

MINISTRY OF ENVIRONMENT AND SPATIAL PLANNING
KOSOVO ENVIRONMENTAL PROTECTION AGENCY



REPORT ON THE STATE OF WATER

2015

Prishtinë, 2015

Foreword



Protection of water resources is a moral, ethical and human obligation of everyone as water is an essential factor to life, health, food, culture, production and renewable energy.

The need for fresh water is one of the greatest environmental issues globally today.

Data show that more than 1.2 billion people worldwide do not have access to drinking water, while approximately 3 billion people (half the population of the world) do not have appropriate sanitary services. Over 200 diseases originate from polluted water and approximately 6.000 people a day die because of diarrheal diseases. According to the World Health Organization, about 5 million people die every year because of polluted water consumption. In view of the current urbanization trend in the world, until 2025 approximately 3 billion people will need water supply and more than 4 billion will need to access wastewater services.

In Kosovo, as in many other countries of the world, the human health and well-being is increasingly threatened by poor water quality or lack of fresh water. Based on data provided by our institutions, approximately 80 % of the population in Kosovo is supplied from the public water supply system and about 60 % of the population has access to the public sewerage system.

Protection, preservation and monitoring of the quality of water resources is one of the greatest environmental challenges of our society. Industrial development, urbanization and intensive agriculture are some of the factors causing water pollution. Despite continuous efforts, uncontrolled use of water resources and damage of river beds remain as factors contributing to the degradation of our water resources.

Lack of groundwater monitoring is another problem demanding solution. Special attention and importance should be placed upon water infrastructure improvement, construction of wastewater treatment plants and climatic change adaptation in the water sector. The MESP will continue its commitment to completing the required legislation for the water sector and transpositioning it with European Union directives, while approval of the National Water Strategy remains one of the key priorities of the sector.

Dr. Ferid Agani, Minister of MESP

Acknowledgments



Dear readers and partners, in your hands you have a report providing information on the water situation in Kosovo during 2011-2014. This is the second sector report on the water situation in the Republic of Kosovo prepared by the Kosovo Environmental Protection Agency (KEPA).

The report was prepared as part of activities for the fulfillment of duties and responsibilities of KEPA related to reporting on the situation of environmental sectors. Its preparation was supported by other departments of the Ministry of Environment and Spatial Planning, especially by its Water Department.

The report also includes data provided by other governmental and non-governmental institutions responsible for certain aspects of the water sector and which provide information about the sector. Therefore, we would like to express our gratitude to everyone who contributed in any form to the preparation and finalization of this report.

Increasing the level of cooperation between institutions responsible for water administration and monitoring will greatly improve the process of water situation data collection, exchange, processing and reporting.

We hope that this report will be a modest contribution to awareness rising about the state of water in Kosovo and that it will help policy makers to enforce sustainable policies in the water sector and donors to properly direct projects.

Dr.sc. Ilir Morina, CEO of KEPA

Abreviations

KEPA	Kosovo Environmental Protection Agency
KSA	Kosovo Statistical Agency
EU	European Union
WFD	Water Framework Directrive
WD	Water Department
EC	European Commision
TH	Total Hardness
GIZ	German Society for International Cooperation
HEC	Hydrocentral
KHI	Kosovo Himdrometeorological Institute
NIPH	National Institute of Public Health
KGS	Kosovo Geological Service
WWRO	Water and Wastewater Regulatory Office
MESP	Ministry of Environment and Spatial Planning
SHUKOS	Association of Water and Wastewater Companies of Kosovo
IPA	Instrument for Preaccesion
IPPC	Integrated Pollution Prevention and Control
KEC	Kosovo Energy Corporation
KFOR	Kosovo Forces
KFW	German Development Bank
IWC	Inter-Ministerial Water Council
RWC	Regional Water Companies
MED	Ministry of Economical Development
PI	Public Interprise
WHO	World Health Organisation
EO	Economical Operator
PH	Hydrogen yon concentration
NP	National Park
KEAP	Kosovo Environmental Action Plan
SHA	Joint Stock
SHBO5	Biological Oxygene Demand
SHKO	Chemica Oxygene Demand
TC	Thermocentral
TCA	Thermocentral A
TCB	Thermocentral B
AI	Administrativ Instruction
UNDP	United Nations Development Programm
VML	Maximal Alloved values
VMM	Monthly average values
VMV	Annual average values
SPA	**S**pecial Protected Water Area

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1.1. INTRODUCTION

Based on the Law on Environmental Protection, reporting on the state of the environment in Kosovo including the condition of environmental media (water, air, soil and landscape) is a responsibility and duty of AMMK.

Within its duties and responsibilities, in addition to preparing the general report on the State of the Environment, KEPA is also obligated to prepare reports on the state of certain environmental sectors.

This report presents the situation and developments of the water sector for 2010-2014, but due to lack of data and for certain comparison aspects, data of a former period were presented.

The data for the preparation of the report were collected from institutions that monitor water quality, water management companies and other governmental and non-governmental organizations that have certain responsibilities in the water sector. The report also includes information on laws and administrative instructions on water, strategic documents for the water sector, as well as data from projects and donors of the field. Some of the data presented in this report were obtained from various relevant publications and reports.

The report consists of textual data, tables and figures, and is structured in five chapters. The first part (the introduction) presents general data about Kosovo. The second chapter discusses the legal and institutional framework for water management. The third chapter

provides general information on water resources.

The fourth chapter provides information on the use of water in various sectors such as households, agriculture, industry, energy production, etc.

The fifth chapter of the report addresses the issue of water pollution and its treatment, while the sixth chapter presents information about water quality based on monitoring of surface and groundwater. Finally, the report also contains a chapter on general aspects related to water management, such as fees, projects and investments in the water sector. The report goes on to provide, in a separate chapter, conclusions and measures taken to improve the situation.

1.2. GENERAL INFORMATION ABOUT KOSOVO

1.2.1. Geographical position

Kosovo is located in the center of Balkan Peninsula. It lies between 41°50'58" and 43°51'42" of the northern latitude and between 20°01'30" and 21°48'02" of the eastern latitude. Its geographical positioning gives Kosovo a special economic, cultural and political importance both regionally and globally.

Kosovo has an area of 10.887 km². It borders with Albania (in the southwest), Macedonia (in the southeast), Serbia (in the east, north and northeast) and Montenegro (in the west). Kosovo has an overall border length of 700.7 km.

1.2.2. Relief

The topographic features of Kosovo include both mountains and plains; its landscape consists of the Kosovo Plain (510-570 m above sea level) and the Dukagjini Plain (350-450 m above sea level). Morphologically, Kosovo represents a real mosaic of hollows of varying sizes, surrounded by medium and high mountains. Its landscape is predominated by mountainous areas made of rocks of different geological ages.

The average altitude in Kosovo is 810 m above sea level, with a lowest point of 270 m and a highest point of 2656 m (Gjeravica). In hypsometric terms, only 16.4 km² of Kosovo›s territory (0.2%) are located below 300 m of altitude; 8754 km² (80.7%) are located at an altitude up to 1000 m; 1872.3 km² (17%) lie at an altitude between 1000 and 2000 m; and 250.6 km² (2.3%) lie at an altitude over 2000 m. The main landscape features of Kosovo are mountains (63%) and hollows (37%).

1.2.3. Climate

Kosovo has a mid-continental climate, with a dominant influence of the Adriatic-Mediterranean climate in the Dukagjini Plain through the valley of the Drini i Bardhe river, and with a lesser impact of the changing Adriatic-Aegean climate in the Kosovo Field. The average annual rainfall is 596 mm. The average annual temperature is 10 OC (lowest temperature is -27 OC and highest temperature is 39 ^{O}C[1]).

1 Kosovo Hydro-metereologica Institute, 2008

The main macro climatic factors affecting the climate in Kosovo include: its positioning in relation to land masses (Eurasia and Africa), water masses (Atlantic Ocean and the Mediterranean Sea), air masses (tropic and arctic-maritime or continental), and the positioning of barometric systems (maximum of the Azores and minimum of Island). Main local factors affecting the climate of Kosovo include: landscape, water resources, soil and vegetation.

1.2.4. Hydrography

Water resources represent an important factor in the country's economic and social development. It is estimated that Kosovo has 1600 m3/water/year per capita. In hydrographic terms, Kosovo is divided into 5 river basins: Drini i Bardhe, Ibri, Morava e Binçes, Lepenc and Plava. In an average humidity year, approximately 3.8 x 109 or 121.2 m3 /sec of water flow out of Kosovo's territory.

The main hydrological feature in Kosovo is the unequal and inadequate distribution of water resources in relation to demand. The water energy potential in Kosovo is very low and it has been used until now to a very modest extent. The main reserves of groundwater are located in the western part of Kosovo, where reserves of surface water are also greater compared to the eastern and southeastern parts where demand for water is very high.

Kosovo has a few natural lakes, while its artificial lakes include: Batllava, Gazivoda, Radoniq, Perlepnica and Badovc. It also has a few irrigation lakes. Kosovo is rich in thermal water resources used for health and recreation.

1.2.5. Precipitation

Kosovo has all forms of precipitation. The most important forms of precipitation include rainfall in the valleys and snowfall in high mountainous areas (Bjeshket e Nemuna and Sharr), with an average annual precipitation of 600 mm in the eastern part and over 700 mm in the western part of Kosovo. The largest annual amount of precipitation occurs in the Bjeshket e Nemuna mountains (1750 mm). Snowfall is common in the cold part of the year.

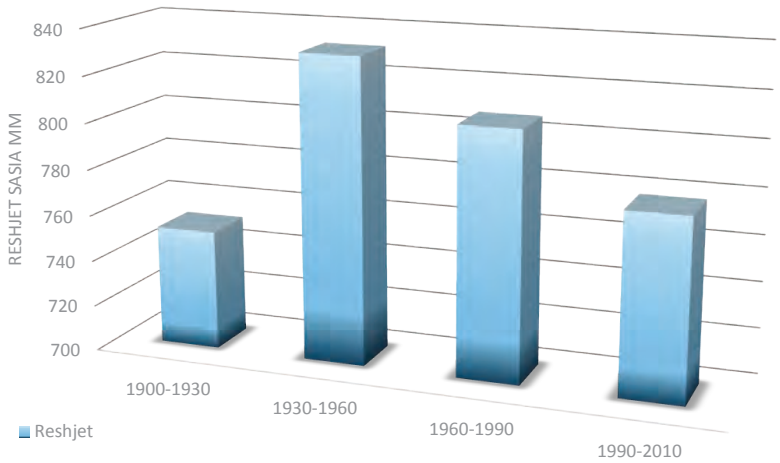


Figure 1: Precipitation in Kosovo 1900-2012[2]

2 Data about precipitation: 1900-2000 from World Bank (http://data.worldbank.org/country/

The average length of snowfall is 26 days in lower parts and 100 days in higher areas of Kosovo.

The first precipitation measurement station in the territory of Kosovo started its observations in 1925. The Kosovo Hydro-meteorological Institute conducts precipitation measurements in its observation stations located in several parts of Kosovo.

1.2.6. Demographic structure

Despite conflicts and migration, the total population in Kosovo has constantly increased at different rates in the post World War II period. In 63 years (1948-2011), the population of Kosovo saw an increase of 138.2% from 727,820 (1948) to 1,733,872[3].

Overall population growth affects the environment in several ways, the most important of which include effects on production rates, use of natural resources, land use, waste production and environmental pollution.

The relation between population growth and environmental influence may be thus presented: more people spend more products and natural resourcesl, causing more damage and producing more waste.

Compared to 1948, rural population in 2004[4] showed a growth of 110.0%, while urban population had an increase of 1430.8%. Regarding participation in the overall population, the percentage of urban population increased from 9.7% (1948) to 46.7% (2004). This level is controversial since the peripheral parts of Kosovo towns do not usually provide even minimum conditions for urban life.

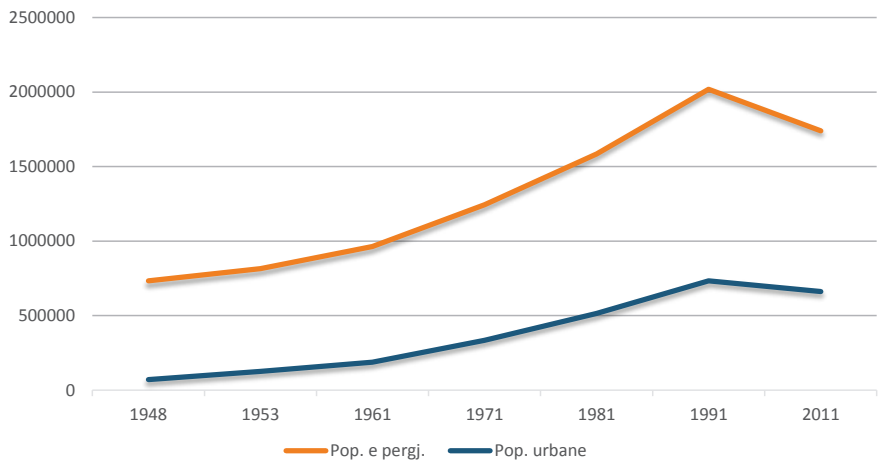


Figure 2: Overall and urban population in Kosovo 1948-2011

kosovo), 2001-2012 Kosovo Hydro-meteorological Institute

3 Population census results - KAS

4 Assessment of prof. A. Pushka (2004). "Statistikat vitale të kohës më të re", Kosovo Agency of Statistics. Prishtina.



2

LEGAL AND STRATEGIC FRAMEWORK

2.1. LEGAL AND STRATEGIC FRAMEWORK

The Republic of Kosovo has undertaken the adoption of EU environmental standards and substantial progress has been made in the development of legislation related to environmental protection in general, including water protection. Harmonization of Kosovo legislation with the EU acquis is assessed by monitoring the transpositioning and implementation progress of the legislation. A considerable number of environmental laws have been reviewed and adopted in recent years by the Assembly of Kosovo[5] . The MESO has made evident progress in adopting secondary legislation as well (administrative instructions, regulations, decisions, etc.).

2.1.1. Legal infrastructure in the water sector e

The legal basis regulating the water management sector in Kosovo consists of primary and secondary legislation.

Primary legislation includes the following basic laws:

Law No. 04/L-147 on the Waters of Kosovo -The goals of this law include:

- ✓ Ensure the sustainable development and use of water resources, which are essential to

5 http://www.Kuvendi-kosova.org

public health, environmental protection and social-economic development of Kosovo;

- ✓ Establish procedures and guidelines for optimal allocation of water resources based on use and purpose;
- ✓ Ensure protection of water resources from pollution, overuse and misuse; and
- ✓ Determine the institutional framework for administration of water resources.

Law No. 02 /l-79 on Hydro-meteorological activities - Is another important law for the water sector, which aims to regulate hydro-meteorological activities and how they are conducted.

Law No. 02/L-78 on Public Health - This law determines institutions responsible for enforcing health policies and stipulates duties of the National Institute of Public Health, which, among others, include drinking water quality monitoring.

Law No. 03/L-086 on the Activities of Water, Wastewater and Waste Services Providers - Is an important law that establishes the Water and Waste Regulatory Office (WWRO) and constitutes the legal framework for the economic regulation of public companies providing water and wastewater services.

Law No. 02/L-9 on the Irrigation of Agricultural Lands - This law regulates the organization and administration of agricultural land irrigation and drainage in Kosovo; the authority and division of responsibilities of irrigation and drainage subjects; the formation and registration of irrigation companies; the organization of irrigation water users associations and federations; irrigation fees; functioning of associations; and other issues related to irrigation and drainage.

Secondary legislation

The following administrative instructions were drafted and signed as part of obligations deriving from the Law on Waters and the Law on Public Health:

- ✓ Administrative Instruction No. 30/2014 on conditions, manner, parameters and limit values of wastewater discharge into the public sewage system and the water body,
- ✓ Administrative Instruction No. 26/2013 determining verification and legitimization of the water inspectorate,
- ✓ Administrative Instruction No. 12/2013 on the water information system,
- ✓ Administrative Instruction No. 16/2012 on the quality of water used for human consumption,
- ✓ Administrative Instruction No. 28/2013 on protected sanitary zones,
- ✓ Administrative Instruction No. 24/05 on the content, form, conditions and method of issuing and retaining water permits,
- ✓ Administrative Instruction No. 06/2006 on water payment structure.

2.1.2. Environmental Protection Strategy 2013-2022

The Environmental Protection Strategy comprises an important long-term component of the general development of Kosovo. The strategy includes the following strategic goals for the water sector:

- Complete and harmonize legislation with the EU acquis;
- Administer strategies and plans for river basins;
- Construct wastewater processing facilities and sewerage connected to them;
- Repair and construct new network for drinking water supply;
- Manage protection and regulation of river beds;
- Improve monitoring of superficial water networks;
- Create network for underground water monitoring.

The Environmental Protection Strategy 2014-2022 sets the following priorities for the water sector:

- Draft sub-legal acts;
- Draft strategy and management plans for river basins management;
- Enhance water information system;
- Prevent degradation of river ecosystems as a result of gravel and sand excavation;
- Protect water enforcing an appropritate strategy, including dikes and water supply systems, in a way that ensures safety of relevant biodiversity;
- Increase cooperation between water and nature inspectorates in enforcing environmental protection legislation;
- Enforce Strategic Environmental Assessment and Environmental Impact Assessment procedures, especially when dealing with acitivities in protected valleys and water zones;
- Construct wastewater treatment plants in urban and rural areas and where feasible, include nonformal settlements in public water and wastewater systems.

2.1.3. Kosovo National Water Draft Strategy 2015-2034

Pursuant to the provisions of the Law on Waters of Kosovo, the Ministry of Environment and Spatial Planning, in cooperation with relevant government authorities, has prepared the National Water Draft Strategy for the period of 2015-2034.

The general purpose of this strategy consists of effective management of water as an essential component of economic development and social well-being in the Republic of Kosovo.

Based on the principle of integrated water management, the strategy applies a comprehensive multi-sector approach that tries to incorporate all important aspects related to water management in the Republic of Kosovo, including among others, the provision of water supply, and wastewater collection and treatment services to households and businesses in inhabited areas.

The strategy also defines strategic objectives for efficient water use and proper and effective administration of waters.

2.1.4. Water monitoring plan

The water monitoring plan is a support mechanism for water management and helps other relevant governmental actors in better water management, protection of water from pollution and in the identification of pollution sources from industry, agriculture and other economy sectors.

The monitoring network provides sufficient data for establishing a reliable database that could help future planning for different economy sectors and improve the quality of surface and groundwater.

The Surface and Groundwater Monitoring Program of the Republic of Kosovo has the following goals:

- ✓ Systematic and coherent quality monitoring of surface and groundwater,
- ✓ Fulfillment of obligations set by local laws and pursuant to WFD 2000/60 EC and EU's directives for surface and groundwater,
- ✓ Facilitation of decision-making procedures,
- ✓ Provision of reliable data on the quality of surface and groundwater

The monitoring program for surface and groundwater includes:

- ✓ Grid location of sampling site;
- ✓ Number of sampling frequencies;
- ✓ Physical-chemical parameters (heavy metals and pesticides), and biological elements presented in table form;
- ✓ Radioactive parameters in the water;
- ✓ Presentation of monitoring sites on the map; and
- ✓ Cost and financial analysis of implementation

2.1.5. European Union water directives

Water management in European Union member states is regulated with several directives. The following table provides data on the purpose of separate directives, year of adoption and their transposition into Kosovo's domestic legislation.

Table 1: EU directives for water quality and level of transposition with domestic legislation[6]

No.	Name of directive	Year of adoption	Purpose	Transposition with domestic legislation (%)[6]
1	Water framework directive (2000/60/EC)	23 October 2000	Maintain "high status" of water where existing by preventing any degradation of current water situation and achieving at least a "good status" for all waters until 2015.	49%
2	Urban waste water treatment directive (91/271/EEC)	21 May 1991	Protect waters from negative effects due to urban wastewater discharge from some industrial sectors.	44%

6 Progress Report 9 Kosovo, Monitoring transposition and implementation of the EU environmental acquis, EC, 2014

3	Drinking water directive (98/83/EC)	3 Novembe 1998	Protect waters from negative effects due to urban wastewater discharge from some industrial sectors.	87%
4	Nitrates directive (91/676/EEC)	12 December 1991	Reduce water contamination from agricultural nitrates and prevent further contamination.	25%
5	Bathing water directive (2006/7/EC)	15 February 2006	The purpose of this directive is to maintain, protect and improve environmental quality and protect human health by amending Directive 2000/60 / EC.	0%
6	Directive on environmental quality standards in the field of water policy (2008/105 EC)	16 December 2008	Pursuant to Article 1 of this Directive and Article 4 of Directive 2000/60/EC, member states shall enforce WQS as determined in Part A of Appendix I of this Directive on surface water bodies.	4%
7	Directive on technical specifications for chemical analysis and monitoring of water status (2009/90 EC)	31 July 2009	Flooding risk management plans will address all risk management aspects focusing on prevention, protection and readiness, including flood predictions and early warning systems and considering features of separate river basins.	12%
8	Groundwater directive (2006/118/ EC)	12 December 2006	Protection of groundwater from deterioration and chemical pollution. This is especially important for groundwater dependent ecosystems and for using groundwater for human consumption.	36%

2.2. INSTITUTIONAL STRUCTURE

2.2.1. Ministry of Environment and Spatial Planning

1.1.1.1. **Water Department**

Pursuant to the Law on Waters (Nr. 04/L-147), the Department of Water of the Ministry of Environment and Spatial Planning has the following responsibilities:

- ✓ Enforcement of laws and sub-legal acts on water resources, including other environmental laws;
- ✓ Development of policies on water resources, as well as of objectives from the governmental water resources and environmental program;
- ✓ Development of national water strategy and water management plans at river basin level;
- ✓ Administration and management of all water resources in the Republic of Kosovo;
- ✓ Conducting all duties and administrative, professional, organizational and developmental activities obligated by this law;
- ✓ Close cooperation with other line ministries in the Republic of Kosovo regarding water resources and living environment;
- ✓ Cross-border cooperation with neighboring countries and beyond in the field of water resources.

For purposes of water management, Kosovo is treated as a region of river basins. The River Basin Authority is established to manage the region, reporting to the Minister of MESP.

2.2.2. Kosovo Environmental Protection Agency (KEPA)

The Kosovo Environmental Protection Agency is a central institution for environmental monitoring. Its duties and responsibilities for the water sector include:

- ✓ Collect and process data on surface and ground water of Kosovo, and store, exchange and publish these data;
- ✓ Monitor quality of surface and groundwater (lakes, flows and rivers) based on the monitoring program;
- ✓ Monitor discharge of urban, agricultural and industrial water;
- ✓ Prepare and draft water situation reports and assessments;
- ✓ Predict and warn potential risk from flooding and other natural disasters in the water sector.

2.2.3. National Institute of Public Health (NIPH)

The National Institute of Public Health is a high health, professional and scientific institution in Kosovo. In the field of water, NIPH is responsible for proposing and setting standards of drinking water distributed by water supply providers, and for monitoring the enforcement of such standards.

The legal basis for NIPH's authority and responsibilities consists of Administrative

Instruction No. 2/99 which regulates the issue of drinking water quality.
NIPH's mission lies in the protection and improvement of the population health by monitoring indicators, preventing diseases and promoting public health.

2.2.4. Kosovo Geological Service (KGS)

The Law No. 04/L-232 on Kosovo Geological Service stipulates the following duties and responsibilities for KGS.

- ✓ Conduct geological and geo-chemical surveys of the territory of Kosovo and prepare maps of different scales, as well as update existing maps with new information about the territory of Kosovo;
- ✓ Conduct research and assessments of mineral resources, groundwater and mineral and geo-thermal water;
- ✓ Supply Minerary Cadastre and GIS of ICMM with updated data from the national geological database, the geological archive and other sources;
- ✓ Provide objective and unbiased analyses to public authorities and private sector organizations within KGS's scope of expertise;
- ✓ Research and promote activities aimed at reducing geo-environmental pollution;
- ✓ Create, maintain, enrich and expand national geological database and archive;
- ✓ Conduct qualified services, such as expertise, analysis, counseling, and monitoring for purposes and fields as determined in this law;
- ✓ Draft programs and research projects for other institutions for purposes and fields as determined in this law

2.2.5. Water and Wastewater Regulatory Office (WWRO)

The Water and Wastewater Regulatory Office (WWRO) is an independent economic regulator for water and wastewater services in Kosovo.

WWRO's role is to ensure provision of quality, efficient and safe services on a non-discriminatory basis to all Kosovo consumers, while taking into consideration environmental and public health protection.

WWRO's duties and responsibilities in the water sector include [7]:

- ✓ License public enterprises providing water and wastewater services;
- ✓ Determine service fees for service providers licensed by WWRO, ensuring fees are fair and reasonable and that they enable the financial sustainability of service providers;
- ✓ Supervise enforcement of service standards by licensed service providers;
- ✓ Approve and supervise enforcement of the Card of Consumers that determines reciprocal rights and obligations between consumers and service providers licensed by WWRO;
- ✓ Establish and support Consumer Counseling Commissions in the seven regions of Kosovo;
- ✓ Themelimi dhe mbështetja e Komisioneve Këshilluese të Konsumatorëve në shtatë regjionet e Kosovës.

7 Water and Wastewater Regulatory Office

2.2.6. Local governments - Municipalities

Based on the Law on Water, municipalities have the following duties and responsibilities regarding water management:

- ✓ Issue water permits pursuant to the sub-legal act on water permits and according to authorization by the Ministry of Environment (Article 14);
- ✓ Construct water facilities and equipment for protection from damaging water effects or other purposes (Article 40);
- ✓ Protect from water damages, erosion and other harmful activities in urban and suburban areas, and provide finances for such actions (Article 46);
- ✓ Draft protection program for harmful water effects in cooperation with relevant governmental authorities (Article 47);
- ✓ Determine erosion spots within urban areas, and finance maintenance and regulation of flows and erosion protection activities in these areas (Article 51);
- ✓ Manage flow regulation facilities in urban areas and undertake all necessary measures to regulate flows in urban areas (Article 52);
- ✓ Inform Ministry of Environment and Spatial Planning as soon as possible in cases of erosion and flooding risks (Article 57);
- ✓ Determine swimming areas based on the relevant sub-legal act, in cooperation with the Ministry of Environment and Spatial Planning, the Ministry of Health and water supply companies (Article 68).

Furthermore, according to the Law on Local Self Government in Kosovo (No. 03/L-040), municipalities have the authority to provide public water supply services. They execute this authority through Agreements of Service they sign with relevant regional companies..

2.2.7. Publicly owned enterprises / Regional water companies

The Law on Publicly Owned Enterprises (No. 03/L-087) categorizes publicly owned enterprises involved in drinking and irrigation water management into three groups: central public enterprises, regional public enterprises and local public enterprises. Below is the list of these enterprises operating in Kosovo[8].

- **Central publicly owned enterprises**
  - Public enterprise HPE Iber Lepenc JSC;
- **Regional irrigation companies**
  - Irrigation Company Drini i Bardhe J.S.C.;
  - Irrigation Company Radoniqi-Dukagjini J.S.C.
- **Regional water companies**
  - Regional Water Company Prishtina J.S.C, Pristina
  - Regional Water Company Hidrodrini J.S.C, Peja
  - Regional Water Company Hidroregjioni Jugor J.S.C, Prizren
  - Regional Water Company Mitrovica J.S.C, Mitrovica

8 Law 03/L-087 on Publicly Owned Enterprises

- Regional Water Company Hidromorava J.S.C, Gjilan
- Regional Water Company Radoniqi J.S.C, Gjakove

- **Local publicly owned enterprises**
  - Water and Waste Company Ibar, Zubin Potok
  - Water Waste Company 24 November, Leposavic
  - Regional Water Company Bifurkacioni J.S.C, Ferizaj/ Kacanik

2.2.8. Association of Water and Wastewater Companies of Kosovo (AWWCK)

SHUKOS is a non-governmental organization established to act as a liaison between its members, and to promote their common interests and fundamental issues of their scope of action. The main members of SHUKOS include all public companies of water and wastewater services in Kosovo.

The highest body of the association is the Assembly, which elects the Board of the Association.

The Board is made of nine members: seven directors of RWCs, one representative of the Ministry of Finance and one representative of MESP's Department of Water. SHUKOS has a Director who reports to the Board[9].

9 www.shukos.org



3

WATER RESOURCES

3.1. SURFACE WATER

Kosovo has limited water resources. Water resources are considered an important factor for the country's economic and social development.

The border between the Dukagjini Plain and the Kosovo Field divides surface waters, which then continue flowing to:

- ✓ The Black Sea with 50.7% (Iber, Morava e Binces);
- ✓ The Aegean Sea with 5.8% (Lepenc); and
- ✓ The Adriatic Sea with 43.5% (Drini i Bardhe and Plava).

3.1.1. Rivers and river basins

The topographic water catchment area in Kosovo is 11.645 km2, while existing accumulation reaches 569.690.00 m². [10] Rivers with the greatest annual flux are located in the basin of Drini i Bardhe in the Dukagjini Plain.

In hydrographic terms Kosovo is divided into 5 river basins:

- ✓ Drini i Bardhe with its tributaries (Lumbardhi i Pejës, Lumbardhi i Decanit, Lumi i

10 MESP/AMMK, The state of water Report in Kosovo, 2010

Erenikut, Lumi i Istogut, Lumi i Klinës, Lumi Mirusha, Lumi Rimniku, Lumi Toplluha and Lumbardhi i Prizrenit),

- ✓ Iber with its tributaries Sitnica (Gracanica, Prishtevka (Prishtina River), Sllakovaqa, Studime, Sazlia, Caraleva, Llapi, Drenica, Trepça, Smrekovnica, Gojbules, Dumnica), and Lushta, Kozareva, Bajskes, Kamenica, Vuça, Gërkaja, Jashanica, Borogllava, Vraqeva, Trebiçka, Bistrica, Ceraja, Mushnica, Dubrava, Jagnjeniqa, Brusovaqa, Bernjaka, Çeçeva, Zubodolli (Albanik), Zubqana, Drena, Tverdan, Leposaviqi and Sllatina,
- ✓ Morava e Binces with its tributaries Kriva Reka, Desivojca, Perlepnica, Gjilanit, Livoçi, Cernica, Smira, Pogragja, Vllastica, Ribniku, Svintulbkes, Llapushnica, Pasjani, Zhegra, Letnica, Pakita (Beranica),
- ✓ Lepenc with its tributaries Nerodime, Ortica, Kavaqeva, Dubrava, Biqeva, Verbeshtica, Suva Reka, Sushica, Ropoti, Prroi i Thatë, Murzhica, Kotlina, Koshtanjeva, Kerveniku.
- ✓ Plava River with its tributaries Restelica, Brod, Radesha, Kapra, Karaxha, Renci, Belobrada, Brodosava, Bljaqa.



Foto: Rrjedha e Lumit Drenica në fshatin Dobroshec

Table 2. Basic data on rivers and river basins [11]

River	Area (S) km^2	Length of river (L) km	Flow (Q) m^3/s	(q) $l/sek/km^2$	Slope %	Perimeter of basin (Km)	Annual flow $x10^6$ (m^3)	Effective precipitation (mm)	Average precipitation (mm)	Coefficient of flow	Flows into
Drini i Bardhë	4340.14	110.7	61.7		2.1	409.8	1946	452.5	900	0.508	Adriatic Sea
Sushica	49.4	17.25			9.4	32			1150		
LB.Pejës	464,8	57	10.21	24.13	2.5	128	200.66	760.1	1168	0.651	
LB.Deçanit	259,3	53	7.84	42.46	3.2	105	152.46	1337.4	1530	0.874	
Ereniku	519.3	51.74	12.16	26.73	3.9	109	383.04	841.8	1515	0.716	
Istogu	405.3	19.74	6.98		4.5	87			1200		
Klina	458.7	72.12	2.8	4.92	4.5	126	65.52	154.9	750	0.221	
Mirusha	336,7	37	1.661		1.7	83			700		
Toplluha	495	34.05	3.44		3.5	108			1000		
LB.Prizrenit	247,8	36.07	6.49	29.68	7.4	77	147.74	935.1	960	0.974	
Plava, Restelic	341.86	22.12	5.25	20.79	5.9	90.56	165.06	655	1080	0.644	
Basin total	4682	110.7	61.01		2.1	409.8	1946	452.5	900	0.508	
Ibri	4044.21	89.50	36.4	6.39	0.3	436.8	1148	218.4	782	0.301	Black Sea
Sitnica	2912	78	13.94	5.38	1.1	276	439.11	169.5	690	0.258	
M.Binçes	1564	76	8.7	5.99	1.5	216	330	188.8	736	0.256	
Kriva Reka	640.70	44.5	4.43	7.27	1.2	128	139.55	229.1	736	0.311	
Lepenci	653	50	8.4	14.91	4.6	130	190	469.8	912	0.516	Aegean Sea
Nerodime	209.4	38.5			2.1	81.5			750		
Total	10 907.00		121.2				$3.8*10^6$				

11 Adopted from Kosovo Waters Master Plan

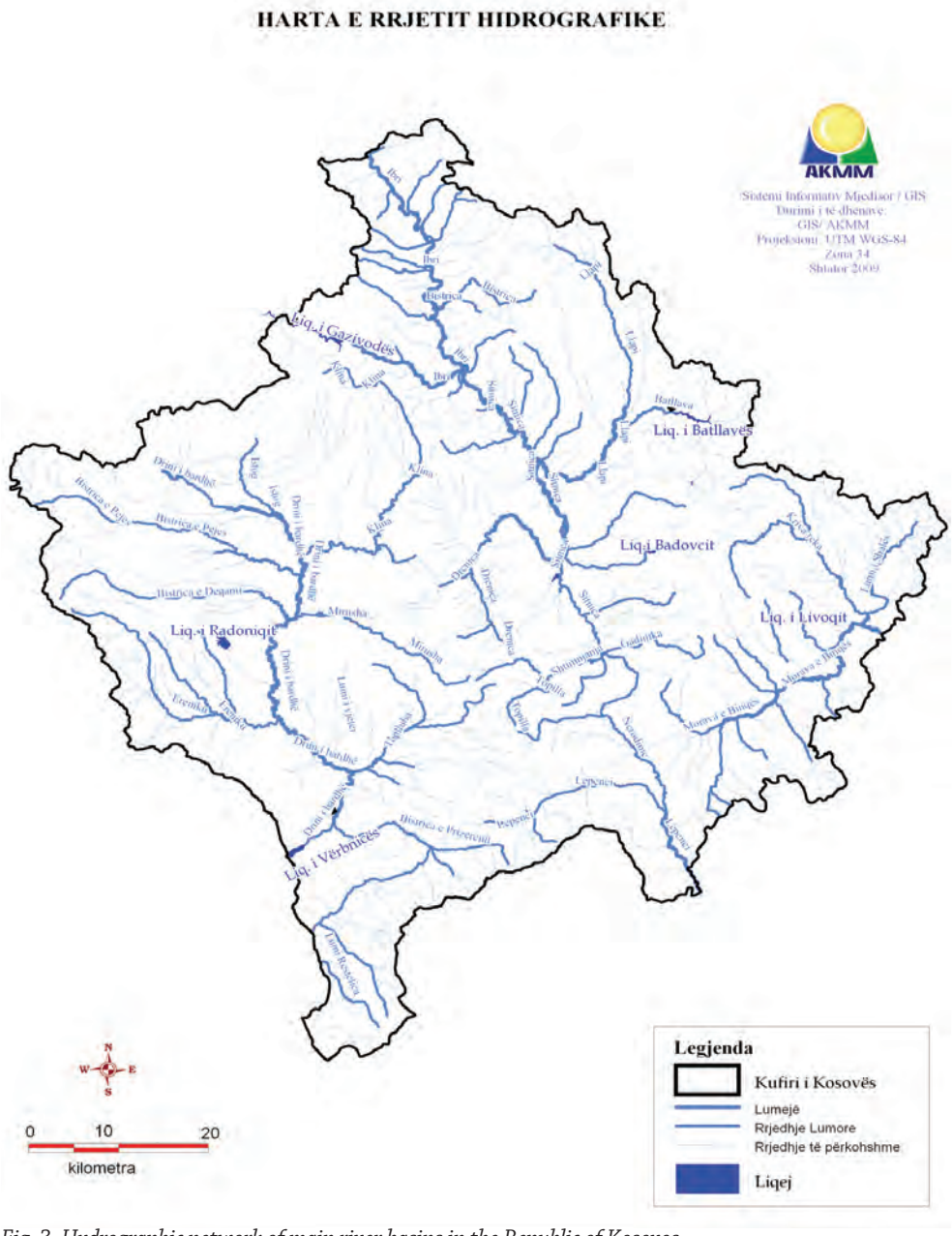


Fig. 3. Hydrographic network of main river basins in the Republic of Kosovos

3.1.2. Artificial lakes

Up to the 1970s, water for drinking and household needs was mainly supplied by flows and rivers. Population growth and water demand increase required the annual accumulation of water from several rivers. Topographic features rendered it impossible to artificially accumulate water for consumption in dry periods in rivers; therefore it was necessary to

intervene technically. Artificial accumulation sites met the water demand, not only for drinking, but for industrial and agricultural needs as well.

The main accumulations in Kosovo are.

- ✓ Gazivoda Lake,
- ✓ Batllava Lake,
- ✓ Badovc Lake,
- ✓ Livoc Lake,
- ✓ Radoniq Lake,
- ✓ Perlepnica Lake.

Table 3. General characteristics of accumulating lakes [12]

Reservoir	River	Area of water catcher	Volume Million [m³]		Year of construction	Height of dike	Territory irrigated by system	Destination		
			Users	Total				Irrigation	Drinking water	Industry
Gazivoda/ Ujmani	Ibër	1060	350	390	1979	101	Zubin Potok Mitrovicë Vushtrri Prishtinë Skenderaj Drenas	20000 ha	Yes	Yes
Batllava	Batllavë	226	25.1	30	1960	46	Prishtinë Podujevë	No	Yes	Yes
Badovci	Graçanicë	103	20	26.4	1963	45	Prishtinë	No	Yes	Yes
Livoç	Livoç	53.6	-	-	-	-	Gjilan	No	No	No
Radoniq	Përrue	130	102	116.6	1982	61	Gjakovë, Rahovec, Prizren	10000 ha	Yes	No
Prilepnicë	Prilepnicë	62	-	-	1982	40	Gjilan	No	Yes	No
Total		1634.6	497.1	563						

12 MESP/AMMK, The state of water Report, 2010



Photo: Badovc Lake

The amount of water accumulated in lakes currently comprises about 15% of the overall amount of water flows in the territory of Kosovo.

However, in order to secure water for drinking, industrial, irrigation and other needs, new accumulations need to be constructed in the future. The table below lists some of the potential accumulations.

Table 4. Basic hydrological features of planned accumulations [13]

No.	Accumulation	River/Flow	Area (km^2)	Average flow (m^3/s)	Annual flux mil. m^3/ year	Volume in million m^3
1	Drelaj	Bistrica e Pejës	173	4.65	146.6	84.5
2	Kërstovc	Binca River	118	3.20	100.96	40
3	Movë	Klina River	239	1.2.	37.80	34
4	Morinë	Llabenica	26	2.25	70.78	38
5	Ripaj	Trava River	59	2.38	74.88	36
6	Reçan	Bistrica e Prizrenit River	155	4.55	143,32	68
7	Dragaçin	Dragacin River	36	0.25	7.92	6.76
8	Kremenata	Kremenata River	56	-	15.90	8.75

13 MESP/AMMK,The state of water Report, 2010

9	Binçë	Lumi i Madhë (Great River)	72	0.63	19.49	1
10	Konqul	Morava e Binces River	1632	6.86	216.03	120
11	Firajë	Lepenc River	229	5.34	168.30	16.5
12	Shtime	Topillë River	102	0.66	20.91	113
13	Cecelija	Lumi i Zi (Black River)	47	0.41	12.92	21
14	Makovc	Prishtevka River	26	0.19	6.01	10
15	Majanc	Kançandollit River	88	0.68	21.35	30
16	Vaganic	Lushta River	46	0.23	7.24	8
17	Miraçë	Tërstena River	31	0.20	6.30	6
18	Dobroshevc	Drenica River	35	1.38	43.4	23.2
19	Pollata	Llap River	111	1.23	38.63	37.5
20	Bistrica	Bistricë e Prizrenit River	159	1.40	44.24	25

3.1.3. Natural lakes

Kosovo has few natural lakes. They are also known as glacial lakes and their water volume increases depending on season, precipitation and snow melting. The main natural lakes are located in our two national parks: in the National Park "Sharri" and in the National Park "Bjeshket e Nemuna".



Photo: Lake of Kuqishte in the National Park "Bjeshket e Nemuna"

The natural lakes of the National Park "Sharri" include:

- ✓ Natural lake of Livadh,
- ✓ Natural lake of Bogovina,
- ✓ Black natural lake,
- ✓ Natural lake of Jazhinca,
- ✓ Natural lake of Brezna,
- ✓ Upper natural lake.

The natural lakes of the National Park "Bjeshket e Nemuna" include:

- ✓ Big Lake of Gjeravica,
- ✓ Small Lake of Gjeravica,
- ✓ Lake of Kuqishta,
- ✓ Lake of Drela

No studies have been conducted yet about the water amount, area or biodiversity of these natural lakes.

3.2. GROUNDWATER

Groundwater reserves in Kosovo are limited and they are mainly found in the western part of the country.

As part of the "Development of water resources in southeastern Kosovo" project, geo-physical studies of groundwater were conducted during 2005-2007 in the municipalities of Gjilan and Ferizaj (basin of Morava e Binces). Furthermore, during 2008-2010 as part of activities of the EC supported project on the basin of Drini i Bardhe, groundwater survey sites were planned for this basin. Historical data point out that this zone is richest in groundwater.

According to the Kosovo Water Master Plan 1983-2000, the Dukagjini Plain has the greatest groundwater potential.

Table 5. Groundwater accumulations in the Drini i Bardhe basin, their area, volume and capacity

No.	Groundwater accumulation	Area of basin (km^2)	Usable volume (m^3)	Assessed capacity	
				m^3/sek	Total (m^3)
1	Istog	76	12x106	2,8	89x106
2	Vrellë	28	14x106	0,600	19x106
3	Drini i Bardhe	90	14x106	3,23	102x106
4	Lubizhdë	42	45x106	4,2(150)	55x106
5	Peja	300	37,5x106	4,0(150)	52x106
6	Decan	144	33x106	3,5(150)	45x106
7	Lloqan	39	12x106	1,2(150)	15x106

8	Krk Bunar	81	10x106	1,6	50x106
9	Korisha	18	3,6x106	0,38	12x106
10	Field of Theranda	50	75x106	2	63x106
Gjithsej		998	271x106		511x106

3.3. THERMO-MINERAL WATER

The Republic of Kosovo has important thermal water resources, which are mainly used for healing and recreation purposes.

Research to identify and study the value of these resources and the amount of such water in Kosovo has been scarce. Data point out that there are about 30 identified sources of thermal and mineral water in Kosovo.

Detailed research has only been conducted for the sources of such water in Peja, Kllokot and Banjska, which function as thermal treatment spas. These thermal water sources may also be used for thermal energy production. The overall temperature of thermo-mineral water in the Republic of Kosovo ranges from 17 to540 C, with a mineralization scale of 2-5 g/l. Sources of thermal and mineral water in the Republic of Kosovo contain sulfates, hydrocarbon, calcium and Magnesium.



Burimi Banjës së Pejës

Table 6. Physical-chemical features of some thermo-mineral sources[14]

No.	Location	Q l/sec	t ^{0}C	pH	Mineralization g/l
1	Banja e Pejës	4,00	48.9	6.9	2.04
2	Banja e Kllokotit	10,00	32.0	6.6	3.601
3	Banjska	2.50	50.0	6.7	1.356
4	Banja e Runikut	15.00	24.8	7.1	0.598
5	Burimi i Nxehtë i Runiku	5.00	23.0	7.2	0.61
6	Gojbula	-	12.0	6.3	2.193
7	Uji i Lluzhanit	0.01	14.0	6.3	1.144
8	Studencia	1.0	25.0	7.1	0.670
9	Deçan	2.00	12.5	6.3	1.433
10	Getnja e Sipërme	0.1	9.0	6.6	2.539
11	Poneshi	0.03	13.0	6.3	3.539
12	Pokleku	1.00	13.0	6.3	3.52
13	Uglari	6.00	25.00	6.8	0.688
14	Zhitija	0.3	20.0	6.5	5.126
15	Dobërçani	**-**	26.8	6.4	**-**

3.4. WETLANDS

SAccording to the definition of the Ramsar Convention (The Convention on Wetlands of International Importance), wetlands include: areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters.

Wetlands make approximately 6% of the overall area of the globe and represent some of the most productive environments. They are considered a "cradle of biological biodiversity", providing water and primary productivity for the existence of numerous species of plants and animals. They have a high concentration of mammals, birds, reptilians, terraqueous, fish and non-vertebral species. According to some experts, wetland ecosystem services provide high economic profit amounting to 4.9 billion dollars a year. Thus, rice is a common plant of wetlands and feeds more than half of humankind. Furthermore, about 2/3 of global fishing is tied to the coast and wetland areas. Agriculture, transportation, energy and tourism also benefit from wetlands.

Because of values and benefits of wetlands, countries are committed to preserving them. This is shown in the continuous increase in the number of wetlands of international importance, as well as the increasing number of countries that have signed this convention since 1971.

14 MESP/AMMK, The state of water Report 2010

The Ramsar Convention was initially signed by 18 countries, scientific institutions and international organizations, while today it is signed by 160 countries. There are 1911 wetlands of international importance with a total area of 186 950 196 hectares.

Kosovo has declared a protected zone which is categorized as wetland. The Government of Kosovo in 2013 declared the Henc/Radeva wetland as a special protection bird area because of its special natural values and characteristics, including ornithological, etiological, hydrogeological, botanic, and landscape features. The area includes an area of 109 hectares, 52 ares and 35 meters square, and it expands over the territory of the municipalities of Gracanica, Lipjan and Fushe Kosova [15].

The professional declaration proposal for this area was prepared by the Kosovo Institute for Nature Protection of the Kosovo Environmental Protection Agency. Goals guiding the declaration of the Henc wetland a Special Protection Area (SPA) include: sustainable use, ecosystem protection, taking measures to rehabilitate damaged ecosystems, rational use of natural resources, increase of scientific, educational, and cultural research opportunities, and other professional activities in accordance with contemporary concepts for the development of this area.

The wetland of Henc is a very rich zone in terms of zoological diversity. Research conducted in this area has shown that many types of wild fauna live there, dominated by wild birds. Natural habitats of the Wetland of Henc provide shelter to many types of birds, many of which are rare and with an unfavorable protection status in Kosovo and in Europe. Until now 78 types of birds have been recorded, but this number may result higher if a comprehensive systematic and professional study is conducted in this area[16].



Landscape in the Wetland of Henc

15 MESP, Professional proposal for declaring the Wetland of Henc a Special Protection Area

16 Professional proposal for declaring the Wetland of Henc a Special Protection Area, MESP/AMMK



4

WATER USE AND WATER RESOURCES

4.1. USE OF WATER FOR DRINKING AND HOUSEHOLD NEEDS

The water supply service means the provision of drinking water to Kosovo's population by the regional water companies in their coverage zones. In addition to major cities, these companies also provide their services to some villages located within their area of responsibility. Many settlements in Kosovo get water from supply systems outside the authority of regional water companies. Table 7 provides drinking water supply data.

Table 7. Availability of water supply network [17]

Nature of supply	Household units	Percentage
Water system provided by public service	204,365	69.6%
Water system provided by other sources	82,609	28.2%
Pipeline water system within building outside household unit	899	0.3%
Pipeline water system outside building	3,413	1.2%
Water supply system not available	2,157	0.7%
Total	293,443	100.0%

As shown in the table, about 69.6 % of the population in Kosovo is supplied with water from public systems managed by regional water companies, 29 % from independent systems not managed by regional water companies, and 0.7% of the population does not have access to the water supply system.

Based on the performance report of regional water companies, coverage with water supply services in their areas was 82 % in 2013, which is 4% higher than the 2012 percentage. (Figure 4).

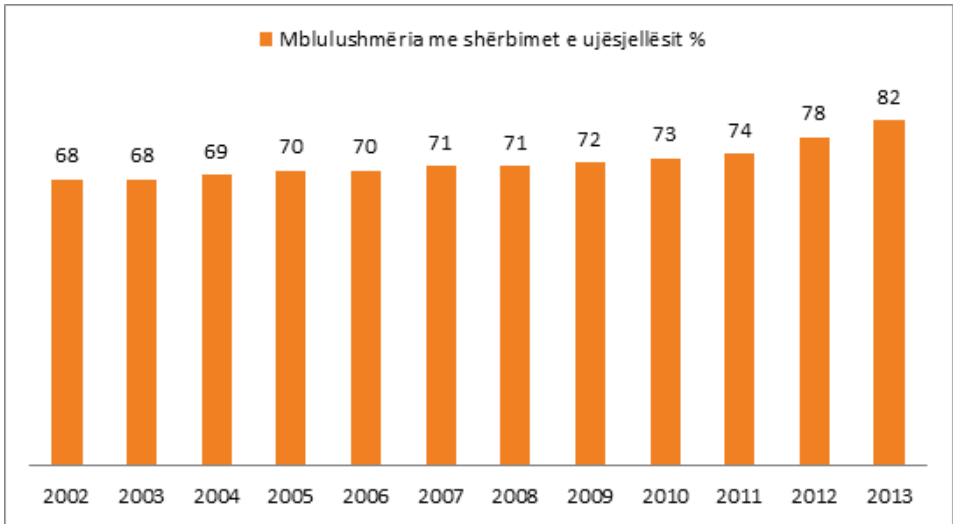


Fig. 4. Coverage of public water supply services in RWC areas (%) 2002-2013

RWC data show that 134 million m3 of water were produced in 2013, which marks a decline compared to 2012 when 138 million m3 of water were produced.

17 Kosovo population census 2011, KSA

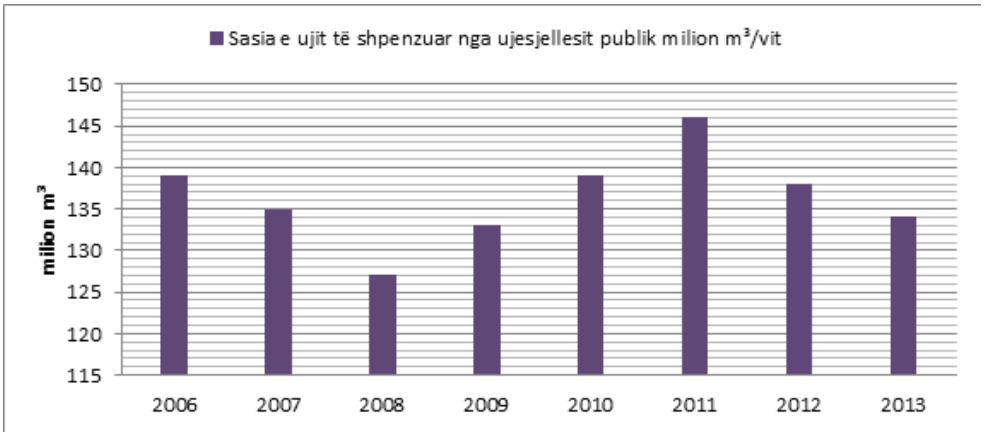


Fig. 5. Quantity of water spent by public water systems (in million m3/year), 2006-2013

4.2. WATER USE FOR IRRIGATION

The use of water for irrigation during 2012 has increased compared to the previous year. According to data of the Kosovo Statistics Agency and the Ministry of Agriculture, Forestry and Rural Development during 2011, approximately 50 million m3 of water have been used for irrigation, which marks a significant increase compared to the previous year. In addition, there has been an increasing trend in the use of water for irrigation from 2001 until 2012, except 2004 and 2009 wherein the use of water for this purpose has declined due to drought. (Figure 6).

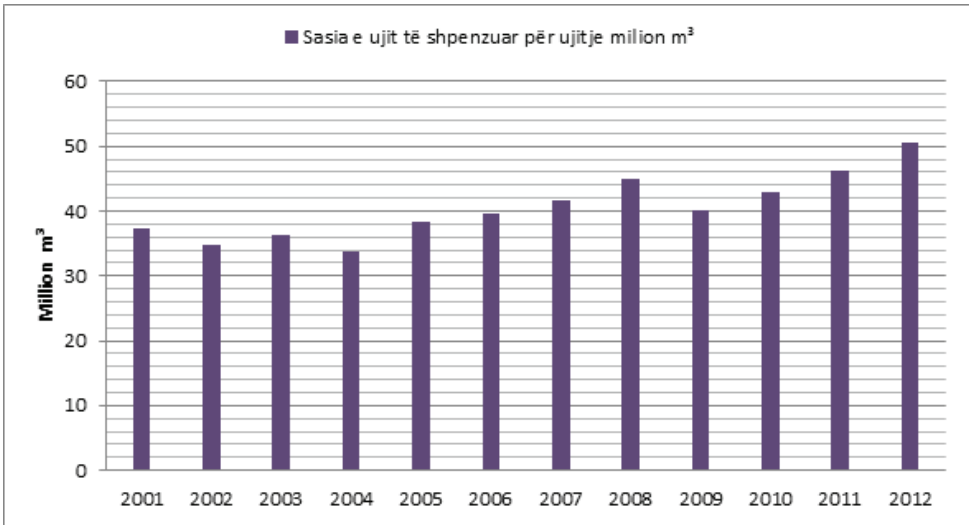


Fig. 6. Quantity of water spent for irrigation 2001-2012[18]

18 Kosovo Statistics Agency

In addition to the increase in the quantity of water used for irrigation, the number of irrigated areas has increased as well. Approximately 12 thousand and 300 hectares of land were irrigated during 2012, which marks an increase compared to 2011 when approximately 11 thousand and 800 hectares were irrigated. Thus, there has been an increasing trend of irrigated areas from 2001 until 2012. (Figure 7).

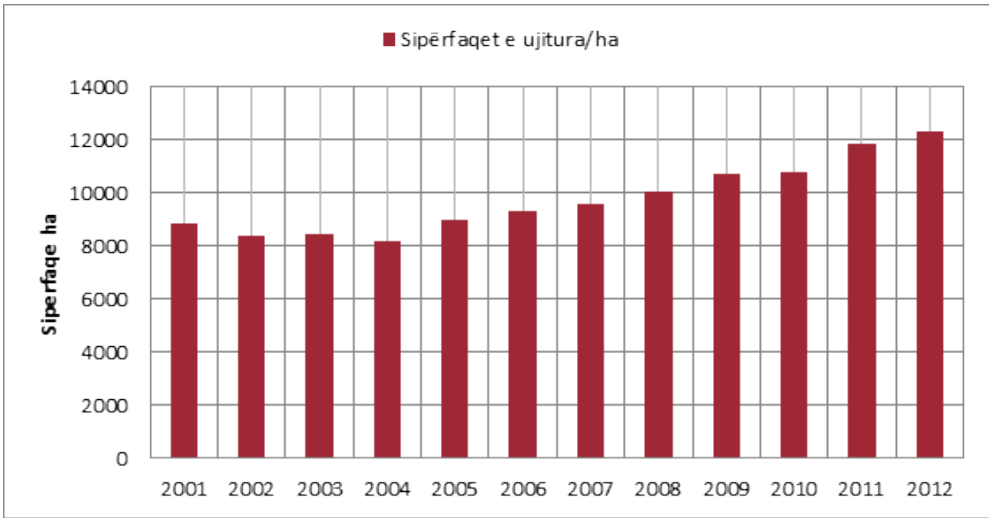


Fig. 7. Irrigated areas 2001-2012 [19]

4.3. WATER USE IN INDUSTRY AND ENERGETICS

Industrial and energetic operators are the greatest users of water. The greatest spenders of water in Kosovo include: KEK, Feronikel and Sharrcem. These operators are mainly supplied with water from superficial accumulating lakes. Some of the smaller industrial operators are supplied with water from the public network, whereas a few of them use well-based independent water supply systems.

Kosovo Energy Corporation

The Kosovo Energy Corporation (KEK) is one of the economic operators that spend most water for energy production purposes.

TC Kosova A is supplied with unprocessed water from the Llap River and from HPE Ibar-Lepenc and Batllava Lake when necessary, while TC Kosova B is supplied with unprocessed water from HPE Ibar-Lepenc. According to data provided by KEK, the corporation used 21 million m3 of water for energy production during 2013, which is lower compared to the previous year. (Figure 8).

19 Kosovo Statistics Agency

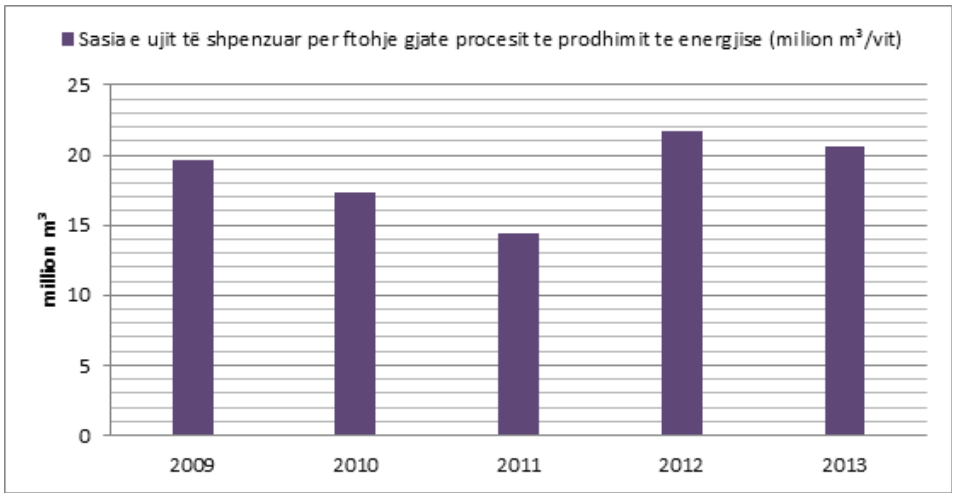


Fig. 8. Quantity of water spent by KEK for energy production [20]

NewCo Feronikel

NewFeronikel is supplied with water for its technological processes from Bivolak (HPE Ibar-Lepenc), which is located 17 km away from the factory and which supplies water reservoirs located above the factory. Feronikel uses this water for industrial and drinking purposes.

The industrial water is mainly used for electrical furnaces cooling, slag granulation, steam production and for gas and dust cleaning systems in convertors and electrical furnaces. The majority of the industrial water used to cool electrical furnaces is re-circulated, while most water is spent in steaming processes (cooling towers, slag granulation).

According to data provided by NewCo Feronikel, approximately 1.2 million m3 of water were spent during 2013, which marks a considerable decline compared to the previous year. (See Figure 9).

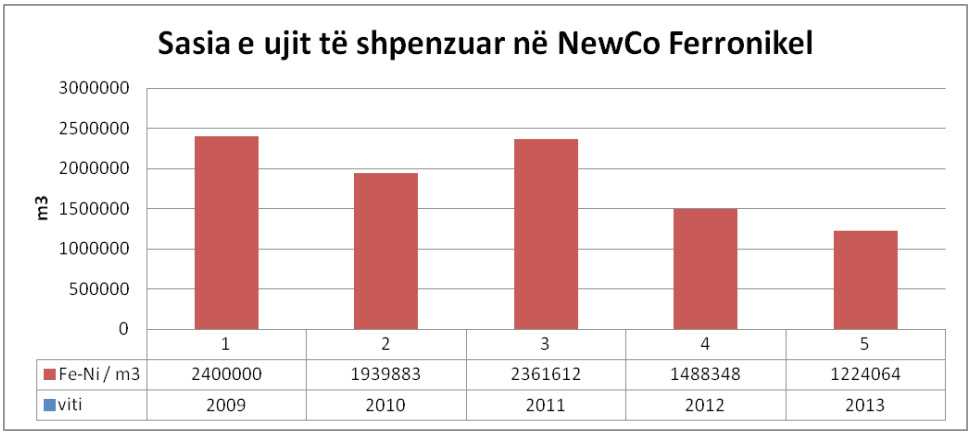


Fig. 9. Quantity of water spent by NewCo Feronikel, 2009-2013 [21]

20 Monthly and annual environmental reports of KEK 2009-2013
21 Monthly and annual environmental reports of NewCo Feronikel 2009-2013

Sharrcem

The cement factory Sharrcem in Hani i Elezit operates with a closed water system at all points of the production process. This system is supplied with water from sources of the Lepenc River and Dimca stream. Water is spent in this operator for conditioning furnace gases, for cooling processes in the air conditioning tower and for sanitary purposes.

According to data provided by the concrete factory SharrCem, 100 thousand m3 of water were used during 2013, which is lower compared to 160 thousand m3 water spend in the previous year, as shown in the figure below

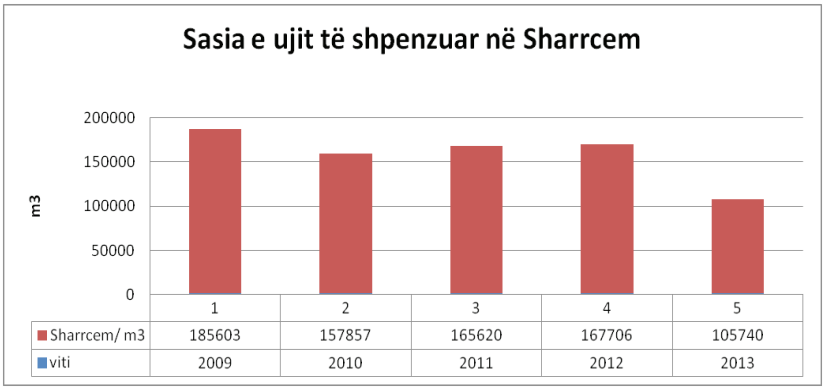


Fig. 10. Quantity of water spent in Sharrcem, 2009-2013 [22]

4.4. WATER USE FOR HYDRO-ENERGY

The hydropower plants currently operating in Kosovo include the plant of Ujman with an energy production capacity of 2 x 17 MW and five small plants contributing to the distribution network with a capacity of 11.82 MW. Other small plants include those in Dikanc, Burim and Prizren. Another operational hydroelectric plant in Kosovo is that of Kozhnjer in Decan, which has been given with concession and produces a small amount of energy. Kosovo has numerous rivers and streams with a hydro-energetic potential that may be used to produce electrical energy. The western part of Kosovo has the hydro-energetic potential of Drini i Bardhe, which comprises more than half of the hydro-energetic potential of Kosovo. The most important hydroelectric plant that may be built in Kosovo is that of Zhur located in the flow of Drini I Bardhe with a capacity of 0.377 Twh/year. The flows of rivers Drini i Bardhe, Iber, Morava, Lepenc and Llap have a significant potential for electrical energy production. The table below summarizes the basic data regarding the capacity of planned hydro-plants and their locations have been presented in the map.

22 Monthly and annual environmental reports of SharrCem 2009-2013

Table 8: Basic data on the capacity of planned hydropower-plants [23]

Name of HP	Potential capacity [MW]	Planned production GWh	Flow m^3/ sec	River
Kuqishta	3.9	19.0	6	Peja
Drelaj	6.2	29.6	6.5	
Shtupeq	7.6	37.2	8	
Bellajë	5.2	26.1	5	Deçani
Deçani	8.3	40.7	6.5	
Lloçan	3.1	14.4	1.5	Lloçani
Mali	3	18.6	2.4	Erenik
Erenik	2	9.5	2.4	
Jasiq	1.9	9.9	2.6	
Dragash	2.2	11.5	5	Plavë
Orçush	5.6	29.2	7	
Reçan	1.5	7.9	2.6	Prizreni
Brezovicë	2.1	11.5	4.5	Lepenc
Lepenci	3.5	19.1	7.6	
Banjska	0.3	1.7	0.5	Banjska
Batare	1.1	5.6	2.3	Bistrica
Majanc	0.6	3.1	1.5	Kaçandoll
Mirusha	4.6	28.1	45	Drini & Deçani
Total	62.7	322.8		
Hydro-plant of Zhur		Potential capacity [MW]		Planned production GWh
Zhur 1		2x 131		342.2
Zhur 2		42		55.39
Total		305		397.6

23 Sustainable Energy Options for Kosovo,2012, Daniel M. Kammen et al., University of California, Berkeley

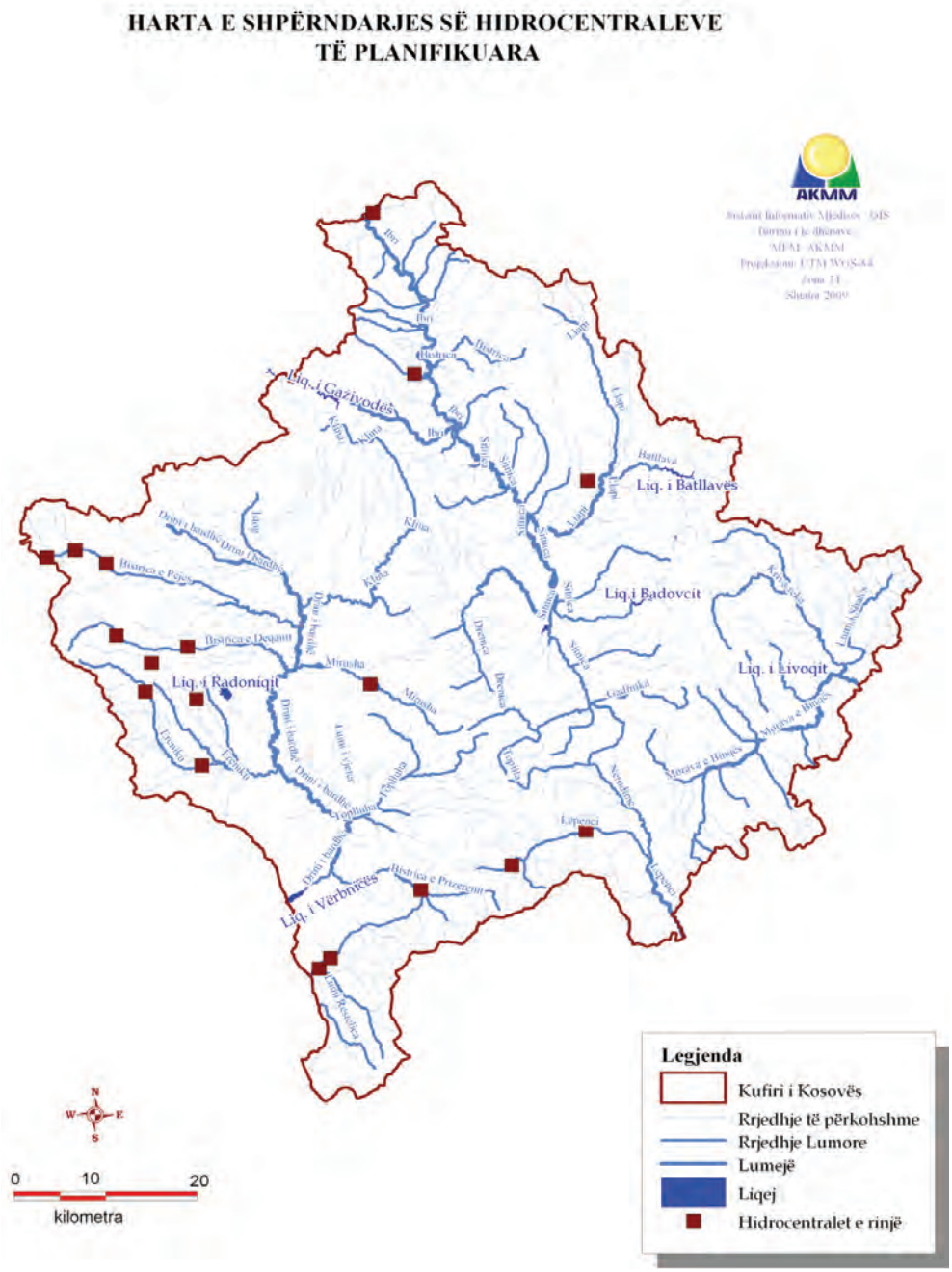


Figure 11: Distribution of planned hydroelectric power plants

4.5. EXPLOITATION OF INERT MATERIALS IN RIVERS

Because of the increased demand and need for construction and economic development after 1999, many operators started river sand excavation activities. The inert materials of many rivers in Kosovo were used inappropriately and in a way that exceeded the capacity of riverbeds. This overexploitation has affected ecosystems of rivers and riverbeds, and has also resulted in overflows and floods.

To prevent this degradation, the Government of Kosovo brought a decision in 2011[24] regulating the use of and preventing exploitation of inert materials from riverbeds, river banks and land surrounding rivers in the entire territory of Kosovo.

This Decision was enforced during 2012 by MESP and other relevant institutions. However, despite measures for implementing this decision and other activities aimed to stop degradation of rivers and exploitation of inert materials, the intended outcomes have not been achieved yet.

Based on data provided by the environmental inspectorate and gathered during field visits, the environmental condition of rivers keeps deteriorating due to sand exploitation activities. The most degraded rivers include the rivers of Drini i Bardhe, Lumbardhi i Pejes, Erenik, Desivojce, Krivareke and Iber.

Table 9: Degraded area by river [25]

River	Area in ha 2009	Area in ha 2012
Drini i Bardhë	861.1	1011.75
Ibri	2.64	4.5
Morava e Binçës	4.29	4.79
Lumëbardhi i Pejës	93.36	134.5
Ereniku	16.28	19.48
Desivojca	7.76	18.95
Total	1004.77	1219.23

Harmful exploitation methods used by operators while excavating inert materials include:

- ✓ Digging holes up to 10 m deep near or in rivers;
- ✓ Moving heavy vehicles on riverbeds, which presses the substrate and results in vehicle oils and chemicals washing into the river;
- ✓ Digging at points of confluence where small tributaries flow into main rivers. This prevents stabilization of rivers at these sites and slows down natural regulation at lower points of the river because of the interruption of the flow of natural sediments;

24 Decision nr.02/46

25 GFO2014, Degradation of rivers in Kosovo; Integrating ecological knowledge into nature conservation and ecosystem management, 44th annual meeting, September 8-12, 2014, Hildesheim, Germany

- ✓ Construction of roads within rivers as a lighter form of exploitation and other forms of riverbed degradation.
- ✓ The excavation of inert materials from rivers causes the following damages:
- ✓ New water channels are created and the natural river flow is interrupted;
- ✓ Numerous holes deeper than 10 m are have been opened in the flow;
- ✓ River flow direction is changed, increasing the risk of soil erosion;
- ✓ River substrate stability is reduced especially in cases of flooding;
- ✓ Natural changes of river ecosystems, flora and fauna are interrupted[26].



Degradation of Drini i Bardhe River

26 MESP/KEPA: State Of Rivers Assessment Report, 2014, Prishtina



Degradation of Lumbardhi i Pejes riverbed



Degradation of Desivojce riverbed

4.6. WATER PERMITS

The Ministry of Environment and Spatial Planning is the authority for reviewing water use requests of economic operators. Economic operators meeting the criteria foreseen by the Law on Waters and other laws are issued water permits. During 2011-2013, MESP issued 42 water use permits to economic operators.

Table 10: Water permits issued by MESP, 2011-2013

	2011	2012	2013
Water permits	12	16	24
Total		52	



5

FLOODS AND EROSION

5.1. FLOODS

Floods as a natural phenomenon are often caused by intense precipitation and rapid snowmelt. Rivers in Kosovo are characterized by evident changes between minimum and maximum levels of water. Different morphological features, such as wide fields surrounded by mountains, result in wide range and dynamic floods. Relatively hollow unregulated and unmaintained riverbeds, throwing waste into rivers and uncontrollable use of inert materials from riverbeds result in wider floods in Kosovo.

According to the Water Master Plan of 1983 on floods probable to occur once in 100 year, the probability of floods from the river basins in Kosovo is as follows:

- ✓ Basin of Drini i Bardhe - 50%
- ✓ Basin of Iber River - 24%
- ✓ Basin of Lepenc River - 20%
- ✓ Basin of Morava e Bincces - 6%.

This assessment shows that the length of Kosovo rivers at flooding risk is about 491 km and only 140 km of them are regulated (28%).

Floods in Kosovo usually occur in spring (March and April) and autumn (October and November). The administrative territory of Kosovo is at risk from floods in all its river valleys, such as the valley of Drini i Bardhe and flows joining it, the valley of Sitnica River in the Kosovo Field, the valley of Lakuar River (Kriva Reka) in Dardana, the valley of Morava e Binces River in Gjilan, the valley of Lepenc River in Kacanik – Han i Elezit, the valley of Llap River in Podujeve, the valley of Drenica River in Drenas, the valley of Klina River in Skenderaj and valleys of other streams.

The landscape features in Kosovo are such that plain areas of its territory are appropriate for settlements, industrial activities and infrastructure development, while mountains surrounding the plains condition rapid flowing of water in great quantities because of their slopes. This increases the need for protecting these areas from floods.

Different morphological features, such as wide fields surrounded by mountains, result in wide range and dynamic floods. Relatively hollow unregulated and unmaintained riverbeds, throwing waste into rivers and uncontrollable use of inert materials from riverbeds result in wider floods in Kosovo. Floods affect fields in Kosovo almost every year causing considerable economic and ecological damages. Most of the riverbeds do not support additional quantities of water leading to wide range floods.

Floods in the basins of Iber and Morava e Binces during 2014

There were floods in the majority of Kosovo municipalities located within the basins of Iber and Morava e Binces in April 2014 because of snowmelt and precipitation. The floods damaged rural infrastructure, mainly roads and bridges. They also affected households and agricultural lands, causing considerable damage to the sector of agriculture.



Floods in Mitrovica



Floods in Mitrovica

There are also floods near rivers and streams, such as Iber, Sitnica and Lushta, and their tributaries, especially during heavy rainfall. During 2014, the Sitnica River in Mitrovica overflowed its bed flooding tens of houses and endangering tens of others. There were floods in the villages of Frasher, Kçiq and Lisca causing damage to agriculture, households, private firms and motels.

In the Municipality of Vushtrri the greatest floods occurred near rivers and streams, such as Sitnica, Llap, Terstena and its tributaries in Pestove, Nedakovc and Prilluzha. After heavy rainfall in Vushtrri, numerous zones near Llap and Sitnica rivers were affected by floods. Families were evacuated in some villages, especially in Stanovc. As a result of floods, land was covered with water, water of wells was contaminated and people had to be evacuated from at-risk locations.

In the Municipality of Prishtina floods occurred when the Prishteva River and its tributaries overflowed their beds. The most affected locations in the Municipality of Prishtina included Llukar, Besia, Makofc, Mramor, Keqekolla, Bernica, Prugofc, Vranjevc, Emshir and Hajvali.

In the Municipality of Obiliq, floods occurred near Sitnica River and its tributaries. They damaged the infrastructure and bridges in Breznica, Dardhishte and Obiliq i Vjeter. In addition to planted fields damaged by the Llap River, in Millosheve and Babimoc villages houses were damaged as well.

In the Municipality of Podujevo, there were floods near the Llap River and its tributaries. Rainfall during 2014 caused floods with considerable material damages in a number of villages in this municipality. The situation was more severe in Repe village, where two bridges were destroyed and because of the dike constructed in the riverbed,



Llap River in Lluzhan of Podujevo

the water level increased posing risk to the houses nearby. Agricultural land was also flooded along Llap River in the villages of Doberdol, Bajçina, Gllamnik, Sekiraqa, Siboc, Lluga and Lupç. In addition, the Dumnica River flooded in Dumnice e Poshtme, Shtedim, Balloc, Surkish and Sfeqel. There were also floods along the river in the villages of Halabak, Ternava and Bellopoja.



Llap River in Podujevo, fixed riverbed during floods

In the Municipality of Viti, Morava e Binces River and its tributaries flooded during 2014 in Viti, Skifteraj, Budrike e Epeme, Remnik, Radivojc and Bince. Floods caused by Morava River were assessed as the most severe, damaging entire areas of agricultural land, especially those planted with potatoes.

After floods that occurred in the villages of Budrike and Radivojce, and in the town of Viti, the water in wells was contaminated.

In the Municipality of Gjilan, there were floods from Morava e Binces River and its tributaries in Nasala, Velekince, Uglar, Lladov, Zhegra, Haxhaj, Demiraj and Shurdhan. The floods damaged agricultural land and led to water contamination.

In the Municipality of Kamenica, floods occurred during 2014 from the rivers Kriva Reka, Lumi i Hogoshtit and Shipashnica, and the tributaries of the latter in Hogosht, Shpashnica, Meshina, Strezovc, Topanica, Muqiverrc, Desivojce and Krileva. Floods affected infrastructure and agriculture, and led to evacuation of inhabitants (Hogosht) and drinking water contamination.

In the Municipality of Fushe Kosova, there were floods during 2014 from the rivers of Sitnica, Graçanka and Prishtevka. Floods caused damage to living infrastructure and agriculture, and led to contamination of wells.

Protection from floods and regulation of water regimes are complex issues requiring long-term solutions and the participation of numerous sectors and subjects.

Activities to address these issues should include the following elements::

- ✓ Probability, range and duration of floods;
- ✓ Prediction of reoccurrence of floods in certain regions;
- ✓ Reviewing administrative issues and constructing hydro-technical facilities;
- ✓ Setting criteria based on comprehensive analyses and projection of costs;
- ✓ Maintenance and financing of construction of hydro-technical infrastructure for protection from floods.

Needs of regions requiring protection from floods include:

- ✓ Reconstructing existing infrastructure to increase level of safety; and
- ✓ When dealing with protection from floods in wider areas, especially agricultural land, factors to consider include timing and duration of floods, and density of settlements.

Activities aimed to regulate water flows are grouped into three categories:

- ✓ Activities in flows where no regulation or flood protection works have been conducted previously;
- ✓ Activities in flows where partial works have been completed and have given positive results; and
- ✓ Activities in flows where works have been conducted before but without result (due to different causes).

When implementing protection measures against floods and projecting hydro-technical structures in a river basin, it is necessary to consider the magnitude of floods at the return period. Selection of the flood return period depends on the project and safety criteria. The following return periods are usually taken into account.

- ✓ For urban drainage of storm water: 10 to 30 years
- ✓ For small deviation structures and accumulation dikes: 50 to 100 years
- ✓ For urban protection against floods: 100 years
- ✓ For big dikes: 5000 to 10000 years or maximum potential floods

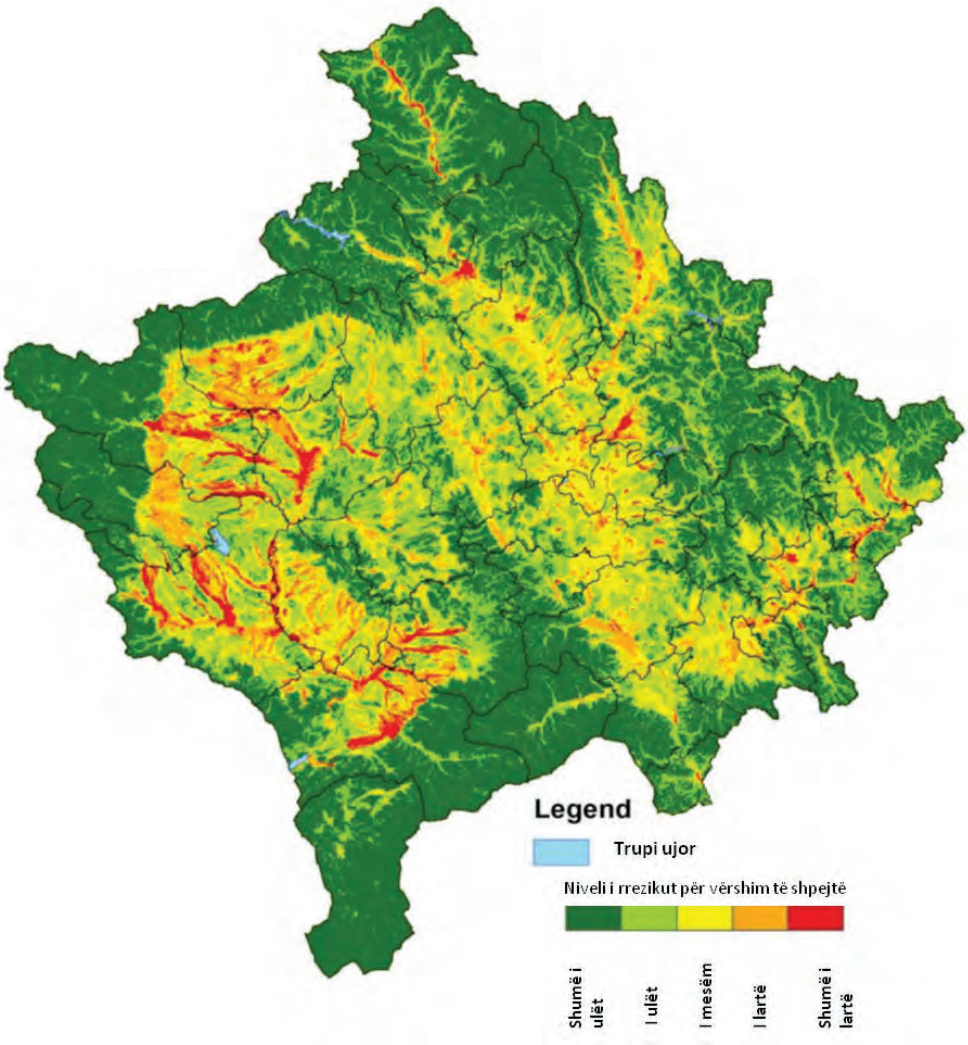


Fig 12: Distribution of risk level from immediate floods in Kosovo [27]

27 Assessment of risk from immediate floods, VRAM

5.2. FLOOD EARLY WARNING

As part of the Climatic Change Adaptation in the Western Balkan 2012-2014 project supported by GIZ, an early warning system has been established for floods in the basin of Drini.

This activity resulted in the installment of measurement meteorological and hydrometric instruments in the Gjonaj hydrometric station in Drini i Bardhe River, in the Gryka e Rugoves station in Bistrica e Pejes River (automatic water level sensor together with the data transfer system connected to the central server in Prishtina through GSM/GPRS), and in three meteorological stations in Peja, Junik and Prizren including automatic rain-meters for precipitation registration and central servers.[28]

The hydrometric station of Gjonaj located in the Drini i Bardhe River is of special importance as its location near the border with Albania gives it an international character and it covers all waters that drain in the Dukagjini Plain. This station hosts a sensor which automatically registers water levels in time intervals of 15 minutes and supports real time access through GSM/GPRS.

The hydrometric station installed in Rugova Canyon in Bistrica e Pejes River also uses a sensor which conducts automatic water level registration in time intervals of 15 minutes and stores data in its data logger, thus enabling non-stop access through the GSM/GPRS system and real time data transfer to the central server of NIPH in Prishtina.

The project also installed a central server operating with the Demasdb software for real time data transfer to the central software and for exchanging information with cross-regional hydro-meteorological institutes, in order to ensure effectiveness in early warning in cases of eventual floods.

28 KHI 2014, Report on implementation of the project "Climate Change Adaptation in Western Balkan – Flood Early Warning System in Basin of Drini/Buna" (http://www.ammk-rks.net/repository/docs/RAPORT_MBI_ZBATIMIN_E_PROJEKTIT_1.pdf)



Figure 12: Map of hydro-meteorological monitoring stations in basin of Drini/Buna [29]



Hydrometric station in Gjonaj

29 KHMI 2014, Report on implementation of the project "Climate Change Adaptation in Western Balkan – Flood Early Warning System in Basin of Drini/Buna"

5.3. EROSION

Erosion is one of the most severe forms of degradation of soil, forests, landscapes, mountain slopes, and residence and road infrastructure.

Table 11: Area of land by category of erosion in Kosovo [30]

Category	Area in km^2	Percentage
Category I – Very strong erosion	714.3	6.6%
Category II – Strong erosion	1890.2	17.6%
Category III – Medium erosion	3367.7	31.3%
Category IV – Weak erosion	3680.2	34.3%
Category V – Very weak erosion	1097.5	10.2%
Total	10749.9	

No complete information is available to assess damages caused by erosion. To prevent erosion, the provisions determined in the Law on Waters need to be enforced and actions foreseen by the Spatial Plan 2010-2020 need to be implemented. Necessary actions include hydro-technical and land management measures.

Thus, erosion prevention necessitates a range of technical, program and legal measures, including but not limited to:

- ✓ Limit zones at risk from erosion and develop appropriate measures for each zone.
- ✓ Determine legally zones at risk from erosion.
- ✓ Inform regularly and give instructions to all affected entities.
- ✓ Implement a program that aims law enforcement against violations of provisions regulating protected areas.

30 Kosovo National Water Strategy 2014 – 2033

Table 12. Overview of construction and condition of embankments based on recordings conducted after 2003-2005 [31]

River	Sector	According to Master Plan	Until 1980	After 1980	After 2000	Realized %	Current condition %
		Projected area in km	Realized km	Realized km	Realized km		
Drini i Bardhë	I	20.65					
	II	20.85					
	III	4.54					
	IV	29.03	13.4				Damaged 11.258 Km
	Total	75.07	13.4			17.85	84
Istogu		19 733	8.188				Damaged 8.188 Km
	Total	19.733	8.188			41.49	100
Lumbardhi i Pejës	I	9.764					
	II	10.130					
	III	10.192					
	IV	4.586	1.685				Damaged
	Total	34.672	1.685			4.85	5
Klina	Klinë						
	Skenderaj						
	Total						
Ereniku	Ura e Terezive			3.23			Damaged
	Total			3.23			20
Lumbardhi i Lloqanit	Fshat	27.3					
	Qytet		2.2	1.262			Damaged 2.2 Km
	Total	27.3	2.2	1.262		12.68	63
Toplluha	Fshat						
	Qytet						
	Totali						
Lumbardhi i Prizrenit	Fshat	7.28					
	Qytet	1.57	1.25		1.015 0.622		Damaged 0.2 Km
	Total	8.85	1.25		1.637	32.62	0.07

31 Department of Water, MESP



6

SURFACE WATER MONITORING

6.1. ORGANIZATION OF SURFACE WATER MONITORING

The monitoring of rivers in the territory of the Republic of Kosovo is conducted by the Kosovo Hydro-meteorological Institute. The quality of these rivers is determined based on physical-chemical analyses and presence of heavy metals. The monitoring network consists of 54 stations. Currently, 10 physical parameters are monitored (11 times a year), 39 chemical parameters (11 times a year) and 8 heavy metals (2 times a year). The complete list of parameters monitored by NIPH is included in Annex 3 of this report.

The basin of Drini i Bardhe include 10 rivers with 23 monitoring stations (10 of which are referent stations and are monitored 2 times a year and 13 are located along river flows and are monitored 11 times a year).

The basin of Iber includes 8 rivers with 18 monitoring stations (5 of which are referent stations and are monitored 2 times a year and 13 are located along river flows and are monitored 11 times a year).

The basin of Morava e Binces included 2 rivers with 6 monitoring stations (2 of which are referent stations and are monitored 2 times a year and 4 are located along river flows and are monitored 11 times a year).

The basin of Lepenc includes 2 rivers with 7 monitoring stations (2 of which are referent stations and are monitored 2 times a year and 5 are located along river flows and are monitored 11 times a year).

Codes and locations of monitoring stations are presented in Annex 4 of this report. The following map shows the distribution of monitoring stations in Kosovo rivers.

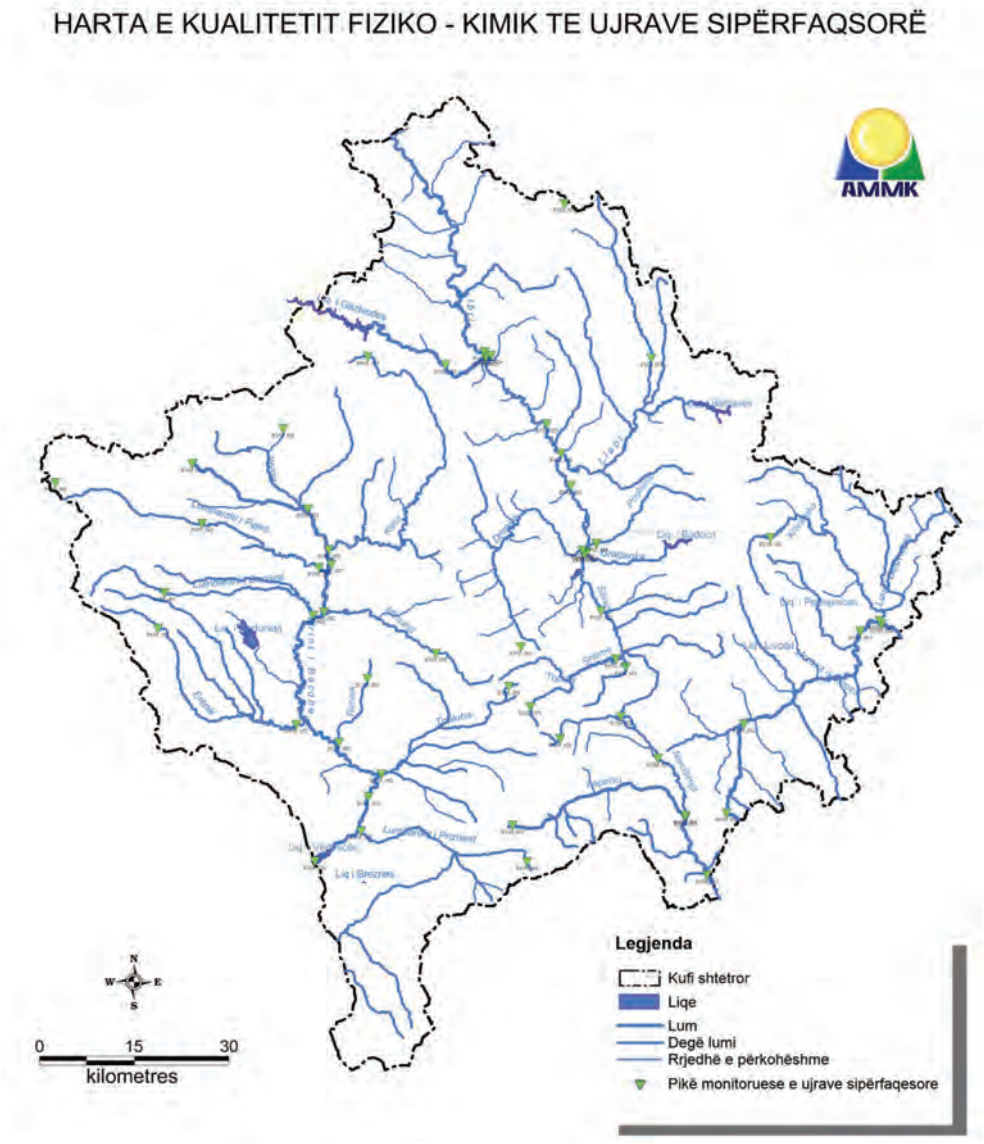


Figure 13: River water quality monitoring stations

6.1.1. Basin of Drini i Bardhe

This basin has the greatest area of all river basins in Kosovo. The monitoring network of this basin consists of 23 monitoring stations of the physical and chemical quality. Three of these are base stations belonging to the Drini i Bardhe River: one at the river source in Radavc mountain above Peja, one at the confluence of Istog and Klina rivers in Klina, and the last one at the confluence of the rivers of Lumbardhi i Pejes, Decani, Mirusha, Erenik, Rimnik and Toplluha, located at the bridge in Gjonaj village of Has. The quality of water varies as it flows through stations. Thus, water at the source has a good quality, but at the other two stations there is pollution caused by untreated waters discharged into the main river and into the rivers mentioned above which are sub-basins of this river. Pollution is also caused by water used to wash agricultural land.

Results of physical-chemical analyses for the last five years show that the quality of water at all river sources is good. The situation starts to change when approaching settlements due to the discharge of wastewater and water from industrial collectors along the flow of this river basin. Another cause of pollution is the throw of waste especially at locations of bridges. Water has a good quality up to the point of confluence with Istog River. Drastic changes begin in the regions of Zllakuqan–Ruhot and Zllakuqan–Klina. At the point of confluence of Drini i Bardhe and Klina rivers, the quality of water is very poor. To conclude, water of the basin of Drini i Bardhe is polluted by discharges into the sub-basins, which have beforehand been subject to human action. This situation continues up to Vllashnje at the point of flow into Lumbardhi i Prizrenit.

Istog River – Originates from the mountain above the town of Istog with a very good quality, which does not change up to its confluence with the Drini i Bardhe River. It is known as the cleanest river in Kosovo.

Klina River – The first monitoring station for this river is located in Cerpule, which does not meet the criteria as the first or main source because of its location far from the source. Until water reaches this location it is affected by human activity, therefore its quality at both monitoring stations is poor, as shown in the laboratory tests given in figures.

Lumbardhi i Pejes River (Bistrica e Pejes) – It is formed from several sources along the Rugova Canyon, the primary monitoring station of which is located in Drelaj village. It has good physical and chemical quality at the first station, but due to urban and industrial water discharge, this quality worsens. The quality of its water is also affected due to the fact that during the summer irrigation season the river goes dry for approximately two months. The third monitoring station is located near Klina before its confluence with the Drini i Bardhe River, where its quality is very poor.

Mirusha River – It is formed in the hills above Bllaca village of Theranda from many small sources. It becomes a full river in the village of Banja e Malisheves (which will be used as a reference point in the future monitoring plan), where it is joined by the powerful surface water source known as Uligja e Banjes. This river is monitored at only one station in Volljak a few meters before it joins the Drini i Bardhe River. Its water has small turbidity, a quantity of dissolved oxygen of 6.41-9.59 mg/l O2, and electrical conductivity of 605-718 μS/cm, therefore it belongs to rivers with medium water quality.

Lumbardhi i Decanit River (Bistrica e Decanit) – The first monitoring station of NIPH's network is located 3 km away from the town above the church, where its quality is very good. The next station is located 10 m before its confluence with the Drini i Bardhe River in Kralan village of Gjakova. Its quality at this station is not very alarming; however,

there has been an increase in the values of parameters compared to the first station. There is also turbidity caused because of gravel excavation from its riverbed by private companies operating tens of meters above the monitoring station.

Erenik River – The first water quality monitoring station of this river is located in the mountains above the village of Jasiq (Municiality of Junik). There is no human influence on the water at that point; therefore, its quality is very good. The second station is located near the confluence with the Drini i Bardhe River at the Ura e Terzive bridge in Gjakova. The quality of water at this point is poor as analyses showed a presence of detergents. There is always foam on the surface this river, which is supposed to result from textile washing or car-washing activities or other uses of detergents from industries operating in the region and which discharge water without prior treatment.

Rimnik River – Its monitoring begins at the place called Zhdrella not far from its source. It is known as a river with a higher conductivity (529 - 770 μS/cm) than all the other river sources and for its considerable quantity of heavy metals. Its next station is located a few meters before its confluence with Drini i Bardhe River in Xerxe, measurements at which show a low quantity of oxygen and a high quantity of Ammonium ions, phosphates, etc.

Toplluha River – The first monitoring station for this river is located at the place called Buqalla above the touristic compound SOLID in Theranda. The quality of its water resulted good in all measured parameters. However, this quality is poorer at the second station in Pirana village a few meters before its confluence with the Drini i Bardhe River. It has a permanent high turbidity because of gravel excavation from its riverbed.

Lumbardhi i Prizrenit River (Bistrica e Prizrenit) – It originates from Prevalla with a torrent flow. Its first monitoring station is located in the Prevalla Canyon and measurements conducted in it show a good quality of water in all parameters. The second station is located in Vllashnje village 3,5 km before its confluence with the Drini i Bardhe River and the quality of water at this point is considerably poorer because of wastewater discharged into it along the flow.

6.1.2. Basin of Iber

The basin of Iber has 18 monitoring stations, three of which belong to the Iber River. Thus, the first station is located in Kushtova and its measurements show a satisfactory water quality. The next station is located at the town exit and monitors water after urban and other discharges resulting in a poorer water quality. The third station is located in Kelmend after its confluence with the Sitnica River, which contains water from all the sub-basins of this river basin. No alarming case has been noticed during this monitoring period.

Sitnica River – Starting from Ferizaj and up to Mitrovica, this is the most polluted river in Kosovo. Regarding physical parameters, suspended materials are present and exceed maximum allowed values. This is caused by the flow of Nerodime River, the rivers of Shtime, Graqanka, Prishtevka, Drenica, Llap and Trepca and other smaller streams into it, which contain household and industrial water discharges. The monitoring of chemical parameters such as the quantity of dissolved oxygen and SHBO5 indicate permanent pollution of the river.

Llap River – This river is monitored from its source in Murgulla village, then outside the town of Podujevo and finally in Milloshevo before its confluence with the Sitnica River. Based on the monitoring results, the water does not exceed maximum allowed values.

Prishtevka River – This river is monitored in Bresje of Fushë Kosova before it flows into

the Sitnica River. It is one of the most polluted rivers in Kosovo as it collects all urban waste water discharges of Prishtina. The monitoring showed that its water exceeds allowed values of nitrites and suspended materials, chemical and biochemical spending of oxygen, lack of dissolved oxygen, presence of detergents, etc.

Graqanka River – The water quality of this river is continuously polluted as a result of water pumping from Kishnica and Artana mines. It has high values of electrical conductivity and sulphate ions. It dries during summer.

Drenica River – This river is monitored in Pjetershtica and before its confluence with Sitnica River in Vragoli. Its water has a good quality in spring at the first station, whereas its quality changes at the second station in Vragoli; thus, its electrical conductivity increases by hundreds of units as a result of the discharge of water from KEK's surface mining.

Shtime River – This river is monitored at two stations; at the first station its quality is measured before the river is affected by human activity, resulting in a good quality of water. At the second station, its quality is measured after the discharge of urban wastewater from the town of Shtime and surrounding villages, resulting in a poor water quality.

6.1.3. Basin of Morava e Binces and Lepenc

Morava e Binces – The monitoring of this river is conducted in Kurbuliq, then in Kllokot and Uglar (Raniluga), and finally at the border with Serbia in Domorovc. This river joins Kriva Reka River in Dardana. The Urban and industrial waters of Viti, Gjilan and Dardana are discharged into it.

Kriva Reka River – This river consists of two flows and at the first monitoring point its water has a good quality, whereas at the second station in Domorovc its quality is poorer because of parameters such as turbidity, ammoniac and nitrites.

Lepenc River – This river has two sources, one of which in the Prevalla Mountain and the other in the Brezovica Mountain. The quality of water at both sources is good and this level is maintained until the Silkapor factory discharge site where occasionally water has a higher turbidity as a result of the discharge of waters used for raw materials washing in the factory. The turbidity continues for some kilometers and is observed at the second monitoring station, which is located in Kacanik, before the confluence of Lepenc River with Nerodime River. Finally, the quality of this river is monitored at the third station in Han i Elezit, which is a cross-border station with the Republic of Macedonia. The quality of water at this point is within allowed limits.

Nerodime River – This river originates in Jezers Mountains of the Municipality of Ferizaj with a good quality of water. At the second station, the quality falls due to the discharge of urban and other waters of Ferizaj region. Its quality gets poorer at the next station in Kacanik, before the confluence of Nerodime River with Lepenc River.

6.2. ASSESSMENT AND MONITORING RESULTS

6.2.1. Basin of Drini i Bardhe

For purposes of interpreting the state of Drini i Bardhe sub-basins, the same variability model will be used at their entry and exit points. The following sections interpret the average annual values (AAV[32]) of each parameter of each river of this basin separately.

Quantity of dissolved oxygen (O2) – Is in considerable values along the entire flow of this river (basin). The average value of dissolved oxygen in 2010 was 7.52 mg/l O2. In 2011, the minimum and maximum values of this quantity were 5.99mg/l O2 and 8.99 mg/l O2, respectively. In 2012, the minimum value of dissolved oxygen was 6.61 mg/l O2, whereas the maximum annual average of this quantity was 10.22 mg/l O2.

Finally, in 2013 the quantity of dissolved oxygen had a minimum value of 5.92 mg/l O2 and a maximum value of 10.53 mg/l O2.

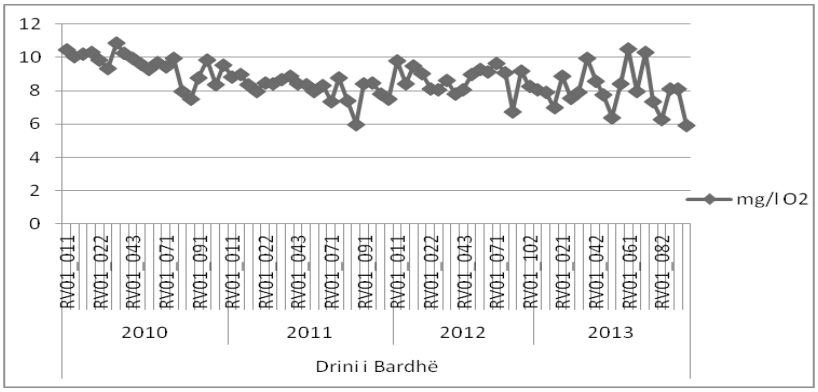


Figure 14: Quantity of dissolved oxygen in Drini i Bardhe Basin in mg/l O2

Biochemical oxygen demand in 5 days (BOD5) – The figure shows this parameter only for the stations located along river flows. Thus, its value was 7.81 mg/l O2 in 2010 and it fell to 6.20 mg/l O2 in 2011. The minimum and maximum BOD values for 2012 were 2.22 mg/l O2 and 6.95 mg/l O2, respectively. These values for 2013 were 2.25 mg/l O2 and 6.25 mg/l O2.

If we compare the average annual values with the values of serial measurements, the BOD values are even higher.

32 AAV were calculated based on serial monthly values.

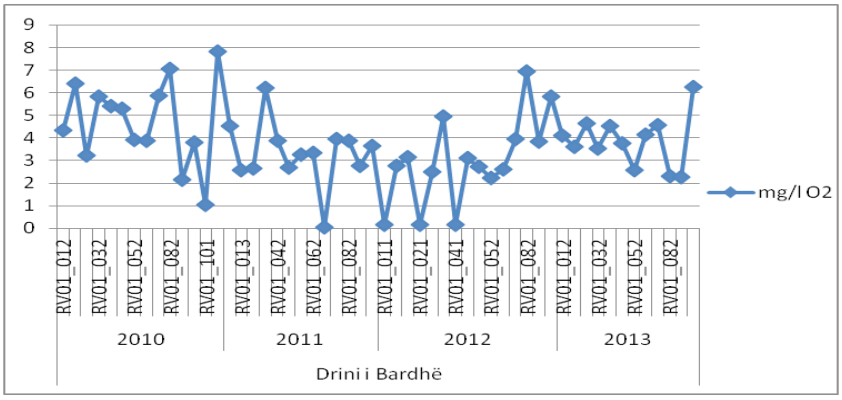


Figure 15: Biochemical oxygen demand in Drini i Bardhe Basin in mg/l O2

Regarding quality, it may be said that there is no marked pollution in none of the monitoring stations.

Electrical conductivity (EC)– For years 2010, 2011 and 2012, the lowest values were noted in Lumbardhi i Prizrenit River in Prevalla -- 101.6 μs/cm, 112 μs/cm and 166 μs/cm, respectively. Regarding maximum values, the Rimnik River in Xerxe dominated in 2010 with a value of 689 μs/cm, in 2011 the maximum value of 769 μs/cm was measured in the same river but at the sampling site of Zhdrella. The highest value of 695 μs/cm was measured in 2012 in Klina River at the sampling site of Klina.

In 2013, the lowest average annual value was noted in Lumbardhi i Prizrenit River in Prevalla at 99.5 μs/cm, whereas the Rimnik River in Xerxe had the highest EC with a value of 730 μs/cm.

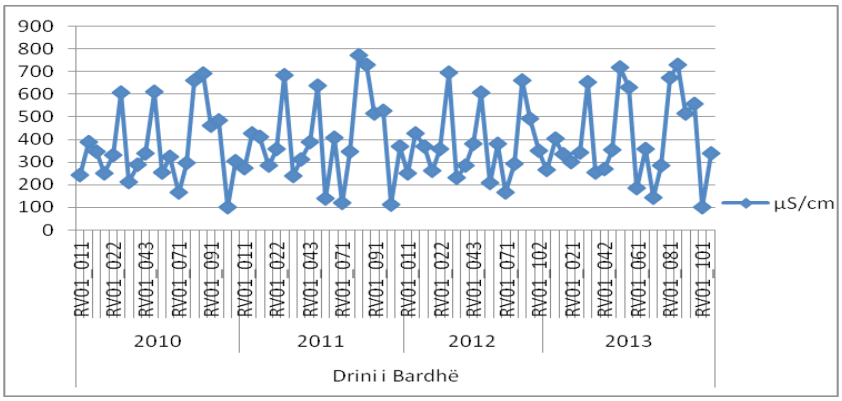


Figure 16: Electrical conductivity in Drini i Bardhe Basin

Hydrogen ion concentration (pH) – The Klina River registered the lowest pH value with 7.74 in 2010, whereas the highest value of 8.34 was registered in the Rimnik River in Zhdrella. A wider pH interval was noted in 2011, with the lowest value of 7.45 shown in Lumbardhi i Prizrenit in Prevalla and the highest value of 8.55 registered in the Tophulla River in Buqalla. In 2012, Lumbardhi i Prizrenit had the lowest pH value of 7.8 in Vllashnje, while Lumbardhi i Pejes marked the highest pH value of 8.3 in Peja. Finally, in 2013

Lumbardhi i Prizrenit River had the lowest pH value of 7.94 in Vllashnje, whereas the highest value of 8.39 was reached by Lumbardhi i Decanit River in Kralan.

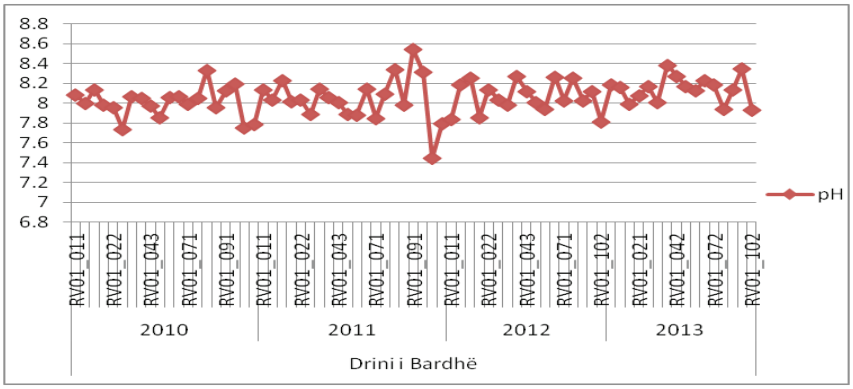


Figure 17: Hydrogen ion concentration in Drini i Bardhe Basin

Nitrogen-nitrate (N-NO3-) – In 2010, limit of quantification was registered in Lumbardhi i Pejes in Drelaj, whereas in the years 2011, 2012 and 2013, limit of quantification was registered in Drini i Bardhe River in Radavc (0.3 mg/l N-NO3-). The average annual values for 2010 and 2011 reached their maximum in the Toplluha River in Pirana -- 1.973 mg/l N-NO3- and 2.363 mg/l N-NO3-, respectively. In 2012, the Rimnik River reached the maximum value of 1.825 mg/l N-NO3- in Xerxe. Finally, in 2013 the Mirusha River in Banja e Malisheves marked a significant increase reaching an average annual value of 4.848 mg/l N-NO3-.

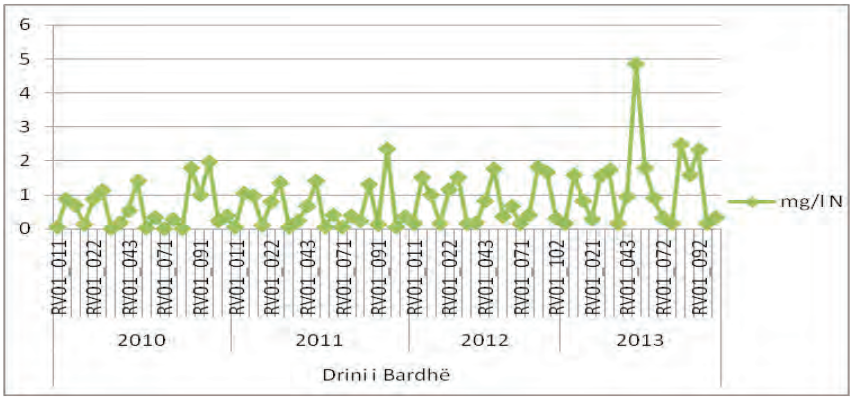


Figure 18: Nitrogen-nitrate in Drini i Bardhe Basin

Nitrogen-nitrite (N-NO2-) – In 2010, limit of quantification (0.009 mg/l N-NO2) was registered in the Rimnik River in Zhdrella, whereas in 2011 and 2012 this limit was registered in Drini i Bardhe River in Radavc. In 2013, Lumbardhi i Pejes River registered the limit of quantification in Drelaj.

Average annual values reached their maximum for the years 2010-2013 were registered in the Rimnik River in Zhdrella, ranging between 0.163 and 0.275 mg/l N-NO2.

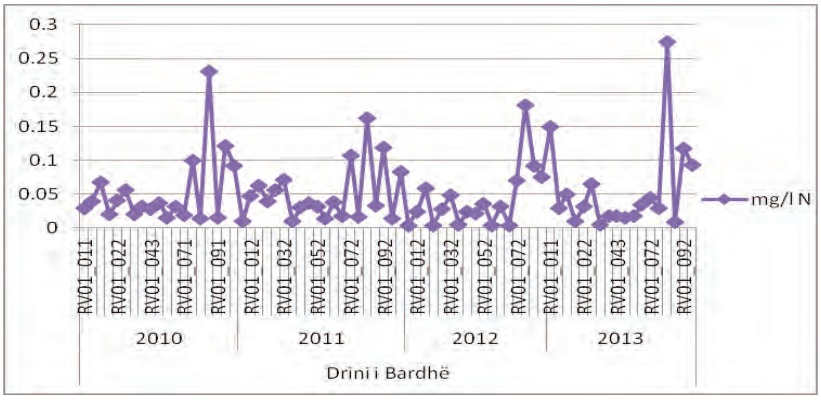


Figure 19: Nitrogen-nitrite in Drini i Bardhe Basin, in mg/l N

Ammonium Nitrogen (N-NH4+) - In 2010, the Istog River in Istog registered the lowest AAV of 0.132 mg/l N-NH4+, whereas in 2011 and 2012 Drini i Bardhe River in Radavc registered the limit of quantification (0.015 mg/l N-NH4+). The lowest AAV for 2013 was registered in Lumbardhi i Prizrenit River in Prevalla with a value of 0.116 mg/l N-NH4+.

The maximum AAV for the four years of the monitoring period were registered in the Rimnik River at the monitoring station in Xerxe, with a range of 2.072 – 3.144 mg/lN-NH4+.

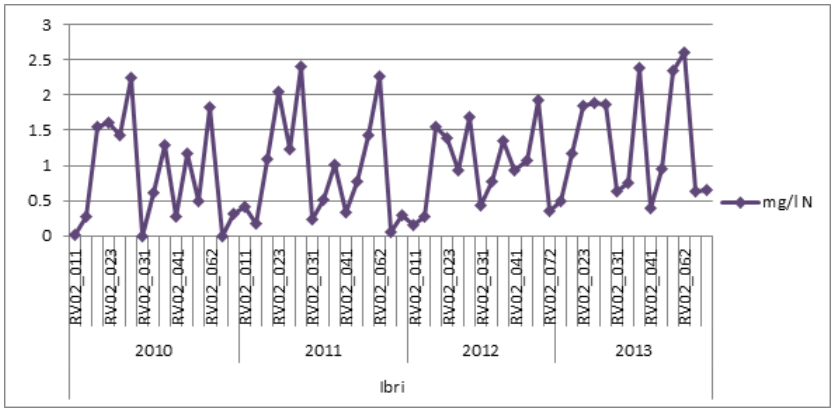


Figure 20: Ammonium Nitrogen in Drini i Bardhe Basin, in mg/l N

Since allowed values should not exceed 1.5 mg/l, water has a good quality only at river sources, whereas water at other monitoring stations is resulted to be of a medium or low quality.

Orthophosphate as phosphorus (P-PO43-) – The limit of quantification (0.003 mg/l P-PO43-) is registered at these monitoring stations: in 2010 in Erenik River in Jasiq; in 2011 in Lumbardhi i Decanit River in Kralan; and in 2012 in Drini i Bardhe River in Radavc.

In 2013, the minimum AAV of 0.005 mg/l P-PO43- was registered in the Toplluha River in Buqalla. The maximum values for the four years of the monitoring period were registered in the Rimnik River in Xerxe with a range of 0.186- 0.394 mg/l P-PO43-.

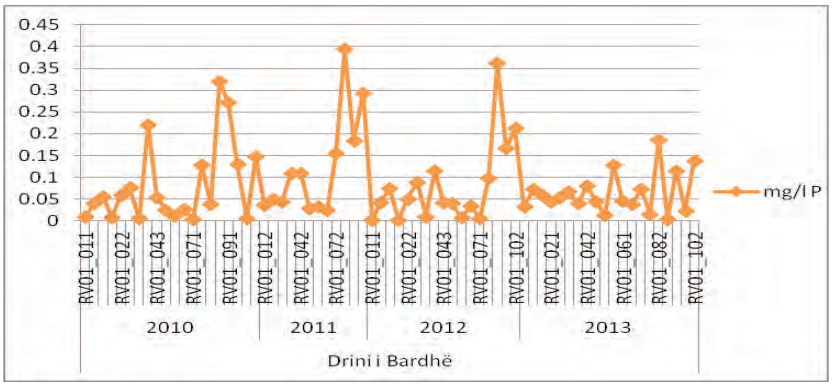


Figure 21: Orthophosphates in phosphorus ions in Drini i Bardhe River, in mg/l P

Total phosphorus (poly and ortho) – Total phosphorus values in the basin of Drini i Bardhe show a high level of fluctuation (this parameter has only been given for the stations along river flows). The minimum AAVs of phosphorus for 2010 and 2013 were registered in Drini i Bardhe River in Gjonaj, with values of 0.039 mg/l P and 0.062 mg/l P, respectively. For 2011 and 2012, the lowest AAVs of 0.045 mg/l P and 0.048 mg/l P, respectively, were registered in Lumbardhi i Decanit River in Kralan. On the other hand, maximum AAVs for the four years of the monitoring period were registered in the Rimnik River at the sampling site of Xerxe, with a range of 0.346 – 0.545 mg/l P.

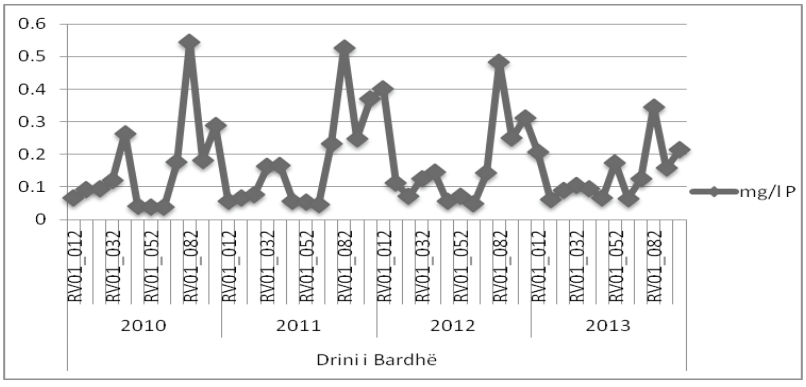


Figure 22: Total phosphorus (poly and ortho) in Drini i Bardhe River, in mg/l P

6.2.2. Basin of Iber

The following sections present average annual values for a number of parameters measured by NIPH, which help us interpret the water situation in the basin of Iber.

Quantity of dissolved oxygen (O2) – It changes from station to station; however, all the rivers of this basin have a sufficient quantity of dissolved oxygen, except the Prishtevka River in Bresje.

There is no significant change in the values of 2010, 2011 and 2012. Thus, the highest level of O2 was measured in the Iber River in Kushtova, ranging from 9.01 mg/l O2 to 12.48 mg/l O2, whereas the lowest values for 2010, 2011 and 2012 were registered in the Prishtevka River in Bresje, ranging from 3.43 mg/l to 3.98 mg/l. However, these are average annual values, because there were cases during monthly monitoring that there was no dissolved O2 at this monitoring station.

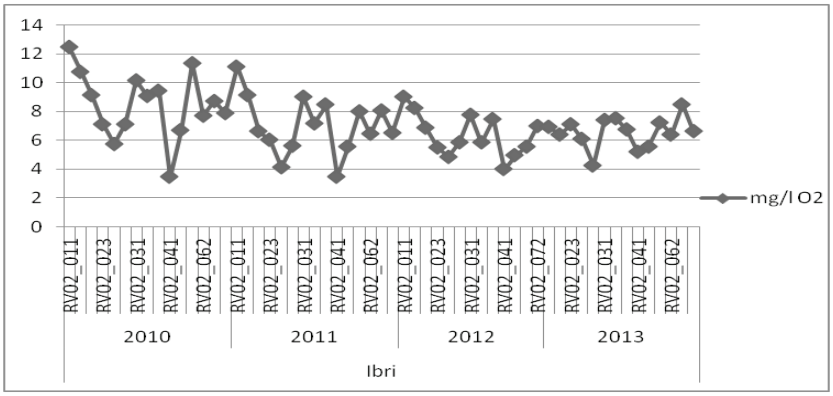


Figure 23: Dissolved oxygen in Iber Basin, in mg/l $O2_2$

In 2013, the lowest AAV of 4.23 mg/l O2 was registered in the Sitnica River in Mitrovica, whereas the highest AAV of 8.47 mg/l O2 was registered in the Erenik River in Jasiq..

Based on this four-year trend, the lowest quantity of dissolved oxygen was registered in the Prishtevka River at the sampling site in Bresje.

Biochemical oxygen demand in 5 days (BOD5) – This parameter has been shown in the figure only for the monitoring stations located along river flows. The comparison of values of 2010, 2011, 2012 and 2013 shows minor changes, which implies that the water quality of this basin remains constant from year to year and from season to season. The highest BOD values were registered in the Prishtevka River at the Bresje monitoring station, ranging from 19.67 mg/l O2 in 2010, 11.43 in 2011, to 14.18 mg/l O2 in 2012. In 2013, the highest BOD marked an increase in Prishtevka River in Bresje, reaching a value of 14.88 mg/l O_2.

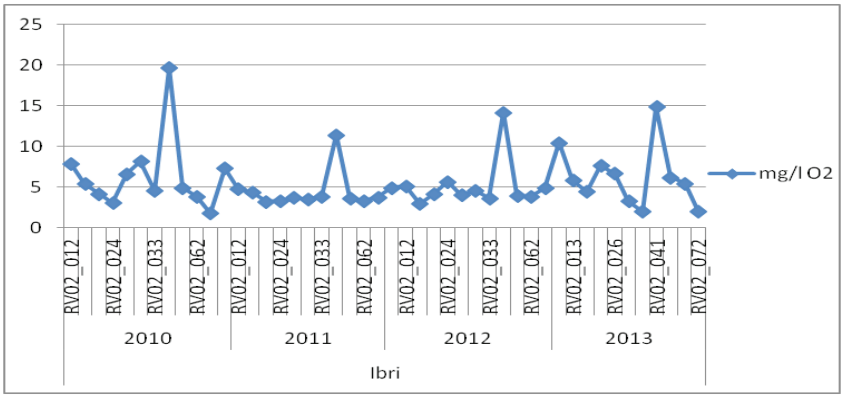


Figure 24: Biochemical oxygen demand in Iber Basin, in mg/l O_2

Electrical conductivity – The overall situation in these four years remained constant. As the sampling site with the lowest AAVs for 2010-2012 regarding electrical conductivity was the Iber River in Kushtova with a range of 303 μs/cm - 335 μs/cm. The lowest AAV for 2013 was registered in the Llap River in Murgulla at 330 μs/cm. On the other hand, the highest AAVs for the four years of the monitoring period were registered in the Graqanka River in Vragoli, with an interval of values between 1522 μs/cm and 1616 μs/cm.

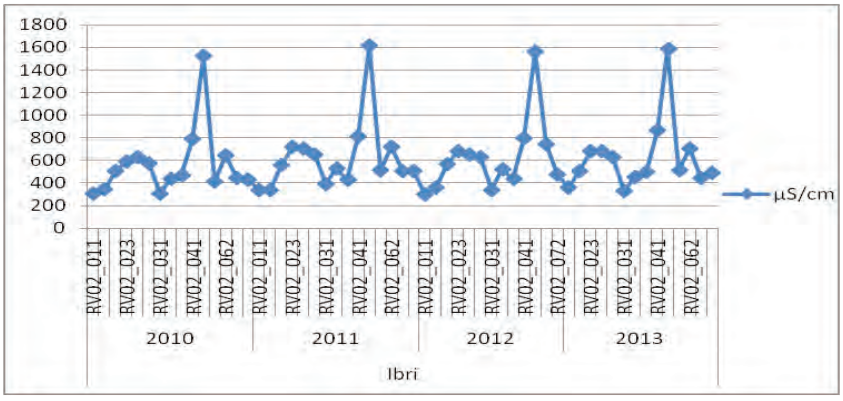


Figure 25: Electrical conductivity in Iber Basin

Hydrogen ion concentration (pH) – The range of pH values in this basin was 7.68 - 8.19 in 2010, from 7.74 to 8.49 in 2011, and between 7.89 and 8.45 in 2012. Finally, the range of pH values was 7.96 – 8.36 in 2013. To summarize, the water of this basin belongs to a low basic environment.

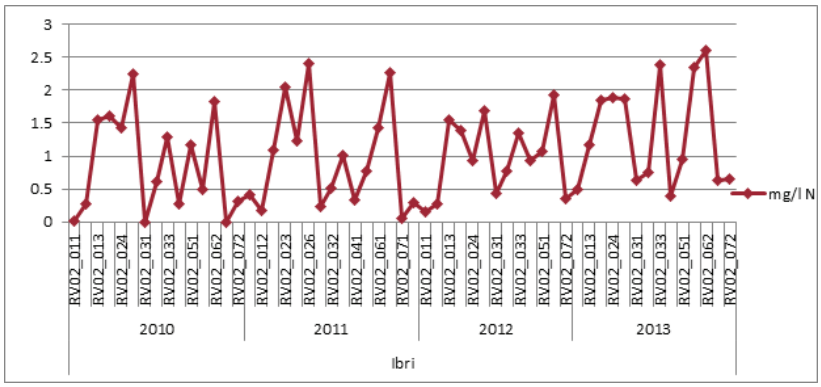


Figure 26: Hydrogen ion concentration in Iber Basin, in mg/l N

Nitrogen-nitrate (N-NO3-) – Quantification limits of 0.3 mg/l N-NO3- are mainly registered at river sources.

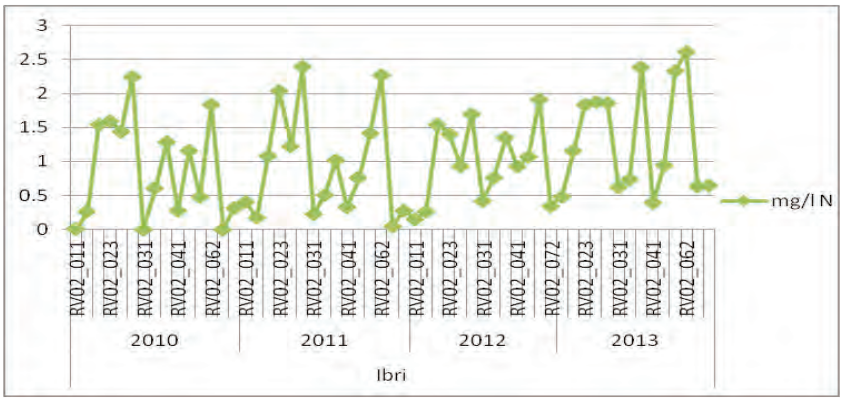


Figure 27: Nitrogen-nitrate in Iber Basin, in mg/l N

The highest average annual values of the parameter of Nitrogen-nitrate for 2010 and 2011 were registered in the Sitnica River in Sitnica at 2.252 mg/l N-NO3- and 2.398 mg/l N-NO3, respectively. Regarding 2012 and 2013, the highest respective AAVs of 1.921 mg/l N-NO3- and 2.614 mg/l N-NO3- were registered in the Drenica River in Vragoli.

Nitrogen-nitrite (N-NO2-) – The highest AAVs of this parameter for 2010, 2011 and 2012 were registered in the Sitnica River sampling site in Mitrovica, at 0.185 mg/l N-NO2-, 0.175 mg/l N-NO2- and 0.154 mg/l N-NO2-, respectively. Finally, in 2013 the highest AAV of 0.136 mg/l N-NO2- was registered in the Sitnica River sampling site in Plemetin.

This implies a poor water quality of this river.

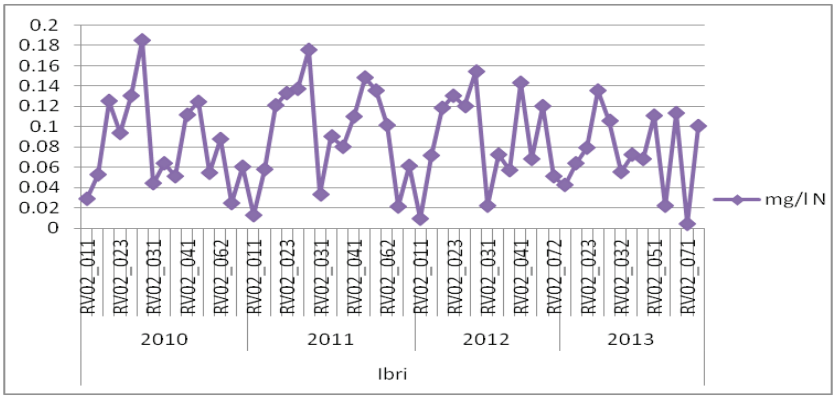


Figure 28: Nitrogen-nitrite in Iber Basin, in mg/l N

Ammonium Nitrogen (N-NH4+) – The highest values of this parameter were registered in the monitoring station in Bresje for the Prishtevka River for all the years of the monitoring period.

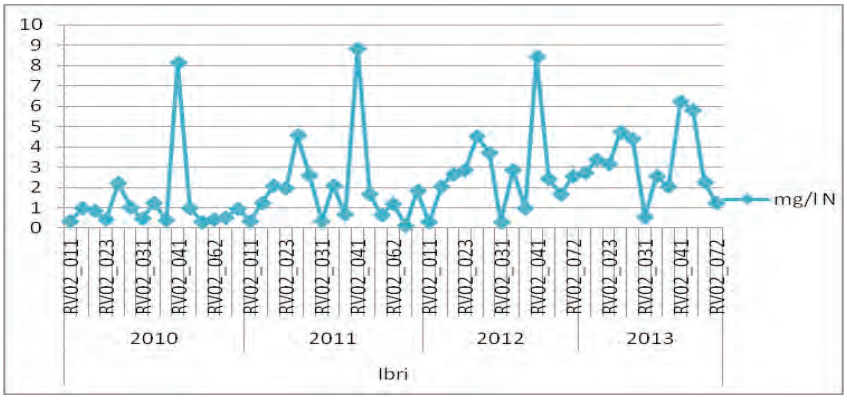


Figure 29: Ammonium Nitrogen in Iber Basin, in mg/l N

The results were the same in 2013, with the highest AAV of 6.237 mg/l N-NH4+ registered in the Prishtevka River in Bresje, whereas the lowest AAVs of this parameter were registered at river sources.

Orthophosphates phosphorus (P-PO43-) – The lowest AAVs for 2010, 2011 and 2012 were registered in Drini i Bardhe River in Radavc, with a range from 0.0104 mg/l P-PO43-- 0.0824 mg/l P-PO43-. In 2013, the lowest AAV of 0.0337 mg/l P-PO43- was registered in the Topilla River in Petrova. On the other hand, the highest AAVs of this parameter in the four years of the monitoring period were registered in the Prishtevka River in Bresje, with a range from 0.7771 mg/l P-PO43- to 1.191 mg/l P-PO43-.

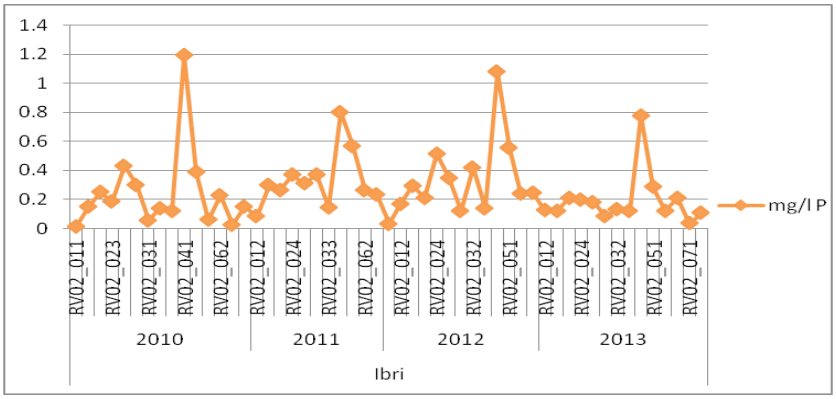


Figure 30: Orthophosphates phosphorus in Iber Basin, in mg/l P

Total phosphorus (poly and ortho) – This parameter has been given only for the monitoring stations along river flows, with the following results: the highest AAVs of total phosphorus for the four years were registered in the Prishtevka River in Bresje, with a range from 0.958 mg/l P – 1.702 mg/l P. The lowest AAVs for 2010, 2012 and 2013 were registered in the Llap River in Millosheva, with a range from 0.159 mg/l P - 0.175 mg/l P, whereas in 2011 the lowest value of 0.128 mg/l P was registered in the Iber River in Mitrovica.

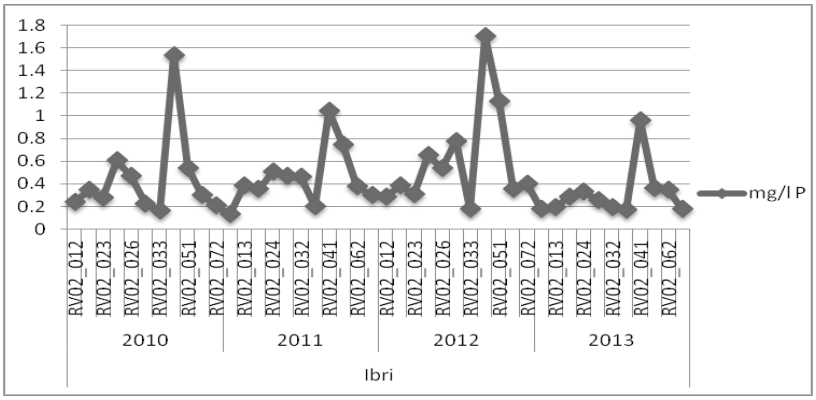


Figure 31: Total phosphorus (poly and ortho) in Iber Basin, in mg/l P

6.2.3. Basins of Morava e Binces and Lepenc

In the following sections, average annual values of quality parameters are presented in figures for each separate river of the sub-basins of Morava e Binces and Lepenc.

Quantity of dissolved oxygen (DO) – The graph shows a declining tendency of DO values in monitoring station after the discharge of urban wastewater. At upper parts of flows water is clean and rich in oxygen. Oxygen impoverishment of rivers results from oxygen spending due to the discharge of organic matter in the form of urban wastewater.

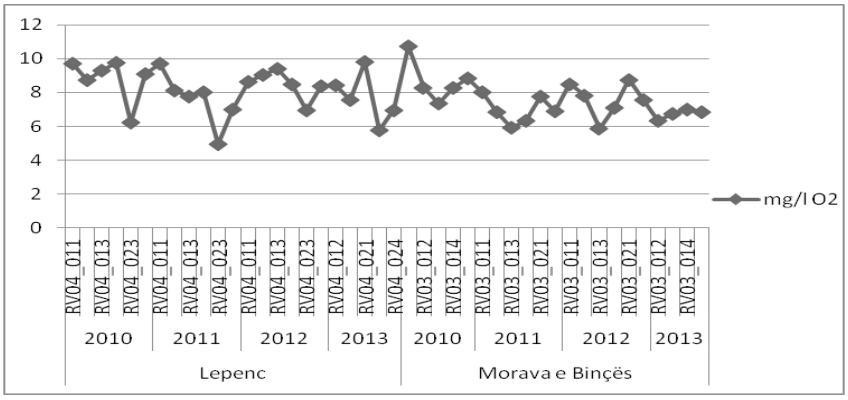


Figure 32: Dissolved oxygen (mg/l O2) in Lepenc and Morava e Binces basins

The DO parameter in the water of the Morava e Binces River in Uglar resulted low in the four years of the monitoring period. The 2010-2012 AAV ranged from 5.86 mg/l O2 to 7.37 mg/l O2. This parameter was registered at its lowest in the Morava e Binces River in Kllokot with a value of 6.35 mg/l O2 in 2013. On the other hand, the highest AAV of 7.02 mg/l O2 was registered in the Morava e Binces in Domorovc.

Regarding the Lepenc River Basin, the lowest AAV in the four years of the monitoring period was registered in the Nerodime River in Gerlica, with a range from 4.97 mg/l O2 to 6.96 mg/l O2. On the other hand, the highest AAV was registered in referent stations of rivers; thus, for the Lepenc River, the highest respective AAVs of 9.74 mg/l O2 and 9.69 mg/l O2 for 2010 and 2011 were registered in Prevalla. Finally, in 2013 this parameter was registered at its highest in the Nerodime River in Jezerc, with a value of 9.79 mg/l O2.

Biochemical oxygen demand in 5 days (BOD5) – This parameter has been presented only for the monitoring stations along river flows with the following results: it registered its lowest level for 2010, 2011, 2012 and 2013 in the Lepenc River, Kacanik with respective values of 5.27 mg/l O2, 5.69 mg/l O2, 4.48 mg/l O2 and 2.06 mg/l O2.

On the other hand, the highest AAVs for the four years of the monitoring period were registered in the Nerodime River in Gerlice at a range from 5.21 mg/l O2 to 9.19 mg/l O2.

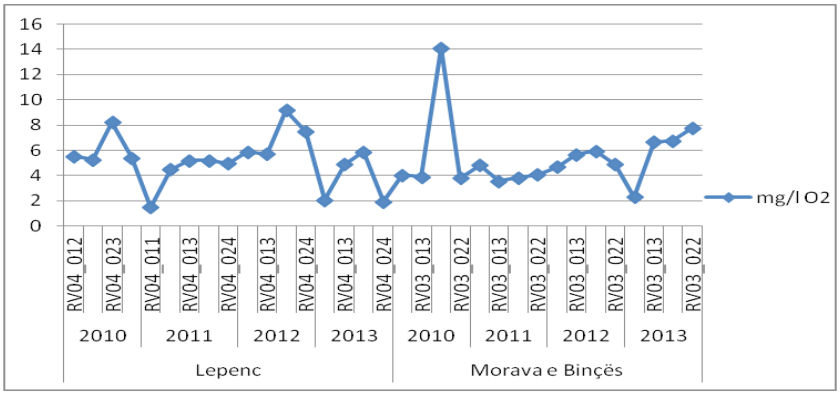


Figure 33: Biochemical oxygen demand (mg/l O2) in Lepenc and Morava e Binces basins

In the Morava e Binces Basin, this parameter registered its lowest level in 2010 in the Kriva Reka River in Domorovc with a value of 3.81 mg/l O2. In 2011, the lowest AAV of 3.55 mg/l O2 was registered in the Morava e Binces River in Uglar. For 2012 and 2013, the lowest AAVs were registered in the Morava e Binces River in Kllokot, 4.7 mg/l O2 and 2.31 mg/l O2, respectively.

The highest AAV was registered in the Morava e Binces River in Domorovc for 2010 and 2012, with respective values of 14.12 mg/l O2 and 5.96 mg/l O2. In 2011, the highest AAV of 4.81 mg/l O2 was registered in the Morava e Binces in Uglar, whereas in 2013 this parameter reached its highest value in the Kriva Reka River in Domorovc with 7.79 mg/l O_2.

Electrical conductivity – Electrical conductivity in 2010 was the lowest in the Lepenc River in Prevalla with a value 86 µs/cm, whereas it was the highest in the Morava e Binces River in Uglar with a value of 503 µs/cm. In 2011, the lowest AAV was also registered in the Lepenc River in Prevalla at 62 µs/cm, whereas it reached its maximum in the Kriva Reka River in Domorovc with a value of 765 µs/cm. In 2012, the lowest value of 116 µs/cm was registered in the Nerodime River in Jezerc, while the highest value of 632 µs/cm was registered in the Kriva Reka River in Domorovc.

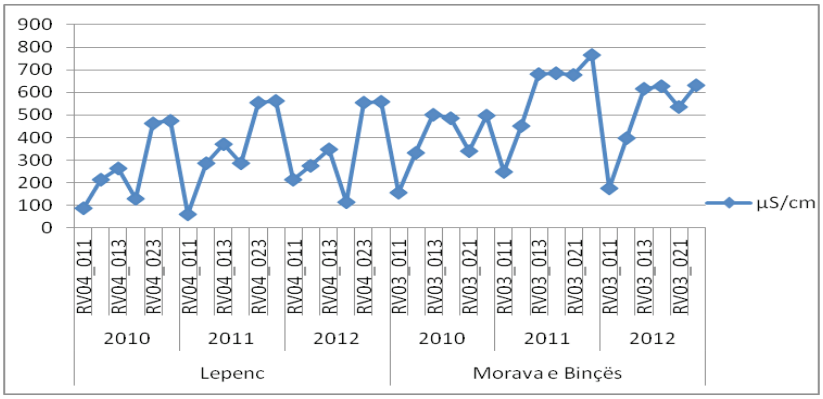


Figure 34: Electrical conductivity (µs/cm) in the Lepenc and Morava e Binces basins

In 2013, this parameter registered its lowest AAV of 131 µs/cm in the Nerodime River in Jezerc and its highest value of 600 µs/cm in the Kriva Reka River in Domorovc.

Hydrogen ion concentration (pH) – The pH values ranged between 7.63 and 8.24 in 2010, between 7.62 and 8.26 in 2011, between 7.73 and 8.32 in 2012 and between 7.9 and 8.24 in 2013.

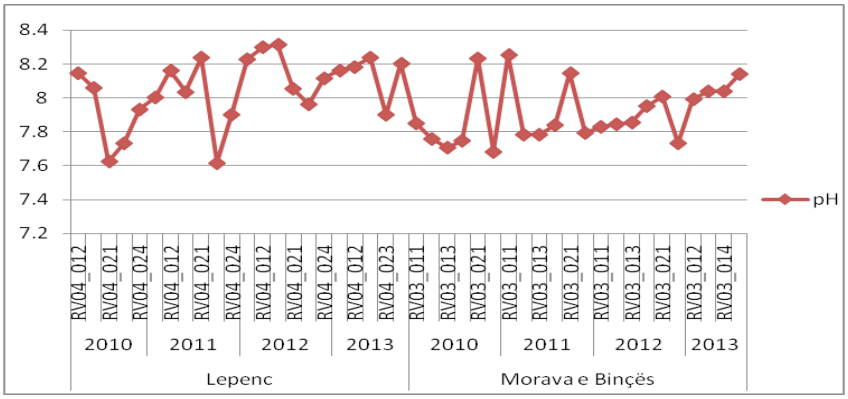


Figure 35: Hydrogen ion concentration (pH) in the Lepenc and Morava e Binces basins

Nitrogen-nitrate (N-NO3-) – In the Lepenc Basin, the Nitrogen nitrates are present with a quantification limit of (0.3 mg/l N-NO3-), mainly at river sources. In addition, the highest AAV for 2010, 2011 and 2012 was registered in the Nerodime River in Kacanik at 1.35 mg/l N-NO3-, 1.049 mg/l N-NO3- and 0.989 mg/l N-NO3-, respectively. As for 2013, the highest AAV of 1.211 mg/l N-NO3- was registered in the Nerodime River in Hani i Elezit

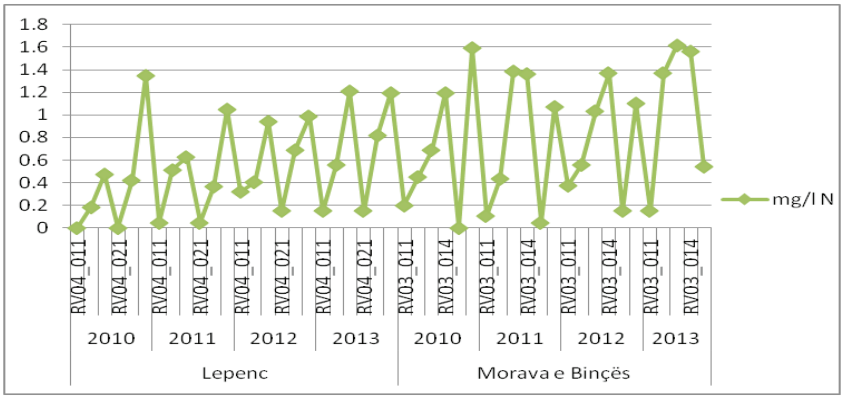


Figure 36: Nitrogen-nitrate (mg/l N-NO3-) in Lepenc and Morava e Binces basins

In the Morava e Binces Basin, the lowest value for 2010, 2011 and 2012 was registered in the referent sampling site of the Kriva Reka River in Zebinca with a quantification limit of 0.3 mg/l N-NO3-, whereas in 2013 the quantification limit was registered in the Morava e Binces in Kurbuliq. The highest AAV in 2010 was registered in the Kriva Reka River in Domorovc at 1.595 mg/l N-NO3-, in 2011 and 2013 in the Morava e Binces River in Uglar at 1.387 mg/l N-NO3- and 1.619 mg/l N-NO3-, respectively, and

in 2012 the highest AAV of 1.369 mg/l N-NO3- was registered in the Morava e Binces River in Domorovc.

Nitrogen-nitrite (N-NO2-) – In the Lepenc Basin, the quantification limit of 0.009 mg/l N-NO2- was registered in the Lepenc River in Prevalla for the four monitoring years. On the other hand, the highest AAV was registered in the Nerodime River in Kacanik with a range from 0.182 mg/l N-NO2- to 0.259 mg/l N-NO2-.

In the Morava e Binces Basin, the Morava e Binces River in Domorovc registered the lowest AAV of 0.035 mg/l N-NO2- in 2010, 0.018 mg/l N-NO2- in 2011, it reached the quantification level (0.009 mg/l N-NO2-) in 2012, whereas the lowest AAV of 0.026 mg/l N-NO2- was noted in the Kriva Reka River in Zebinca.

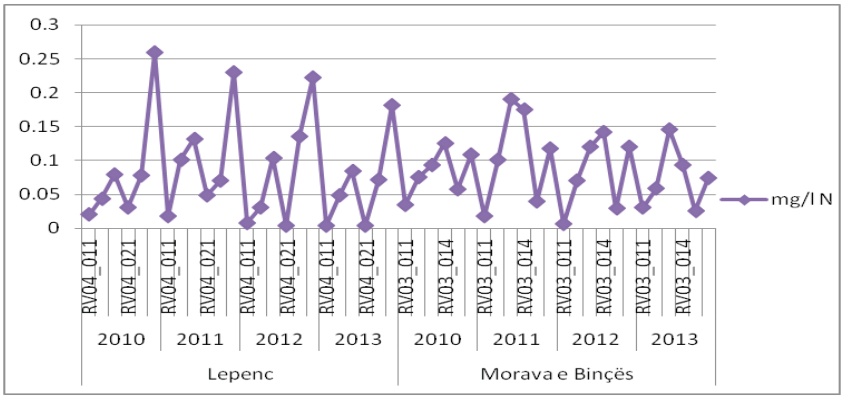


Figure 37: Nitrogen-nitrite (mg/l N-NO2-) in Lepenc and Morava e Binces basins

On the other hand, the highest AAV for 2010 and 2012 was registered in the Morava e Binces River at the Domorovc monitoring station: 0.125 mg/l N-NO2- and 0.142 mg/l N-NO2-, respectively. In 2011 and 2013, the highest AAV was registered at the Uglar monitoring station of the same river: 0.191 mg/l N-NO2- and 0.146 mg/l N-NO2-, respectively.

Ammonium Nitrogen (N-NH4+) – As a pollution factor, it is present in high quantities after the discharge of urban and rural wastewater. In alkaline environments of pH > 10, ammoniac has harmful effects upon the aqueous fauna. Its presence results in a foul smell.

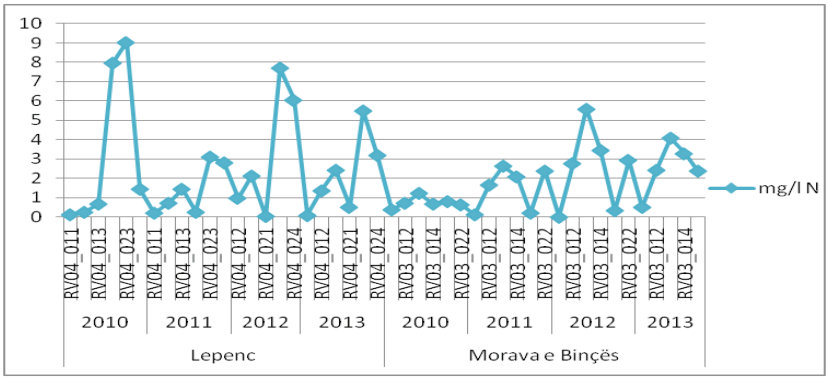


Figure 38: Ammonium Nitrogen (mg/lN-NH4+) in Lepenc and Morava e Binces basins

Regarding the Lepenc Basin, the lowest AAV of this parameter in the four monitoring years ranged from 0.05 mg/lN-NH4+ to 0.206 mg/lN-NH4+ and were registered in the Lepenc River in Prevalla. On the other hand, the highest AAV was registered in the Nerodime River in Gerlica and ranged between 3.108 mg/lN-NH4+ and 9.047 mg/l N-NH4+.

As for the Morava e Binces Basin, the lowest AAV of this parameter were registered in the Morava e Binces River in Kurbuliq in the four monitoring years, ranging from 0.023 mg/l N-NH4+ to 0.498 mg/l N-NH4+. On the other hand, the highest AAV was registered in the Uglar monitoring station of the same river, ranging from 1.242 mg/l N-NH4+ to 5.597 mg/l N-NH4+.

Orthophosphates phosphorus (P-PO43-) – In the Lepenc Basin, the following lowest AAVs were registered in the four monitoring years: 0.006 mg/l P-PO43- in 2010 at the Prevalla monitoring station of the Lepenc River, 0.079 P-PO43- in 2011 at the Kacanik monitoring station of the same river, and 0.006 P-PO43- and 0.004 P-PO43- in 2012 and 2013, respectively, at the Jezer monitoring station of the Nerodime River. On the other hand, the highest AAV in all the years was registered at the Gerlica monitoring statin of the Nerodime River, ranging from 0.316 mg/l P-PO43- to 0.566 mg/l P-PO43-.

As for the Morava e Binces Basin, the lowest AAV was registered at a value of 0.143 mg/l P-PO43- in 2011, whereas for the other three years, the minimum level of phosphorus in orthophosphates ranged from 0.004 mg/l P-PO43 to 0.037 mg/l P-PO43-. The highest AAV was registered in the Morava e Binces River at the Uglar monitoring station, ranging from 0.213 mg/l P-PO43- to 0.339 mg/l P-PO43-.

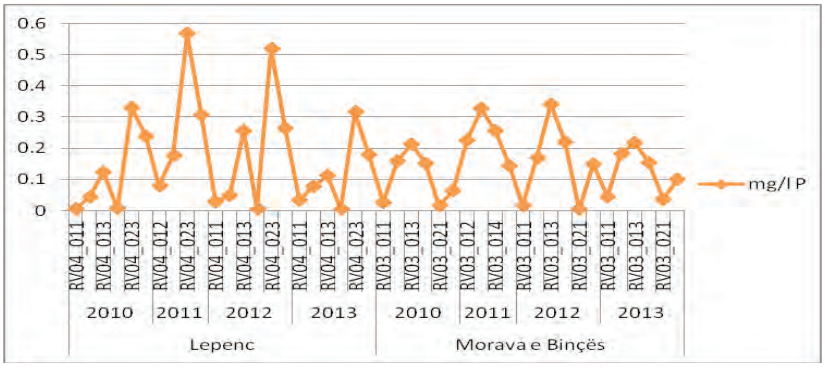


Figure 39: Orthophosphates phosphorus (mg/l P-PO43-) in Lepenc and Morava e Binces basins

The results show that the phosphate parameter registered the highest value at the Nerodime River monitoring station in Gerlica.

Phosphate ions were present in higher quantities after urban and industrial discharges.

Total phosphorus (poly and ortho) – This parameter was registered in lower values at river sources and the figures show levels of phosphorus along river flows. The lowest AAV for 2010-2013 was registered in the Lepenc River at the Kacanik monitoring station, with a range from 0.064 mg/l P to 0.168 mg/l P. Whereas, the highest AAV was measured in the Nerodime River at the Gerlica monitoring station, ranging between 0.420 mg/l P and 0.765 mg/l P.

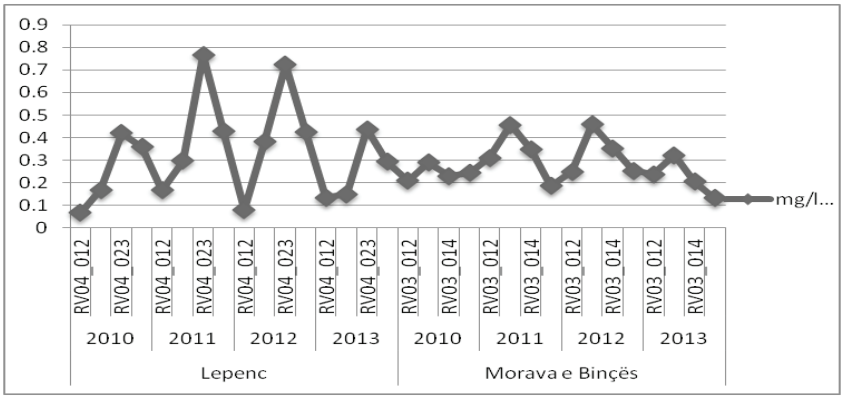


Figure 40: Total phosphorus (poly and ortho)(mg/l P) in Lepenc and Morava e Binces basins

In the Morava e Binces Basin, the lowest levels of total phosphorus in 2010 and 2012 were registered at the Kllokot monitoring station of the Morava e Binces River: 0.21 mg/l P and 0.251 mg/l P, respectively. In 2011 and 2013, the lowest levels of this parameter were registered at the Domorovc monitoring station of the Kriva Reka River: 0.187 mg/l P and 0.134 mg/l P, respectively. On the other hand, the highest AAV in the four years was registered at the Uglar monitoring station of the Morava e Binces River, ranging from 0.291 mg/l P to 0.459 mg/l P.

6.2.4. Heavy metals monitoring and assessment

The NIPH began monitoring the presence of heavy metals in surface water in 2008 and, after a pause of two years, it resumed doing it in 2011.

The list of monitored elements includes essential elements such as Fe, Zn, Mn and Cr, and toxic elements such as Pb, Cd, Cu, Cr, Ni, etc.

Table 13. Maximum allowed values of some heavy metals in surface water, based on Legislative Decree No. 152 of 11 May 1999 [33]

No.	Metal	Symbol	Measurement unit	MAV
1	Cadmium	Cd	µg/l	5
2	Chromium	Cr	µg/l	50
3	Manganese	Mn	µg/l	50
4	Iron	Fe	µg/l	200
5	Nickel	Ni	µg/l	20
6	Lead	Pb	µg/l	10
7	Copper	Cu	µg/l	1000
8	Zinc	Zn	µg/l	3000

The following sections show which heavy metals exceed Maximum Allowed Values (MAV) in the rivers of Kosovo.

Drini i Bardhe Basin – According to the Legislative Decree dated 11 May 1999, metals Manganese, Iron and Zink exceed MAVs (See below graphs for these metals).

Manganese – In 2011, quantification limits (4.5 µg/l) were mainly registered in referent monitoring stations. On the other hand, MAVs were exceeded along the flows of the Istog River in Zllakuqan, Klina River in Klina, Lumbardhi i Pejes outside Peja, Erenik at Ura e Terzive Bridge, Rimnik River in Xerxce and Toplluha River in Pirana.

In 2012, quantification limits were also recorded in referent stations, whereas MAV exceeding of Manganese was recorded at these sampling sites: Gjonaj for Drini i Bardhe River, Klina for Klina River, Peja and Grabanica for Lumbardhi i Pejes, Kralan for Lumbardhi i Decanit, Ura e Terzive Bridge for Erenik River, Xerxe for Rimnik River, Pirana for Toplluha River and Vllashnje for Lumbardhi i Prizrenit.

Similarly, in 2013 quantification limits were registered at referent monitoring stations, whereas Managanese levels exceed MAVs at the following monitoring stations: Gjonaj for Drini i Bardhe River, Ura e Terzive Brdige for Erenik River, Xerxe for Rimnik River, Pirana for Toplluha River and Vllashnje for Lumbardhi i Prizrenit River.

33 LEGISLATIVE DECREE No. 152 dated 11 May 1999, Provisions on water protection from pollution, Directive 91/271/EEC for treatment of discharged urban wastewater

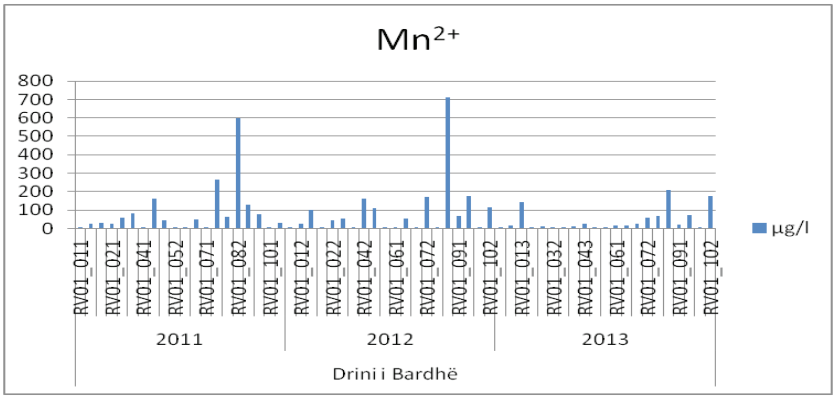


Figure 41: Presence of Manganese in Drini i Bardhe Basin

The highest Manganese contamination in Drini i Bardhe Basin was recorded in the Rimnik River at Xerxe monitoring station for these three years.

Iron – In 2011, the quantification limit of 4.5 µg/l was registered at referent stations, whereas MAV exceeding was registered at the following monitoring stations: Zllakuqan for Istog River, Grabanica for Lumbardhi i Pejes River, Ura e Terzive Brdige for Erenik River and Vllashnje for Lumbardhi i Prizrenit River.

In 2012, the presence of iron exceeded MAVs in the following monitoring stations: Gjonaj for Drini i Bardhe River, Grabanica for Lumbardhi i Pejes River, Krelan for Lumbardhi i Decanit, Ura e Terzive Bridge for Erenik River, Xerxe for Rimnik River, Pirana for Toplluha River and Vllashnje for Lumbardhi i Prizrenit River.

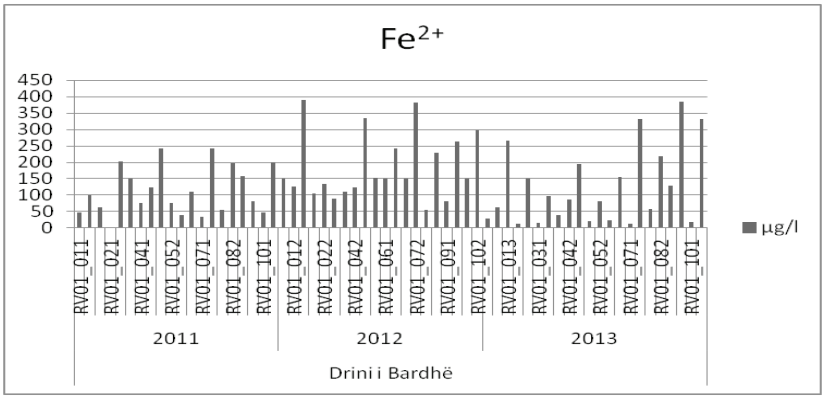


Figure 42: Presence of iron in Drini i Bardhe Basin

In 2013, the presence of iron exceeded MAVs in the following monitoring stations: Gjonaj for Drini i Bardhe River, Ura e Terzive Bridge for Erenik River, Xerxe for Rimnik River, Pirana for Toplluha River and Vllashnje for Lumbardhi i Prizrenit River.

Iber Basin – The presence of heavy metals Chromium, Manganese and Iron was recorded in this basin. The figures below present only the metals that exceed MAVs.

Chromium – The quantification limit of 9 µg/l was registered at referent monitoring stations in 2011-2013. In 2011, the presence of Chromium exceeded MAV at the following stations: Kelmend for Iber River, Marinca and Podujeva for Llap River, and Vojnovc for Shtime River. In 2012, MAV exceeding was recorded at the monitoring station in Vragoli for the Drenica River.

In 2013, Chromium concentration exceeded MAV in the monitoring stations of Mitrovica and Kelmend along the flow of Iber River, and at Bresje monitoring station of the Prishtevka River.

Manganese – Manganese concentration was registered at all monitoring stations of the Iber Basin in these three years. To have a better picture of the Manganese concentration situation, the results recorded at the Vragoli station of the Gracanka River because Manganese concentration was very high in the three monitoring years: Mn2+= 15960 µg/l in 2011, Mn2+= 15961 µg/l in 2012 and Mn2+= 4180 µg/l in 2013. In 2011, Manganese concentration exceeded MAV at the following monitoring stations: Kelmend for Iber River, Vragoli, Plemetin and Mitrovica for Sitnica River, Podujeva for Llap River, Bresje for Prishtevka River, Vragoli for Drenica River and Vojnovc for Shtime River. In 2012, Manganese MAV exceeding was recorded in the following monitoring stations: Kelmend for Iber River, Vragoli and Mitrovica for Sitnica River, Podujeva for Llap Rriver, Bresje for Prishtevka River, Vragoli for Drenica River and Vojnovc for Shtime River.

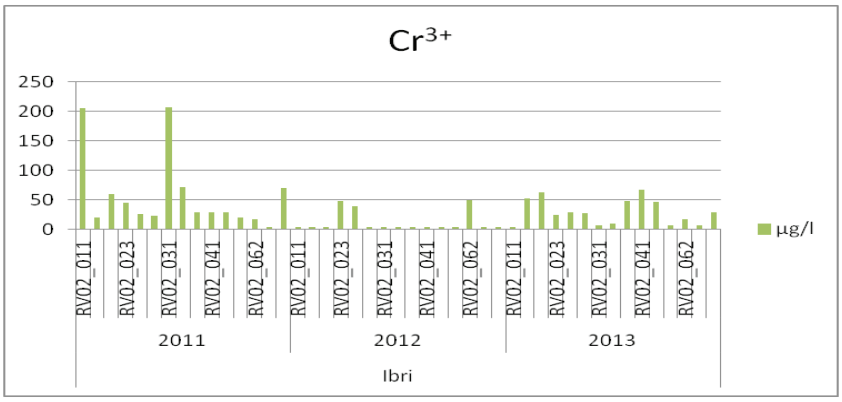


Figure 43: Presence of Chromium in Iber Basin

Manganese concentration in 2013 exceeded the MAV in the same monitoring stations as in the two previous years: Mitrovica and Kelmend for Iber RIver, Plemetin and Mitrovica for Sitnica RIver, Podujeva and Millosheva for Llap River, Bresje for Prishtevka River and Vragoli for Drenica River.

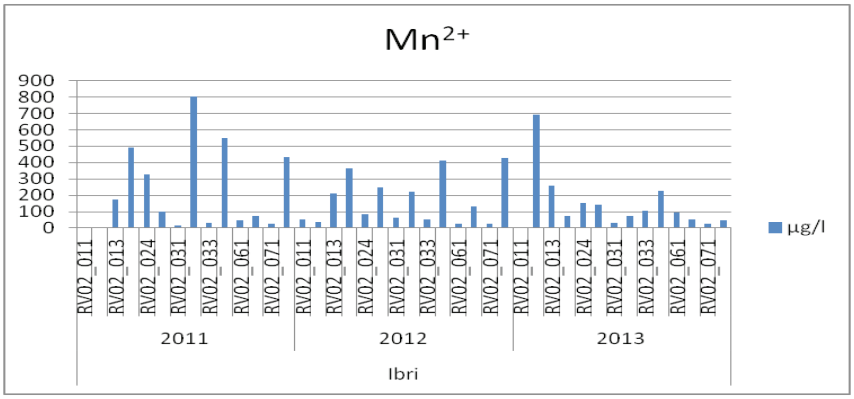


Figure 44: Presence of Manganese in Iber Basin

The Graçanka River has the highest Manganese concentration in the three monitoring years.

Iron – In 2011, iron concentration MAV exceeding was registered at the Bresje monitoring station of the Prishtevka River and at the Vojnovc station for the Shtime River. In 2012, MAV exceeding was registered at these stations: Bresje for Prishtevka River, Vragoli for Graçanka River and Vojnovc for Shtime River.

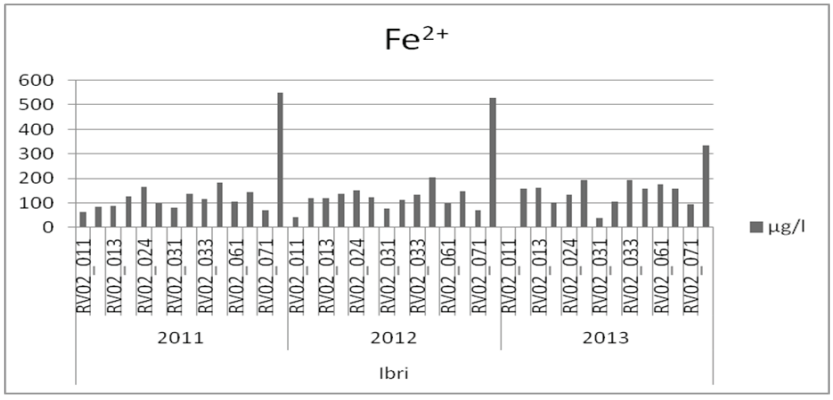


Figure 45: Iron concentration in Iber Basin

In 2013, the highest iron concentration was registered in the Prishtevka River at Bresje monitoring station and the Shtime River at Vojnovc station.

To summarize, the Prishtevka River resulted as the most iron concentrated river of this basin (average annual value range of 231-397.5 µg/l), followed by the Shtime River (average annual value range of 335-550 µg/l).

Basins of Morava e Binces and Lepenc – In these two basins, Manganese and Iron concentration exceeds maximum allowed values according to the EU directive 152/1999, whereas the concentration of other metals is lower than MAVs.

Manganese – In the Morava e Binces Basin, water of the Kriva Reka River at the Domorovc monitoring station resulted high in Manganese concentration (Mn2+= 1932 µg/l in 2011, Mn2+= 1945 µg/l in 2012 and Mn2+= 493 µg/l in 2013), therefore those results were removed from the graph.

In general, MAV exceeding was not registered in referent stations, whereas Manganese concentration exceeds the MAV in other stations along the river flow.

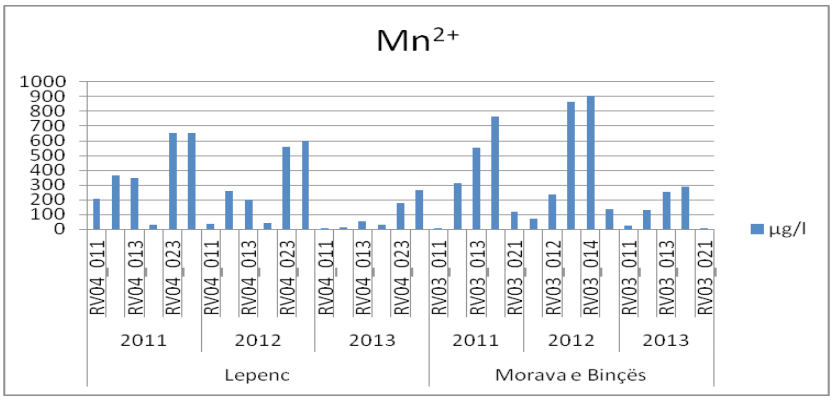


Figure 46: Manganese concentration in Morava e Binces and Lepenc basins

Iron – In 2011 and 2012, iron concentration exceeded MAV in all monitoring stations of the Morava e Binces River (except the referent station), in Domorovc station of the Kriva Reka River and in Kacanik and Han i Elezit stations of the Lepenc River.

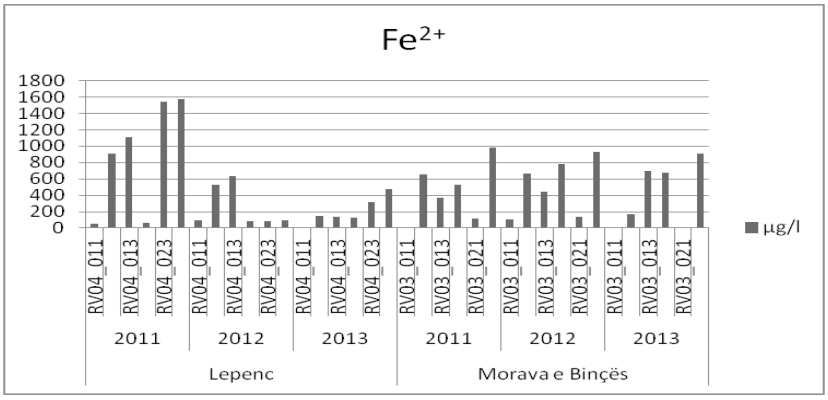


Figure 47: Iron concentration in Morava e Binces and Lepenc basins

In 2013, iron concentration did not exceed maximum allowed values in any of the referent stations of the two basins. The highest iron concentration in the Morava e Binces Basin was registered in the Kriva Reka River at the Domorovc monitoring station. As for the Lepenc River, the highest iron concentration was registered in the Nerodime River at the Kacanik monitoring station.

6.3. MONITORING OF RIVER WATER QUANTITY

The hydrometric network consists of 22 stations which measure the water quantity in rivers. Some of these stations are out of use due to technical dysfunctions. The parameters of Level (h) and Flux (Q) are measured in these stations. Table 14 presents minimum, medium and maximum values of the annual flux, based on long-term monitoring data of NIPH.

Table 14: Minimum, medium and maximum flux values (Q=m3/s) of hydrometric stations by river basin [34]

No.	BASIN	STATION	RIVER	Q_{min}	Q_{mes}	Q_{max}
1	DRINI BARDHË	Berkovë	Istogut	0.48	3.75	186
2		Drelaj	Bistrica Pejës	0.32	4.20	83.50
3		Grykë	Bistrica Pejës	0.46	5.95	194
4		Klinë	Klina	000	1.49	49.20
5		Mirushë	Mirusha	0.02	1.21	23.30
6		Deçan	Bistrica e Deçanit	0.60	4.28	58.00
7		Rakovinë	Drini Bardhë	0.80	24.64	358
8		Gjakovë	Ereniku	0.06	12.33	542
9		Piranë	Toplluha	0.04	3.47	55.40
10		Gjonaj	Drini Bardhë	0.10	48.8	1118
11		Prizren	Bistrica Prizrenit	0.03	4.47	424
12	IBRI	Drenas	Drenica	0.02	1.52	32.80
13		Lluzhan	Llapi	0.90	5.01	63.80
14		Nedakovc	Sitnica	0.50	13.62	328
15		Milloshevë	Llapi	0.00	4.48	82.70
16		Prelez	Ibri	0.80	13.39	452.80
17		Leposaviq	Ibri	0.50	30.85	667
18	MORAVA BINQËS	Konçul	Morava Binçës	0.03	9.21	1012
19		Domarovc	Kriva Reka	0.2	2.6	30.8
20		Viti	Morava Binçës	0.05	1.06	18.70
21	LEPENCI	Kaçanik	Nerodime	0.15	4.17	17.50
22		Hani Elezit	Lepenci	0.10	10.49	184

Table 15 presents water level data (in cm) for some of the stations which registered measurements levels for 2010-2014.

34 Kosovo Hydrometereological Institute

Table 15: Average annual values of water level H (in cm) by measurement station [35]

STATION	RIVER	2010	2011	2012	2013	2014
Grykë	Bistrica Pejës	0.614	0.530	0.669	0.549	-
Drelë	Bistrica e Pejës	0.503	0.438	0.515	-	-
Prizren	Bistrica Prizrenit	0.463	0.361	0.589	0.666	0.593
Mlikë	Brod	0.763	0.579	0.638	0.668	0.588
Lluzhan	Llapi	1.141	0.843	0.699	0.860	1.042
Milloshëvë	Llapi	0.990	0.543	0.566	0.934	-
Viti	Morava Binçës	0.333	0.219	0.216	0.193	0.277
Hani Elezit	Lepenci	0.692	0.619	0.547	0.630	1.000
Brod	Lepenci	0.492	0.397	0.433	0.402	0.480
Gjakovë	Ereniku	0.690	0.519	0.597	0.743	0.583

6.4. DRINKING WATER MONITORING

The National Institute of Public Health (NIPH) is responsible for monitoring the quality of drinking water in Kosovo, including processed and pumped water provided by the seven regional water companies, water provided by municipal water supply systems in several municipalities, small community providers and bottled source water.

The National Institute of Public Health of Kosovo (NIPHK) is also responsible for all health related issues, including the "monitoring and enforcement" of drinking water standards for all water providers in Kosovo, in compliance with provisions of Article 7, Law 2007/02 L78 on Public Health. Water quality standards currently applicable in Kosovo include a number of standards covering microbiological issues comprehensively and a limited number of physical-chemical parameters.

Ensuring that provided water is drinkable and of a high quality is essential to the population health and well-being. The quality of drinking water provided by the regional water companies is assessed based on regular monthly reports of NIPHK's Water Monitoring Center, which is responsible for monitoring and ensuring the quality of water distributed by RWCs. The Center's assessments show that the water provided by these companies is drinkable and pursuant to legal parameters[36].

The 2013 performance report for water service providers in Kosovo shows that the water distributed by RWCs complies with several key microbiological and physical-chemical parameters of drinking water quality.

The compliance level takes into account the total number of samples analyzed in relation to the number of samples that meet drinking water quality standards. A low compliance may imply a low quality of water.

35 Kosovo Hydrometereological Institute
36 Administrative Instruction No. 16/2012 on drinking water quality for human consumption.

Microbiological compliance of water[37] is the most important indicator with an immediate effect on health. Physical parameters such as color, taste and smell are important for consumer perceptions about the esthetic quality of water. Regarding the bacteriological analysis of water, the test pass rate in 2013 was 98.4%, which is better compared to the pass rate of 97.6% in 2014.

The improved performance of the regional water companies of Prishtina, the South Hydrological Station and Mitrovica contributed to the overall result improvement. The performance in other companies remained the same, except RWC Hidrodrini which had a poorer performance this year with a pass rate of 98.6% in bacteriological tests.

RWC Radoniqi provided the best quality water in bacteriological terms in 2013 as well.

The bacteriological quality of water was mainly compromised by the presence of coliform and E. coli bacteria, which indicated a possible feces contamination of water. The presence of these microorganisms is not allowable in drinking water.

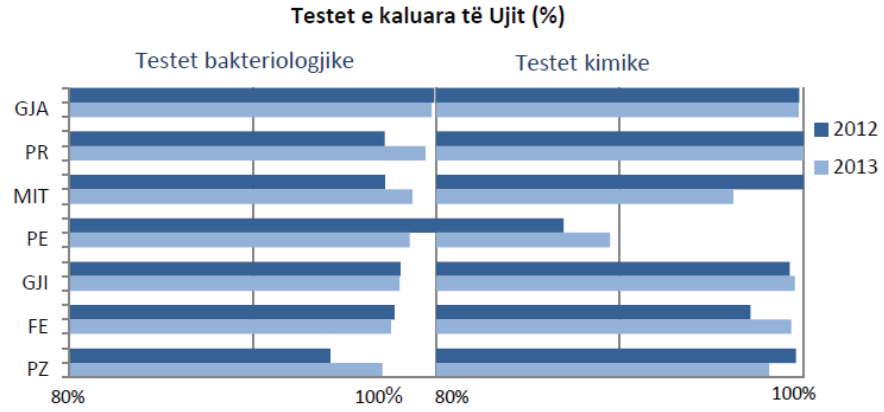


Figure 48: Passed bacteriological and chemical tests (%) by RWC [38]

Physical-chemical compliance[39] of water quality at sector level during 2013 marked was 97,4%, the same as in 2012.

Two RWCs (Mitrovica and South RWC) reported a higher level of physical-chemical noncompliance in 2013.

The poor quality of water in physical-chemical terms during 2013 was recorded in the RWC of Mitrovica (covering Mitrovica, Skenderaj and Vushtrri). Compared to 2012, the chemical parameters of Manganese (Mn) and nitrites (NO2) resulted higher than the allowed values. Despite the progress made in 2013, the RWC Hidrodrini still shows high chemical pollution, mainly in the supply area of the Operating Unit in Klina.

Water consumption and health effects – Water is an essential natural source for human health and well-being. It is an integral part of almost all economic activities, as well as of aqueous ecosystems. Population growth, environmental degradation, climatic changes,

37 Annual performance report for water service providers in Kosovo, 2013.
38 WWRO Annual performance report on water service providers in Kosovo, 2013
39 Ibid.

economic conditions, technological capacity, infrastructure and governance are some of the factors affecting the water situation.

The quality of water is directly related to the human health. Improvements in urban wastewater infrastructure and water quality have resulted in a considerable reduction of infective and parasitic diseases. However, poor quality of water remains a threat to public health, especially where the level of hygiene is unsatisfactory. Some infective diseases are directly related to water consumption and quality.

Water-borne threats to public health result from various pathogens and microorganisms such as Cyanobacteria related to algae flourishing. Cyanobacteria levels have increased in the majority of European lakes and other water sources used for aquaculture, drinking and recreation. Direct contact with water containing cyanotoxins may cause allergic reaction and skin, eye and ear damages. Insertion of such toxins through water into the body causes gastro-intestinal diseases, liver damaging and also affects the nervous system[40].

40 EEA-JRC Report: Environment and human health. Denmark, 2013.



7

WATER DISCHARGES

7.1. URBAN WASTEWATER DISCHARGE

The collection of urban wastewater includes water of the public service operated by the regional water companies and a number of smaller operators. Based on the Kosovo Statistics Agency census of population, households and dwellings, about 53% of population discharges wastewater into the public sewerage network, 16% into sewerage systems not managed by public companies, 27% use other discharge forms (canals, septic holes, etc.), while 4% does not have access to the sewerage network (See Figure 49).



Figure 49: Population in dwellings by type of wastewater discharge [41]

Public service coverage of wastewater collection provided by regional water companies in 2013 was 60%, which marked an increase of 4% compared to 2012. The region of Prishtina has the highest public network coverage with 77.8%, whereas the lowest coverage was registered in the region of Peja with 41.2%.

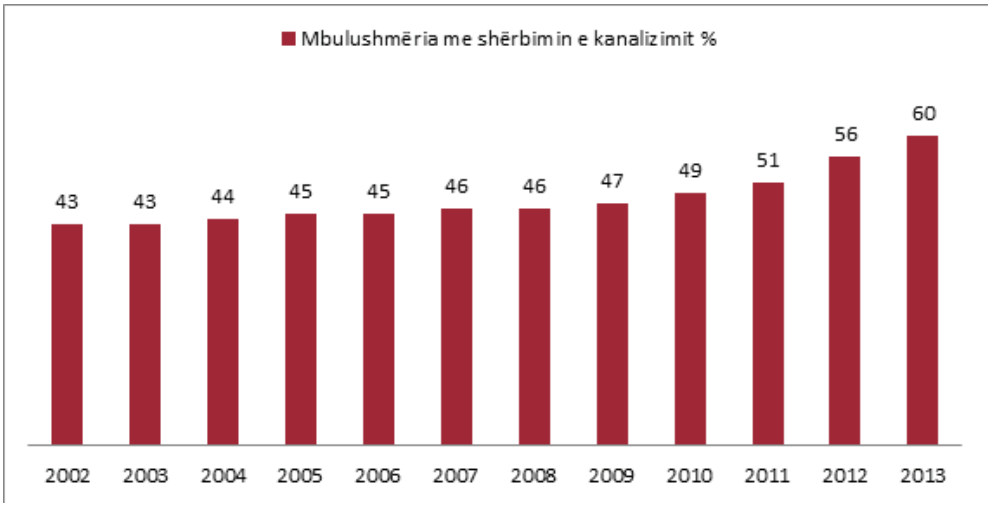


Figure 50: Sewerage system coverage in Kosovo in RWC service areas 2002-2013 [42]

41 Kosovo population census 2011, KSA
42 Data from performance reports of water service providers 2002-2013, WWRO

7.2. WASTEWATER DISCHARGE FROM AGRICULTURE

The use of fertilizers in agriculture affects surface waters. Intensification of agricultural production must be accompanied with agricultural-environmental and efficiency measures to minimize pollution risk and to maximize added value. The actual impact of agricultural activities on surface waters is assessed to be low. The average quantity of used fertilizers is 346 kg/ha. The average quantity of used organic fertilizers is 2,845 kg/ha, which is much lower than the rate of use in many EU member states. Supposing that 20% of fertilizers consists of Nitrogen (equivalent to 70 kg per hectare) and the content of 7 kg/T Nitrogen (20 kg per hectare) in organic fertilizers, this implies an equivalent to a combined application Nitrogen rate of 90 kg per hectare, which is much lower than the threshold of 170 kg determined in the Nitrates Directive.[43]

7.3. WASTEWATER DISCHARGE FROM INDUSTRY

Water is important for many industrial processes such as heating, cooling, production, cleaning and rinsing. Industries generate a considerable part of potentially contaminated wastewater. Industrial waters release a big group of complex organic components and heavy metals. The discharge of such waters into surface flows may have harmful effects on the human health and the environment[44].

The major industrial dischargers in Kosovo include the Kosovo Energy Corporation (KEK), Ferronikel, Sharrcem, Silcapore, and the mines of Trepça, Kishnica and Artana, etc. The polluted water from industries and mines is rich in acidic content and heavy metals.

7.4. WASTEWATER TREATMENT

Generally in Kosovo, there is no wastewater treatment. Wastewater is usually discharged directly into rivers and represents one of the main surface water pollutants. The only wastewater treatment plant is located in Llausha, Skenderaj and it does not function properly due to technical and financial problems.

Sipas përmbledhjes së përllogaritjeve në dispozicion nga Studimet e Fizibilitetit për Ujërat e Ndotura nga donatorët, nga Master Plani për ujërat e ndotura për pellgun e lumit Ibër dhe nga Master Plani për komunën e Dragashit i përgatitur nga UNDP, vlerësohet se kostoja totale për trajtimin e ujërave të ndotura arrin rreth 517 milion Euro.

However, with the support of foreign donors feasibility studies on wastewater treatment have been conducted in the regions of Prizren, Gjakova, Peja, Gjilan, Ferizaj and Mitrovica. The feasibility studies for Prizren, Gjakova and Peja were financed by KFW (German Bank

43 Kosovo Draft National Water Strategy 2014-2033, MESP

44 UNEP, Sick water, The Central Role of Wastewater Management in Sustainable Development, A Rapid response assessment

for Development) and the Government of Kosovo, while the studies for Gjilan, Ferizaj and Mitrovica were financed by the European Union.



Wastewater treatment plan in Skenderaj

Based on the summary of available calculations from the feasibility studies on wastewater, the Master Plan of polluted water for the Iber River Basin and the UNDP's Master Plan for the Municipality of Dragash, the total wastewater treatment costs amount to € 517 million.

Table 16. Wastewater treatment needs assessment

Agglomerate	Source of calculation	Population equivalent of long-term coverage	Assessed cost In million €
Prishtina	KIBP Feasibility Study	625,000	161
Gllogoc	Wastewater Master Plan for Iber	70,000	26
Podujeva	Wastewater Master Plan for Iber	94,000	30
Shtime	Wastewater Master Plan for Iber	27,000	11
Mitrovica - Vushtrri	Wastewater Master Plan for Iber	185,000	59
Prizren	KfW Feasibility Study	140,000	60
Gjakova	KfW Feasibility Study	80,000	54
Peja	KfW Feasibility Study	100,000	64
Gjilan	KIBP Feasibility Study	140,000	34
Dragash	UNDP Master Plan	30,000	18
Total		1,491,000	517.00€



8

FEES FOR WATER USE AND WATER SERVICES

8.1. WATER AND WASTEWATER SERVICE FEES

Water and wastewater service fees are set by the WWRO based on principles, criteria and procedures defined in the legal and regulatory framework. Fees for these services are determined based on applications made by regional water companies and on the principle of covering operative and capital costs necessary for service provision.

During 2012 - 2014, the fixed consumer service component was 1 Euro per month for household consumers and 3 Euros per month for commercial and institutional consumers.

Table 17: Fixed fees in Euros (per consumer per month) for all RWCs [45]

Type of consumer	2012	2013	2014
Household	1	1	1
Commercial	3	3	3
Institutional	3	3	3

45 Water and wastewater services fees, WWRO 2012

The table below presents the average volumetric fees for all RWCs during 2012-2014.

Table 18: Average volumetric fees for drinking water and wastewater services for 2012 – 2014 (euro/m3) [46]

Type of service		2012	2013	2014
Water supply (per m3 of sold water)	Household	0.3141	0.3345	0.3564
	Commercial	0.6791	0.6955	0.7016
	Institutional	0.6791	0.6955	0.7016
Wastewater (per m3 of water)	Household	0.0593	0.0679	0.0798
	Commercial	0.1383	0.1579	0.1828
	Institutional	0.1383	0.1579	0.1828

8.2. WATER USE FEES

Compensation fees for water use, wastewater discharge and exertion of inert materials from riverbeds and banks is regulated with the Administrative Instruction for Water Payment Structure.

The following table provides data on compensation fees for using surface water, groundwater and mineral water as stipulated in this Administrative Instruction.

Table 19: Compensation fees for using surface water, groundwater and mineral water [47]

Type of water use	Compensation fee
Untreated water used directly	0.001 € për 1m^3
Water of drinking quality used for sale	To legal entities 0.003 € and citizens 0.0015 € m^3
Water of drinking quality used for personal needs	0.003 €
Producers packaging mineral and natural water	0.009 € per liter of sold water
Irrigation of farm land from artificial lakes	10 € per ha
Irrigation of farm land from water flows or natural resources	5 € per ha
Fish ponds	0.15 € per kilogram of sold fish
Electrical energy producers	2.5% of the price per each kilowatt/hour produced in hydro plants 1.7% of the price per each kilowatt/hour produced in closed cooling system power plants

46 Report of fees review findings 2012-2014 for the seven regional companies licensed for providing water and wastewater services, WWRO

47,43 Administrative Instruction for Water Payment Structure.

Data on wastewater discharge compensation are shown in Table 20.

Table 20. Wastewater discharge compensation fees [48]

Type of water used	Compensation fee
Water used in technical and technological processes related to oil and oil products processing and transportation; ferrous and non-ferrous metallurgy; textile industry; paper industry; leather industry; farms; butchery and meat industry; and vehicle services.	0.03 € për 1 m^3;
Water from other industries not mentioned above	0.02 € per 1 m^3;
Urban water collected in sewerage systems	0.001 € per 1 m^3;
Other types of used waters	0.010 € per 1 m^3;
Water used in open cooling system power plants	1.5% € per 1 m^3

48 Administrative Instruction for Water Payment Structure.



8

WATER SECTOR INVESTMENTS AND PROJECTS

9.1. WATER SECTOR INVESTMENTS

Important investments have been made in the water sector[49] by the Government of Kosovo and foreign donors. Investment by the Government of Kosovo focused on regulation of rivers and improvement of water infrastructure especially for water and wastewater services.

Table 21. Water sector investments (in million €) for 2000-2012 by the Government of Kosovo [50]

Source of investment	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Government of Kosovo	1.02	1.64	2.23	0.63	0.96	3.13	4.46	4.17	6.06	14.63	14.18	12.74	13.00

Donor investments also focused mainly on improving water sector services and on feasibility studies for water treatment infrastructure.

49 Water sector refers to drinking water, sewerage, irrigation, accumulations, rivers, administration of water resources, etc.

50 Historical trend of water sector investments in Kosovo, Arian Shuku 2012

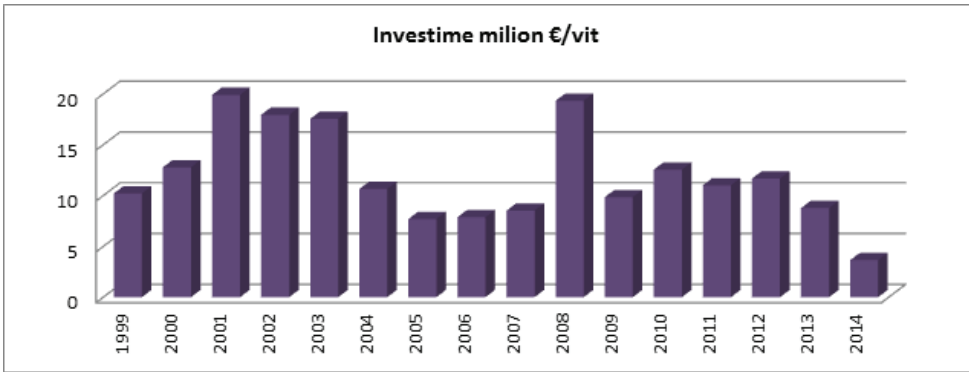


Figure 51: Water sector investments (in million €) for 1999-2014 by foreign donors

Based on available data, total investments in the water sector since 1999 amount to € 255.77 million, out of which € 189.9 million were donations. The main foreign donors include the European Union, the Swiss Government and the KfW (German Development Bank), which together have invested a total of € 154.9 million or 61% from total investments. The highest level of investments was in 2010, with a total of € 26.63 million..

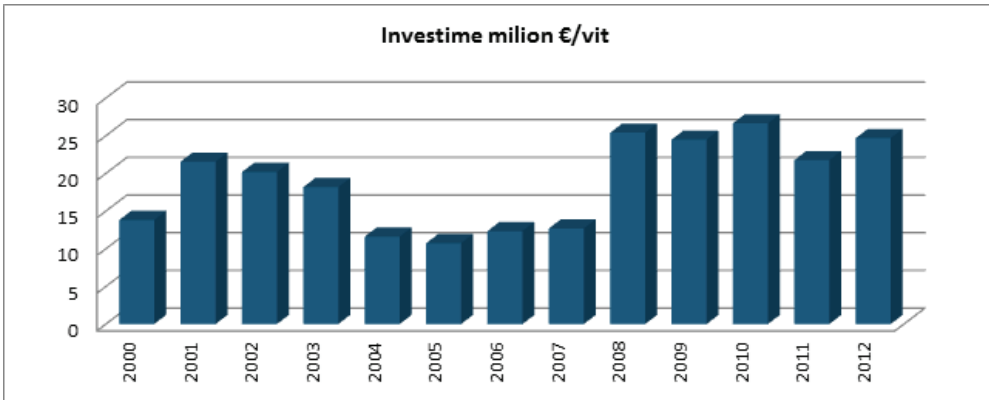


Figure 52: Total investments in the water sector 2000-2012 [51]

51 Historical trend of water sector investments in Kosovo, Arian Shuku 2012

9.2. REGIONAL AND TRANSBOUNDARY PROJECTS

7.4.1. Transboundary cooperation for sustainable water management

Sustainable water management is an environmental challenge in all countries. Transboundary environmental impact is regulated with international conventions, and host country agreements, directives and other legal acts[52].

Generally, these international agreements contribute to increased understanding and dialogue encouraging between two or more countries related to the management of transboundary natural resources and the prevention of negative effects. Institutional and transboundary cooperation is necessary to promote integrated management of water resources and solution of transboundary management problems.

Kosovo as a territory is part of cross-border basins. All river basins of Kosovo are part of cross-border basins; thus, the basins of Iber and Morava e Binces are transboundary basins of the Danub River Basin, whereas the Drini i Bardhe Basin belongs to the Drini River Basin. Consequently, Kosovo participates in drafting protection policies for cross-border basins of the Drini Basin and is also a member of the Transboundary Basin Protection Commission. Numerous interstate conferences have been organized between Greece, Macedonia, Albania, Kosovo and Montenegro.

The main objectives of transboundary cooperation include: integration of water resources, transboundary management of water quality, management of cross-border water resources, and provision of services in transboundary water administration.

In order to achieve these objectives, it is important to comply with relevant agreements and directives, which recommend the implementation of common transboundary water management and protection measures, such as: standards regulating transboundary water quality and emissions, water quality monitoring, risk level identification, classification of water bodies, management plans development, public information and public involvement in decision making processes.

8.6.1. Climate Change Adaptation Program in Western Balkans[53]

The Danube Water Program began its implementation in 2013 with the support of the World Bank. Kosovo participates in this program together with 12 countries of the Danube Region (Austria, Albania, Ukraine, Romania, Moldavia, Bulgaria, Macedonia, Serbia, Croatia, Bosnia and Herzegovina, and Montenegro). This project aims to help these countries in constructing strong and sustainable water and wastewater services. The Work Plan is built on five pillars: policies, tariffs, resource management and investment planning, and service efficiency improvement. The program is implemented using three main instruments: analytical and counseling actions, knowledge sharing platform and capacity development activities.

52 Transboundary Water Management, Climate Change Adaptation in Western Balkan (www.giz.de)
53 http://www.danube-water-program.org/

8.6.2. The Danube Water Program (IAWD)

The Danube Water Program began its implementation in 2013 with the support of the World Bank. Kosovo participates in this program together with 12 countries of the Danube Region (Austria, Albania, Ukraine, Romania, Moldavia, Bulgaria, Macedonia, Serbia, Croatia, Bosnia and Herzegovina, and Montenegro). This project aims to help these countries in constructing strong and sustainable water and wastewater services. The Work Plan is built on five pillars: policies, tariffs, resource management and investment planning, and service efficiency improvement. The program is implemented using three main instruments: analytical and counseling actions, knowledge sharing platform and capacity development activities.

10. CONCLUSIONS AND RECOMMENDATIONS

10.1. CONCLUSIONS

- ✓ Kosovo has not adopted its National Water Strategy yet.
- ✓ Its actual legal basis needs to be amended and harmonized with European Union directives.
- ✓ Despite marked progress, water sector institutions still face problems and shortcomings.
- ✓ Kosovo is still in the construction phase for infrastructure required for drinking water, sewerage networking, wastewater treatment, flood protection, etc.
- ✓ Lack of wastewater treatment plants is considered one of key problems in the water sector.
- ✓ Pollution of surface water is still considered to be high.
- ✓ The surface water monitoring system needs modernization, while there is no groundwater monitoring system.
- ✓ There is lack of scientific research about water, especially groundwater resources.
- ✓ There is an increased demand for water resources.
- ✓ Despite investments and projects in the water sector, needs and requests for support remain numerous.

10.2. RECOMMENDATIONS

- ✓ Adopt National Water Strategy as soon as possible.
- ✓ Complete water legislation and harmonize it with European Union directives.
- ✓ Complete and modernize surface water quality monitoring system and establish groundwater monitoring system.
- ✓ Promote sustainable use of water resources.
- ✓ Build wastewater treatment plants.
- ✓ Establish water saving measures in all sectors.
- ✓ Maintain and expand water supply and sewerage systems.
- ✓ Increase cooperation and information between central and local institutions.
- ✓ Conduct scientific research on water focusing on groundwater resources.
- ✓ Raise awareness and education levels on protection and sustainable use of water resources.
- ✓ Assess needs for water infrastructure investments and prioritize them.

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12.3. ANNEX 3

Physical, chemical and heavy metals parameters monitored by NIPHK [54]

Indicators	Symbol	Unit	Frequency of measurements/ Year
Physical parametres			
Time	h	0:00	11
Weather	M	Observation	11
Water temperature	Tu	0C	11
Air temperature	TA	0C	11
Smell	Ar	Smell	11
Color	Ngj	Co/Pt	11
Turbidity	Tur	NTU	11
Electrical conductivity	χ	μScm-1	11
Dissolved matrers	M.tert.	mg/l	11
Hydrogen ion concetration	pH	0-14	11
CHEMICAL PARAMETRES			
Dissolved Oxygen	OT	mg/l O2	11
Oxygen abundance	NgO	%	11
Chemical Oxygen Demand	SHKO	mg/l O2	11
Chemical Oxygen Demand with dichromate	SHKO-Cr	mg/l O2	11
Biochemical Oxygen Demand	SHBO5	mg/l O2	11
Biochemical Oxygen Demand	SHBO7	mg/l O2	11
Total Organic Carbon	KOT	mg/l C	11
Total Suspended Matters	MTS	mg/l	11
Detergents	DET	mg/l	11
Nitrate ion	NO3-	mg/l	11
Nitrate Nitrogen	N-NO3-	mg/l N	11
Nitrite ion	NO2-	mg/l	11
Nitrite Nitrogen	N-NO2-	mg/l N	11
Nitrite ion	NH4+	mg/l	11
Ammonium ion	N-NH4+	mg/l N	11
Ammonium Nitrogen	ATI	mg/l N	11
Not ionized ammonium	NH3	mg/l	11
Nitrogen of not ionized ammonium	N-NH3	mg/l N	11
Total organic+inorganic Nitrogen	AT	mg/l N	11
Total Organic Nitrogen	ATO	mg/l N	11
Ortophsfates	PO43-	mg/l	11

54 Only parameters highlighted in blue are assessed and presented in this report.

Phosphorus of orto phosphates	P - PO43-	mg/l P	11
Total Phosphorus (poli+orto)	Ptot.	mg/l	11
Sulphate Ion	SO42-	mg/l	11
Total hardness	Fp	0dH	11
Calcium hardness	Fca	mg/l	11
Magnesium hardness	FMg	mg/l	11
Calcium Ion	Ca+	mg/l	11
Magnesium Ion	Mg+	mg/l	11
P-Alkalinity	Pa	ml 0.1 e HCl	11
M-Alkalinity	Ma	ml 0.1 e HCl	11
Total Alkalinity	AT	mmol/l HCl	11
Bicarbonates	HCO3-	mg/l	11
Free chlorines	Cl2	mg/l	11
Chlorines	Cl-	mg/l	11
Silicates	SiO32-	mg/l	11
Silicon in Silicates	Si - SiO32-	mg/l Si	11
Chlorophyll a	Chlorophyll a	µg/l	11
Phenole	C6H5OH	mg/l	11
Heavy Metals			
Chromium	Cr3+	µg/l	2
Cadmium	Cd2+	µg/l	2
Nickel	Ni2+	µg/l	2
Zinc	Zn2+	µg/l	2
Manganese	Mn2+	µg/l	2
Copper	Cu2+	µg/l	2
Iron	Fe2+	µg/l	2
Lead	Pb2+	µg/l	2

12.4. ANNEX 4

Codes of water quality monitoring stations in surface waters - Rivers

Code	Location	River	Flow to
RV01_011	Radavc	Drini i Bardhë	Mediterranean sea/Adriatic Sea
RV01_012	Klinë	Drini i Bardhë	Mediterranean sea/Adriatic Sea
RV01_013	Gjonaj	Drini i Bardhë	Mediterranean sea/Adriatic Sea
RV01_014	Vermicë	Drini i Bardhë	Mediterranean sea/Adriatic Sea
RV01_021	Istog	Istogu	Mediterranean sea/Adriatic Sea
RV01_022	Zllakuqan	Istogu	Mediterranean sea/Adriatic Sea
RV01_031	Stërnac i ulët	Klina	Mediterranean sea/Adriatic Sea
RV01_032	Klinë	Klina	Mediterranean sea/Adriatic Sea
RV01_041	Drelaj	Lumbardhi i Pejës	Mediterranean sea/Adriatic Sea
RV01_042	Pejë dalje	Lumbardhi i Pejës	Mediterranean sea/Adriatic Sea
RV01_043	Grabanicë	Lumbardhi i Pejës	Mediterranean sea/Adriatic Sea
RV01_051	Banjë e Malishevës	Mirusha	Mediterranean sea/Adriatic Sea
RV01_052	Volljakë	Mirusha	Mediterranean sea/Adriatic Sea
RV01_061	Deçan Hyrje	Lumbardhi i Deçanit	Mediterranean sea/Adriatic Sea
RV01_062	Kralan	Lumbardhi i Deçanit	Mediterranean sea/Adriatic Sea
RV01_071	Jasiq	Ereniku	Mediterranean sea/Adriatic Sea
RV01_072	Ura e Terzive	Ereniku	Mediterranean sea/Adriatic Sea
RV01_081	Zhdrellë	Rimniku	Mediterranean sea/Adriatic Sea
RV01_082	Xërxë	Rimniku	Mediterranean sea/Adriatic Sea
RV01_091	Buqallë	Toplluha	Mediterranean sea/Adriatic Sea
RV01_092	Piranë	Toplluha	Mediterranean sea/Adriatic Sea
RV01_101	Prevallë	Lumbardhi i Prizrenit	Mediterranean sea/Adriatic Sea
RV01_102	Vllashnje	Lumbardhi i Prizrenit	Mediterranean sea/Adriatic Sea
RV02_011	Kushtovë	Ibri	Black Sea
RV02_012	Mitrovicë	Ibri	Black Sea
RV02_013	Kelmend	Ibri	Black Sea
RV02_021	Bablak	Sitnica	Black Sea
RV02_022	Lipjan	Sitnica	Black Sea
RV02_023	Vragoli	Sitnica	Black Sea
RV02_024	Plemetin	Sitnica	Black Sea
RV02_025	Nedakovc	Sitnica	Black Sea
RV02_026	Mitrovicë	Sitnica	Black Sea
RV02_031	Marincë	Llapi	Black Sea
RV02_032	Podujevë	Llapi	Black Sea
RV02_033	Milloshevë	Llapi	Black Sea
RV02_041	Bresje	Prishtevka	Black Sea

RV02_051	Vragoli	Graqanka	Black Sea
RV02_061	Pjetërshticë	Drenica	Black Sea
RV02_062	Vragoli	Drenica	Black Sea
RV02_071	Devetak	Shtime	Mediterranean sea/Adriatic Sea
RV02_072	Vojnovc	Shtime	Black Sea
RV03_011	Korbuliq	Morava e Binçës	Black Sea
RV03_012	Kllokot	Morava e Binçës	Black Sea
RV03_013	Ranilugë	Morava e Binçës	Black Sea
RV03_014	Domoroc	Morava e Binçës	Black Sea
RV03_021	Marec	Kriva reka	Black Sea
RV03_022	Domoroc	Kriva reka	Black Sea
RV04_011	Prevallë Subain	Lepenci	Mediterranean sea/Aegean Sea
RV04_012	Kaçanik	Lepenci	Mediterranean sea/Aegean Sea
RV04_013	Hani i Elezit	Lepenci	Mediterranean sea/Aegean Sea
RV04_021	Jezerc	Nerodimja	Mediterranean sea/Aegean Sea
RV04_022	Bifurkaconi	Nerodimja	Mediterranean sea/Aegean Sea
RV04_023	Gërlicë	Nerodimja	Mediterranean sea/Aegean Sea
RV04_024	Kaçanik	Nerodimja	Mediterranean sea/Aegean Sea

Report on the state of water 2015

Prepared by the Kosovo Environmental Protection Agency

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Working group:

Tafë Veselaj, Afrim Berisha, Merita Mehmeti, Fatlije Buza, Agron Shala, Hasan Hasani and Përparim Gashi

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