



European Regional Development Fund - Instrument for Pre-Accession II Fund

MUHA



D.T1.1.1. Report on National consultations on water supply safety mechanisms - Slovenia”

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Version 02

December, 2020

This project is supported by the Interreg ADRION Programme, funded under the European Regional Development Fund and IPA II fund.



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1. Introduction

The regulation of the water sector is centralized at the national level. In general, governmental decisions regarding the quality of drinking water, water management and protection are made under four national entities which are in charge of water sector regulation in Slovenia. Those are Ministry of health with the National Institute for Public Health and The Ministry of Environment and Spatial Planning with The Environment Protection Agency.

Ministry of Environment and Spatial Planning is responsible for water sector policy development and implementation and also in charge of regulatory benchmark, finances investments and manages EU Cohesion Funds (MOP 2015). Ministry provides a healthy living environment for all inhabitants of the Republic of Slovenia and promotes and coordinates efforts towards sustainable development based on the efficient and economical use of natural resources and ensuring social wellbeing. Within this aspect, there is also the protection of water resources in the country.

Another entity operating within the water sector on a national level is The Environment Protection Agency, which is responsible for issuing water abstraction permits and water resources management and allocation. It is also responsible for monitoring water resources quality and quantity (natural state of the water bodies), collecting water abstraction and pollution taxes and protecting drinking water intake zones (ARSO 2015).

The third high-level entity governing in the water sector is the Ministry of health which is responsible for the development of a high-quality and accessible public health system based on universality, solidarity and equity. It strives to promote and protect health and prevent diseases among which field it is concerning also the allowed parameters in drinking water for the and user.

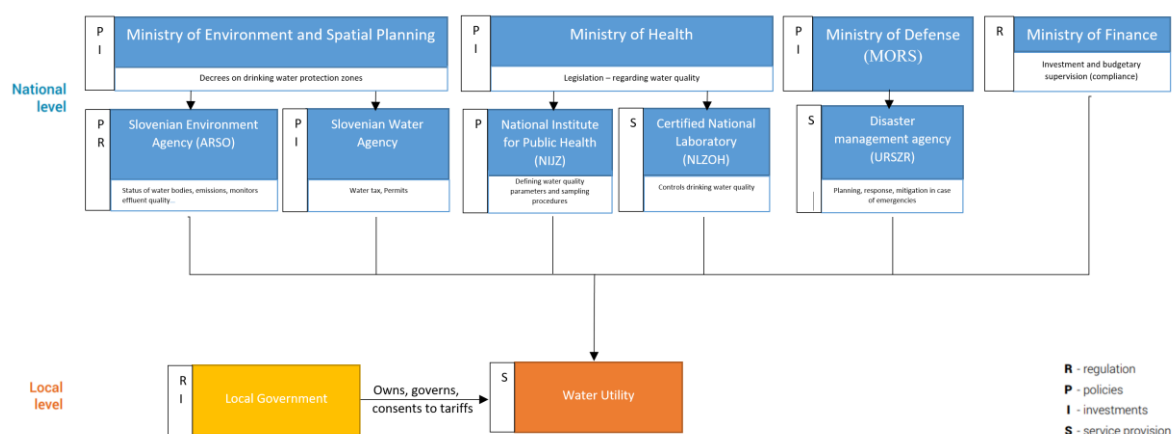


Figure 1: Water regulatory body scheme for Slovenia

In Slovenia water is a public good. The access to safe drinking water has been enshrined in the Constitution in 2016. All public water utilities are organized under municipality regulated public services Except of few private water distributors working under concession.



Quality of water intended for human consumption in Slovenia shall be determined based on indicators of the health standards of drinking water in compliance with the Rules on drinking water. The water supply comes mainly from groundwater (98%). Despite water abundance, there are quantity problems at summer pic consumptions at the coastline. The main reason for higher consumption in the summer, despite higher temperatures, is on a base of the summer tourism at the Slovenia shore.

In Slovenia, 94% of the population was supplied by drinking water supply utilities in 2017. The quality of drinking water is monitored at the end-user tap in a shape of national monitoring. Other 6% of the population of Slovenia is not included in the monitoring of drinking water as those systems supply less than 50 people (e.g. own small scale drinking water supply excluded from monitoring in the shape self-supply) or for other reasons e.g. incomplete capture. In Slovenian cities, as a rule, all residents are supplied with drinking water, which is monitored on national and utility scale (inner control). (ARSO, 2020)

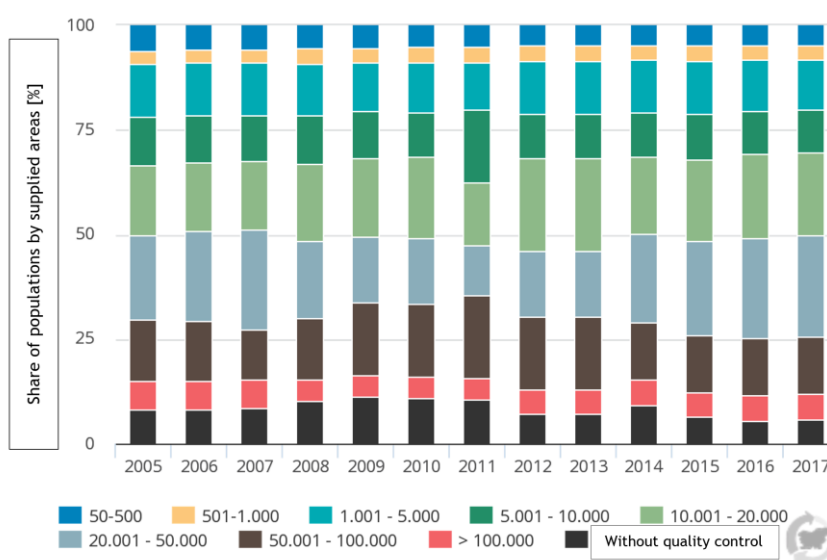


Figure 2: Share of population by supplied area (sosDanubis, 2015)

As seen from 2015 statistical data (sosDanubis, 2015) local government units provide water and sanitation services through 98 utilities. Fifteen regional utilities serve 58% of the population. Eighty medium and small municipal water utilities serve about 26% of the population. The rest of the population, mainly located in rural areas, relies on self-provision (12%), half of those despite the public utility water connection are remaining on self-provision. Three private operators provide water and sanitation services to 7 municipalities. One of them is located at the MUHA pilot action - in Kamnik municipality.



FIGURE 1: WATER SERVICES PROVIDER TYPES AND MARKET SHARES

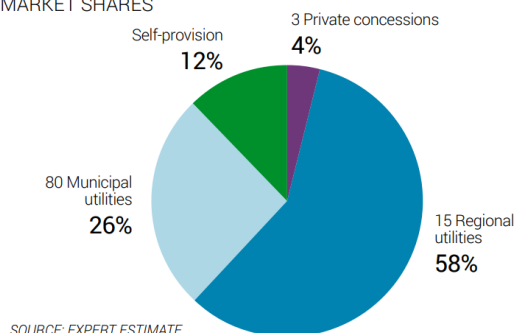


Figure 3: Water service providers and market share (sosDanubis, 2015)

Local government units are in charge of service quality and tariff setting. Water services management staff is appointed by municipal representatives. Staff training has mainly been driven by individual initiatives from water utilities. The national water association does not currently provide training or technical assistance to water stakeholders.

The water sector in Slovenia is regulated through a public self-regulated model since there is no national regulatory agency. A partial benchmarking approach has been adopted by the Ministry of Environment, but it is not being used as an economic regulatory tool (MOP, 2015). Service quality and tariff setting are the responsibility of municipalities, which must follow a mandatory methodology spelt out in a decree issued in January 2013 and laws accepted by the state ministries. The pricing mechanism is based on the cost recovery principle. Tariffs are revised on an annual basis by utilities and must be approved by municipal councils. Before this decree, water tariffs were controlled by the central government and were kept low.

Slovenia is among one of the reaches EU countries looking on quantity of renewable freshwater resources per capita. There is on average more than 15000 m³/person/day. The ratio between ground and surface water as a water supply source is in favour of groundwater used for public water supply with 98% despite the usage of surface water used for public water supply, which is about 2% while the number of inhabitants connected with underground water source is 98%, connected to surface water 2%. (sosDanubius)

The proportion of compliant samples (according to the Rules on Drinking Water) in the year 2019 was more than 99 % for organoleptic indicators of water quality, and more than 96 % for microbiological parameters (Escherichia coli and enterococci) (according to data on the percentage of non-compliant samples for individual parameters and samples). (Ministry of Health, 2020)

Water service utilities can be distinguished between three different distribution providers. According to World Bank data, the largest part of the distribution is served by municipal providers, followed by regional providers (large provider over a few municipalities) and lastly with self or informal providers. Looking on the point of view of a market share 58% of it is among 15 regional utilities following by 26% of share among 80 municipality utilities, self-provision is estimated to 12% and lastly with a 4% there are 3 private concessions. According to the inscription of access to water in the constitution, the private concessions among public water services will not be manageable anymore once the contracts with private company concessioners will be expired.



The share of the population using safety managed water service is over 95% with a share of the population with piped water access of 98%. The differences in personas using safety managed water service and share of the population with piped water access is in the fact that some people nevertheless having the access to piped water are still using water from their springs and wells (self-provision).

2. Concept of water supply safety in the country Slovenia

2.1 Legislation related to water safety

As already described above there are two major institutions governing the water sector in Slovenia that produced most of the law in this field. Anyway, we can found also other institutions involved in the management of drinking water utilities that had a part in the legislation below.

National level:

- Act Regulating the Sanitary Suitability of Foodstuff, Products and Materials Coming into Contact with Foodstuffs (Uradni list RS, št.52/00, 42/02 in 47/04 - ZdZPZ)
<http://www.pisrs.si/Pis.web/pregledPredpisa?id=ZAKO1381>
This Act lays down the conditions to be met by foodstuffs, food additives and products and substances that come into contact with foodstuffs in order to be medically fit and regulates the health control of their production and trade in order to protect human health and protect the interests of the consumer and enables uninterrupted trade in the internal market and with third countries, monitoring the health adequacy of food and products and substances that come into contact with food, and inter-ministerial and international cooperation in the field of nutrition and nutrition policy.

Subordinate to national level Act above:

Rules on drinking water (Official Gazette of the RS, št. 19/04, 35/04, 26/06, 92/06, 25/09, 74/15 in 51/17) <http://pisrs.si/Pis.web/pregledPredpisa?id=PRAV3713>
These Regulations took in consideration Commission Directive 98/83 / EC of 3 November 1998 on the quality of water intended for human consumption (OJ L 330, 5.12.1998, p. 32), Commission Directive (EU) 2015/1787 of 6 October 2015 amending Annexes II and III to Council Directive 98/83 / EC on the quality of water intended for human consumption (OJ L 260, 7.10.2015, p. 1). 6). Regulation determines the requirements that drinking water must meet in order to protect human health from the harmful effects of drinking water pollution.

Utility level:

- HACCP (obligatory from the rules on drinking water)



Environmental Protection Act (Uradni list RS, št. 39/06 - uradno prečiščeno besedilo, 49/06 - ZMetD, 66/06 - odl. US, 33/07 - ZPNačrt, 57/08 - ZFO-1A, 70/08, 108/09, 108/09 - ZPNačrt-A, 48/12, 57/12, 92/13, 56/15, 102/15, 30/16, 61/17 - GZ, 21/18 - ZNOrg in 84/18 - ZIURKOE) <http://pisrs.si/Pis.web/pregledPredpisa?id=ZAKO1545>

This law regulates the protection of the environment against pollution as a basic condition for sustainable development and in this context sets out the basic principles of environmental protection, environmental protection measures, environmental monitoring and environmental information, economic and financial instruments of environmental protection, public environmental protection services and others environmental issues

The water protection area is determined on the basis of regulation of the Government of the Republic of Slovenia. Water protection zones were in the past (till 2001) accepted and defined on the municipal level. From 2001 on the decision-making process was transferred on the national level. If the WPZ is not defined yet on the national level, the old WPZ as defined before 2001 on the municipal level is valid. Therefore, in the next chapter, we are attaching two different maps of WPZ within Slovenia.

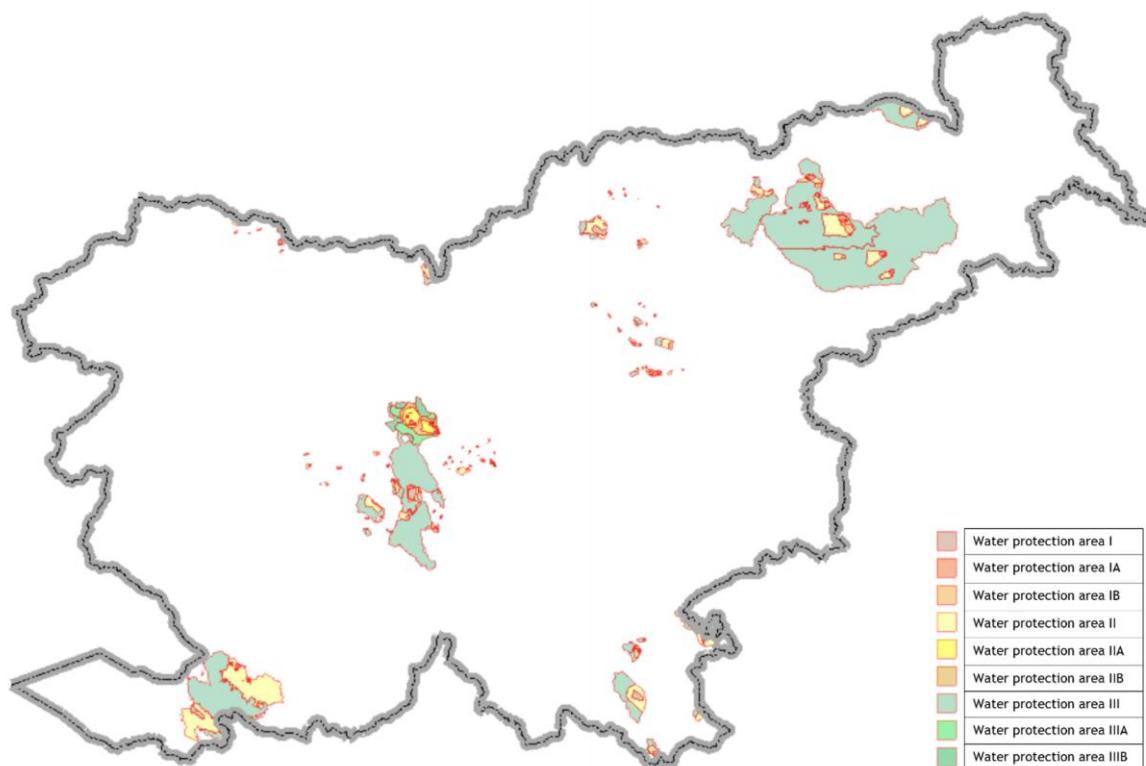


Figure 4: Water protection areas determined by the state (Atlas voda, 2020)

Subordinate to national level Act above:

- Rules on drinking water supply (Uradni list RS, št. 35/06, 41/08, 28/11 in 88/12)
<http://www.pisrs.si/Pis.web/pregledPredpisa?id=PRAV6487>
 These Rules set out the requirements for the supply of drinking water, which must be met



in the provision of services of the obligatory municipal public utility service for the protection of the environment of drinking water supply and in the own supply of drinking water. These Rules also determine the content of records of water mains and their operators, and operational program for environmental protection relating to the supply of drinking water, records of the provision of public service services and records of own drinking water supply, cadastre of public water supply, drinking water supply program, and reports on the implementation of the public service.

- Decree on the methodology for determining prices of obligatory municipal public services for environmental protection (Uradni list RS, št. 87/12, 109/12, 76/17 in 78/19)
<http://www.pisrs.si/Pis.web/pregledPredpisa?id=URED6060>

This Regulation determines a methodology for pricing the services of compulsory municipal public utility services for environmental protection for drinking water supply, drainage and treatment of municipal and stormwater, collection of certain types of municipal waste, treatment of certain types of municipal waste, and disposal of residues from the recovery or disposal of municipal waste. The Decree also determines measures and norms related to the calculation of prices of public service services to their users.

- Services of General Economic Interest Act (Uradni list RS, št. 32/93, 30/98 - ZZLPPO, 127/06 - ZJZP, 38/10 - ZUKN in 57/11 - ORZGJS40)
<http://www.pisrs.si/Pis.web/pregledPredpisa?id=ZAKO272>

This Act determines the manner and forms of performing public utility services. Determine that public utility services provide material public goods as products and services whose permanent and uninterrupted production in the public interest is provided by the Republic of Slovenia or a municipality or other local community to meet public needs when and to the extent that they cannot be provided on the market.

- Local Self-Government Act (Uradni list RS, št. 94/07 - uradno prečiščeno besedilo, 76/08, 79/09, 51/10, 40/12 - ZUJF, 14/15 - ZUUJFO, 11/18 - ZSPDSLS-1, 30/18, 61/20 - ZIUZEOP-A in 80/20 - ZIUOOPE)
<http://www.pisrs.si/Pis.web/pregledPredpisa?id=ZAKO307>

This law regulates municipalities as basic self-governing local communities. Within the framework of the Constitution and laws, describe that the municipality independently regulates and performs its actions and performs the tasks delegated to it by laws which can also be found the laws obligating of the municipalities in relation with drinking water supply.

Subordinate to national level Act above on a municipal level:

- Ordinance on drinking water supply (For PA Kamnik) <https://www.uradni-list.si/glasilo-uradni-list-rs/vsebina?urlurid=20092738>

This decree determines the conditions and manner of drinking water supply from public



water supply systems and the rights, duties and responsibilities of the owner, contractor and users in relation to the supply and consumption of drinking water. Within the decree, it is also defined that whole public water utility infrastructure is in possession of municipality itself despite the connection of the building to the public water supply.

- Decree on the designation of buffer zones and measures to ensure the coverage of Iverje drinking water (For PA Kamnik) (no internet source for PA Kamnik, internal document)

Water protection zone determined on the basis of municipal ordinances:

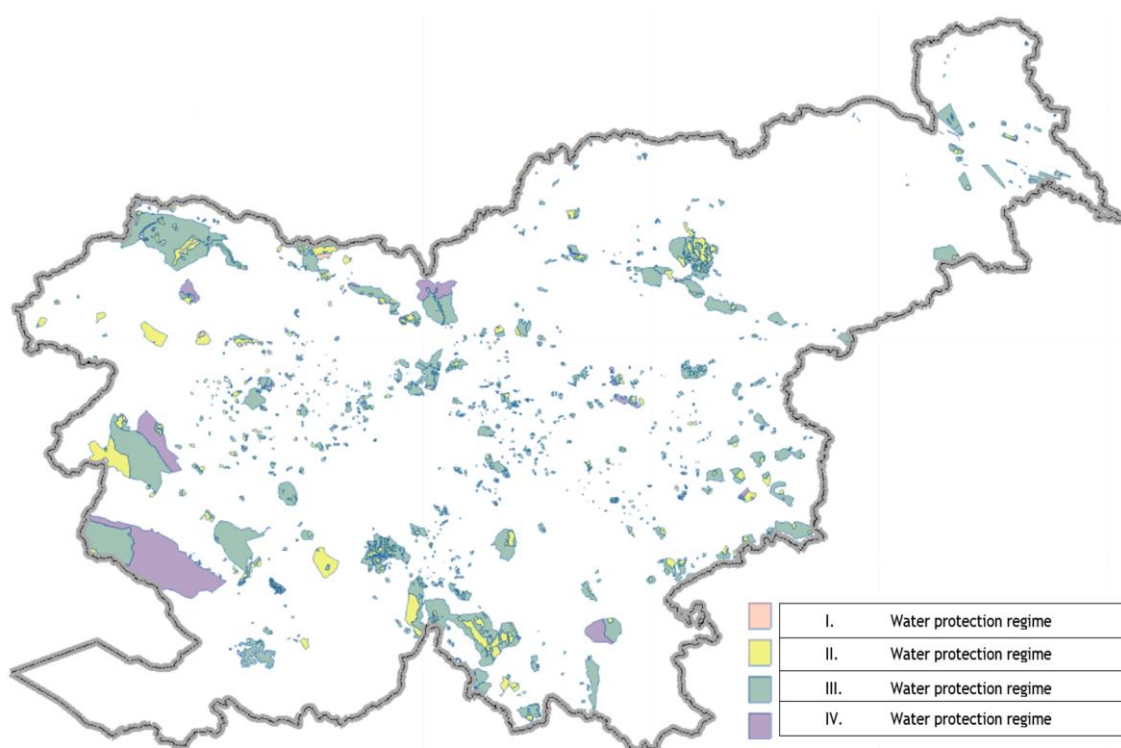


Figure 5: Water protection areas determined by the municipality ordinance (Atlas voda, 2020)

- Protection Against Natural and Other Disasters Act (Uradni list RS, št. 51/06 - uradno prečiščeno besedilo, 97/10 in 21/18 - ZNOrg)
<http://pisrs.si/Pis.web/pregledPredpisa?id=ZAKO364>
 This Act regulates the protection of people, animals, property, cultural heritage and the environment against natural and other disasters. Protection against natural and other disasters aims to reduce the number of accidents and to prevent or reduce the number of victims and other consequences of such disasters. The state, municipalities and other self-governing local shall organize protection against natural and other disasters as a unified and comprehensive system in the state. Defining the protection system shall include programming, planning, organization, implementation, supervision, financing of measures



and activities for protection against natural and other disasters. This Act transposes the following European Community directives into the legal order of the Republic of Slovenia; Council Directive 89/391 / EEC of 12 June 1989 on the introduction of measures to encourage improvements in the safety and health of workers at work (OJ L 183, 29.6.1989), Council Directive 89/618 / EURATOM of 27 November 1989 on informing the public of the health protection measures to be taken and of the rules of conduct in the event of a radiological emergency (OJ L 357, 7.12.1989)), Council Directive 96/29 / EURATOM of 13 May 1996 laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionizing radiation (OJ L 159, 29.6.1996), Council Directive 96/82 / EC of 9 December 1996 on the control of major accident hazards involving dangerous substances (OJ L 10, 14.1.1997).

Subordinate to national level Act above on a municipal level:

- Drinking water supply plan in emergency situations (no internet source for PA Kamnik, internal document)

Emergency response planning is a document that helps water system managers and staff quickly react in emergencies with described vulnerabilities, and in best cases procedures to follow during an emergency. It aims is to prepare employee on quick response in a preliminary defined emergency situation that can save lives, prevent illness, enhance system security, minimize property damage, and lessen liability.

Other, without state-level legislation defining guidance documents:

- Technical guidance documents for individual water utility (defining use of EN standards i.e. EN 805, EN 1717) (no internet source for PA Kamnik, internal document)

2.2 Institutions related to water safety

Water utilities (public utility services) - “Izvajalci obvezna lokalne gospodarske službe varstva okolja - oskrbe s pitno vodo”

The public water supply system is a system that provides drinking water supply and is owned by a self-governing local community and has the status of a built public good. Water utilities are providing safe drinking water for end users. Among their tasks are maintaining utility infrastructure, continuously providing drinking water, taking samples for inner control and reporting the status of distributed water (obligatory annually status overview report and reporting to NIJZ when samples of inner control are not within the regulations).

According to the 22nd article of the Decree on drinking water supply (88/12) water utilities shall prepare and maintain Program of Measures in the Case of Emergencies Due to Pollution.

National institute of public health - “Nacionalni Inštitut za Javno Zdravje (NIJZ)”



NIJZ - (National Institute of Public Health) is a central national establishment with a main purpose to educate, protect and enhance the health of the population of the Republic of Slovenia by means of raising awareness and other preventive measures.

Among the main NIJZ activities are monitoring and evaluation of healthcare system and the health of the population, recognizing health threats and developing measures to control them, managing health and healthcare services databases and promotion of health and developing professional bases for adopting health-friendly policies, programs and measures for disease prevention. The main task regarding water safety and its quality is to governance the process of quality control (through Program of Monitoring Plan) and collecting the results of water quality control, making annual reports and giving directives in case of inadequacy of water quality samples.

National Laboratory for Health, Environment and Food - “Nacionalni laboratorij za zdravje, okolje in hrano “(NZLOH)”

The National Laboratory of Health, Environment and Food is the central and the largest laboratory for public health, dealing with hygienic and health-related ecological activities, environment protection problems, microbiological diagnostics and chemical analyses of samples of different kind and research activities. In the laboratory, the services for governmental needs are executed, first of all for monitoring and official inspection and supervision from the competencies of the Ministry of Health, Ministry of Agriculture, Forestry and Food and Ministry of the Environment and Spatial Planning. Free capacities are offered to customers on the open market. In cooperation with other institutions in Slovenia and abroad, the NLZOH cooperates in national and international research, applicative and advisory projects. The laboratory examines water quality under health control critical levels according to Rules on drinking water and samples of national monitoring taken on the end user pipes.

National Environmental Agency (ARSO)

Slovenian Environment Agency performs expert, analytical, regulatory and administrative tasks related to the environment at the national level. The Environment Agency is a body of the Ministry of the Environment and Spatial Planning. Its mission is to monitor, analyse and forecast natural phenomena and processes in the environment, and to reduce natural threats to people and property. Between the tasks performed by the national services for meteorology, hydrology and seismology are preserving natural resources, biodiversity and sustainable development; observing, analysing and forecasting natural phenomena and processes in the environment; reducing impact of natural hazards; ensuring legal protection and professional assistance to participants in environmental encroachment procedures.

Specific role of ARSO relative to water supply is monitoring of groundwater levels and status of groundwater bodies, which are primary source of drinking water in Slovenia.

Administration of the Republic of Slovenia for Civil Protection and Disaster Relief - “Uprava RS za zaščito in reševanje - URSZR”



Administration of the Republic of Slovenia for Civil Protection and Disaster Relief (hereinafter referred to as URSZR) is a constituent body of the Ministry of Defence. It performs administrative and professional protection, rescue and relief tasks as well as other tasks regarding protection against natural and other disasters. URSZR is divided into six internal organizational units (four sectors and two services) based in Ljubljana as well as 13 other URSZR branches operating throughout Slovenia. Within each branch, there is a regional notification centre that performs a 24-hour duty service. Altogether, around 300 people are employed at URSZR branches and regional notification centres.

URSZR is in charge of legislation related to the provision of water for fire-fighting from public water supply systems. Overall contingency management is guided by the protocols defined by URSZR - defining also the legislation relative to the disaster management cycle in relation to drinking water supply, decree on the content and elaboration of protection and rescue plans (24/12).

Slovenian local communities; municipalities - “Občine”

Public administration is organized at the national and municipal levels. Slovenia is a parliamentary republic composed of 212 municipalities. Local self-government units perform activities such as local spatial planning and development and provision of local public services including water and wastewater services. Providing legislation on municipality level based on the state law. Providing decrees, ordinances and technical guidelines for local water utilities.

Local communities are owners of public water utility companies, they also play the key decisional role in the formation of the prices according to the Decree on the methodology for determining prices of obligatory municipal public services for environmental protection (87/12). Local communities are also owners of the all drinking water supply infrastructure, which is managed by public or private water utilities.

2.3 Ongoing processes

There has recently been little change in the water supply sector. Many water utilities in urban areas have been in continuous operation for more than a century. After the transition process in the 1990s, the number of municipalities increased from 60 to 212. From that point, the number of water services increased to 98 utilities. Prompted by the EU integration process, some investments were made to improve the accessibility of the water supply. However, there is currently one ongoing change in the water supply sector. For years ago in the 2016 access to safe drinking water was enshrined in Constitution. The main consequence in the practice of this enrolment is to end the granting of rights to private water concessionaires. There is still a minor part of private concessionaries providers as the rights were not taken for ongoing signed contracts.

2.3.1 Existing practices aiming at the drinking water safety



As there is no legislation related to water safety plans in Slovenia, all existing practices aiming at the drinking water safety are related to HACCP protocols. There is draft of the Regulation on Drinking Water from 2018, but was not officially published. In this document it can be found the term “Načrt za zagotavljanje varnosti pitne vode” which translation would be similar to “Plan on assuring safety of drinking water”. This can be taken as an attempt to establish the new approach of water safety in the country, but it also can be seen just as an improved version of HACCP and not as holistically taken WSP. Mentioned document is concerning more or less just on the health approach of water safety (with HACCP critical control points) and is not dealing with any probabilities, or even mentioning the standard SIST EN 15975. If the standard is taken in concern by the utilities it is by the municipality documents - Technical guidance for specific municipal utility or as a good practice from utility employee personnel.

According to mentioned draft of the new Regulation (which was not officially published) the National Institute for Public Health and National Laboratory for Health, Environment and Food were organizing the workshops on this thematic. Few Utilities already started to improve their HACCPs in the documents named as “Načrt za zagotavljanje varnosti pitne vode”.

According to The WHO Status Report on Water Safety plan from 2017 in Slovenia more than 10 WSP were established, none of them in the rural area.

In the feedbacks on the questioner from the utilities, three out of four utilities stated that they already have Water Safety Plans.

2.3.2 Level of implementation

According to the previous facts (WHO, 2017), the level of WSP implementation in the country for the year 2017 which is around 9%.

We are providing comparison between the chapters of HACCP and WSP document from Idrija Water Utility. Bolded chapters can be found defined in both documents with slight differed determination in the part of defining the operational plan - as active plan of the system. Newly established plan is defined in twelve additional points as seen below.

Main HACCP - Idrija Water Utility

- **Analysis of biological, chemical and physical risk factors**
- **Designation of critical control points (CCPs)**
- **Setting critical limit values and correction procedures**
- **Establishment of CCP monitoring**
- **Establish verification procedures to verify the operation of the HACCP system**
- **Establishing documentation taking into account the scope and type of food business**

Plan on assuring safety of drinking water - Idrija Water Utility

- **Analysis of biological, chemical and physical risk factors**
- **Determination of critical control points (CCPs)**
- **Determination of critical limit values and correction procedures**



- **Establishment of CCP monitoring**
- **Establish verification procedures to verify the operation of the Plan on assuring safety of drinking water**
- **Establishment of documentation taking into account the scope and type of activities (using water)**
- Program of oriented education / training
- Implementation of personal hygiene and other hygienic procedures at work, health monitoring conditions
- Protective equipment for employees
- Control of water protection areas
- Water preparation before distribution
- Availability, maintenance, proper operation of capture, preparation and distribution devices drinking water and measuring equipment
- Providing appropriate hygienic and technical conditions in facilities and devices for capture, preparation and distribution of drinking water (maintenance and rehabilitation of facilities and installations; catchments, reservoirs, distribution network)
- Pest control
- Water use restriction plan
- Water analysis plan in internal control
- Communication with users and other stakeholders (informing users, resolving complaints, answering users' questions, informing competent institutions)

2.4 Tools

In the following chapter we are providing the overview of the tools which are supporting the water safety procedures implementation in Slovenia. Listed tools are provided according to the feedbacks of the questionnaire sent to utilities and fulfilled with tools existing on the national scale.

Water sources safety/protection/management

- Information system for monitoring mandatory municipal public utility services for environmental protection (IJSVO)
<https://www.ijsvo.si/Obcine.aspx>

Water supply system

- Water quality reporting to National Institute for Public Health (NIJZ) by the online application Internal control of drinking water "Notranji nadzor pitne vode"
<http://www.npv.si/>
- Water quality reporting to National Institute for Public Health (NIJZ) by the online application Monitoring of drinking water "Monitoring pitne vode"
<http://www.mpv.si/>
- SCADA
- Tango (central smart city dashboard)
- Remote monitoring



- Dynamic hydraulic model
- At-line MB (microbial) analyser
- HACCP operational meetings
- Education on tools and workshops
- GIS software
- System operational databases
- User notification system

End-of-pipe control (tap monitoring and measures)

- National monitoring (NLZOH). Detailed description can be found in the document MUHA DT.1.1.4 chapter 3.2.2.

Tools enabling interaction with the civil protection

- Monitoring, observation and control system (SMOK)
<https://smok.sos112.si/Voda/PostajaMap/Map?Alarm=True&Narasc a=True&Pada=True&Ustaljen=True&Brez=False>
- Collective cadastre of economic public infrastructure (ZKGJI)
<https://www.e-prostor.gov.si/zbirke-prostorskih-podatkov/zbirni-kataster-gospodarske-javne-infrastrukture/>
- SPIN
<https://spin3.sos112.si/javno/>
- Overview of active interventions (activated by the civil protection - URSZR)

2.5 Risks, bottlenecks, challenges

Some of the potential risks that may negatively affect the successful implementation of improved water safety procedures are identified according to feedback inputs of questionnaire sent to water companies. It needs to be marked that only four utilities respond even if the kind requests were additionally sent two times.

- 1) Technical risks (describing specific status of WSS)
 - Internal installations (inadequate)
 - A backup water source is not provided for all water sources
 - Karst world with low self-cleaning ability
 - Microbiological pollution due to groundwater contact with surface water
 - Impact from urban wastewater discharges (ever limited with successful implementation of UWWTD).
 - Piping - distribution system oversize due to fire safety requirements. Impact on overheating of water, stagnation in the system.
 - Inadequate technical condition of reservoirs
 - Problems repairing water supply failures
 - Aging of collection, collection and distribution facilities
 - Karst geological structures with limited treatment capacity
- 2) Economic risks (limited funding)



- Insufficient investments of the owner (municipality) in outdated infrastructure
- 3) Political risks (i.e. low priority in society)
- Outdated municipal ordinances on the one hand, and new regulations on the other are very complex. They involve interdepartmental control, which can be a big problem.
 - Inconsistency of legal starting points in the harmonization of the Drinking Water Rules, the Food Safety Regulation and the Protection against Natural and Other Disasters Act (often misunderstood by water supply operators as well as municipal services, but not excluded)
 - The technical rules have not been adopted and are only valid internally
 - All legislation and documentation relates to food, water is specific and needs different treatment
- 4) Other
- Modern diseases that can affect a large number of employees, which could disrupt the regular water supply process
 - Limited guidelines, rules and training for the preparation of HACCP and protection and rescue plans documentation
 - Lack of awareness of external staff about the possible consequences of interventions in the water source
 - Limited education (smaller plumbing systems that do not have competent internal staff)

<p>■ STRENGTHS</p> <ul style="list-style-type: none"> - water protection zones are defined - national and internal monitoring established - some reporting procedures are established (IJSVO) 	<p>■ WEAKNESSES</p> <ul style="list-style-type: none"> - Age of water supply systems - Small WSS - Lack of investments by municipalities - Limited experts at the WSS - Outdated municipal ordinances - inadequate internal installations in small WSS - legal compliance of Drinking water regulations and Decree on the content and preparation of protection and rescue plans is not sufficient
<p>■ OPPORTUNITIES</p> <ul style="list-style-type: none"> - establishing WSP -improving drinking water safety 	<p>THREATS</p> <ul style="list-style-type: none"> - alternative water source is not established for all sources (quantity)



<p>- improving of the reporting system</p>	<ul style="list-style-type: none"> - WSP seen as improved HACCPs - no regulations over adequacy of the Technical Rules (municipality legislative document) - unpredictable HE - climate change / water availability at the sea shore area at the summer - Drinking Water Regulation legal document is not officially realised / accepted by the government. There is a threat that all of the accumulated knowledge from 150-year experience in the field will not be taken in concern while preparing the Drinking Water Regulation
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3. Specific hazards/risks addresses by the water safety procedures in the Slovenia

According to answers of the questionnaire in the last 10 years the utilities have the problems providing drinking water as a consequence of (sum up of events in 5 utilities):

- flood (4),
- sleet (power outage) (4),
- droughts (13),
- accidental pollution (6)
- heavy rain (20),
- unauthorized access (1),
- damages because of low temperatures (1)

The differences between the regions in the country is seen especially in the hazardous events in a shape of (sleet & damages because of low temperatures). Those two events occurred in the utilities that are in pre-alpine region where the occurrence of sleet is more likely than in the other regions. The problems of providing drinking water because of the drought occurred in 3 out of 5 utilities.

Risks which are addressed by the water safety procedures (Water Safety, HACCP, other) in your country (general).

- Water quality
- Monitoring of the structures and water protection zones of the water sources
- Water intake chlorination station with measurement of the residual chlorine
- Monitoring the water quality in the case of water delivery using water tanks
- Sanitary risk programmes ensuring water safety
 - Cleaning process



- General instructions for the processes where workers do not have a contact with the drinking water
- General instructions for the processes where workers do have a contact with the drinking water
- Management of the areas around the water facilities
- Pest control
- Personal hygiene and health of the workers
- Recharge area
- Reservoirs
- Water intake
- Pump station
- Distribution system

Protection of water resources

Water protection zones (WPZ) were established on municipality level till 2001, from that point on they are in a national domain. If not defined on national level the municipality determination of WPZ is valid.

Measures against accidental pollution (surface waters, groundwater)

Measurements on ground and surface water are established within national monitoring of waterbodies and can be seen as measures for detection of accidental pollution. Other measures against accidental pollution are WPZ protecting the water sources for drinking water.

Measures addressing floods

Flood maps are established on national level.

Measures addressing droughts

Droughts within WSS are not specifically addressed by any regulatory body and in most cases, there are no good practices by indexing the levels of the source water body.

On national level there is continuously daily calculated Water Deficit index with a mGROWA-SI model, build and calculating at Environmental Agency of Slovenia (ARSO). Also other indexes can be found calculated for area of Slovenia within extended version of provided indexes in DriDanube project platform.

Measures addressing earthquakes

No specific measures are concerning earthquakes for Water Utilities. All buildings must be designed within the aspect of possible earthquakes ground acceleration with return period of 475 years.



Measures addressing other risks (please provide if some other risks are recognized and anyhow addressed in your country i.e. cyber-attacks, intentional damage, etc.)

Sleet (with power outage): Performed personal notification to the end users as there were problems with notifications over conventional media procedures. Purchasing of electric generators. Operation of WSS devices was performed with the help of electric generators where built-in or supplied by civil protection.

4. Conclusions

The main conclusion after a general overview on water safety the priority would certainly be legitimize the WSPs in the regulation with a specific emphasis on regulation of reporting the events.

Nevertheless, there is no regulation concerning establishment of WSP there are few water utilities who already started establishing those documents which is seen as very positive as shows there is a common sense that HACCPs documents for establishing safe and uninterrupted water supply is not enough. Those documents in general are good foundation for WSPs.



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Appendix 1:

Overview of the structure of the questionnaire

GENERAL

The first set presents issues of a general nature related to the management of existing practices for the safe provision of drinking water.

1. Can you list and briefly describe the processes that are currently (or have recently been) actively underway in order to improve the provision of a safe drinking water supply?
2. Can you indicate which tools you use to help implement legislation on the provision of drinking water supply? (leads, hydraulic models, tables for selecting sampling methods, training...)
3. Do you notice any risks, bottlenecks and challenges in the implementation of improving the provision of safe drinking water supply within your system?
4. Have you noticed in practice any specific risks and dangers in the procedures of ensuring safe drinking water supply that have not yet been included in the HACCP system?

HACCP / Drinking Water Safety Plan

5. Have you faced drinking water supply problems in the last 10 years as a result (circle)
 - a. earthquakes (pipe breakage, cracks in the infrastructure, sedimentation,...)
 - b. floods
 - c. drought
 - d. extraordinary pollution (eg spills)
 - e. other: _____
 - f. If you answered in the affirmative to the previous question; What were the consequences for the drinking water supply system (physical and management) for the operator (what measures have been put in place)?

Please indicate the date of the last preparation / amendment of the protection and rescue plan or. contingency plan, in case of emergencies, in accordance with the Decree on the content and preparation of protection and rescue plans (Official Gazette of the Republic of Slovenia, no. 24/12, 78/16 and 26/19);

_____.



6. We are interested in whether you had specific difficulties in preparing the HACCP security document?

Were there any problems in securing and maintaining the document?

7. Is the document defined response or. entry of Civil Protection (CZ) from emergencies?

Was the document forwarded to CZ for review, what were their comments on the document?

Does CZ have a municipal or regional headquarters in your area?

8. Which stakeholders do you actively cooperate with in your daily work, in connection with ensuring a reliable and safe drinking water supply? Please rate the intensity of participation in the table below from 1 to 5.

NIJZ 1 2 3 4 5

Ministry of Health 1 2 3 4 5

Municipality 1 2 3 4 5

Civil protection of the municipality 1 2 3 4 5

CZ regions 1 2 3 4 5

CZ states - URSZ 1 2 3 4 5

Concessionaires (VGP) 1 2 3 4 5

DRSV 1 2 3 4 5 Environmental Inspectorate 1 2 3 4 5

the inspectorate responsible for protection against natural and other disasters. 1 2 3 4 5

Other:

_____ 1 2 3 4 5

_____ 1 2 3 4 5

_____ 1 2 3 4 5

Do you work with non-institutional stakeholders (eg associations) and which ones?

1) _____ 1 2 3 4 5

2) _____ 1 2 3 4 5



10. Can you name an institution that does not currently exist in the Republic of Slovenia, but should perform specifically defined tasks in the field of ensuring the safety of drinking water, which are not currently defined?

11. Please identify which are the KEY THREATS for the security of drinking water supply that you identify for your system?

- a) Flood 1 2 3 4 5 6 7 8 9 10
- b) Earthquake 1 2 3 4 5 6 7 8 9 10
- c) Pollution (hinterland) 1 2 3 4 5 6 7 8 9 10
- d) Extraordinary pollution 1 2 3 4 5 6 7 8 9 10
- e) Drought 1 2 3 4 5 6 7 8 9 10
- f) Please indicate any additional ones not defined above;

12. Within the project, we will set up a collection tool for monitoring the probability of extraordinary events (Event probability analysis). Therefore, please describe how to manage emergencies on your plumbing system (who manages what data is captured, who analyzes it - according to which direction). (Example: record of failures in the water supply system.)

13. Describe the relationship between HACCP (prepared according to the Drinking Water Rules and the Food Safety Regulation) and the Protection and Rescue Plan (Law on Protection against Natural and Other Disasters, Regulation on the Preparation of Plans...).

Do you think that both legal bases are properly harmonized (circle) 1 2 3 4 5

Do you think that there are enough educations and guidelines, rules for:

Preparation and management of HACCP documentation?

NOT ENOUGH / NON OF IT / ENOUGH

Possible comment:

Preparation and management of a protection and rescue plan?

NOT ENOUGH / NON OF IT / ENOUGH

Possible comment:



SECURITY PLANS FOR DRINKING WATER SUPPLY:

14. Are you familiar with the term / document "Drinking Water Safety Plan"?

(YES / NO)

Do you have a standard EN 15734 (parts 1 and 2) purchased from the company?

(YES / NO / ONE PART ONLY)

Are you familiar with the contents of standard EN 15734

(PARTIALLY, GOOD, NO)

15. Have you already initiated preparation procedures;

- Drinking water safety plan

(YES / NO)

- and the implementation / amendment of the plan managed in emergencies?

(YES / NO)

If you answered YES to the previous questions:

- To what extent is the latter document ready? (descriptive)

- What extraordinary events are identified in your plan (in preparation) that were not covered by HACCP (descriptive)

16. In your opinion, what are the most important elements of the water supply system (components) that should be analyzed in the Drinking Water Safety Plan in relation to your water supply system? (circle)

a) Source of drinking water (surface water) 1 2 3 4 5 6 7 8 9 10

b) Source of drinking water (groundwater) 1 2 3 4 5 6 7 8 9 10

c) System for enrichment and protection of drinking water source 1 2 3 4 5 6 7 8 9 10

d) Capture (pumping stations) 1 2 3 4 5 6 7 8 9 10

e) Transport and storage of raw water 1 2 3 4 5 6 7 8 9 10

f) Preparation of drinking water 1 2 3 4 5 6 7 8 9 10

g) Tanks, extenders, pumping stations 1 2 3 4 5 6 7 8 9 10

h) Transport and distribution of drinking water 1 2 3 4 5 6 7 8 9 10

i) End-user network 1 2 3 4 5 6 7 8 9 10

j) Organization of work and keeping records / information 1 2 3 4 5 6 7 8 9 10



k) Risks in the (near) future (climate change,...) 1 2 3 4 5 6 7 8 9 10

Is any key element of the plumbing system missing - please indicate:

1) _____

2) _____

3) _____

Practice under existing legislation

17. On average, how many times in the last ten years have you received a recommendation / proposal to take into account additional parameters (change / note / expert opinion) from the NIJZ or regional health care institute?

- a. Never
- b. up to 1x per year
- c. up to 3 times a year
- d. more than 3x a year

18. Please indicate how HACCP is related to the Operational Plan for Drinking Water Supply of your municipality? (descriptive)

19. How is HACCP related to the technical regulations defined for the design, construction and operation of your water supply system (descriptive) - do you think that improvement is needed and in which parts and where?

20. In the last ten years, have you been ordered to carry out additional monitoring for substances and micro-organisms for which no limit value has been set for a parameter suspected to be present in concentrations or numbers that pose a potential hazard?

(YES / NO)

If you answered YES to the question;

How many times?

21. Have you established monitoring of the identification of organic compounds in the last ten years? (YES / NO)

If you answered YES to the previous question;

To what extent has the identification of organic content been carried out?



22. Do you have a replacement water source (Article 16 of the Decree on drinking water supply) or sources within the drinking water supply system that can mainly compensate for the loss of the main water source?

(YES / NO)

- If you answered YES to the previous question:

- Have you been forced to include an alternative water source in the network in the last ten years? (YES / NO)

- In the case of using an alternative source as a substitute in case of emergencies, which has not been used for more than 6 months, it was possible to provide (especially from the point of view of the time component) the full analysis of parameters set out in Article 15 of the Drinking Water Rules ?

(YES / NO)

23. Is the monitoring defined in Article 15 of the Drinking Water Rules (paragraph 4) recorded in the Drinking Water Supply Plan in exceptional circumstances?

(YES / NO)

24. Have you recently carried out any monitoring of parameters that are not specified in the annex to the Rules on Drinking Water?

(YES / NO)

If you answered YES to the previous question - What was the reason or. the reason for such a decision?

25. If you have detected in the last ten years the inadequacy of the parameters during internal control or. monitoring, what were the main causes of the elevated values?

26. How fast and to what extent was the communication with the NIJZ, and what was their response to the recommendations in case of non-compliance of a certain parameter?

Additional suggestions and comments:




- List of organizations, names and contact persons with which the draft was communicated (as a part of received questionnaire)

Organization (water utilities)	Contact person	Contact
VOKA Snaga	Brigita Jamnik	brigita.jamnik@vokasnaga.si
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The questionnaire was presented at the on-line conference “Upravljanje z vodovodnimi sistemi - varnost in optimiziranje”. The list of attendance below is in a shape of “print - screen” from the on-line meeting.



USERS (25) 

Ul UL FGG Ajda Cilenšek (You)	Be Bernarda
Ba Banovec, Primož	Da Daniel Kozelj
Ži Žiga Ščukovt UL FGG	Gr Gregor
Al Aleš Stražar	Iz Iztok Rozman, GZS-ZKG
An Ana Strgar - UL NTF	Je Jelko Gomboc
An Antun Gašparac	Ka Kaja Zgonc
Ba Barbara Čenčur Curk	Ma Marko
Be Benjamin Resnik	Ma Marko
Be Bernarda	Ma Matej Cerk
Da Daniel Kozelj	Ma Mateja Jelovčan
Gr Gregor	Ma Mateja Rejc
Iz Iztok Rozman, GZS-ZKG	Te Teja Račnik
Je Jelko Gomboc	To Tomaž Ružič
Ka Kaja Zgonc	Ul UL FGG_Andreja Žerjav
Ma Marko	Đu Đuvelek, Edo
Ma Marko	Šp Špela Ferjančič
Ma Matej Cerk	Ži Žiga Pižorn