DRINK ADRIA

NETWORKING FOR DRINKING WATER SUPPLY IN ADRIATIC REGION

„Ј. ЧЕРНИ"

Contents

I INTRODUCTION

Jaroslav Černi Institute for the Development of Water Resources (JCI), together with sixteen partners from the Adriatic region (from Italy, Slovenia, Croatia, Albania, Bosnia & Herzegovina, Montenegro and Greece), is participated in implementation of DRINKADRIA (***Networking for Drinking Water Supply in Adriatic Region***) project. The project goal is to accomplish number of activities that contribute in improvement of drinking water supply in the Adriatic Basin. One of the initial objectives was to develop protocols that will have a positive effect on water supply security, as well as interactive shared web platform development that provide projects data, information and outputs to professional circles and the general public. At present, strategic project DRINKADRIA is the only of this type that addresses cross-border water supply and implements a number of measures in seven pilot areas.

The implementation of the project started in December 2013 and is scheduled for completion in September 2016. The project is funded through the EU IPA *Adriatic Cross Border Cooperation Program 2007-2013*. The budget of the project is 6,643,648 €. The lead partner is the Area Council for Eastern Integrated Water Service of Trieste (CATO).
The following 17 partner institutions from the Adriatic region are members of project consortium:

Italy
Area Council for Eastern Integrated Water Service of Trieste (CATO)
VERITAS Joint Stock Company - Multiutility Water Service of Venice - Laboratory Division
Optimal Territorial Area Authority n. 3 Marche Centro - Macerata
Italian National Council - Water Research Institute (CNR-IRSA)

Slovenia
Water Utility of Nova Gorica - Sector of Development and Investment
University of Ljubljana

Croatia
University of Rijeka - Faculty of Civil Engineering
Croatian Geological Survey - Department of Hydrogeology and Engineering Geology
Region of Istria
Water Utility of Istria - Team for installation of remote reading system for water meters

Serbia
Jaroslav Černi Institute for the Development of Water Resources, Department of Water Supply, Sewerage, and Water Protection

Albania
Water Supply and Sewerage Association of Albania

Bosnia and Herzegovina
Hydro-Engineering Institute of Sarajevo, Faculty of Civil Engineering
P.C. Utility Neum

Montenegro
Public Water and Wastewater Utility of Niksic - Tehnical Department

Greece
Region of Ionian Islands
University of Thessaly

Jaroslav Černi Institute for the Development of Water Resources is the only DRINKADRIA project partner from Serbia.

Project activities have been divided into six work packages:

1. WP1 - Project and financial management
2. WP2 - Communication and dissemination, comprised of the following activities:
   - •Development of Communication Plan;
   - •External communication and dissemination;
   - •Active Web page development and operation.

3. WP3 - Capitalization and sustainability – **Under the DRINKADRIA project, Jaroslav Černi Institute is the lead partner of this work package**, which includes:

- Development of a capitalization plan;
- Capitalization activities relevant to project viability;
- Data collection and review of other relevant regional projects (e.g. Danube River Basin Management Plan);
- Establishment of an exchange platform for resources and good practices.

4. WP4 – Cross-border water resources management, including the following sub-activities:

- Regional characteristics and climate change;
- Risks related to present and future availability of water resources, with a focus on drinking water supply;
- Risks related to the security of water resources used for present and future drinking water supply;
- Protection, mitigation of adverse effects, and cross-border management of water resources.

5. WP5 - Cross-border management of drinking water supply systems, comprised of the following activities:

- Overview of cross-border water supply history (pertains to regional schemes in individual countries, if relevant to the project).
- Development and proposal of standardized approaches and procedures needed for present and future effective and efficient management of cross-border water supply systems.
- Conceptual solution/proposal of an economic model for long-term planning of cross-border and regional water supply schemes.

6. WP6 – Pilot actions – Activities under this WP have been divided into the following sub-groups:

- Development of a common analytical framework applicable to all pilot sites;
- Activities at individual pilot sites;
- Establishment of protocols and documenting of lessons learned from the implementation of pilot site activities.

According to the rules of the IPA Adriatic Fund, Serbia could not propose a pilot area. However, a DRINKADRIA final beneficiary from Montenegro (Public Water Utility of Nikšić), given the long-term successful cooperation with the Jaroslav Černi Institute, engaged JCI to provide external expertise in implementation of activities for pilot area of the Nikšić Utility, which was approved by the IPA Fund.

During the implementation period , the DRINKADRIA project aims to propose potential solutions for cross-border water supply issues recognized by the project participants: distribution network water losses, ageing infrastructure, low water tariffs, increase in water demand, climate and land use change impact, and high seasonal variation in water consumption.

Although the project is focused on cross-border drinking water resources and cross-border water supply systems, a lot of effort is devoted to regional water supply schemes in different countries, especially to the cross-border/regional context of water resources management, as well as climate and land use change and socioeconomic characteristics for the selected regions.

DRINKADRIA project has already contributed to the development of a regional networking platform in the field of water supply, focused on water supply security and stability enhancement. Furthermore, one of the expected outcomes of the project is a contribution to the improvement of the quality of water supply and the quality of life in the entire Adriatic Basin. The target group is the population of the countries in the region covered by the project. Parallel project outcomes refer to public awareness raising about the importance of protecting conserving potable water and water resources for present and future generations, such that the project has generated a series of informative materials like brochures and flyers, and organized a number of technical meetings and workshops (24) for professionals and researchers, as well as presentations for the general public.

Jaroslav Černi Institute organized three very successful stakeholders national workshops that addressed water supply issues and regional water supply schemes in Serbia. A large number (over 150) of professionals and researchers from Serbian water and wastewater utilities, scientific institutions and universities, as well as guests from project partner institutions, participated on workshops. JCI also hosted a regional DRINKADRIA meeting for the project partners in Belgrade.

II WORK PACKAGES

DRINKADRIA project have included six different work packages:

1. WP1 - PROJECT AND FINANCIAL MANAGEMENT

is split in two activities:

1.1 Project management comprises activities in two directions.
First is communication with all other partners in project, in trying to find the best solution for different tasks and solving some problems when appeared; and second is coordination between stuffs of FB10 partner – Jaroslav Černi Institute (JCI), related to issues of all work packages.

Each partner has made Project progress report each 6 months. It could be said that communication between partners were very good, and majority of problems have been solved successfully. The greatest happened problem was half year of Managing Information System (MIS) disfunctioning, which was not direct responsibility of any project partner. Due to that fact, project has been postponed for 6 months, so the duration is almost 3 years (from November 2013. to September 2016.). The greatest problem for JCI was fact that, due to EU IPA Adriatic rules, Serbia can not ask for reimbursments after 31. December 2015.,e.g. can not be active as before.

1.2 Financial management comprises activities related to spending funds. Total JCI budget was 308.789,29 euros. IPA Adriatic has financed 85% (about 260.000 €), and 15% were covered by JCI's own funds. We had 10 reported periods, duration each of them from 1 to 4 months. We used twice possibilities to change budget, between work packages and budget lines, and final spending funds table is as follows:

	WP0 (€)	WP1 (€)	WP2 (€)	WP3 (€)	WP4 (€)	WP5 (€)	WP6 (€)	TOTAL (€)
Staff	0	14,500.00	15,500.00	77,000.00	42,500.00	55,000.00	36,000.00	240,500.00
Overheads		0	0	0	0	0	0	0.00
Travel and accommodation	1,000.00	1,500.00	5,000.00	8,789.29	2,500.00	3,000.00	9,000.00	30,789.29
External expertise	0	0	2,000.00	1,000.00	3,000.00	2,000.00	0	8,000.00
Meetings and events	0	0	0	5,000.00	2,500.00	2,500.00	2,000.00	12,000.00
Promotion costs		0	2,500.00	2,000.00	0	0	0	4,500.00
Equipment		0	0	0	0	0	13,000.00	13,000.00
Investments		0	0	0	0	0	0	0.00
Fin. charges & guar.		0	0	0	0	0	0	0.00
TOTAL	1,000.00	16,000.00	25,000.00	93,789.29	50,500.00	62,500.00	60,000.00	308,789.29

2. WP2 - COMMUNICATION AND DISSEMINATION

In accordance with the terms of reference and the communication and dissemination plan of the DRINKADRIA project, planning and implementation of communication activities have been defined as essential conditions for project visibility and promotion. The target public of the project includes: professional organizations (public water management companies, water and sanitation utilities, regional water supply systems, various associations); scientific institutions (institutes, universities); decision makers - government bodies; nongovernmental organizations; media outlets; and citizens. Given that the ultimate target population is that of the countries in the Adriatic region, one of the most important outcomes of the project is raising public awareness about the importance of drinking water and water resources for present and future generations.

Communication Channels and Activities

The following communication channels have been selected to promote and present the project and the activities undertaken by the Jaroslav Černi Institute: JCI's website; printed materials; photographic and video content; special events; and media.[1]

Drinkadria Project – Channels of communication

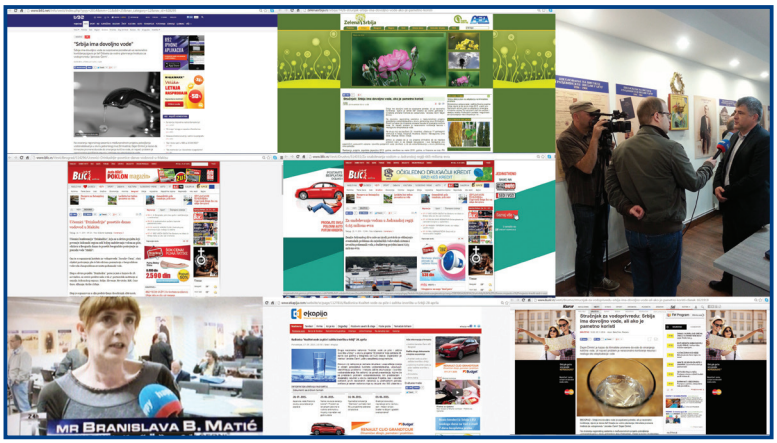
A special web page titled "International projects" was created on JCI's website (http://www.jcerni.org/en/activities/international-projects/drinkadria.html) to present the DRINKADRIA project's activities. The web page comprises of the most important data and information about the project and project activities, such as workshops, regional meetings, completed activities, upcoming actions, etc. Website visitors can access graphical and video material, as well as presentations from the workshops and meetings. To further promote the project, two bilingual (Serbian/English) promotional leaflets have been printed and distributed to national workshop participants. Posters were also produced for the national workshops. All printed material is available on the website in electronic format.

[1]Branislava Matic, Marijana Miletic-Radic: "Drinkadria Project Capitalization and Sustainability and Connection with Good Practice of Dissemination and Communication Activities", International Symposium: Cross-Border Drinking Water Management, Proceedings, 29th January 2016, Rijeka, Croatia

Drinkadria visual identity: Graphic materials

The Activity Plan calls for photographic and video documenting of Jaroslav Černi Institute's activities; this also applies to the activities at meetings organized by other project partners, as well as engineering activities undertaken during project implementation on the ground. The photographic and video materials have been used to produce a short bilingual (Serbian/ English) film about project activities and contributions.

With regard to special events, Jaroslav Černi Institute has organized three national workshops and one regional meeting of all project participants. These events served as a basis for attracting media attention and cooperating with media outlets on the dissemination and communication of project information of interest to the general public. News and information about the project and JCI project implementation activities are released in printed, electronic and online media.[2]



Drinkadria Project Media coverage

The progress of the project and the intensification of cooperation with the media increased the number of media outlets interested in covering the project. Relations with the media during the course of the project were founded upon cooperation, through which important information was disseminated to the target as well as wider public, thus contributing to the achievement of the proclaimed project objectives.

[2]Drinkadria Project – JCI Report on Communication and Dissemination

Communication activities on the implementation of the DRINKADRIA project have resulted in positive changes by raising public awareness about key water supply and cross-border water supply issues.

Drinkadria Project Media coverage

3. WP3 - CAPITALIZATION AND SUSTAINABILITY

The main goal of this work package was to capitalize important knowledge and skills significant for cross- border and regional water supply and to integrate them in project implementation to sustain project sustainability. Given the diversity of DRINKADRIA project tem (Water Utility Partners, Research Partners, Authority Partners and Associate Partners) the first step was to develop capitalization plan and methodology (Figure below) that would formalize the lessons of experience, validate them, integrate them into practice and guarantee blending skills and knowledge among project team and stakeholders in eight countries. This approach results in main outputs that maintain project sustainability:

- Capitalization activities in 8 countries that involved over 800 participants from water supply public utility company, authorities, decision makers, researchers, and students;
- Comparable outputs from different countries with respect to stakeholders' opinion on DRINKADRIA main goal and objectives;
- Identification of main issues and constrains at the project level relevant for cross-border and regional Drinking Water Supply System and water (re)sources management;
- Development of DRINKADRIA shared platform that blends outputs and results from all work packages.

Methodology for stakeholders' management[3]

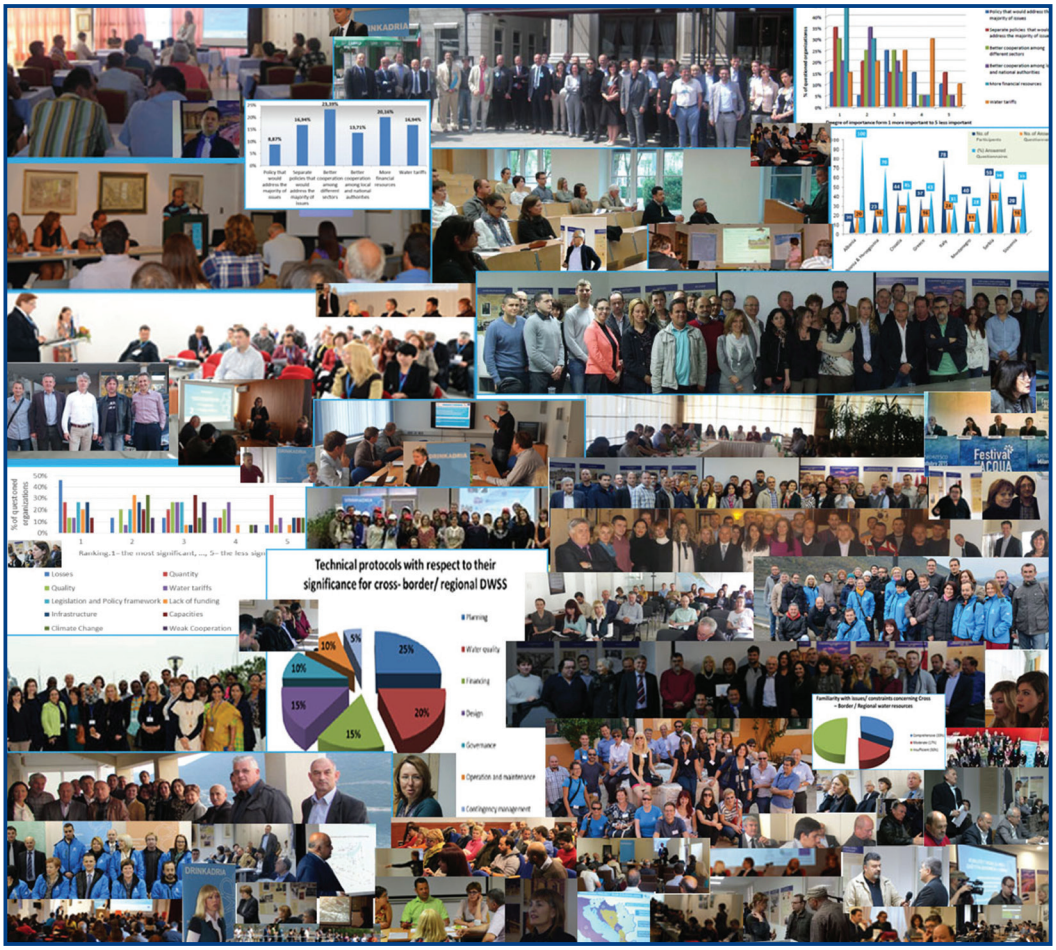
In addition to methodology the capitalization plan is developed to pinpoint key significant processes for cross- border/regional water management and water supply, relevant stakeholders, capitalization tools that would generate pertinent stakeholders' inputs and feedbacks to sustain project implementation.

During the project implementation 24 national events for stakeholders are organized. Total number of participants exceeds 800 participants in eight countries and their experience and knowledge are assembled by commonly developed tools, e.g., questionnaires.

Generally speaking, majority of stakeholders identified losses as one of the main problems, followed by water tariffs (water pricing mechanisms) that are still social categories in some countries, quantity, etc. Despite the significant role of state level institutions for cross – cutting issues and constrains the great number of participants recognize role of their institutions as significant for sustainable cross –border/ regional water supply. Moreover, they consider technical protocols as an important mechanism for cross – border/ regional water management and drinking water supply.

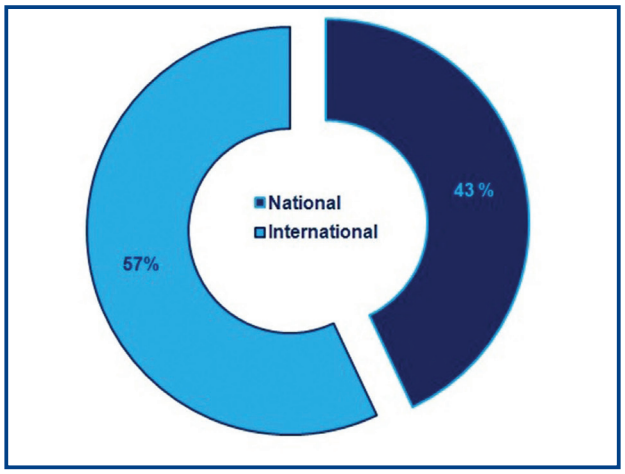
In addition to stakeholders workshops, number of capitalization events are implemented, e.g., presentations for students and in International River Basin Commissions (Danube and Sava), symposiums, round tables. Figure DRINKADRIA project Stakeholders' streamline summarizes all these capitalization activities.

[3]Source: DRINKADRIA Report on Methodology for project integration

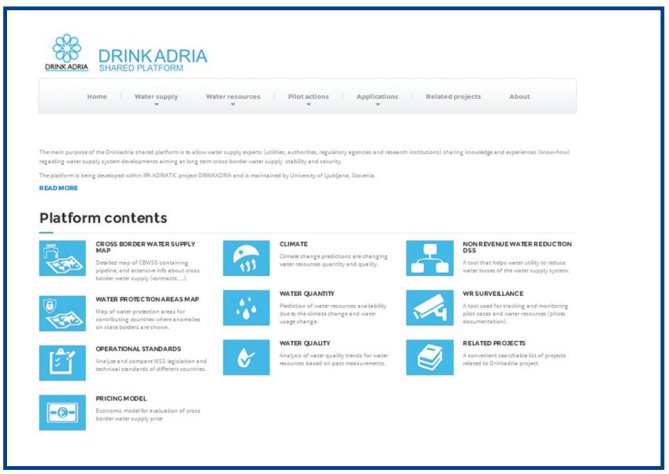


DRINKADRIA project Stakeholders' streamline[4]

Given the cross cutting issues and constrains relevant for cross – border/ regional drinking water management and supply experience, knowledge, results and outputs from projects relevant for DRINKADRIA are collected by template that provide uniformity with respect to information provided by all DRINKADRIA team members. Total number is 200 with 57% of international and 43% of national projects. Data base is developed and comprise of regional, national and transboundary projects and some of them are beyond the region addressed in DRINKADRIA project given the some project partners experience in development of transboundary River Basin Management Plans (Danube, Sava, etc). Summary of relevant projects review and evaluation is presented in Figures DRINKADRIA relevant projects statistics.



DRINKADRIA relevant projects statistics[5]



http://drinkadria.fgg.uni-lj.si/ is web platform for sharing knowledge and experiences regarding cross border water supply that was gained in DRINKADRIA project (UL, 2014)

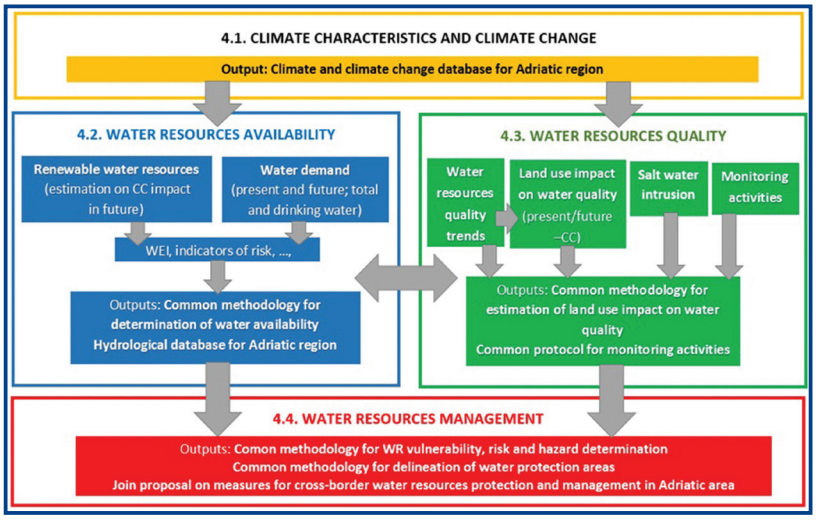
[4]Source: DRINKADRIA Reports on Capitalization Activities

[5]Source: DRINKADRIA Report on methodology for project integration

DRINKADRIA's shared web platform (http://drinkadria.fgg.uni-lj.si/) is developed to provide professionals with access to information, outputs and deliverables from work packages WP3 –WP6. DRINKADRIA shared platform is regulary updated and provide knowledge, experiences and good practices significant for drinking water supply systems, water (re)sources management and protection at all levels (local, regional, cross-border) in the context of changes that result from natural and anthropogenic triggers. The web platform will contribute to a long term cross-border water supply and water resources stability and sustainability.

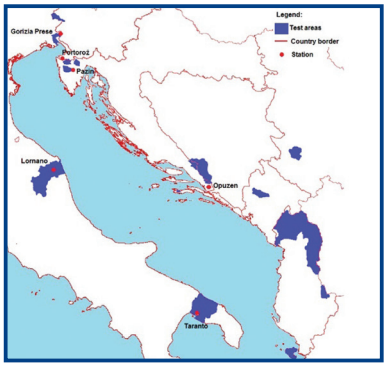
4. WP4 - CROSS BORDER WATER RESOURCES MANAGEMENT

The main objective of this project activity is to provide data base and information of effects of climate, land-use and future water exploitation changes on drinking water resources used within the project area Test Areas to support implementation of sustainable water use in cross-border/ regional contexts. The Institute for Water Resources Development Jaroslav Černi (JCI) contributed in all activities and deliverables development relevant for cross border/ regional drinking water resources management as presented in Figure DRINKDADRA project activities



DRINKADRIA project activities in WP4[6]

In addition for reports relevant for regional water supply system Rzav (Figure 4), data and information on Republic of Serbia legislation and policy framework for drinking water quality and drinking water protection zones, JCI team contributed in development of reports and outputs for Test Area Nikšić (Figure DRINKADRIA report on climate and climate change data):



- Report on Climate And Climate Change Data for Pilot Area;
- Report on Water Resources Availability on Test Area Nikšić Based on Common Methodology; and
- Report on Common Methodology Application for Estimation of Climate Change Induced Land Use Changes and Changes in Water Quality on Test Area Nikšić.

DRINKADRIA project test areas[7]

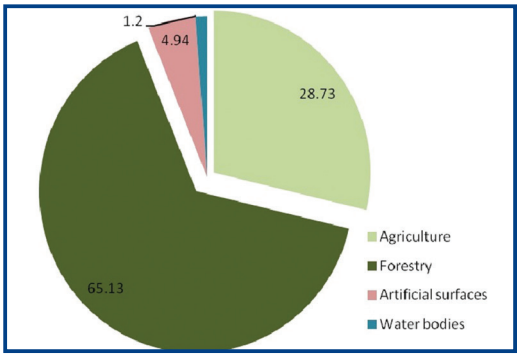
Data about the current and future climate change at the project level are evaluated based on outputs for averge temperature and precipitation from 3 climatological models (Aladin, Promes and RegCM3) for referent period (1961 - 1991) and for future scenario 2021 – 2050. For test Area Nikšić huge discrepancy is identified for precipitation in comparison to observed data. Based on precipitation data, the common methodology for Water Exploitation Index (ratio between drinking water demand and available drinking water sources for different scenario agreed among the DRINKADRIA project team) is approximated for all Test Areas as presented in WEI evaluation within the Test Areas maps.

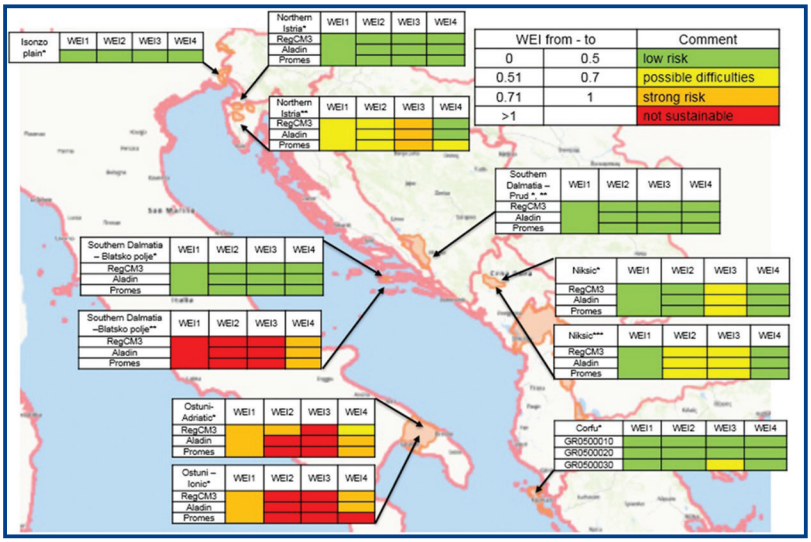
[6]Source: Cross-border water resources management in present conditions and for future scenarios, Karleuša et al., 2016

[7]Source : DRINKADRIA report on climate and climate change data

Summary of WEI evaluation within DRINAKADRIA Test Areas[8]

For the land use changes and water quality assessment on Test Area Nikšić outputs are based on existing data (Water Quality Monitoring, CORINE land cover for 2006 and 2012, Republic of Montenegro Water Management Strategy, Republic of Montenegro Spatial Plan, diverse technical studies, etc). Based on available data on land use (Percentiles of land use practices for Nikšić Test Area) pressures and triggers are identified and measures that would mitigate adverse effects are identified.





Percentiles of land use practices for Nikšić Test Area[9]

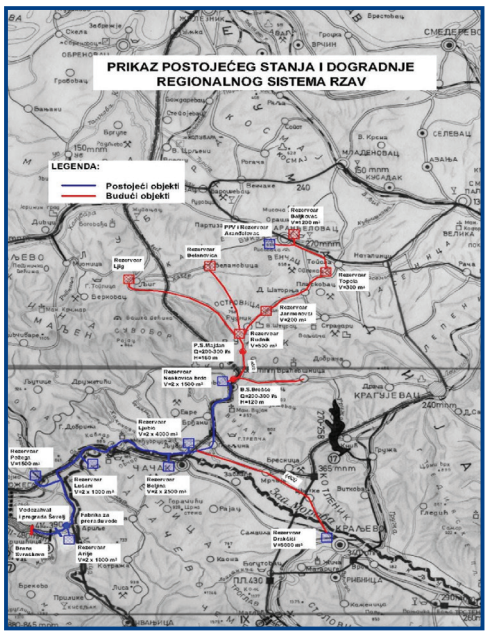
5. WP5 - CROSS-BORDER MANAGEMENT OF DRINKING WATER SUPPLY SYSTEMS

is split in three activities:

5.1 Historical development of cross-border (CB) drinking water supply systems (DWS) comprises collection of different CB DWS examples, which exist between Italy and Slovenia, Slovenia and Croatia, Croatia and BiH. Serbia doesn't have CB DWS. Regional DWS are as well of interest, because they deliver water to different municipalities, and experience in work could be applied on CB DWS systems. Serbia has offered experience of our three regional DWS:

A. RZAV – for supllying Arilje, Požega, Lučani, Čačak and Gornji Milanovac municipalities,
B. ĆELIJE – for supllying Kruševac, Aleksandrovac, Varvarin, and Ćićevac municipalities,
C. NIVOS – for supllying Niška banja, Babušnica and Bela Palanka municipalities and the town Niš.

A. Existing Regional DWS Rzav to date includes a water intake on the Rzav river, a raw water pipeline to a water treatment plant in Arilje and water main to the water reservoirs of 5 current municipality users. Overall capacity of the system is 1200l/s. Present water demand of this regional DWS is between 500 and 700 l/s.



For this RWSS a new waterworks company has been established (JP Rzav). They take care for whole process (water intake, water treatment, main pipeline delivering) until the flow meters at the beginning of each Municipality. Each Municipalities has one member in the Management board of this water company.

Further development includes the erection of the Svračkovo Dam on the Rzav river near Arilje, and the construction of water mains and reservoirs (feasibility study of further development prepared), from Gornji Milanovac via mountain Rudnik to Topola, Arandjelovac and Ljig, and from Čačak via Mrčajevci to Kraljevo.

[8]Source: DRINAKADRIA report on water availability

[9]Source: Estimation of climate change induced land use changes and the impact on water quality for Test Area Nikšić

B. Existing Regional DWS Kruševac to date includes dam Ćelije as a water intake on the Rasina river, a raw water pipeline to a water treatment plant in Majdevo and water main to the water reservoirs of current municipality users. Overall capacity of the system is 700 l/s. Present water demand of this regional DWS is between 400 and 600 l/s. The biggest waterworks company (Kruševac Municipality) take care for whole process until the flow meters at the beginning of each Municipality.

C. Water demand of this whole regional DWS is between 1100 and 1500 l/s. In different part of the year, capacity of sources are changeable. Karst springs Ljubeređa, Divljana, Mokra and Krupac (right figure) deliver 600–1400 l/s, while karst spring Studena deliver 150–300 l/s. Alluvial water source Mediana on Nišava river deliver from 0 to 600 l/s. Several small wells at J.Morava alluvion deliver up to 30 l/s. The biggest WS company (Niš Municipality) take care for whole process.

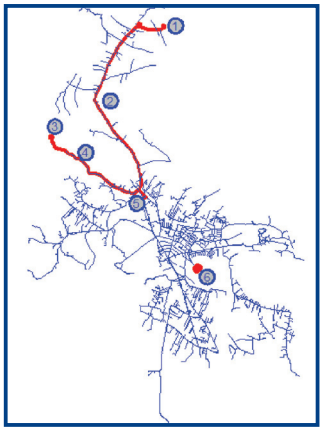
5.2 Development of standard protocols and procedures necessary for the efficient and effective cross border water supply is quite complicate issue which include contract between municipalities in two different state and needed steps necessary before making agreement. This procedure will likely develop in practice.

5.3 Long term cross-border water supply planning and regional drinking water supply economics model try to find method which offer development of enough fair price for drinking water in each possible case. Due to fact that each case is unique case, this economic model give starting position for searching real economic price in each particular case.

6. WP6 – PILOT ACTIONS

is split in three activities:

6.1. Development of common analytical framework for the pilot actions
6.2. Development of standard protocols and procedures necessary for the efficient and effective cross border water supply
6.3. Rule-development and documented experience on implementation of pilot actions



For this work package JCI was consultant for Nikšić water supply system (WSS) - pilot area in Montenegro. Water network cover the city of Niksić and few suburbs, with about 65 000 inhabitants. Main parts of this water supply system are:

1. Springs Vidrovan (lower – KN = 660 mnm, upper – KN = 670 mnm) Q = 200 – 500 l/s;
2. Pipeline DN1000, L = 14 km (gravicity from Vidrovan);
3. Wells Poklonci Q = 5 x 40 l/s;
4. Pipeline DN 500; (pumping from Poklonci);
5. BPS Duklo Q = (2+1) x 400 l/s, H = 55 m;
6. Reservoir Trebjesa (out of function) (KD/KP = 690/695 mnm, V = 7.500 m^3)

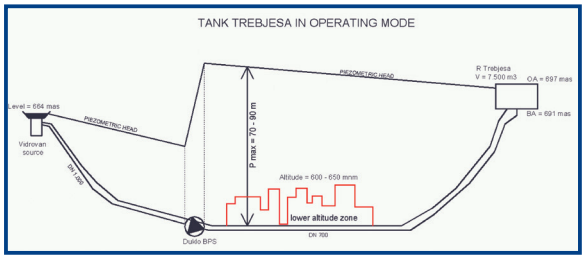
Water source “Poklonci” is only used in low flow periods during the year when it is impossible to meet the needs for drinking water from the springs “Vidrovan”.

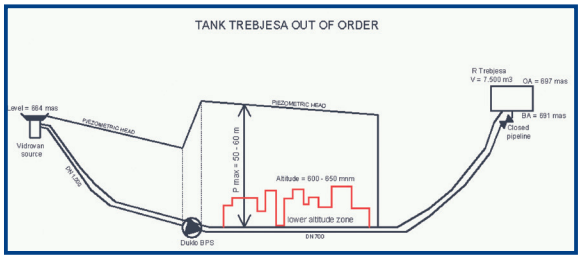
Several activities were planned by Aplication form, at the beginning of the project:

1. Preparation of Geographic Information System (GIS) for Nikšić WSS.
2. Hydraulic network modelling.
3. Split Nikšić water supply system in basic balancing zones (OZB).
4. Procurement and installing equipment for measurement and link with SCADA information system.
5. Link GIS and SCADA information system.
6. Definition of procedures for control and loses reduction in WSS.
7. Balancing and analysis of WSS.
8. Field work for loses reduction (10% expected).
9. Working on visibility of project results and public education regarding the necessity of drinking water rational using

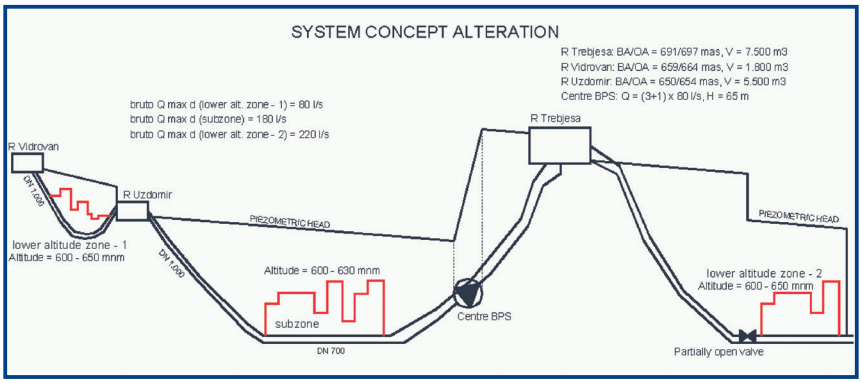
First 7 activities were done, while the 8th should continue after the end of the project. The 9th activity is ongoing process. After mutual field activities, expecting results of reduction of real loses for 10% in comparation to the start of the project is achieved. Preparation and calibration of the mathematical model for Nikšić WSS, in addition to help in realization of activities given in Aplication form, uncover the problematic WSS concept in general, that had been defined a several decades ago. The concept of the system is such that its work produces a general instability, which is manifested with increased number of defects in the network, among other things.

On the next two diagrams, which represent the principle longitudinal profile of Nikšić WSS - from the source to the distribution network, its general mode is shown. The first scheme (system with Reservoir Trebjesa in operation) refers to the decades-old concept, which has been applied until recently, while the second scheme (system with Reservoir Trebjesa out of order) indicates the current status. The main objectives of improving the work of the existing WSS Niksić is to establish gravity flow, as a dominant in the distribution network (instead of pumping) and to Activate existing reservoir space at Trebjesa (V = 7.500 m^3);





To do that, the proposed working mode of WSS Nikšić is given on the third scheme:



To achieve this working mode, several activities should be done:
- Construction of Vidrovan tank (R Vidrovan, BE/OE = 662/666 mas, V = 500 - 1000 m^3),
- Construction of Uzdomir tank (R Uzdomir, BE/OE = 657/661, V = 4000 - 6000 m^3),
- Separation of lower subzone from the rest of the network,
- Realization of booster station BPS Center,
- Installation of pressure reducing valve at the entrance to each of the peripheral zones of consumption,
- Elimination of the BPS Duklo from the regular system work and establishment of this structure as a hot reserve, for irregular circumstances,

Funds, needed for this whole Investment are between 2 and 3 Milion euros. Hopefully, some other project will offer possibility to implement this new concept.

III REGIONAL MEETINGS

- Preparatory meeting Trieste, Italy (March, 2013)
- Kick-off meeting Trieste, Italy (November, 2013)
- Rijeka, Croatia (February, 2014)
- Neum, Bosnia and Herzegovina (May, 2014)
- Ljubljana, Slovenia (July, 2014)
- Belgrade, Serbia (November, 2014)
- Sarajevo, Bosnia and Herzegovina (March, 2015)
- Nova Gorica, Slovenia (May, 2015)
- Tirana, Albania (July, 2015)
- Corfu, Greece (September, 2015)
- Macerata, Italy (November, 2015)
- Venice, Italy (March, 2016)
- Trieste, Italy (July, 2016)

IV NATIONAL WORKSHOPS

As part of its project activities, Jaroslav Černi Institute (JCI) organized three extremely successful national workshops, which were attended by representatives of water utilities from Serbia and Republika Srpska, scientific institutions (institutes and universities), government agencies from the Serbian water sector, and a number of project partners.

The First National Workshop that addressed Water Supply Systems Efficiency Advance in Serbia was held on April 9 2014 in Belgrade, at the Milutin Milanković Association. The workshop was attended by 59 stakeholders, including water supply experts from nine Serbian public water utilities (PUC), i.e., PUC Belgrade Waterworks and Sewerage, PUC Valjevo Waterworks, PUC Požarevac Waterworks and Sewerage, PUC Miloš Mitrović – Velika Plana, PUC Inđija Waterworks and Sewerage, PUC Kruševac Waterworks, PUC Čačak Waterworks, PUC Loznica Waterworks and one regional water supply scheme – Rzav. In addition to the above-mentioned direct practitioners, active workshop participants included representatives from research and scientific organizations (Jaroslav Černi Institute for Development of Water Resources, University of Belgrade's Faculty of Civil Engineering), representatives from professional organizations (Waterworks and Sewerage Association of Serbia, Milutin Milanković Association), state institutions (Water Directorate of the Serbian Ministry of Agriculture, Forestry and Water Management, Ministry of Energy, Development and Environmental Protection, Serbian government's European Integration Office), as well as representatives of the Municipal Infrastructure Support Program (MISP) and a representative of the DRINKADRIA project partner from Montenegro.

In the discussion, the workshop participants shared their experiences and observations concerning the most common problems faced by local and regional water utilities in Serbia, such as: water losses, ageing infrastructure, low water prices, low level of revenue collection, illegal consumption and lack of funding for the construction of major new facilities for local and regional water supply systems.

The participants emphasized the importance of this kind of professional gatherings that help upgrade expert knowledge and boost water supply efficiency.

The Second National Workshop, titled "Drinking Water Quality and Protection of Water Sources in Serbia", was held in Belgrade on 28 April 2015. Serbia's water supply issues attracted more than 60 workshop attendees, representing a large number of public water utilities from Serbia (Belgrade, Niš, Novi Sad, Sombor, Inđija, Kruševac, Čačak, Paraćin and Kragujevac),

Republika Srpska (Bijeljina) and Montenegro (Nikšić – a project partner), as well as experts from research organizations and University (University of Belgrade/Faculty of Civil Engineering, JCI and the Public Health Institute of Serbia "Dr. Milan Jovanović Batut"). The workshop was also attended by government agencies: Serbian Ministry of Health and Ministry of Agriculture and Environment, National Water Directorate and Serbian European Integration Office.

Many questions were raised at the workshop and potential solutions offered with regard to water quality and water source protection. The main objective of the workshop – to exchange lessons learned and improve knowledge in the area of water supply enhancement, including problem identification and attempts at defining a methodology for river reservoir and water supply source protection – was effectively achieved through dynamic discussions among public water utilities, but also a constructive dialogue with representatives from scientific and research organizations and government agencies.

During the course of the presentations and discussion, it was obvious that all matters relating to water supply issues and regional schemes are highly topical but insufficiently studied and not readily accessible to either the public or professional circles. Specially highlighted was the idea to delve deeper into the legal framework relating to sanitary protection zoning and maintenance, and a gathering to address that particular topic was proposed.

The attendees, organizers and media outlets all deemed the workshop exceptionally useful, informative and educational.
The third national workshop, titled "Existent and Prospective Regional Water Supply Systems in Serbia", was held in Belgrade on December 4, 2015. The issue of regional water supply in Serbia attracted nearly 40 participants to the workshop. This theme was chosen because the issue of water supply is very significant and because there is a growing need for a solution in the regional framework. The workshop was attended by representatives from water supply and sanitation utilities, as well as those of the regional water supply schemes in Serbia (Belgrade, Sombor, Kruševac, Čačak, Kragujevac, Valjevo, Arilje), Republika Srpska (Bijeljina), Montenegro (Nikšić), and experts from various scientific and academic institutions (Jaroslav Černi Institute for the Development of Water Resources, University of Belgrade's Faculty of Civil Engineering). The workshop was also attended by representatives of from relevant government agencies: Ministry of Agriculture and Environment, Serbian Water Directorate, and Serbian government's European Integration Office.

The workshop raised various issues pertinent to regional water supply use, maintenance and challenges, and also offered suggestions concerning possible solutions aimed at improving existing and prospective regional water supply systems. The main objective of the workshop – to exchange experiences and acquire new knowledge in the area of improving the quality of water supply and regional water supply, including the identification of problems and attempts to define solutions to overcome them – was successfully achieved through a dynamic discussion among the representatives of water utilities, but also a constructive dialog with the representatives of academic and government institutions about key issues of potential further development and improvement of the regional water supply system capacities.

Promoting the DRINKADRIA project as an example of good practice, Jaroslav Černi Institute representatives presented possible strategies for managing the capitalization and sustainability of international projects. The DRINKADRIA project partners from the University of Ljubljana and the University of Rijeka, as well as from the Nikšić Water Utility, made presentations of their project activities and results, and shared their experiences concerning regional water supply, thus hugely contributing to the content and quality of the workshop. All participants, as well as guests from the region, expressed great pleasure at having taken part in the Third National Workshop within the framework of the international DRINKADRIA project.

V IMPRESSIONS

The Managing Authorities declared that strategic DRINKADRIA project is the most successful IPA Adriatic project. This significant recognition was announced at their meeting on 16 March 2016 in Italy. Among other things, it is demonstrating the possibility of effective cooperation among countries that had previously involved in conflicts or tensions.

The outcomes of all the packages have so far been extremely good. The most important packages with regard to the level of participation of the Jaroslav Černi Institute are WP6, WP3 and WP2.

Within the WP6, JCI provided external expertise for the Nikšić Water Utility. In addition to the commitments undertaken in connection with the project's application form, JCI proposed reconstruction of the water supply system of Nikšić, which would imply a significant change to the water supply concept. The authorities of Nikšić apprised the proposed concept extremely interesting and will consider the financial feasibility of commissioning the design and implementation of such a project.

Within the WP3, JCI was the lead partner and has successfully managed and implemented activities relating to the capitalization of results in all participating countries.

Within the WP2, JCI implemented communication and dissemination activities of project outcomes and diverse information on a much larger scale than required by the project's application form. This was a major contribution to awareness raising about the importance of improving the operation of water supply systems and the way in which such improvements can be implemented.

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