Legislative framework for drinking water (re)sources monitoring in the Adriatic region

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Abstract: The Strategic project Networking for Drinking Water Supply in Adriatic Region (acronym DRINKADRIA) co-financed by the European Union through the program IPA Adriatic CBC 2007–2013 evaluated various aspects for cross-border drinking water resources management and protection in the Adriatic region, e.g., climate and land use change impact, monitoring and protection legal and policy framework, increased demand during touristic season, etc. Seventeen partner institutions from eight countries across the Adriatic region (Italy, Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Serbia, Albania and Greece) participated in project implementation. Due to complexity of cross-border drinking water (re)sources management the legal framework pertaining to drinking water sources monitoring at national and regional level is analysed based on data and information provided by partners. All legal acts and descriptions in English are uploaded on the DRINKADRIA project shared platform. This paper provides legal framework evaluation synopsis, underline the identified gaps, and provide comparison of monitoring practices with respect to cross-border drinking water sources in the Adriatic region. Given the differences in national legal framework it is concluded that the protocol for cross-border monitoring of water resources used for human consumption should be defined on bilateral (trilateral) level among countries instead as a unified protocol for the whole Adriatic area. However, the basic framework and common structure of the protocol is proposed.

Key words: legal framework, drinking water resources management, cross-border, transboundary, Adriatic region

1. INTRODUCTION

While management of water supply systems is a broad domain well addressed by professionals and researchers the issue of cross-border water supply systems is not so recognized (Altran et al., 2014). The Strategic project Networking for Drinking Water Supply in Adriatic Region (acronym DRINKADRIA), with total budget of 6,600,000 EUR, main goal was to develop a foundation for strategies and procedures that would secure cross-border water supply with specific emphasis on drinking water resources management in trans-boundary context, climate change and specific socio-economic aspects of the Adriatic region (Karleuša, 2016a). Seventeen partner institutions from eight countries across the Adriatic region (Italy, Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Serbia, Albania and Greece) participated in project implementation (Figure 1).

In addition to evaluation of various significant aspects of cross–border drinking water resources management and protection within the project area (climate and land use change impact, monitoring and protection legal and policy framework, increased demand during touristic season, etc.) several guidelines for protocols development are proposed to contribute in sustainable cross–border drinking water resources management, e.g., Guidelines for the improvement of drinking water protection zones delineation in the Adriatic region (Brenčić and Čenčur Curk, 2016), Guidelines for long term Cross-Border Water Supply Planning (Vidmar and Matić, 2016), etc.

Drinking water resources and supply management at the national level is extremely complicated and when it comes to cross-border level it is multiplied as stated by Kanakoudis et al., 2015.
Cross-border water supply systems are not typical in Europe and majority of them occurred in regions where the wars have occurred in last 100 years together with major political changes (Vidmar and Matić, 2016). Based on Banovec et al. (2016) specifics regarding differences in legislation and different agencies are even more evident in case of countries involved in DRINKADRIA project.

One of Project activities was to analyse the possibility to define a common protocol for water (re)sources monitoring in the Adriatic area. This paper provides legal framework evaluation synopsis, underline the identified gaps, and presents main monitoring practices comparison findings with respect to cross-border but also cross-regional (between regions within one country) drinking water (re)sources in the Adriatic region.

2. EXISTING LEGAL FRAMEWORK OVERVIEW

Adriatic region countries diversity, types of drinking water sources, intention to address both cross-border and cross-regional monitoring practices resulted in template development for data and information collection. Due to complexity of cross–border and cross–regional drinking water (re)sources management the legal framework pertaining to drinking water sources monitoring at national and regional level was analysed based on data and information provided by partners during the project implementation (Karleusa, 2016b). As presented in Figure 2 collection and analyses of legal framework relevant for protocol development at EU and national level (including legislation on regional level in countries where existing) is considered in evaluation. Also the stage of implementation of EU legislation in national legislation in countries that are not member of EU was analysed.

2.1 EU legislation

2.2 National legislation

The overview and analyses of most important national and regional legislation regarding water (re)sources monitoring in Adriatic area in all partner countries is based on reports submitted by project partners’ during year 2015 (Karleuša, 2016b).

The Italian legislation, on the national level, concerning the quality of surface and groundwater intended for human consumption basically derives from the application of EU Drinking Water Directive according to the: Legislative Decree no. 31, Implementation of EU Drinking Water Directive 98/83/EC on the quality of water intended for human consumption and Legislative Decree no. 27, An integration/modification of the previous Legislative Decree, no. 31/2001; Legislative Decree no. 152, but also Environmental Code (that is a unified text of law that takes into account several aspects connected to Environmental quality and actions; among other aspects: Environmental Impact Assessment (EIA), Water management and pollution prevention, Waste management and Contaminated soils remediation, Air protection and pollution prevention, Compensation claims against environmental damages) and Legislative Decree no. 30, Implementation of EU Groundwater Directive.

Slovenian legislation dealing with drinking water monitoring, the surface and groundwater quality monitoring is presented in six regulations. The legislation is on the national level. On the top of the hierarchy there is the Water act and below are specific regulations: Regulations on drinking water, and depending on the type of water resource: Decree on ground water status and Regulations on ground water monitoring, Decree on surface water status and Regulations on surface water status.

Water legislation in Croatia functions within a legal framework comprised of several regulations. The legislation is on the national level. On the top of the hierarchy is the Water act and below are specific regulations: Act on water intended for human consumption, Regulations on parameters compliance and analysis methods for water intended for human consumption, and Decree on water quality standard both for surface and ground water.

The Greek legislation dealing with the surface and groundwater quality, monitoring and drinking water is presented in several regulations: National Law 3199/2003 for the “Protection and management of water”, Joint Ministerial Decision (JMD) Y2/2600/01 regarding the water quality for human consumption, Ministerial Decision 1811 for the determination of the maximum allowable concentrations of pollutants in groundwater, JMD 140384 Determination of the national stations network for monitoring the quality and quantity of the water systems, and JMD 51354/2641/E103/2010 for the determination of the Environmental quality standards for the concentrations of pollutants in surface waters.

In Bosnia and Herzegovina (B&H) surface and ground water quality requirements are regulated differently on the national and the entity (regional) level (Federation of Bosnia and Herzegovina (FB&H) and Republic of Srpska). Quality of ground water intended for human consumption is
under the authority of the Bosnia and Herzegovina (on national level), and is regulated according to: \textit{Regulations on drinking water safety and Regulations on natural mineral and natural spring water.}

Quality of the surface water under the authority of the FB&H is regulated by: \textit{Water Act, Regulations on dangerous and harmful substances in water, Regulations on classification of waters and coastal sea waters within the borders of Former Socialist Republic of Bosnia and Herzegovina, Regulations on watercourse categorization, Decision on characterization of surface and ground waters, reference requirements, and parameters for the assessment of water status and water monitoring.}

Additionally, in the FB&H the \textit{Decision on characterization of surface and ground waters, reference, requirements, and parameters for the assessment of water status and water monitoring} deals with the quality of ground water but only in the terms of determination of the water quality status, pollution pressures, quantity and similar parameters necessary for the issuing of management plan for river basins and is in line with the WFD, 2000/60/EC recommendations.

Quality of the surface water under the authority of the Republic of Srpska is regulated by \textit{Water Act and Regulations on classification and categorization of watercourses.}

For Montenegro legislation at the national level significant for drinking water comprises of \textit{Water act, Regulations on the hygienic quality of drinking water, Regulations on methods for determining and maintaining sanitary protection zones for drinking-water sources and restrictions in the related zones, and Law on communal activities.}

In Serbia drinking water and water resources quality monitoring legal framework includes number of acts and by-laws, namely, \textit{Water act, Act on sanitary observation, Drinking water supply sources management and protection act, Environmental protection act and Act on amendments and additions to the Act on environmental protection, Act on public health, Regulations on drinking water sanitary standards, Regulations on surface water ecological and chemical status parameters and groundwater chemical and quantitative status parameters.}

\textit{Water Framework Directive} is not operative in Albania in 2015, but the \textit{Law on integrated management of water resources} and some other Decisions of the Council of Ministers (DCM) were supposed to be updated in 2015 were written in compliance with this directive. Albania legislation dealing with the surface water, groundwater and drinking water quality monitoring was presented in several laws and regulations: \textit{Law no. 1. 111/2012, Integrated management of water resources, DCM no. 1189, to the rules and procedures for the drafting and implementation of a national program of environmental monitoring, DCM no. 246, for determination of the environmental quality standards for surface waters, DCM no. 1304, The approval of the regulation on the water supply and sewage services in the service area of the water-joint stock supply and sewage utilities, DCM no. 145, for the approval of the Hygiene and health regulation for the control of drinking water quality, the design, construction and supervision of systems of drinking water supply.}

### 3. THE MAIN OUTPUTS AND DATABASE

Since Italy, Slovenia, Croatia and Greece are EU members their national drinking water and water resources quality legislation is in compliance with the \textit{WFD (2000/60/EC), DWD (98/83/EC) and GWD (2006/118/EC).}

In Bosnia and Herzegovina, Serbia, Montenegro and Albania the level of EU legislation transposition and implementation differs from country to country.

Monitoring legislation referring to water quality for human consumption in Bosnia and Herzegovina is in accordance with \textit{Drinking water directive} although B&H is not member of EU. Croatia has two regulations that cover jointly the DWD. There are minor differences between national legislative acts regarding monitoring the quality of water for human consumption in Italy, Slovenia, Croatia and B&H. Montenegro, Serbia and Albania have their own legislation relevant for the monitoring of the water quality for human consumption. The proposal for the \textit{Regulation on Drinking Water Quality in Albania} which integrates \textit{DWD (98/83/EC) norms and regulation (2015),} is under the approval process.
In Serbia WFD requirements are transposed into Water act and by-laws (existing and those that are still pending to be approved). Water Framework Directive is not operative in Albania, but the Law on integrated management of water resources and some other DCM updated recently are developed in compliance with this Directive. The most complex structure of legislation is found in the Bosnia and Herzegovina (B&H). The surface and ground water quality requirements are regulated differently on the national and entity level (FB&H and Republic of Srpska).

From analyses of national legislation for water (re)sources monitoring in DRINKADRIA countries it can be concluded that there are more particularities and differences with respect to monitoring of water quality intended for human consumption.

The analyses of national legal framework, because of the domain complexity and discrepancy among national legal framework resulted in conclusion that the more specific protocol for cross-border drinking water sources monitoring should be defined on bilateral (trilateral) level among countries instead as a unified protocol for the whole Adriatic area. However, based on outcomes and identified gaps, the guideline framework and common structure of the protocol was proposed within the Project outputs (Karleuša, 2016b).

The bi/tri-lateral protocol for monitoring activities on cross-border water resources used for drinking water supply should include:

- relevant institutions in countries involved;
- the procedure for exchange of results from monitoring at the national and other levels of monitoring between relevant institutions of both (all three) countries;
- the procedure for planned monitoring programmes exchange or even the preparation of joint monitoring programmes;
- the procedure to enable the access to monitoring locations in the neighbour country;
- the procedure of sample collection;
- the monitoring methods for both (all three) countries that should be standardized and comparable;
- the procedures regarding data and information use and publication;
- the procedure of covering additional monitoring costs;
- human resources and capacities development;
- other that might address cross-border water resources used for human consumption management.

The DRINKADRIA project shared platform (http://drinkadria.fgg.uni-lj.si/) is organised to provide different tools that help in capitalisation of new knowledge and results from the Project assuring the DRINKADRIA project sustainability (Matić, 2016; Matić B. and Miletić-Radić M., 2016). On shared web platform an application for searching water (re)sources monitoring legislative acts in Adriatic region was created (http://drinkadria.fgg.uni-lj.si/water-resources/legislation-water-sources-monitoring/). It is designed as a database from which is possible to find legal acts from EU and from each project country and access the act/decree/regulation in the original language and if available in English language (Figure 3). For national acts/decrees/regulations there is a short description of the content in English language.

5. CONCLUSION

Because of the domain complexity and discrepancy among national legal framework for drinking water monitoring in eight DRINKADRIA project countries evaluation of national data resulted in conclusion that the more specific protocol for cross-border drinking water sources monitoring should be defined on bilateral (trilateral) level among countries instead as a unified protocol for the whole Adriatic area. However, based on outcomes and identified gaps, the guideline framework and common structure of the protocol was proposed within the Project outputs. The next step should be the preparation of bilateral (trilateral) protocols between countries.
that share cross-border water resources used for human consumption with all specifics regarding national legislation.

The other relevant output of the Project is the *Legislation on water source monitoring database*, which consists of legislative acts from EU and from each project partner country with the possibility to access to the act/decree/regulation in the original language and if available in English language with a short description of the content in English language. It is expected that this database will be updated thought future projects in which DRINKADRIA project partners, with the help of the developed network of institutions and professionals, will participate.

**Figure 3.** DRINKADRIA shared web platform – list of relevant legislative documents for Bosnia and Herzegovina (BIH), Croatia (CRO), Italy (ITA), and Slovenia (SVN), (http://drinkadria.fgg.uni-lj.si/water-resources/legislation-water-sources-monitoring/, accessed 30.01.2017)

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