

D.T. 3.4.3 - NATIONAL LEVEL POLICY RECOMMENDATION DISCUSSION PAPERS IN EN & NATIONAL LANGUAGES

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INTRODUCTION

A policy recommendation is simply written policy advice prepared for some group that has the authority to make decisions, whether that is a Cabinet, council, committee or other body. Policy recommendations are in many ways the chief product of the ongoing work of government managers to create and administer public policy. Policy recommendations have a lot in common with briefing notes. Like a briefing note, a policy recommendation serves to inform senior decision-makers about a policy issue. However, a policy recommendation document goes further than a briefing note, providing both a more in-depth analysis of the options and a policy recommendation. Policy recommendations are the key means through which policy decisions are made in most levels of government. Whether the policy recommendation is accepted as sound advice or dismissed in favour of another option largely depends on how well the issue and the arguments justifying the recommended course of action are presented.



1. Collecting Relevant Data, Defining Existing Gaps, Key Stakeholders and Enablers

The previous deliverable D.T. 3.4.2. Country reports on national frameworks gave an overview of existing regulations, policies, and strategies regarding water management in the Republic of Croatia. It also provided a comprehensive list of other regulations, policies, and strategies, that govern other legal areas, but also contain individual provisions on water issues. Furthermore, the institutional framework of water management with the emphasis on authorities responsible for water quality standards and stormwater runoffs has also been given. Lastly, the report provided insight into existing campaigns, programs and projects that promote water protection and conservation as well as the list of the key stakeholders that are co-creating the legal and policy framework in Croatia i.e., in FUA Split.

This document provides an extensive and detailed representation of both legal and institutional framework, existing strategies and policy instruments carried out in D.T. 3.4.2., extended with SWOT and PESTLE analyses, as well as policy recommendations.

1.1. Step 1 - Mapping

Initially, a comprehensive mapping process is carried out entailing a detailed description of the existing framework. The mapping process lists particular laws, regulations and strategies on a water-related matter such as main acts, sectoral regulations (water for industrial reuse), decisions, etc.

The following tables comprise all laws and regulations addressing water management of the Republic of Croatia, complemented with a detailed description of the actions they govern.

Table 1. Acts

Name	Description
Water Act for Human Consumption (NN 56/13, 64/15, 104/17, 115/18, 16/20)	Regulates the health safety of water for human consumption, the competent body for the implementation of this Act and the manner of reporting to the European Commission on the implementation of this Act, the obligations of legal entities supplying water for human consumption in the Republic of Croatia, procedures and reporting in case of deviations for checking the conformity of water for human consumption, monitoring and other official controls of the health safety of water for human consumption and their financing, in order to protect human health from adverse effects of any pollution of water for human consumption and ensure the health safety of water for human consumption on the territory of the Republic of Croatia.
Water Act (NN 66/19)	Regulates the legal status of water, water resources and water structures, water quality and quantity management, protection against harmful effects of water, detailed land reclamation and irrigation, public water supply and drainage activities, special activities for water management, the institutional structure of these activities and other issues related to water and water resources.
Water Management Financing Act (NN 153/09,90/11, 56/13, 154/14, 119/15, 120/16, 127/17, 66/19)	Determines the sources of funding for water management, and in particular water fees, including the obligation to pay, taxpayers, basis, method of calculation, determination of the amount, the purpose of spending these funds, enforcement, the statute of limitations and other issues related to the realization and use of these funds.
Water Services Act (NN 66/19)	Regulates the institutional framework for the provision of water services, the price of water services, the legal position and sustainable operation of water service providers, the operation of the Water Services Council, and other related issues.

Table 2. Regulations

Name	Description
Regulation on bathing water quality (NN 51/14)	Determines bathing water quality standards for inland surface waters which set limit values for microbiological indicators and other characteristics of bathing water and bathing water quality management in order to ensure the preservation, protection or improvement of the quality of surface water used for bathing and thus contributes to preservation and protection of the environment and human health.
Regulation on service areas (NN 67/14)	Establishes service areas and determines their boundaries.



Name	Description
Regulation on special conditions for performing public sewerage activities (NN 28/11, 16/14)	Determines the special conditions that must be met by a public water service provider for performing public sewerage activities. Management activities in terms of this Regulation include regular maintenance of public sewerage buildings, including wastewater treatment plants, adoption of general and technical conditions for the delivery of water services, development planning and other activities that ensure the permanent functional capacity of public sewerage buildings excluding the construction of these buildings.
Regulation on special conditions for performing public water supply activities (NN 28/11, 16/14)	Determines the special conditions that must be met by a public water service provider for performing public water supply activities. Management activities in terms of this Regulation include regular maintenance of buildings for public water supply, current and investment maintenance of water connections to real estates, calibration and servicing of water meters, adoption of general and technical conditions for the delivery of water services, development planning and other activities that ensure permanent functional capacity of buildings for public water supply excluding the construction of those buildings.
Regulation on special conditions for performing the activity of water tightness testing of buildings for drainage and wastewater treatment (NN 1/11, 9/20)	Determines the special conditions for performing the activity of testing the water tightness of buildings for drainage and wastewater treatment.
Regulation on special conditions for performing water sampling and testing activities (NN 3/20)	Determines the special conditions for performing activities of sampling and testing of water, except water for human consumption according to special regulations, and in particular technical equipment, number and expertise of employees, technical specifications for testing and monitoring of water, sediment and biota and pollutant emissions. wastewater, minimum performance requirements for methods of analysis used in the testing and monitoring of water, sediment and biota, and pollutant emissions in wastewater and rules for demonstrating the quality of analytical results.
Regulation on special conditions for the performance of activities to prevent the spread and eliminate the consequences of extraordinary and sudden pollution of water and water resources (NN 3/20)	Determines special conditions for the performance of activities to prevent the spread and eliminate the consequences of extraordinary and sudden pollution of water and water resources, which include technical equipment, number and expertise of employees.
Regulation on technical requirements for wastewater drainage structures, as well as deadlines for mandatory control of the correctness of drainage and wastewater treatment structures (NN 3/11)	Establishes technical requirements for wastewater drainage structures, as well as deadlines for mandatory control of the correctness of drainage and wastewater treatment structures.
Regulation on the amount of compensation for water protection (NN 82/10, 83/12, 151/13, 116/18)	Determines the amount of the fee for water use and correction coefficients which reduce the amount of the fee for water use.
Regulation on the calculation and payment of water protection fees (NN 48/19)	Determines the method of calculation and payment of water protection fees, bases, accounting periods, temporary and final calculation, collection of fees through payment slips, fixed technological loss for individual industries, payment deadlines, establishment and maintenance of fee records, delivery of data from records and manner exercising the right to a refund of overpaid amounts of compensation.
Regulation on the conditions for granting concessions for the economic use of water (NN 89/10, 46/12, 51/13, 46/12)	Defines the conditions for granting concessions, the term for which the concession is granted, the minimum amount of the concession fee, the manner of determining the amount of the concession fee and the deadlines for issuing opinions.
Regulation on the content of the Action Program for the Protection of Waters against Nitrate Pollution of Agricultural Origin (NN 7/13)	Prescribes the detailed content of the Action Program for the Protection of Waters from Pollution Caused by Nitrates of Agricultural Origin.
Regulation on the issuance of water legal acts (NN 9/20)	Determines the name and form of water legal acts, necessary evidence for issuance, mandatory content, validity of water legal acts, powers of water supervision, storage and safekeeping of water legal acts and other issues referred to in the Water Act.
Regulation on wastewater emission limit values (NN 26/20)	Determines the limit values of pollutant emissions in industrial wastewater before their discharge into the public sewerage system and in all treated or untreated wastewater discharged into water, preconditions for temporary permitting of wastewater discharge above the prescribed quantities and emission limit values, criteria and assumptions for collection, treatment and discharge of municipal wastewater, preconditions for exceptionally permitted discharges into groundwater, methodology of sampling and testing of wastewater composition, frequency of sampling and testing, the form of the register of discharged wastewater, the form of the register of chemicals placed on the market for use in the Republic Croatia that reach the waters after use, form and manner of keeping the register, deadlines, more detailed contents and forms of data submission,



Name	Description
	cases of application of the fixed correction coefficient from the regulations governing the amount of the fee for water protection.
Regulation on water quality standard (NN 96/19)	Addresses the water quality standard for surface waters, including coastal waters and territorial sea and groundwater, special water protection objectives, criteria for determining water protection objectives, conditions for extending deadlines for achieving water protection objectives, elements for assessing water status, monitoring water and water status reporting.

Table 3. Provisions

Name	Description
Provision on the criteria for the economic operation of water service providers (NN 112/10)	Determines the criteria for the economic operation of water service providers.
Provision on the lowest basic price of water services and the type of costs covered by the price of water services (NN 112/10)	Determines the lowest basic price of water services and the costs covered by the price of water services.
Provision on the maximum amount of compensation for the connection of buildings and other real estates to communal water structures (NN 109/11)	Determines the highest amount of compensation for the connection of buildings and other real estate to utility water structures.

Table 4. Ordinances

Name	Description
Ordinance on special conditions for performing activities of water exploration and other hydrogeological works, preventive, regular and extraordinary flood defence, and management of detailed buildings for drainage and irrigation (NN 83/10, 126/12)	Determines the special conditions for performing the activities of hydrogeological research, geophysical research and drilling of exploratory wells and wells, and in particular the technical equipment, number and expertise of employees, and protected areas.
Ordinance on the boundaries of sub-basins, small basins and sectors (NN 97/10, 31/13)	Establishes the boundaries of sub-basins, small basins and sectors in the Republic of Croatia.
Ordinance on the conditions for performing the tasks of the water guard service (NN 114/10)	Determines the conditions for performing the tasks of the water guard service, the form and content of the water guard card and keeping a register of issued cards.
Ordinance on the determination of sanitary protection zones of springs (NN 66/11, 47/13)	Determines the conditions for determining the zones of sanitary protection of springs used for public water supply, measures and restrictions implemented in them, deadlines and the procedure for making decisions on the protection of springs.
Ordinance on the gravel and sand extraction register (NN 80/10, 3/14) Ordinance on the deposited gravel and sand register (NN 80/10, 3/14)	Determines the form and content of the register of gravel and sand extraction, the manner of keeping the register, the deadlines for keeping the register and the methodology of making geodetic surveys, analysis of the granulometric composition of the extracted material.
Ordinance on the register of abstracted and used quantities of water (NN 81/10)	Determines the content and manner of keeping the register of water quantities affected by legal and natural persons referred to in Article 80, paragraph 1 of the Water Act, including the measurement of affected or used water quantities, and the submission of such data to the Croatian Waters.

Table 5. Decisions

Name	Description
Decision on the adoption of the River Basin Management Plan 2016 - 2021 (NN 66/16)	The River Basin Management Plan 2016-2021 adoption.
Decision on the border between inland waters and sea waters (NN 89/10)	Establishes the demarcation line between inland waters and sea waters, which refers to the mouths of rivers flowing into the sea and canals connected to the sea. The provisions of this Decision do not apply to the boundaries of the fishing sea, determined by special regulations governing the management of living resources in the framework of marine and freshwater fisheries.
Decision on the designation of sensitive areas (NN 81/10, 141/15)	Determines sensitive areas in the Danube River Basin and the Adriatic River Basin District in the Republic of Croatia.



Name	Description
Decision on the designation of vulnerable areas in the Republic of Croatia (NN 130/12)	Determines vulnerable areas in the Republic of Croatia, in the Danube River basin district and the Adriatic rivers basin district, where it is necessary to implement enhanced measures to protect waters from nitrate pollution of agricultural origin.
Decision on the determination of the area of waters suitable for the life of freshwater fish (NN 33/11)	Determines the areas of water suitable for the life of freshwater fish.
Decision on the determination of waters suitable for bivalve mollusk life and growth (NN 78/11)	Determines the waters suitable for the life and growth of shellfish in the area of transitional and coastal waters.
Decision on penalties for illegally extracted gravel and sand (NN 80/10, 3/14)	Determines the amount of compensation for illegally extracted or excavated gravel and sand, as well as stone and earth, including clay in the area important for the water regime.

Corresponding strategic documents i.e., strategies and plans that provide strategic commitments and guidelines for the development of water management, utility infrastructure, and other water-related issues are complementing the legal framework. A detailed description of each document is given in the table below.

Table 6. Strategic documents

Name	Description
River Basin Management Plan for the period from 2016 to 2021	Aims to protect and improve the ecological and chemical status of surface waters, i.e., quantitative and chemical status groundwater. Additional requirements apply to protected areas (waters intended for human consumption, water suitable for the protection of economically important aquatic organisms, water for bathing and recreation, areas subject to eutrophication, including areas of poor exchange water in coastal waters, areas vulnerable to nitrates, areas intended for the protection of aquatic and waters dependent habitats and species), following the regulations based on which protection is established.
Multi-year Program for the Construction of Regulatory and Protective Water Structures and Buildings for Land Reclamation (NN 117/15)	Establishes a framework programme for investment in water management in order to protect against the harmful effects of water, through the construction of regulatory and protective water structures and buildings for basic reclamation drainage that can serve the reception and evacuation of large waters, and irrigation.
Multi-year Program for the Construction of Utility Water Structures (NN 117/15)	Establishes a framework programme for investment in public water supply and public sewerage. The implementation system is also being operationalized, in a way that will contribute to the more efficient use of financial, human and information as well as documentation resources available to the water management in the activities of water use and water protection.
The Main Flood Defence Implementation Plan	Contains an overview of territorial units for the direct implementation of flood protection measures (including the number and designation of sections and other necessary data) by protected areas of the sector and associated water protection structures where flood protection measures are implemented. It covers ice on watercourses, water levels at which the preparatory state begins on a particular section, regular or extraordinary flood defence and state of emergency, criteria of ice protection on watercourses, the schedule of flood defence managers and their deputies from Croatian Waters, and legal entities and their managers and deputies registered for flood defence, i.e., ice defence on watercourses, as well as the schedule of flood defence managers from legal entities that manage dams and reservoirs.
The National Flood Defence Plan (NN 84/2010)	Regulates territorial flood defence units, levels of flood defence, flood defence measures (including preventive measures), flood defence authorities, flood defence management (with obligations and rights of flood defence managers), the content of flood defence implementation plans, information, warning system and communication system and ice protection measures on watercourses.
National Water Management Strategy (NN 91/08)	Provides strategic commitments and guidelines for water management development starting from the current state of the water sector, development needs, economic opportunities, international obligations, and the need to preserve and improve water conditions, and aquatic and water-dependent ecosystems.

The aforementioned nationwide framework regulates water use, protection of water and aquatic environment, wastewater and wastewater infrastructure, water quality standards, water fees, protection



against adverse effects of water, etc. However, Croatia currently lacks specific regulations concerning rainwater collection, stormwater runoffs, and water reuse.

Individual provisions on water issues are found in the laws which regulate other legal areas:

- Environmental Protection Act (NN 80/13, 153/13, 78/15, 12/18, 118/18)
- Nature Protection Act (NN 80/13, 15/18, 14/19, 129/19)
- Natural Disasters Consequences Mitigation and Elimination Act (NN 16/19)
- Act on Navigation and Inland waterway ports (NN 109/07/ 132/07, 51/13, 152/14, 118/18)
- Utility Economy Act (NN 68/18, 110/18, 32/20)
- Forest Act (NN 68/18, 115/18, 98/19, 32/20, 145/20)
- Agricultural Land Act (NN 20/18, 115/18, 98/19)
- Expropriation and Determination of Compensation Act (NN 74/14, 69/17, 98/19)
- Freshwater Fisheries Act (NN 63/19) and others.

Water issues also include spatial planning of the water-utility infrastructure, such as green infrastructure in form of efficient water and land management, green roofs, green permeable surfaces, etc. In regards to the aforementioned, the main legal act is the Physical Planning Act (NN 153/13, 65/17, 114/18, 39/19, 98/19) which regulates the spatial planning system i.e. goals, principles and subjects of spatial planning, monitoring the situation in space and spatial planning, spatial planning conditions, adoption of the Spatial Development Strategy of the Republic of Croatia, spatial plans including their development and adoption procedure, implementation of spatial plans, construction land development, property institutes of building land management, and supervision. The Construction Act (NN 153/13, 20/17, 39/19, 125/19) regulates the design, construction, use, and maintenance of buildings and the implementation of administrative and other procedures for ensuring the protection and arrangement of space. This is done in accordance with the regulations governing spatial planning while ensuring basic requirements for the construction as well as other requirements stated by this Act and other (special) regulations that are based on it. The drainage system of public green surfaces is implied by the water acts and regulations. The concept of green roofs falls under activities in the field of preservation, sustainable use, protection, and improvement of the environment as well as energy efficiency and the use of renewable energy sources. Thus, it's covered by the Environmental Protection Act (NN 82/94 and 128/99) and the Energy Act (NN 68/01).

Water management activities are comprised not only by the listed acts but also by the following strategic documents belonging to other legal areas/sectors. These documents refer to environmental protection, chemical safety, sustainable development, and other areas that support circular economy and sustainability.

- River Transport Development Strategy in the Republic of Croatia (2008-2018) (NN 65/08)
- Spatial Development Strategy of the Republic of Croatia (NN 106/17)
- Transport Development Strategy of the Republic of Croatia for the period from 2014 to 2030 (NN 131/14)
- Agriculture and Fisheries Strategy of the Republic of Croatia (NN 89/02),
- Strategy for Sustainable Development of the Republic of Croatia (NN 30/09)
- Strategy and Action Plan for the Protection of Biological and Landscape Diversity of the Republic of Croatia (NN 143/08)
- Waste Management Strategy of the Republic of Croatia (NN 130/05)
- Energy Development Strategy of the Republic of Croatia by 2030 with a view to 2050 (NN 25/20)



- National Environmental Protection Strategy (NN 46/02)
- Strategy and action plan for Nature Protection of the Republic of Croatia for the period from 2017 to 2025 (NN 72/17)
- National Chemical Safety Strategy (NN 143/08)
- Tourism Development Strategy of the Republic of Croatia until 2020 (NN 55/13).

1.2. Step 2 - Comparative View

The mapping process on the level of CWC partnership considers European legislation and comparative legal views with other circular countries such as Cyprus, Greece, Spain, etc. Thus, the following text lists the European water legislation transposed into the Croatian national framework and provides examples of national regulations, regarding water reuse, rainwater and stormwater collection, established by the several Member States.

Some of the transposed water directives into national framework are:

- Water Framework Directive (2000/60/EC)
- Floods Assessment and Management Risks Directive (91/676/EEC)
- Drinking Water Directive (98/83/EC)
- Bathing Water Directive (76/160/EEC)
- Fish and Shellfish Water Directives (78/659/EEC, 79/923/EEC, 2006/113/EC, 2006/44/EC)
- Groundwater Directive (80/68/EEC, 2006/118/EC)
- Nitrates Directive (91/676/EEC)
- Urban Wastewater Treatment Directive (91/271/EEC)
- Discharges of Dangerous Substances Directive and "daughter" directives (76/464/EEC, 86/280/EEC, 2006/11/EC, 82/176/EEC, 83/513/EEC, 84/491/EEC)
- Directive on industrial emissions (201/75/EU)
- Wild Birds Directive (79/409/EEC)
- Habitat Directive (92/43/EEC) and others.

The European-wide standards or guidelines for water reuse were inexistent. Thus, over the years, due to increased population and density in the urban areas, rising water consumption due to excessive development as well as increasing water scarcity problems associated with climate change, the EU has developed a portfolio of directives developed to protect the environment and human health, regulate the water cycle, etc. Adoption of the Regulation on Minimum Requirements for Water Reuse (EU 2020/741) set obligations for each Member State to establish water reuse practice as well as water scarcity alleviation, rainwater collection and stormwater runoffs. Several Member States already have in place numerous initiatives regarding water reuse for irrigation, industrial uses, and aquifer recharge. Examples of such initiatives are given below.

Table 7. Water reuse policy and regulatory tools in different Member States

Member State	National regulatory framework
Cyprus	Standards for the reuse of treated wastewater for irrigation, Decree no. 296/03.06.05 adopted in 2005 along with a Code of Good Agricultural Practice (P.I. 263/2007).



Member State	National regulatory framework
	The Water Pollution Control Laws. The basic legislative instrument on which the control of water and soil pollution control is regulated is Law No. 106 (I)/2002. This Law together with its amendments (No. (I)/2005, 76 (I)/2006, 22 (I)/2007, 11 (I)/2008, 53 (I)/2008, 68 (I)/2009, 78 is known as “The Control of Water Pollution Laws 2002 to 2013”
Denmark	Guidelines on water use in food businesses in 2014 (Vejledning nr.9236 af 29. april 2014 om fødevarehygiejne, kap. 10 or ‘Guidelines on hygiene’
France	Regulation for water reuse for agricultural and green areas irrigation. Official Journal of the French Republic. Decree n-0153 du 4 of July 2014 Page 11059 Text No. 29, by which the Previous Decree is Modified for the Use of Treated Effluents for Irrigating Crops or Green Areas
Greece	Common Ministerial Decision No 145116 (354B)/08.03.11: Measures, Limits and Procedures for Reuse of Treated Wastewater
Italy	Italian regulations for water reuse, MINISTERIAL DECREE of the 12 June 2003, no. 185
Malta	Guidelines on water reuse, including quality standards and a publicly available information system on the quality of the treated effluent are under preparation
Portugal	Regulations for water reuse for irrigation purposes. Portuguese Standard NP 4434. NP 4434:2005 - norma portuguesa para reutilização de águas residuais urbanas tratadas na rega
Spain	Regulations for Water Reuse - Royal Decree RD 1620/2007 of 7 December, State Official Journal, BOE no. 294, of 8 December 207, pages 50,639 to 50,661

Furthermore, Europe adopted a Common Agricultural Policy associated with good practice for the maintenance of biodiversity, landscape, soil protection and water resources. Also, there are many organizations, associations, and others that promote water conservation, digitalization in the water sector and water reuse Europe-wide, such as Water Reuse Europe, European Water Association, Water Europe, Digital Water City, etc. The European database (Eurostat) provides numerous statistics regarding water resources, uses, abstraction and treatment which enable comparison of different water management strategies in the Member States and to the EU average.

Croatia, on the other hand, lacks not only relevant legislation but also guidelines, standards, and other relevant measures on water reuse and recycling. Also, according to the European Commission Country reports on Croatia for 2020 (subsection 4.5. Environmental Sustainability), the sewage systems are underdeveloped and the water supply networks face high leakage rates. For a country rich in water resources, only 54.6% of the population is connected to the sewage system and 86% are connected to the public water supply, which has a medium leakage rate of 44% (almost double the EU average - 23%). Much of the collected wastewater is discharged without appropriate treatment. This can become an issue with the arousing density of the urban areas and particularly when infrastructure use peaks during the summer months. In effect, the poor state of the sewage systems harms the ecosystems on which Croatia’s tourism depends. As regards drinking water, in addition to high leakage rates, quality requirements are still not met in some areas, most notably Eastern Slavonia.

The water sector lags considerably behind EU standards. The estimated total investment gap in the water utility sector is HRK 28 billion, almost 7% of Croatia’s 2019 GDP. Almost one-quarter concerns investments in public water supply, with more than three quarters related to the public sewage system and wastewater treatment. A significant share of necessary funding is eligible under the European Structural and Investment Funds. The long-awaited reorganization of the water utility sector is expected to speed up the implementation of projects in the water sector and resolve budget constraints of smaller municipalities. The adopted Water Service Act lays down the foundation for this reorganization, while the Regulation of Service Areas delineates water service areas, reducing the number of water utility companies from almost 200 to 40. Improved efficiency in the water sector, including through more cost-effective measures, as well as increased consolidation, could help reduce the financing gap. An ambitious update of the national water investment plan is expected to guide the prioritization of investments.



1.3. Step 3- Assigned Authorities

The legal authorities that could enable, support, authorize, or otherwise provide a legal basis for water management activities are identified. As in D.T. 3.4.2., the figure below represents all stakeholders responsible for the design and implementation of water-related documents and legislation.

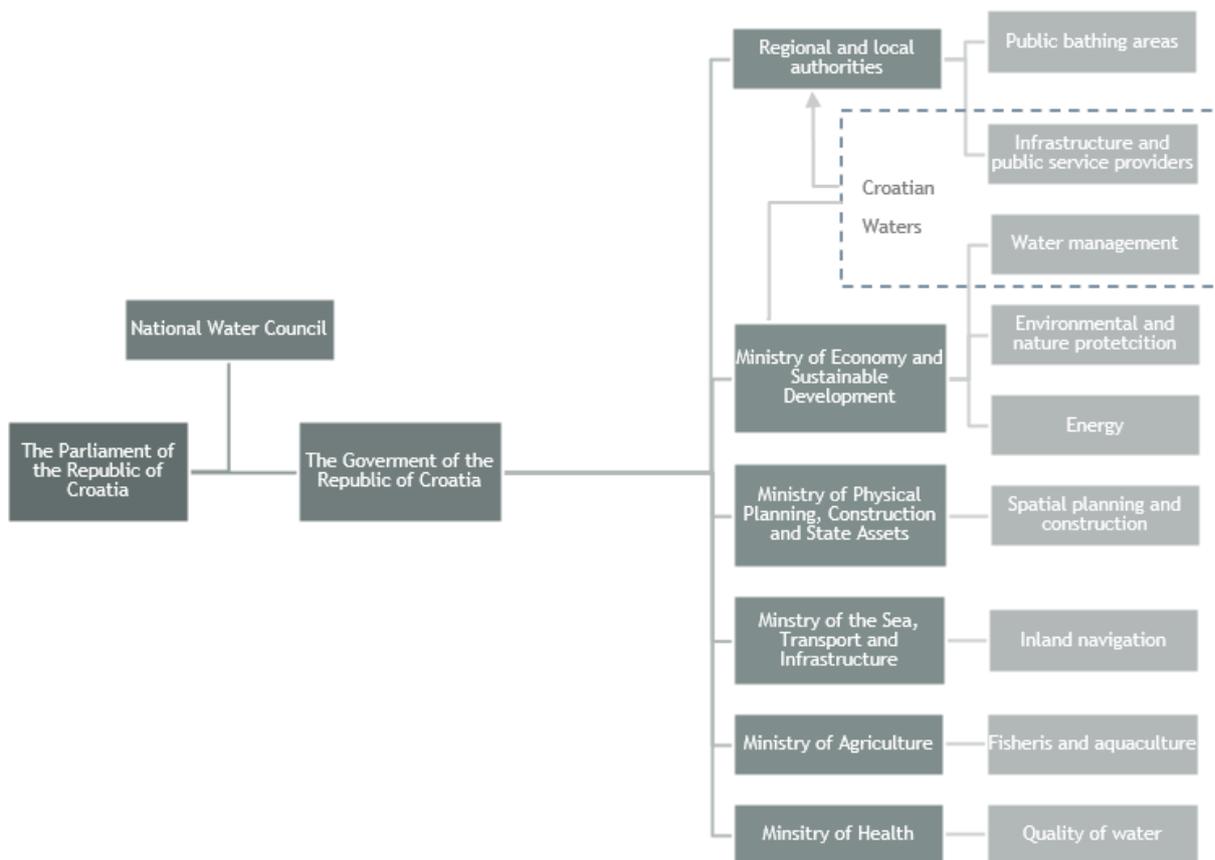


Figure 1. Responsible authorities for water management and related water issues

The main actors are Croatian Waters and the Ministry of Economy and Sustainable Development that co-create main water management documents and propose relevant regulations. Other presented ministries create individual provisions on water issues related to legal areas they govern. For example, the Ministry of Physical Planning, Construction and State Assets proposes and creates documents and laws regarding spatial planning of green infrastructure, whereas the Ministry of Agriculture is in charge of the relevant framework for fisheries and aquaculture. Regional and local authorities are responsible for water management activities concerning water and wastewater infrastructure and public service providers in their area.

Water quality standards and stormwater runoffs are comprised under different activities that are performed by different authorities. The overview of authorities competent for the supervision of the aforementioned is given below.

The water quality standards fall under the activity of water protection performed by Croatian Waters. The activity also includes monitoring of surface, coastal and groundwater as well as the laboratory work in monitoring. It also includes implementing and supervising the implementation of measures from the National Plan of Measures in case of extraordinary and sudden pollution. Furthermore, the activity encompasses giving feedback, and exceptionally approval, to the regulations adopted by local and/or regional authorities on the basis of the Water Act as well as the co-financing of the public wastewater drainage structures



construction and supervision over the intended use of funds. Taking into consideration that water quality is of general interest when it concerns water for human consumption, bathing water but also wastewater and groundwater, the quality testing is performed by the Department for Water Safety and Supply within the Croatian Institute of Public Health. The Department also examines spring, mineral and table water, precipitation, technological, cooling, and other types of water for special purposes. Based on the obtained test results, an expert opinion and conclusion are given on the health safety of the water for human consumption and pool water, the quality of the sea and inland waters, and on the ecological status of surface, coastal and groundwater. In addition to conducting research, the Department also participates in monitoring, preparation of expert reports, and studies within their field of work. All testing is performed according to valid regulations and standardization methods. The superior authority of the Institute is the Ministry of Health.

Even though stormwater is not separately regulated in Croatian legislation, according to the Water Act, rainwater/stormwater it is wastewater generated by leaching precipitation from the surfaces of roads, parking lots or other surfaces, gradually dissolving the pollution on these areas. Buildings of precipitation drainage in populated places (urban precipitation drainage) are built and maintained by local authorities. Rainwater drainage from residential buildings, business, and other premises are maintained and built by the owners of the buildings and premises. It is stormwater drainage that connects the private plots to urban stormwater drainage, road drainage or watercourses. Responsible authorities for maintaining rainwater drainage channels from roads, which are built on the road or railway land, ports and port areas, airports and aviation infrastructure, are persons designated by special regulations for road management. Also, when the heavy storms lead to floods which fall under the activity water management and protection against harmful effects of water, the responsible authority is Croatian Waters. The activity comprises monitoring and determination of hydrological conditions (including monitoring, collection, control, processing, storage, and publication of hydrological data, analysis of hydrological regime, forecast of hydrological extremes, floods, and droughts), flood risk assessment, monitoring of watercourses and regulatory and protective water structures; investment activities in the construction and maintenance of regulatory and protective water structures; supervision over the construction and maintenance of regulatory and protective water structures; flood risk management; management and supervision and implementation of preventive, regular and emergency flood defence.

The State Inspectorate, the central body of state administration, has an important role in the regulatory framework. According to the Law on the State Inspectorate (NN 115/2018) it performs all inspections for the protection of public interest and public health interest in the implementation of regulations and misdemeanour liability. That, among others, encompasses the water management and water for human consumption that is examined by the Water Inspection. The scope of business performed by the Water Inspection includes the following:

- compliance with water law acts
- fulfilment of obligations from the concession agreement for water use
- action in case of extraordinary and sudden water pollution
- performing activities of water services of public water supply and drainage
- performing special activities for the needs of water management.

1.4. Step 4 - Levels of Government

Since roles are shared in different ways between the national and local levels of government, the mapping report as part of the Assessment distinguishes the roles and responsibilities of these levels of government wherever possible. Therefore, there are three levels identified.

1. Central



National (State) Public authorities:

- approve the national River Basin Management Plan (RBMP) and the Flood Risk Management Plan (FRMP) and propose relevant legislation and strategies to the Parliament
- adopt the relevant legislation and national strategies, such as the Water Management Strategy
- facilitate international cooperation, including bilateral cooperation with neighbouring countries and cooperation via international river basin commissions for the Danube and Sava basins
- exercise overall responsibility for water management, including supervision of Croatian Waters.

Croatian Waters (Hrvatske Vode, a national body under the Ministry of Economy and Sustainable Development) is the national authority responsible for water management. Its responsibilities include the following:

- prepare and implement the national River Basin Management Plan, Programme of Measures, Flood Risk Management Plan, water supply plans
- participate in the drafting of legal and sub-legal acts for water use
- monitor and assessment of groundwater and surface water
- co-ordinate public participation
- compile statistical data related to water management
- provide expert, technical, economic, and legal assistance to municipalities in defining, preparing, and implementing projects.

2. Regional Public authorities:

- protect drinking water sources, with local authorities and with the prior consent of Croatian Waters
- are obliged to obtain from Croatian Waters requests for the development of spatial plans and an opinion on compliance with the requirements of the spatial plans with water management planning documents.

3. Local Public authorities:

- protect drinking water sources, with regional authorities and with prior consent issued by Croatian Waters
- determine the locations for bathing (bathing areas) and the duration of the season for bathing on surface waters, show the assessment of the quality of surface bathing water and perform the classification and determine the profile of bathing water
- support public consultations for the RBMP and FRMP
- implement specific measures set out in the RBMP and FRMP (together with Croatian Waters)
- own companies responsible for water supply, sewerage and wastewater treatment (decide on the program of construction of utility infrastructure, introduction of the fee for development, program of maintenance of facilities and devices of utility infrastructure, confirmation of the price of utility service proposed by utility operators; public drainage, connection to the public water supply system, connection fees).



1.5. Step 5 - Prioritization

As previously emphasized, the regulatory framework on water reuse, rainwater collection, and stormwater runoff is poor in the Republic of Croatia. Even though these notions are somewhat captured by existing laws and planning documents there are no specific regulatory documents. The same goes for wastewater reuse and recycled water standards. In order to cross to a sustainable economy i.e., to achieve circularity and improve overall public health and environmental protection affected by water-related activities, Croatia needs to prioritize its national framework. The framework should be adopted on the national level and certain provisions should be brought particularly for infrastructure and public service providers as well as other industry players. Additionally, the adoption of European regulations, standards, and guidelines will facilitate the creation of necessary laws and documents and harmonize them with the Europe-wide framework.

The scope of policy measures that support circular water-economy needs to be both more comprehensive and more focused in order to cover all relevant segments of the economy and regulations, such as:

- **regulatory instruments:** regulations on water reuse, rainwater collection, stormwater runoffs; development of National Water Conservation Strategy, adoption of European Regulation on minimum requirements for water reuse
- **economic instruments:** changes of water fees for the protection of water, incentives, and subsidies for good practices regarding water management and green public procurement, as well as for infrastructure investments
- **R&D funding:** financially supporting circular economy-related subjects, and infrastructure, innovation incubators focused on green infrastructure, water collection, and reuse systems
- **information, networking support and voluntary measures:** advisory and information services for companies, start-ups, customers, professional training, qualifications and skills courses.

1.6. Step 6 - Existing Policy Support

The circular economy model aims to achieve environmentally and economically sustainable growth by maintaining the value of products, materials and resources in the economy for as long as possible. Unlike the “traditional”, linear economic model used since the industrial revolution and based on a 'take-make-consume-throw away' pattern, in a circular economy, products and the materials they contain are valued highly. In practice, a circular economy model aims to reduce waste to a minimum as well as to promote re-using, repairing, refurbishing and recycling of existing materials and products. What used to be considered as waste can be turned into a valuable resource. According to the European Commission, managing resources more efficiently throughout their life cycle would not only reduce pressure on the environment and enhance the security of the supply of raw materials; it could also bring significant economic gains. Indeed, considerable benefits can be expected in terms of innovation, competitiveness, new growth and job opportunities. On December 2nd 2015, the European Commission presented its new Circular Economy Package. Key actions, both legislative and non-legislative, put forward in the action plan included:

- actions to reduce food waste, including a common measurement methodology, improved date marking, and tools to meet the global Sustainable Development Goal to halve food waste by 2030
- development of quality standards for secondary raw materials
- measures in the Eco-design working plan for 2015-2017 to promote reparability, durability and recyclability of products, in addition to energy efficiency



- a new regulation on fertilising products, to encourage nutrient recycling while ensuring the protection of human health and the environment
- a strategy on plastics in the circular economy, addressing issues of recyclability, biodegradability, the presence of hazardous substances in plastics, and the Sustainable Development Goals target for significantly reducing marine litter
- **a series of actions on water reuse, including a legislative proposal on minimum requirements for the reuse of wastewater (Regulation on minimum requirements for water reuse was adopted on May 25th 2020)**
- a fitness check of the Ecolabel.

Selected circular economy and eco-innovation areas supporting the circular economy in Croatia are given below.

1. Waste management

Croatia has recognized the importance of managing resources more efficiently for the benefit of long-term economic and environmental sustainability, in line with the European Union's 'Circular Economy Package'. The Government of Croatia has acknowledged the need to move towards a circular economy, minimizing waste generation, separating at source, directing waste streams to various ways of utilization and treating waste as a resource. Therefore, the country is looking to speed up meeting EU Circular Economy targets and incorporating circular economy approaches into the current National Waste Management Plan (NWMP) 2017-2022 as well as into the future (post-2022) NWMP. In this context, the Ministry of Economy and Sustainable Development requested World Bank support and the two began working on the implementation of the Circular Economy Approaches in Solid Waste Management technical assistance, intending to improve waste management practices in Croatia and support the country in transitioning towards a circular economy. This technical assistance program is financed from the European Union's Cohesion Fund using the Bank's Reimbursable Advisory Services (RAS) instrument. The engagement started in September 2020 and is scheduled to last until the end of November 2022.

There are several Croatian regulations managing the policy framework of Croatia with regards to waste management and the circular transition aiming at streamlining the policy with that of the rest of the EU.

- Act on Sustainable Waste Management (NN 94/13, 73/17, 14/19, 98/19)
- Regulation on Communal Waste Management (NN 84/19, 14/20)
- Ordinance on waste management (NN 81/20)
- Ordinance on packaging and packaging waste (NN 88/15, 78/16)
- Waste Management Strategy of the Republic of Croatia (NN 130/05)
- Ordinance on by-products and end-of-waste status (NN 117/14)
- Waste Management Plan for the Republic of Croatia for the period from 2017 to 2022 (NN 3/17)
- other special waste categories like waste textile and footwear, waste tire, waste oil, waste batteries and accumulators, vehicles, medical waste, waste electrical and electronic equipment, construction waste and waste containing asbestos are regulated with additional regulations.

There are two initiatives supporting circularity, already existing in Croatia. The Social entrepreneurship and circular textiles by Humana Nova Čakovec and reusing textile waste in Regeneracija. The Humana Nova collects used clothes and textile waste, mostly from northwest Croatia. This type of recycling led to a reduction of 1.368 million kilograms of CO₂ over 7 years and more than 1,500 tons of clothes and



textile waste reused or recycled. The core business of Regeneracija lies in the recycling of textile waste from surrounding textile industries to produce insulation for the construction and automotive industry, protective floor coverings, filtration, and furniture industry. The company collects 35% of household textile waste, 15% of industrial textile waste while 50% of textile waste is imported. In 2017, the company collected and recycled approximately 9,000 tonnes of textile waste, and manufactures 60% of its own raw materials. The obtained finished products were exported to other EU countries.

Furthermore, the Waste Prevention Portal is developed with the objective of waste prevention and information exchange and good practice exchange to contribute to the achieving goal of waste prevention. Specific objectives are the development of a system for preventing waste generation by exchanging data and informing and exchanging good practices between competent bodies, business entities and citizens.

2. Renewable energy

Croatia achieved its 2020 targets for renewable energy and the reduction of greenhouse gas emissions, mainly due to its strong hydropower sector. An increase in renewable energy capacity is mainly due to the National Renewable Energy Action Plan (NREAP), which guaranteed feed-in-tariffs and premium tariff support schemes. However, there have been delays in adopting the necessary legislation and the energy efficiency obligation scheme is not yet fully operational.

3. Eco-labelling

The Croatian Ministry of Economy and Sustainable Development implemented labelling program Friends of the environment (Prijatelji okoliša), to promote products and services that, compared to similar products and services, have a less negative impact on the environment throughout their life cycle and thus contribute to the efficient use of environmental components and a high level of environmental protection.

4. Water reuse

The Circular Economy Package included actions on water reuse, however, in Croatia, there is a lack of such specific actions. The inexistent regulatory framework makes innovations and development in that area difficult. Participation in the CityWaterCircle project should enable nationwide development of water recycling practices supported by appropriate legislation and raising awareness of citizens on the benefits and importance of those practices. Furthermore, the development of green infrastructure, interpolation of green solutions into existing infrastructure and the upgrading of current levels of wastewater treatment will further support circularity and enable sustainable development.

Overall eco-innovation index (circular economy index) in 2019 Croatia achieved a performance score that is 25 points lower than the EU average, which places it 6th from the bottom in the EU-28 eco-innovation ranking. The indicators of eco-innovations include GHG emissions, water productivity, material productivity, the total value of green early-stage investment, implementation of sustainable products among SMEs, etc. This ranks Croatia within the group of member states that are catching up on eco-innovation practices compared to the rest of the EU.

Specific examples of eco-innovation projects/products/services in Croatia are:

- Project of wastewater collection, drainage and treatment in the area of the island of Krk
- Delt Papir d.o.o. paper awarded with EU Ecolabel
- Six Valamar Campsites Hold the Prestigious EU Ecolabel for Tourist Accommodation
- Saponia d.d. acquired the EU Ecolabel



- Croatian Chamber of Economy, HGK_COR Akcelerator (a platform that promotes partnership between the business sector, state institutions and the civil sector in achieving the goals of sustainable development in Croatia)
- Food Waste Prevention Centre (FWAPC) is a Civil Society Organization (CSO) / Non-Governmental Organisation (NGO) founded in 2018 in Zagreb
- ArboSmart
- Gideon Brothers
- HUBBIG
- Nuotwo and others.

The additional supporting strategic documents for the development of circular economy in Croatia include:

- National Action Plan for Renewable Energy Sources to 2020
- Integrated National Energy and Climate Plan for the Republic of Croatia for period 2021-2030
- Energy Development Strategy of the Republic of Croatia until 2030 with an outlook to 2050 (NN 25/20)
- Strategy for Innovation Encouragement of the Republic of Croatia 2014-2020
- Croatian Smart Specialization Strategy 2016-2020
- National Action Plan for Green Public Procurement for the period 2015-2017 (with a 2020 perspective)
- Nature Protection Strategy and Action Plan of the Republic of Croatia for the Period 2017-2025
- Strategic Plan of the Ministry of Economy, Entrepreneurship and Craft (2019-2021)

Furthermore, the good practice examples of policy instruments, measures and programs that support circular economy are:

- Co-financing the purchase of energy efficient vehicles (project We Drive Economically by the Environmental Protection and Energy Efficiency Fund)
- Project FIRESPOL - Financial Instruments in Renewable Energy Projects

Key stakeholders that are co-creating the legal and policy framework in Croatia on the national level as well as, sectoral agencies are presented in the table below.

Table 8. Key stakeholders

Institution	Contact person	E-mail	Telephone number
National Public Authority			
Ministry of Economy and Sustainable Development	Tomislav Ćorić	javnost@mingor.hr	+38513717111
Ministry of the Sea, Transport and Infrastructure	Oleg Butković	info@mppi.hr	+38516169115
	Irena Gerovac Zrnić	irena.gerovaczrnic@mmpi.hr	+38513784520
Ministry of Physical Planning, Construction and State Assets	Darko Horvat Goran Gotal	ministar@mpgi.hr	+38513782143
Ministry of Agriculture	Marija Vučković	kabinet@mps.hr	+38516106111
Ministry of Health	Vili Beroš	pisarnica@miz.hr	+38514607555
Association of entrepreneurs			



Institution	Contact person	E-mail	Telephone number
Croatian Chamber of Commerce	Ana Marija Puzić	apuzic@hgk.hr	+38521321139
Croatian Employers' Association	Damir Zorić	hup@hup.hr	+38514897556
	Vesna Ivić-Šimetin	hup-split@hup.hr	+38521368288
Sectoral agency			
Croatian Waters	Toni Carević	toni.carevic@voda.hr	+38521309436
	Mirjana Švonja		
The Environmental Protection and Energy Efficiency Fund	Lidija Tošić	Lidija.tosic@fzoeu.hr pisarnica@fzoeu.hr kontakt@fzoeu.hr	+38515391800
Croatian Institute of Public Health	n/a	hzjz@hzjz.hr	+38514863222
National Coordinating Body for Energy Efficiency	n/a	ee@cei.hr	+38516430600



2. Targeted Analysis of Results

2.1. SWOT Analysis Assessing the Necessity of Adopting Water Conservation Policies, Laws and Regulations

The first conducted analysis is the SWOT analysis that summarizes information presented in the previous chapter on Croatian water management. The internal factors define Strengths and Weaknesses on the subject in the country whereas the external factors define Opportunities and Threats as opposed to other Member states and EU in general.

STRENGTHS	OPPORTUNITIES
<ul style="list-style-type: none"> • <i>Adopted European water directives and regulations</i> • <i>Existing water laws and strategic documents</i> • <i>Existing provisions on water issues in documents and laws governing other legal areas</i> • <i>Existing policies supporting circular economy</i> • <i>Distribution of water management activities between responsible authorities</i> • <i>Existing eco-innovation projects/products and services</i> • <i>Adoption of the European Circular Economy Package</i> • <i>Preserving water resources through environmental protection</i> • <i>Wealth of water resources</i> 	<ul style="list-style-type: none"> • <i>Existence of the EU Regulation on minimum requirements for water reuse</i> • <i>EU funding available</i> • <i>Participation in CityWaterCircles project</i> • <i>Existing water reuse regulations, standards, and measures in several Member States</i> • <i>Existing Europe-wide incentives and programs promoting water reuse and conservation (Water Reuse Europe, European Water Association, Water Europe, etc.)</i> • <i>Existing Common Agricultural Policy associated with good practice for the maintenance of biodiversity, landscape, soil protection, and water resources</i> • <i>Existence of adequate statistics to monitor water performance, resources, use, etc. (Eurostat database)</i>
WEAKNESSES	THREATS
<ul style="list-style-type: none"> • <i>Absence of national legislation that specifically regulates rainwater, water reuse, stormwater, and water recycling</i> • <i>Lack of citizen awareness on the benefits of water reuse and rainwater/stormwater collection</i> • <i>National eco-innovation index below the EU average</i> • <i>Current wastewater treatment levels are low or non-existent</i> • <i>Absence of regulations on green roof infrastructure</i> • <i>Underdeveloped water supply and sewage system with high leakage rates</i> • <i>Investment gap in the water utility sector</i> 	<ul style="list-style-type: none"> • <i>Increased water consumption across Europe due to excessive development</i> • <i>Expressed climate change and water scarcity problems</i> • <i>Lack of regulations and policies on green infrastructure on the European level</i> • <i>Increased population and density in urban areas</i>



2.2. PESTLE Analysis Assessing the Necessity of Adopting Water Conservation Policies, Laws and Regulations

The second conducted analysis is PESTLE which represents a framework for the analysis of key impact factors (Political, Economic, Sociological, Technological, Legal and Environmental). This analysis gives insight into the external factors impacting the issues at hand.

POLITICAL ISSUES	ECONOMIC ISSUES
<ul style="list-style-type: none"> • <i>The awareness of national authorities on water reuse and recycling (water management issues)</i> • <i>The level of administrative obstacles associated with water management systems (spatial limitations, longevity of the approval processes)</i> • <i>The promotion of sustainable water economy by the national/regional/local government</i> • <i>The scope of relevant strategic documents regarding water conservation, rainwater collection, water reuse on a national level</i> 	<ul style="list-style-type: none"> • <i>Low level of recognition of benefits associated with the application of drainage infrastructure facilities</i> • <i>High investment costs of the water reuse management and discharge systems</i> • <i>High investment costs of implementation of green roof systems and adaptation of existing wastewater infrastructure to higher levels of purification treatment</i> • <i>Low level of rainwater and stormwater collection and drainage system implementation</i>
SOCIAL ISSUES	TECHNOLOGICAL ISSUES
<ul style="list-style-type: none"> • <i>The willingness to cooperate between different groups of stakeholders in the decision-making process associated with water management</i> • <i>The level of social awareness concerning water conservation and reuse</i> • <i>Residents' safety level regarding water and wastewater quality and infrastructure safety levels.</i> • <i>The level of social losses due to inappropriate water management</i> • <i>The susceptibility of the society to use innovative water management solutions</i> 	<ul style="list-style-type: none"> • <i>Efficacy of the transfer of innovative solutions from research to the industry</i> • <i>Ensuring enough capacity in the water reuse management systems</i> • <i>The reliability of water reuse and recycling infrastructure and the required maintenance frequency</i> • <i>The level of experience in the operation of water reuse and recycling systems</i> • <i>The level of wastewater purification of current wastewater treatment plants</i>
LEGAL ISSUES	ENVIRONMENTAL ISSUES
<ul style="list-style-type: none"> • <i>The scope of regulations concerning water reuse, rainwater, and stormwater collection</i> • <i>The scope of regulations regarding green roof infrastructure</i> • <i>The range of requirements in applicable spatial planning and construction plans</i> • <i>The scope of requirements in the field of drainage infrastructure</i> 	<ul style="list-style-type: none"> • <i>The level of the legal protection of the environment and natural resources</i> • <i>The level of capacity of drainage systems to supply underground water resources and an increase of biodiversity in urban areas</i> • <i>The scale of how water and wastewater infrastructure impact the environment</i> • <i>The quality of the water and wastewater of the receiving drained area</i>



3. Policy Recommendations

The policy recommendations are based on the previous mapping process and the conducted analyses (SWOT and PESTLE). They are presented in a standard format and as focused and as brief as possible so that readers spend the minimum time required to obtain the needed information. Each recommendation is based on an identified issue and is followed by a brief explanation.

<i>Issue: Inexistent regulatory framework on water reuse, rainwater/stormwater collection, and reuse</i>
<i>Recommendation: Adoption of EU Regulation on minimum requirements on water reuse and creation of national legal framework on water reuse and rainwater/stormwater collection reuse</i>
<i>Rationale: EU Regulation has to be adopted by 2023 by all Member States. Moreover, the development of national regulations and standards regarding water reuse and rainwater collection will enable water reuse for irrigation and industrial purposes that will reduce overall water consumption. Thus, it will reduce water costs and positively impact the preservation of current water resources.</i>

<i>Issue: Inexistent national strategy for water conservation</i>
<i>Recommendation: Development of a National Water Conservation Strategy</i>
<i>Rationale: The protection of water and the aquatic environment as well as the protection against adverse effects of water, is partially regulated by different acts and strategic documents. However, there is no single document/strategy that governs water conservation on a national level. The creation of such a strategy will contribute to the harmonization of water protection throughout the country as well as to the change of water charges adapted to individual service areas.</i>

<i>Issue: Low level of citizens/households connected to the sewage system</i>
<i>Recommendation: Further implementation of the Multi-annual program for the construction of municipal water structures</i>
<i>Rationale: Only 54.6% of citizens are connected to the sewage system, and areas such as islands often do not have a built sewage system, instead the wastewater is collected in septic tanks or discharged directly into the sea. Further implementation of the Multi-annual program for the construction of municipal water structures will contribute to increasing the amount of treated wastewater, as well as increasing the potential amount of water for reuse and ultimately environmental protection.</i>



<i>Issue: High losses in the water supply network</i>
<i>Recommendation: Further implementation of the Multi-annual program for the construction of municipal water structures</i>
<i>Rationale: As stated by the European Commission Country reports, the water supply and sewage system leakages are over 40%. That incurs significant water and financial losses. Further implementation of the Multi-Annual Program for the Construction of Municipal Waterworks will reduce operating costs due to new pipelines, thus contributing to water conservation.</i>

<i>Issue: Inexistent specific regulation on green roofs infrastructure</i>
<i>Recommendation: Development of a national and strategic framework on green roofs</i>
<i>Rationale: Urban areas are highly affected by the growing population, over-construction, reduction of green areas and increasing noise pollution. This causes buildings to heat up faster during the summer season, increases energy consumption, reduced biodiversity, etc. Green roofs, on the other hand, can help mitigate the problems that cities create by bringing natural cooling, water treatment, and air filtration properties that vegetated landscapes provide to the urban environment. Architects and planners can use green roofs to help solve environmental problems by bringing nature back to the city. The nationwide and strategic framework on green roofs in form of regulations, standards and measures will facilitate and boost green roof implementation and development.</i>

<i>Issue: Eco-innovation index lower than EU average</i>
<i>Recommendation: To increase the level of incentives and subsidies for eco-innovations (water management, eco-labelling, waste management, etc.)</i>
<i>Rationale: Even though there are several projects regarding eco-innovations in different areas, the Croatian eco-innovation index is far below the European average. To make the transition to a circular economy easier, an increase in innovations in each area such as water reuse, eco-labelling, waste management, and renewables is needed. Such a boost can be achieved by promoting and increasing the level of incentives and subsidies for eco-innovation and green public procurement enacted by the public authorities.</i>



<p><i>Issue: Lack of citizen awareness on benefits of water and wastewater reuse and green roofs</i></p>
<p><i>Recommendation: Introduction of advisory and information services for companies and the general public, start-ups, customers, professional training, qualifications and skills courses</i></p>
<p><i>Rationale: There is a lack of awareness of citizens and companies/entrepreneurs about the benefits of reusing water and wastewater and green roofs. Water/wastewater can be reused for industrial purposes, irrigation or flushing toilets. Sludge from wastewater treatment can be used for agricultural purposes. The use of a green roof reduces the heating of buildings and increases air filtration. All the benefits lead to a reduction in energy and water consumption which ultimately reduces costs. The introduction of these benefits in the form of advisory and information services for companies and the general public, start-ups, customers, vocational training, qualification and skills courses could lead to increased awareness, and thus a higher level of adoption of water/wastewater reuse practices and implementation of green roofs.</i></p>



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