative analysis of the four water management systems in Italy, Montenegro and Albania based on the pilot projects' results, such as:

- adequate tools for continuous monitoring of water quality and wastewater treatment processes;
- correct activities on the water loss management; and
- investments on new water supply system.

This analysis aims to identify the best solutions and good practices to be transferred and replicated in the other regions involved, and not only, and provide common and specific policy recommendations to support policy makers during the decision phase (§ chapter 5).

Results and perspectives of the CBWMS Plan are declined into the four Pilot Projects briefly described in chapter 4.

4. GOAL AND STRATEGIES: THE ROLE OF PILOT PROJECTS

4.1. Pilot projects

In line with the Cross Border Water Management Plan (Deliverable 05/21) the overall objective is to promote economic growth and to intensify cooperation in the south Adriatic area, by implementing joint actions between national and regional institutional through the implementation and the results of n° 4 pilot actions, one for each project area, as described in the following paragraphs:

1. PUGLIA "Water resource protection and energy optimization";
2. MOLISE "Strategies and techniques for optimization of water supply management";
3. MONTENEGRO "Monitoring, control and protection of the Bolje sestre spring"APULIA "Water resource protection and energy optimization"
4. TIRANA "Water supply network in Kasalla Village";

4.1.1. MOLISE "Strategies and techniques for optimization of Water supply management"

The optimization of the distribution systems and the fight against water waste are therefore the two main objectives of the pilot project of Molise Region, which will be tested on an aqueduct section and which can be subsequently replicated on all water supply transport and water supply distribution networks present in the Region.

The first operational phase of the project will concern the increasing of the cartographic, geographic and geometric knowledge of the aqueduct branch under examination. This work phase will be carried out through the acquisition of all the GIS, cartographic and geographical information already existing in the Molise Region

Together with this phase, the Gis platform will be implemented on Esri ArcGis software both in the desktop version and in the online version. This phase also will include technical training on the use of GIS instrumentation and software for the Molise Region and Molise Acque staff.

The pilot project also comprises the implementation of electronic equipment to measure and collect the significant hydraulic data of the main nodes of the aqueduct (pressure, flow, levels, etc.). 16 PLCs

will be installed in the municipal reservoirs of the villages considered most significant in terms of population and more problematic for the aspects of hydraulic management.

The pilot project also comprises the purchase of a GIS-based hydraulic modeller that will be calibrated using the data recorded by the PLCs and by the geographic data acquired by the GIS software.

4.1.2. PUGLIA " Water resource protection and energy optimization"

The approach of AQP is based on the acquisition of tools for continuous monitoring of wastewater and sludge quality in WWTPs. For this reason, the pilot project is about the implementation of measurement and monitoring systems both at Monopoli plant, operating anaerobic sludge treatment, and Sammichele di Bari plant, working with aerobic digestion, to control the wastewater treatment process.

Monopoli plant

The pilot project consists in the implementation of a monitoring system of the biological sector through the determination of the redox potential in the denitrification tank, of the nitrates, ammoniacal nitrogen, dissolved oxygen and total suspended solids (TSS) in the oxidation tank, and of the orthophosphates at the outlet of the secondary sedimentation, in order to optimize energy consumption and the use of reagents for chemical dephosphating. This kind of system has to be implemented at the Monopoli wastewater treatment plant.

It involves the installation of measuring devices and the power supply and data transmission instrumentation from the following measuring instruments to be installed at the oxidation / denitrification station.

Finally, the pilot project for the Monopoli wastewater treatment plant provides the qualitative measurement and analysis of the biogas produced downstream of digestion, evaluating the following minimum percentage parameter of CH_4, in order to define the energy potential and the management actions for optimizing the stabilization, so to proceed with the quantitative assessment of biogas sent to the gasometer and the one coming out of it.

San Michele plant

First of all, it is planned the installation of a monitoring system of the biological sector for measuring nitrates (oxidation) and redox potential in the denitrification tank, the automatic determination of the values of ammonia nitrogen, dissolved oxygen and TSS in the oxidation tank, and of orthophosphates at the outlet of the secondary sedimentation, in order to optimize energy consumption and the use of reagents for chemical dephosphating. In particular, it is planned the installation of electrical panels and electrical cables or similar suitable power supply and data acquisition systems from the following measurement instruments to be installed at the oxidation / denitrification station.

Finally, the pilot project provide the measurement of the TSS and flowrates of the sludge to be sent to the centrifuge, in order to optimize the dewatering process and mitigate as much as possible the environmental impact in terms of CO_2, since reducing the volumes of dehydrated sludge decreases the transport costs of disposal. This requires the installation of an electrical panel and electrical cables or similar suitable power supply and data acquisition systems from the following measuring equipment at the dehydration station.

4.1.3. MONTENEGRO "Monitoring, control and protection of the Bolje sestre spring"

The Bolje Sestre spring is one of several sublake springs located along the shore of Lake Skadar shared between Montenegro and Albania.

The structure, operating since 2010, has solved the big problem about the scarcity of water due to the strong supplies from the small coastal springs, exploited in the summer months when the tourist season is high.

The regional water supply company, therefore, manages an innovative system in order to better provide for the supply of drinking water to local water realities present above all on the Montenegrin coast.

In order to be able to better exploit the water resource, Montenegro, with regard to its Pilot Project, has set itself the goal of:

- monitoring, control and protection of the Bolje sestre source (P6), also going to better determine the different protection zones of the source itself;

- to study the possibility of including additional neighbouring water sources in order to expand the capacity of the regional water system;
- to proceed with the construction of monitoring stations, including groundwater;
- to install technological equipment in order to improve the monitoring of the entire water balance and the construction of a measurement and control unit in front of the Budva pumping station.

As part of the implementation of the project, **6 other pilot projects** are being implemented:

1. Supply of leak detection equipment;
2. Monitoring, control and protection of the regional water supply source "Bolje Sestre";
3. Supervision of the monitoring, control and protection of the regional water supply source "Bolje Sestre";
4. Establishment of the network of monitoring stations;
5. Supply and installation of flow and pressure measuring equipment;
6. Construction of a measuring and control unit in front of the Budva pumping station.

4.1.4. ALBANIA, TIRANA "Water supply network in Kasalla Village"

The village of Kasalla so far is not supplied with potable water from a well-structured pipeline network except some small neighbourhoods. Water supply was made from illegal connections, private wells etc.

The only source of water supply for this area is the pumping stations of Zall-Herr through a 250m3 water tank, which is supplied from the transmission pipeline Dn-700mm of Bovilla e vjeter via a pipeline of Dn-63mm PE. The Zall-Herr pumping station supply also the village of Cerkez Morine.

The project consists of building a new water supply network for the village of Kasalla.

The main source of water supply will be through the Zall-Herr pumping station where it is foresees to install a new centrifugal water pump which must be adapted to the current flow and water head. For the people to be supplied according to the proper water drinking norms a new water tank with the capacity of 400 m3 will be constructed.

The pilot project foresees n. 4 different phases

- 1st phase construction of TRANSMISSION PIPELINE

- 2nd phase construction of DISTRIBUTION NETWORK
- 3rd phase DISTRIBUTION NETWORK AND MATERIAL OF PIPELINE
- 4th phase Construction works and mechanical works at Pumping Station Zall-Herr
- 5th phase Reconstruction and protection of the transmission line from the Zall-Her Pumping Station to the Cekrez water reservoir

4.2. Goals and Expected Benefits

The Cross Border Policy Paper indicates how pilot projects results can support the evidence to enable a transition towards a more sustainable and integrated water management system. The Cross Border Policy Paper is based on the results of 4 pilot projects implemented under the Interreg IPA CBC Programme (Italy, Montenegro, Albania) - Cross water project.

4.2.1. Molise Region

The pilot project of the Molise Region offers a contribution to regulatory compliance and allows to increase performance in terms of:

- increase the level of knowledge of the management of the aqueduct network;
- creation of a platform that will be the basis for the acquisition and collection of information related to the state of the network over time;
- reduction of intervention times in case of water leaks;
- collection of information to plan ordinary activities and extraordinary maintenance activities;
- maintenance efficiency activities.

4.2.2. Puglia Region

The pilot project regards the service of installation, maintenance and calibration of measuring probes of the main parameters to control the treatment processes at the wastewater treatment plants of the agglomerations of Monopoli and Sammichele di Bari, as well as the remote acquisition of data and the preparation of appropriate reports.

The main goal of the pilot project on two wastewater treatment plants is the optimization of wastewater and sludge treatment processes.

For this purpose, the first expected result is the identification of monitoring and information systems that could be used on plants, through different testing activities and the definition of the most performing one.

In addition, the second expected result is the achievement of a global energy consumption reduction, i.e., the possibility to carry out the same processes using a lower amount of energy.

Besides, other important expected results are: the reduction of chemical consumption in the wastewater treatment processes, the correct determination of the sludge concentration and flow sent to the digester, the optimization of the dehydration process and the evaluation off the total amount of the TSS produced by the biological system.

This benefit brings to the most important expected result, represented by the reduction of the environmental impact in terms of:

- CO_2 released in the atmosphere, because by reducing volumes of dehydrated sludge, transport costs for disposal will decrease;
- sludge amount to be disposed of;
- amount of dephosphating reagents.

4.2.3. Montenegro

The regional water supply for coastal municipalities has come to life in full capacity in all municipalities and it can be expected very soon to start using the so-called in full capacity. In the future, the water supply of the subject area will continue to be performed in combination, from local sources and from the regional water supply system. In addition, appropriate research and other measures need to be carried out in order to include the remaining potential sources of drinking water in this system.

The criterion of rational management of this system in the future implies the following principles: distribution solution within the minimum allowable water losses, reduction of water consumption to real needs and according to the recommendations of the European Union, increasing the energy

efficiency of water supply systems that use water from this system, introduction of metering based on consumption, pricing policy reforms raising the collection rate in order to solve financial problems.

This project brings a many benefits as:

- providing a sufficient amount of water at the Bolje Sestre spring for the planned number of consumers, throughout the year (at this point it is not certain that there is sufficient quantity for summer 2022);
- Number of newly installed Monitoring stations - Monitoring of changes in natural factors that may significantly affect changes in the yield of Bolje Sestre springs;
- Water user satisfaction, i.e. number of positive replies for water delivery;
- Water leak detection – length of the controlled pipelines with the newly purchased equipment and number of detected leaks.

4.2.4. Albania

The main goal of the pilot project is to provide potable water for nearly 2'360 people. This project falls in line with Goal 6 of Sustainable Development Goals of UN, to ensure access to clean water and sanitation for all. By the end of this project, main benefits are the following:

- Providing drinking water to 550 families with 24h supply;
- Providing clean and safe drinking water to the residents of the Kasalla village. This will ensure an improvement of hygienic sanitary conditions of their water;
- Meeting the needs of water supply during drought periods;
- Reducing illegal water connections to the water network;
- Reducing non-revenue water;
- Increased revenues through new contracts/connections to the water supply network;
- River protection (which means protection of the old water pipeline that passes through the river);
- Reconstruction of the damaged parts of the old network that will improve the water supply through the Cekrez water reservoir.

5. COMMON AND SPECIFIC COMMTTMENTS

5.1. Common commitments

Improving a Cross-border water management system and drinking water supply management are among the basic concerns for all Adriatic countries. An approach to face these challenges is being developed through the cooperation among CrossWater project partners with several organizations and stakeholders involved in the implementation of the Cross Water project.

This Cross Border Policy Paper discusses its specific objective and output linked to Improve the cross-border framework conditions for the WMS through a common integrated plan, starting from best practices analyses and aiming to improve technical and institutional capacity of the beneficiaries. The integrated plan is realized through the implementation of n. 4 pilot actions, one for each project area. The 4 Pilot projects on water management and water supply systems and resources in the Adriatic area have been developed and tested by the partners involved with the aim of provide and share measurable results to support decision makers in the adaptation of effective and efficient measures and policies.

Policy common recommendations:

1. **Definition of a methodological framework for modelling environmental and resource costs.**

   The implementation of policies that lead to the sustainable use and management of water resources plays a pivotal role in sectoral planning. The challenges that the international community is called to face in the future (e.g., SDGs, Green Deal) require the need to support the actions that will be adopted through a correct assessment of environmental and resource costs, in order to preserve their renewability and quality.

   The need for a correct position of these costs within the pricing modules is an essential requirement in the context of water resource management. To this end, it is necessary to prepare analyses and studies aimed at identifying the structure, efficiency and impact of the entire water system on the environment, for example supported by the analysis of water supply management schemes and of the current infrastructural context and identification of critical points, aimed at

recovering evidences that should be used for the implementation of analyzes and for the evaluation of the implementation of methodologies for the assessment of environmental and resource costs.

2. Implementation of a water balance for ensuring a rationale use of the resource, which takes into account climate change scenarios

The need to guarantee a sustainable use and management of water resources represents one of the most important challenges that the scientific and institutional community will be called to face in the future. The climatic variations due to human activities that the entire Earth has been observing in recent decades constitute a source of considerable uncertainty in forecasting the potential availability of water resources, exacerbating the need to provide for the preparation of scientific tools able to provide reliable answers to this problem.

With this aim, the implementation of water and hydrological balance techniques that are able to interpret and predict with an acceptable degree of reliability the climatic dynamics that will take place in the future constitutes an important challenge in order to improve planning and management of the entire water sector, as well as guaranteeing an use that aims to preserve the renewability of the resource, guaranteeing the functionality of ecosystems.

3. Improving water system governance

The treatment of the concept of water governance can be adequately supported by recalling its definition, as provided by Rogers & Hall (2003), which includes under this concept all the "political, social, economic and administrative systems that are in place to develop and manage the water resource and the provision of water services at the various levels of society ".

It emerges that these fields cover a wide range of actions and activities that must be implemented to ensure proper management of the entire water sector.

The preparation of suitable contrast tools is made indispensable by the need to guarantee adequate actions to face future challenges in the water sector, such as the increase in demand for water and pressures on the environment.

The improvement and management of an efficient water sector governance capable of facing future challenges is therefore a crucial action for the area in question.

4. Actions against desertification

Desertification is a major threat to confront in the future. In general terms it refers to a progressive depletion of the potential of a territory and the loss of the productive capacity of the soils, with consequent effects on society and ecosystems. It is the result of the interaction of very different causes, which can be traced back to both a natural origin (such as climate change) and an anthropic one (such as improper use of water resources and urbanization). It follows that the fight against this phenomenon involves a large number of strongly interacting sectors and activities, in which water resources represent a key element to be preserved and protected.

Activities such as:

- the correct management of the water sector;
- adequate planning in the use of soils and agricultural activities and the monitoring of pollution levels of natural systems can represent important actions to deal with this emergency, to be declined according to contexts and territorial priorities;
- The development of a database is a first unavoidable step to understand the risk of desertification;
- GIS implementation is a subsequent and effective method that relate hydrological and hydraulic data to geographic data and helps to analyse the actual situation and how the situation is developed from the past years until now;
- water resources modelling is the third step that allow in making predictions about how desertification could improve and how it is possible to break it.

5.2. Specific commitments for each Country

5.2.1. Molise Region

- Overcoming the high fragmentation of Water Management System through the entrusting to a single operating company with industrial grade management
- Improving the use of IT Information Technology in the Water Management System to keep on track performances quickly and simply, according to the ARERA macro-indicators
- Planning strategies of action to collect data from water networks; analyzing on economic, environmental and social aspects; defining costs and investing on infrastructure to reduce water leaks and improve the WMS service level

5.2.2. Puglia region

- Promoting agricultural wastewater reuse through the preparation of specific financial tools and information campaigns.
- Increase the number of wastewater treatment plants with advanced control systems for the quality of the treated water, in order to increase the quality of treated wastewater and improve the efficiency of the treatments.
- Preparation of specific regulatory instruments aimed at contrasting and discouraging the unauthorized withdrawal of groundwater.

5.2.3. Montenegro

The main business goal of the Regional Waterworks is to meet the expectations of users of public water supply services, business partners and the tourism industry, local governments and employees.

- The company plans to continue with the introduction of new technologies and standards in business, through seminars, specialized training and additional training of its staff, and thus enable all employees to acquire new knowledge

- The company plans to carry out activities to promote the importance of water and water resources, which would give an active contribution to raising awareness of the importance of these resources among consumers and all residents of Montenegro.

Special emphasis is given to maintaining the quality of surface and groundwater, sustainable use of water resources, because human impact at the global level (climate change), or at the local level (construction and other illegal activities in sanitary protection zones, irrational water use, etc.) can negatively affect the quality and sustainability of resources.

5.2.4. Albania (Tirana Municipality)

- revise, update and adopt the national sector strategy for water supply and sewerage services through better define the role and responsibilities of parties involved in the policy development and delivery of the service
- use a hydrogeological model and based on legally established travel durations, the meaning of protection zones should be explained.
- install a monitoring system (appropriate network monitoring) in the protection zones and recharge zones surrounding water sources, as well as to identify and monitor pollution sources in the protection zones.
- data on water production, water quality, water level, pollution sources, and trend monitoring be documented and updated inn an accessible and informative GIS database, information regarding water production facilities, water resources protection zones, well monitoring, possible pollution sources, and land use may be recorded.
- Develop an information package on water resource preservation for residents and workers in the region, including the requirements placed on the protection zones, the quality of the water used, and the water source's environmental statistics.

5.3. Follow-up activities

The Cross Border Policy Paper includes the indication of specific commitments that national and local authorities must undertake in order to improve a better Water Policy in their countries using also

International stakeholders suggestions. One of this commitment will be the realization of **a follow up activity related to the pilot project realized in order to verify (after at least 12 months) if those interventions have impacted in a positive way generating a better WMS in the related countries.**

Furthermore, recommendations of CBWMS should be taken into account, which foresees that the monitoring of the implementation of this plan with a focus on three macro areas covering institutional, capacity buildings and technical aspects.

The rationale for this measure of verify has been provided by defining three indicators supported by precise goals and deadlines. **Time benchmarks have been fixed at 5 years intervals, starting in 2026, in the hypothesis that the WMS plan and the Cross Border Policy Paper will start in 2022.**

6. CONCLUSIONS

The EU Green Deal, aiming at advancing the Paris Climate Agreement and the United Nation's 2030 Agenda for Sustainable Development, states that Water is the "life-blood" of our economy, industries, societal functions, nature as well as health and wellbeing of our citizens.

Without water everything else in the 69.8 Trillion Euro global economy would fail. 75% of our jobs depend on water and water crises rank among the top 5 global risks in terms of impact[9].

Reason why it is essential that the new EU policies and innovation programs consider the real "Value of Water" to develop **integrated solutions and changes towards healthy water bodies, secure and resilient water management infrastructures, and the secure availability of the right water quality for the right use within a sustainably circular society.** To meet these challenges, we need transition to more sustainable integrated water management system providing opportunities for all stakeholders to develop a secure and resilient sector. The COVID-19 crisis showed how "be resilient" is critical to adequately respond to emergencies and contribute to the overall stability and resilience of our society.

As lesson learnt, we can affirm that **a sustainable Integrated WMS is a key element to cope with the emerging challenges of the planet for a sustainable growth**.

On the basis of this statement, all Cross Water partners undertake to support the actions jointly implemented also over the next five years.

[9] file:///C:/Users/gianfranco/Downloads/water-13-00832-v2.pdf

ANNEX I – TABLE OF FIGURES