



REPUBLIC OF CROATIA  
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## Performance Audit Report

# Improvement of water quality and the availability of water for human consumption in the Republic of Croatia



This version of the Report on the Improvement of water quality and the availability of water for human consumption in the Republic of Croatia is a translation from the original, which was prepared in the Croatian language. All possible care has been taken to ensure that the translation is an accurate representation of the original. However, in all matters of interpretation of information, views or opinions, the original language version of Auditors' report takes precedence over translation.

## CONTENT

page

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INTRODUCTION	2
AUDIT SUBJECT, AUDITEES AND AUDIT OBJECTIVES	3
AUDIT METHODS	3
AUDIT CRITERIA	4
IMPROVEMENT OF WATER QUALITY AND THE AVAILABILITY OF WATER FOR HUMAN CONSUMPTION IN THE REPUBLIC OF CROATIA	6
Legislative and institutional framework	6
Implementation and financing of public water supply, drainage and wastewater treatment projects	20
Realization of activities, goals and planned indicators and monitoring of goal achievement	29
ASSESSMENT OF THE EFFECTIVENESS OF IMPROVING WATER QUALITY AND THE AVAILABILITY OF WATER FOR HUMAN CONSUMPTION	75
STATEMENT OF THE MINISTRY AND CROATIAN WATERS	81

## PERFORMANCE AUDIT REPORT

### IMPROVEMENT OF WATER QUALITY AND THE AVAILABILITY OF WATER FOR HUMAN CONSUMPTION IN THE REPUBLIC OF CROATIA

Based on the provisions of Articles 19 and 21 of the Law on the State Audit Office (Official Gazette 25/19), an audit of the effectiveness in improving water quality and the availability of water for human consumption was carried out in the Ministry of Economy and Sustainable Development (hereinafter: Ministry) and in the legal entity for water management Croatian Waters (hereinafter: Croatian Waters).

The audit was performed in the manner and according to the procedures established by the Framework of Professional Principles, Standards and Guidelines of the International Organization of Supreme Audit Institutions (INTOSAI) (Official Gazette 17/20) and the Code of Professional Ethics of State Auditors.

Audit procedures were carried out from February 20, 2023 to February 20, 2024.

## INTRODUCTION

The Republic of Croatia, as a member of the United Nations (hereinafter: UN) and as a member of the European Union (hereinafter: EU), has undertaken the obligation to implement and achieve the goals of the 2030 Agenda for Sustainable Development. It has undertaken the obligation to ensure the implementation of 17 global sustainable development goals, to incorporate them into strategic planning documents at the national, regional and local levels, and to contribute to the achievement of sustainable development goals at the global level.

The International Organization of Supreme Audit Institutions (INTOSAI) has defined promoting the achievement of global sustainable development goals as one of its strategic goals. For this purpose, it encourages the implementation of internationally coordinated audits by supreme audit institutions, which evaluate the implementation of sustainable development goals.

During 2023, the State Audit Office of the Republic of Croatia, in cooperation with the Supreme Audit Institutions of Hungary, Poland, Serbia and Ukraine, performed an international coordinated audit of the achievement of the global sustainable UN Goal 6: Ensure availability, sustainable management of water and sanitation for all. Within the framework of Goal 6, as an area of common interest in which it is necessary to perform a performance audit, the implementation and achievement of two UN sub-goals have been determined: 6.1. Safe and affordable drinking water and 6.3. Improvement of water quality.

Activities related to the implementation and achievement of the two sub-goals of global sustainable development goals are the responsibility of the Ministry and Croatian Waters, which implement them through the program of development and improvement of public water supply, public drainage and municipal wastewater treatment in the territory of the Republic of Croatia. The implementation of a comprehensive reform of the water services sector is foreseen, while the planned investments in the water utility sector will contribute to the preservation of water resources, and at the same time ensure the availability of water for human consumption to all citizens, reducing pollution of the environment and water resources by wastewater, and reducing losses in water supply systems. The aforementioned would reduce the pressure on water bodies and contribute to long-term sustainable water management and the achievement of water protection goals (environmental goals), revitalization and protection of natural resources. The total estimated value of investments in the development of water utility infrastructure from 2021 to 2030 is about HRK 52.8 billion, or EUR 6.9 billion.

## AUDIT SUBJECT, AUDITEES AND AUDIT OBJECTIVES

The **audit subject** of the performance audit was the implementation of activities and the achievement of the objectives of the Ministry and Croatian Waters regarding the improvement of water quality and the availability of water for human consumption in the Republic of Croatia, i.e. by implementing activities for the purpose of achieving UN sub-goal 6.3. Improvement of water quality and UN sub-goal 6.1. Safe and affordable drinking water (availability of water).

**Auditees** of the performance audit of the implementation of activities and the achievement of goals are related to the improvement of water quality and the availability of water for human consumption, that is by implementing activities for the purpose of achieving UN sub-goals 6.3. and 6.1., were the Ministry and Croatian Waters. The Ministry is responsible for the water economy, is the holder of the water policy and is responsible for the implementation of the reform of the water utility sector. The implementing body at the national level is Croatian Waters, which is a body responsible for the implementation of water utility projects. Water utility projects in cooperation with the Ministry and Croatian Waters are carried out by public suppliers of water services, that perform the activity of public water supply and wastewater drainage, whose founders are local government units.

The **main audit objective** was to assess the effectiveness of the implementation of activities and the achievement of the objectives of the Ministry and Croatian Waters in connection with the improvement of water quality and the availability of water for human consumption, that is, the implementation of activities for the purpose of assessing the effectiveness of the achievement of UN sub-goal 6.3. and UN sub-goal 6.1. in the part related to the availability of water for human consumption, for which the Ministry is responsible.

The **specific audit objectives** were:

- verify the establishment of the legislative and institutional framework related to the improvement of water quality and the availability of water for human consumption
- evaluate the implementation and financing of public water supply, drainage and wastewater treatment projects in connection with improving the quality and the availability of water for human consumption
- evaluate the achievement of activities, goals and planned indicators related to the improvement of water quality and the availability of water for human consumption and whether the achievement of goals is being monitored.

## AUDIT METHODS

In accordance with the auditing standards of the International Organization of Supreme Audit Institutions (INTOSAI), the audit was planned and performed in a way that provides the necessary audit evidence and provides a reasonable basis for audit findings and conclusions and the achievement of audit objectives.

In the implementation of the audit, the following methods of data collection and analysis were used in connection with the improvement of water quality and the availability of water for human consumption:

- analysis of the legal, strategic and planning framework
- analysis of reports on the implementation of goals, measures and activities
- insight into published reports and analysis of published data

- analysis of the documentation of audit subjects in order to verify the achievement of set goals and the implementation of activities
- insight into databases and analysis of data
- meetings / interviews / electronic correspondence with representatives of auditees
- comparison of data at the level of EU member states and UN members.

## AUDIT CRITERIA

To evaluate the effectiveness of the implementation of activities and the achievement of goals in connection with the improvement of water quality and the availability of water for human consumption, i.e. by implementing activities for the purpose of achieving UN sub-goals 6.3. and 6.1., the audit criteria derived from the law and other regulations and the undertaken activities of the Ministry and Croatian Waters.

The audit criteria for assessing effectiveness were determined according to the **audit areas**: legislative and institutional framework, implementation and financing of public water supply, drainage and wastewater treatment projects, and the achievement of goals related to the improvement of water quality and the availability of water for human consumption.

The backbone of the audit was the **main question** and **three sub-questions** related to the audit subject.

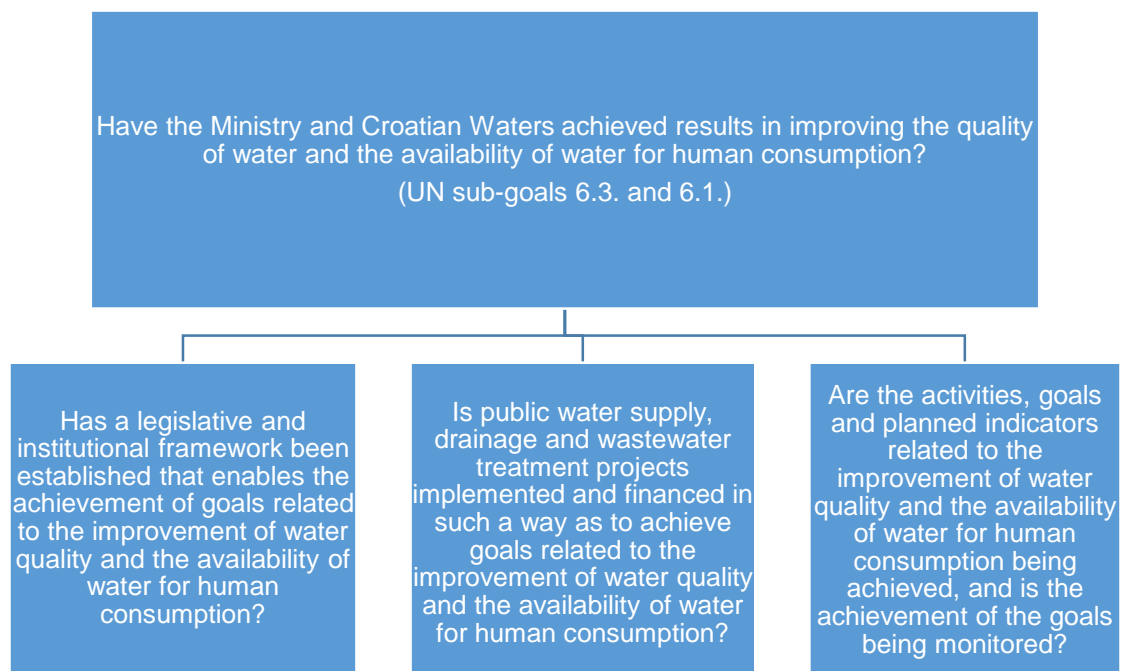


Table number 1 gives the criteria for assessing the effectiveness of the implementation of activities and the achievement of goals related to the improvement of water quality and the availability of water for human consumption, i.e. by implementing activities for the purpose of achieving UN sub-goals 6.3. and 6.1., according to the audit areas.

Table number 1

Audit criteria for assessing effectiveness,  
according to audit areas

Ordinal number	Audit areas	Audit criteria
	1	2
1.	Legislative and institutional framework	<ul style="list-style-type: none"> <li>○ the necessary regulations, strategic acts and planning documents were adopted to improve the quality of water and the availability of water for human consumption</li> <li>○ the legal framework related to improving the quality and availability of water for human consumption is aligned with EU directives</li> <li>○ the goals and activities for the improvement of water quality and the availability of water for human consumption, the actors of the implementation of the activities and the sources of financing have been determined</li> <li>○ deadlines, target values and other indicators of the achievement of the goals were determined</li> <li>○ the goals for improving water quality and the availability of water for human consumption are aligned with the sustainable development goals of the UN</li> <li>○ certain bodies are responsible for the effective implementation of activities</li> <li>○ a sufficient number of people are employed in jobs related to the implementation of activities to improve the quality of water and the availability of water for human consumption</li> <li>○ coordinated action of the bearers of individual activities is ensured</li> <li>○ problems in the water supply, drainage and wastewater treatment system have been identified, and solutions to improve the system are continuously being developed</li> </ul>
2.	Implementation and financing of projects public water supply, drainage and wastewater treatment	<ul style="list-style-type: none"> <li>○ public water supply, drainage and wastewater treatment projects are being implemented</li> <li>○ projects are implemented in such a way as to achieve the goals related to the improvement of water quality and the availability of water for human consumption</li> <li>○ financial resources for the implementation of projects were planned and spent</li> <li>○ financing options from EU funds are used</li> <li>○ public tenders were held for the purpose of implementing projects</li> <li>○ activities and procedures for the implementation of projects are prescribed in detail</li> <li>○ the implementation of projects is monitored</li> </ul>
3.	Realization of activities, goals and planned indicators and monitoring of goal achievement	<ul style="list-style-type: none"> <li>○ activities and goals related to the improvement of water quality and the availability of water for human consumption are being achieved</li> <li>○ activities are carried out within the planned period and target values</li> <li>○ the indicators of achieving the goals have been determined and are measurable and evaluated</li> <li>○ the indicators used are in accordance with the UN indicators recommended for measuring the implementation of the given goal</li> <li>○ the achievement of goals, that is, the overall results and effects of the implementation of activities, is monitored, according to established indicators</li> <li>○ the results of the implementation of goals and implemented activities are analyzed</li> <li>○ UN decisions and guidelines are applied to calculate the achievement of goals</li> <li>○ the method of reporting on the activities carried out and the achievement of goals related to the improvement of water quality and the availability of water for human consumption has been determined</li> <li>○ reports on the achievement of goals and implemented activities are drawn up</li> <li>○ the competent authorities publish reports and other relevant data on the activities and projects carried out on their websites</li> </ul>

Implementation of activities and achievement of goals related to improvement of water quality and the availability of water for human consumption, i.e. implementation of activities for the purpose of assessing the effectiveness of the achievement of UN sub-goals 6.3. and 6.1., in the Ministry and Croatian Waters, it is considered **effective** if a legislative and institutional framework is established that enables the achievement of goals related to the improvement of water quality and the availability of water for human consumption, and projects of public water supply, drainage and wastewater treatment are implemented and financed in such a way that goals related to the improvement of water quality and availability of water for human consumption are achieved and activities, goals and planned indicators related to the improvement of water quality and availability of water for human consumption are realized and the achievement of goals is monitored.

Implementation of activities and achievement of goals related to improvement of water quality and the availability of water for human consumption, i.e. implementation of activities for the purpose of assessing the effectiveness of the achievement of UN sub-goals 6.3. and 6.1., is evaluated as **effective, with improvements needed**, if certain weaknesses and omissions are identified that do not significantly affect the implementation of activities and the achievement of goals.

Implementation of activities and achievement of goals related to improvement of water quality and the availability of water for human consumption, i.e. implementation of activities for the purpose of assessing the effectiveness of the achievement of UN sub-goals 6.3. and 6.1., is assessed as **partially effective**, if certain irregularities and omissions have been determined in connection with the implementation of activities and the achievement of goals and significant improvements are needed.

Implementation of activities and achievement of goals related to improvement of water quality and the availability of water for human consumption, i.e. implementation of activities for the purpose of assessing the effectiveness of the achievement of UN sub-goals 6.3. and 6.1., is considered **ineffective**, if irregularities and omissions are found that significantly affect the implementation of activities and the achievement of goals and more significant improvements are needed.

## **IMPROVEMENT OF WATER QUALITY AND THE AVAILABILITY OF WATER FOR HUMAN CONSUMPTION IN THE REPUBLIC OF CROATIA**

### **Legislative and institutional framework**

#### **– Legislative framework**

The legislative framework governing water management in the territory of the Republic of Croatia includes numerous national regulations, international treaties and EU acts, as well as strategic and planning documents.

Table number 2 provides an overview of basic regulations and strategic and planning documents which regulate the implementation of activities and the achievement of goals related to the improvement of water quality and the availability of water for human consumption in the Republic of Croatia.



Table number 2

Basic regulations and strategic and planning documents that govern the implementation of activities and the achievement of goals related to the improvement of water quality and availability of water for human consumption

Basic regulations	Basic strategic and planning documents
<p><b>Law on Water</b> (Official Gazette 66/19, 84/21 and 47/23)</p> <ul style="list-style-type: none"> <li>the legal status of water, water assets and water structures, management of water quality and quantity, protection against the harmful effects of water, detailed melioration drainage and irrigation, special activities for the needs of water management, institutional organization of activities, etc. are regulated</li> </ul> <p><b>Law on Financing of Water Management</b> (Official Gazette 153/09, 90/11, 56/13, 154/14, 119/15, 120/16, 127/17 and 66/19)</p> <ul style="list-style-type: none"> <li>the sources of funds for the financing of the water management are determined, especially water fees, obligation to pay, obligee, basis, method of calculation, determination of the amount, purpose of spending funds, execution, statute of limitations, etc., are determined</li> </ul> <p><b>Law on Water Services</b> (Official Gazette 66/19)</p> <ul style="list-style-type: none"> <li>the institutional framework for the provision of water services, the price of water services, the legal position and sustainable operations of water service providers, the work of the Council for Water Services, etc. are regulated</li> </ul> <p><b>Law on Water for Human Consumption</b> (Official Gazette 56/13, 64/15, 104/17, 115/18 and 16/20) which was in force until March 16, 2023, and the Law on Water for Human Consumption (Official Gazette 30/23) which is in force since March 16, 2023</p> <ul style="list-style-type: none"> <li>regulates the healthiness of water, the competent authorities and the method of reporting, the obligations of legal entities that supply water, the manner of handling and reporting in case of deviations from the parameters for checking the conformity of water, monitoring and other controls of the healthiness of water and their financing, etc.</li> </ul> <p><b>EU directives</b></p> <ul style="list-style-type: none"> <li>Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (OJ L 327, 22 December 2000) (hereinafter: Water Framework Directive)</li> <li>Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment (OJ L 135, 30 May 1991) (hereinafter: Urban Waste Water Treatment Directive)</li> </ul>	<p><b>Water Management Strategy</b> (Official Gazette 91/08)</p> <ul style="list-style-type: none"> <li>the vision, mission, goals and tasks of the state policy in water management in the long-term period are determined</li> </ul> <p><b>National Development Strategy of the Republic of Croatia until 2030</b> (Official Gazette 13/21) (hereinafter: National Development Strategy)</p> <ul style="list-style-type: none"> <li>within the framework of the protection of natural resources and the fight against climate change, focuses on the improvement of the system of public water supply, drainage and treatment of municipal wastewater and the efficient reorganization of the water services sector</li> </ul> <p><b>River Basin Management Plan 2016-2021</b> (Official Gazette 66/16) and <b>River Basin Management Plan until 2027</b> (Official Gazette 84/23)</p> <ul style="list-style-type: none"> <li>the Water Framework Directive is being implemented, which establishes rules for preventing the deterioration of the state of EU water bodies and achieving a good state of rivers, lakes and groundwater</li> </ul> <p><b>Decision on the Adoption of the Multi-Year Program for the Construction of Municipal Water Structures for the Period Until 2030</b> (Official Gazette 147/21) (hereinafter: Multi-Year Construction Program)</p> <ul style="list-style-type: none"> <li>determines construction projects of water utility structures, method and period of implementation, participants, investment amounts, sources of financing, order of priority in implementation, etc.</li> </ul> <p><b>National Recovery and Resilience Plan 2021-2026</b> (hereinafter: NRRP)</p> <ul style="list-style-type: none"> <li>includes water-related reforms and investments within the Economy component, objective C1.3. Improvement of water management and waste management, measure C1.3.R1 Implementation of the water management program</li> </ul>

<ul style="list-style-type: none"> <li>✚ Directive (EU) 2020/2184 of the European Parliament and of the Council of 16 December 2020 on the quality of water intended for human consumption (amendment) (Text with EEA relevance) (OJ L 435, 23 December 2020) (hereinafter: Directive on the quality of water intended for human consumption)</li> <li>✚ Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration (OJ L 372, 27 December 2006)</li> </ul>	
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In September 2015, at the session of the UN General Assembly, 193 member countries adopted the Resolution ***Transforming our world: The 2030 Agenda for Sustainable Development*** (hereinafter: Agenda 2030). With the 2030 Agenda, members committed to eradicating poverty, achieving a sustainable world by 2030 and beyond, with the well-being of people and a healthy planet at its core. The main backbone is represented by 17 global goals of sustainable development elaborated in detail in 169 interrelated sub-goals intended for universal application in all countries. By assuming the political obligation to implement the 2030 Agenda, the Republic of Croatia is obliged to contribute as soon as possible to the easier adoption of the global goals of sustainable development and to incorporate them into national strategies, sectoral strategies, national programs, action plans and, through international cooperation, to contribute to the achievement of the goals of sustainable development at the global level.

After the adoption of the Agenda 2030, in 2016 the European Commission created a communication document called ***Future steps for a sustainable European future - European action for sustainability***<sup>1</sup>, which set the EU framework for achieving the goals of sustainable development and implementing the Agenda 2030. According to the aforementioned document, the vision of the 2030 Agenda is fully aligned with the objectives of the EU's external action. Given the horizontal nature of the 2030 Agenda, its implementation requires an intersectoral approach by the EU and member states. In January 2019 the European Commission published a document entitled ***Towards a sustainable Europe by 2030***<sup>2</sup>, in which it referred to three scenarios to encourage discussion on the implementation of sustainable development goals. The European Green Plan adopted in December 2019 is an integral part of the European Commission's strategy for the implementation of the Agenda 2030 and sustainable development goals.

***The National Development Strategy*** was adopted in February 2021 and is the highest national act of strategic planning that defines priorities for the long-term sustainable development of the country. According to the above-mentioned Strategy, investments in the modernization and expansion of the water supply network, public drainage system and municipal wastewater treatment devices will increase. Permanent investments will be made in programs to reduce water losses from water supply systems.

Contribution to the goal of sustainable development from Agenda 2030, **Goal 6: Clean water and sanitation** (full name Goal 6: Ensure availability, sustainable management of water and sanitation for all), is achieved through three development directions: Strengthening resistance to crises, Green and digital transition and Balanced regional development.

<sup>1</sup><https://eur-lex.europa.eu/legal-content/HR/TXT/PDF/?uri=CELEX:52016DC0739&from=HR>

<sup>2</sup><https://eur-lex.europa.eu/legal-content/HR/TXT/HTML/?uri=CELEX:52019DC0022&from=HR>

Figure 1 shows the connection between the strategic framework of the National Development Strategy and the UN Sustainable Development Goals from the 2030 Agenda<sup>3</sup>.

Picture number 1

Connection of the strategic framework of the National Development Strategy and the UN Sustainable Development Goals



In 2019, the Government of the Republic of Croatia prepared a document called *the Voluntary National Review on the Implementation of the Goals of the UN Sustainable Development Program until 2030*.<sup>4</sup> According to the aforementioned Review, in the last 15 years, with an average of 27,333 m<sup>3</sup> of water per inhabitant per year, the Republic of Croatia has the largest the amount of freshwater resources in the EU (Eurostat data). The Republic of Croatia is at the very top in Europe in terms of quality water supplies per year of population, right behind Finland and Sweden. The total water wealth of the Republic of Croatia amounts to 111.66 billion x 10<sup>9</sup> m<sup>3</sup>/ year, or 26.059 x 10<sup>9</sup> m<sup>3</sup>/year per inhabitant. The distribution of water quantities is not favorable and there is a distinct spatial and temporal unevenness in the distribution of water wealth. Access to water for drinking and sanitary needs is provided to the majority of citizens, and more than 94.0 % of the population uses water that is safe for health, and the infrastructure and access to a proper and well-maintained drainage system are constantly improving. The social price of water service for socially vulnerable citizens is permanently ensured in such a way that the price of water service does not exceed 60.0 % of the full price of water service paid by other citizens, including water supply, drainage and wastewater treatment. In June 2023, the National Council for Sustainable Development adopted the second Voluntary National Review on the implementation of the UN Sustainable Development Program 2030<sup>5</sup>, which the Government of the Republic of Croatia sent to the Secretariat of the UN Economic and Social Council.

In February 2020, the European Commission prepared a Commission staff working document, *Country Report Croatia 2020*, accompanying the document Communication from the Commission to the European Parliament, the European Council, the Council, the European Central Bank and the Eurogroup – 2020 European Semester: Assessment of progress on structural reforms, prevention and correction of macroeconomic imbalances, and results of in-depth reviews under Regulation (EU) No 1176/2011<sup>6</sup>.

<sup>3</sup>[https://narodne-novine.nn.hr/clanci/sluzbeni/2021\\_02\\_13\\_230.html](https://narodne-novine.nn.hr/clanci/sluzbeni/2021_02_13_230.html)

<sup>4</sup><https://vlada.gov.hr/UserDocsImages/2016/Sjednice/2019/Srpanj/164%20sjednica%20VRH/UN%20Final/UN%20-%20zadnja%20-%20hrvatska%20verzija.pdf>

<sup>5</sup><https://vlada.gov.hr/UserDocsImages/2016/Sjednice/2019/Srpanj/164%20sjednica%20VRH/UN%20Final/UN%20-%20zadnja%20-%20hrvatska%20verzija.pdf>

<sup>6</sup><https://op.europa.eu/hr/publication-detail/-/publication/2868b45e-5944-11ea-8b81-01aa75ed71a1>

According to the mentioned document, drainage systems are insufficiently developed. Only 54.6 % of the population is connected to the public drainage system, and 86.0 % to the public water supply system, which has water losses of about 44.0%, which is almost double the EU average of 23.0 %. A large part of collected wastewater is discharged without proper treatment. Drinking water in some areas is still not of satisfactory quality. It is stated that the water sector lags significantly behind EU standards, and it is estimated that there is a lack of investments worth HRK 28 billion, i.e. almost 7.0 % of the GDP of the Republic of Croatia in 2019. Almost one quarter of the funds refer to investments in public water supply, and more than three quarters to the public drainage and wastewater treatment system.

During 2021, an instrument with financial resources called **Next Generation EU** was established at the EU level, which should ensure accelerated economic recovery and digital and green transformation for the sake of sustainable development and greater resilience of society and the economy to future crises for the member states. Within the framework of the mentioned instrument, **the Mechanism for Recovery and Resilience** (hereinafter: MRR) was introduced, from which the member states, through their own national plans for recovery and resilience, were enabled to use grants and loans to finance reforms and investments.

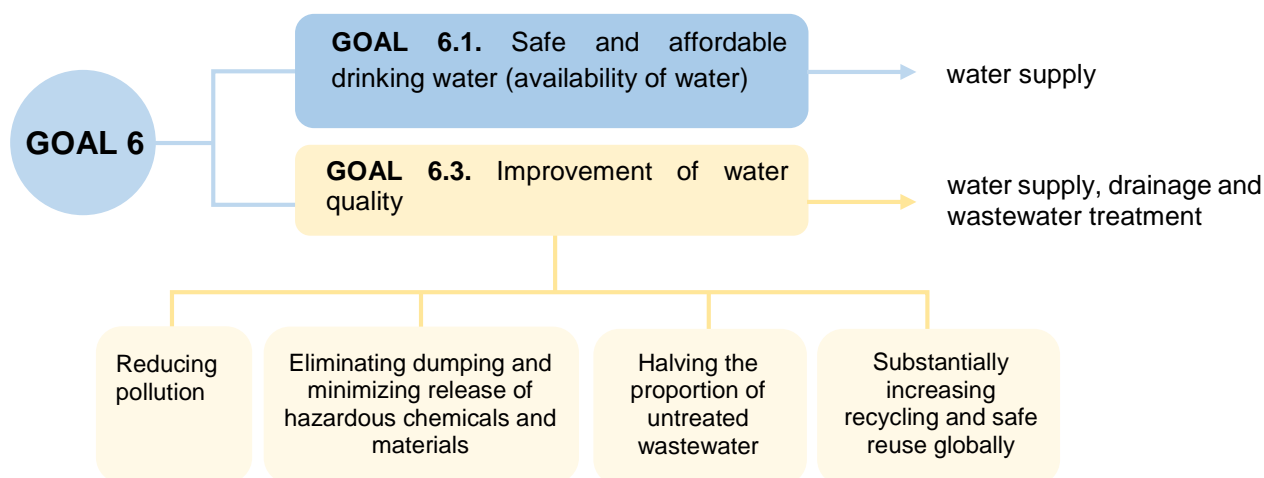
As one of the acts of strategic planning, which supports the implementation of the National Development Strategy, the Government of the Republic of Croatia adopted **NRRP**, in which reforms and investments related to water are included in the Economy component, objective **C1.3. Improvement of water management and waste management**, measure **C1.3. R1 Implementation of the Water management program**. The Ministry is responsible for the implementation of the water management program. The target group is public suppliers of water services, consumers, the population and Croatian Waters. The estimated investment cost is HRK 5,250,116,802.00 and the implementation period is from February 2020 to June 2026. According to NRRP, the improvement of water management will be achieved through the implementation of **three key water management programs**:

- **Public water supply development program** aimed at ensuring access to safe and affordable water for human consumption
- **Public wastewater drainage development program** with the aim of improving water quality by reducing pollution and reducing the proportion of untreated wastewater and
- **Disaster risk reduction program** in the water management sector.

According to NRRP, the investments foreseen through three programs will contribute to the preservation of water resources with the aim of achieving greater resistance to climate change, while at the same time ensuring the availability of water for human consumption to all citizens, especially for vulnerable and marginalized groups, as well as in demographically endangered areas, reducing pollution of the environment and water resources by wastewater and the reduction of losses in water supply systems, which will reduce the pressure on water bodies and contribute to long-term sustainable water management, as well as reducing the risk of floods, i.e. contribute to the achievement of water protection goals (environmental goals), revitalization and protection of natural resources.

The goals and measures from the NRRP implemented within the Public water supply development program and the Public wastewater development program are directly related to the implementation of UN sub-goals 6.3. and 6.1. and are covered by this audit, which is shown in graphic representation number 1.

## Graphic representation number 1

Connection of the Water management program from NRRP  
with UN sub-goals 6.3. and 6.1.

According to the NRRP, in order to strengthen the implementation capabilities and investment capacity as well as the financial and technical self-sustainability of public suppliers, a complete reform was initiated, which implies a mutually harmonized process of adopting the legislative framework and implementing investments combined in two programs. The Law on Water Services represents the first step in the implementation of a comprehensive reform of the water utility sector, which is fragmented, inefficient and without a thorough restructuring cannot meet the requirements set by assuming obligations from EU directives. It is necessary to strengthen the implementation capabilities and investment capacity and to ensure the financial and technical self-sustainability of public water service providers in order to successfully implement demanding investments, and that the price of water, even after the implementation of the investments, is socially affordable for all consumers. Implementation capabilities and investment capacity depends on the personnel, technical and financial capacity of the public supplier. The integration (merging) of existing public suppliers in the service area will improve the personnel structure (unite the personnel capacities of small and large suppliers and strengthen them numerically and in terms of knowledge and experience), technical potential (unify equipment, machines, etc.) and investment capacity (to merge smaller distribution areas into one large service area, which would ultimately significantly increase revenues from water services, development fees, accumulate funds for the implementation of projects that public suppliers receive from EU funds and national sources) and rationalize operations.

The provisions of the Law on Water prescribe planning documents for water management: Water Management Strategy, River Basin Management Plan, multi-year construction programs, financial plan of Croatian Waters, Water Management Plan and detailed plans regulated by the said Act. According to the **Water Management Strategy**, adopted by the Croatian Parliament in July 2008, for the efficient performance of public water supply, drainage and wastewater treatment services, the organization of these activities is of crucial importance. The strategic determinants are listed: increasing the degree of connection of the population to public water supply systems (increase to 85.0-90.0 %); in the improvement of the management of public water supply systems by determining the distribution areas as a technological-economic unit (establish a utility company in each, prescribe a single water price and carry out reorganization and consolidation) and by connecting water supply systems.

Also, listed are: introducing an economic price for water in compliance with the "consumer pays" principle, which will affect the rationalization of consumption; with the reduction of water losses to acceptable values (15.0 - 20.0 %) following the example of developed European countries, and with meeting the needs for water and increasing the security of water intake for public water supply.

The ***River Basin Management Plan 2016-2021*** was adopted by the Government of the Republic of Croatia in July 2016, while at the time of the audit (June 28, 2023), ***the River Basin Management Plan until 2027*** was adopted. At the end of December 2021, the Government of the Republic of Croatia adopted and the ***Multi-Year Construction Program***, prepared by Croatian Waters, and published in the Official Gazette and on the websites of the Ministry and Croatian Waters. The Multi-Year Construction Program was adopted in accordance with the Water Management Strategy and the River Basin Management Plan. The Multi-Year Construction Program<sup>7</sup> supports **four development directions of the water utility sector**:

1. Sustainable economy and society - along with the implementation of the reform of the water utility sector, investing in infrastructure development and improving the operations of public water service providers will greatly contribute to improving the sustainability of this part of the public sector

2. Strengthening resistance to crises - by investing in the development of water utility infrastructure, establishing higher standards for the performance of water utility services, the level of security is increased, and thus the population's resistance to crisis situations

3. Green and digital transition - by investing in the development of water utility infrastructure, especially in the part related to the reduction of losses in public water supply systems and the reduction of pollution by municipal wastewater, a significant contribution is made to the protection and preservation of natural resources as a basic step in the green transition

4. Balanced regional development - investment in water utility infrastructure contributes to the development and establishment of a unique higher standard of performance of water supply and drainage services in an environmentally acceptable manner in the territory of the Republic of Croatia, which creates an appropriate foundation for balanced regional development.

The Multi-Year Construction Program covers the period up to 2030, and includes projects and deadlines for the implementation of activities in accordance with the conclusions of the meeting with the European Commission held on November 5 and 6, 2019 (Overview of activities in the field of the state of the environment, cohesion policy and compliance). The starting points for creating the Multi-Year Construction Program are that the new legislative framework should help achieve the deadlines for the implementation of EU directives and that the Law on Water Services created legal prerequisites for the establishment of new service areas and the implementation of the integration of public suppliers in service areas. The result of the complete reform will be a technically, technologically and economically sustainable system, which will be ready for the increased scope of operations and the achievement of the level of quality of water services resulting from EU directives. The Law on Water Services regulates in more detail the obligation to connect to the built water utility infrastructure and prescribes the obligation for public suppliers to take over the management of all local water supply systems that deliver an average of more than 10 m<sup>3</sup> of water per day or that supply more than 50 people.

<sup>7</sup>[https://mingor.gov.hr/UserDocImages/Uprava\\_vodnoga\\_gospodarstva\\_i\\_zast\\_mora/Planski\\_dokumenti\\_upravljanja\\_vo\\_dama/Visegodisnji%20program%20gradnje%20komunalni%20vodni%20gradjevina%20za%20razdoblje%20do%202030%20godine.pdf](https://mingor.gov.hr/UserDocImages/Uprava_vodnoga_gospodarstva_i_zast_mora/Planski_dokumenti_upravljanja_vo_dama/Visegodisnji%20program%20gradnje%20komunalni%20vodni%20gradjevina%20za%20razdoblje%20do%202030%20godine.pdf)

A delay in achieving compliance with the Urban Waste Water Treatment Directive is foreseen for two to seven years compared to the deadlines set out in the EU Accession Treaty. In October 2022, Croatian waters brought Detailed implementation plan of the Multi-Year Construction Program of water utility structures for the period up to 2030 for the issue of prioritization of drainage and municipal wastewater treatment projects and for the issue of depreciation of water utility infrastructure<sup>8</sup>.

#### – Institutional framework

In *Guidance Note on Facilitating Integration and Coherence for SDG Implementation, Institutional and Coordination Mechanisms, United Nations Development Programme*<sup>9</sup> is stated that the successful implementation of the Agenda 2030 will require a clear institutional framework that will determine coordination and facilitate the implementation and monitoring of the achievement of sustainable development goals.

Ensuring an institutional framework is important for UN member countries in order to successfully integrate the goals into national policies because the lack of an institutional framework, defined roles and responsibilities among bodies and institutions engaged in the implementation of the Agenda 2030 can cause difficulties in implementation. The aforementioned Guidelines also describe the experiences of UN member states, highlight the crucial role of strong institutional and coordination frameworks, and state that many member states have adapted their existing institutional frameworks and expanded them for the implementation of sustainable development goals. Special emphasis is placed on national councils for sustainable development, their activities and the limitations and challenges they face in coordination. It is stated that in order to achieve the goals of sustainable development for most member countries, it will be necessary to establish new, multisector coordination structures and institutions and public officials will be required to develop new competencies and skills for interacting with multiple stakeholders working on the goals of sustainable development.

Croatian Government, adopted the Decision on the system of management and monitoring of the implementation of activities within the framework of the National Recovery and Resilience Plan 2021-2026 (Official Gazette 78/21) in July 2021, which determines the institutions that manage, coordinate and monitor the implementation of activities from the NRRP and other bodies and their functions and responsibilities. For objective C1.3. Improvement of water management, the competent body of the state administration is the Ministry, and Croatian Water is the implementing body.

In addition to the Ministry and Croatian Waters, covered by this audit, certain activities and tasks related to the improvement of water quality and the availability of water for human consumption in the Republic of Croatia, i.e. implementing activities for the purpose of achieving UN sub-goals 6.3. and 6.1., are under the jurisdiction of other bodies, which is shown in table number 3.

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<sup>8</sup><https://voda.hr/sites/default/files/2022-10/DETALJNI%20PROVEDBENI%20PLAN%20VPGKVG%20-%2019.%20LISTOPAD%202022..pdf>

<sup>9</sup>[https://sustainabledevelopment.un.org/content/documents/2478Institutional\\_Coordination\\_Mechanisms\\_GuidanceNote.pdf](https://sustainabledevelopment.un.org/content/documents/2478Institutional_Coordination_Mechanisms_GuidanceNote.pdf)

Table number 3

Competent bodies for the implementation of improvement of water quality activities and the availability of water for human consumption in the Republic of Croatia and their basic tasks

Competent authority	Basic tasks
<p><b>Croatian Government</b></p>	<ul style="list-style-type: none"> <li>• adopts a river basin management plan for a period of six years, after a strategic assessment of the plan's impact on the environment and coordination with other relevant bodies and neighboring countries, which is published in the Official Gazette</li> <li>• adopts a multi-year program for the construction of water utility infrastructure, regulatory and protective water structures and melioration structures created by Croatian Waters, in accordance with the Water Management Strategy and River Basin Management Plan</li> <li>• the regulation on service areas establishes service areas and determines their boundaries, after consultation with local and regional government units and public water service providers</li> <li>• passes a decree on the evaluation of the efficiency of water service providers' operations and a decree prescribing the methodology for determining the price of water services</li> </ul>
<p><b>Ministry of Economy and Sustainable Development</b></p>	<ul style="list-style-type: none"> <li>• holder of water policy in the Republic of Croatia</li> <li>• performs administrative and professional tasks in the field of water protection, use of water for various purposes, activities of public water supply and public wastewater drainage, including the process of restructuring water utility infrastructure</li> <li>• participates in drafting laws and other regulations in the field of water management in the part related to public water supply and drainage and to the determination of water supply areas and agglomerations</li> <li>• carries out administrative supervision over the implementation of the Law on Water, the Law on Water Services and the Law on the Financing of Water Management, as well as the regulations adopted on the basis of the aforementioned laws</li> <li>• monitors the fulfillment of general and special conditions for the performance of water service activities and submits an annual report to the Government of the Republic of Croatia, which coordinates with the Council for Water Services and publishes it on its website</li> <li>• proposes and implements measures for the restructuring and consolidation of public suppliers</li> <li>• monitors and evaluates the economy and efficiency of public water supply and public drainage activities</li> <li>• works on defining the best methodological approach for the assessment and future management of losses and proposes measures to reduce losses in water supply systems</li> <li>• is a Level 1 Intermediary Body in the preparation and implementation of projects co-financed from EU funds and implements NRRP</li> </ul>
<p><b>Ministry of Health</b></p>	<ul style="list-style-type: none"> <li>• competent body for conducting policy in the field of water for human consumption and the implementation of administrative and professional tasks according to the provisions of the Law on Water for Human Consumption and regulations adopted on the basis of the said Law</li> <li>• submits to the European Commission, through Croatian Waters, three-year reports on the results of monitoring the healthiness of water for human consumption</li> <li>• publishes on its website information on permitted deviations, measures taken, deadlines and health risks of water for human consumption, with an emphasis on particularly sensitive populations</li> <li>• issues a decision on the registration of a legal entity in the Register of legal entities performing the activity of public water supply</li> <li>• the register of legal entities is kept in electronic form and is available to sanitary inspectors of the State Inspectorate</li> </ul>



<b>Competent authority</b>	<b>Basic tasks</b>
	<ul style="list-style-type: none"> <li>• in the implementation of the Law on Water for Human Consumption, it cooperates with the ministry responsible for water management, agriculture and construction, and with Croatian Waters</li> </ul>
<b>Croatian Institute for Public Health</b>	<ul style="list-style-type: none"> <li>• collects, systematizes and processes data on the health suitability of drinking water</li> <li>• analyzes the collected data and informs the public about the aforementioned</li> <li>• monitors the healthiness of drinking water together with the appropriate units within the county public health institutes</li> <li>• carries out the education of professional staff for work in public health and other laboratories that deal with testing the healthiness of water</li> <li>• based on the data provided by the Ministry of Health on the monitoring carried out and data on the results of official controls and measures taken, it is obligatory to establish a database in electronic form on the health suitability of water intended for human consumption</li> </ul>
<b>Croatian Waters</b>	<ul style="list-style-type: none"> <li>• implement and coordinate the implementation of state policy in the field of water</li> <li>• prepare draft proposals for the Water Management Strategy, river basin management plan, multi-year construction programs, adopt detailed plans and programs along with river basin management plans</li> <li>• adopt a water management plan on an annual level, which is in accordance with the river basin management plan</li> <li>• prepare a report on the implementation of the river basin management plan, which is submitted to the Croatian Parliament every three years</li> <li>• create a multi-year program for the construction of water utility structures and propose it to the Government of the Republic of Croatia</li> <li>• submit a report to the Government of the Republic of Croatia on the implementation of the multi-year program for the construction of water utility structures</li> <li>• issue a written opinion on the compliance of the construction plan of water utility structures of the public water service provider with the multi-year construction program</li> <li>• perform study and analytical work, work in water management and protection against the harmful effects of water, in melioration drainage, water use, water protection, irrigation, management of public water resources and other work</li> <li>• is a Level 2 Intermediary Body in the preparation and implementation of projects co-financed from EU funds</li> </ul>
<b>State Inspectorate</b>	<ul style="list-style-type: none"> <li>• carries out inspection supervision, i.e. official controls based on the provisions of the Law on Water for Human Consumption and implementing regulations adopted on the basis of the aforementioned Law (sanitary inspection)</li> <li>• carries out inspection supervision over the application of the provisions of the Law on Water, the Law on Water Services and the Law on the Financing of Water Management, as well as the regulations adopted on the basis of the aforementioned regulations (water law inspection)</li> <li>• submits to the Croatian Institute of Public Health the results of official controls and measures taken</li> </ul>
<b>Croatian Bureau of Statistics</b>	<ul style="list-style-type: none"> <li>• monitors and reports on the sustainable development goals from the Agenda 2030</li> <li>• establishes and maintains the Croatian Sustainable Development Goal Indicator Portal, for the coordination of national development activities, production and dissemination of sustainable development indicators of the Republic of Croatia</li> <li>• publishes reports and publications with water-related data</li> </ul>
<b>Local government units</b>	<ul style="list-style-type: none"> <li>• ensure the provision of water services in the service area, together with public water service providers, in accordance with the provisions of the Law on Water Services</li> <li>• through water service providers, ensure the collection and treatment of municipal wastewater, before its direct or indirect discharge</li> <li>• ensure the implementation of a multi-year construction program by co-founding public suppliers of water services, exercising membership and shareholder rights and obligations in public suppliers and in other ways in accordance with the Law on Water Services and other laws</li> </ul>

Competent authority	Basic tasks
<b>Public supplier of water services</b>	<ul style="list-style-type: none"> <li>• performs water service activities in the service area</li> <li>• concludes a contract on the delivery of water services with water services users</li> <li>• adopts the general conditions for the delivery of water services and acts in accordance with them</li> <li>• makes a decision on the price of water services and submits the decision on the price of water services and data on operating costs to the Council for Water Services</li> <li>• implements a multi-year construction program, within the deadlines set by the program</li> <li>• adopts the Plan for the construction of water utility structures aligned with the multi-year construction program and publishes it on its website and keeps it available to the public for the duration of its validity</li> <li>• implements water utility projects</li> <li>• is a beneficiary of grants from European structural and investment funds for water utility infrastructure improvement or construction projects</li> </ul>
<b>Josip Juraj Strossmayer Water Institute</b>	<ul style="list-style-type: none"> <li>• provides scientific and professional support to water management</li> <li>• carries out systematic monitoring of the state of water (monitoring), i.e. supervision of the state of surface waters, including coastal and underground waters, as well as laboratory work for the purposes of monitoring</li> <li>• creates professional bases for the creation of a water management strategy, a river basin management plan, a flood risk management plan and multi-year programs for the construction of water structures</li> <li>• creates scientific, study and analytical materials for the needs of water management and conducts other scientific research in the field of water management</li> </ul>
<b>Water Services Council</b>	<ul style="list-style-type: none"> <li>• ensures legality in the area of determining the price of water services, development fees and other issues from the legally defined scope</li> <li>• maintains a collection of data on benchmarks and performance indicators of water service providers and publishes them, if prescribed</li> <li>• submits a report to the Croatian Parliament on the situation in the water services sector and on its work once a year</li> </ul>

### – Summary of the legislative and institutional framework

The audit determined that the implementation of activities to improve the quality of water and the availability of water for human consumption, i.e. implementation of activities for the purpose of assessing the effectiveness of the achievement of UN sub-goals 6.3. and 6.1., is regulated by numerous regulations in the Republic of Croatia. Certain regulations have been amended and supplemented several times in previous years for the purpose of harmonizing with EU directives.

At the time of the audit, the Croatian Parliament passed the Law on Water for Human Consumption, which is in force since March 16, 2023. In the explanation of the Draft of the said Law, it is stated that the law is being passed because the provisions of the Law on Water for Human Consumption from 2013 have been amended four times due to the need to harmonize with EU regulations in the field of water quality for human consumption and due to the official notice sent by the European Commission to the Republic of Croatia on March 8, 2019, regarding the non-compliance of the regulations of the Republic of Croatia with the provisions of the Directive on the quality of water intended for human consumption (related to the healthiness and purity of water intended for human consumption, free from any microorganisms and parasites and substances that in certain numbers or concentrations represent potential danger to human health and compliance with the prescribed indicators of microbiological and chemical parameters).

During the audit, the Law on Amendments to the Law on Water (Official Gazette 47/23) was adopted, which entered into force on May 4, 2023. The changes refer, among other things, to the final harmonization with the Directive on the quality of water intended for human consumption.

According to NRRP, in order to achieve measure C1.3. R1 Implementation of the water management program, it is planned to adopt four by-laws by the end of the fourth quarter of 2022: Regulation on water service areas, Regulation on evaluating the efficiency of water service providers' operations, Regulation on the methodology for determining the price of water services and the Regulation on special conditions for the performance of water services.

At the end of December 2021, the Government of the Republic of Croatia adopted the Regulation on Water Service Areas (Official Gazette 147/21), which established 41 water service areas in the territory of the Republic of Croatia, certain borders and the acquiring company. Service area boundaries are the outer boundaries of local government units that border the neighboring service area. When individual settlements from cities and municipalities are included in the service area, then the outer border of these settlements forms the boundary of the service area. The border between the service areas is based on the official records of spatial units from the Register of Spatial Units of the State Geodetic Administration, as of September 27, 2019. The said Regulation entered into force on January 8, 2022.

However, during 2022, several proponents (local government units, public suppliers of water services, citizens' associations) submitted a proposal for the evaluation of the compliance of the Regulation with the Constitution of the Republic of Croatia and the law. The Constitutional Court of the Republic of Croatia, by Decision No. U-II-627/2022 (Official Gazette 40/22) of March 29, 2022, initiated the procedure for assessing the compliance of the Regulation with the Constitution of the Republic of Croatia and the Law on Water Services and temporarily suspended the execution of all general and individual acts and actions undertaken on the basis of the Regulation. The proponents pointed out objections of a formal and material nature.

Objections of a formal nature related to the conducted e-Consultation, i.e. the fact that all objections and remarks of the proponent and other interested entities were submitted on time during the e-Consultation process, but after that the Ministry did not publish a report on the conducted consultation, that is, it published it after that the Regulation entered into force, which is why the proponents did not have the possibility of insight into the remarks and objections of other participants or answers to the remarks and objections. The Constitutional Court pointed out that the Government of the Republic of Croatia should have adopted the Regulation after consultation, and it is indisputable that the report on the conducted e-Consultation was published after the Regulation entered into force on January 8, 2022. The Ministry stated that, as the holder of the Draft Regulation, due to the large number of objections received and their contradictions, considered that in the process of reconciliation between various ministries and other central bodies of the state administration, it would be difficult to justify the objections due to different arguments, as well as that amendments to the Regulation could be requested. Therefore, the report on the conducted e-Consultation was published only after the entry into force of the Regulation. The Constitutional Court has assessed that the publication of the aforementioned report after the entry into force of the regulations is contrary to the purpose for which the e-Consultation is carried out.

Regarding objections of a material nature, the proponents pointed out that some public suppliers do not meet the conditions prescribed by the Law on Water Services and that the establishment of service areas, in the manner prescribed by the Regulation, will not achieve the legitimate goal of ensuring the affordability of water prices for residents and business users and quantitative and qualitative availability of water and drainage services.

The Constitutional Court considers that the service areas should have been established in such a way as to ensure the return of costs from water services, to establish a public supplier capable of sustainable development and maintenance of water utility structures, including the ability to implement obligations from the EU Accession Treaty, and to maintain business self-sustainability, financial stability and a high degree of efficiency of public suppliers. The Ministry reasons that public suppliers cannot cover their capital expenditures, fragmented public suppliers cannot even cover operating costs (they continuously accumulate financial losses) and fragmented service areas cannot achieve affordable water prices in the future. The coverage of operational costs only from the price of the water service is the meaning of Article 9 of the Water Framework Directive.

In the Decision of the Constitutional Court, it is stated that the affordability indicator is expressed as a percentage as the ratio of the price of water expressed in the average weighted average per m<sup>3</sup> of water consumed and the annual net disposable income of the household. In the explanation accompanying the Final Proposal of the Law on Water Services, the upper limit of affordability is determined, i.e. it will be ensured that the price of water will be socially affordable for consumers even after the implementation of the investment, within the limits of the supplier's economic efficiency, and as a rule up to 3.0 % of net disposable income households annually<sup>10</sup>.

The Constitutional Court established that the Government of the Republic of Croatia, in addition to the e-Consultation procedure, and independently of it, was obliged to attach an explanation in the process of adopting the Regulation that would show why the service areas were formed in the manner prescribed by the Regulation and that in each of service areas meet the criteria prescribed by the Water Services Act (e.g. that some public suppliers do not meet the legal requirements, that some are merged with over-indebted companies etc. Also it determined that additional criteria should have been prescribed for the establishment of the service area (e.g. criteria based on good management of water losses from the water supply system, the ability to use grants from EU funds and the future affordability of the water service price after the implementation of the EU project).

The decision of the Constitutional Court of the Republic of Croatia No.: U-II-627/2022 dated February 7, 2023 and two separate opinions of the judges (Official Gazette 23/23) repealed the mentioned Regulation on Water Service Areas from 2021 in such a way that the Decision enters will enter into force on July 15, 2023, and the Ministry must adopt a new Regulation by the same day, otherwise the aforementioned Regulation will be repealed.

During the audit implementation, a Draft Proposal for the Regulation on Water Service Areas was prepared, which, according to the Ministry's explanation, corrected all objections of the Constitutional Court of the Republic of Croatia of a formal nature. The Regulation on Water Service Areas (Official Gazette 70/23) entered into force on July 15, 2023.

According to the explanation of the person responsible in the Ministry, final proposals were made for the mentioned three regulations, e-Consultations were conducted and the opinions of the relevant bodies were collected. Due to the additional requirements of the European Commission, the Ministry was in constant communication with the European Commission and harmonized certain details of the Regulation with the requirements of the European Commission without consequences for the payment of the next installment of financial resources from the NRRP.

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<sup>10</sup>According to the calculation from the Multi-Year Construction Program, at the level of utility companies, in relation to the annual net disposable income of the household, the total potential future price of water varies 1.0 - 6.0 %, at the level of the water supply zone 1.6 - 4.2 %, at the county level 1.8-4.5 %, and at the regional level 1.9-3.2%. According to the analysis, it is predicted that the limit of affordability will be broken, that is, that the price of water in the existing areas of water service provision, without the process of consolidating public suppliers, would become unaffordable or difficult for citizens to afford. According to the Report on the situation in the water services sector and the work of the Council for Water Services for 2020, the price of water for households in the Republic of Croatia is HRK 16.16/m<sup>3</sup> or EUR 2.14/m<sup>3</sup>.

The Regulation on the evaluation of the efficiency of water service providers' operations (Official Gazette 70/23), the Regulation on the methodology for determining the price of water services (Official Gazette 70/23) and the Regulation on special conditions for the performance of water services activities (Official Gazette 70/23) entered into force effectively in July 16, 2023.

According to the provisions of the Law on Water, the Government of the Republic of Croatia shall adopt regulations and other general acts determined by the said Law within one year from the date of entry into force of the said Law, or the minister within two years from the date of entry into force of the said Law. The audit determined that by the end of July 2023, it was prescribed to adopt a rulebook on the content of the River Basin Management Plan (the rulebook from 2013 is in force and applies), a rulebook that regulates in detail the way of consulting and informing the public about the draft Water Management Strategy and River Basin Management Plan (rulebook from 2014 is in force and applies), rulebook prescribing technical requirements for design, construction, maintenance and control of the technical correctness of buildings for wastewater drainage (rulebook from 2011 is in force and applies), a rulebook which prescribes the technical requirements for the design, construction, maintenance and control of the technical correctness of water supply buildings (not adopted), the rulebook on the content and method of keeping records on the quantities of water affected and the submission of data on the use of water to Croatian Waters (the rulebook is in force and applies from 2010), the rulebook that regulates in more detail the conditions for establishing sanitary protection zones, the measures and restrictions implemented in them, the deadlines for making decisions on the protection of sources and the procedure for making those decisions on the protection of sources (the rulebook from 2011 is in force and applies), rulebook prescribing the content, form and manner of keeping water documentation (the rulebook from 2010 is in force and applied) and others. The Regulation on limit values of wastewater emissions (Official Gazette 26/20) and the Regulation on Issuing Water Acts (Official Gazette 9/20 and 39/22) were adopted within the prescribed period.

According to the explanation of the responsible person of the Ministry, the regulations are harmonized with the acquis of the EU. As the drafting of the River Basin Management Plan until 2027 has started in the meantime, and the public has been given six months to submit remarks and comments on the draft Plan, it was not rational to change the regulations in the middle of the process. Given that the regulations are in force until new ones are adopted, there is no legal gap in that area. He also states that the regulations were not adopted because the Ministry focused on the adoption of higher-level regulations within its competence, as well as on regulations that needed to be adopted in order to harmonize with the EU acquis and on regulations in the field of water management based on the Action Plan for administrative relief of the economy for 2019.

The State Audit Office draws attention to the timely undertaking of activities related to the adoption of regulations, which is particularly significant due to the fulfillment of the obligations assumed by the Republic of Croatia by concluding the EU Accession Treaty. According to the provisions of the Treaty on the Functioning of the European Union (consolidated version) (2016/C 202/01)<sup>11</sup>, if non-compliance with EU law is discovered, the European Commission can initiate proceedings against the Republic of Croatia before the Court of Justice of the European Union for not fully transferring its legislation all relevant provisions of the directives and can issue an official warning due to the incomplete transfer of EU law.

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<sup>11</sup><https://eur-lex.europa.eu/legal-content/HR/TXT/HTML/?uri=CELEX:12016ME/TXT>

Furthermore, the audit found that the implementation of activities and individual tasks related to the improvement of the quality and availability of water for human consumption in the Republic of Croatia, that is, the achievement of UN sub-goals 6.3. and 6.1. under the jurisdiction of numerous bodies. The activities and responsibilities of the competent authorities are not determined by a separate document, except that for the implementation of the activities determined by the NRRP related to the reform of the water economy, the Decision on the management system and monitoring of the implementation of activities within the framework of the National Recovery and Resilience Plan 2021-2026, it was determined that for objective C1.3. Improvement of water management, the competent body of state administration is the Ministry, and the implementing body is Croatian Waters.

The activities and responsibilities of the competent bodies can be seen from the description of the jobs and tasks of the mentioned bodies, prescribed by numerous laws and relevant regulations for water for human consumption, which is shown in table number 3. The aforementioned table number 3 was created for the purpose of conducting the audit in order to indicate the large number of bodies that participate in activities and tasks related to the improvement and availability of water for human consumption.

***Considering the large number of bodies participating in activities and tasks related to the improvement of water quality and availability of water for human consumption, the State Audit Office is of the opinion that very good coordination is needed between the bodies participating in the realization of UN sub-goals 6.3. and 6.1. and more effective implementation of all activities in order to implement them by the end of 2030 and to effectively implement the water utility directives in practice, which the Republic of Croatia committed to by joining the EU.***

### **Implementation and financing of public water supply, drainage and wastewater treatment projects**

The Ministry and Croatian Waters carry out the activities necessary for the implementation and financing of investments in projects related to the improvement of water utility infrastructure, i.e. water utility projects of public water supply, drainage and wastewater treatment, through the allocation of grants. The obligation to invest in water utility infrastructure stems from the Treaty on Accession to the EU, which established transitional periods for harmonization with the Directive on the quality of water intended for human consumption and the Urban Waste Water Treatment Directive.

As part of the EU accession negotiations, the Government of the Republic of Croatia adopted in November 2010 the Plan for the Implementation of Water Utilities Directives, which contains agreed activities and deadlines related to their implementation, and requested a transition period until December 31, 2018 (with regard to microbiological indicators), i.e. until December 31, 2023 (with regard to municipal wastewater treatment). The Plan for the Implementation of Water Utilities Directives shows the state of water supply and drainage in the Republic of Croatia, and then estimated the total costs of implementing the directives in the amount of EUR 12.6 billion from 2010 to 2023.

The Multi-Year Construction Program set goals related to the reform of the water utility sector and the improvement of public water supply and drainage services (*described under the title of this Report: Achieving activities, goals and planned indicators and monitoring the achievement of goals*).

The Multi-Year Construction Program contains 138 projects that include activities planned to be implemented in order to improve public water supply and to include local waterworks in the public water supply system. All activities are systematized in accordance with goals such as improving access to water for human consumption (development of the public water supply system, expansion and reconstruction of the system), improving the healthiness of water (investment in the development of water pumping stations and implementation of measures in the catchment area, including investment in the construction of wastewater treatment plants), ensuring a good quantitative condition of water bodies from which water is taken (reconstruction, rehabilitation of the existing distribution part of the system and network, reduction of losses) and improvement of the efficiency of the operations of public suppliers (introduction of monitoring and management systems, etc.).

Table number 4 shows the estimated total value of the planned investments in water utility infrastructure from 2021 to 2030, according to the Multi-Year Construction Program.

Table number 4

Estimated total value of planned investments  
into water utility infrastructure from 2021 to 2030

UKUPNA POTREBNA ULAGANJA 2021. - 2030.	('000 HRK)	('000 EUR)
<b>Vodoopskrba</b>		
1.prioritetna skupina (44 projekta)	12.931.580	1.701.524
2.prioritetna skupina (63 projekta)	10.144.673	1.334.825
3.prioritetna skupina (29 projekata)	957.882	126.037
Klorinatori	5.000	658
Vodomjeri	100.000	13.158
Južni ogranak Senj	1.500.000	197.368
<b>SVEUKUPNO VODOOPSKRBA</b>	<b>25.639.135</b>	<b>3.373.570</b>
<b>Odvodnja</b>		
1. prioritetna skupina (57 aglomeracija)	15.844.481	2.084.800
2. prioritetna skupina (22 aglomeracije)	2.598.393	341.894
3. prioritetna skupina (180 aglomeracija)	7.424.180	976.866
Aglomeracije < 2000 ES	671.969	88.417
Ulaganje u zbrinjavanje mulja	599.999	78.947
<b>SVEUKUPNO ODVODNJA</b>	<b>27.139.022</b>	<b>3.570.924</b>
<b>Posebni projekti</b>		
Projekt poticanja energetske učinkovitosti	20.000	2.632
Projekt uspostave kibernetičke sigurnosti	20.000	2.632
<b>SVEUKUPNO OSTALI</b>	<b>40.000</b>	<b>5.263</b>
<b>UKUPNA POTREBNA ULAGANJA 2021. - 2030.</b>	<b>52.818.157</b>	<b>6.949.757</b>

Source: Multi-Year Construction Program

According to the Multi-Year Construction Program, the total estimated costs of the development of water utility infrastructure amount to HRK 52.8 billion and are evenly distributed (51.0 % are the costs of the development of public drainage, and 49.0 % are the costs of the development of public water supply).

Public water supply development projects are classified in order of priority, where the criteria used are directly related to the goals of achieving public water supply service standards (assessing water health risks, reducing losses and increasing water availability). The largest part of the investment relates to access to water, expansion and reconstruction of the system (65.6 %) and ensuring a good quantitative condition of water bodies from which water is taken (25.2 %). A smaller part is planned for public drainage projects. The largest investments are planned to be made by the public suppliers of water services Vodoopskrba i odvodnja doo, Zagreb (about HRK 2.3 billion), Vinkovački vodovod i kanalizacija doo, Vinkovci (about HRK 1.9 billion) and KD Vodovod i kanalizacija doo, Rijeka (about 1, HRK 6 billion). The estimated costs are systematized by projects and public suppliers, in such a way that for each public supplier the costs of construction, preparation of technical documentation, supervision and management of the project and the total value of the project are estimated.

Investments in public drainage systems mostly refer to the development of public drainage and wastewater treatment of agglomerations with a load of more than 2,000 PE, which have priority for compliance with the Urban Waste Water Treatment Directive. The total costs of achieving the required degree of connection are about HRK 18.7 billion (72.0 %), and about HRK 7.2 billion (28.0 %) relate to the construction of treatment plants. The costs of public drainage infrastructure development were estimated for each agglomeration in such a way that system development costs, device costs, and system and device development costs were estimated.

According to the Multi-Year Construction Program, the amount of financial resources available for the implementation of water utility projects until 2030 depends on the amount of allocation for water utility projects in Operational Program Competitiveness and Cohesion 2014-2020 (hereinafter: OPCC 2014-2020), on the amount of the remaining unspent allocation after December 31 2020, on the amount of allocated allocation within the NRRP and on the amount of allocation in the Multiannual Financial Framework 2021-2027.

According to the aforementioned Program, a total of EUR 849,340,216.00 was allocated from the OPCC in 2014-2020 (the allocation was EUR 1,049,340,216.00, but was reduced in 2020 and was redistributed to help entrepreneurs preserve liquidity). 60 projects were approved, the total eligible costs of which amounted to HRK 20,093,364,254.82, of which EU funds were HRK 14,074,994,052.22. The decision to approve projects was made taking into account that not all projects will be fully financed from EU funds and that part of the projects will be completed from national funds, while part of the projects will continue to be financed in the period 2021 - 2027. Given that it has been agreed more than the available amount (overbooking) within OPCC 2014-2020, it was proposed that eleven projects approved through OPCC 2014-2020 be redistributed to NRRP, while 49 projects continue to be financed through OPCC 2014-2020 up to the amount of allocated allocation (849,340 EUR 216.00), that is, for their implementation from 2021 to 2023, EUR 568,169,000.00 will be available (the amount of the unspent allocation after December 31, 2020). The amount of the allocated allocation within the NRRP is EUR 0.53 billion, and since the allocation for water utility projects in the Multiannual Financial Framework 2021-2027 was not known at the time of the creation of the Multi-Year Construction Program, three variants were considered in which the amounts ranging from EUR 0.7 billion to EUR 1.26 billion.

The needs for investments with a total value of around EUR 3.7 billion have also been identified in the NRRP. Within the period 2014-2020, EUR 1.0 billion of grants are available, and the same amount is expected in the period 2021-2027. A large number of projects were approved through the NRRP, the value of which is significantly higher than the available funds with the intention of financing all projects that are estimated to be realized by June 2026. The estimated cost for the Public Water Supply Development Program is HRK 1,039,000,000.00 from the MRR (a total of HRK 1,298,750,000.00), and it is implemented through three subprograms: Development of water supply in the territory of the Republic of Croatia with an estimated value of HRK 834,750,000.00 (HRK 667,800,000.00 from MRR), Ensuring quality and safe water supply in rural, mountainous and demographically vulnerable areas with an estimated value of HRK 384,000,000.00 HRK (HRK 307,200,000.00 from MRR) and measuring devices at water intakes with an estimated value of HRK 80,000,000.00 (HRK 64,000,000.00 from MRR), without value added tax. The public wastewater development program includes eleven projects prepared for financing from OPCC 2014-2020, investments in one project that is at a high level of readiness, investments in smaller parts of the drainage system for agglomerations that need to be harmonized with EU directives, and priority investments in public water supply systems of agglomerations.



The estimated cost is HRK 3,022,844,731.00 from the MRR (a total of HRK 4,224,695,165.00), and it is implemented through two subprograms: Improvement of the water utility infrastructure of the agglomeration with an estimated value of HRK 3,411,940,141.00 (2,372,640,711.00 HRK from MRR) and Implementation of investment projects related to smaller parts of the drainage system with an estimated value of HRK 812,755,024.00 (650,204,020.00 HRK from MRR), excluding value added tax.

Regarding the realization of the planned investments from 2021 to 2030, the Multi-Year Construction Program foresees the inability to secure financial resources, both grants through EU funds and national funds, as the biggest risk. Due to the above, redistributions within OPCC in 2014-2020 are foreseen in order to increase the existing allocation, in such a way that the allocation for the Multi-Year Financial Framework 2021-2027 amounts to as much as possible, and at least 1.3 billion EUR. For the multi-year financial framework 2028-2034, which partially overlaps with the investment period 2021-2030, it is also necessary to secure the largest possible amount of grants from EU funds. In order to mitigate the risks of non-realization of planned investments, i.e. the lack of national funds, it is necessary to strengthen the investment capacity of public suppliers in such a way as to fully implement the water management reform and to activate loans from international financial institutions. Also, the same risks are mentioned in the NRRP.

According to the explanation of the responsible person of Croatia Waters, the redistribution of funds, in order to ensure the smooth implementation of water utility projects, is mostly carried out due to the problems of users of funds for financing approved projects related to the implementation of public procurement, unforeseen circumstances caused by the epidemic, disruptions in the market of construction materials and products, problems in the delivery of the necessary equipment due to interruption of supply chains, later conclusion of the contract than planned, etc.

Water utility projects of public water supply, drainage and wastewater treatment are carried out by public water service providers, and financing is done through several financial packages. The largest part of water utility projects is financed from the funds of Environmental Protection Operational Program 2007-2013 (hereinafter: EPOP 2007-2013), OPCC 2014-2020, NRRP and from the Swiss grant.

Water utility projects were implemented in previous years through the EU Cohesion Fund for the co-financing of EPOP, with one of the main goals, the development of infrastructure and public services in the area of drinking water supply, municipal wastewater treatment and the protection of water resources, which would contribute to the balanced and sustainable development of the Republic of Croatia. The projects build on investments financed from previous EU programs, especially the Instrument for Structural Policies for Pre-Accession – ISPA) and Instrument for Pre-Accession Assistance – IPA. According to the data of Croatia Waters, by the end of 2022, 157 projects with a total value of HRK 1,589,459,446.00 have been approved and implemented from the EPOP 2007-2013. Total funds in the amount of HRK 1,437,749,586.00 were realized (HRK 1,043,732,345.00 in grants, with the remaining funds from the Ministry, Croatia Waters, etc.).

The largest number of water utility projects are financed with grants from OPCC 2014-2020, Priority axis 6 - Environmental protection and sustainability of resources, Investment priority 6ii - Investment in the water sector in order to meet the requirements of the EU acquis in the area environment, Specific objective 6ii1 - Improvement of the public water supply system with the purpose of ensuring the quality and safety of drinking water supply services and 6ii2 - Development of the wastewater collection and treatment system with the aim of contributing to the improvement of water conditions.

According to data of Croatian Waters, by the end of 2022, 60 projects with a total value of HRK 21,420,023,512.00 have been approved from OPCC 2014-2020. Total funds in the amount of HRK 8,984,015,771.00 were realized (HRK 6,320,513,235.00 in grants, and the remaining funds came from the Ministry, Croatian Waters, etc.). Four projects were implemented.

Through the NRRP, water utility projects are implemented within the framework of the Public Water Supply Development Program and the Public Wastewater Development Program. According to the data of Croatian Waters, by the end of 2022, 79 projects with a total value of HRK 876,705,733.00 were approved from the NRRP, and HRK 483,907,772.00 were realized (HRK 387,126,217.00 in grants, and the remaining funds Ministry, Croatian Waters, etc.). All projects are in the implementation phase.

Funds for water utility projects obtained from the Swiss grant were obtained on the basis of the framework agreement between the Swiss Federal Council and the Government of the Republic of Croatia on the implementation of the Swiss-Croatian cooperation program on reducing economic and social inequalities within the EU, from June 2015 (entered into force 9 January 2017). The Swiss contribution is available to 13 countries that have joined the EU since 2004. In October 2022, a new Framework Agreement was signed, allocating CHF 23 million for investments in water utility infrastructure, i.e. the construction of water supply and drainage systems in the area of Gorski kotar. The total value of the Swiss grant is CHF 45 million (HRK 326 million). The implementation period is from 2017 to 2024. The allocation of the Program is contracted in 100 percent amount through eleven projects with a total value of CHF 42.7 million, while the remainder of CHF 2.25 million refers to the Swiss cost of managing the program. According to the data of Croatian Waters, by the end of 2022, three projects with a total value of HRK 230,846,540.00 were approved from the Swiss grant, and HRK 190,010,150.00 were realized (HRK 137,709,583.00 from the Swiss grant, and the remaining funds Croatian Waters). The projects are being implemented, the work is expected to be completed in 2023, while the trial operation of the wastewater treatment plant would be completed in the first half of 2024.

For the purpose of implementation and financing of water utility projects and the implementation of NRRP, the Ministry has published several public calls for co-financing.

In November 2021, a limited call for financing the implementation of already started investment projects related to smaller parts of the public water supply and public wastewater drainage system was published. The deadline for submitting applications is mid-June 2023. The purpose of the call for investments is to contribute to the preservation of water resources, and at the same time to ensure the availability of drinking water to all citizens, especially for vulnerable and marginalized groups, as well as in demographically threatened areas, to reduce pollution of the environment and water resources by wastewater, reduction of losses in water supply systems, with an emphasis on the NRRP default indicators and compliance with EU regulations on environmental protection. The subject of the call is the allocation of grants for the financing of already started investments in the expansion and reconstruction of public water supply, drainage and wastewater treatment systems with the aim of ensuring quality and safe water supply, reducing losses in water supply systems, preventing pollution of water resources and the environment with untreated wastewater, improving management waters and achieving greater resistance to climate change and contributing to compliance with EU directives. Total grants amount to EUR 106,178,247.00. Also, in April 2022, a limited call for financing the implementation of investment projects related to smaller parts of the public water supply and wastewater drainage system was published. The deadline for submitting applications is the end of December 2024. Total grants amount to EUR 437,722,808.42. Eligible applicants are trading companies whose founders are public entities.

In December 2022, a limited call for financing the implementation of investment projects related to the improvement of the water utility infrastructure of agglomerations was published. The deadline for submitting applications was the end of August 2023. The purpose of the call is to contribute to improved water management and conservation of water resources with the aim of achieving greater resistance to climate change, increasing the number of residents who have access to improved water supply and the number of residents who use an improved wastewater treatment system. The subject of the call is the allocation of grants to finance investments in the improvement of the water utility infrastructure of agglomerations within the framework of the Public Wastewater Drainage Development Program. Investments in the construction/reconstruction of public wastewater drainage systems and/or wastewater treatment devices and the construction/reconstruction of public water supply systems and/or drinking water treatment devices will be financed. Total grants amount to EUR 314,903,538.53. Eligible applicants are trading companies whose founders are public entities, i.e. public suppliers of water services that provide public water supply or drainage.

In addition, in December 2022, a call for investment financing was published: Measuring devices at water intakes. The tender type is a direct award, and the deadline for submission of applications was the end of December 2022. The purpose of the call is to award grants to finance investments in measuring devices (water meters) to contribute to improved water management and the preservation of water resources. By installing and using water meters, water will be better managed and the affected water quantities will be controlled by establishing a telemetry system, which will contribute to the control of losses and the rational use of water. Total grants amount to EUR 8,494,259.74. The highest rate of co-financing of eligible expenditures with grants is 80.0 %, and 20.0 % is provided by Croatian Waters, which, as a commission agent, conducts the procurement process on behalf of public suppliers whose water intakes the measuring device is installed on.

According to the Multi-Year Construction Program, the methodological framework resulting from the obligation to comply with the Water Framework Directive foresees the establishment of the Project Register. The Register of agglomerations with associated projects is in operation, and in the process of preparing the Multi-Year Construction Program, the preparation of the register of water supply projects is starting.

The minimum amount of data and information that should be stored and monitored within the Project Registry is proposed, such as the project holder (public supplier) and the goal related to the Directive on the quality of water intended for human consumption. Thus, data related to public and local water supply systems are needed, such as ensuring the availability of water for human consumption (connection, possibility of connection), compliance with water health parameters (microbiological, chemical and indicator indicators), reconstruction and rehabilitation of the system in accordance with the depreciation plan, and establishment of an appropriate monitoring and management system, equipment of water pumping stations, implementation of sanitary protection measures, reduction of losses (improving the efficiency of water infrastructure, avoiding excessive use of water, assessing the level of water losses and reducing them if they are above a certain threshold), other information that the project owner considers to be need to be delivered. Taking into account the goals to be achieved by the project, the Register can include the data regarding the construction of new and/or reconstruction, i.e. rehabilitation of existing water structures and/or parts of the system and/or water supply system, i.e. drainage and wastewater treatment system, spatial scope of the project by settlements, level connections at the settlement level, current and future state after the implementation of the project.

Also, the data on the description of the initial solution of the project (technical data, percentage of wastewater collected), project status (approved, phased, state of realization, construction completed, construction in progress, abandonment), preparation of documents, project implementation period (planned, contracted, realized), project implementation costs, information on the financing model (total costs, eligible costs, EU share in co-financing, national co-financing, parallel investments, etc.) and financing instruments (for preparation of documentation and construction).

According to the explanation of the responsible person of Croatian Waters, the Register of water supply projects has not yet been established in digital form, as a complete information system. The list of water supply projects is kept in Croatian Waters, but in the form of auxiliary tables and in paper form. According to the explanation, when the said Register is established, the data is mostly prepared for transfer and will be transferred and available in the said Register. However, he states that it is a large amount of data that takes a long time to transfer. Also, a large number of data from of the mentioned tables has not yet been connected to each other to form a single and comprehensive database and information. The mentioned system is not yet fully connected with the accounting system, in terms of updated and continuous monitoring of project implementation.

***The State Audit Office recommends that Croatian Waters undertake activities to establish a complete and comprehensive register of water supply projects, with all recommended data, in the manner determined by the Multi-Year Construction Program.***

According to the explanation of the responsible person of Croatian Waters, which is also described in the Multi-Year Construction Program, there are three key risks that significantly affect the success of the implementation of water utility projects, and thus the effective implementation of the reform of the water utility sector.

One of the basic risks, assessed as a very high risk, is the lack of reliable information about the current state of the water utility infrastructure. The implementation of the Multi-Year Construction Program is intended to expand the coverage of the entire territory of the Republic of Croatia into a system of controlled and regulated public water and communal services (local water supply systems, individual water supply, individual drainage systems, areas outside the jurisdiction of public suppliers) and to improve the standard of water and communal services through investments in development and accompanying necessary and key reconstructions.

Insufficient knowledge of the current state of water utility infrastructure (especially in areas outside the jurisdiction of public suppliers, local water supply systems and individual drainage systems) can have a negative impact on the choice of technically high-quality and financially acceptable solutions and on future business planning. The quantity and quality of available information and data differs significantly depending on the public suppliers, given that the procedure and methodology of data collection has not been fully developed, and the obligation to establish an Infrastructure Register has not yet been fully introduced into regular practice, that is, into the business of public suppliers.

In order to avoid the mentioned risks, in practice the necessary data and information are mostly collected at the project level, and the proposed projects in the Multi-Year Construction Program are project ideas that identify a need, part of it is at the level of a project proposal with a developed conceptual design, and only very small number of proposed projects are projects with prepared technical documentation and permits that are fully ready for financing.

Only for projects with prepared technical documentation can it be concluded that there is sufficient quality information about the state of the water utility infrastructure in the area covered by the project. However, at the program level, the available data are not consistent and can hardly be systematized.

It was stated that it is necessary to highlight the significance of the timely reform of the sector, within which the integration of public suppliers and the extension of their jurisdiction to local water supply systems and supervision of individual water supply and individual drainage systems in their service area is foreseen. In this process, it is planned to collect a large amount of data on the existing infrastructure and its condition. It is suggested that at the same time, for each newly established supplier of water services for the corresponding service area, a more detailed Investment Plan for the maintenance and renovation of the water utility infrastructure should be made.

According to the explanation of the responsible person of the Ministry, for each major project of the development of water utility infrastructure, an appropriate feasibility study is prepared in which data on the state of the existing infrastructure is processed, and for smaller projects, data on the state of the infrastructure must be provided in the application process in order to be able to evaluate the project's proposal. Furthermore, each integrated public supplier comes up with a four-year business plan, an integral part of which is a plan for the construction of water utility structures and a plan for building maintenance. The basis for the plan is data on the condition of the infrastructure they manage.

The risk of a lack of complete reliable information about the state of the infrastructure is solved at the level of each project, and after integration, the complete state will be known for each service area. This is also a preliminary action that the acquiring company determines in each service area for its existing delivery area, as well as for the distribution areas of public suppliers that are being merged. The most important thing is to determine the age of the infrastructure and the level of losses in the water supply systems, as well as to determine areas where there is no infrastructure and areas where renovation is necessary.

***The State Audit Office recommends that the Ministry, in cooperation with Croatian Waters, more promptly undertake activities to design the methods and methodology necessary for the systematic and continuous collection of high-quality, reliable and comprehensive data on the state of water utility infrastructure at public water service providers. The aforementioned data will also be used in planning, approving and determining the co-financing of individual projects of public water supply and public drainage and will be a quality basis for the implementation of the reform of the water utility sector.***

***It recommends to the Ministry, in cooperation with Croatian Waters, to encourage the activities of public suppliers of water services to establish a complete register of infrastructure with public suppliers, which would be one of the prerequisites for approving water utility projects and their co-financing.***

As a very high risk, which significantly affects the success of the implementation of water utility projects are, for example, the limitations of the construction sector, which is largely engaged in the reconstruction of earthquake-ravaged areas, limitations related to construction activities in urban areas and tourist areas, which is why it is estimated that it cannot currently fully support the timely and efficient implementation of projects.

As measures to reduce risk, it was stated that it is necessary at the project level, when preparing the technical documentation, to work out the dynamics of project implementation in detail and adapt them to time and space limitations, after five years of program implementation, to conduct a market research (available capacities of the construction sector and price trends) and evaluate the impact of changes on the realization of the program and to develop the control system and the efficiency of the implementation of public procurement procedures. It is estimated that even after the implementation of risk reduction measures, the stated risk will continue to be high.

Furthermore, the successful implementation of the Program depends to a large extent on the initiative of the local government units responsible for organizing water services, but also on the organizational and professional capacities of public suppliers. Together, this makes them significant bodies responsible for fulfilling obligations from EU directives. The implementation of the Multi-Year Construction Program requires strengthening the capacity of public suppliers and at the same time stimulates their technical and organizational specialization, with the aim of improving economic and environmental efficiency and sustainability.

According to the explanation of the responsible person of the Ministry, the water utility sector has around 8,289 employees (data for 2021). The number of employees is constantly decreasing. However, the sector lacks, especially among smaller public suppliers, highly qualified staff of appropriate professions (engineers) and workers with work experience who know the system they manage and possess specific knowledge (managing the operation of wastewater treatment devices). The problem is intended to be solved by integration in the water services sector, which is underway and should be completed by the end of 2024, in a way to consolidate the existing professional capacities in the service areas.

***The State Audit Office recommends that Croatian Waters undertake activities to encourage the education of employees at local government units and public water service providers on the actions necessary for the implementation of public water supply and drainage projects, so that public providers are ready to implement water-utility projects and withdraw EU funds for their implementation in the coming years and to actively participate in the effective reform of the water utility sector.***

The third and very high risk in the implementation of water utility projects is a change in the financial framework, because the results of financial analyzes indicate that the Multi-Year Construction Program will be realized under conditions of extremely limited and, considering the ten-year implementation period, variable financial framework (for example, the introduction of the euro, the impact of the epidemic on the economy). The above could result in changes in labor, material and equipment prices and changes in the cost of capital. As measures to reduce risk, it was stated that it is necessary at the project level, when preparing technical documentation, to provide all financial data and indicators in HRK and EUR, to conduct research on the capital market at the beginning of program implementation and after five years of program implementation, to evaluate the impact of changes on the implementation of the program, to conduct sociological-economic research related to acceptability and to create a communication strategy in the first year of program implementation. It is estimated that even after the implementation of risk reduction measures, the stated risk will continue to be high.

According to the explanation of the person responsible in the Ministry, a study was prepared on the state of the construction market, and in the Multi-Year Construction Program, estimates were given that were in force, while further price increases are assessed and analyzed individually for each project that is affected by the increase in market prices.

At the level of an individual project approved for financing, a feasibility study and cost-benefit analysis is carried out, which also includes a socioeconomic analysis and an analysis of the affordability of water services. Regarding the creation of a communication strategy, he states that in July 2015, the Communication Strategy of the European Structural and Investment Funds for the Republic of Croatia for the period 2014-2020 was created.

*Given that it is about the implementation of activities that last until the end of 2030, the State Audit Office recommends that Croatian Waters assess the impact of changes on the implementation of the Multi-Year Construction Program, i.e. water utility projects, and elaborate measures to reduce risks in implementation in more detail, especially with regard to changes in the financial framework for the implementation of projects for which, during the preparation of the aforementioned program, it was assessed that it would not be sufficient, the limited administrative and technical capacities of the water utility sector, but also other risks in the implementation of water utility projects, that were estimated to continue even after implementation of risk reduction measures be high.*

### **Realization of activities, goals and planned indicators and monitoring of goal achievement**

Sustainable Development Goal 6 calls for ensuring universal access to safe and affordable drinking water and sanitation for all, as well as improving water quality and the efficiency of its use. Improvement of water quality and availability of water for human consumption is directly related to sub-goal 6.3. in the context of the UN Sustainable Development Goals: Improving water quality by reducing pollution, eliminating dumping and minimizing the release of hazardous chemicals and materials, halving the share of untreated wastewater and significantly increasing recycling and safe reuse, and sub-goal 6.1. Safe and affordable drinking water.

The Multi-Year Construction Program defines individual public water supply and drainage projects, the method and period of implementation, participants, investment amounts and sources of funds, and the order of priority in implementation. The mentioned projects are financed from EU funds, the state budget, NRRP and other sources. The goals of the Multi-Year Construction Program are related to the achievement of UN sub-goals 6.1. and 6.3. Also, the River Basin Management Plan contains a list of quality goals for surface waters, including coastal waters, waters of the territorial sea and groundwater, including protected areas, and deadlines for achieving the goals. According to the River Basin Management Plan until 2027, the environmental goals of achieving at least a good state, i.e. ensuring the condition that water conditions do not deteriorate for all water bodies of surface and underground water, must be achieved by 2027 at the latest. The stated goals are related to the achievement of UN sub-goal 6.3.

The Ministry and Croatian Waters have identified problems that exist in the Republic of Croatia that need to be solved in order to ensure water availability and sustainable water management, which are related to water supply, drainage and wastewater treatment.

The picture below shows the basic data related to **the current state of public water supply and public drainage in the Republic of Croatia**, according to the data collected during the audit.

## Picture number 2

## Current state of public water supply and public drainage in the Republic of Croatia

**PUBLIC WATER SUPPLY**

- use of water is enabled for **93,4 %** of the population
- **86,9 %** of the population is connected
- **42,0 %** of the population is at risk with regard to the healthiness of the water
- there are about **200** local water supply systems that are not managed by public suppliers, and in which water quality control is performed irregularly or not at all
- water losses amount to about **50,0 %** of the total amount of water taken for public water supply

**PUBLIC DRAINAGE**

- **57,4 %** of the population is connected to public drainage systems
- **42,6 %** of the population uses individual drainage systems, and generates about 79 million m<sup>3</sup> of wastewater annually
- **46,8 %** of the population is connected to wastewater treatment systems
- **7,0 %** of wastewater is treated in accordance with EU legislation (EU average is 82,0 %)
- **43** agglomerations out of **245** of them with a load of more than 2,000 PE are aligned with the Urban Waste Water Treatment Directive
- **198** wastewater treatment plants are in operation, of which **112** are in agglomerations with more than 2,000 PE
- **16,0 %** of wastewater from the public drainage system is discharged into the environment untreated
- **51,5 %** of rivers and **11,3 %** of lakes met environmental goals in achieving good water condition

In this Report, the basic problems are described and the available data on the achievement of goals and indicators from the Multi-Year Construction Program and NRRP, global indicators of the UN's sustainable development goals, and data on reporting on the activities carried out and the achievement of goals related to the improvement of water quality and the availability of water for human consumption are presented.

#### – **Achieving goals and indicators from the Multi-Year Construction Program**

The Ministry and Croatian Waters monitor the achievement of goals and indicators from the Multi-Year Construction Program through reports on the implementation of the Multi-Year Construction Program. Below is an overview and description of the achievement of individual goals and indicators related to: a) access to water for human consumption for all residents, b) local water supply systems and the healthiness of water for human consumption in local water supply systems, c) capture of water for human consumption and losses from water supply systems, d) connection of the population to public drainage systems and municipal wastewater treatment, e) individual drainage systems and f) reduction of water load by discharging untreated or insufficiently treated wastewater in order to achieve good water condition.



### a) Access to water for human consumption to all residents

According to the Multi-Year Construction Program, the availability of water for human consumption is viewed from two aspects, namely: the total number of inhabitants who have the possibility of connecting to the public water supply system, regardless of whether they are connected or not (hereinafter: the possibility of connection) and the actual situation connection, which is the actual state of taking over the delivery of water for human consumption, where the healthiness of the water can be monitored (hereinafter: connection). According to estimates from the aforementioned Program, the population's connection to water supply systems, including local waterworks, increased from an average of 86.0 % to 87.0 %, and the possibility of connection is 93.4 %. The negative demographic trend was reflected in a significant decrease (over 20.0 %) of residents connected to 24 supply zones. It is estimated that in 2018 a total of 3,808,525 inhabitants had the possibility of connecting to public water supply systems. This assessment was calculated at the settlement level and systematized by supply zones and water supply areas.

Table number 5 provides data on the estimated number and share of the population (population estimate of the Croatian Bureau of Statistics for 2018) according to access to water for human consumption (possibility of connection) and connection to the water supply system in 2018, according to the Multi-Year Construction Program.

Table number 5

Estimated number and share of population according to access to water for human consumption and connection to the water supply system in 2018

<b>Access to water for human consumption in connection to the water supply system</b>	<b>Estimated population</b>	<b>Share of inhabitants (in %)</b>
	1	2
Has access to water for human consumption (possibility of connection)	3 808 525	93.4
- connected	3 542 698	86.9
- not connected	265 827	6.5
It has no access to water for human consumption	267 721	6.6
<b>Total number of inhabitants</b>	<b>4 076 246</b>	<b>100.0</b>

According to the Report on the Healthiness of Water for Human Consumption in the Republic of Croatia for 2018 by the Croatian Institute of Public Health (hereinafter: CIPH), the number of inhabitants connected to public water supply is 3,921,348 or 91.5 %, and the number of inhabitants connected to local water supply is 63,037 or 1.5 %.

For the number of inhabitants, data from the 2011 Census was used, not the estimation by the Croatian Bureau of Statistics for 2018 as in the Program. In 2022, 3,603,345 inhabitants or 92.7 % were connected to the public water supply, and 51,950 or 1.3 % were connected to the local water supply (population data from the 2021 Census).

According to NRRP, the use of water from public water supply systems is enabled for 94.0 % of the population, while the actual connection is 86.0 %. The goal is to improve the quality of public water services and ensure the availability of water through public water supply systems for about 93.0 % of the population by 2026 (by 2030 for 95.0 % of the population).

In the Multi-Year Construction Program, the goals of achieving the standards of public water supply services are established and are determined at the project level and at the level of the Republic of Croatia. For the indicator Increasing the availability of water intended for human consumption, a target value of 98.0 % was determined, while the initial value is 93.4 %. Both values were determined in relation to the number of inhabitants in 2018.

Table number 6 provides data on the population's connection to public and local water supply systems and the possibility of connection and the share of achieving the target values until 2030, according to three different data sources (Multi-Year Construction Program, Report on the health suitability of water for human consumption in the Republic of Croatia for 2018 and 2022 by CIPH, NRRP).

Table number 6

The population's connection to public and local water supply systems and the possibility of connection, and the share of achieving target values by 2030, according to three different data sources

Connection of the population to public and local water supply systems and the possibility of connection	Multi-Year Construction Program		CIPH		NRRP	
			2018 (Census 2011)	2022 (Census 2021)		
	state	goal 2030	state	state	state	goal 2030
1	2	3	4	5	6	7
Connection	86.9	-	93.0	94.0	86.0	-
-to the public water supply	-	-	91.5	92.7	-	-
-to the local water supply	-	-	1.5	1,3	-	-
Possibility of connection	93.4	98.0	-	-	94.0	95.0

The audit determined that the data on the possibility of connecting the population to public water supply systems and the data on the actual connection of the population in several different documents (data sources) are different, and in some cases it is not clear the year to which the data refer. For example, the data of 86.9% from the Multi-Year Construction Program on the population's connection to water supply systems includes local water supply systems, while the reports of CIPH show data separately for public water supply and separately for local water supply, and if the two data are added together to obtain data on the population's connection as in the Multi-Year Construction Program, is 93.0 % in 2018 and 94.0 % in 2022.

Because of the above, it is not known exactly how many of the population are connected to public or local water supply systems. In addition, the goals and target values differ in the NRRP from the goals and target values from the Multi-Year Construction Program. According to NRRP, the goal is to ensure the availability of drinking water for about 93.0 % of the population through public water supply systems by 2026, and by 2030 for 95.0 %.

According to the CIPH report for 2022, 92.7 % of the population is already connected to public water supply systems, and if we add 1.3 % connected to local water supply systems, the total population connection is 94.0 %. In addition, in the NRRP, in the description of the main challenges, it has already been stated that the use of water from public water supply systems is enabled for 94.0 % of the population.

The goal of the Multi-Year Construction Program is to increase the availability of water intended for human consumption from 93.4 % in 2018 to 98.0 % in 2030. However, without reliable data, the achievement of the goal from the Multi-Year Construction Program, the goal from the NRRP, or the sub-goals cannot be monitored of the UN 6.1. Safe and affordable drinking water.

Accurate and reliable data is a prerequisite for measuring progress in achieving goals, including the UN's sustainable development goals, and in the absence of such data, it is not possible to determine the initial and target value or measure progress and goal achievement.

*The State Audit Office recommends that the Ministry, in cooperation with Croatian Waters, harmonize with CIPH the method of reporting data on the connection and the possibility of connection of population to public water supply systems, i.e. the method of reporting on the availability of water intended for human consumption for the purpose of monitoring the achievement of the goals of the Multi-Year Construction Program and sub-goals of the UN 6.1. Safe and affordable drinking water.*

#### **b) Local water supply systems and the healthiness of water for human consumption in local water supply systems**

According to the provisions of the Law on Water Services, local water supply systems are structures for water supply from the source or other water intake to the point of connection of the end user or to the public tap, except for water utility structures, internal water supply systems and individual water supply systems, the construction of which was directly financed by persons, and exceptionally legal entities, and for the purpose of securing water for the purpose of human consumption for one or more settlements or part of the settlement. In other transitional and final provisions of the Law on Water Services, it is stipulated that public water service providers are obliged, within six months of the execution of the decision on the fulfillment of special conditions for starting business, to list the local waterworks to which water is supplied in an average quantity of more than 10 m<sup>3</sup> per day or supplies more than 50 people, built before the entry into force of the aforementioned Act in the service area and submit the list to the Ministry. Local water pipes are transferred to the management of the public supplier in the service area, and the decision on the transfer is made by the Ministry. The Ministry will refuse the transfer of local water pipes that are technically unusable. The public supplier manages the local water supply with the care of a good householder and in the way it manages the municipal water structures it owns.

According to the explanation of the responsible person of the Ministry, decisions on the transfer of local water supply systems have not been issued because the consolidation of public suppliers has not yet been carried out. Since public water supply system development projects co-financed by EU funds are intensively implemented, local water supply systems that are technically unsafe, which is the majority, are gradually replaced by newly built water supply networks and thus cease to function. He also states that CIPH maintains a list of local water supply companies.

According to the Law on Water for Human Consumption, public suppliers are obliged to ensure that the water intended for human consumption that they supply meets the health requirements and other parameters for checking conformity, and to ensure the implementation of operational monitoring and monitoring of parameters through sampling and analysis by an official laboratory if they deliver water intended for human consumption for less than 5,000 inhabitants, or provide their own minimum laboratory capacities if they supply more than 1,000 m<sup>3</sup> or supply water for more than 5,000 inhabitants.

Local government units and the City of Zagreb are obliged to ensure the implementation of tests of all chemical, microbiological and indicator parameters prescribed by the Ordinance on compliance parameters, methods of analysis and monitoring of water intended for human consumption at water pumping stations of local water supply systems that supply 50 or more inhabitants (Official Gazette 64/23 and 88/23 – correction) at least once a year during the hydrological year.

Water from the local water supply system is potentially unhealthy and can have negative health effects. Residents who are connected to the local water supply are considered to be at risk in terms of health, because the local water supply systems are not under the management of public suppliers and monitoring is not carried out regularly.

According to the Report on the Healthiness of Water for Human Consumption in the Republic of Croatia in 2021, 215 local water supply systems were registered, while in 2022, 204 were registered. 1.3 % of the population is connected to local water supply systems. According to the aforementioned Report for 2022, local waterworks pose the greatest risk from a public health point of view because water is delivered to consumers without any treatment, and often without disinfection, which results in analyzes that show that, out of 487 samples from local waterworks, 227 or 46.6 % health-impaired.

According to the Multi-Year Construction Program, given that the biggest problem of non-compliance with the health parameters of water for human consumption according to microbiological parameters occurs precisely in water supply zones where there are local water supply systems that are not under the management of public suppliers and where monitoring of water health is not carried out regularly, the implementation of the reform of the water utility sector is crucial. Namely, after they are taken over by the competent public suppliers, the local water pipes will gradually be repaired and reconstructed, and those that are so worn out and unusable will be replaced with new ones. Investors of reconstructions and new constructions will be public suppliers.

According to the explanation of the responsible person of the Ministry, in the Republic of Croatia, until ten years ago, there were about 400 small unregulated local water supply systems that do not have an identified owner or their ownership is not legal or provable, they do not have adequate water quality control or management by legal entities prescribed by law. Most of them are in Krapina-Zagorje, Varaždin and Zagreb counties. There is an urgent need for local waterworks to be included in a system of organized management, equal to public water supply systems, under the management of public suppliers.

It states that for the development and improvement of local waterworks, it is possible to use funds from EU funds through NRRP and other EU financial mechanisms. However, existing local water utilities and their current users and managers are not eligible investors. EU funds can only be used by public suppliers that are organized and operate in the manner prescribed by the Law on Water Services. Given that the state is obliged to harmonize local water supply systems with the requirements of the directives and is responsible for fulfilling the obligations from the EU Accession Treaty, it must have a legal instrument to introduce legal management of them, in order to protect the health of the population and the environment.

Also, for a comprehensive solution to the problem of using water from local water supply systems, the willingness of local government units and public suppliers to undertake activities in accordance with regulations is required, and the necessary financial resources can be secured from EU funds, Croatian Waters funds and other funding sources.

According to the provisions of the Law on Water Services, the Minister issues an order on the list of local waterworks, which regulates the content of the list, namely: technical features and location of local waterworks, their technical correctness and usability, owners, managers and owners or co-owners, as well as other data important for the expediency of the list. It is stipulated that the minister will issue an order within three months from the date of entry into force of the said Act (deadline is July 2022). The list of local water supply companies can be created by the existing public supplier before the deadline, for all local water supply companies in the area of local government units that are the founders of the public supplier. The audit found that the order on the list of local waterworks was not passed. According to the explanation of the responsible person of the Ministry, preparations have been made for adoption, that is, there is a list of local waterworks.

***The State Audit Office recommends that the Ministry undertake activities to determine the mandatory elements that would contain the list of local water supplies managed by individual public suppliers, i.e. to issue an order on the list of local water supplies, so that public suppliers of water services would be ready to provide quality and comparable data.***

***It recommends to the Ministry to encourage local government units and public suppliers of water services that manage local water supply systems in their territory, or whose local water supply systems will be transferred to management after the consolidation of public suppliers, to undertake the activity of listing local water supply systems with established mandatory elements, and to indicate to them the possibility of co-financing water supply projects through EU funds, with the purpose of including local waterworks in the system of organized management of public water supply and ensuring their health safety.***

According to the Multi-Year Construction Program, as it is expected that the implementation of public water supply projects will last a longer period, and in order to ensure, during that period, the appropriate healthiness of the water in terms of microbiological indicators, on the local water supply systems (systems in the local water supply zones), the planned is the implementation of the Intervention Project for the procurement and installation of chlorinators at the water intakes of all local water supply systems, the estimated value of which is HRK 5,000,000.00. Until the establishment of the service areas, the maintenance and management of the chlorinators will be the responsibility of the existing public suppliers to whom the local systems will be assigned.

According to the Second Report on the implementation of the multi-year construction program, the preparation and implementation of the project Intervention measure of installation of chlorinators at water intakes in the supply zones of local waterworks has not started. The mentioned zones have been assessed as very high risk zones where it is not possible to permanently and continuously provide sanitary water for human consumption. However, in order to permanently solve the issue of water supply in areas that are supplied with water from local waterworks, it is necessary to develop detailed technical documentation, which should be included in the extended concepts of public water supply. This type of analysis takes time, which is why an intervention measure has been planned that includes the purchase and installation of a chlorinator.

*Considering that in previous years, activities related to solving the problems of local water supply systems, i.e. their inventory, health condition, transfer to public suppliers, were carried out very slowly, and that it is not possible to use EU funds for their development and improvement, because their current users and managers are not acceptable investors for investments, and as the implementation of public water supply projects (which includes local water supply systems) is expected to take a long period of time, the State Audit Office recommends to Croatian Waters to determine the need for financing, procurement and installation of chlorinators at water intakes of local water supply systems, and to plan funds for the stated purpose and implement the project, in order to ensure the healthiness of water for human consumption in the water supply zones that were previously assessed as very high risk zones where it is not possible to permanently and continuously ensure the healthiness of water for human consumption.*

**c) Capture of water for human consumption and losses from water supply systems**

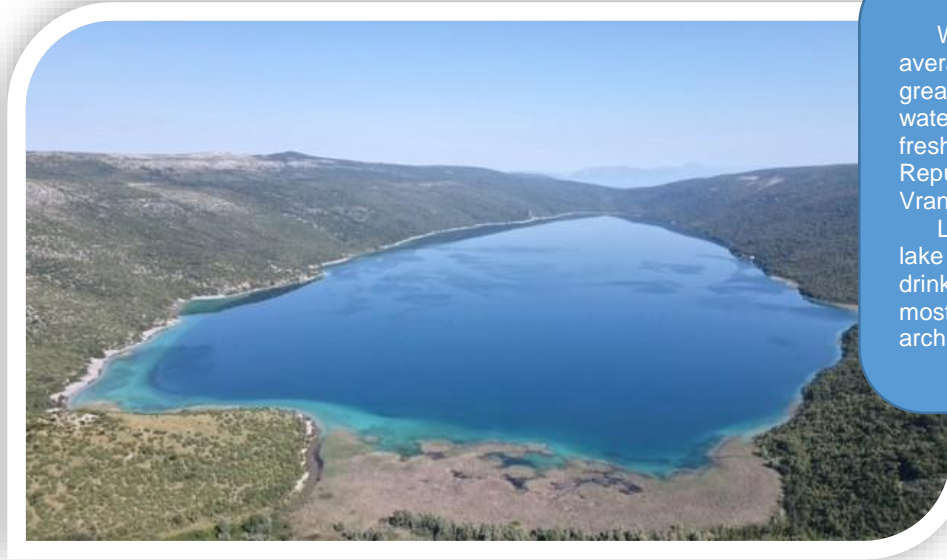
According to Eurostat data, the Republic of Croatia has the largest amount of freshwater resources per inhabitant in the EU with an average of 26,478.24 m<sup>3</sup> per year and is at the very top in the EU in terms of freshwater resources, after France, Sweden and Germany with an average of 118,312 .76 million m<sup>3</sup>.

However, according to the Strategic Environmental Impact Assessment of the River Basin Management Plan 2022-2027, the Republic of Croatia is relatively rich in water, but not in water supplies due to its geological structure with a large proportion of surfaces with karst structures and a large spatio-temporal scale of runoff heterogeneity. The karst relief occupies about half of the territory and has little possibility of long-term accumulation of water reserves, especially during droughts, which represent one of the threats of climate change. The consequence of the projected increase in air temperature for the period up to 2070, as well as stagnation or the stated trends of the smallest changes in the total amount of precipitation, is an increase in evapotranspiration, a decrease in surface and underground runoff, and thus a decrease in water supplies.

According to data from Croatian Waters, an average of 480 million m<sup>3</sup> is captured annually, and 240 million m<sup>3</sup> of water is delivered for human consumption, or 50.0 % of the captured quantity.

The picture below shows Lake Vrana on the island of Cres, the richest freshwater lake in the Republic of Croatia.

Picture number 3

Lake Vrana on the island of Cres<sup>12</sup>

Water losses of an average of 240 million m<sup>3</sup> are greater than the amount of water in the richest freshwater lake in the Republic of Croatia, Lake Vrana on the island of Cres.

Lake Vrana is a natural lake with 220 million m<sup>3</sup> of drinking water that supplies most of the Cres-Lošinj archipelago.

Source: State Audit Office

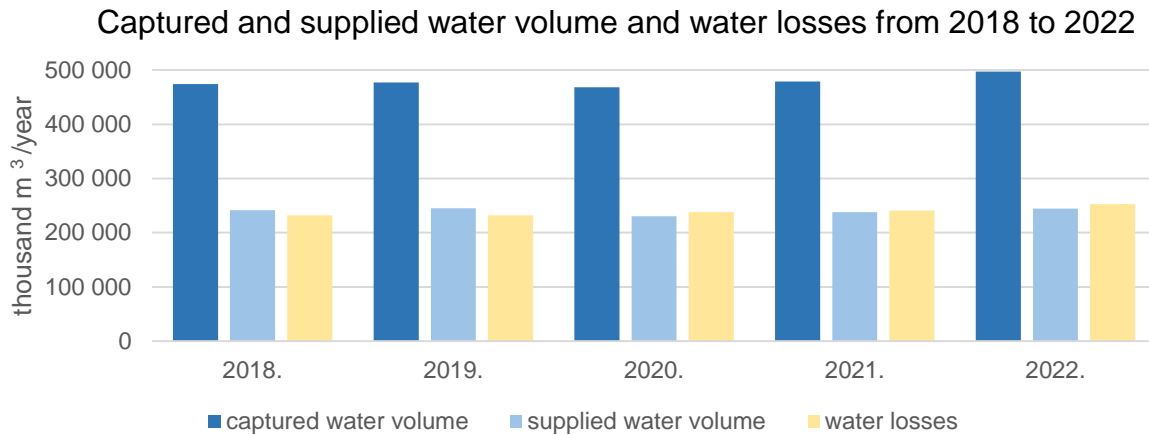
According to the public call for co-financing of the program to reduce losses in water supply systems in the Republic of Croatia, the impact of water losses is reflected in the capture of unnecessarily large amounts of water in certain catchment areas, which in the long term can lead to a change in the natural biological and hydrological balance, but also to a decrease in the capacity of certain springs as a result of a negative water balance (higher extraction than replenishment), which in the long term may threaten the supply of certain areas.

According to the explanation of the responsible persons of the Ministry and Croatian Waters, Croatian Waters regularly monitors the captured and delivered quantities of water from the public water supply system by public suppliers, who are obliged according to the Ordinance on calculation and collection of fees for water use (Official Gazette 36/20) to submit monthly reports on to the calculated and paid compensation. The audit established that Croatian Waters collects data from public suppliers on the amount of water taken and taken over, the amount of water delivered and sold, and water losses.

Graphical representation number 2 provides data on the amount of water captured and delivered, as well as water losses from 2018 to 2022, according to data from Croatian Waters.

<sup>12</sup>[https://voda.hr/sites/default/files/dokumenti/prateca-dokumentation/hidromorfoloski\\_monitoring\\_stajacica\\_u\\_2019\\_godini\\_-\\_studija.pdf](https://voda.hr/sites/default/files/dokumenti/prateca-dokumentation/hidromorfoloski_monitoring_stajacica_u_2019_godini_-_studija.pdf)

## Graphic representation number 2



Source: State Audit Office (according to data from Croatian Waters)

According to the explanation of the responsible person of Croatian Waters, the causes of generating water losses are numerous, and the most important are:

- a) lack of knowledge about the issue of water losses among public suppliers, i.e. ignorance of the real situation within the water supply network (state of construction, operational characteristics, hydraulic legality, etc.) and ignorance of the quantitative and spatial distribution of water losses and the causes of water losses. There is a lack of theoretical knowledge necessary for conducting system analyzes (water balance, IWA methodology, dividing the system into zones, etc.), as well as practical knowledge related to conducting active leakage control (use of equipment, searching for microlocations of leakage occurrence, etc.). Certain public suppliers have certain equipment, but due to lack of knowledge they do not use it. In the event that water losses are detected in a certain part of the system, the lack of knowledge results in a long period until their removal, which increases the total amount of leakage.
- b) the absence of expert teams for solving water loss problems (active leakage control) at public suppliers
- c) poor technical equipment of public suppliers, that is, public suppliers do not have the necessary equipment to effectively deal with the issue of reducing water losses. Equipment includes measuring equipment (flow and pressure meters) and other devices for searching for water losses (correlator, geophone, etc.).
- d) irrationally high pressures in the water supply network in most water supply systems. The average pressure is around 5.0 bar, and the range is from 3.0 to 8.0 bar. World and EU trends indicate rational operating conditions with an average pressure of 3.0 bar.
- e) non-implementation of active leakage control and repair of cracks (defects) that are invisible (leakage takes place below the surface of the field, without flooding on the surface). Current practice shows that only visible defects are removed that result in water flooding onto the surface of the terrain, deterioration of road surfaces, etc.
- f) the age of the system or its individual parts. A significant part of the water supply network is very old, i.e. the design service life of the pipes and accompanying equipment has been exceeded (over 50 years) and it is rational to expect their replacement. In order to achieve long-term sustainable management of water supply systems, the aforementioned practice needs to be changed, that is, the practice of neglecting the regular maintenance of parts of the water supply system (primarily pipelines) should be abandoned.
- g) inappropriate pipe materials and/or their protection.



Water losses most often appear in the form of leaks along the pipeline network (rupture and damage to pipes, joints, plumbing fittings and shaped pieces), which is described as a system failure. In this context, the elimination of water losses implies the elimination of defects, that is, the rehabilitation of the pipeline network and accompanying elements, which represents an additional cost and a negative impact on the financial operations of public suppliers.

According to the explanation of the person responsible in Croatian Waters, the activities that need to be undertaken are the education of expert teams, financing of equipment, financing of measurements, financing of study analyzes of water supply systems, and financing of renovations and reconstructions.

Since 2017, the Ministry and Croatian Waters have been carrying out activities aimed at reducing water losses. Croatian Waters implemented the project Analysis of the state of business of water service providers<sup>13</sup> in the Republic of Croatia - Technical and technological aspects of business, within the framework of which a study<sup>14</sup> and an action plan<sup>15</sup> covering a period of ten years were prepared in September 2017. The study includes a comprehensive analysis of the system and development of improvement proposals that will enable efficient and economically justified management of the systems. Special attention is given to the problem of water losses and their control, especially prevention measures, but also further reduction. In the study, an assessment of investment costs, returns and a time plan of implementation was carried out.

According to the aforementioned study, in the Republic of Croatia there is no unique way of displaying water losses or assessing the technical condition of water supply systems, which is why a well-founded evaluation of the system's operation at the national level is not possible. Since the early 1980s, it has been recognized that the presentation of losses as a percentage of the total water input to the system is not suitable for assessing the operational efficiency of system management from the point of view of actual losses. The problematic nature of displaying losses in percentages is increasingly recognized, and in some countries around the world new standards have been established that would enable better analysis, prioritization, monitoring of efficiency and comparison of water supply systems. IWA (*International Water Association*) methodology is proposed as a method of calculating indicators of success in solving the problem of real losses in water supply systems, i.e. the calculation of the indicator infrastructure leakage index (hereinafter: ILI indicator), which is the ratio of annual amounts of real losses and unavoidable real losses. In the action plan, the state of water supply systems is assessed according to the ILI indicator. Out of 132 public suppliers, 18 of them are classified in group D with an ILI indicator of 8 or more (very inefficient use of resources, loss reduction programs are necessary and should be a priority), and 20 are classified in group C with an ILI indicator of 4 to 8 (weak control of losses, can only be tolerated if water is cheaper and abundant, even in that case the size and nature of losses should be analyzed and efforts to reduce losses should be increased). It is stated that the application of correct indicators, i.e. methodology, is of crucial importance for the effective implementation of the Loss Reduction Program, as it ensures the conditions for the accurate calculation of all details of the water balance and the valorization of the achieved results.

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<sup>13</sup>According to the Law on Water, buildings for public water supply - reservoirs, water intakes (wells, catchments and other intake structures on water bodies), water conditioning devices, water reservoirs, pumping stations, main supply pipelines and the water supply network of pipelines are water utility buildings. According to the Law on Water Services, water utility structures are owned by the public water service provider in the service area, who manages them. Under management are considered the activities of the investor in the construction of municipal water structures, their operation and maintenance, as well as their preservation and use for the purposes for which the municipal water structures serve.

<sup>14</sup>[https://voda.hr/sites/default/files/dokumenti/PUVP3%20-%20OUE%20-%200001\\_1.pdf](https://voda.hr/sites/default/files/dokumenti/PUVP3%20-%20OUE%20-%200001_1.pdf)

<sup>15</sup>[https://voda.hr/sites/default/files/dokumenti/PUVP3%20-%20OUE%20-%200001\\_2.pdf](https://voda.hr/sites/default/files/dokumenti/PUVP3%20-%20OUE%20-%200001_2.pdf)

Furthermore, an assessment of the costs of the proposed activities for the improvement of the public water supply system was carried out. The total value of the investment is estimated at HRK 1,804,353,540.00 for the following activities: installation of flow meters at the water intake, analysis of the water supply system, zoning of the system (DMA zones) for the purpose of monitoring and balancing the system, implementation of the remote monitoring system, balancing the system (pressure regulation), active loss control, remediation of the leak location and reconstruction of individual parts of the network and hubs with frequent ruptures. Investment costs are spread over ten years (2018–2027). A projection of the financial balance of investments and realized savings by reducing water losses, a projection of the reduction of pumped water, losses and an increase in savings over ten years, and a projection of the reduction of the ILI indicator and the unit value of losses within the system was made.

On the basis of the above-mentioned Analysis of the business conditions of water service providers, in December 2017 Croatian Waters, in cooperation with the Ministry, published a Public call for co-financing of the loss reduction program in water supply systems in the Republic of Croatia<sup>16</sup> (hereinafter: the Loss Reduction Program), according to which the financing of the program, projects and activities to reduce water losses in public water supply systems is a priority with the aim of reducing pressure on water bodies and long-term establishment of sustainable management of public water supply systems and unification of business standards of public water service providers. The objectives of the implementation of the Loss Reduction Program are the return of the investment in ten years or less, the reduction of losses to an economically acceptable level, the reduction of the unit value of losses within the system from an average of 0.4 to 0.2 m<sup>3</sup>/h/km (in accordance with German quality standards water supply systems), reduction of the annual total amount of pumped water to about 318,000,000 m<sup>3</sup>, reduction of the amount of non-revenue water from 49.0 % to 25.0 %, reduction of the ILI indicator at the level of the Republic of Croatia from the current average of 5.0 to 3.8 and bringing all public suppliers individually (especially the worse ones) to an appropriate technological level and implementing the reform and consolidating public suppliers into new service areas.

The subject of the public call and co-financing of the implementation of the Loss Reduction Program are four main groups of activities. Measure A includes the creation of project documentation - a conceptual solution with a preliminary feasibility study. Measure B includes the implementation activities of the solutions from the project documentation according to which works are carried out in the water supply system in order to reduce losses and establish their control and management (development of conceptual design of remote monitoring and control, implementation of the remote monitoring and control system, construction of control shafts for flow measurement and pressure with measuring equipment, implementation of a pressure regulation system, active loss control and flow regulation, remediation of the leak location). The last measure under the Loss Reduction Program is C, which includes, if necessary, the reconstruction of sections of water supply pipelines. Measure M refers to the installation of flow meters at all water intakes in the Republic of Croatia. The public invitation is intended for public suppliers of water services for the implementation of the mentioned activities.

The implementation of the Loss Reduction Program began in 2018, and the activities that were financed from 2018 to 2022 mostly related to activities from measures A (analysis of the current state of the water supply system and development of conceptual solutions and feasibility studies) and B (implementation remote monitoring system, pressure regulation system, active control of losses, construction of monitoring wells for flow measurement and others), while a small number of public suppliers financed the reconstruction activities of the water supply system. The share of Croatian Waters in the financing of the program is 80.0 %, and the public supplier of water services 20.0 %.

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<sup>16</sup>[https://voda.hr/sites/default/files/dokumenti/novosti/2022-07/javni\\_poziv\\_-\\_gubici\\_program\\_final\\_-\\_1\\_12\\_2017.pdf](https://voda.hr/sites/default/files/dokumenti/novosti/2022-07/javni_poziv_-_gubici_program_final_-_1_12_2017.pdf)

Table number 7 provides data on realized expenditures of Croatian Waters for the Loss Reduction Program and water losses from 2018 to 2022, according to data from Croatian Waters.

Table number 7

Realized expenses of Croatian Waters for the Loss Reduction Program and water losses from 2018 to 2022

Year	Realized expenses of Croatian Waters for Loss Reduction Program (in HRK)	Water losses (in %)
1	2	3
2018	30,950,000.00	49.0
2019	69,526,000.00	48.6
2020	99,146,000.00	50.9
2021	77,295,000.00	50.3
2022	76,726,000.00	50.9
<b>Total</b>	<b>353,643,000.00</b>	<b>-</b>

It is evident from the above table that although expenditures in the amount of HRK 353,643,000.00 from 2018 to 2022 for Loss Reduction Program were realized, water losses increased from 49.0 % in 2018 to 50.9 % in 2022, that is, there was no reduction in water losses.

According to the explanation of the responsible person of Croatian Waters, it is very necessary for the competent state institutions to finance the Loss Reduction Program, which are generated in significant quantities in all water supply systems, with the aim of establishing long-term sustainable management of water supply systems. Almost all the amount of water that is captured is pushed towards the end users or individual objects of the system (using pumps) with a considerable consumption of electricity, and considerable amounts of water are additionally conditioned to ensure the healthiness of drinking water, which further increases the cost of water supply. Therefore, there is a negative financial impact due to large losses of water within the water supply systems, for which considerable financial resources were previously spent in order to release them into the system in order to supply them to the end users.

During the audit, data from Croatian Waters was analyzed on captured and delivered water quantities and water losses from 2018 to 2022 by public suppliers. The audit determined that seven public suppliers reduced water losses in 2022 compared to 2018 by more than ten percentage points, while 56 of them reduced water losses by up to ten percentage points. A total of 62 public suppliers increased losses in 2022 compared to 2018, of which eight increased water losses by more than ten percentage points.

Table number 8 provides data on the number of public water service providers according to the percentage of water losses from 2018 to 2022, according to data from Croatian Waters.

Table number 8

Number of public water service providers according to the percentage of water losses from 2018 to 2022

Year	Water losses (in %)										Total number of public suppliers <sup>17</sup>
	0	0.1-9.9	10.0-19.9	20.0-29.9	30.0-39.9	40.0-49.9	50.0-59.9	60.0-69.9	70.0-79.9	80.0-89.9	
1	2	3	4	5	6	7	8	9	10	11	12
<b>2018</b>	6	5	11	18	26	21	18	13	9	4	131
<b>2019</b>	5	4	9	22	22	25	15	16	7	6	131
<b>2020</b>	4	2	11	18	26	24	16	14	8	6	129
<b>2021</b>	4	2	11	17	29	20	16	14	9	5	127
<b>2022</b>	3	4	9	18	32	16	17	15	8	5	127

Table number 8 shows that in 2022 a total of 45 public suppliers achieved water losses exceeding 50.0 %, of which five achieved losses above 80.0 % (Vodovod doo, Brinje, Vrelina doo, Vrhovine, JP Komunalac doo, Hrvatska Kostajnica, Komunalno doo, Vrgorac and Komunalac doo, Otočac). Between 20.0 % and 50.0 % losses were achieved by 66 public suppliers, and 16 of them have water losses below 20.0 % (Vodovod doo, Omiš, Vodoopskrba doo, Darda, Komunalije doo, Novalja, Vodovod Pula doo, Pula, Vodoopskrba doo, Hrvatska Dubica, Ponikve voda doo, Krk, Krakom-vodoopskrba i odvodnja doo, Krapina, Vodovod Brač doo, Supetar, Koprivničke vode doo, Koprivnica, Lip-Kom doo, Lipovljani, Vodovod doo, Veliki Grđevac, utility company Dugi otok and Zverinac, doo, Sali, Vodovod Hrvatsko primorje-Južni ogranak doo, Senj. Kraljevac doo, Udbina, Vodovod – Vir doo, Vir, Vode Žumberak doo, Kostanjevac).

The audit determined that Croatian Waters spent around HRK 353 million in the five years of implementation of the Loss Reduction Program, while water losses at the national level increased. Croatian Waters has not established the indicators on the basis of which they monitor the results of the implementation of the Loss Reduction Program (for example, the indicators on the basis of which the projections of the financial balance of investments and realized savings by reducing water losses, projections of the reduction of pumped water, losses and increase in savings and projections of the reduction of indicators and actual losses). According to the explanation of the responsible person of Croatian Waters, public suppliers have the obligation to report to Croatian Waters on the performed works on a monthly basis, but specific indicators have not been officially defined.

***The State Audit Office recommends that Croatian Waters establish indicators on the basis of which the implementation of the Loss Reduction Program in water supply systems would be monitored and the achievement of goals, that is, the effectiveness of the implementation of measures from the Program, evaluated. The above could be used for better analysis, prioritization of funding, monitoring of the effectiveness of the implementation of water loss reduction projects and comparison of water supply systems, especially with emphasis on good practice in the implementation of water loss reduction at individual public suppliers.***

<sup>17</sup>Out of a total of 131 public suppliers of water services at the end of 2022, one is a private concessionaire (Zagrebačke otpadne vode doo), while the rest are public suppliers of water services (public capital).

The obligation to assess the level of water losses in public water supply systems for public suppliers whose daily delivery amounts to at least 10,000 m<sup>3</sup> or who supply at least 50,000 people using the ILI method is established by the Law on Amendments to the Law on Water (in force from May 4, 2023).

Public suppliers are obliged to submit the above estimate for the period from January 1, 2024 to November 30, 2025 to Croatian Waters by December 12, 2025, and Croatian Waters prepares a unified estimate of the level of losses for the territory of the Republic of Croatia and submits it to the European Commission by January 12 in 2026.

Croatian Waters is obliged to adopt an action plan that determines measures to reduce losses and submit it to the European Commission within two years of the adoption of the European Commission's act that determines the threshold of acceptable losses. The provisions of the Directive on the quality of water intended for human consumption were transposed into the Croatian legislation by the said Act. According to the explanation of the responsible person in the Ministry, the application of the ILI methodology is also encouraged through the national legislation by the Regulation on the amount of the fee for the use of water (Official Gazette 82/10, 83/12, 10/14, 32/20 and 140/22), which prescribes the method calculation of fees for the use of water charged by public suppliers. The fee calculation is based on the maintenance of the water balance, the calculation of unavoidable water losses and the calculation of the OR indicator in accordance with the Annex to the Regulation.

In order to encourage public suppliers to make more rational use of the water they capture and to more efficiently manage public water supply systems, the Regulation on Amendments and Supplements to the Regulation on the Amount of Fees for Water Use (Official Gazette 32/20) was adopted in March 2020. In accordance with Article 4 of the Regulation, the fee for the use of water is charged on the amount of water delivered until December 31, 2022, which provided the opportunity for public suppliers to adapt to the fact that the basis for charging the fee will be the amount of water consumed from January 1, 2023. In December 2022, the Government of the Republic of Croatia adopted the Decree on Amendments to the Decree on the Amount of Fees for Water Use (Official Gazette 140/22), which postponed the application of the new fee collection calculation model until January 1, 2024. The fee is a public benefit that is the income of Croatian Waters, and serves to cover the costs of resources and environmental protection on the basis of billing (the amount of water involved) and the purpose it serves, in accordance with the Water Framework Directive, which calls on member states to "take into account the principle of cost recovery from water services, including the costs of environmental protection and resources" and that the member states will ensure "that the water price policy represents an appropriate incentive for users to use water resources efficiently and thereby contribute to the achievement of the objectives of the Directive".

Measuring the amount of water taken and delivered is the first step towards all other steps aimed at establishing efficient water use. According to the explanation from the Draft Regulation, the obligation to charge a fee for the affected amount of water has been a legal obligation since 2010, and at the request of public suppliers it has been postponed several times, i.e. the basis for calculating the fee is still the delivered amount of water, which represents the difference between the affected amount of water and losses. Amendments to the aforementioned Regulation from 2020 prescribe the use of correction coefficients that reduce the amount of compensation to public suppliers who reduce losses to an acceptable level, i.e. lower than 25.0 %.

The action plan for the installation, management and maintenance of measuring devices at water catchments of public water supply and recording, collection, processing and control of data on the amount of water taken<sup>18</sup> intends to establish universal measurement of water take at all water catchments by September 30, 2022, to enable constant availability of measurement data in real time through the telemetry system and to ensure the application of the same standards in measuring equipment and equipment for the transmission of measured data. The intention is to ensure the charging of resource costs and environmental protection according to credible data on the amount of water take, to ensure the commitment of public suppliers to the goals of loss management, and to provide further encouragement for the efficient use of water for human consumption.

The image below shows an example of a built-in water meter.

Picture number 4

Water meter



Source: Journal Water Management, vol. 31 (2023), no. 244<sup>19</sup>

The audit determined that the universal measurement of water take at all water catchments was not established by September 30, 2022, as provided for in the aforementioned Action Plan. After a public call in 2022, Croatian Waters concluded a contract for installation works with two contractors for the entire territory of the Republic of Croatia for the installation of a total of 656 measuring devices at 487 water intakes. In January 2023, the works of installing measuring devices began, which were delivered and installed from January to September 2023. According to the data of Croatian Waters, on September 6, 2023, the contractors delivered 652, and 593 measuring devices were installed.

Furthermore, in May 2022, Croatian Waters concluded a service contract for the procurement of the Central Platform for the collection, processing, presentation and control of data on water take volumes (hereinafter: CPoZKV platform). According to the Project Terms of Reference from the mentioned contract (also described in the Action Plan), in the Republic of Croatia, the volumetric model for collecting data on the quantities of water delivered through the public water supply system is universal, both in relation to business users and in relation to households.

<sup>18</sup>[https://voda.hr/sites/default/files/dokumenti/novosti/2022-07/akcijski\\_plan\\_za\\_vodomjere.pdf](https://voda.hr/sites/default/files/dokumenti/novosti/2022-07/akcijski_plan_za_vodomjere.pdf)

<sup>19</sup><https://vode.eindigo.net/casopis-hrvatska-vodoprivreda/?pr=iiif.va&id=36553>

The quantities of delivered water are measured at the main water meters, which are the last point in the public water supply system before the user system. However, the measurement of the water take at water catchments of the public water supply (from surface and underground water bodies) is not widespread enough.

There is no measuring equipment on the part of the water catchments or it is non-standard and non-functional, and nowhere is it telemetrically connected to Croatian Waters. The information system in Croatian Waters, which monitors the water balance, relies on data provided by public suppliers, in accordance with existing regulations. This data is often unreliable, arbitrary, subject to subsequent changes and delayed in real time. According to the aforementioned contract, users of the platform will be employees of Croatian Waters and public suppliers. The platform must be open to receive other data from sensors that will be installed at individual water catchments (for example, water level and temperature, measurement of parameters for water quality, operating conditions, etc.). The calculation and monitoring of the collection of fees for the use of water will be done in the water information system. Data on affected quantities collected through the platform will be the basis for calculating the fee.

The audit established that the CPoZKV platform was created and put into operation. However, since not all measuring devices have been installed at water catchments in the Republic of Croatia and measurements are not yet carried out at all water catchments, the data on the water take are not complete, and the mentioned platform is not used in its full functionality.

According to the explanation of the responsible person of the Ministry, in NRRP, OPCC 2014-2020 and from the regular funds of Croatian Waters, funds are provided for water supply projects which, among other things, also solve losses in water supply systems, and this is a condition that needs to be fulfilled through the implementation of these projects, a contribution to climate goals, i.e. reducing losses, as well as proving the energy efficiency of the system (lower consumption of electricity when capturing water). Public suppliers that have large losses and high consumption of water, and have not made significant progress in repairing losses, will pay a higher amount of fees for water use. Furthermore, he explains that through certain agglomeration projects, the establishment of a supervisory and management system and a supervisory and management center is also financed, in terms of construction/reconstruction, i.e. the acquisition of the necessary equipment. In relation to individual water meters, he states that public suppliers are obliged to enact General Conditions for the Delivery of Water Services, which, among other things, prescribe the required standards of water meters and flow meters and their installation and maintenance, as well as the conditions for installing individual water meters in built buildings.

According to the explanation of the responsible person of the Ministry, within the framework of water utility projects approved through NRRP, the reduction of losses by 20.0 % is one of the selection criteria for reconstruction works of the existing network. Strategic drainage projects are financed primarily due to the worse condition, in terms of size and sensitivity of the area. The primary criterion in the case of water supply is to address areas with problematic water quality.

From May 2022, the Ministry and Croatian Waters participate in the project Support for the reduction of water loss within the framework of the reform of the water sector in the Republic of Croatia, which is financed through the Technical Support Instrument of the EU, and is implemented by the World Bank in cooperation with the Main Administration for Support of Structural Reforms (DG Reform) of the European Commission.

The goal of the project is to create a National Action Plan for reducing water losses by the end of 2023, based on which public water service providers will be required to create their own action plans for reducing losses. Implementation is planned from 2024 to 2038, and it is estimated that EUR 1.7 billion is needed to implement the comprehensive plan of measures. In November 2023, the Report for the final draft of the National Loss Reduction Action Plan in the Republic of Croatia was published<sup>20</sup>.

From all of the above, it is evident that water losses in the Republic of Croatia in the amount of 50.0 % can threaten the supply of certain areas in the long term and are not in accordance with Goal 6: Ensure access to drinking water for all, sustainable water management and sanitation for all. It was found that the current calculation of water losses is not precise and does not give a true picture of real losses. A more precise calculation will be possible when the methodology recommended by the International Water Association is in full use and when the new model for calculating the fee for water use in the public water supply for affected water volumes is in use. The Ministry and Croatian Waters undertook activities to establish legislative and institutional preconditions, i.e. a new Regulation on service areas, a Regulation on amendments and additions to the Regulation on the level of fees for water use and the Law on Amendments and amendments to the Law on Water, the installation of measuring devices at water catchments of the public water supply is financed, and the CPoZKV platform is partially established. Financial mechanisms have been established to encourage loss reduction through the Loss Reduction Program, OPCC 2014-2020 and NRRP.

However, although the investments from the mentioned financial packages and sources are still ongoing and the water utility projects have not been completed, no positive progress has been established because water losses have increased from 49.0 % in 2018 to 50.9 % in 2022, the affected amount of water in m<sup>3</sup> increased in 2022 by almost 5.0 % compared to 2018, water losses in m<sup>3</sup> increased by almost 9.0 %, while the amount of water supplied increased by only 1.0 %.

***The State Audit Office recommends the Ministry and Croatian Waters to ensure the effective application of legislative prerequisites in the area of water losses (for example methodologies for the precise calculation of water losses, calculation models for charging fees for the use of water in the public water supply for affected water volumes, implementation of the Regulation on service areas, etc.) and the adoption and implementation of the National Action Plan for the reduction of water losses, in order to reduce the negative impact of water losses, i.e. the capture of unnecessarily large amounts of water in certain areas, which in the long run can lead to a change in the natural biological and hydrological balance, but also to a reduction in capacity of certain springs, which may endanger the water supply of certain areas.***

***It recommends that the Ministry and Croatian Waters continue the activities of encouraging public suppliers of water services to reduce losses by providing financial, administrative, technical, investment and operational assistance, with the aim of reducing water losses at the national level and with the aim of establishing long-term sustainable management of water supply systems at public water service providers.***

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<sup>20</sup>[https://mingor.gov.hr/UserDocsImages//Uprava\\_vodnoga\\_gospodarstva\\_i\\_zast\\_mora//Aktivnost%206\\_NLRAP\\_Konac\\_ni%20Nacrt\\_Studenii%202023.pdf](https://mingor.gov.hr/UserDocsImages//Uprava_vodnoga_gospodarstva_i_zast_mora//Aktivnost%206_NLRAP_Konac_ni%20Nacrt_Studenii%202023.pdf)



#### **d) Connection of the population to public drainage systems and municipal wastewater treatment**

According to the Urban Waste Water Treatment Directive, EU member states are obliged to ensure the collection of wastewater for all agglomerations<sup>21</sup> with more than 2,000 population equivalents (hereinafter: PE). In addition, they are required to ensure that municipal wastewater entering the collection systems undergoes secondary or equivalent treatment before discharge for all agglomerations with more than 2,000 PE. In the Treaty of Accession to the EU, the Republic of Croatia has committed to comply with the aforementioned Directive by December 31, 2018 in agglomerations with more than 15,000 EP, except for certain coastal agglomerations, by December 31, 2020 in agglomerations with more than 10,000 PE whose wastewater is discharged into sensitive areas and in eleven coastal agglomerations and until December 31, 2023 in agglomerations with more than 2,000 PE.

According to the provisions of the Rulebook on wastewater emission limit values, the first stage (I) of treatment is the treatment of municipal wastewater by physical and/or chemical processes that include the deposition of suspended substances or other processes in which the BOD<sub>5</sub> of the incoming wastewater is reduced by at least 20.0 % before discharge, and the total suspended substances of incoming wastewater by at least 50.0 %. The second stage (II) of treatment is the treatment of municipal wastewater by a procedure that generally includes biological treatment with secondary sedimentation and/or other procedures that achieve the requirements from Table 2 of Annex 1 of this Ordinance. The third stage (III) of treatment is a stricter treatment of municipal wastewater with a process which, in addition to the second stage of treatment, achieves the requirements for and/or phosphorus and/or nitrogen from Table 2.a, Annex 1 of this Ordinance, and/or microbiological indicators and/or other pollutants in order to protect sensitive areas, i.e. to achieve water protection goals.

According to Eurostat data<sup>22</sup> for 2021, the Republic of Croatia is at the bottom of the ranking of EU member states with 57.4 % of the population connected to the public municipal wastewater drainage system.

Graphic representation number 3 shows the share of the population connected to the municipal wastewater collection system in EU member states in 2021, according to Eurostat data.

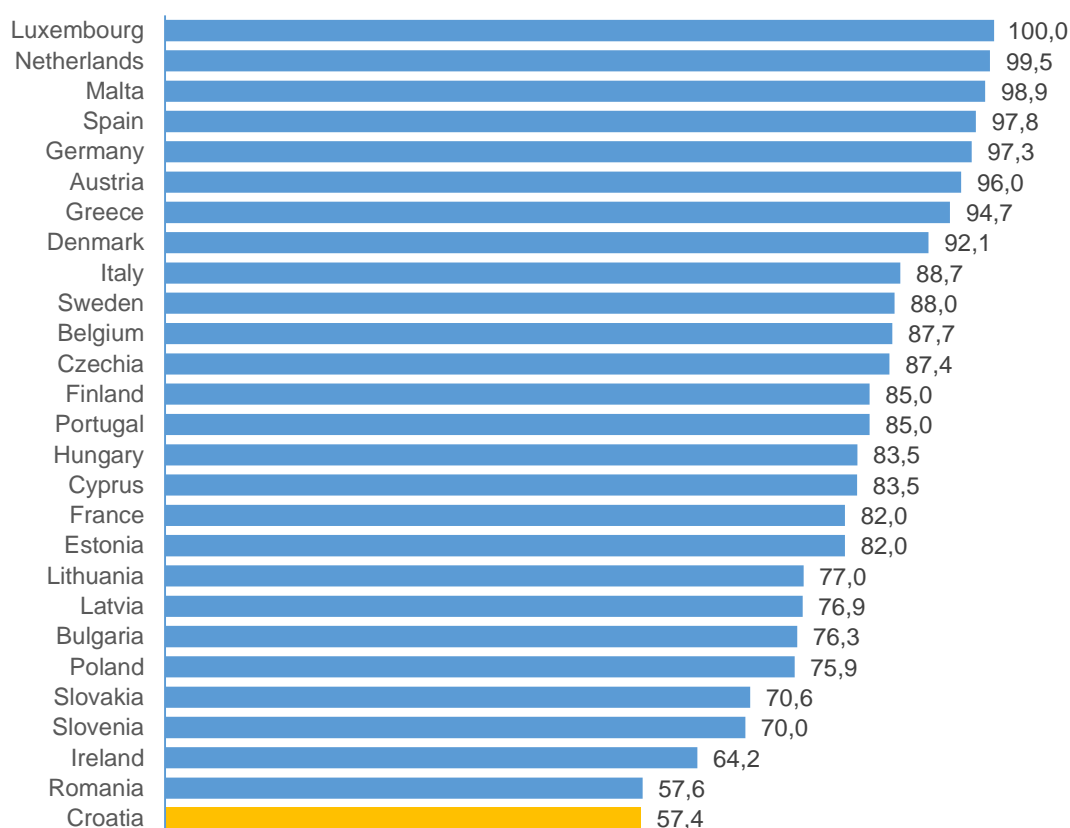
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<sup>21</sup>According to the Law on Water, an agglomeration is an area where the population and/or economic activities are sufficiently concentrated that municipal wastewater can be collected and transported to a wastewater treatment plant or to the final discharge point.

<sup>22</sup>[https://ec.europa.eu/eurostat/databrowser/view/ENV\\_WW\\_CON/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/ENV_WW_CON/default/table?lang=en)

## Graphic representation number 3

## Share of the population connected to the municipal wastewater collection system in EU member states in 2021



Source: State Audit Office (according to Eurostat data)

\* data for Germany is for 2019, Bulgaria, Cyprus, France, Italy, Portugal, Spain and Sweden for 2020.

According to the Multi-Year Construction Program, the goals related to the improvement of the public drainage service derive from the Water Management Strategy, the Treaty on Accession to the EU, and the need to comply with the Urban Waste Water Treatment Directive. The goals of achieving public drainage standards refer exclusively to agglomerations with a load greater than 2,000 PE, for which the goal is more than 98.0 % connection to public drainage systems.

The indicator "connection to the public drainage system" is monitored in relation to the assessment of the existing state of compliance, and a compliant system is considered to be a system where more than 98.0 % of the load is connected to the required level of treatment, while a conditionally compliant system is considered to be a system where connected between 90.0 % and 98.0 %. According to the Second Report on the Implementation of the Multi-Year Construction Program from July 2023, the achieved value of the "connection to the public drainage system" indicator, which measures overall full compliance with the requirements of the Urban Waste Water Treatment Directive, is extremely low and at the level of the Republic of Croatia is around 5.0 %. Namely, in as many as 34 service areas, compliance is 0.0 %. The most favorable situation is in service areas 37 and 23, where 71.2 % and 52.9 % of the population are connected to the appropriate system and the appropriate level of wastewater treatment.

Table number 9 provides data on the compliance of agglomerations with regard to the degree of connection to public drainage systems in 2020, according to data from Croatian Waters.

Table number 9

Compliance of agglomerations with more than 2,000 EP with regard to the degree of connection to public drainage systems in 2020

	Number of agglomerations with more than 2,000 PE	Total load of agglomerations (PE)	Total load connected to public drainage systems (PE)	Load connection (%)	Number of inhabitants of agglomerations with more than 2,000 PE	Population connected to public drainage systems	Connection of the population (%)
	1	2	3	4	5	6	7
Harmonized	14	224 128	222 786	100.0	42 241	41 628	99.0
Conditionally compliant	23	1 219 780	1 142 430	94.0	900 773	833 908	93.0
Mismatched	208	3 212 533	1 957 584	61.0	2 191 670	1 318 703	60.0
<b>In total</b>	<b>245</b>	<b>4 656 441</b>	<b>3 322 800</b>	<b>71.0</b>	<b>3 134 684</b>	<b>2 194 239</b>	<b>70.0</b>

According to the data of Croatian Waters for 2020, which can be seen from table number 9, in terms of the compliance of load collection with public drainage systems (percentage of the population connected to the public drainage system), out of 245 agglomerations with more than 2,000 PE, 14 of them are compliant with the Urban Waste Water Treatment Directive, 23 of them are conditionally harmonized, and 208 agglomerations are not harmonized.

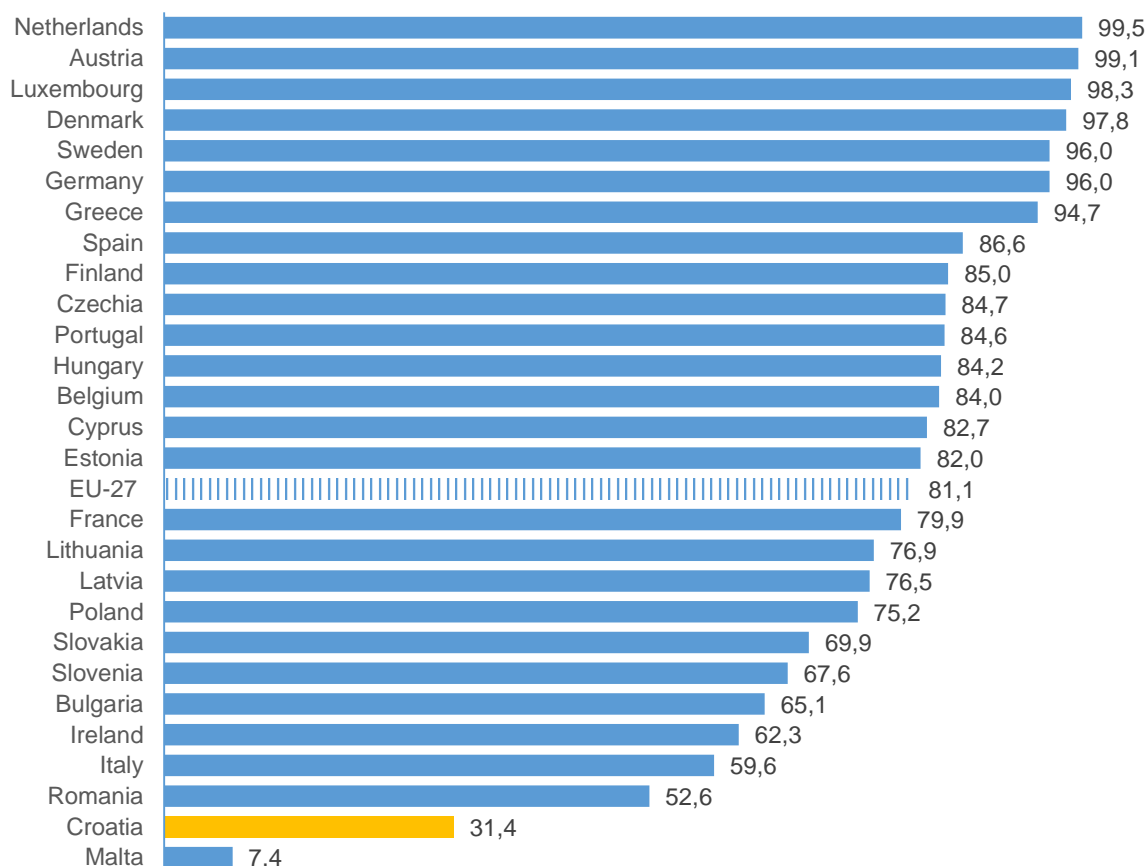
In the Multi-Year Construction Program, the indicator of the degree of load connection was assessed as high risk, with the explanation that achieving the goal is technically-technologically and financially very demanding, which significantly slows down the implementation of the program and significantly affects business operations and the affordability of water prices. According to Eurostat data, in 2021, in the Republic of Croatia, 31.4 % of the population was connected to at least second-stage wastewater treatment, which is a decrease of 5.5 percentage points compared to 2020. For the EU-27 level, this share is 81.1 % for 2020, while for 2021 it has not been announced. Only Malta has a smaller share than the Republic of Croatia, 7.4 %.

According to data from Croatian Waters, 46.8 % of the population is connected to the wastewater treatment system, of which 15.4 % to first-stage treatment, 26.4 % to second-stage treatment and 5.0 % to third-stage treatment.

Graphic representation number 4 shows the share of the population connected to at least secondary wastewater treatment in EU member states in 2021, according to Eurostat data.

## Graphic representation number 4

## Share of the population connected to at least secondary wastewater treatment in EU member states in 2021



Source: State Audit Office (according to Eurostat data)

\* data for Italy are for 2015, Germany for 2016, Portugal for 2017, Spain and Cyprus for 2018, Bulgaria, France, Luxembourg and EU-27 for 2020.

Table number 10 provides data on the number of harmonized agglomerations according to the size of the agglomeration, river basins and deadlines for achieving compliance in 2020, according to data from Croatian Waters.

## Table number 10

The number of harmonized agglomerations according to the size of the agglomeration, river basins and deadlines for achieving compliance in 2020

Ordinal number		The total number of aggl.	Agglomeration size (PE)				
			2 000 – 10,000	10,000 – 15,000	15,000 – 50,000	50,000 – 150,000	>150,000
	1	2 (3 + 4 + 5 + 6 + 7)	3	4	5	6	7
<b>Danube River Basin – sensitive</b>							
1.	required level of treatment		Second level	Third level	Third level	Third level	Third level
2.	compliance deadline		31 December 2023	31 December 2020	31 December 2018	31 December 2018	31 December 2018
3.	number of agglomerations	121	84	10	18	8	1
4.	number of harmonized agglomerations	26	19	1	2	4	0

Adriatic River Basin – sensitive							
5.	required level of treatment		Second level / appropriate	Third level	Third level	Third level	Third level
6.	compliance deadline		31 December 2023	31 December 2020	31 December 2018	31 December 2018	31 December 2018
7.	number of agglomerations	32	20	2	8	2	0
8.	number of harmonized agglomerations	10	10	0	0	0	0
Adriatic River Basin – normal							
9.	required level of treatment		Appropriate	Second level	Second level	Second level	Second level
10.	compliance deadline		31 December 2023	31 December 2023	31 December 2018 / 31 December 2020*	31 December 2018	31 December 2018
11.	number of agglomerations	92	54	13	17	6	2
12.	number of harmonized agglomerations	7	5	0	1	1	0
<b>Total number of agglomerations</b>		<b>245</b>	<b>158</b>	<b>25</b>	<b>43</b>	<b>16</b>	<b>3</b>
<b>Total number of harmonized agglomerations</b>		<b>43</b>	<b>34</b>	<b>1</b>	<b>3</b>	<b>5</b>	<b>0</b>

\*coastal agglomerations with a significant share of tourism (>30.0 %) in the total

According to the data of Croatian Waters for 2020 (the last available reporting year), which can be seen from table number 10, 43 agglomerations out of 245 of them with more than 2,000 PE achieved compliance with the Urban Waste Water Treatment Directive with regard to the required level of treatment. Compliance was not achieved by any of the three agglomerations with more than 150,000 PE, and five of the 16 agglomerations with more than 50,000 PE and three of the 43 agglomerations with more than 15,000 PE were aligned.

According to data published on the WISE information system website<sup>23</sup>, in the Republic of Croatia, 7.0 % of wastewater in agglomerations larger than 2,000 PE is treated in accordance with EU legislation (for comparison, at the EU level, this share is 82.0 %). According to the Working Document of the Commission's Environmental Activities Review 2022 - Report for Croatia<sup>24</sup>, compliance with the Urban Waste Water Treatment Directive is significantly lower than the EU average: 93.0 % of municipal wastewater is not collected and/or does not meet the requirements for biological treatment and greater efforts are needed to achieve compliance.

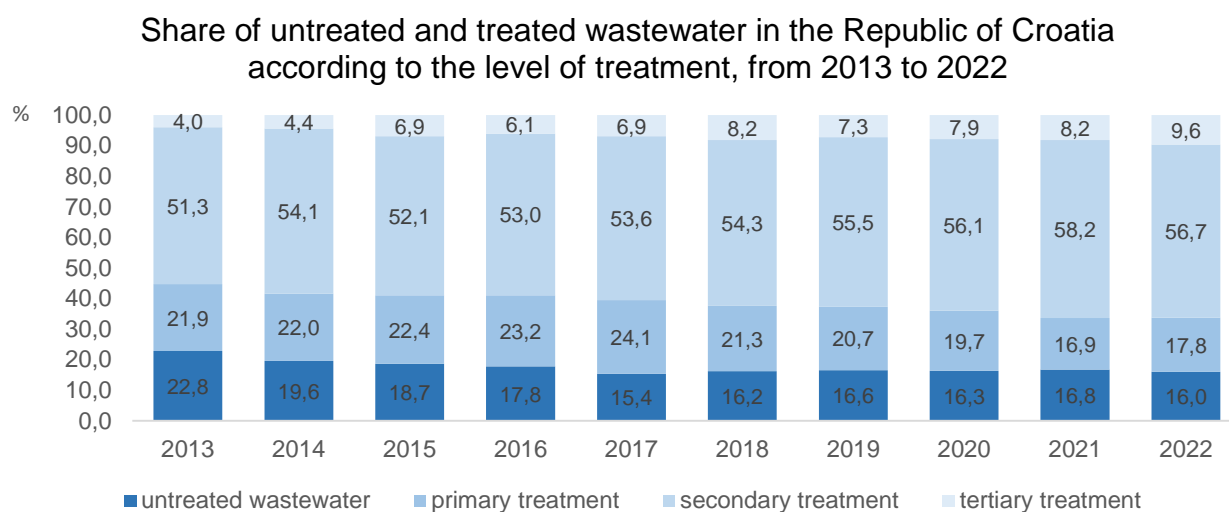
According to the Multi-Year Construction Program, the deadlines for achieving compliance with the Directive on the quality of water intended for human consumption and the Urban Waste Water Treatment Directive, which the Republic of Croatia presented in the framework of the Joint Meeting with the European Commission held on November 5 and 6, 2019, have been extended. A delay is expected in achieving compliance with the Urban Waste Water Treatment Directive in two to seven years compared to the deadlines set out in the Agreement on the Accession of the Republic of Croatia to the EU, with the latest expected completion date for the construction of the municipal wastewater collection system and municipal wastewater treatment plant being 2025.

<sup>23</sup><https://water.europa.eu/freshwater/about/wise-freshwater>

<sup>24</sup><https://eur-lex.europa.eu/legal-content/HR/TXT/HTML/?uri=SWD:2022:258:FIN&from=EN>

Graphic representation number 5 shows the share of untreated and treated wastewater in the Republic of Croatia according to the level of treatment, from 2013 to 2022, according to data published on the website of the Croatian Bureau of Statistics.

Graphic representation number 5



Source: State Audit Office (data from the Croatian Bureau of Statistics)

From graphic representation number 5, it is evident that the share of untreated wastewater in the period from 2013 to 2022 decreased, but still a significant share (16.0 % in 2022) of collected wastewater is released into the environment without treatment. The share of third-stage treatment of 9.6 % is the highest in 2022. However, the share of tertiary treatment in the total wastewater collected is very low, especially if it is taken into account that, according to the Multi-Year Construction Program, the largest number of agglomerations larger than 2,000 PE discharge (untreated wastewater into waterways (all land surface waters in the Republic of Croatia are declared sensitive according to the Decision on Designation of Sensitive Areas (Official Gazette 79/22)), and then into the part of the sea that is not declared sensitive, while nine agglomerations larger than 2,000 PE discharge wastewater into groundwater, which is allowed only in exceptional cases.

Only 45 out of 105 constructed municipal wastewater treatment facilities in agglomerations larger than 2,000 PE are aligned with the requirements of the Urban Waste Water Treatment Directive, that is, they have the required or higher level of treatment, and only 9.0 % of the total load of these agglomerations is treated at devices with the required treatment levels. 202 or 82.4 % of agglomerations larger than 2,000 EP are not aligned with regard to the level of treatment, and should be aligned with the Urban Waste Water Treatment Directive by December 31, 2023.

It is evident from the above that in the Republic of Croatia, a significant share of wastewater is not collected and a significant share of collected wastewater is not treated. Approximately 13.6 million m<sup>3</sup> of wastewater is discharged into the environment untreated (57 million m<sup>3</sup> of collected untreated wastewater according to the data of the Croatian Bureau of Statistics and 79 million m<sup>3</sup> of wastewater from individual drainage systems for which there is no information on whether they are treated or not). According to the World Bank report entitled *Croatia: Cost of environmental degradation*<sup>25</sup> from January 2021, the discharge of untreated wastewater can affect human health by reducing the quality of water for drinking and recreation, on economic activities that use water as an input for production, and on the environment by degrading water surfaces and ecosystem.

<sup>25</sup><https://documents1.worldbank.org/curated/en/929211613036393029/pdf/Croatia-Cost-of-Environmental-Degradation.pdf>

Table number 11 shows the number of municipal wastewater treatment plants in the Republic of Croatia according to the level of treatment from 2018 to 2022, according to data from Croatian Waters. The data refer to all agglomerations, regardless of the size of the agglomeration.

Table number 11

Number of wastewater treatment plants in the Republic of Croatia according to the level of treatment from 2018 to 2022

Level of treatment	2018	2019	2020	2021	2022
Previous	41	41	42	42	42
First degree	21	21	21	21	21
Second degree	99	100	100	102	103
Third degree	23	24	26	26	32
<b>In total</b>	<b>184</b>	<b>186</b>	<b>189</b>	<b>191</b>	<b>198</b>

From table number 11, it is evident that from 2018 to 2022, the number of wastewater treatment plants is in constant slight increase, which is mostly contributed by the increase in the number of tertiary treatment plants, nine of which were built in the mentioned period. Of the 198 wastewater treatment plants in 2022, 112 of them were built in agglomerations larger than 2,000 PE, which is seven plants more than in 2018.

According to the Second Report on the implementation of the Multi-Year Construction Program, about 17.0 % of agglomerations in the Republic of Croatia has the required, or "necessary level of treatment". As many as 14 service areas do not have a single agglomeration with the required level of treatment. The most favorable situation is in service area 29, where all three agglomerations are fully harmonized with regard to the required level of treatment, but in that area it is necessary to invest in municipal wastewater collection systems. In five service areas (3, 4, 7, 16 and 22), over 50.0 % of the agglomerations has the required level of treatment.

The audit established that some progress has been made in increasing the population's connection to public drainage systems and wastewater treatment facilities, as well as in the number of wastewater treatment facilities. However, progress is slow and it is certain that the Republic of Croatia will not comply with the Urban Waste Water Treatment Directive within the deadline.

***The State Audit Office recommends that the Ministry and Croatian Waters intensify activities on the implementation of water utility projects in order to improve water quality by the end of 2030 in such a way as to reduce pollution and halve the share of untreated wastewater, i.e. to achieve progress towards the achievement of the UN sub-goal 6.3. Improving water quality, and to fulfill the obligations assumed from the Urban Waste Water Treatment Directive.***

### e) Individual drainage systems

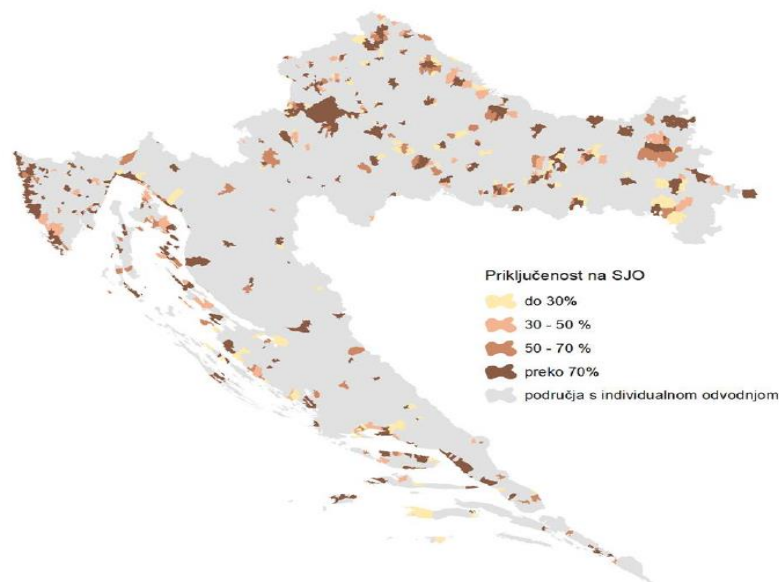
According to the Law on Water, an individual drainage system is a technically and technologically connected set of buildings, pipes and equipment for drainage and treatment of sanitary wastewater from one or more households and/or one or more business premises, which are not connected to the public drainage system. Individual drainage systems in particular include drainage channels, collection pits, small sanitary devices, industrial wastewater treatment devices, outfalls, household pipes, etc.

According to the Multi-Year Construction Program, the average degree of connection to public drainage systems of agglomerations larger than 2,000 PE is 68.0 %. According to the available and incomplete data collected from public suppliers for the purposes of preparing a report on the state of implementation of the Urban Waste Water Treatment Directive until the end of 2018, in agglomerations with a load of more than 2,000 PE, approximately 21.0 % of the total load is additionally handled by some type of individual drainage system. About 85.0 % of the applied solutions refer to septic tanks, about 12.0 % to collection pits and slightly less than 2.0 % to small biological devices, plant devices, etc. The share of load collected by septic tanks in the total load of agglomerations is above 2 000 PE is about 18.0 %, and in collection pits about 2.5 %.

The picture below shows the level of connection to public drainage systems in the Republic of Croatia, according to Multi-Year Construction Program.

Picture number 5

Level of connection to public drainage systems  
in the Republic of Croatia



Source: Multi-Year Construction Program

In the Multi-Year Construction Program, it is stated that the Republic of Croatia has not yet fully implemented all planned activities in the field of establishing a fully regulated system of monitoring and supervision of individual drainage systems, which is inextricably linked to the reform of the water utility sector, which is why the current level of detailed knowledge about the complete status of individual drainage systems is still unreliable. In a significant area of the Republic of Croatia, activities, more precise analysis and planning of the scope and load of individual agglomerations, which are carried out as part of project preparation, have not yet been carried out.



Therefore, it is not possible to provide a complete and reliable overview of the state of individual drainage systems in agglomerations. It is stated that the adoption of the Law on Water and the Law on Water Services created prerequisites for a comprehensive solution to the issue of individual drainage systems and the requirements set forth in the Urban Waste Water Treatment Directive.

In the Law on Water, the term individual drainage systems is defined and it is determined that the decision on wastewater drainage, which regulates drainage in the area of a certain agglomeration, prescribes their application in more detail, as well as the obligation to connect to the public drainage system in accordance with the general conditions for the delivery of water services.

Furthermore, the supervision of the implementation of decisions on wastewater drainage is regulated, as well as the method of controlling the maintenance of individual drainage systems. The law on water services stipulates the obligation to connect to buildings for public drainage within a year from the notification of the water service provider, which should contribute to reducing the share of individual drainage systems.

It is further stated that the Republic of Croatia is carrying out water utility reform activities in order to unify the area of water service provision, which will contribute to the technical strengthening and more efficient operation of public suppliers, and thus to better implementation of regulations. Furthermore, the plan is to establish a regulatory framework for keeping a register of individual drainage systems that public suppliers would keep in a unique way, which is the basis for collecting data with greater reliability and for a more reliable assessment of the fulfillment of goals for individual drainage systems. Within the framework of more precise planning procedures including the loads of individual agglomerations that are carried out as part of the preparation of projects, among other things, the real possibility of developing buildings for public drainage is considered, whereby when defining the conceptual solution of drainage, the areas of application of individual drainage systems and possible technical solutions are determined, taking into account local specificities of the area.

After the establishment of the register of individual drainage systems and the collection of complete data, the intention is to establish unique criteria at the national level in order to standardize the approach to the application of individual drainage systems and their classification as appropriate systems. The mentioned criteria will be developed in accordance with the guidelines established in the framework of the revision of the Urban Waste Water Treatment Directive. It is stated that the introduction of registers of individual systems will significantly improve the system of collection, quality and reliability of data on individual treatment systems at the national level, which is a prerequisite for a reliable assessment of individual systems in agglomerations in the Republic of Croatia.

***The State Audit Office recommends that the Ministry undertake activities to establish a framework for maintaining the register of individual drainage systems, as provided for in the Multi-Year Construction Program, which would be managed by public water service providers in a unique manner, which would also improve the collection system, quality and reliability of data on municipal wastewater treatment in the Republic of Croatia.***

According to data from Croatian Waters for 2021, 57.4 % of the population was connected to public water supply systems, and 42.6 % to individual drainage systems. For only 3.5 % of the population, wastewater is transported from individual tanks to wastewater treatment plants.

The images below show examples of individual drainage systems.

Picture number 6

An example of an individual drainage system with bio-treatment built in 2023 for the needs of a family home on a Croatian island.



Picture number 7

An example of an individual drainage system for the needs of a family home in the continental part of the Republic of Croatia, built 45 years ago with an outlet into the ground.



Source: State Audit Office

According to the explanation of the responsible person of Croatian Waters, when showing the share of the population that has a connection to public drainage systems in agglomerations, the data of public suppliers collected using the online application of Croatian Waters is used. The public supplier provides data on the number of connected inhabitants of the settlement within the agglomeration, expressed as load in PE, as well as data on individual systems for the population that is not connected to the public drainage system. No data is collected for the population living in settlements outside the agglomerations, but it is assumed that they have some kind of individual solution for collecting wastewater. It is estimated that residents who have individual drainage systems generate about 79 million m<sup>3</sup> of wastewater per year.

The explanation also states that providing data is, among other things, necessary to prove compliance with the requirements of the Urban Waste Water Treatment Directive for cases that the European Commission requires a detailed explanation, as well as in any future proceedings before the competent court initiated due to non-compliance with obligations arising from EU regulations. The legal framework must prescribe the obligation to keep a register of individual systems, define the entities involved and their obligations, the scope of necessary data, obligations and the dynamics of data delivery and/or input into the national system (if the Republic of Croatia decides on this solution), etc.

After the establishment of the register, after the collection of field data, which is controlled by the competent entities, it is necessary to carry out their analysis at the national level, which will be the basis for defining criteria on the acceptability of certain technological solutions of treatment and discharge for their qualification as appropriate, respecting the local specificities of the area.

It is also necessary to carry out an analysis of the way they are financed in terms of procurement, operation and maintenance, including the waste transport system, in order to establish a long-term sustainable system in which their users would not be placed in an unequal position in relation to other users whose wastewater is collected through the public drainage system.

According to the explanation of the responsible person of the Ministry, the population that is not connected to the public drainage system collects its wastewater in individual systems and empties it through authorized concessionaires or discharges its municipal wastewater into the water environment without any pre-treatment, which is the worst option. By investing in the development of the public drainage system, which is co-financed through EU projects, the share of individual drainage systems and the discharge of municipal wastewater without pretreatment will gradually decrease.

According to the Law on Water, the owners or other legal holders of individual drainage systems are obliged to empty them through public suppliers or concessionaires and under the supervision of a water warden. The Ministry reasons that there is no legal obligation to keep a register of individual systems, however, in order to implement effective supervision of water management, each public supplier should keep its own register of individual drainage systems in its territory. Water management is regulated by the Law on Water Services. Water stewards are employees of public suppliers and supervise the connection of real estate to water utility structures, as well as the discharge of wastewater from individual drainage systems in the field at the users' premises. Public suppliers have established their own register of customers of water services, while the register of individual drainage systems has yet to be established in order for water wardens to be able to effectively carry out supervision in the field.

The audit determined that there is a significant share of 42.6 % of the population connected to individual drainage systems, which are estimated to generate around 79 million m<sup>3</sup> of wastewater per year, of which only 3.5 % of wastewater is transported to wastewater treatment plants through authorized concessionaires. Also, it is not known how many of the population that are not connected to the public drainage system treat their wastewater, and how many discharge it into the water environment without any pre-treatment.

***The State Audit Office recommends to the Ministry to encourage public suppliers of water services in their area, in cooperation with the local government units in whose area they perform their activities, to supervise the connection of real estate to water utility structures, as well as the discharge of municipal wastewater from individual drainage systems in the field, at water service users and whether legal and natural persons discharge wastewater into the public drainage system, through water stewards or in another appropriate way. The above is necessary considering that there is a significant share of the population that is connected to individual drainage systems, and for which a very small share of wastewater is transported to waste water treatment facilities, that it is not known whether they treat their wastewater or whether and to what extent they release the wastewater into the environment without any pretreatment and considering that these are estimates and there are no reliable data.***

#### **f) Reduction of water load by discharging untreated or insufficiently treated wastewater in order to achieve good water status**

The Water Framework Directive, which was transposed into Croatian legislation through the Law on Water, establishes rules for preventing the deterioration of the state of EU water bodies and achieving a good state of rivers, lakes and groundwater. The Directive is implemented through the River Basin Management Plan.

During the audit, in June 2023, the River Basin Management Plan until 2027 was adopted for the period 2022-2027, and it was prepared by Croatian Waters in cooperation with many scientific and professional institutions and specialized companies that prepared professional documents, starting from the second River Basin Management Plan (2016–2021), strategic guidelines from the Water Management Strategy and conclusions from four bilateral meetings of representatives of Croatian competent institutions with representatives of the European Commission. Intercalibration<sup>26</sup> of the classification systems of inland surface waters, transitional waters and coastal waters was carried out, which was completed at the end of 2021 through the cooperation of Croatian biologists, with reviewers appointed by the European Commission.

According to the Law on Water, the River Basin Management Plan contains a list of quality objectives for surface waters, including coastal waters, waters of the territorial sea and groundwater, including protected areas, and deadlines for achieving the objectives. According to the River Basin Management Plan until 2027, the environmental goals of achieving at least a good status, i.e. ensuring the condition that the water status does not deteriorate for all water bodies of surface and underground water, must be achieved by 2027. In the event that this is not possible, it is necessary start the exemption procedure from achieving good water status, which can be temporary or permanent.

Water protection is achieved, among other things, by monitoring the state of water quality and sources of pollution, the construction and management of wastewater drainage and treatment facilities, and other measures aimed at preserving and improving the quality and intended use of water. *Drainage and wastewater treatment facilities are described under the title of this report Implementation and financing of public water supply, drainage and wastewater treatment projects in connection with the subheading Connection of the population to public drainage systems and municipal wastewater treatment.*

Supervision over the state of surface and coastal waters and underground waters is carried out by systematic monitoring of the water state (hereinafter: monitoring). The goals of monitoring are to determine long-term changes (surveillance monitoring), to determine changes due to the implementation of measures in areas that have been determined not to meet the conditions for good condition (operational monitoring) and to determine unknown relationships (research monitoring).

The monitoring is carried out by the Josip Juraj Strossmayer Water Institute according to the monitoring plan, which is carried out in accordance with the Regulation on water quality standards (Official Gazette 96/19, 20/23 and 50/23 - correction).

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<sup>26</sup>According to the River Basin Management Plan until 2027, the Water Framework Directive stipulates the harmonization of the national boundaries of the classes of very good and good water status and good and moderate status with normative definitions and comparison with the national boundaries of other member countries through the intercalibration procedure. The goal of the intercalibration procedure is to achieve consistency and comparability of the results of the assessment of the monitoring system and the assessment of the ecological state for the biological elements of water quality.

The Decree on the Water Quality Standard prescribes the water quality standard for surface waters, including coastal waters and waters of the territorial sea, as well as underground waters. The aforementioned Regulation and accompanying methodological manuals (Methodology of sampling, laboratory analyzes and determination of ecological quality ratio of biological quality elements and Methodology of monitoring and evaluation of hydromorphological indicators) prescribe the criteria and procedure for monitoring and evaluating the ecological state of surface waters.

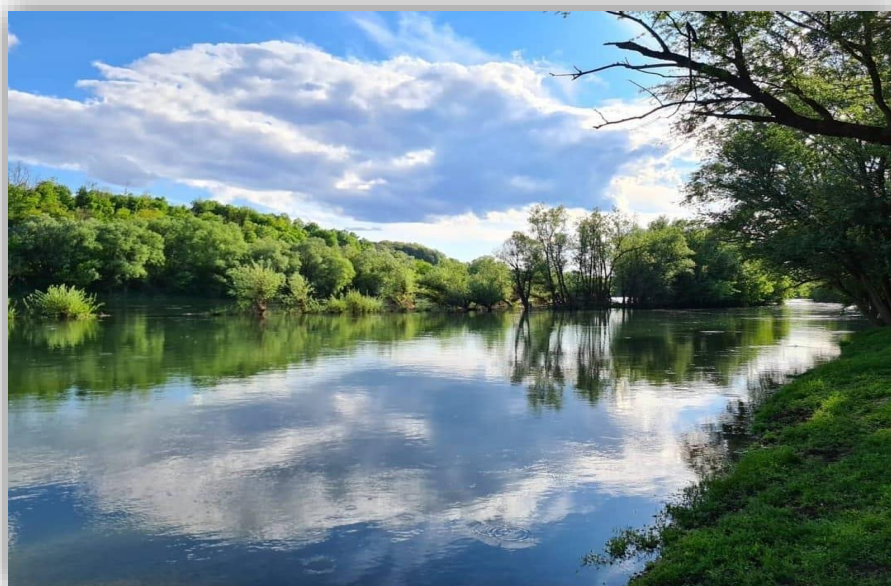
In February 2023, the aforementioned Regulation was amended in accordance with the latest results of the intercalibration procedure, and an assessment was made on the state of water bodies that will be valid in the planning period 2022-2027. The amendments to the Regulation set new environmental goals. In the Regulation, the limit values of the categories of ecological state and ecological potential are given by individual indicators and elements of quality by types of water bodies and categories of ecological state.

The Republic of Croatia is divided into two river basins, the Danube River Basin and the Adriatic River Basin. Each river basin is divided into smaller units called water bodies. The state of water is determined at the level of water bodies, which represent the basic units for analyzing the characteristics and management of water quality.

The picture below shows the river Kupa.

Picture number 8

Kupa River



Source: State Audit Office

Based on the results of the monitoring, an assessment of its condition is made for each water body individually and it is classified into the appropriate category determined by the Regulation on Water Quality Standards, and with an impact analysis, the risk that a certain water body will not achieve the objectives of protecting the water environment, i.e. that it will not maintain the state in accordance with objectives of water environment protection. The classification of water bodies is a component of the River Basin Management Plan.

Croatian Waters created the Register of Water Bodies, according to which a total of 3,487 rivers, 80 lakes, 77 coastal water bodies and 34 transitional water bodies were identified. According to the River Basin Management Plan until 2027, there is an obligation to report to the European Commission for about 40.0 % of certain water bodies. These are rivers with a catchment area of more than 10 km<sup>2</sup> and lakes with an area of more than 0.5 km<sup>2</sup>, which includes international water bodies regardless of their surface area and all water bodies of coastal, transitional waters and territorial seas.

The condition of water bodies is assessed according to the criteria of the Water Framework Directive, that is, the ecological and chemical condition of water bodies is assessed, and the overall condition of the water body is determined according to the worse of the ecological or chemical condition. Biological, physical-chemical, chemical and hydromorphological elements of quality are evaluated for the ecological condition. Individual priority and priority hazardous substances are assessed for chemical status. The evaluation principle is "*one out, all out*", that is, if one of the indicators does not meet the environmental goals, then it is concluded that the overall situation does not meet the environmental goals.

Table number 12 shows the total number of water bodies of surface water, the number of water bodies for which there is a reporting obligation, and the number of water bodies that have met environmental goals by type of water body, according to the River Basin Management Plan until 2027 and data from Croatian Waters.

Table number 12

The total number of water bodies, the number of surface water bodies for which there is a reporting obligation, and the number of water bodies that have met the environmental objectives according to the type of water body

Type of water body	Surface water bodies			Water bodies for which there is a reporting obligation				
	Total number	Met environmental goals		Total number	Met environmental goals			
		Number	Share in %		Ecological condition/potential	Chemical state	Total condition	share in %
	1	2	3	4	5	6	7	8
rivers	3 487	1 797	51.5	1 362	528	1 201	487	35.8
lakes	80	9	11.3	17	8	11	5	29.4
transition waters	34	0	0.0	34	24	1	0	0.0
coastal waters	77	0	0.0	77	54	77	0	0.0
artificial	647	22	3,4	231	22	208	15	6.5
physically significantly changed by human activity	502	67	13.3	256	17	169	14	5.5

Table number 12 shows that the environmental goals have been met at 51.5 % of the total number of rivers. If we look at the water bodies for which there is a reporting obligation, only 35.8 % of the rivers meet the environmental goals.

According to the River Basin Management Plan until 2027, in the Adriatic River Basin, about 66.0 % of rivers meet the environmental goals, and in the Danube River Basin, about 42.0 % meet them. Out of a total of 80 lakes, nine of them or 11.3 % meet the environmental goals, while almost 30.0 % of the water bodies for which there is a reporting obligation meet the environmental goals.

The environmental objectives were not achieved on 1,690 rivers, on 71 lakes, and not a single water body of transitional and coastal waters. These results are the result of the *"one out, all out"* method of determining the overall state of waters prescribed by the Water Framework Directive. For all water bodies where the environmental goals are not met, mandatory implementation of measures, i.e. load reduction activities, is prescribed in order to achieve them. Of the 33 groundwater bodies, 30 or 90.9 % meet the environmental objectives. In relation to the previous River Basin Management Plan, the assessment of the state of groundwater was extended to mineral and geothermal groundwater. Out of 18 water bodies, 17 or 94.4 % meet the environmental objectives.

Tests of the elements of the assessment of the ecological condition for the preparation of the River Basin Management Plan 2016-2021 were carried out at 343 measuring stations, while for the preparation of the River Basin Management Plan until 2027, the number of measuring stations increased significantly to 544.

According to the explanation of the responsible person of Croatian Waters, the good condition of the waters was not achieved primarily because of the indicators of the ecological condition. As the ecological state of water bodies is evaluated based on three groups of indicators: physicochemical, biological and hydromorphological, according to the results of the analysis it can be concluded that in most cases the environmental goals were not achieved according to the biological indicators of macrophytes and fish. Although half of the water bodies in the Republic of Croatia are not in good condition, Croatian Waters emphasizes that this condition assessment is not solely the result of an increase in human activities, i.e. an increase in water load. In the past period, between the creation of two river basin management plans, there was a significant increase in the scope of monitoring and a change in classification systems (implemented intercalibration procedures), and a better, more precise and reliable insight into the condition of waters / water bodies was obtained.

In order to achieve the objectives of water environment protection determined in accordance with the Regulation on water quality standards, a program of measures for protection of surface waters, including coastal waters and underground waters is drawn up for each river basin, taking into account the results of analyses. The program of measures is a component of the River Basin Management Plan and contains basic, supplementary and additional measures that are implemented in protected areas and in significantly changed water bodies, as well as detailed exceptions for exceptionally permitted discharges into groundwater. The mentioned measures are aimed at solving/reducing certain loads due to which the environmental goals have not been achieved, which is the case with water bodies where the water quality has been lowered by any element of quality below the prescribed standards, which means that such bodies are under significant negative influences. Appropriate measures should be planned and implemented for such water bodies in order to stop negative processes and bring the water bodies to a good state if possible.

In the River Basin Management Plan until 2027, within the framework of the basic measures, the control measures of point sources of pollution are determined. It was stated that it is necessary to intensify work on the revision and harmonization of water legal acts in accordance with the adopted Action Plan, which includes the completion of the regulatory framework that governs the remaining disputed issues, including issues of establishment and control of individual drainage systems, as well as continuous education and capacity building at all levels of the management system and control, as well as the institution responsible for issuing water legal acts in order to ensure more efficient preparation and implementation of projects.

Furthermore, it is necessary to continue work on regulating the permanent disposal of sludge from municipal wastewater treatment plants, improving load monitoring and intensifying activities on compliance with discharge standards, which includes municipal wastewater disposal projects in agglomerations larger than 2,000 EP. The program of measures to control point sources of municipal wastewater pollution includes the construction / expansion of the system for collecting municipal wastewater and the construction / extension of appropriate devices for the treatment of municipal wastewater for all agglomerations larger than 2,000 PE. Some of the measures are the continuation of activities related to monitoring and reporting on wastewater discharge, which include monitoring and analysis of data on waste, treated wastewater and sludge (load monitoring) and harmonization of operational monitoring related to monitoring and analysis of data on the state of water bodies that are under the influence of wastewater discharge (impact monitoring - operational monitoring), prescribe the implementation of measures to reduce the load on groundwater bodies that have been determined not to meet environmental goals, i.e. are at risk in terms of chemical and/or quantitative status, and increase the scope of regular monitoring and the implementation of research monitoring on groundwater bodies where environmental goals have not been achieved. Croatian Waters is responsible for the aforementioned measures.

According to information published on the website of the WISE information system<sup>27</sup>, according to the latest River Basin Management Plan, municipal wastewater discharges significantly contribute to less than good water quality for 7.6 % of rivers and 12.0 % of transitional waters. Wastewater discharges from non-connected households significantly contribute to less than good water quality for 56.1 % of rivers, 21.6 % of lakes and 3.8 % of coastal waters.

According to the River Basin Management Plan until 2027, wastewater from the population without a public drainage system participates in the so-called dispersed water load. Wastewater pollution from the population is monitored through indicators of organic pollution, nutrient pollution and more specific pollutants that occur in household wastewater. The total burden of pollution from the population connected to the public drainage system was estimated on the basis of the number of connected inhabitants, assumed emission factors per inhabitant and assumed pollution removal at the sewage treatment plant where such a plant exists. In addition, the emission of relevant pollutants from the population without connection to the public drainage system is also assessed.

Furthermore, in the said Plan, the burden of pollution from the population at the public drainage outlets is given according to polluting substances (BOD<sub>5</sub>, COD, total nitrogen, total phosphorus, etc.). It is stated that almost 40.0 % of organic pollution, about 12.0 % of nitrogen and 16.0 % of phosphorus are removed from the collected wastewater. The removal of heavy metals ranges from 37.0 to 44.0 %. The level of wastewater treatment is more favorable in the Danube River Basin than in the Adriatic River Basin, in correlation with the capacity and structure of active wastewater treatment plants per river basin.

In the Danube River Basin, the secondary wastewater treatment prevails and the removal of about 53.0 % of organic pollution, 29.0 % of nitrogen and 22.0 % of phosphorus is achieved. Most of the capacity in the Adriatic River Basin is related to preliminary treatment, so that a low level of pollution removal is achieved, around 13.0 % of organic substances, 6.0 % of nitrogen and 5.0 % of phosphorus.

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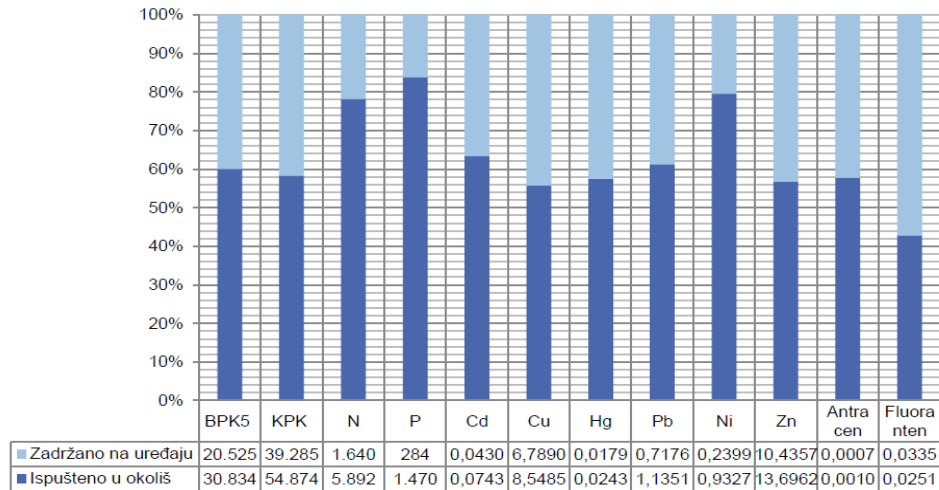
<sup>27</sup><https://water.europa.eu/freshwater/about/wise-freshwater>



The figure below shows the balance of the pollution load from the population with connection to the public drainage system (tons/year) from the River Basin Management Plan until 2027.

Picture number 9

Balance of the pollution load from the population with connection to the public drainage system (tons/year) from the River Basin Management Plan until 2027



Picture 9 shows that more pollutants are released into the environment (groundwater, rivers and the sea) than are retained in the wastewater treatment plants. If polluting substances from the population that are not connected to public drainage systems are added to this, the burden of pollution from the population is even greater. However, from the River Basin Management Plan, it is not possible to determine the extent of the impact of this burden on the less than good water status, i.e. the contribution of the discharge of municipal wastewater and wastewater from non-connected households to less than good water quality (for example, it is not possible to determine how many rivers have less than good water quality due to the discharge of wastewater from unconnected households).

According to the explanation of the person responsible in Croatian Waters, the Josip Juraj Strossmayer Water Institute monitors the state of water in a way that it performs measurements at monitoring stations of rivers and lakes. Operational monitoring in rivers and lakes and overall monitoring in transitional, coastal and underground waters are contracted with universities, institutes and authorized laboratories. Laboratories that carry out water sampling and testing have a decision from the Ministry responsible for water management on the fulfillment of special conditions for carrying out the activity of taking samples and testing water for indicators, group or groups of indicators in accordance with the Ordinance on special conditions for carrying out the activity of taking samples and testing water (National newspaper 3/20). For sampling and testing, accredited methods are used in accordance with HRN EN ISO/IEC 17025 (General requirements for the qualification of testing and calibration laboratories). In the intercalibration procedures for biological elements of quality, in addition to the classification system, the procedures for causing and analyzing are harmonized and are comparable with EU member states.

Furthermore, according to the explanation, monitoring has been improved compared to the previous planning period because the scope and frequency of monitoring has been increased, a greater number of measuring stations and water bodies have been included, the list of monitored indicators has been significantly expanded, as well as the media in which they are analyzed, and the implementation of a series of research monitoring projects is planned.

Furthermore, the monitoring harmonization program has been prepared, but it has not yet been adopted because, in accordance with the Regulation on water quality standards, it is adopted by Croatian Waters six months after the adoption of the River Basin Management Plan. The project "Improving the monitoring of the state of water in the Republic of Croatia" is being implemented<sup>28</sup>, in the framework of which a feasibility study was made, which analyzed the current situation and needs, established goals and solutions, and made a proposal for measures for the establishment of fully harmonized monitoring and a plan of necessary activities. The implementation of the project is planned through a package of activities, according to the conditions of financing from EU funds that will be valid in the period 2021-2027, and therefore it is planned that the first phase of monitoring improvement will be realized by 2027.

The State Audit Office assesses as positive the activities carried out so far to improve monitoring, the implementation of the project Improving the monitoring of water conditions in the Republic of Croatia, and the cooperation of Croatian Waters with scientific and professional institutions and specialized companies in the preparation of the River Basin Management Plan until 2027.

Based on the results of the monitoring in the River Basin Management Plan, which is the basic instrument for water management, Croatian Waters analyze the water condition for each water body and, with a program of measures, determine the measures that need to be implemented to achieve environmental goals. According to the data from the River Basin Management Plan, almost half of the natural flowing water bodies (48.5 %) in the Republic of Croatia and most of the natural stagnant water bodies (88.7 %) do not have good water quality, that is, they can harm the function of the ecosystem and human health. Achieving good water status is one of the goals of the water policy in the Republic of Croatia and the Water Framework Directive.

The unfavorable state of water is connected, among other things, to the discharge of untreated municipal wastewater, especially wastewater from the population that is not connected to public drainage systems, i.e. the delay of drainage and treatment development projects in relation to the dynamics determined by the EU Accession Treaty. *The aforementioned is described under the headings of this Report: Connection of the population to public drainage systems and municipal wastewater treatment and Individual drainage systems.*

***Considering that almost half of the natural flowing water bodies and the majority of natural stagnant water bodies in the Republic of Croatia do not have good water quality, that is, they can harm the function of the ecosystem and human health, the State Audit Office recommends Croatian Waters, in cooperation with the Josip Juraj Strossmayer Water Institute, to continue to undertake activities to improve the monitoring of water status, in order to achieve good water status, as one of the goals of the water policy in the Republic of Croatia and the Water Framework Directive.***

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<sup>28</sup> <https://voda.hr/sites/default/files/dokumenti/PUVP3%20-%20OUE%20-%200013.pdf>

## – Achievement of goals and indicators from NRRP

Within the framework of the NRRP, the goals to be achieved through the implementation of the Water Management Program have been determined, which are directly related to the implementation of two sub-goals of the UN (goal 6.1. Universal and equal access to safe and affordable drinking water for all and goal 6.3. Improving water quality by reducing pollution, eliminating dumping and minimizing the release of hazardous chemicals and materials, halving the share of untreated wastewater and significantly increasing recycling and safe reuse).

In the Annex to the Implementation Decision of the Council on the approval of the evaluation of the plan for the recovery and resilience of Croatia<sup>29</sup>, the qualitative indicators for the key stages are determined (*milestones*) and quantitative indicators for target values (*targets*) for the achievement of the goal Improvement of water management, according to water management programs. The funds that the Republic of Croatia obtains within the framework of NRRP depend on the fulfillment of key stages and target values. Monitoring progress and reporting on the fulfillment of target values and indicators is the responsibility of the state administration body responsible for a specific component/subcomponent of the NRRP. For component C1.3. The Ministry is responsible for the improvement of water management, and the implementing body is Croatian Waters.

Table number 13 gives the qualitative indicators for the goal of Improvement of water management program, according to NRRP, and their achievement, according to data from Croatian Waters.

Table number 13

### Qualitative indicators for the goal Improvement of water management program and their realization

Program	Deadline for implementation	Activity	Achievement
C1.3.R1 Implementation of the water management program	until the end of the fourth quarter of 2022	enacted secondary legislation: Decree on service areas, Decree on evaluating the efficiency of water service providers, Decree on the methodology for determining the price of water services and Decree on special conditions for the performance of water service activities	all regulations were adopted in June 2023
	until the end of the fourth quarter of 2023	integration of existing 200 public suppliers in 40 service areas, in principle one supplier of water services per service area	in process
	until the end of the fourth quarter of 2021	adoption of the multi-year construction program	adopted in December 2021
C1.3. R1-I1 Program for the development of public wastewater drainage	until the end of the fourth quarter of 2023	concluded works contracts for water utility sector projects (60)	by September 2023, 59 works contracts were concluded
C1.3. R1-I2 Public water supply development program	until the end of the fourth quarter of 2023	concluded works contracts for water utility sector projects (100)	by September 2023, 105 works contracts were concluded

<sup>29</sup><https://eur-lex.europa.eu/legal-content/HR/TXT/?uri=CELEX%3A52021PC0401>

Table number 13 shows that out of the five qualitative indicators, three indicators were achieved within the deadline, one indicator was achieved with a delay of six months, and the achievement of one indicator is ongoing (considering that there was a delay in the implementation of the Regulation on service areas, it is certain that the indicator will not be fulfilled within the foreseen period).

Table number 14 gives quantitative indicators for the goal of Improving water management according to the NRRP, and their achievement, according to data from Croatian Waters.

Table number 14

Quantitative indicators for the goal Improvement of water management program and their realization

Program	Deadline for implementation	Activity	Achievement by the implementation deadline (where applicable)	Realization by the end of 2022
C1.3. R1 Implementation of the water management program	until the end of the second quarter of 2026	reduction of losses in public water supply systems that are subject to reconstruction (25.0 %)	it is proven in the second quarter of 2026	-
	until the end of the second quarter of 2026	45,429 inhabitants have access to improved water supply	it is proven in the second quarter of 2026.	12,952 inhabitants
C1.3. R1-I1 Program for the development of public wastewater drainage	by the end of the fourth quarter of 2025	constructed and functional devices for wastewater treatment (12)	it is proven in the first quarter of 2026	1
	– until the end of the second quarter of 2022	- built or reconstructed a total of 115 km of public drainage network		
	– until the end of the fourth quarter of 2023	- a total of 269 km of public drainage network was built or reconstructed	– built or reconstructed 125.99 km	– built or reconstructed 141.95 km
	– until the end of the fourth quarter of 2025	- built or reconstructed a total of 775 km of public drainage network		
	until the end of the second quarter of 2022	6 km of public water supply network built or reconstructed, by the end of 4Q/2023 27 km, by the end of 4Q/2025 226 km (cumulative)	- 20.94 km of public water supply network was built or reconstructed	- 24.13 km of public water supply network was built or reconstructed
	until the end of the second quarter of 2026	214,083 population equivalents use an improved wastewater treatment system	it is proven in the second quarter of 2026	-
C1.3. R1-I2 Public water supply development program	– until the end of the second quarter of 2022	- built or reconstructed a total of 226 km of public water supply network		
	– until the end of the fourth quarter of 2023	- a total of 646 km of public water supply network was built or reconstructed (673 in the Executive Decision of the EC)	– built or reconstructed 234.59 km	– built or reconstructed 263.46 km
	– until the end of the fourth quarter of 2025	– a total of 730 km of public water supply network was built or reconstructed (956 in the Executive Decision of the EC)		

Program	Deadline for implementation	Activity	Achievement by the implementation deadline (where applicable)	Realization by the end of 2022
	until the end of the fourth quarter of 2022	at 526 water pumping stations, the necessary equipment was installed to record the quantities of water affected	0	– by the end of the second quarter of 2023, 593 water meters have been installed

Table number 14 shows that all quantitative indicators, i.e. all activities whose implementation deadline has expired, were implemented within the target value, except for the installation of water meters (whose implementation deadline was the end of 2022). According to the explanation of the responsible person of Croatian Waters, the extension of the deadline for the installation of 526 water meters at the water pumping stations was approved, and 593 of them were installed by the end of the second quarter of 2023.

The implementation of the Public call for measuring devices at water intakes from December 9, 2022 and the Public call for financing the implementation of investment projects related to the improvement of the water utility infrastructure of the agglomeration from December 19, 2022, in terms of monitoring the achievement of the target values determined in the NRRP, is monitored through review and verification of requests for reimbursement of funds and reports on project progress submitted by users. The public invitation from April 14, 2022 and the public invitation from November 24, 2021 are monitored through documents in Excel that list public suppliers, project elements, financial data and reported and achieved values by individual indicators (target values from the NRRP) classified according to water supply and drainage.

#### – Global indicators of the UN Sustainable Development Goals

Sustainable development goals and sub-goals should be monitored and analyzed using a set of global indicators developed by the Inter-agency and Expert Group on SDG Indicators of the UN.

National statistical offices are responsible for monitoring indicators of sustainable development goals and cooperate with competent institutions, which in the Republic of Croatia is performed by the Croatian Bureau of Statistics, which has the obligation to systematically monitor and report on sustainable development goals from the Agenda 2030.

For the purpose of disseminating indicators related to the sustainable development goals in the Republic of Croatia, in 2018, the Croatian Bureau of Statistics established the Croatian Sustainable Development Goals (SDG) Indicator Portal<sup>30</sup> (hereinafter: the Croatian SDGs Indicator Portal).

The figure below shows the three global indicators of the UN sustainable development goals included in this audit, for two sub-goals 6.1. and 6.3.

<sup>30</sup><https://croatianbureauofstatistics.github.io/sdg-indicators/%C4%8Dista-voda-i-sanitarni-uvjeti/>

## Picture number 10

Three global indicators of the UN's sustainable development goals included in this audit, for two sub-goals 6.1. and 6.3.

SUBGOAL	INDICATOR
6.1. Safe and affordable drinking water	6.1.1. Share of population using safely managed drinking water services
6.3. Improving water quality	6.3.1. Share of treated wastewater from households and industry 6.3.2. Share of water bodies with good water quality

According to the explanation of the responsible person of the Ministry, the World Health Organization (hereinafter: WHO) and UNICEF have a mandate to monitor global progress in the implementation of sub-goals 6.1. and 6.2. on water, sanitation and hygiene (hereinafter: WASH), while WHO also monitors the fulfillment of sub-goal 6.3., i.e. indicator 6.3.1. The aforementioned bodies carry out a consultation process with the states, including the Republic of Croatia, every year. In this process, the calculated indicators calculated by the consultants of the mentioned institutions on the basis of Eurostat data are submitted to each country for verification. After receiving a request for the delivery or verification of data, the Ministry delivers it to the competent authorities (e.g. the Ministry of Health), consolidates the data from the competent authorities and sends it to WHO or UNICEF.

According to the explanation of the responsible person of the Ministry, for the Republic of Croatia, no target values have been established that are intended to be achieved by 2030 for the above three indicators. However, the Multi-Year Construction Program specifies the target values of indicators related to public water supply services, namely indicators related to ensuring access to water for human consumption and indicators related to the healthiness of water for human consumption. The target values of indicators for reducing losses from water supply systems are also listed. The aforementioned three indicators are equivalent to indicator 6.1.1. for achieving sustainable development sub-goal 6.1. The target value by 2030 for the percentage of the total number of inhabitants who have access to water from water supply systems is 98.0 %. The same target value also applies to the indicator related to risk reduction with regard to the healthiness of water intended for human consumption.

Furthermore, the Ministry emphasizes that the goals and indicators according to the EU water directives are not formally and explicitly the same as the goals and indicators of the UN for sustainable development, and this is because the UN also deals with countries that are completely underdeveloped in terms of public water supply, as well as those countries that have achieved high standards in this regard. Therefore, due to the different level of development of individual countries in the world, the indicators of achieving the goal are different from the goals of the EU directives that apply to developed EU member states. However, the common goals arising from the EU directives and the UN goals for sustainable development are to ensure access to safe water for everyone in one of the safe ways of water supply, and the use of water from public water supply systems is the safest way. The same applies to access to sanitation or public drainage systems.

If a country achieves the goals prescribed by the EU water directives (Directive on the quality of water intended for human consumption and Urban Waste Water Treatment Directive), it has also achieved the UN goals for sustainable development, or sub-goals 6.1. and 6.3.

Furthermore, in order to achieve UN sub-goal 6.3, it is necessary to increase the share of treated wastewater from industry and households (indicator 6.3.1), and this is achieved by collecting wastewater and building and putting into operation devices for wastewater treatment of the appropriate level of treatment. The above is evaluated through the indicators "connection to the public drainage system" and "compliance with the required level of treatment" from the Multi-Year Construction Program.

The Ministry reasons that the sub-goals of sustainable development 6.1. and 6.3. of the UN are in principle equal to the goals from the Multi-Year Construction Program adopted by the Government of the Republic of Croatia in 2021, only the indicators are somewhat different. The indicators from the Multi-Year Construction Program are based on the EU water directives, and the UN's goals for sustainable development are basically the same, they are just expressed in a different way, that is, with other indicators. By fulfilling both indicators, the same final goal is achieved, which is to "ensure access to healthy water for human consumption and sanitation for everyone" and "achieve an appropriate level of wastewater treatment in order to achieve a good state of all water."

According to data published on the Croatian SDGs Indicator Portal for indicator 6.1.1., in 2021, 94.1 % of the population used safe<sup>31</sup> drinking water services. The data are available for the period from 2010 to 2021, and the source of the mentioned data is CIPH. The Ministry is responsible for reporting on indicator 6.1.1. in the Republic of Croatia, in cooperation with the Ministry of Health. The Ministry is responsible for reporting on indicators for UN sub-goal 6.3. Improving water quality, while Croatan Waters calculate individual components of the indicators.

Data for indicator 6.3.1 Share of treated wastewater from households and industry have been published on the Croatian SDGs Indicator Portal from 2000, when the share was 24.2 %, to 2021, when the share was 66.0 %. The indicator measures the amount of wastewater produced in households and economic activities that has been safely treated<sup>32</sup> before being released into the environment in relation to the total amount of wastewater generated in households and economic activities.

On the WHO website<sup>33</sup> documents are available for individual countries for indicator 6.3.1 Share of treated wastewater from households, among other, for the Republic of Croatia. According to that document, it is estimated that in the Republic of Croatia in 2020, 60.0 % of household wastewater was purified (safely treated), while for 2022 the indicator is 34.0 %, which is a significant decrease compared to 2022. The same share is published on the website of UN Water<sup>34</sup>.

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<sup>31</sup>According to the methodological instructions of the UN, safe water services are defined as the basic source of drinking water (improved sources of drinking water, i.e. water supply in the apartment, yard or land, public taps or hydrants, boreholes, protected dug wells, protected springs and rainwater) which is located on the premises and is available as needed and without fecal and priority chemical contamination (which means that the drinking water meets the international standards of microbiological and chemical quality specified in the Guidelines for the quality of water for human consumption of the WHO). For the purposes of global monitoring, the priority indicator of microbiological contamination is E. coli, and the priority chemical pollutants are arsenic and fluoride.

<sup>32</sup>According to the UN's methodological instructions for this indicator, safely treated wastewater is wastewater that has been treated at least through secondary treatment.

<sup>33</sup><https://www.who.int/teams/environment-climate-change-and-health/water-sanitation-and-health/monitoring-and-evidence/water-supply-sanitation-and-hygiene-monitoring/2021-country-files-for-sdg-6.3.1-proportion-of-water-safely-treated>

<sup>34</sup><https://sdg6data.org/en/indicator/6.3.1>

According to the methodology for the indicator safely treated wastewater from households from the mentioned WHO and UN-Habitat Document *Sustainable Development Goal 6 Monitoring*, wastewater is classified as purified (safely treated) when it is released into the environment in accordance with standards, and if these data are not available, if processed on a device with at least secondary treatment.

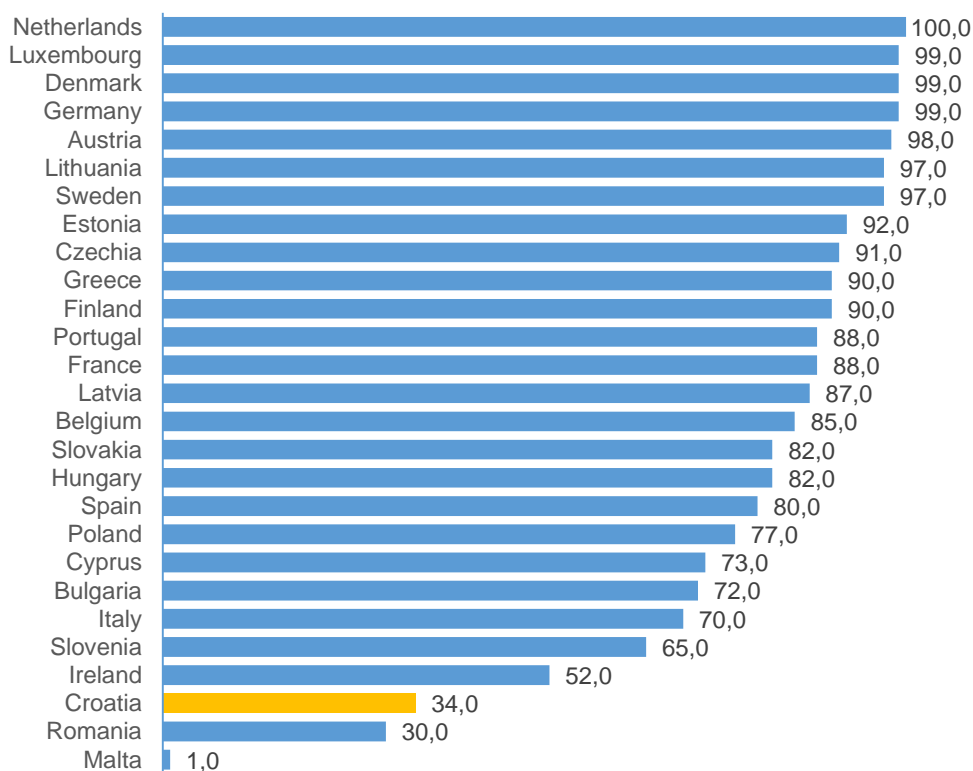
Regarding the difference in the data for 2020 and 2022, the Ministry argues that the difference stems from a different methodological approach given by the WHO. The aforementioned shares were calculated by consultants from WHO and UN-Habitat and submitted to the Ministry for verification. The calculation methodology is not changed by an individual country, but by the data requester (WHO, UN, etc.), who, along with the calculated values of the indicators, also submits a guide with explanations on the requested data and methodology, and each country is required to verify the calculation according to the given methodology. The data was verified by the Ministry after the calculation was checked by Croatian Waters.

According to the explanation of the responsible person of Croatian Waters, the share for 2020 was calculated in such a way that devices with secondary treatment were taken into account in the calculation, while for 2022 the methodology of compliance with standards was applied, i.e. based on data on the compliance of device operation from the 11<sup>th</sup> reporting cycle with the reference 2018.

In graphic representation number 6, indicator 6.3.1. Share of treated wastewater from households in 2022 for EU member states is given, according to data published on the UN Water website.

Graphic representation number 6

Indicator 6.3.1. Share of treated wastewater from households in EU member states in 2022



Source: State Audit Office (according to UN Water data)



From graphic representation number 6, it is evident that the Republic of Croatia is at the bottom of the ranking of EU member states with a share of treated wastewater from households of 34.0 %, and only Romania and Malta have a smaller share. *The above is described under the subtitle of this Report: Connection of the population to public drainage systems and municipal wastewater treatment.*

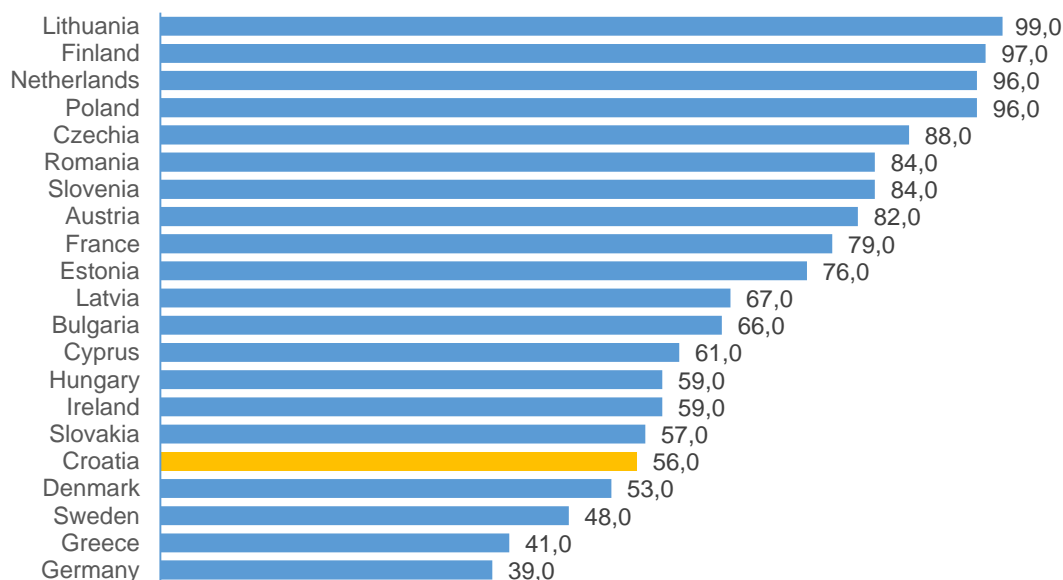
The Ministry, in cooperation with Croatian Waters, reports on SDG indicator 6.3.2. Share of water bodies with good water quality. Good indicates water quality that does not harm ecosystem function and human health according to basic environmental quality indicators<sup>35</sup>. The indicator makes it possible to determine whether the undertaken activities and measures have an effect on the improvement of water quality, i.e. whether the sub-goal of sustainable development 6.3 is achieved. The indicator relies on data from *in situ* measurements and analysis of samples from rivers, lakes and groundwater. Water quality is assessed by measuring physical and chemical parameters that reflect the natural quality of water and the main human influences on water quality.

The UN Water website<sup>36</sup> provides an overview of the global status of indicator 6.3.2. for 2020, which monitors progress in achieving sub-goal 6.3. According to published data and according to data from Croatian Waters, in 2020, 55.9 % of water bodies in the Republic of Croatia were of good quality, namely 55.0 % of rivers, 71.4 % of lakes and 91.0 % of groundwater bodies. The Croatian Bureau of Statistics does not publish this indicator on the Croatian SDGs Indicator Portal.

In graphic representation number 7, indicator 6.3.2 Share of water bodies with good water quality in 2020 in EU member states is given, according to data published on the UN Water website.

#### Graphic representation number 7

##### Indicator 6.3.2. Share of water bodies with good water quality in EU member states\* in 2020



Source: State Audit Office (according to UN Water data)

\*data not available for Belgium, Italy, Luxembourg, Malta, Portugal and Spain

<sup>35</sup>According to the metadata published on the Croatian SDGs Indicator Portal, the assessment of water quality is based on a basic set of five determinants that warn of significant disturbances in water quality present in many parts of the world: total dissolved solids (TDS), percentage of dissolved oxygen (% DO), dissolved inorganic nitrogen (DIN), dissolved inorganic phosphorus (DIP) and Escherichia coli (E.coli). In order to classify whether a water body has good quality or not, a threshold is applied where 80 % or more of the monitoring values meet the target values.

<https://croatianbureauofstatistics.github.io/sdg-indicators/6-3-2/>

<sup>36</sup><https://sdg6data.org/en/indicator/6.3.2>

According to the UN methodology, water quality is evaluated based on five parameters (oxygen, salinity, nitrogen, phosphorus and pH status). Each country can include additional parameters (chemical and biological parameters and additional measuring stations) depending on its own needs.

According to the explanation of the responsible person of Croatian Waters, the shares for the Republic of Croatia were not calculated according to the UN methodology for indicator 6.3.2., and the main reason is that the state of water bodies is assessed for the purpose of creating river basin management plans, once in the planning cycle from six years. The mentioned shares were obtained from the River Basin Management Plan 2016-2021, in which the assessment was made according to the criteria of the Water Framework Directive: the ecological and chemical status of water bodies was assessed, and the overall status is determined by the poorer of its ecological status or its chemical status. Biological, physicochemical and chemical and hydro morphological elements of quality are evaluated for the ecological condition. Individual priority and priority hazardous substances are assessed for chemical status. The evaluation principle is "*one out, all out*".

The criteria of the Water Framework Directive are stricter than the criteria of the UN methodology, according to which water quality is evaluated based on the five mentioned parameters that represent only one group of quality elements that are evaluated according to the Water Framework Directive.

According to the explanation of the responsible person of Croatian Waters, the assessment of the state of water bodies is the same in the River Basin Management Plan and in reporting on indicator 6.3.2. of the UN Sustainable Development Goal. The methodology of the Water Framework Directive is used when reporting on indicator 6.3.2. so that the assessment of an individual water body is the same in all reports.

Analyzing the websites of the national statistical institutions of the EU member states from graphic representation number 7, it was determined that some countries publish indicators calculated according to the criteria of the Water Framework Directive, some according to UN criteria, while some publish national or Eurostat indicators<sup>37</sup>. Examples of countries that publish on national portals the share according to the Water Framework Directive that differs from the share published on the UN Water website are France (on the national portal the share is 43.1 %, while the share on UN Water is 79.0 %), Estonia (on the national portal the share is 51.0 %, while the share on UN Water is 76.0 %), Lithuania (on the national portal the share is 53.0 %, while the share on UN Water is 99.0 %). Examples of countries that publish the share according to the UN criteria on their national portals and which is equal to the share published on the UN Water website are the Netherlands, Bulgaria and Denmark. Sweden publishes the share according to the Water Framework Directive on the national portal, and this share is equal to that published on the UN Water website (48.0 %).

The audit found that the Ministry and Croatian Waters monitor and report on progress in the achievement of sustainable development indicators 6.3.2. Share of water bodies with good water quality. However, the indicator is not calculated on the basis of the UN methodology, but on the basis of the methodology of the Water Framework Directive, which is why the data for the Republic of Croatia published on the UN Water website are not fully comparable with the data for countries whose indicators are calculated on the basis of the UN methodology.

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<sup>37</sup>Eurostat uses EU-relevant indicators that enable monitoring of progress towards the achievement of sustainable development goals in the context of long-term EU policies. These indicators are related to the UN indicators, but they are not identical. An indicator that can be considered similar to the global indicator 6.3.2. is biochemical oxygen consumption (BOD) in rivers.

According to the June 2023 Resolution on the implementation and achievement of the Sustainable Development Goals, the European Parliament considers it crucial to monitor the progress of all 169 sub-goals of sustainable development. It calls on member states to improve their data collection and adopt sustainable development indicators and monitor their implementation in national recovery and resilience plans, and emphasizes that a minimum level of data and statistical breakdowns should be provided and better harmonized with the global framework for monitoring the Sustainable Development Goals.

***The State Audit Office recommends to the Ministry and Croatian Waters, when reporting to the UN on progress in achieving sustainable development indicator 6.3.2. Share of water bodies with good water quality, consider the possibility of applying the UN methodology so that the data are better aligned with the global framework for monitoring the goals of sustainable development and comparable with the data of other countries.***

***It recommends that the Ministry and Croatian Waters, in cooperation with the Croatian Bureau of Statistics, consider the possibility of publishing indicator 6.3.2. Share of water bodies with good water quality on the Croatian SDGs Indicator Portal so that the public is aware of water quality and the achievement of progress towards the realization of UN sub-goal 6.3.***

According to Article 55 of the 2030 Agenda, each country should establish national target values that will take into account global goals and national circumstances. The 2030 Agenda allows for the development of national indicators that would be as relevant as possible in national circumstances. Establishing national target values and national indicators would contribute to faster and better monitoring of the achievement of sustainable development goals.

According to the explanation of the responsible person of Croatian Waters, at the level of the Republic of Croatia, no target value has been determined that is to be achieved by 2030. for indicator 6.3.2. Croatian Waters state that the Republic of Croatia, as a member of the EU, is obliged to achieve compliance with the requirements of EU directives. The environmental goals of achieving at least a good water status, i.e. ensuring the condition that the water status does not deteriorate for all water bodies of surface and underground water must be achieved no later than 2027, that is, in the planning period of the River Basin Management Plan until 2027. Share of water bodies of rivers, of lakes and groundwater with good water quality is determined in six-year cycles that are related to the period of validity of the River Basin Management Plan.

One of the sub-goals of goal 6.3. is, among other things, for countries to significantly increase recycling and safe reuse of water. According to the explanation of the responsible person in the Ministry, the use of purified wastewater from wastewater treatment plants is not part of traditional agricultural production in the Republic of Croatia, partly due to the fact that the Republic of Croatia does not currently have significant water shortages, partly due to the fact that at the moment, projects for the construction of wastewater treatment plants are just underway, and especially taking into account the potential health risks that the irrigation of agricultural areas with treated wastewater has on the health of the population. Also, there is economic unprofitability due to the necessary additional investments in special infrastructure for irrigation with purified wastewater, but also the orientation of the Republic of Croatia towards the development of the public irrigation system. Such a point of view is in accordance with the River Basin Management Plan for the period up to 2027, with a note that this decision will be regularly reviewed, especially taking into account the increasingly pronounced consequences of climate change.

It states that Regulation (EU) 2020/741 of the European Parliament and of the Council of 25 May 2020 was adopted on minimum requirements for water reuse, according to which a member state can decide that water reuse is not suitable for the irrigation of agricultural land in any of its river basins or more of them, or in parts of those areas, taking into account the criteria specified in that paragraph (geographical and climatic conditions, pressures on other water resources and their condition, pressures and condition of surface water bodies, resource costs).

In view of the above, the Republic of Croatia will for the time being take advantage of the possibility of applying the above-mentioned article, i.e. make a decision with the corresponding explanation on the inappropriateness of the reuse of purified municipal wastewater for the irrigation of agricultural land in the Republic of Croatia, with the foreseen possibility of reviewing this decision in the future.

#### **– Reporting on the activities carried out and the achievement of goals**

The Ministry and Croatian Waters report to the competent authorities on the activities carried out and the achievement of goals and planned indicators related to the improvement of water quality and the availability of water for human consumption, and monitor the achievement of goals. Thus, in July 2022, according to the provisions of the Water Services Act, Croatian Waters prepared the First Report on the implementation of the Multi-Year Construction Program for the period from January 1 to June 30, 2022. During the audit, in July 2023, they prepared the Second Implementation Report on Multi-Year Construction Program for the period from July 1 to December 31, 2022. The aforementioned reports were submitted to the Government of the Republic of Croatia and were published on the Croatian Waters website. Reporting on the implementation of the Multi-Year Construction Program is done semi-annually, which corresponds to the request of the European Commission from May 2022 on semi-annual reporting with a focus on R1-I1 and R1-I2 investments from NRRP.

Croatian Waters prepared the Report on the implementation of the River Basin Management Plan 2016-2021 for the period from 2016 to 2018. An integral part of the Report (Chapter 6) is an interim report on the progress achieved in the implementation of the program of measures (Plan Implementation Indicators) which, according to the provisions of the Law on Water, Croatian Waters electronically submits to the European Commission within three years from the publication of each plan and its amendments. The report on the implementation of the aforementioned Plan is submitted to the Croatian Parliament every three years and is an integral part of the new River Basin Management Plan. The report refers to that part of the Plan that is related to the implementation of the Water Framework Directive. The above data is also entered into the WISE information system.

Data and reports are submitted to the WISE information system according to the requirements of the Urban Waste Water Treatment Directive and the Directive on the quality of water intended for human consumption, data and reports related to the sustainable goal of the UN SDG 6 - Global analysis and assessment of sanitation and drinking water are submitted to the UN GLAAS information system (*The UN - Water Global Analysis and Assessment of Sanitation and Drinking-Water*), data and reports on water and health are submitted to the WASH UNICEF information system, it is reported to the Government of the Republic of Croatia and competent authorities on the implementation of the NRRP, on the implementation of the National Development Strategy, for the needs of the Croatian Bureau of Statistics, etc.

## **ASSESSMENT OF THE EFFECTIVENESS OF IMPROVING WATER QUALITY AND THE AVAILABILITY OF WATER FOR HUMAN CONSUMPTION**

The State Audit Office conducted an audit of the effectiveness of improving water quality and the availability of water for human consumption. The subjects of the audit were the Ministry and Croatian Waters. The main objective of the audit was to evaluate the effectiveness of the implementation of activities and the achievement of the objectives of the Ministry and Croatian Waters in connection with the improvement of water quality and the availability of water for human consumption, that is, the implementation of activities for the purpose of assessing the effectiveness of the achievement of UN sub-goal 6.3 and UN sub-goal 6.1. in the part related to the availability of water for human consumption, for which the Ministry is responsible. The specific objectives of the audit were to check the establishment of the legislative and institutional framework, to evaluate the implementation and financing projects of public water supply, drainage and wastewater treatment and evaluate the achievement of activities and goals and planned indicators related to the improvement of water quality and the availability of water for human consumption and whether the achievement of goals is monitored.

Based on the facts established by the audit, applying the established audit criteria, the State Audit Office assessed that the Ministry and Croatian Waters undertook activities related to the adoption of regulations for the purpose of harmonizing with EU regulations, goals, measures and activities for improving water quality and the availability of water for human consumption, the bearers of the implementation of the activities and the sources of financing, the deadlines, target values and other indicators of the achievement of the goals, which are aligned with the sustainable development goals of the UN, have been determined, the bodies responsible for the effective implementation of the activities have been determined, and the problems in the system of water supply, drainage and wastewater treatment have been identified. Within the NRRP, the Water Management Program is being implemented, within which a complete reform of the water-community sector has been initiated, which includes the adoption of a legislative framework and the implementation of investments, qualitative and quantitative indicators for the goal of Improving water management from the NRRP and their realization are being monitored, public water supply, drainage and wastewater treatment projects are implemented for which financial resources are planned and spent and their implementation is monitored, projects are financed from EU funds, NRRP, the state budget and other sources, public tenders are conducted for the purpose of implementing projects, the risks affecting the successful implementation of water utility projects were determined, activities were undertaken to establish legislative and institutional preconditions and financial mechanisms to encourage the reduction of water losses. A Multi-Year Construction Program and the River Basin Management Plan until 2027 have been drawn up, activities necessary for the implementation and financing of investments in projects related to the improvement of water utility infrastructure are being carried out, the total value of planned investments in water utility infrastructure until 2030 has been estimated, The Multi-Year Construction Program defines individual public water supply and drainage projects, the method and period of implementation, participants, investment amounts and sources of funds, and the order of priority in implementation. The population's connection to water supply systems, including local waterworks, has increased, that is, the availability of water for human consumption to all residents has increased. Based on the monitoring results, the River Basin Management Plan analyzes the state of water for each water body, and the program of measures determines the measures that need to be implemented to achieve environmental goals. National indicators from the Multi-Year Construction Program and target values for public water supply and drainage have been established, and are linked to EU water directives.

The achievement of goals is monitored according to established indicators related to the improvement of water quality and the availability of water for human consumption, and the competent authorities are reported on the achievement of goals and the activities carried out.

However, it was assessed that there are shortcomings related to not adopting a significant number of regulations for harmonizing the area of water quality improvement and the availability of water for human consumption with the EU acquis within the deadline, the lack of reliable information on the current state of the water utility infrastructure, the absence of a complete and comprehensive register of water supply projects, the achievement of goals and activities for the improvement of water quality and the availability of water for human consumption in full and on time, the absence of accurate and reliable data on the basis of which initial and target values should be determined and progress and goal achievement measured, as well as inconsistency in the presentation of individual data. Progress has been made in increasing the population's connection to public drainage systems, wastewater treatment facilities, and increasing the number of wastewater treatment facilities, but progress is slow and it is certain that the Republic of Croatia will not comply with the Urban Waste Water Treatment Directive within the deadline. Activities related to solving the problems of local water supply systems, i.e. their inventory, health condition and transfer to public suppliers, are carried out very slowly. The Program for reducing losses in water supply systems is being implemented, but no indicators have been established on the basis of which the results of the implementation of the mentioned Program would be monitored, the current calculation of water losses is not precise and does not give a true picture of real losses, and despite investments from EU funds and the Program for reducing losses, a positive shift in the reduction of water losses was not achieved. There are no comprehensive data on individual drainage systems, and it is not possible to provide a complete and reliable overview of the state of individual drainage systems, the way in which problems in the area of individual drainage systems will be solved has not been fully designed, it is not known how many people not connected to the public drainage system treat their wastewater, and how many discharge it into the aquatic environment without any pre-treatment. Almost half of the water bodies of natural liquids and most of the natural stagnant water bodies do not have good water quality, that is, they can harm the function of the ecosystem and human health, which affects the achievement of good water status, as one of the goals of the water policy in the Republic of Croatia and the Water Framework Directive.

On the basis of the above, the State Audit Office assesses that the activities and goals achieved in the Ministry and Croatian Waters in connection with the improvement of water quality and the availability of water for human consumption, i.e. by implementing activities for the purpose of achieving UN sub-goal 6.3. Improvement of water quality and sub-goals 6.1. Safe and affordable drinking water (availability of water), are **partially effective** and the following recommendations are given, according to the audit areas:

## **1. Implementation and financing of public water supply, drainage and wastewater treatment projects**

- 1.1. Undertake activities to establish a complete and comprehensive register of water supply projects, with all recommended data, in the manner determined by the Multi-Year Construction Program. (Croatian Waters)

- 1.2. In cooperation with Croatian Waters, more promptly undertake activities to design the methods and methodology necessary for the systematic and continuous collection of high-quality, reliable and comprehensive data on the state of the water utility infrastructure at public water service providers. The aforementioned data will also be used in planning, approving and determining the co-financing of individual projects of public water supply and public drainage and will be a quality basis for the implementation of the reform of the water utility sector. (Ministry)
- 1.3. In cooperation with Croatian Waters, encourage the activities of public suppliers of water services to establish a complete register of infrastructure with public suppliers, which would be one of the prerequisites for approving water utility projects and their co-financing. (Ministry)
- 1.4. Undertake activities to encourage the education of employees at local government units and public water service providers on actions necessary for the implementation of public water supply and drainage projects, so that public providers are ready to implement water utility projects and withdraw EU funds for their implementation in the coming years, and in order to actively participate in the effective reform of the water utility sector. (Croatian Waters)
- 1.5. Given that it is about the implementation of activities that last until the end of 2030, assess the impact of changes on the implementation of the Multi-Year Construction Program, i.e. water utility projects, and elaborate measures to reduce risks in implementation in more detail, especially with regard to changes in the financial framework for implementation of projects for which, during the preparation of the aforementioned program, it was assessed that it would not be sufficient, limited administrative and technical capacities of the water utility sector, but also other risks in the implementation of water utility projects that were estimated to continue even after the implementation of risk reduction measures be high. (Croatian Waters)

## **2. Realization of activities, goals and planned indicators and monitoring of goal achievement**

- 2.1. In cooperation with Croatian Waters, harmonize with CIPH the method of reporting data on the connection and the possibility of connection of population to public water supply systems, i.e. the method of reporting the availability of water intended for human consumption for the purpose of monitoring the achievement of the goals of the Multi-Year Construction Program and UN sub-goals 6.1. Safe and affordable drinking water. (Ministry)
- 2.2. Undertake activities to determine the mandatory elements that would contain the list of local water supply systems managed by individual public suppliers, i.e. to issue an order on the list of local water supply services, so that public water service suppliers would be ready to provide quality and comparable data. (Ministry)

- 2.3. Encourage local government units and public suppliers of water services that manage local water supply systems in their territory, or whose local water supply systems will be transferred to management after the consolidation of public suppliers, to undertake the activity of listing local water supply systems with established mandatory elements, and to indicate to them the possibility of co-financing water supply projects through the EU funds, with the purpose of including local waterworks in the system of organized management of public water supply and ensuring their health safety. (Ministry)
- 2.4. Given that in previous years, activities related to solving the problems of local water supply systems, i.e. their inventory, health condition, transfer to public suppliers, were carried out very slowly, that it is not possible to use EU funds for their development and improvement, because their current users and managers are not eligible investors for investments, and as the implementation of public water supply projects (which includes local water supply systems) is expected to take a long period of time, determine the need for financing, procurement and installation of chlorinators at water intakes of local water supply systems, and plan funds for the stated purpose and implement the project, in order to ensure the healthiness of water for human consumption in the water supply zones that were previously assessed as very high risk zones where it is not possible to permanently and continuously ensure the healthiness of water for human consumption. (Croatian Waters)
- 2.5. Establish the indicators on the basis of which the implementation of the Loss Reduction Program in water supply systems would be monitored and the achievement of goals, that is, the effectiveness of the implementation of measures from the Program evaluated. The above could be used for better analysis, prioritization of funding, monitoring of the effectiveness of the implementation of water loss reduction projects and comparison of water supply systems, especially with emphasis on good practice in the implementation of water loss reduction at individual public suppliers. (Croatian Waters)
- 2.6. Ensure effective application of legislative prerequisites in the area of water losses (for example methodologies for the precise calculation of water losses, calculation models for charging fees for the use of water in the public water supply for the amount of water taken, implementation of the Regulation on service areas, etc.) and adoption and implementation of the National Action Plan for the reduction of water losses, in order to reduce the negative impact of water losses, i.e. the capture of unnecessarily large amounts of water in certain areas, which in the long run can lead to a change in the natural biological and hydrological balance, but also to a reduction in the capacity of certain springs, which may endanger the water supply of certain areas. (Ministry and Croatian Waters)
- 2.7. Continue the activities of encouraging public suppliers of water services to reduce losses by providing financial, administrative, technical, investment and operational assistance, with the aim of reducing water losses at the national level and with the aim of establishing long-term sustainable management of water supply systems at public service providers. (Ministry and Croatian Waters)



- 2.8. Intensify activities on the implementation of water utility projects in order to improve the quality of water by the end of 2030 in such a way as to reduce pollution and halve the share of untreated wastewater, that is, to achieve progress towards the achievement of UN sub-goal 6.3. Improving water quality, and to fulfill the obligations assumed from the Urban Waste Water Treatment Directive. (Ministry and Croatian Waters)
- 2.9. Undertake activities to establish a framework for maintaining a register of individual drainage systems, as provided for in the Multi-Year Construction Program, which would be managed by public water service providers in a unique way, which would also improve the collection system, quality and reliability of data on municipal wastewater treatment in the area of the Republic of Croatia. (Ministry)
- 2.10. Encourage public suppliers of water services in their area to, in cooperation with the local government units in whose area they perform their activities, to supervise the connection of real estate to water utility structures, as well as the discharge of municipal wastewater from individual drainage systems in the field, at water service users and whether legal and natural persons discharge wastewater into the public drainage system, through water stewards or in another appropriate way. The above is necessary considering that there is a significant share of the population that is connected to individual drainage systems, and for which a very small share of wastewater is transported to waste water treatment facilities, that it is not known whether they treat their wastewater or to what extent they release the wastewater into the environment without any pretreatment and considering that these are estimates and there are no reliable data. (Ministry)
- 2.11. Considering that almost half of the natural flowing water bodies and the majority of the natural stagnant water bodies in the Republic of Croatia do not have good water quality, that is, they can harm the function of the ecosystem and human health, in cooperation with the Josip Juraj Strossmayer Water Institute, to continue to undertake activities to improve the monitoring of water status, in order to achieve good water status, as one of the goals of the water policy in the Republic of Croatia and the Water Framework Directive. (Croatian Waters)
- 2.12. When reporting to the UN on progress in achieving sustainable development indicator 6.3.2. Share of water bodies with good water quality, consider the possibility of applying the UN methodology so that the data are better aligned with the global framework for monitoring the goals of sustainable development and comparable with the data of other countries. (Ministry and Croatian Waters)
- 2.13. In cooperation with the Croatian Bureau of Statistics, consider the possibility of publishing indicators 6.3.2. Share of water bodies with good water quality on the Croatian SDGs Indicator Portal so that the public is aware of water quality and the achievement of progress towards the achievement of UN sub-goal 6.3. (Ministry and Croatian Waters)

Considering the large number of bodies participating in activities and tasks related to the improvement of water quality and availability of water for human consumption, the State Audit Office stated the opinion that very good coordination is needed between the bodies participating in the realization of UN sub-goals 6.3. and 6.1. and more effective implementation of all activities is needed in order to implement them by the end of 2030 and to effectively implement the water utility directives in practice, which the Republic of Croatia committed to by joining the EU.

The State Audit Office stated the opinion that by implementing the aforementioned recommendations, improvements would be achieved in connection with the establishment of the legislative and institutional framework, the implementation and financing of public water supply, drainage and wastewater treatment projects, as well as the realization of activities, goals and planned indicators, as well as the monitoring of the achievement of goals, which would increase the effectiveness of implementing activities and achieving the goals of improving water quality and the availability of water for human consumption in the Republic of Croatia, i.e. implementation of activities for the purpose of achieving UN sub-goals 6.3. and 6.1.

## STATEMENT OF THE MINISTRY AND CROATIAN WATERS

*The Ministry and Croatian Waters commented on the draft report on the audit of the effectiveness of the improvement of water quality and the availability of water for human consumption. They stated that they accept the recommendations of the State Audit Office.*

*In the Statement, the Ministry explains, in connection with the recommendations related to the improvement of the data collection system and keeping the register of individual drainage systems, that it is necessary to emphasize that this is the responsibility of public suppliers of water services, which are supervised in this sense by the State Inspectorate of the Republic of Croatia - Water Inspection. It agrees that the issue needs to be improved, but also that it is important to emphasize which bodies are involved in solving it, along with the Ministry. Public suppliers of water services through water management, which must be organized within each public supplier, keeps a list of individual drainage systems in its territory and has the authority to take measures to achieve the functionality, structural stability and water tightness of these systems/buildings, including their regular emptying and removal of wastewater for treatment in public systems, according to the Law on Water Services.*

*Croatian Waters states that it entirely accepts other recommendations, because they are in line with the audit objectives.*

*In the Statement, Croatian Waters explains, in connection with the recommendation to undertake activities to establish a complete and comprehensive register of water supply projects, with all recommended data, in the manner determined by the Multi-Year Construction Program, that Croatian Waters included a series of recommended data when creating the Multi-Year Construction Program in order to the register of water supply projects was as complete as possible. In addition to these projects, public water service providers are implementing and will implement numerous public water supply projects in which Croatian Waters are not involved. They consider the recommendation to be justified and after the establishment of service areas, a complete register of service areas could be established.*

*In connection with the recommendation to undertake activities to encourage the education of employees at local government units and public suppliers on actions necessary for the implementation of public water supply and drainage projects, so that public suppliers are ready to implement water utility projects and withdraw EU funds for their implementation, and actively participate in the effective reform of the water utility sector, they state that the recommendation coincides with the efforts of Croatian Waters to continuously educate employees of public suppliers and local government units through conferences, seminars, educations, publishing professional publications etc. Also, the Law on Water Services prescribes the obligation of permanent professional training of employees of public suppliers, and the Regulation on special conditions for the performance of water services activities states that the public supplier is obliged to provide permanent professional training for all key employees and other employees and to ensure that key employees achieve the appropriate number of points in training period.*

*In connection with the recommendation to evaluate the impact of changes on the implementation of the Multi-Year Construction Program, i.e. water utility projects and to elaborate in more detailed measures to reduce risks in implementation, it states that until the end of 2030, Croatian Waters will continuously monitor and implement data collection activities, analyze and on the basis of this, evaluate the impact of changes on the implementation of the Multi-Year Construction Program, i.e. water utility projects and adapt/develop risk reduction measures. Croatian Waters will twice in a period of nine years (4.5 years from the start of implementation of the Multi-Year Construction Program) review the implemented activities and measures and the results achieved with regard to risk reduction in the implementation of the aforementioned Program and publish it on Croatian Waters website. There are three identified risks.*

*For risk 1. Lack of reliable information about the existing state of the water and communal infrastructure, namely the measures foreseen, Measure 1: Timely collection of information and detailed analysis of the actual state of the water and communal infrastructure during the preparation of the technical documentation of individual projects, Croatian Waters states that the measure is implemented and is part of the activities to collect data on the actual state of the water utility infrastructure, for which the data analysis was carried out in the Detailed Implementation Plan. The continuation of the activities will follow the activities of the actual preparation of the projects in cooperation with public suppliers. For Measure 2: In the process of reforming the sector, a large amount of data on the existing infrastructure and its condition will be collected and detailed maintenance/renovation investment plans will be prepared. Also, a detailed investment maintenance/renovation plans will be created for newly established service areas. Namely, only after the association and establishment of service areas, it will be possible to look at the "needs" related to local water supply systems and get a detailed insight into the number and condition of the remaining "individual" water intakes or wastewater discharges. For measure 3: As an intervention measure to ensure the healthiness of water on local water supply systems, the installation of chlorinators is planned, they say that it will be carried out immediately after the takeover of local water supply systems by public suppliers, which will fulfill the conditions for their correct operation and necessary maintenance. Croatian Waters regularly provides funds for these purposes in the annual Water Management Plan.*

*For risk 2. Limited administrative and technical capacities at the national level and limited technical and implementation capacities of the water utility sector, Measure 1 at the national level: at the project level, when preparing technical documentation, the dynamics of project implementation should be worked out in detail and adapted to time and space limitations, it is carried out, that is, applied in preparatory and initial activities (technical documentation) of project implementation. The request for a detailed elaboration of the project implementation dynamics adapted to time and space limitations is incorporated into the project tasks (the measure is monitored by the number of contract extensions and the relative deviation from the planned duration of the project). Measure 2 at the national level: After five years of implementation of the Program, market research will be conducted (available capacities of the construction sector and price movements) and the impact of changes on the implementation of the Program will be evaluated, it is planned to be implemented in 2026. In the Water Management Plan for 2026, Croatian Waters will plan funds needed for market research and analysis and assessment of the impact of changes in the construction sector on the implementation of the Multi-Year Construction Program. The results of the research will be published on the website of Croatian Waters (the measure is followed by the publication of the research results). For Measure 3 at the national level: Develop the control system and efficiency of public procurement, it states that it is being implemented and that Croatian Waters employees who participate in the implementation of projects are certified and monitor changes in public procurement, that is, they regularly participate in training programs and regularly renew their certificates.*

Furthermore, for any possible ambiguities, a connection has been established with the Administration for the Public Procurement System. The sector for support for the preparation and implementation of EU projects, which carries out ex ante control in the preparation of projects, regularly controls the tender documentation before publication and the public procurement procedure itself (the effect of this measure can be monitored by shortening the average duration of procurement in the period before 2021 and the new period and by reducing number of complaints). Measure 1 at the level of the water utility sector: the reform of the water utility sector is being implemented. By adopting a series of regulations related to the reform of the water utility sector, the conditions for institutional and professional capacity building of public suppliers were created. Part of the regulation also foresees employee education programs (implementation of the measure will be monitored by the number of educational programs conducted, number of workshops and participants).

For risk 3. Changes to the financial framework: Measure 1 at the project level: when preparing technical documentation, all financial data and indicators should be provided in kuna and euros. Namely, all financial data in the Multi-Year Construction Program are expressed in euros and kuna, all comparisons are possible and there is no need to extend the measure.

For Measure 2 Conduct capital market research at the beginning of the implementation of the Program in 2021 and after five years of implementation of the Program and evaluate the impact of changes on the implementation of the Program, they state that it was not implemented. The planned analysis of the capital market will be carried out in 2024, i.e. after the adoption of the new financial framework. In the Water Management Plan for 2024, Croatian Waters will plan the funds needed for market research and analysis and the evaluation of the impact of changes on the implementation of the Multi-Year Construction Program. The results of the research will be published on the website of Croatian Waters (the measure is followed by the publication of the research results). Regarding the measure to conduct a sociological-economic study related to willingness to pay, they state that it has not been conducted. The analysis will be done in 2025, i.e. after the adoption of the new financial framework. In the Water Management Plan for 2025, Croatian Waters will plan the funds needed for research and analysis and assessment of the impact of changes. The results of the research will be published on the website of Croatian Waters (the measure is followed by the publication of the research results). Regarding the measure of creating a communication strategy in the first year of the Program implementation, they state that the measure has not been implemented, and that the communication strategy can be prepared after the acceptability analysis has been made. Considering the deadlines for the implementation of the Multi-Year Construction Program, the two analyzes are planned to be carried out in parallel with appropriate coordination in 2025. In the Water Management Plan for 2025, Croatian Waters will plan the funds needed to create a communication strategy that will determine the indicators that will be used to monitor the impact of the application. The results of the research will be published on the website of Croatian Waters (the measure is monitored by the publication of the strategy and monitoring of indicators).

In connection with the recommendation to determine the need for financing, procurement and installation of chlorinators at water intakes of local water supply systems, and to plan funds for the stated purpose and implement the project, in order to ensure the healthiness of water for human consumption in water supply zones that were previously assessed as very high risk zones where it is not possible to permanently and continuously provide health-safe water for human consumption, they state that Croatian Waters and the Ministry have been finding solutions for years to ensure health-safe drinking water delivered through local water supply systems.

Thus, starting in 2020, the Investment Plan of Croatian Waters provides HRK 2,000,000.00 each year, and EUR 170,000.00 in 2023, for the improvement of water quality in local water supply systems, and funds are also provided for the purchase and installation of chlorinators. Efforts continue in the direction of ensuring healthy water in water supply zones that have been assessed as risk zones.

In connection with the recommendation to determine the indicators on the basis of which the implementation of the Loss Reduction Program in the Republic of Croatia would be monitored and the achievement of the goals, i.e. the effectiveness of the implementation of measures from the Program, would be assessed, state that the recommendation is accepted, that water losses amount to about 50.0 % and represent a major problem in the financial and technical-technological sense. Funding of the Loss Reduction Program and associated projects is a priority in order to reduce pressure on water bodies and enable long-term establishment of sustainable management of water supply systems. Croatian Waters and the Ministry have been implementing a Loss Reduction Program since 2018, which is designed to enable public suppliers, especially those with larger losses in the network, to determine the zero state and, in addition to other programs (OPCC, NRRP, etc.), to actively start reducing losses and bringing the system to an appropriate level. During 2023, measuring devices were installed at all water intakes, as a basic measure. The Ministry and Croatian Waters are the beneficiaries of the project Support for the reduction of water loss within the framework of the water sector reform in the amount of EUR 600,000.00. The project is financed through the Instrument for Technical Support within the framework of the NRRP, and is implemented by the World Bank in cooperation with the Directorate General for Structural Reform Support of the European Commission. It is expected that the project will contribute to the sustainability and affordability of public water services as well as the security and resilience of the water sector, strengthen the capacity to reduce water losses and improve the efficiency of public suppliers' operations. The main expected result of the project is the creation of a National Action Plan for reducing water losses in public water supply systems by the end of June 2024, based on which integrated public suppliers will be able to create their own action plans for reducing losses by the end of 2025, and with quality management of the water balance determine the situation and qualitative analysis and determination of priorities for effective implementation of water loss reduction.

In connection with the recommendation to ensure the effective application of legislative prerequisites in the field of water losses and to adopt and implement the National Action Plan for the Reduction of Water Losses, they state that as a measure from the NRRP in July 2023, the Regulation on Service Areas, the Regulation on special conditions for the performance of water service activities, the Regulation on the efficiency of water service providers' operations and the Regulation on the methodology for calculating the price of water services. The regulation on the efficiency of water service providers' operations, among other things, prescribes key indicators of the efficiency of operations, including indicators of water loss management. As part of the project Support for the reduction of water losses in the framework of the reform of the water sector in the Republic of Croatia, a National Action Plan for the reduction of water losses in public water supply systems for the entire Republic of Croatia was drawn up and a National Authority for monitoring losses in water supply systems was defined. The national action plan will be adopted by the end of the second quarter of 2024, and based on it, individual action plans of public suppliers will be drawn up by the end of 2025. By the end of 2024, the Ministry will establish a National Body for Monitoring Losses in Water Supply Systems, which will supervise the implementation of all a measure of the National Action Plan to reduce water losses in public water supply systems and to verify the action plans of public suppliers.

*Regarding the recommendation to continue the activities of encouraging public suppliers of water services to reduce losses by providing financial, administrative, technical, investment and operational assistance, they state that 18 workshops were held in 2022 within the framework of the project Support for the reduction of water losses within the reform of the water sector in the Republic of Croatia and 2023 in order to strengthen the capacity of public suppliers. The European Commission also approved the project Support for the reduction of water losses within the framework of the reform of the water sector in the Republic of Croatia phase II, with which it is planned to help public suppliers in creating their own action plans for reducing losses, strengthening their capacities through at least 12 planned workshops and strengthening the capacities of regulators Council for water services through assistance for the establishment of a national system for evaluating the efficiency of public suppliers' operations and regulatory accounting. The expected start of the project is May 2024, and the duration is until the end of 2025.*

*Related to the recommendation to intensify activities on the implementation of water and communal projects in order to improve the quality of water by the end of 2030 in such a way as to reduce pollution and halve the share of untreated wastewater, that is, to achieve progress towards the achievement of UN sub -goal 6.3. Improvement of the water quality and in order to fulfill the obligations assumed by the Urban Waste Water Treatment Directive, they state that the recommendation fully coincides with the interest of Croatian Waters. Directly related to this recommendation is the recommendation recommending the need for more detailed elaboration of measures to reduce risks in the implementation of the Multi-Year Construction Program. At this moment, in the existing situation of insufficiently secured EU grants, as well as insufficient funds from other funding sources, the need to establish a comprehensive sustainable financial framework for new projects in agglomerations stands out from the total necessary measures as a particularly priority measure that is on the critical path, above 2 000 PE, especially for the agglomeration from the 1st and 2nd priority order to fulfill the requirements of the Urban Waste Water Treatment Directive. In terms of technical readiness, there are currently a number of projects with a high level of readiness, the implementation of which cannot be started without securing the necessary funds and re-checking whether the project remains within the limits of affordability for end users according to the newly established co-financing model.*

*Measures to mitigate this priority risk of lack of funds are listed in the Multi-Year Construction Program itself. The first measure refers to the strengthening of the investment capacity of public suppliers in such a way as to fully implement the reform of the water utility economy, and the second measure refers to the activation of loans from international financial institutions. In the situation of insufficient EU funds, very limited possibilities of Croatian Waters (significantly reduced by the recently adopted relief measures within the Action Plan for the reduction of non-tax and para-fiscal benefits in 2023), the only significant possibly available source of grants at the national level is the state budget. In the greater or lesser lack of its availability, in the total missing amount, the only remaining realistic source of financing remains financing from the local level, that is, from the end users themselves (via the development fee).*

*In connection with the recommendation to continue to undertake activities to improve the monitoring of water conditions, in order to achieve a good water condition, as one of the goals of the water policy, they state that based on the Regulation on Water Quality Standards, Croatian Waters are adopting a Program for harmonizing monitoring with the River Basin Management Plan by 2027. With the adoption of the Monitoring Harmonization Program, the monitoring improvement process is implemented with the aim of achieving efficient and reliable water management (water condition and flood risks).*

*In order to determine the state of water bodies in the cycle of the River Basin Management Plan until 2027 (2022 to 2027), monitoring of elements of the ecological and chemical state is carried out at a total of 578 measuring stations in rivers and lakes, 200 measuring stations in transitional and coastal waters and nine measuring stations in the territorial sea, and monitoring of elements of the chemical state at 394 measuring stations in underground waters and 39 measuring stations in geothermal and mineral waters. Hydrological monitoring in rivers and lakes is carried out at 617 measuring stations, and in groundwater at 688 measuring stations. In order to develop a reliable, continuous, financially sustainable and institutionally based monitoring system, suitable for current needs with open development potential, the project Improvement of monitoring of the state of water in the Republic of Croatia is being carried out, within the framework of which a feasibility study was prepared, which analyzed the current state and needs, determined goals and solutions and developed a proposal for measures for the establishment of fully harmonized monitoring and a plan of necessary activities. With the amendments to Article 50 of the Law on Water, the responsibility for monitoring is transferred to the Josip Juraj Strossmayer Institute for Water, which every year, based on the Monitoring Coordination Program, adopts a monitoring plan and interprets the results of the monitoring, on which it prepares an annual report.*

*In connection with the recommendation that, when reporting to the UN on progress in achieving sustainable development indicator 6.3.2. The share of water bodies with good water quality, consider the possibility of applying the UN methodology so that the data are better aligned with the global framework for monitoring the goals of sustainable development and comparable with the data of other countries, they state that after the UN's inquiry about the explanation and selection of the methodology for calculation of sustainable development indicator 6.3.2. Share of water bodies with good water quality, accepted UN methodology with several corrections of limit values of electrical conductivity for lakes and groundwater and pH values for lakes and rivers. In November 2023, it was reported and accepted by the UN.*

*Regarding the recommendation to consider the possibility of publishing indicators 6.3.2. in cooperation with the Croatian Bureau of Statistics. The share of water bodies with good water quality on the Croatian SDGs Indicator Portal, in order for the public to be aware of water quality and the achievement of progress towards the achievement of UN sub-goal 6.3., state that Croatian Waters support the initiative to publish indicator 6.3.2., as well as all other indicators of sustainable of development on the Croatian SDGs Indicator Portal. Croatian Waters will inform the Croatian Bureau of Statistics about the above.*