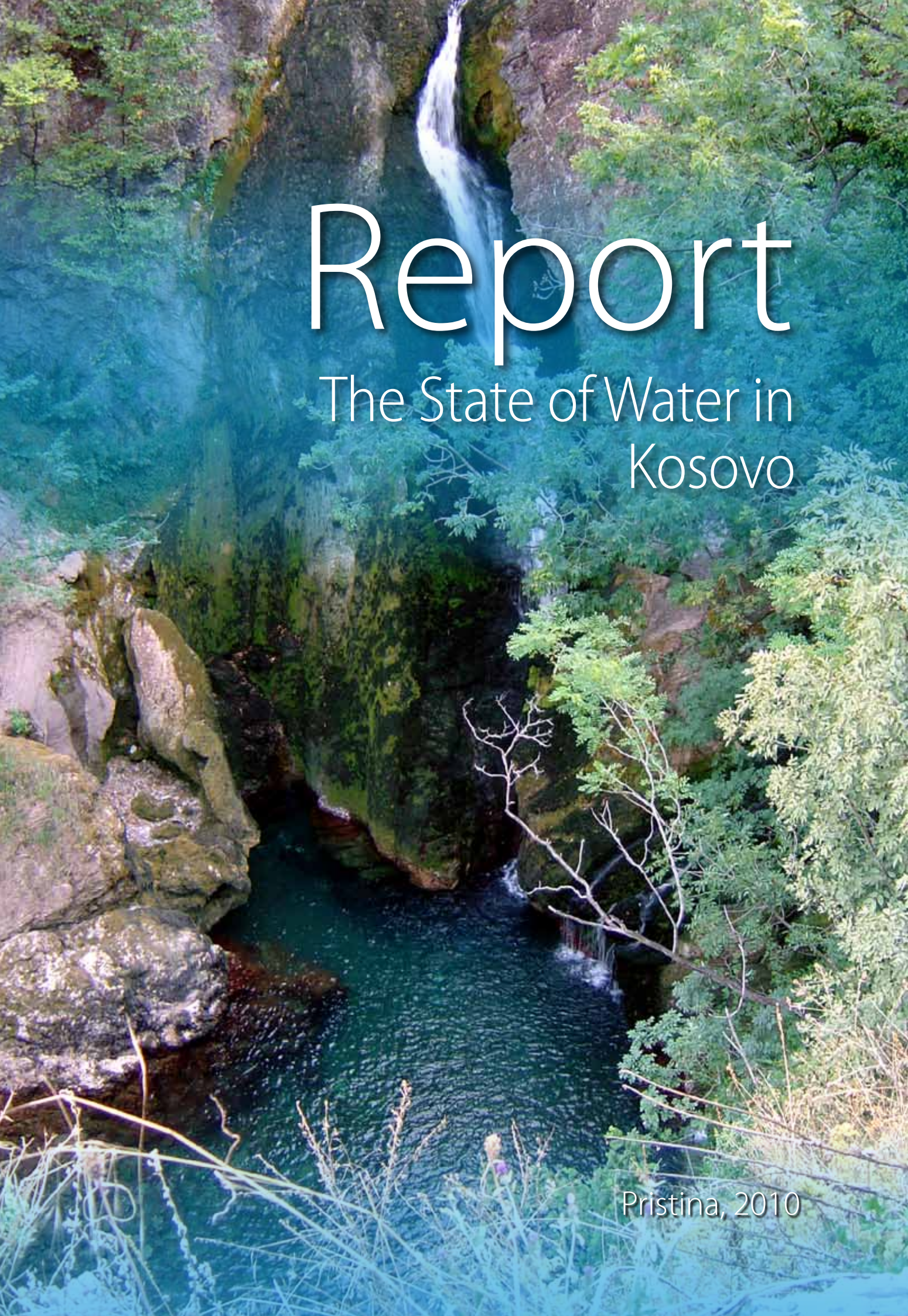


Report

The State of Water in Kosovo

Pristina, 2010

MINISTRY OF ENVIRONMENT AND SPATIAL PLANNING
KOSOVO ENVIRONMENTAL PROTECTION AGENCY

Report

THE STATE OF WATER IN KOSOVO

Pristina, 2010

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PREFACE

Dear reader,

Water is a natural resource with limited and unequal distribution in time and space. All forms of life and all human activities depend on water. Water resources are of great importance for human life and economy and represent the main source to meet the needs for drinking water, irrigation and industry. Lack of water is considered as a limiting factor for socio-economic development of the country.

Modern industrial development and urbanization have resulted in the creation of large urban areas, industrial areas and intensive agricultural development. This has increased the need for water, but also increased urban and industrial water discharges into rivers without any prior treatment, thereby reducing the water ability for auto purification. Destruction of habitats and decline of the world's plants and animals in aquatic ecosystems is another environmental impact, arising as a result of pollution of surface waters. The need for clean water now is considered one of the greatest global environmental problems.

Currently, more than 1.2 billion people worldwide do not have access to drinking water, while some 3 billion people (half the world's population) do not have adequate sanitation. More than 200 diseases are originating from contaminated water. About 6000 people a day lose their lives from diarrhoea diseases. According to the World Health Organization, it is estimated that about 5 million people die each year from consumption of contaminated water. Having taken into account the current trend of urbanization in the world, about 3 billion people will need water supply and more than 4 billion will need access to sanitation by the year 2025.

In Kosovo, as in many other countries, health and quality of life is increasingly threatened by the poor water quality and scarcity of water reserves. Currently about 75% of the population is covered with water supply services, while only about 55% with sewerage services.

It is estimated that Kosovo has limited water resources, so the protection, conservation and monitoring of their quality is one of the main environmental challenges facing our society. Sustainable management of water resources, protection of water and improving water quality, require special dedication of all responsible factors.

Mahir Ya□cilar
Minister of Ministry of Environment and Spatial Planning



ACKNOWLEDGEMENTS

Dear readers and colleagues. In your hands you have a report that contains basic information on the state of water in Kosovo. This report was prepared by the Kosovo Environmental Protection Agency, in the frame of fulfilling the tasks and responsibilities this institution has for the state of the environmental sectors. Preparation of this report was assisted and supported by other departments of the Ministry of Environment and Spatial Planning, especially by the Department of Water and Hydro-meteorological Institute. In gathering the data needed to prepare the report, valuable contribution provided the National Institute of Public Health, Waste and Water Regulatory-WWRO, Regional Water Companies, irrigation companies, and other governmental and nongovernmental institutions. We consider that promotion of cooperation among responsible institutions for water management and monitoring, will significantly improve the process of data collecting, exchanging and processing, and reporting on the water quality in particular and for the water sector in general. In this case, KEPA expresses appreciations to all governmental and nongovernmental organizations, economic operators, donors, experts and various enterprises for cooperation shown in finalizing this report.

Dr. Ilir Morina
Chief Executive of KEPA

INDEX OF ABBREVIATIONS

AER	European Agency for Reconstruction
KEPA	Kosovo Environmental Protection Agency
KTA	Kosovo Trust Agency
EU	European Union
WD	Water Department
SOK	Statistical Office of Kosovo
TH	Total hardness
GTZ	German Technical Cooperation
KHMI	Kosovo Hydrometeorology Institute
NIPHK	National Institute of Public Health of Kosovo
KFW	German Development Bank
KFOR	Peacekeeping forces in Kosovo
KEK	Kosovo Energy Corporation
RWC	Regional water supply company
KK	Municipality
MEF	Ministry of Economy and Finance
MESP	Ministry of Environment and Spatial Planning
OSCE	Organization for Security and Cooperation in Europe
PE	water conductivity
PH	Hydrogen ion concentration
KEAP	Kosovo Environmental Action Plan
QKMF	Municipal Centre of Family Medicine
BOD_5	Biochemical Oxygen Demand
SHUKOS	Water Supply and Sewerage Association of Kosovo
TC	Thermal Power Plant
TCA	Thermal Power Plant Kosovo A
TCB	Thermal Power Plant Kosovo B
HPP	Hydro Power Plant
WTF	Water Task Force
AI	Administrative Instructions
UNMIK	United Nations Mission in Kosovo
MAV	Maximal Allowed Values
AAV	Annual Average Values
EIA	Environmental Impact Assessment
WWRO	Waste and Water Regulatory Office

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1. INTRODUCTION SECTION

1.1. INTRODUCTION

Reporting on the state of the environment in Kosovo, including the state of environment for specific sectors (water, air, soil and biodiversity), is a responsibility and task of KEPA, based on the law of environmental protection.

Within these tasks and responsibilities, in addition to the preparation of the general report on the state of environmental, KEPA has to report on the state of certain environmental sectors.

This report provides information on the state of water and water sector in general. The data for the preparation of the report were collected from the institutions that monitor water quality, water management companies and other government and non government organizations that deal with water sector. This report includes details about the laws and administrative guidelines for water, water strategic documents and data from projects and donors in this area. Some data presented in this report are taken from various relevant publications and reports.

The report is divided into chapters and each chapter addresses a particular aspect. In the first (introductory section), general data for Kosovo are presented. The second chapter presents the situation with legal and institutional framework for water management. In the third chapter of the report are presented general information about water resources and rainfall.

The fourth chapter contains data on water use in various sectors such as households, agriculture, industry, energy, etc..

The fifth chapter of this report addresses the problem of water pollution and wastewater treatment, while in the chapter six are presented data on water quality monitoring of surface water, groundwater and drinking water. The report includes the chapter on general aspects of water management as tariffs for services provided, projects and investments in water sector. In a separate chapter the report provides conclusions and recommendations.

The last chapter presents the references (sources) of data presented in this report.

1.2. GENERAL INFORMATION FOR KOSOVO

1.2.1. GEOGRAPHICAL POSITION

Kosovo has a central geographical position in the Balkan Peninsula. It lies between 41° 50'58 "and 43° 51'42" of north geographical latitude and 20 ° 01'30" and 21°48'02" of east geographical longitude. Kosovo's geographical position is considered of particular importance in terms economic, cultural and political areas, related to the region and the world.

Kosovo has a total area of 10,887 km ², with about 2.1 million inhabitants (1991 estimate) and the average density of 192 inhabitants km². It is bordered with Albania (southwest), Macedonia (southeast), with Serbia (east, north and northeast) and Montenegro (west). The overall length of the border between Kosovo and neighbouring countries is about 700.7 km.

1.2.2. RELIEF

Kosovo is a mountainous country with lowlands, consisting of Kosovo plain (510-570 m in altitude) and Dukagjini plain (350-450 m altitude).

By morphological aspect, Kosovo represents a true mosaic of hollow with different dimensions, defined by mid-high mountains. In the relief morphology are distinguished mountainous areas, the construction of which is consisted by rocks of various geological ages. The most present are Paleozoic (PZ) and Mesozoic (MZ), while the lower area of the field dominate the new sediment Pliocene (PL), composed mainly of terrigenous rocks, clay, sand, conglomerate and less limestone.

The Average altitude of Kosovo is 810 m, the lowest peak is 270 m and the highest peak is 2656 m (Gjeravica). In hypsometric terms, area below 300m altitude covers only 4.16 km ^{2} (0.2%). Up to 1000 m altitude includes 8754 km ^{2} (80.7%). From 1000 to 2000 m 1872.3 km ^{2} (17%) and above 2000m altitude belong 250.6 km ^{2} (2.3%) of Kosovo territory. The main forms of relief in Kosovo are: Mountains (63%) and hollow (37%).

1.2.3. CLIMATE

The climate is medium-continental climate with a dominant influence of Adriatic-Mediterranean climate in the Dukagjinit Plain, (through the valley of the Drini i Bardhe), and with less impact of Aegean-Adriatic climate in the Kosovo plain. The annual average rain is 596 mm. The annual average temperature is 100C, (minimal temperature -27 0C and maximal temperature 39^{0}C)[1] .

Key climate macro-factors, which affect the climate in Kosovo are: its position toward earth land masses (Euro-Asia and Africa), water masses(Atlantic Ocean and Mediterranean Sea), air masses (the tropics and the Arctic-maritime or continental), the position of baric systems (azures maximum and Iceland minimum). The main local factors that affect the climate in Kosovo are: relief, water, land and vegetation.

1.2.4. HYDROGRAPHY

Kosovo has insufficient water resources, and in the future it will be a limiting factor for economic and social development of the country. It is estimated that Kosovo has only 1600 m3/water/year per capita. In hydrographical terms, Kosovo is divided into four hydrographical river basins: the Drini i Bardhe, Ibri, Morava e Binçës and Lepeneci. The annual average of water flow from Kosovo is approximately 3.8 x 109 or 121.2 m3 / sec.

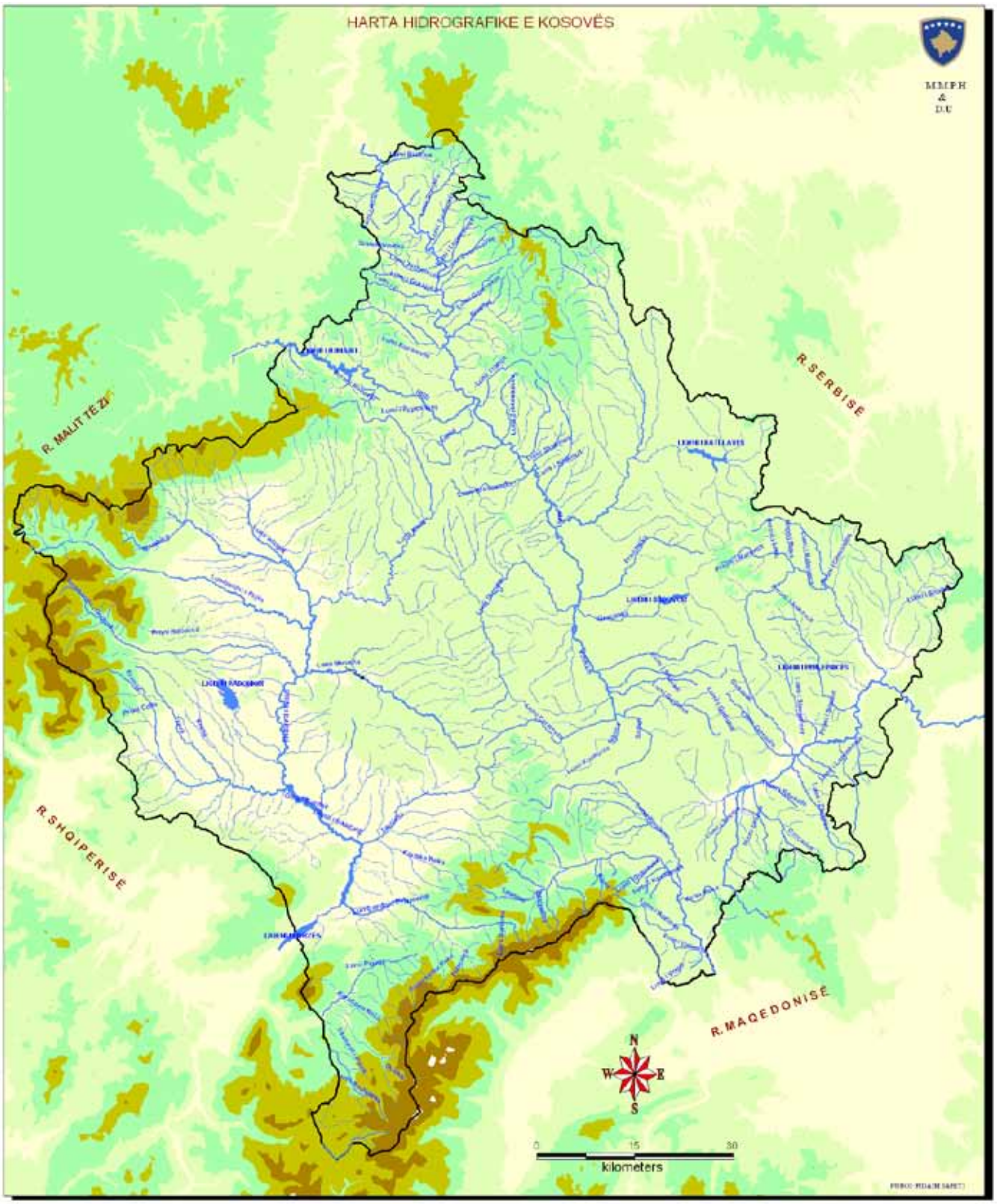
The main hydrological feature of Kosovo is the unequal water distribution and insufficient water resources in comparison to the needs. The potential of water for hydropower plants is very low, and so far its use is quite modest.

The ground water reserves are limited and are mostly located in the western part of Kosovo, where the surface water reserves are greater, compared with the few reserves of eastern part, and with the south-eastern part where water needs are very large.

Kosovo has a small number of natural lakes. Artificial lakes are: Batllava, Gazivoda, Radoniqi, Perlepnica and Badovci, and a small number of lakes for irrigation needs. Kosovo has important sources of thermal waters used for recreation and health purposes. Protection, preservation and development of water resources is very important and one of the greatest environmental challenges of Kosovo.

1 KHMI, 2008

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Map 1: The Kosovo hydro-graphy

1.2.2. POPULATION STRUCTURE

For a long period of time (over 25 years) Kosovo faced a lack of statistical data on population, so the population growth numbers are mainly based on estimates and projections.

Despite the numerous pressures (violent migration, political pressures etc), The total number of Kosovo's population is constantly increased in the post World War II period. During 58 years (1948-2006) the Kosovo population growth is 188.5%.

Table 1: Total population growth in Kosovo 1948-2006

Year	Number of inhabitants	Comments
1948	727820	**Registration**
1961	963988	**Registration**
1971	1243693	**Registration**
1981	1584440	**Registration**
1991	1956196	**Estimation**
2002	1985000	**SOK Estimation**
2006	**2100000**	**SOK Estimation**

Kosovo's population is young. In 2006 the age group 0-19 years constituted 38% of population. The age group of 20-64 years 56%, while the age group of over 65 years old was 6% of the total population.

Table 2: Population structure by the age in Kosovo 1981-2006 [2] [3] [4]

Age group (years)	1981	1991	2001	2006
0-19 vjeç	52	48	41	38
20-64 vjeç	43	47	54.1	56
Over 65	5	5	5.9	6

2 Bulletin 17,SOK, 1991-2001
3 Trends and distribution of Albanian population in ex Yugoslavia ,Institute of Economics 1997
4 Kosovo in figures 2006, SOK, Pristina 2007



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2. LEGAL AND INSTITUTIONAL FRAMEWORK

2.1 LEGAL AND STRATEGIC FRAMEWORK

2.1.1 LAWS AND ADMINISTRATIVE INSTUCTIONS IN THE WATER SECTOR

The legal framework for water is almost completed and, it relatively meets the needs for the management, development and sustainable utilization of water resources.

Law Nr. 2004/24 on Kosovo water - The purpose of this law is:

- To ensure sustainable development and utilization of water resources, which are necessary for public health, environmental protection and socio-economic development of Kosovo;
- To establish procedures and guiding principles for optimal allocation of water resources, based on the use and purpose;
- Ensure protection of water resources from pollution, misuse and overuse
- To establish the institutional framework for water resource management.

Law no. 02 / l-79 on hydro-meteorological tasks. It is another important law in the water sector, aimed to regulate meteorological works and the manner of their accomplishment.

Law no. 02/L-78 on public Health-This law stipulates, inter alia, institutions responsible for implementation of health policies, defines the duties of the National Institute of Public Health of Kosovo, and among other establishes the responsibilities for drinking water quality monitoring.

Law Nr. 03/L-086 on providers of waste, water, and sewage services-is an important law by which the WWRO is established, and established the legal framework for economic regulation of public companies which provide water and sewerage services;

Law Nr. 02/L-9 on Irrigation of Agricultural Land-This Law regulates the organization and management of irrigation and drainage of agricultural land in Kosovo; it defines the powers and responsibilities of the entities for irrigation and drainage. It defines also the establishment and registration of: irrigation companies, associations that use the water for irrigation, federations and their organization, irrigation, water fees, associations' business and other issues related to irrigation and drainage.

In the framework of the obligations arising from the Water law and Public Health Law, the administrative instructions are issued[5] that regulate the following issues:

- Water permits
- Structure of water charges
- Water infrastructure
- Testing and implementation of minimum standards for drinking water quality monitoring
- Sanitary inspectors
- Criteria for establishment of water protected areas for drinking water sources;
- Allowed limit values for effluent parameters which can be discharged into the water body or public sewage network.

5 Water Department, 2009

Administrative instruction under the drafting procedure are:

- Measures and actions for protection from erosion;
- Use and maintenance of dams;
- Water information system;
- Content of the strategic plan for water resources management.
- Water protocol

2.1.2 KOSOVO ENVIRONMENT STRATEGY

The environmental strategy is an important document of the overall long-term development of Kosovo. The development of the strategy is implemented through inter-ministerial cooperation and assistance of other institutions. The strategy has the following strategic orientations for the water sector[6] :

a) Development of plans for water resources management in the principles of water basins, sharing responsibilities at all levels and among all participants.
b) Ensuring the right to drinking water for all residents.
c) Long-term protection and conservation of water resources as national assets and their use by the principles of sustainable development.

Strategic priorities for water sector are:

Adoption of laws and regulations for water users and suppliers in harmonization with EU laws and regulations.
Monitoring of water quality and quantity.
Development of river basin management plans for water (integrated water management).
Protection of surface and ground waters from pollution.
Approval of strategic plans for emergency actions.
The extension of water supply and improvement of water supply to citizens.
Extension of sewerage network in urban and rural areas.
Development of national plan for the construction of urban and industrial wastewater treatment plants, and create suitable models for the treatment of wastewaters in urban and rural settlements.
Awareness raising and education of population on rational use of water resources.

2.1.3 KOSOVO WATER STRATEGIC PLAN

Kosovo Water Law, Article 22, obliges the Ministry of Environment and Spatial Planning, that in cooperation with the competent authorities for economy, finances, agriculture, forestry, rural development, trade, industry, health, transport, communications, energy, enterprise for public services, environment, nature protection and other authorities to draft the Water Strategic Plan.

Waters Strategic Plan has to cover a period of 20 years, with possibility of review by the Government every five years.

The Water Strategic Plan sets policies which ensure[7] :

- Water sustainable management by filling the needs of all users qualitatively and quantitatively;
- Water protection from pollution;

6 Kosovo Environment Strategy, MESP 2003
7 The Law No 2004/24 on Kosovo waters

- Protection and enhancement of ecosystems, and
- Protection from harmful consequences of water.

Waters Strategic Plan should include:

- Assessment of the status of water management;
- The objectives and guidelines for the protection, regulation and sustainable use of water;
- Priorities for achieving the objectives for water management;
- Estimates of the budget needed to implementing the plan and the deadline for achieving the objectives, and
- Guidelines for implementation of international agreements concerning water management.

2.1.4 KOSOVO ENVIRONMENTAL ACTION PLAN

In the framework of the Kosovo Environmental Action Plan 2006-2010, the chapter on the water objectives, defines the measures, activities and priority projects for the period 2006-2010.

Table 3. Objectives, measures, activities and priority projects for water within the KEAP[8]

Objectives	To provide the legal, technical, financial and human capacities to establish policy basis for integrated water management in Kosovo based on the principles of sustainable development	
Measures	□ Rehabilitation and construction of infrastructure (water supply and sewerage networks, wastewater treatment plants) in order to protect the environment and to meet the needs of the population. □ Adoption of needed secondary legislation in line with EU Directives □ Strengthen institutional capacities	
Activities	Establishment of National Council for Waters	
	Develop the National Strategy and Action Plan for Waters	
	Human capacity building in the ministry and other relevant institutions	
	Development of strategy for water quality monitoring and establishment of monitoring network	
	Compiling of water cadastre and cadastre of water pollutants	
	Harmonization of national regulations with EU norms and standards.	
	Action plan for construction of water treatment plants in urban areas with more than 10,000 inhabitants	
	Creation of economic instruments to reduce water pollution	
	Human capacity building for inspection services	
Nr:	Project	Budget (EUR)
1.	Compile cadastre data on water polluters	131,110
2.	The establishment and institutionalization of the network for water quality monitoring	675,600
3.	Improve the management of water resources by regulating the consumption, price and collection of the fees.	99,480
TOTAL		**906,190**

8 Kosovo Environmental Action Plan 2006-2010, MESP/REC, 2006

2.1.5 EUROPEAN UNION DIRECTIVES ON WATER

At the EU level, water management is regulated by several directives. The following table provides information for the purpose of these directives, the year of ratification and the rate of harmonisation at our national legislation.

Table 4 : The EU Directives on water quality and level of transposition at Kosovo national legislation[9] .

Nr.	Name of the directive	Year of adoption	Purpose	Transposed at national legislation (%)
1	Water framework directive (2000/60/EC)	23 October 2000	Maintaining high status of water where it exists, preventing any deterioration in the existing status of waters and achieving at least "good status" in relation to all waters by 2015	25
2	Directive for urban waste water treatment (91/271/EEC)	21 May 1991	Protection of waters from adverse effects from discharges of urban wastewater from certain industrial sectors	27
3	Drinking water directive (98/83/EC)	3 November 1998	To protect human health from adverse effects of any contamination of water intended to be used for human consumption, ensuring the drinking water is healthy and clean	47
4	Nitrates directive (91/676/EEC)	12 December 1991	Preventing and reducing water pollution caused by Nitrates from agricultural sources	16

2.2 INSTITUTIONAL FRAMEWORK

2.2.1 MINISTRY OF ENVIRONMENT AND SPATIAL PLANNING / WATER DEPARTMENT

According to the Law on Waters (no. 2004/24), the Ministry of Environment and Spatial Planning through the Water Department responsible for:

- Determination and implementation of policies for water development in Kosovo;
- Achievement of the objectives of the program approved by the Government;
- Management of water resources;
- Development of water strategic plan and other plans for water management;
- Performing of related administrative and professional tasks
- Other organizational and development tasks pursuant to the provisions of the water law.

9 9Report on progress monitoring, REC 2008, 2009

With the aim of water management in the territory of certain river basins, two river basins districts are established:
a. the River Basin District of the Drini i Bardhë; and
b. the River Basin District of the Ibri, Morava e Binçës and Lepenci.

The law establishes a River Basin District Authority for each of the two river basin districts

2.2.2 WATER COUNCIL OF KOSOVO

The Water Council of Kosovo, is an independent body, established by the Kosovo Water Law. The Council is an advisory body, which reviews systematic issues of Water Management, harmonizes needs and diverse interests and proposes measures for the development, use and protection of resources and water system in Kosovo. The Council also has the duty to:

- Reviews and give opinions in regard to legislative proposals on Water Management;
- Initiates up-to-date approaches for medium and long-term solutions, and global determinations in the field of water system development, ensure water balances, water management, financing, organization of water systems and public resource development policy;
- Reviews other issues of interest for the general and conceptual development of Water Management and the development of water systems of interest to Kosovo.

In regard to issues that it reviews, the Council gives opinions, conclusions and proposals for issuing legal provisions and undertaken measures.

2.2.3 KOSOVO ENVIRONMENTAL PROTECTION AGENCY

The Kosovo Environmental Protection Agency is a central institution for the state of environment monitoring. Duties and responsibilities of this institution in the water sector are:

- Collects and processes data for surface and ground waters of Kosovo; storage, exchange and publication of these data;
- The surface and ground water quality monitoring based up on schedule and methodology for operation with network of monitoring stations;
- Urban, agriculture and industrial waste water discharges monitoring;
- Prepares and compiles reports on the state of the waters; takes part in the review of various cases of EIA in the field of water (water and environmental permits, etc..)
- Forecasting and warning of potential or spontaneous risk for the loss of surface and ground waters in terms of quality and quantity;
- Coordinates preparation of programs for municipal governance of water resources as according to their competencies.

2.2.4 KOSOVO HYDRO-METEOROLOGICAL INSTITUTE

The KHMI is established in 2000. According to the law on Hydro-meteorological activities the KHMIs responsibilities in the field of water are[10] :

- Construction and maintenance of the basic network of hydrological and meteorological stations,
- Measurements and observations of the elements and occurrences: meteorological, hydrological, bio- meteorological, and hydro-biological,
- Measurements and observations of the electricity in atmosphere and air, water pollution and rainfalls, according to the unique program and methodology that is valid for essential network stations,
- Study, elaboration, conservation, exchange and data's annunciation of the hydro-meteorology and researching results on the monitoring network,
- Organization, maintenance and calculating development, observation system of data base and accomplishing prognosis of the hydro-meteorological works,
- Accomplishing the systematic hydro-meteorological measurement and observation on the rivers in usual cases and in cases of environmental disturbances, ,
- The systematically pursuit and ascertainment of air pollution, rainfalls, underground and surface waters of first resource and ground, also the hydro-meteorological studies and conditions prognosis of the environment protection,
- Publishing of the hydrological, meteorological analyses and short term specification of the: weather, water, ice on rivers, and weather impact on agricultural,
- Premonition of any hydro-meteorological elementary fatality,
- Given reports, foresight and premonition of central and local competent authorities on hydro-meteorological occurrences with importance for protection from flooding, ice, changes of water quality, as well as premonition regarding to the destruction and other water presented pollutions,
- Weather studies, climate studies, studies on ground and surface waters and their impact on the atmosphere,
- Preparation of hydro-meteorological works and including of hydro-meteorological services for flood protection,

2.2.5 NATIONAL INSTITUTE OF PUBLIC HEALTH OF KOSOVO

The National Institute of Public Health of Kosovo is a professional and scientific institution of Kosovo. In the field of water, the NPHIK is the responsible authority that sets standards for drinking water quality, to be met by providers. NPHIK also monitors the implementation of these standards. The legal basis for the authority and responsibilities of NPHIK are based on the administrative Instruction (AI nr.2/99), which regulates issues of water quality. The mission of the NPHIK is to protect and improve the public health through the monitoring of indicators, prevention of the occurrence of diseases and promoting public health.

10 Law no. 02/l-79 on hydro-meteorological activities

2.2.6 WATER TASK FORCE

Water Task Force (WTF) is a committee of relevant ministries of the Government of Kosovo, led by the Prime Minister or Deputy Prime Minister. WTF is responsible for improving the situation in the water sector through development of sector policies and action plans based on good practice.

WTF serves as a forum for gathering and evaluating the positive experiences in the water sector, but also it addresses barriers to implementation, communication and cooperation. Moreover, it provides a platform for the development of policies for reforming the water sector, considering different perspectives, from water users to service providers. WTF also will develop and adopt policies to ensure sustainability of reforms and investments in the water sector.

The Water Task Force consists of seven permanent members (five of whom have voting rights):

- Prime Minister (Chairman);
- Minister of Environment and Spatial Planning (Deputy Chairman) (for water resources);
- Minister of Economy and Finances (for water companies and finances);
- Minister of Local Government Administration(for local governments);
- Minister of Foreign Affairs (for transboundary waters);
- Two members nominated by donor community (non-voting)

Furthermore, the following ministries will contribute to the thematic cases that coincide with related issues to water management: the Ministry of Justice, Ministry of Energy and Mines, Ministry of Health, Ministry of Trade and Industry, Ministry of Agriculture, Forestry and Rural Development and Ministry of Internal Affairs.

2.2.7 LOCAL GOVERNMENT- MUNICIPALITIES

Under Article 20 of the Water Law (no. 2004/24), duties and responsibilities of municipalities in water management are to manage sources for important water supply at local level such as natural water springs, public springs, public wells and ditches.

While, the Law on Local Self-Government in Kosovo (no. 03/L-040), municipalities are responsible for providing public water supply. This competence in the case of water and sewerage services should be realized through Service Agreements that municipalities make with respective regional companies that offer their services in the municipality concerned.

2.2.8 WASTE AND WATER REGULATORY OFFICE

Waste and Water Regulatory Office (WWRO) is an independent economic regulator for water and waste services in Kosovo.

The WWRO role is to ensure non-discrimination and provision of qualitative, efficient, and reliable services at a fair and reasonable price for customers with respect for environment and public health

Duties and responsibilities of WWRO in the water sector are[11]:

- Licensing of public enterprises that provide water supply and sewerage services,
- Sets up and approve service tariffs for regulated services, ensuring that tariffs are fair and reasonable and enable financial viability of service providers;
- Monitors and enforces compliance with service standards for licensed service providers;
- Supervises and enforces Customers` Charter which contains all rights and obligations for both, service providers and customer;
- Establishes and supports Customers` Consultative Committees in each service area - seven regions of Kosovo.

2.2.9 PUBLIC ENTERPRISES / COMPANIES

According to the Law on Public Enterprises (Law 03/L-087), public enterprises dealing with drinking water and irrigation water are classified into three groups: central public enterprise, regional public enterprise and local public enterprise as follows[12] :

- Central Public Enterprises
  - Public Company Hydro-system Iber-Lepenc JSC;
- Regional Irrigation Companies
  - Irrigation Company "Drini i Bardhe JSC
  - Irrigation Company "Radoniqi-Dukagjini" JSC
- Regional Water Companies
  - RWC "Pristina" JSC,Pristina
  - RWC "Hidrodrini" JSC, Peje
  - RWC "Hidroregjioni Jugor" JSC, Prizren
  - RWC "Mitrovica" JSC Mitrovice
  - RWC "Hidromorava" JSC, Gjilan
  - RWC "Radoniqi" JSC, Gjakova
- Local Public Enterprises
  - Water and Waste Company "Ibri", Zubin Potok
  - Water and Waste Company "24 Nentori", Leposaviq
  - Water Company "Bifurcation"JSC, Ferizaj / Kaçanik

11 WWRO 2009
12 Law No. 03/L-087 on public enterprises

 © Agjencia e Kosoves per Mbrojtjen e Mjedisit

2.2.10 WATER SUPPLY AND SEWERAGE ASSOCIATION OF KOSOVO (SHUKOS)

SHUKOS is a nongovernmental organization founded in order to establish an interconnection between the members themselves, to promote their common interests and to advance the fundamental issues of their scope. SHUKOS' primary members are all water supply and sewerage public enterprises in Kosovo. The highest association's body is the Assembly which elects the board of the Association. The Board consists of nine members, seven directors of RWCs, one representative of the Ministry of Economy and Finance and one representative of the Ministry responsible for water sector (Ministry of Environment and Spatial Planning, Water Department). SHUKOS has the Managing Director who is responsible to the board[13] .



Lumbardhi i Pejës

13 www.shukos.org



3. WATER RESOURCES

3.1 SURFACE WATERS

The annual average of water flow from Kosovo is approximately 3.8 x 109 or 121.2 m3 / sec, while the total accumulated volume in existing accumulations is 569.69 million m3, which represents only 15.7% of the total average amount. Most of the rivers belong to the Black Sea basin 50.7%, the Adriatic Sea 43.5% and Aegean Sea 5.8%. Most of the rivers are characterized by irregular seasonal flow. River flows are higher during winter or early spring.
Accumulative surface topography of Kosovo is 11,645 km2, which means that only 758 km2 or 6.5% is inconsistent with its total area (10,887 km2).

3.1.1 RIVERS AND RIVER BASINS

The hydrography of water flows of Kosovo is split into four river basins: the Drini i Bardhe, Ibri, Morava e Binçës and Lepenci.

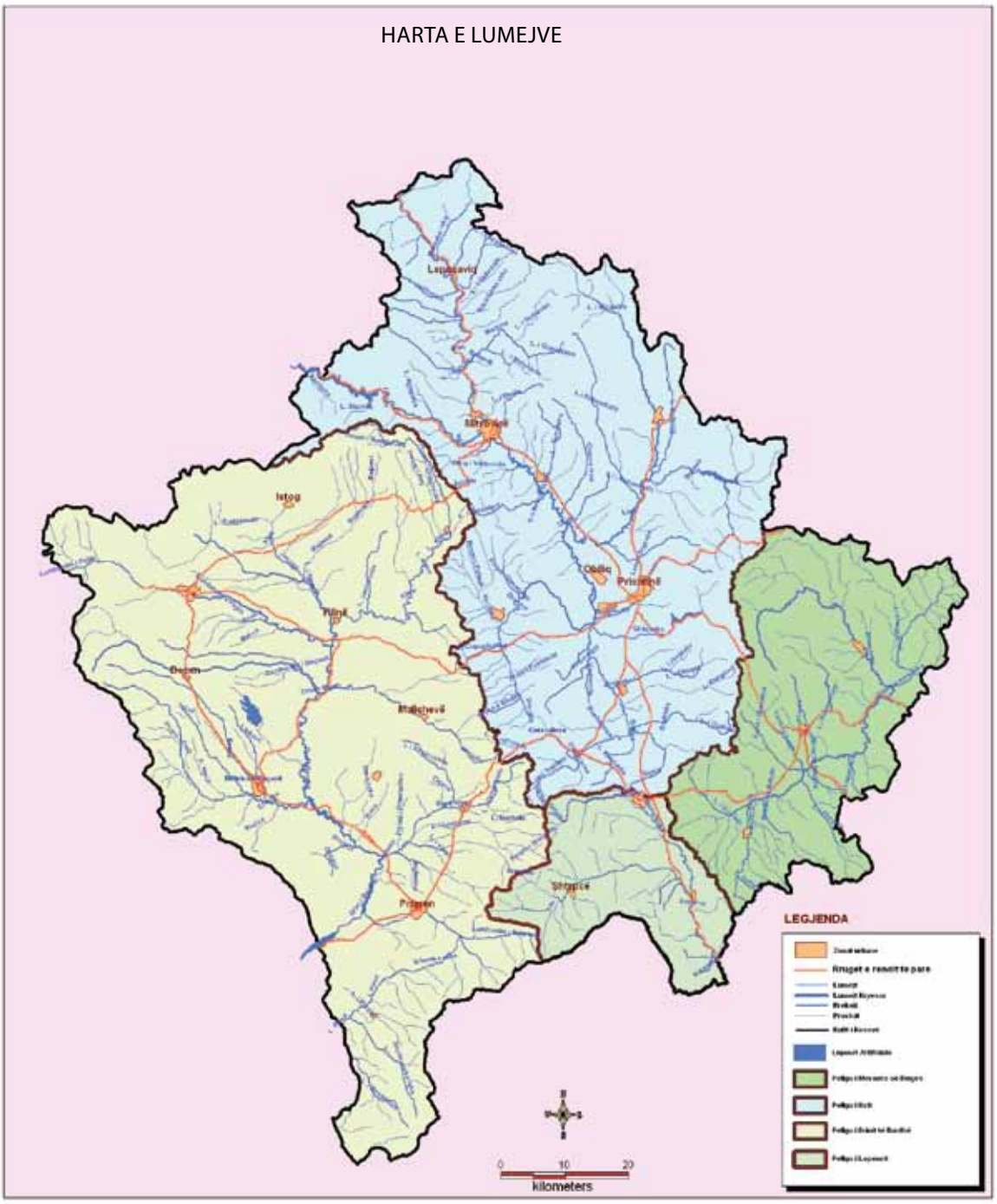
Kosovo river flows pour into three sea basins: Black Sea, Adriatic Sea and Aegean Sea. The main rivers that belong to the Black Sea basin are: Ibri, Sitnica with its branches (Llapi, Drenica); and Morava e Binçës. Rivers that belong to the Adriatic Sea is the Drini i Bardhe with its branches (Lumëbardhi i Pejes, Lumëbardhi i Decanit, Lumëbardhi i Prizrenit, Klina, Ereniku, Mirusha, Toplluha and Plava). The Lepenci river with its main branch (Nerodime) belongs to the Aegean Sea. Watershed lines (river basins), flow in different directions. The flow ratio ranges from 3.93 l/sec/km2 (Morava e Binçës) to 42.46 l/sec/km2 (Lumëbardhi i Decanit).

The Drini i Bardhe river has the greatest length in kilometres within the territory of Kosovo with 122 km, while the Lumëbardhi i Prizrenit is shortest with 31 km. Data on the length of main rivers within the territory of Kosovo are presented in the tab. 5.

Table 5 : Length in kilometres of main rivers in Kosovo[14]

Name	Length in km within Kosovo territory s	Surface km²
Drini i Bardhë	122	4.622
Sitnica	90	2.873
Lumëbardhi i Pejës	62	424.9
Morava e Binçës	60	1.552
Lepenci	53	679.0
Ereniku	51	510.3
Ibri	42	1.155
Lumëbardhi i Prizrenit	31	262.6

14 Facts on the environment, SOK, 2007



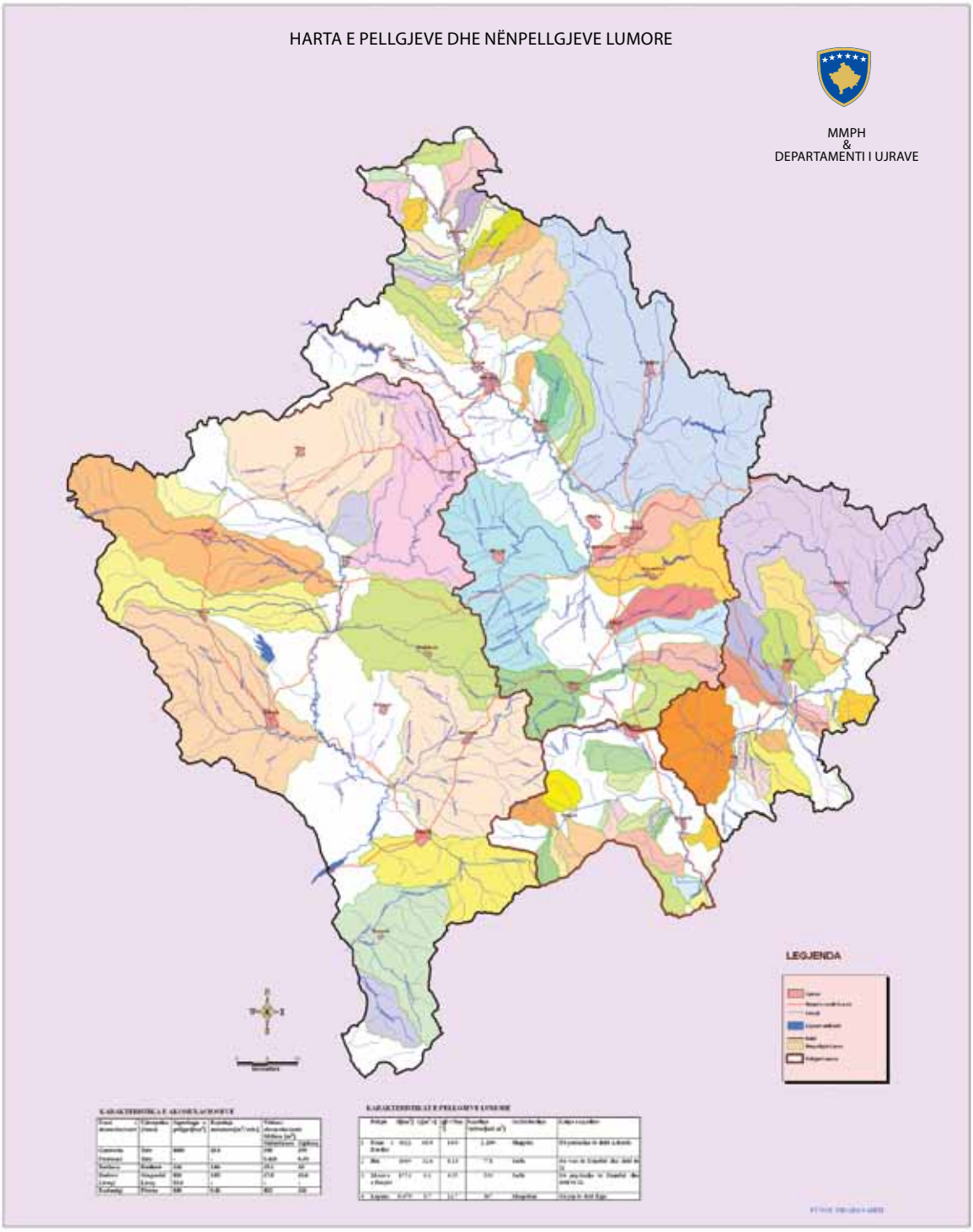
Map 2: Rivers and basins of Kosovo

Table 6 . River basins, surface, and water flowing amount [15]

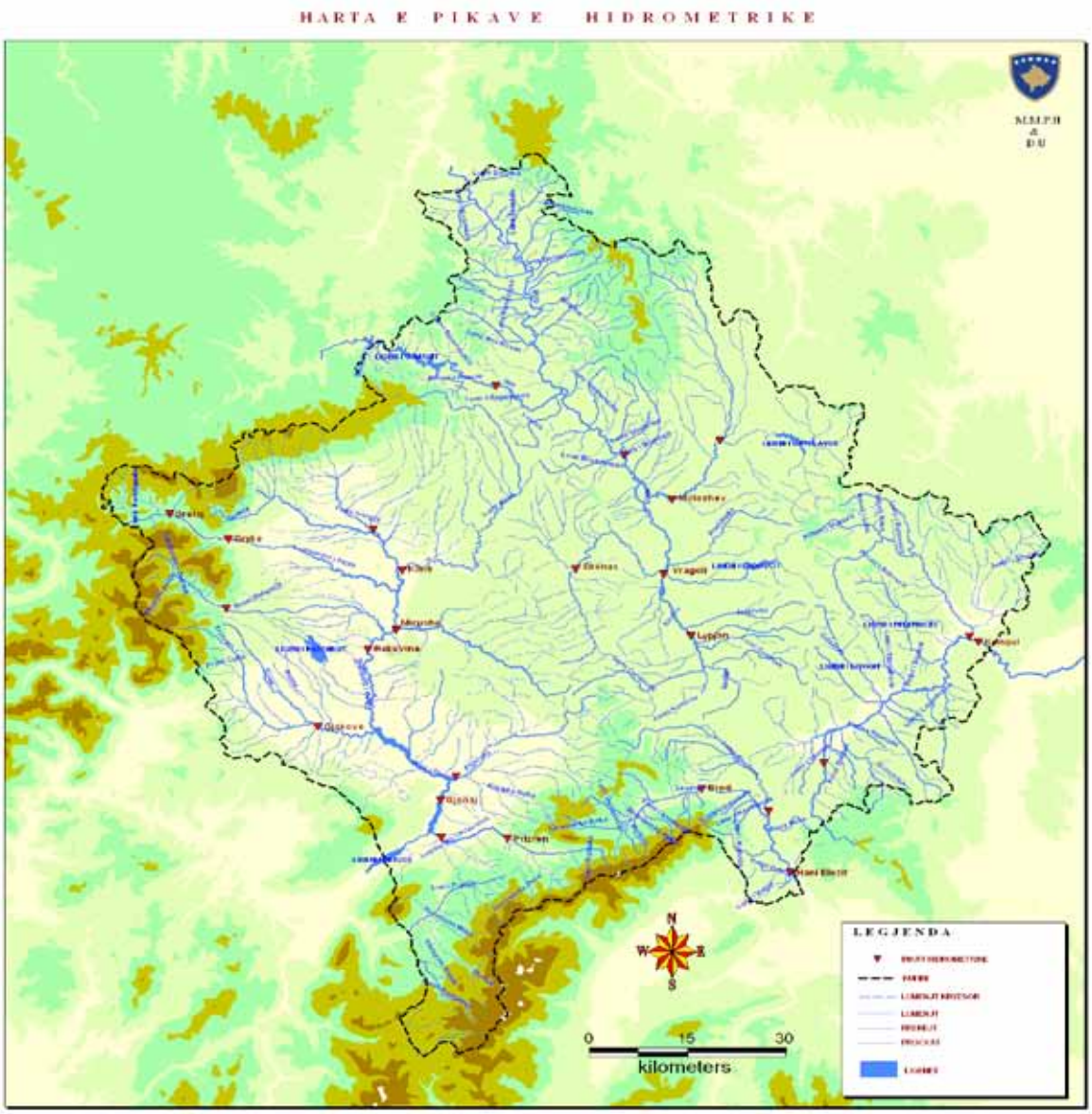
Nr.	River basin	S[km²]	Length in km²	Q[m³/s]	q[l/s*km²]	Annual water flow [million m³]	Watercourse
1	Drini i Bardhë	4649	122	61.0	14.6	2.200	Detit Adriatik
2	Ibri	4009	42	32.6	8.13	771	Deti i Zi
3	Morava e Binçës	1564	60	6.1	4.35	330	Deti i Zi
4	Lepenci	0.685	53	8.7	12.7	307	Deti Egje
5	Plava	252	-	4.71	18. 6	-	Detit Adriatik

15 Water master plan 1983

 © Agjencia e Kosoves per Mbrojtjen e Mjedisit



Map 3: River basins and sub-basins



Map 4: Map of hydrometric stations

The hydrometric network consists of a number of measuring stations across the rivers where continuous and coordinated measurements on the water volume and physical-chemical parameters are carried out.

The network has started to function in 2003, by the implementation of the project for the rehabilitation of Kosovo Hydro-Meteorological network, with a donation from EAR.

Within this project 22 hydrometric stations are installed.

At these measurement points, are primarily located digital sensors that permanently record the level of water and some of other physical-chemical parameters. During 2007 was implemented the project for overall rehabilitation of the Kosovo hydrometric network, through which initially are being monitored surface waters, while the ground water monitoring is expected to start function in the near future. In these stations are measured level, (h) and flow (Q). In the table 7 data on the maximal and minimal values, and average annual flow for some stations are presented.

Table 7: Maximal, minimal and average annual values of water flow (Q = m3 / s) of hydrometric stations

 © Agjencia e Kosoves per Mbrojtjen e Mjedisit

according to river basins [16]

NR.	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

3.1.1 SURFACE ACCUMULATIONS

In order to meet water needs for drinking, irrigation, fishing, tourism and electricity production, many countries have built dams to collect water streams and rivers, during the seasons with high flow rate and to use it during seasons when rainfall are very low and demand is very high. The negative and positive environmental impacts of water accumulations are presented in the following table.

16 KHMI, 2008

Table 8: Positive and negative environmental impacts from water accumulations

Positive impacts	Negative impacts
• Increased surface reserves and flooding prevention • Increased opportunities for fishing and water sports. • The dams created to prevent flooding and irrigation may be used to produce electricity through the Hydro power plants.	• flooding of large land areas and population displacement. • loss of abundant seasonal fields with nutritional elements, due to river erosion. • Intense evaporation and increased concentration of salt. • Land salinity, if used for irrigation. • Increase of diseases associated with harmful microbes, which multiply in the inflowing waters, as is the case of large reservoirs. • The risk of dam destruction. • Filling the reservoir with sediment, reducing its lifespan



Accumulation lake in Batllava

Kosovo has some surface water accumulations, otherwise known as artificial lakes (Batllava, Gazivoda, Radoniqi, Perlepnica and Badovci), as well as a number of small lakes for irrigation.

Table 9: Main water accumulation in Kosovo, surface, water flow and volu[17]

Name of accumulation	Water flow (River)	Area of basin [km2]	Average flow [m3/sec.]	Volume of accumulation Million [m³]	
				Shfrytëzues	Gjithsej
Gazivoda	Ibër	1060	13.5	350	390
Pridvorci	Ibër	-	-	0.435	0.49
Batllava	Batllavë	226	1.06	25.1	30
Badovci	Graçankë	103	1.05	20	26.4
Livoçi	Livoç	53.6	-	-	-
Radoniqi	Lumëbardhi i Deçanit	130	0.16	102	113

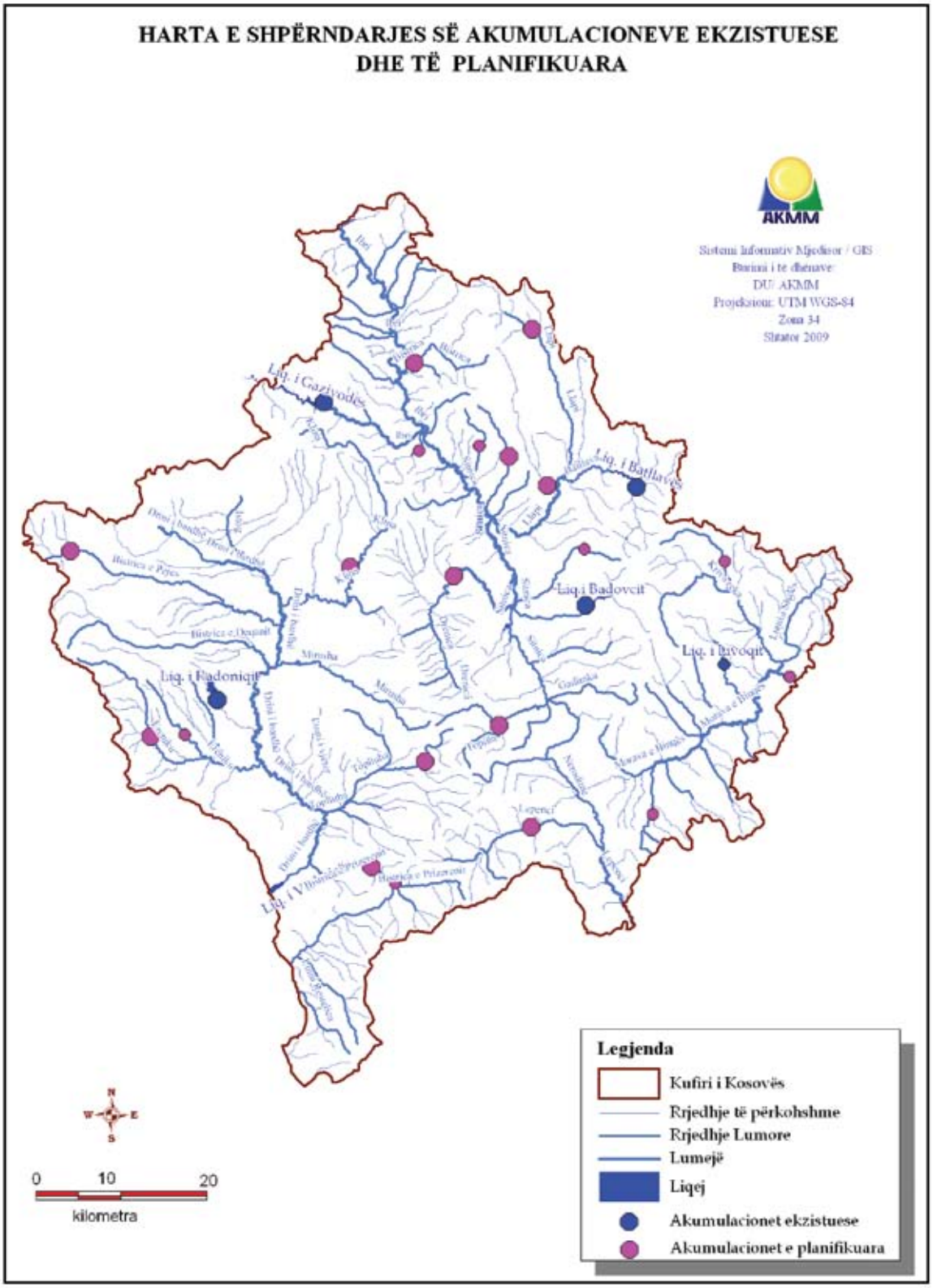
Table 10: Volume of Badovc and Batllava lakes, expressed in million m3 by different levels [18]

	Batllava Lake			Badovc Lake		
	Level according to geodesy altitude m	Volume (x million m ³)	Surface (km ²)	Level according to geodesy altitude m	Volume (x million m ³)	**Surface (km ²)**
Maximal level	635	38.00	2.25	650	26.400	**0.89**
Minimal operation level	614	3.60	0.21	632	6.500	**0.23**
Bottom level	**602**	**0.00**	**0.00**	**610**	**0.000**	**0.00**



Radoniqi gjatë thatësisë

17 Water Department, 2008
18 RWC Prishtina, 2008



Map 5: Existing and planned water accumulations

According to Water Master Plan (1983), in the territory of Kosovo are supposed to be built twenty additional surface water accumulations as well as a number of micro-accumulations. In the following table are presented some features of surface water accumulations planned for construction.

Table 11: The main features of water accumulations planned for construction

Nr	Accumulation	River/water flow	Surface (km²)	Average water flow (m³/s)	Annual water flow mil m³/vit	Volume million m³
1	Drelaj	Pejë-Bistrica e Pejës	173	4.65	146.6	84.5
2	Kërstovc	Lumi i Binçës	118	3.20 (2.16)	100.96 (68.20)	40
3	Movë	Lumi i Klinës	239	1.2.	37.80	34
4	Morinë	Llabenica	26	2.25 (0.73)	70.78 (22.87)	38
5	Ripaj	Lumi Trava	59	2.38 (1.35)	74.88 (42.65)	36
6	Reçan	Lumi Bistrica e Prizrenit	155	4.55	143,32	68
7	Dragaçin	Lumi Dragaçin	36	0.25	7.92	6.76
8	Kremenata	Lumi Kremenatë	56	-	15.90	8.75
9	Binçë	Lumi i Madhë	72	0.63	19.49	1
10	Konqul	Lumi Morava e Binçës	1632	6.86	216.03	120
11	Firajë	Lumi Lepenc	229	5.34	168.30	16.5
12	Shtime	Lumi Topillë	102	0.66	20.91	113
13	Cecelija	Lumi i Zi	47	0.41	12.92	21
14	Makovc	Lumi Prishtevka	26	0.19	6.01	10
15	Majanc	Lumi i Kançandollit	88	0.68	21.35	30
16	Vaganic	Lumi Lushta	46	0.23	7.24	8
17	Miraçë	Lumi Tërstena	31	0.20	6.30	6
18	Dobroshevcë	Lumi Drenica	35	1.38	43.4	23.2
19	Pollata	Lumi Llap	111	1.23	38.63	37.5
20	Bistrica	Lumi Bistricë e Prizrenit	159	1.40	44.24	25



Foto 3: Lumbardhi i Prizrenit, nearby Reçan

3.2 GROUND WATERS

Groundwater reserves in Kosovo are not researched enough. Groundwaters in Kosovo are located in rocks of different formations, from Paleozoic to Quaternary. These reserves are important for drinking water supply needs, industry, agriculture etc. Currently the use of groundwater in Kosovo is made mainly through wells and sources. The following table shows data on groundwater accumulation in the Drini i Bardhe river basin

Table 12: Ground water accumulations, surface, volume and capacity in the area of Drini i Bardhe river basin.

Nr.	Groundwater accumulation	Basin (km^2)	Useable volume (m^3)	Estimated capacity	
				m^3/sec	Total (m^3)
1	Istog	76	$12x10^6$	2,8	$89x10^6$
2	Vrellë	28	$14x10^6$	0,600	$19x10^6$
3	Drini i Bardhë	90	$14x10^6$	3,23	$102x10^6$
4	Lubizhdë	42	$45x10^6$	4,2(150)	$55x10^6$
5	Pejë	300	$37,5x10^6$	4,0(150)	$52x10^6$
6	Deçan	144	$33x10^6$	3,5(150)	$45x10^6$
7	Lloqan	39	$12x10^6$	1,2(150)	$15x10^6$
8	Krk Bunar	81	$10x10^6$	1,6	$50x10^6$
9	Korishë	18	$3,6x10^6$	0,38	$12x10^6$
10	Fusha e Therandës	50	$75x10^6$	2	$63x10^6$
Total		998	$271x10^6$		$511x10^6$

The complex geological and geo-tectonical conditions have influenced the way of the creation, expansion, and movement of groundwater resources to be different in the territory of Kosovo, due to the presence of water-non-penetrable rocks. The territory of Kosovo, has a complex geological construction and it is characterised with terrains with granular and inter-granular porous aquifers (Neogene's and Pliocene's alluviums and sediments); aquifers with rift porosity, carstic aquifers (limestone, marble) as well as with insulator and terrains, flysch, schist[19] .

The alluvium aquifers of gravel and sand are prevalent in all water flows. Their dimensions correspond to the size of the river alluviums and cover the area of 2650 km2 or 24.3% of the Kosovo territory. A larger expansion have the alluviums of: Drini i Bardhe, Sitnica, Morava e Binçës, Lumëbardhi i Pejes, Lumëbardhi i Prizrenit, Lumëbardhit i Decanit, Drenica, Klina, etc.

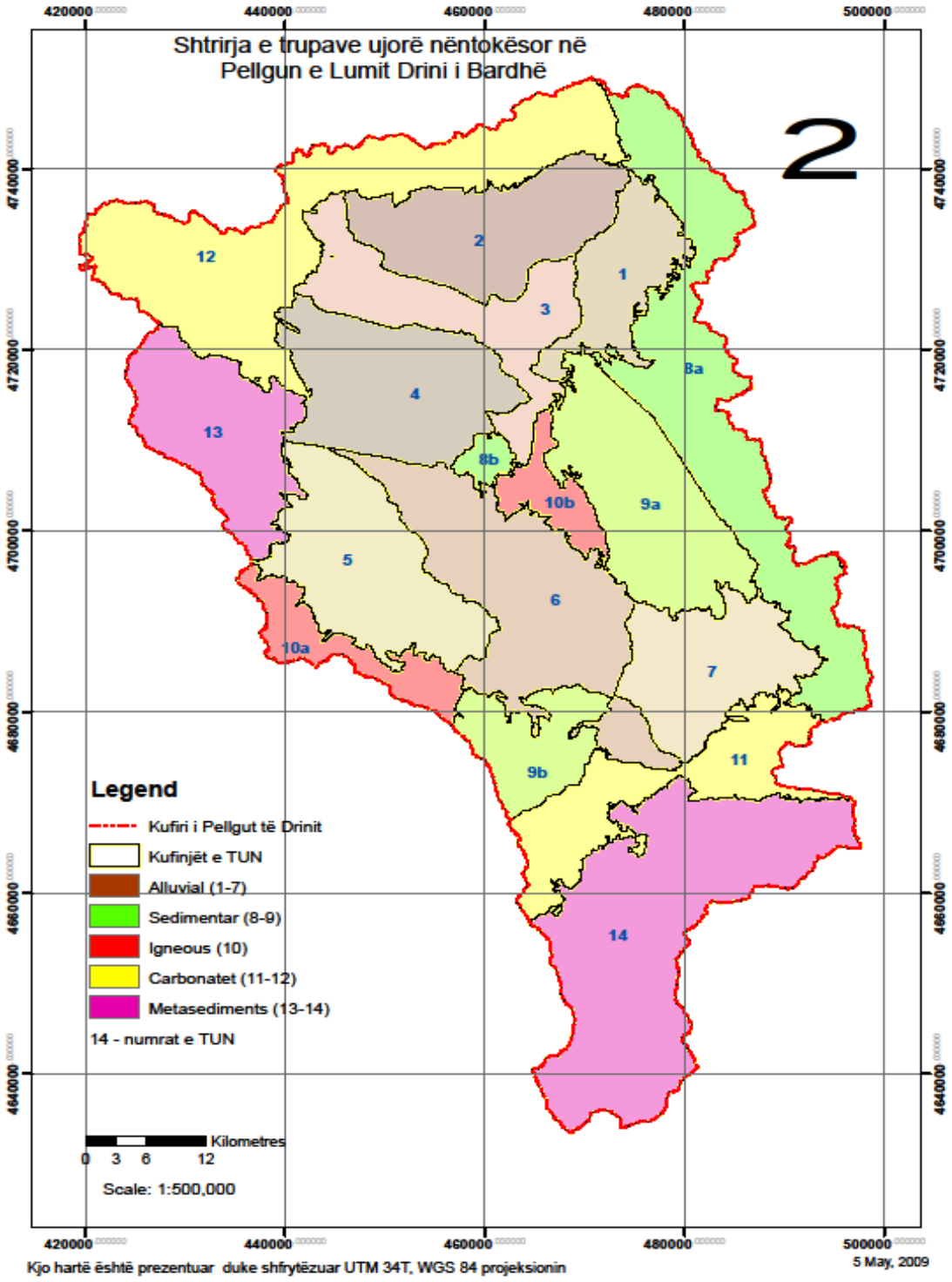
Alluvium of Sitnica-is represented by sand and gravel with inter-granular porosity thickness of 3-20 m and a flow of 3-15 l/sec.

Alluvium of the Drini i Bardhe - has a thickness of 10-35 m, with thickness of water horizon 3-15 m and water flow of 50-20 l/sec. Groundwater level is at depth of 2.5-15.5 m

Alluvium of The Morava e Binçës - has a thickness of 3-10 m, with a flow of up to 8.0 l/sec and the depth of the water level up to 2.0 m.

Alluvium of Llapi - thickness of up to 10 m, water level depth of 2-9 m and flow 3-10 l/sec

19 Kosovo hydro-geologic construction, Vilimirovic J,



Map 6: Groundwater bodies in the Drini i Bardhë river basin[20]

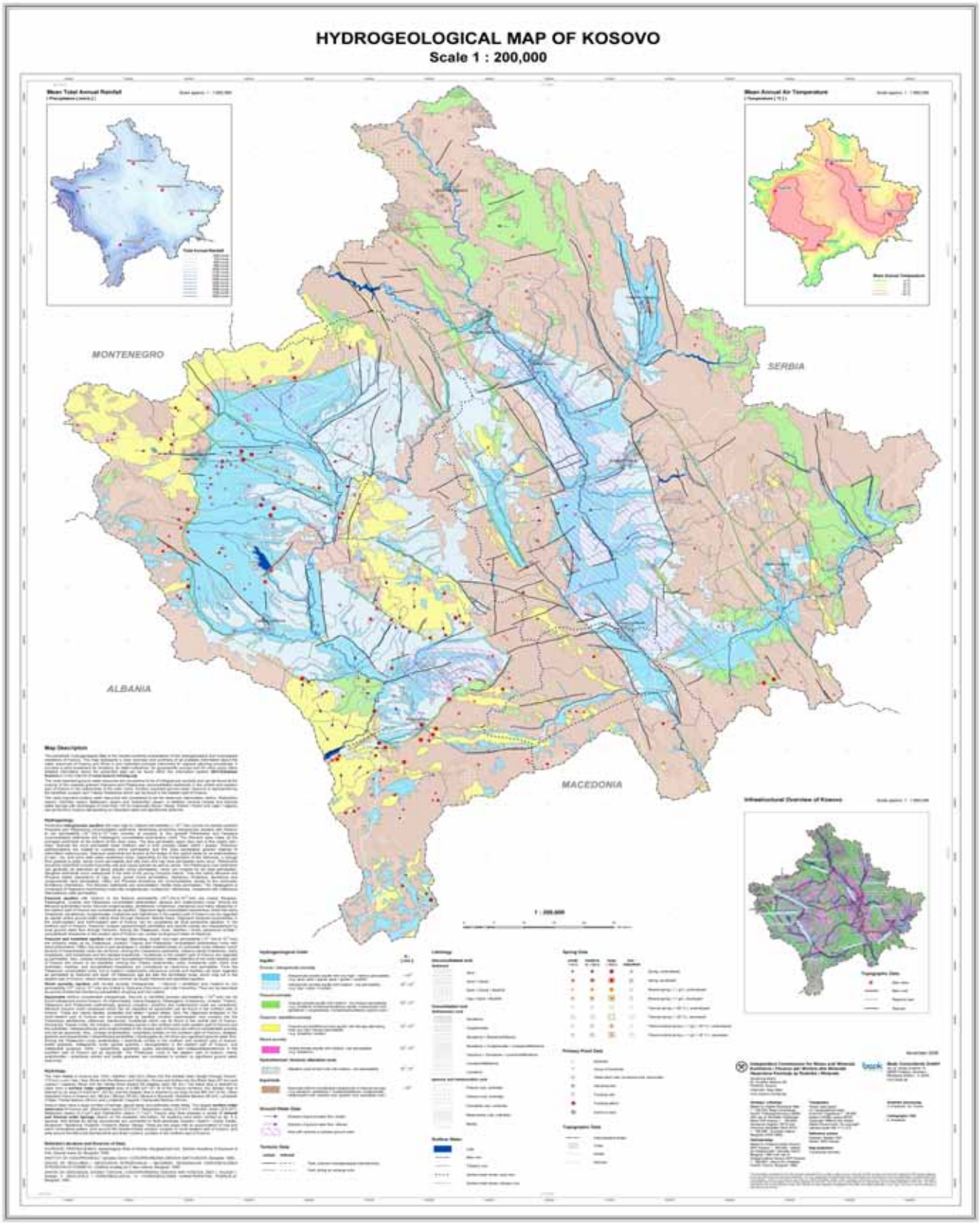
20 The project on institutional support for the MESP and River Basins Authority

Carstic aquifers - The carstic terrains are constructed from karstified limestone of Triassic and Cretasic age and marbles of Paleozoic. It covers an area of 1300 km2 or 11.0% of Kosovo territory.

The limestone building masses construct the western and south-western parts of Kosovo, west of Peja, Istog and Decan. Large limestone masses are present in Pashtrik and Rahavec-Klina region, while small masses appear in Sharr, Lepenc Valley, near Gjilan, Novo Bërdë, Golesh, Stan-Tërgë etc. It is particularly important the complex limestone of Triassic groundwater who pour out through sources and large water flow rills as the source of Drin i Bardhe, Source of Istok, source of Vrellë, Banja etc. with maximum flow of 0.15 to 10 m3/sec. Smaller karst springs with a flow of 10-20 l/ sec appear to Novo Bërda, Stan Tërgu, Hoqa e Madhe, etc. Total exploitation reserves of all karst groundwater are assessed to be over 8.0 m3/sec.

The Neogene aquifer basins- The Neogene sediments in the Kosovo territory includes the area of 1.650 km2 , or 15.1% of the territory. Represented by clay, sand and gravel, with less content of sand, limestone and conglomerate with various thickness. Such areas are the Besiana basin with thickness of up to 300 m, the basin of Kosovo plain up to 1000 m, Drenica 300 m, the Morava e Binçës to 700 m and the Dukagjini plain up to 2000 m. The Neogene sediments are present with the sand and gravel aquifers with about 5-15 m thickness and a flow of 2-10 l/sec. In these sediments are found significant groundwater reserves with pressure (Gjakova, Besiana, Drenica, Ferizaj, Vragoli, Vrellë etc).

In the new region of Malesia e re (Suharekë, Prizren) the sediments in the depth of 50-120 m are presented with three layers with artesian water (pressure) with a flow of 5-10 l/sec.



Map 7: Kosovo Hydro-geology [21]

21 Modified by BIK-u and Independent Commission for Mines and Minerals, 2005

3.3 THERMAL AND MINERAL WATES

The territory of Kosovo is rich in thermal and mineral water springs. So far, there has been little research to identify and study the values of these resources. According to the data recorded so far, there are about 30 thermal and mineral water sources in Kosovo. More detailed studies are conducted for the thermal sources of "Banja e Pejes", "Banja e Kllokotit" and "Banjska", which function as a healing thermal baths. Besides healing aspect, the Kosovo thermal waters can also be used for thermal power generation, but so far has not been any detailed study to analyze the production potential of these waters. In general, temperature of thermal and mineral waters in Kosovo ranges between 17-54 0C, while the degree of mineralization between 2-5 g/l. Sources of thermal and mineral waters in Kosovo contain sulphates, hydrocarbons, calcium and magnesium. The table.13 shows physical and chemical characteristics of some thermal-mineral sources of Kosovo.

Në tab.13 janë prezantuar karakteristikat fiziko-kimike të disa burimeve termominerale të Kosovës.

Table 13: Physical-chemical characteristics of some thermal-mineral water sources of Kosovo [22]

Nr	Locality	Q l/sec	t °C	pH	Mineralization g/l	Specific components	Gas content
1	Banja e Pejës	4,00	48.9	6.9	2.04	H_2SiO,Ra	**CO_2**
2	Banja e Kllokotit	10,00	32.0	6.6	3.601	CO_2Ra,H_2	**CO_2**
3	Banjska	2.50	50.0	6.7	1.356	H_2SiO_3	**CO_2**
4	Banja e Runikut	15.00	24.8	7.1	0.598		**CO_2-N_2**
5	Burimi i Nxehtë i Runiku	5.00	23.0	7.2	0.61	Ra	**CO_2-N_2**
6	Gojbula	-	12.0	6.3	2.193	CO_2	**CO_2**
7	Uji i Lluzhanit	0.01	14.0	6.3	1.144	Ra,H_2SiO_3	**CO_2**
8	Studencia	1.0	25.0	7.1	0.670	-	**CO_2-N_2**
9	Deçan	2.00	12.5	6.3	1.433	CO_2	**CO_2**
10	Getnja e Sipërme	0.1	9.0	6.6	2.539	-	**CO_2**
11	Poneshi	0.03	13.0	6.3	3.539	CO_2, Fe	**CO_2**
12	Pokleku	1.00	13.0	6.3	3.52	Fe,Ra,CO_2 H_2SiO_3	**CO_2**
13	Uglari	6.00	25.00	6.8	0.688	--	**CO_2-N_2**
14	Zhitija	0.3	20.0	6.5	5.126	Fe,CO_2	CO_2
15	Dobërçani	--	26.8	6.4	--	--	CO_2, H_2S

In order to more rationally use the thermal and mineral waters in Kosovo, in the future should be paid special attention to developing strategies for using these waters; regulation of infrastructure and urban planning, conduct detailed research on the physical-chemical characteristics and quality of these water; and research on assessment for the potential geo-thermal energy productivity of these waters.

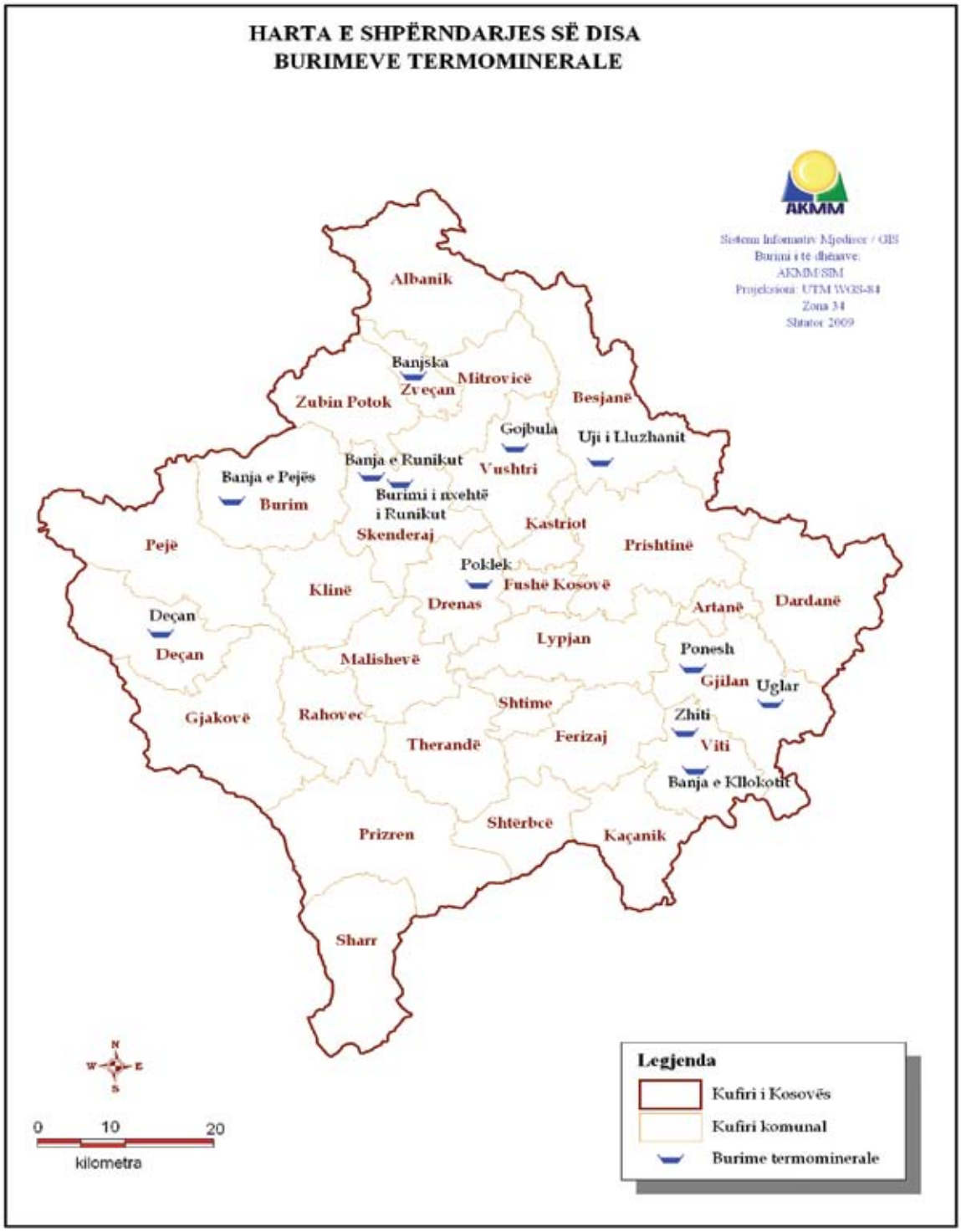
22 Kosovo geo-thermal energy and its development perspective, Avdi Konjuhi et al



Thermal-mineral source of "Banja e Pejës"



Vendburimi i ujit termomineral në Banjë të Skenderajt



Map 8: Some thermal-mineral water sources

3.4 RAINFALLS

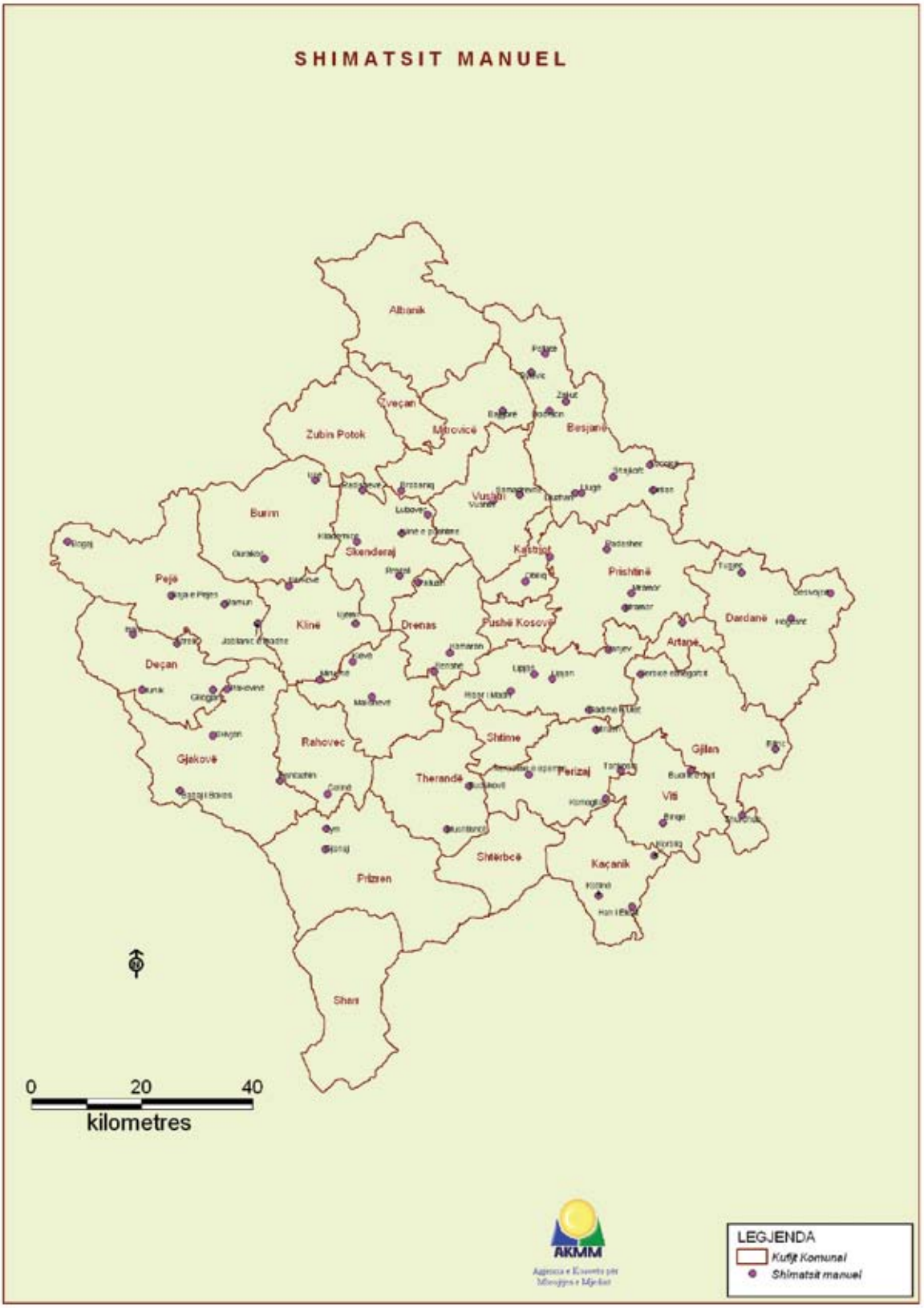
All forms of atmospheric precipitation are present in Kosovo. A greater importance have rainfalls in the form of rain in the valleys and rainfall of snow in high mountain areas (Bjeshket e Nemuna and Sharr Mountains), where in the eastern part of Kosovo, during the year fall on average (600 mm), while in the west over (700 mm). During the year, the largest amount of precipitation falls in the Bjeshket e Nemuna (1750 mm). The snowfalls are common in the winter season. In the lowlands of Kosovo, in average 26 days are with snowfall, while in mountain areas over 100 days.

The first station to measure the rainfalls in the territory of Kosovo has started observations in 1925. After the war, by the establishment of state institutions, it is established the KHMI, which takes records of rainfall through observation stations located in several locations in Kosovo.

The existing stations network of rainfall is comprised of 13 automatic and 53 manual rain-gauges



The rain-gauge placed at KHMI's garden



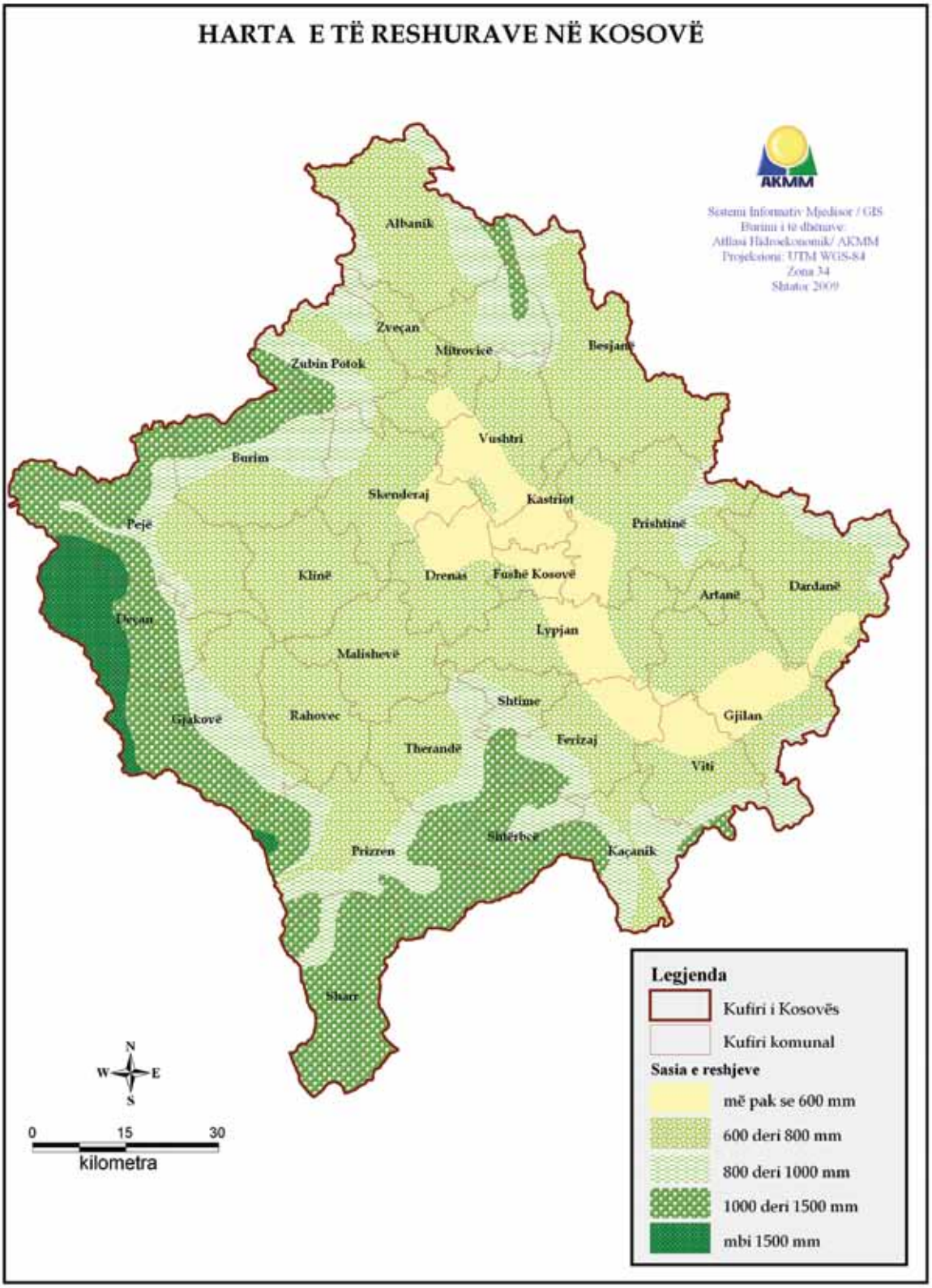
Map 9: Manual rain-gauges in the Kosovo territory

According to data recorded in the measurement stations, the annual average rainfalls in Kosovo varies from 570 mm (Dardana) to 1408 mm (Junik). Data on annual average values of rainfall for 37 locations in Kosovo are presented in the tab.14.

Table 14: Average annual rainfall values by months for the period 1948-1978 [23]

Nr	Location	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	mes/vjet
1	Bella Cërkv	60	55	60	58	71	63	51	37	67	69	90	78	766
2	Bostane	54	51	48	62	84	74	55	48	53	82	84	61	751
3	Budakovë	62	53	55	77	97	83	68	49	61	80	80	81	848
4	Qyqev	69	68	63	71	84	80	73	57	61	80	101	91	899
5	Çallapek	94	78	62	64	74	65	53	34	62	83	106	95	870
6	Devet Jugoviq	39	40	37	54	72	67	53	41	46	60	68	56	634
7	Dollc	72	56	52	54	65	54	57	42	55	68	90	85	748
8	Domorovc	43	44	52	46	67	63	49	33	49	51	63	57	609
9	Repish i Posh.	101	80	64	62	68	50	45	36	60	86	118	103	871
10	Duhël	44	48	44	66	71	64	50	37	54	67	80	68	690
11	Gjakovë	108	90	78	74	75	47	52	43	75	90	123	127	981
12	Gjurakocë	67	54	51	50	61	50	53	48	48	66	85	77	706
13	Gllaviçicë	102	79	61	61	68	57	46	44	51	86	111	108	865
14	Gllogjan	84	69	52	61	59	44	50	38	56	77	101	95	786
15	Gjilan	39	36	36	45	73	63	47	41	43	55	64	51	593
16	Janjevë	43	45	42	56	32	69	46	38	45	56	63	57	632
17	Juniku	158	142	113	107	94	83	64	46	88	140	194	183	1408
18	Kijevë	54	47	39	50	79	54	49	40	57	60	81	70	680
19	Korbuliq	71	73	58	81	114	86	59	50	69	79	83	80	903
20	Dardanë	44	40	40	39	58	61	49	38	43	51	58	49	570
21	Mitrovicë	42	40	40	46	60	68	48	41	44	54	67	58	608
22	Leshan	42	43	42	46	73	65	55	41	46	50	56	52	610
23	Lipjan	44	40	41	52	71	72	50	45	51	54	62	55	633
24	Nedakovc	47	42	38	49	63	65	50	45	48	55	70	37	628
25	Rahovec	59	58	53	58	69	65	54	40	67	68	84	77	753
26	Orllan	42	45	50	57	76	66	51	38	61	63	77	62	689
27	Pejë	97	71	71	64	76	63	53	42	53	85	114	101	886
28	Besianë	39	42	37	51	70	68	52	40	49	56	67	51	632
29	Ponoshec	105	112	95	82	85	51	58	42	82	115	168	146	1142
30	Prishtinë	35	35	34	51	72	73	47	43	48	54	62	51	598
31	Prizren	65	56	59	61	72	59	58	38	65	62	79	73	747
32	Skenderaj	45	43	35	47	60	49	52	42	43	54	71	59	600
33	Suharekë	49	47	50	57	76	66	48	41	59	59	67	65	687
34	Ferizaj	49	45	49	52	80	71	62	49	52	60	68	55	688
35	Vushtrri	45	41	35	45	61	62	50	48	48	65	67	57	615
36	Jazhicë	87	72	81	85	114	93	81	53	75	78	97	91	1006
37	Kaçanik	80	66	69	68	94	70	63	43	59	77	90	79	858

23 KHMI, 2008



Map 10: Distribution of rainfalls in Kosovo [24]

24 IKHMI 2009



The Radoniqi lake during the dry season in 2007



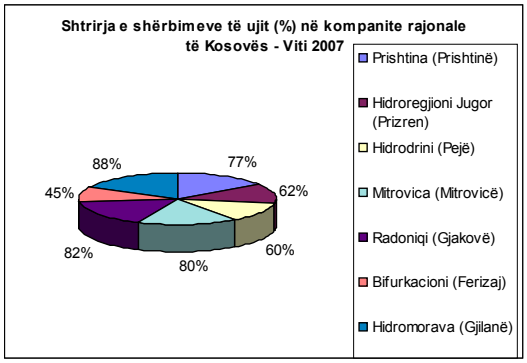
Drini i Bardhë



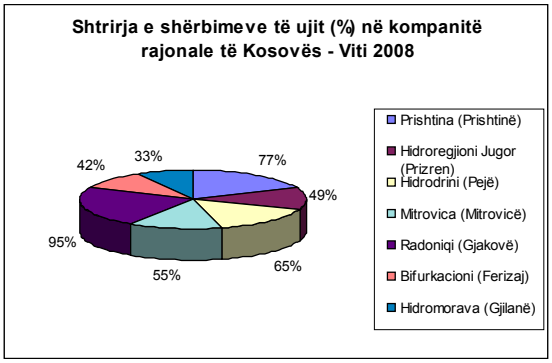
4. WATER USE

4.1 THE USE OF WATER FOR DRINKING AND HOUSEHOLD

Water services in Kosovo are provided by seven licensed Regional Water Companies (RWC). The RWCs offer services in 25 municipalities of Kosovo. Serb majority municipalities (Strpce, Novobërdë, Leposavic, Zubin Potok, Zvecan and the northern part of Mitrovica) are not provided with services by the RWCs. Apart from major cities, these companies provide their services in some of the villages located within their service areas.



a)



b)

Figure 1:Extent of water services (%) by the RWCs [25]
For years a) 2007 and b) 2008

Table 15: The RWCs performance for 200825

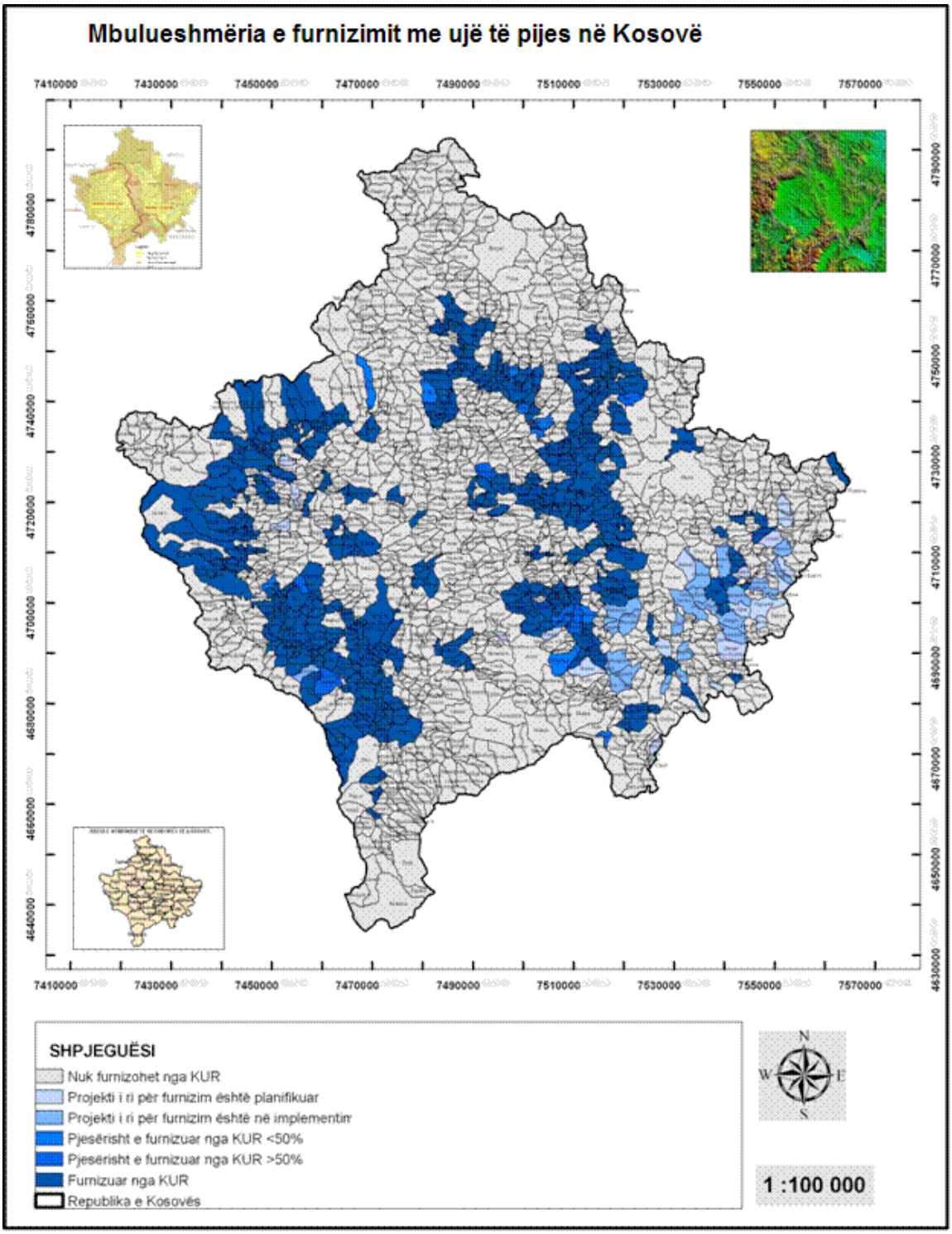
RWC	Number of municipalities covered with services	Number of consumers	Number of population covered	Water supply extension %	The sewerage extension %
Prishtina	7	82,443	445,432	77	66
Hidroregjioni Jugor	4	28,464	189,069	49	44
Hidrodrini	4	28,996	157,120	65	34
Mitrovica	3	20,780	116,440	55	47
Radoniqi	3	26,667	158,394	95	62
Hidromorava	3	15,901	86,413	33	36
Bifurkacioni	2	14,947	79,816	42	29
Gjithsej	25	219,198	1,232,683	60	48

Based on the number of household customers that are billed by RWCs, the WWRO has estimated that the number of people who were offered with water services is 1,232,683 people (or 60% of total population), while with sewerage services are covered 987.130 inhabitants (or 48% of total population)[26] .

Also, there is a considerable number (about 200) of rural water supply systems that are not operated by RWC's, but from communities such as villages and are not included in this assessment. This figures must be added to water systems in municipalities with a Serb majority, which are not managed by RWC's. Having taken into account the factors

25 WWRO, 2008
26 Performance review of RWCs, report. WWRO 2008

above, it is estimated that the coverage of water supply services in Kosovo is about: 70% -75%, while the sewerage services: 50% - 55%



11: Service coverage of water supply from public water supply systems

Total production of water distributed by regional companies in 2008 was 127.3 million m3. More than half of the water amount (55%), is obtained from surface sources (accumulations), while the rest (45%) from underground natural sources. The following table reflects the sources of water supply and quantity in m^3 / day.

Table 16 . Sources of drinking water supply, daily and annual quantities (m^3)[27]

Nr.	Place of water abstraction	Amount of used water [m^3 / day]	Amount of used water [m^3 / year]	Percentage [%]
1	Natural sources	153.264	55.941.360	32.10
2	Reservoir	7.749	2.828.385	1.62
3	River	11.191	4.084.715	2.34
4	Lake (surface accumulation)	279.260	101.929.900	58.44
5	Wells	26.340	9.614.100	5.51
Total		**477.804**	**174.398.460**	**100**

The table shows that the largest amount of drinking water is used by surface accumulations.

Of the total amount of water produced by regional companies, 55.7 million m3/year is billed to customers, while another amount of 71.6 million m3 (or 56%) is (lost) water that is not billed because of technical and administrative losses. The overall length of water supply network that is operated and maintained by RWCs is 3.357 km, while the sewerage system of wastewater is 938 km. As a result of high losses from the system of water supply and because of insufficient production capacity, most of the Regional Water Companies are unable to provide uninterrupted water supply to consumers. Thus, customers of the region of Mitrovica, Pristina, Gjilan and Ferizaj, face regular water supply cuts, which cuts are more prevalent during summer months, when water consumption increases significantly.

Commercial losses are also high, as a result of illegal connections, which are often due to technically inappropriate connection problems. It also decreases the drinking water quality.

Other problems include: inadequate capacity to retrieve the water resources, non-rational consumption and large amount of losses in the network, old filtering and limited capacity stations, lack of adequate urbanisation in the settlements, expansion of water supply system even if the water capacity is limited, lack of stimulating actions for drinking water saving, lack of professional human resources for water management, etc.

27 SHUKOS



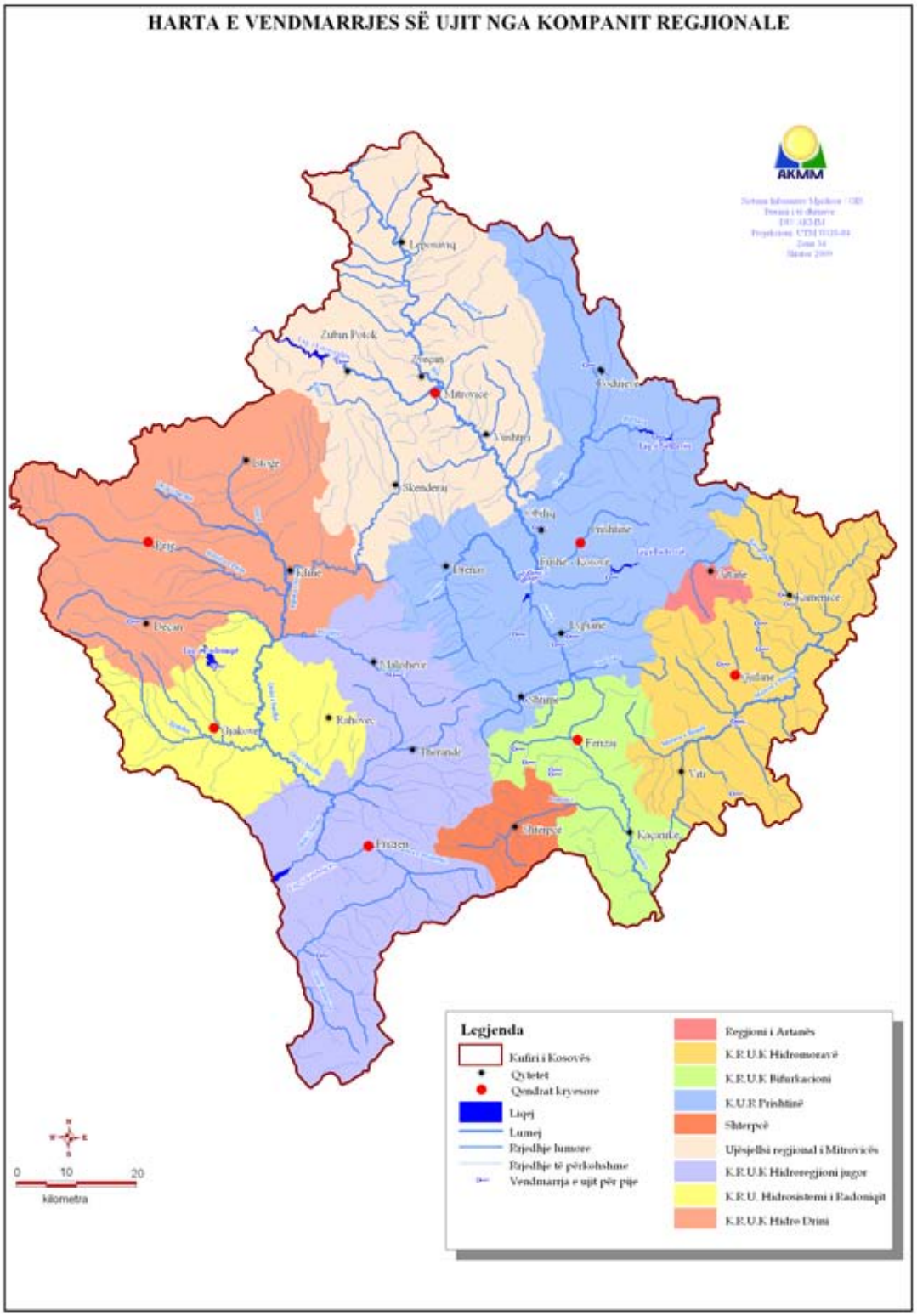
The spring of Drini i Bardhë, one of drinking water sources

Table 17. Sources of water supply from water supply companies and the annual amount (m^3) [28]

		RWC "HIDRODRINI" PEJË	RWC HIDROSISTEMI "RADONIQI" GJAKOVË	RWV "HIDROREGJIONI JUGOR " PRIZREN	RWV "PRISHTINA" PRISHTINË	RWC "HIDROMORAVA" GJILAN	RWC "BIFURKACIONI" FERIZAJ	"IBËR LEPENCI"
Water sources	Nr. of sources	13		1		3	4	
	Annual amount m^3	38,302,370.00		13,311,185.00		2,680,560.00	1,458,175.00	
Lakes	Nr. of lakes		1		2	1		**1**
	Annual amount m^3		20,803,540.00		36,249,610.00	3,311,280.00		**25,811,895.00**
Rivers	Nr. of rivers			1			3	
	Annual amount m^3			732,920.00			3,352,560.00	
Reservoirs	Nr. of reservoirs	1		1				
	Annual amount m^3	2,199,490.00		628,895.00				
Wells	Nr. of wells	1			30	2		
	Annual amount m^3	10,010.00			8,814,020.00	819,790.00		
Drillings	Nr. of drillings			1				
	SAnnual amount m^3			434,715.00				
Total		**40,601,870.00**	**20,803,540.00**	**15,107,715.00**	**45,063,630.00**	**6,811,630.00**	**4,810,735.00**	**25,811,895.00**

28 Water Department, 2009

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Map 12: The places of water abstraction by the RWC s

4.2 THE USE OF WATER FOR IRRIGATION

About 400,000 ha of agricultural land in Kosovo, from total 1,088,000, are suitable for irrigation. Land areas along the major rivers are suitable for irrigation. About 50,000 ha of agricultural lands are very suitable for irrigation and about other 100000 ha could have been favourable, with some slight remedial measures. The largest portion of irrigated land is in the Peja region with about 39.5% of the total area of cultivated agricultural land, while the smallest area is in Gjilan region with 4.8%. Irrigated land surfaces by regions in Kosovo are presented in the following table.

Table 18: Irrigated areas by regions [29]

Region	Irrigated area (ha)	Total surface of cultivated agricultural land (ha)	% of irrigated land
Kosova	39.368,7	226.905	17.4
Prishtinë	5.926,4	56.984,9	10.3
Mitrovicë	4.206,7	38.347,2	10.9
Pejë	12.696,5	32.086,6	39.5
Gjakovë	10.694,4	27.385,0	39.0
Prizren	2.551,6	24.949,4	10.2
Ferizaj	2.013,7	21.102,1	9.5
Gjilan	1.276,4	26.049,7	4.8

Currently, the irrigation system in Kosovo is administered by the central public enterprises: The Public Enterprise "Hidrosistemi Iber Lepenc" and two company for Regional Irrigation: "Drini i bardhe" and "Radoniqi-Dukagjini [30]".

The main characteristics of the irrigation schemes by the Irrigation Companies are presented in the table below.

Table 19: Characteristics of major schemes of official irrigation in [31]

Scheme	Type of irrigation	Equipped surface (ha)	Irrigated surface (ha)	Surfaces irrigated by present schemes and water sources during seasonal peak(ha)
Ibër Lepenc	Sprinkler irrigation	20.000	515	14.500[1]
Radoniqi	Sprinkler irrigation	8.600	4.700	5.000
Dukagjini	Surface and sprinkler irrigation	5.000	800	2.500
Drini Bardhë Pejë	Surface irrigation	6.500	1.300	2.500
Istog	Surface irrigation	8.500	1.350	2.000
Lumi Bardhë	Surface irrigation	8.500	1650	3.000
Total		**57.100**	**10.315**	**29.500**

29 The seurvey of economic agricultural households, SOK 2007
30 The Law on Public Enterprises
31 Ministry of Agriculture, Forestry and Rural Development

The table 20 shows irrigated areas by Public Companies for the period 2008-2009, while the figure 2 shows the chronology of irrigated areas for the period 2000-2008

Table 20: Irrigated areas by Public companies 2008-2009[32]

Irrigation Company	Area irrigated/ha 2008	Area irrigated /ha 2009
Iber-Lepenci	1424	**1132**
Radoniqi dhe Dukagjini	5248	**5234**
Drini i Bardhë	1650	**1050**
Total	**8322**	**7416**

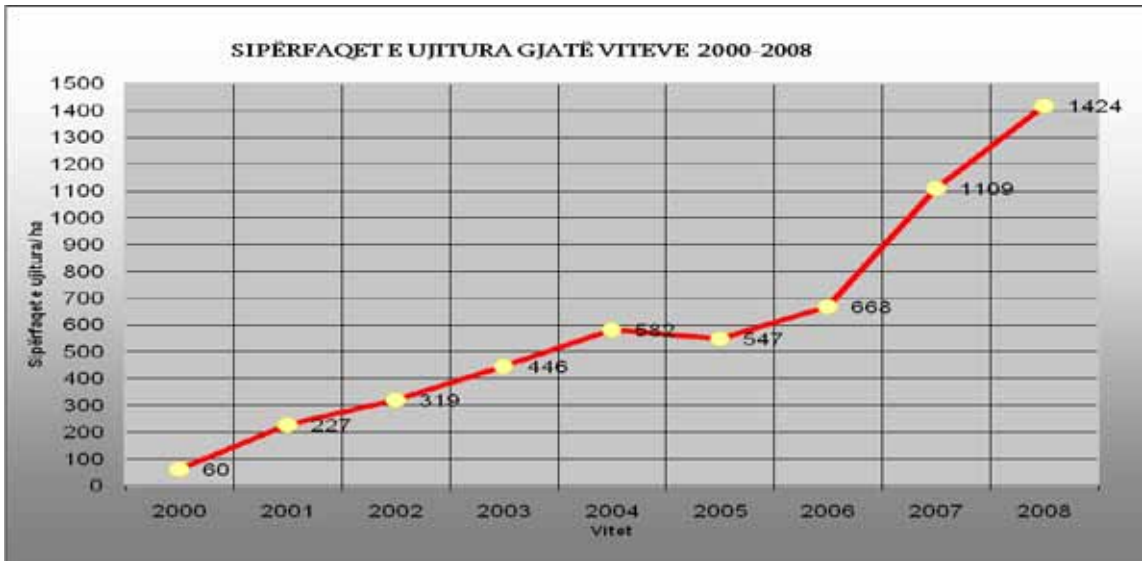


Figure 2: Irrigated areas (ha) by "Ibër Lepenc" for the period 2000-2008

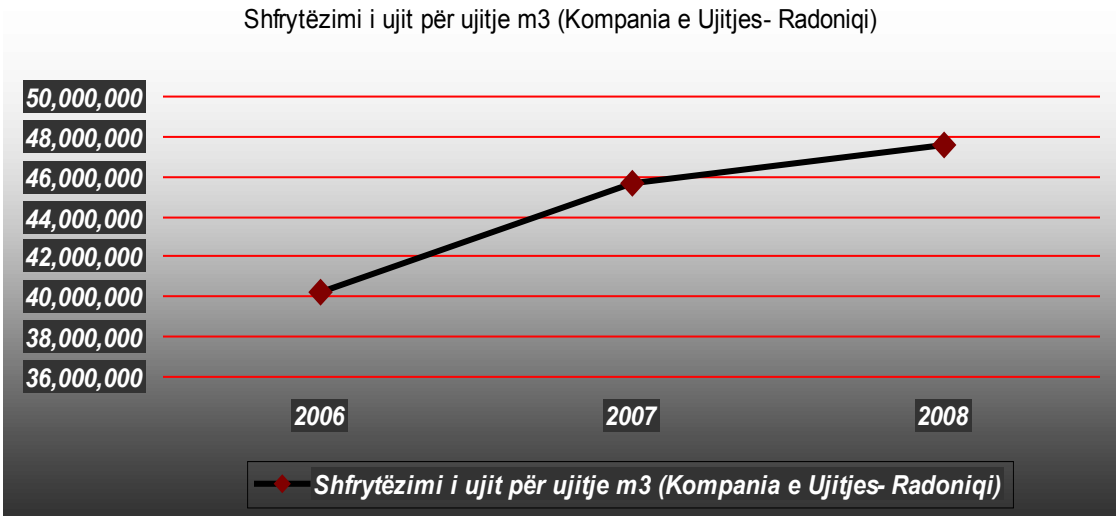


Figure 3: Water used for irrigation from the irrigation company Radoniqi

32 Ministry of Agriculture, Forestry and Rural Development

In the figure 3, is presented the water amount used for irrigation from the Irrigation Company "Radoniqi" for the period 2006-2008, where is indicated an increase of water consumption in this sector.

Based on a survey conducted by the Department of Irrigation in MAFRD, it is proved that in 2005 the area under informal irrigation (out of Irrigation Company) was about equal to the area irrigated by the Irrigation Companies.

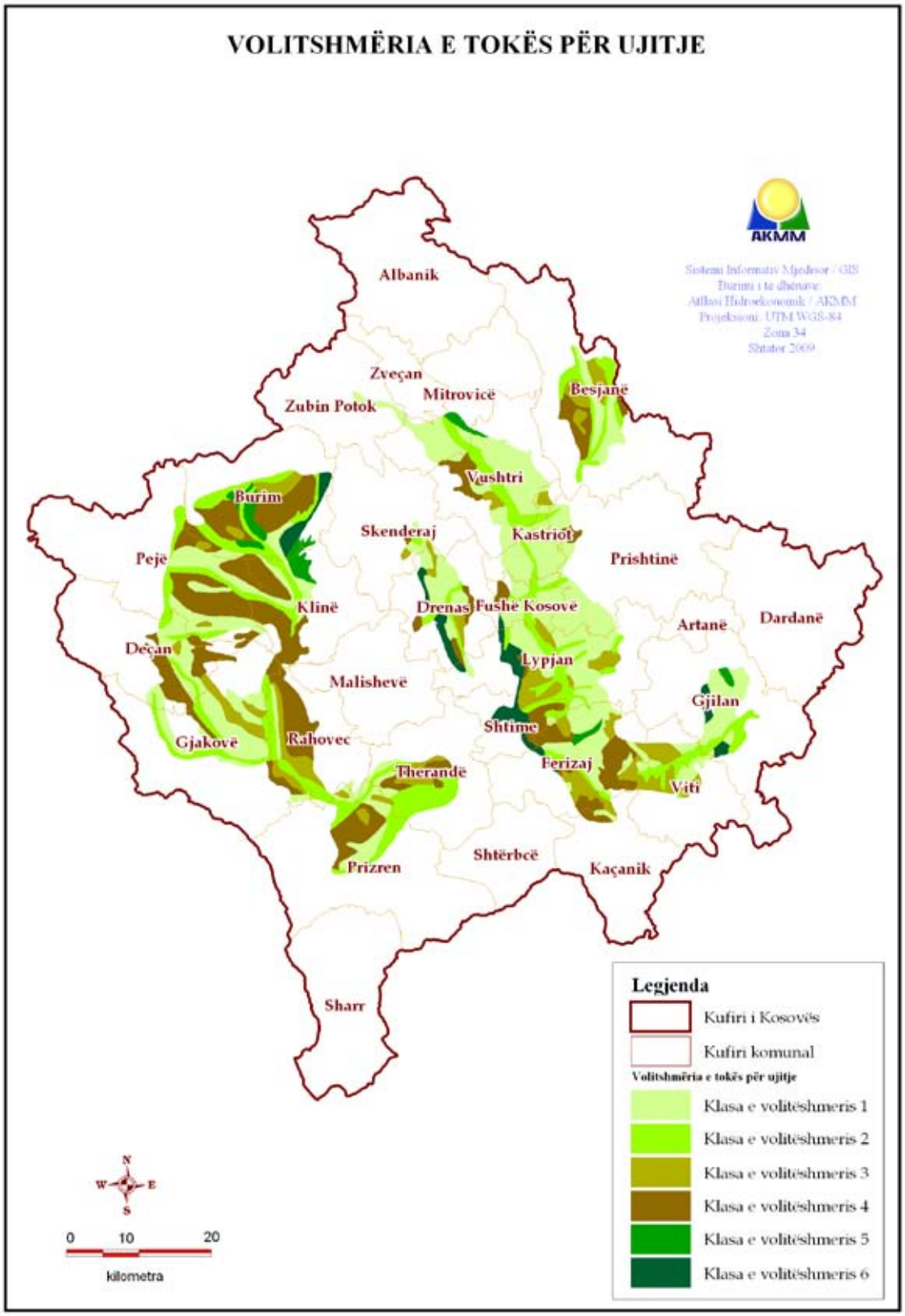
Table 21: Different types of informal irrigation in 2005 [33]

Types of irrigation	**Area (ha)**
Modern schemes / improved irrigation under Irrigation Companies	7,063
Traditional irrigation schemes under Irrigation Companies	1,581
Total informal irrigation	8,644
Informal Irrigation using river water by gravity	5,208
Sprinkler irrigation with private pumps	641
Informal Irrigation with River water using pumps	542
Irrigation using water springs	1,700
Irrigation with ground water from wells	984
Total informal irrigation	8,225



Liqeni i Badovcit

33 Ministry of Agriculture, Forestry and Rural Development (MAFRD)



Map 13: Lands with favourable position for irrigation

4.3 THE USE OF WATER FOR INDUSTRIAL NEEDS

Industry is considered as the largest sector of water consumption. The largest industrial water consumers in Kosovo are large industrial enterprises as KEK, New Co Feronikeli, Sharcem etc.

Most industrial enterprises are supplied with surface water from accumulative lakes. Data indicate that the large industrial enterprises (for technological, processes, cooling, and sanitary needs, etc..) consume more than 30% of the total water amount consumption.

Table 22: Water consumption for the years 2007/2008 by large industrial enterprises

Consumers	Years	Water consumption			
KEK		TCA		TCB	
		Monthly consumption (m^3)	Specific consumption (m^3/MWh)	Monthly consumption (m^3)	Specific consumption (m^3/MWh)
	2007	6955000	5.23	871300	2.987
	2008	8274000	mes=6.12	9330057	mes=2.60
Sharrcem	□ Annual (m^3)	Conditioning of furnace's gasses (m^3)	Cooling of equipments (m^3)	Sanitary needs (m^3)	Special cases (m^3)
	113,661	29,565	43,800	18,396	21,900
New CO Feronikeli		Data according billing system from the hydro system Ibër- Lepenc (m^3)			
	2007	1232466			
	2008	3604560			

The amount of water use in the industry exceeds the amount of water use for agriculture and household.

The majority of small industrial enterprises use the water from public water supply networks, while very few of them have their own water supply system (wells). The following table show data on industrial water consumption in some of Kosovo municipalities.

Table 23: Water amount consumption by industrial enterprises in several municipalities of Kosovo and their sources of supply [34]

Municipality	Amount of water consumption m^3/ year	
	Own ground water sources (wells) and from the water supply system	Public water supply system
Deçan	-	1000
Gjakovë	-	158000
Burim	190000	-
Klinë	22000	-
Rahovec	-	54000
Pejë	10000	122000
Prizren	4000	163000
Therandë	-	809000
Gjithsej:	**226000**	**1307000**

34 Water Department, 2008

Having into consideration that Kosovo is a developing country, it is expected that in the future the water use demands will be increased, which could further worsen the supply situation of the population with drinking water, especially in accumulative basins that are used for both drinking and industrial purposes.

4.4 THE USE OF WATER FOR HYDRO-ENERGETICS

On contrary to the electricity produced by the thermal power, the electricity produced by hydro power plants is gas free.

The usability of hydro energetic resources is contingent upon geological and topographic conditions for dam construction and especially the topographic conditions. It requires high initial development and operational investments, actions to mitigate the flooding consequences and to mitigate the ecosystem changes due to the large area coverage with water (Water accumulation). It includes also the population resettlements.

Construction of new dams creates major problems between rural areas near the river, and affects the energy companies, tourist companies and water supply companies, because each of these seek to defend its interests that are almost diametrically opposed to each other.

The greatest benefit from the use of water power may be realized through construction of small hydropower stations. At first, the construction of these hydropower stations has been designed for electricity supply to remote areas, but later on, all hydro power plants were connected to the integrated electricity networks. These plants belong mostly to the derivation type and use the water resources near the areas where located. Lifespan of these hydropower plants is 25 years.

Development of the programme for activation of these hydropower plants is part of the energy policy in the Energy Strategy of Kosovo and it is expected these power plants to start function as soon as possible.

In Kosovo currently is operating the Ujmani Hydropower plant, which has the power production capacity of 2 x 17 MW, and five other small hydropower plants in the distribution network with a capacity of 11.82 MW. Other small hydropower plants are: Dikanci, Burimi and Prizreni. In Kosovo operates also the Kozhnjeri hydropower plant, which is given by concession, and generates a very small amount of electricity.

Table 24: Production of electricity from existing hydropower plants

Hydropower plants	Power MW	Energy GWh
Existing hydropower plant in the distribution network	11.82	**38**
Hydropower plant of Ujmani	35.0	**101**
Total	**36.82**	**139**

Kosovo is characterized by rivers and water streams with a hydro-energetic potential, which can be considered to be used for electricity production. The Drini i Bardhe River in the western part of Kosovo, represent almost the half of the total hydro energetic potential in Kosovo. The total usable hydropower potential in Kosovo is about 0.7 TWh/year. The most important hydropower plant that can be built in Kosovo is the Hydropower plant in Zhur, in the course of the Drini i Bardhe, with a potential of 0.377 TWh/year. The water flows of rivers Drini i Bardhe, Ibri, Morava, Lepenci, Llapi, are characterized by a significant potential for electricity production.

The table 25 shows the hydropower potential of rivers in Kosovo

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Table 25: Hydro-energetic potential of Kosovo's rivers [35]

	River	Hydro-energetic potential technically usable	Hydro-energetic economically usable
Nr.		GWh/vit	GWh/vit
1	Drini i Bardhë	554.00	554.00
2	Ibri	103.27	102.17
3	Morava e Binçës	8.75	8.75
4	Lepenci	23.80	16.53
Total		**689.64**	**681.27**

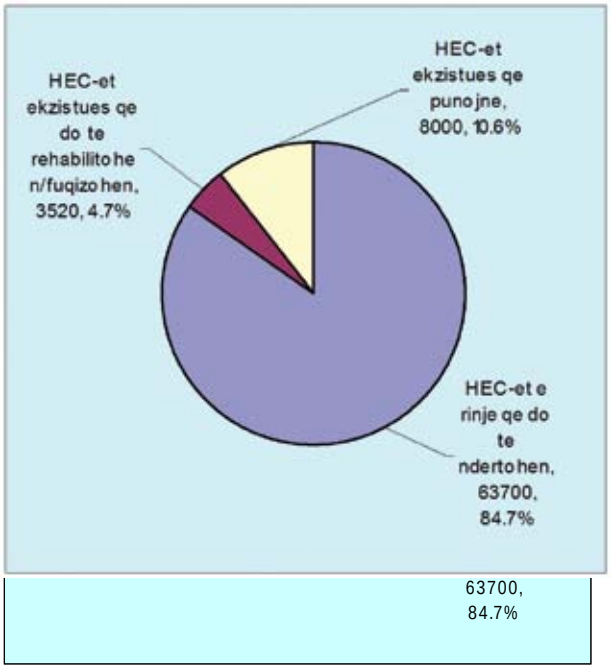


Figure 4: The potential of Hydropower plant by categories [kW]

Table 26: New HPPs to be built in Kosovo [36]

Name	Power [kW]	Energy [Million kWh]	Water flow m³/sec	Slope [m]	River
1: Kuqishta	3900	17	6	80	Lumëbardhi i Pejës
2: Drelaj	6200	27	6.5	120	
3: Shtupeq	7600	35	8	120	
4: Bellajë	5200	25	5	130	Lumëbardhi i Deçanit
5: Deçan	8300	39	6.5	160	
6: Lloçan	3100	14	1.5	250	Lumëbardhi i Lloçanit
7: Mal	4000	18	2.4	200	Erenik
8: Erenik	2000	9	2.4	100	
9: Jasiq	1900	9.7	2.6	90	
10: Dragash	2200	10	5	55	Plavë
11: Orçush	5600	25.6	7	100	
12: Reçan	1500	6.7	2.6	70	Lumëbardhi i Prizrenit
13: Brezovicë	2100	10	4.5	60	Lepenc
14: Lepenci	3500	16	7.6	60	

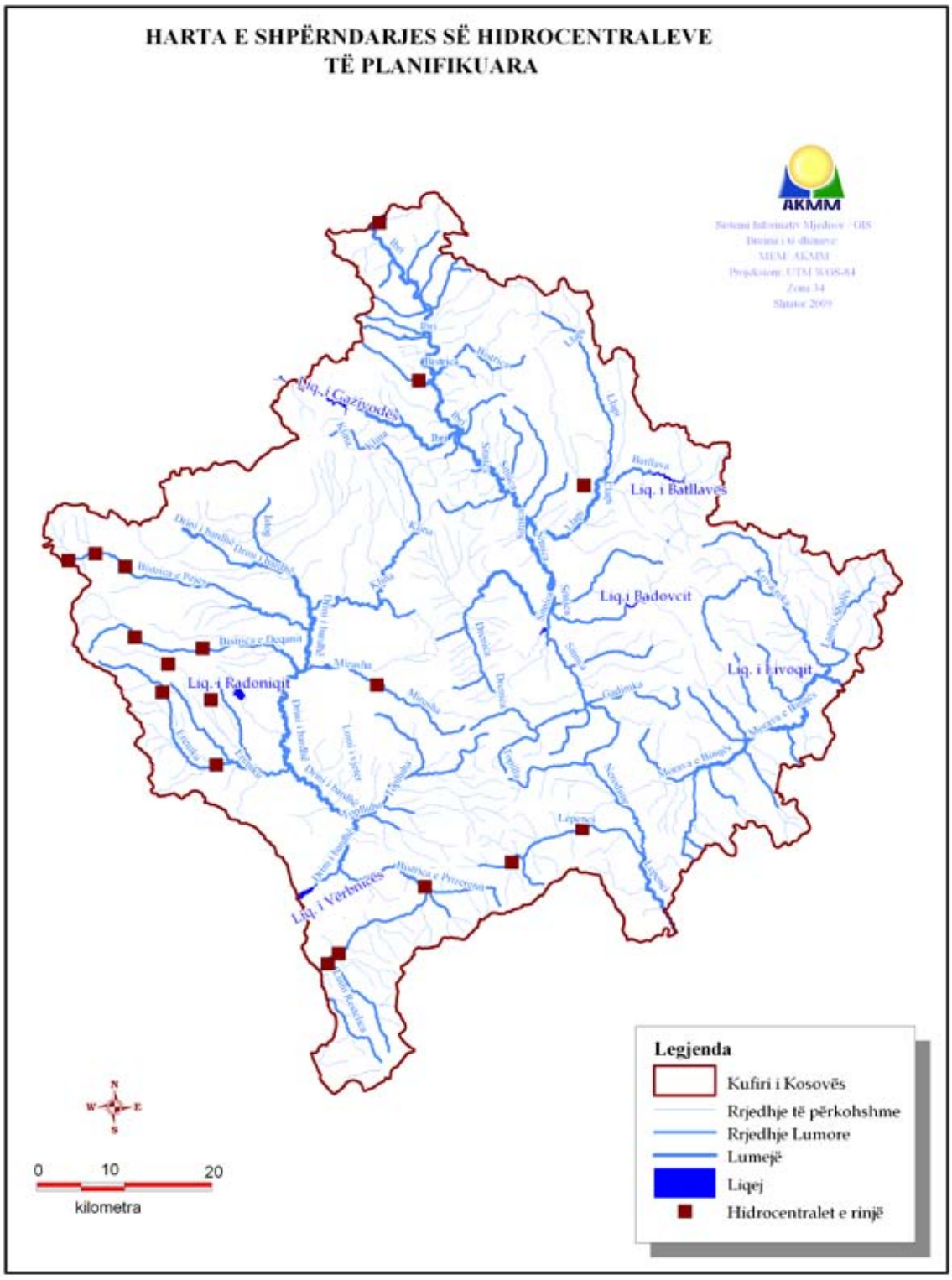
35 Report of prefeasibility study on identification of water resources for small HPPs in Kosovo, MEM & AAEESD, 2006

36 Report of prefeasibility study on identification of water resources for small HPPs in Kosovo, MEM & AAEESD, 2006

15: Banjska	300	1.4	0.5	85	Banjskë
16: Batare	1100	5.8	2.3	60	Bistrica (Batare)
17: Majanc	600	2.9	1.5	50	Kaçandoll
18: Mirusha	4600	22	45	15	Drini i Bardhë dhe L. Deçanit
Total	**63700**	**294.1**			



Lumëbardhi i Deçanit, a location planned for a HPP



Map 14: Planned Hydropower plants

4.5 THE USE OF INERT FROM RIVER BEDS

The Kosovo's rivers are degraded mainly by uncontrolled use of inert from river beds by the activities of operators that extract the gravel in and around the rivers. The most damaged rivers are those in the Drini i Bardhe river basin area. Including the River Drini i Bardhe itself along the areas from Kramovik to Gjonaj. The River Erenik is also damaged, in particular along the area between Korenice and Ura e Tabakut (next to Gjakova[37]). Among damaged rivers due to uncontrolled use of inert is the Lumbardhi i Pejes River.

In all the above mentioned sectors the use of inert is inappropriate either in terms of saving water regime, either in terms of exploitation of mineral raw materials. Changing the water regime, affects the surrounding agricultural lands and agriculture activities as this area is well known for agriculture production.

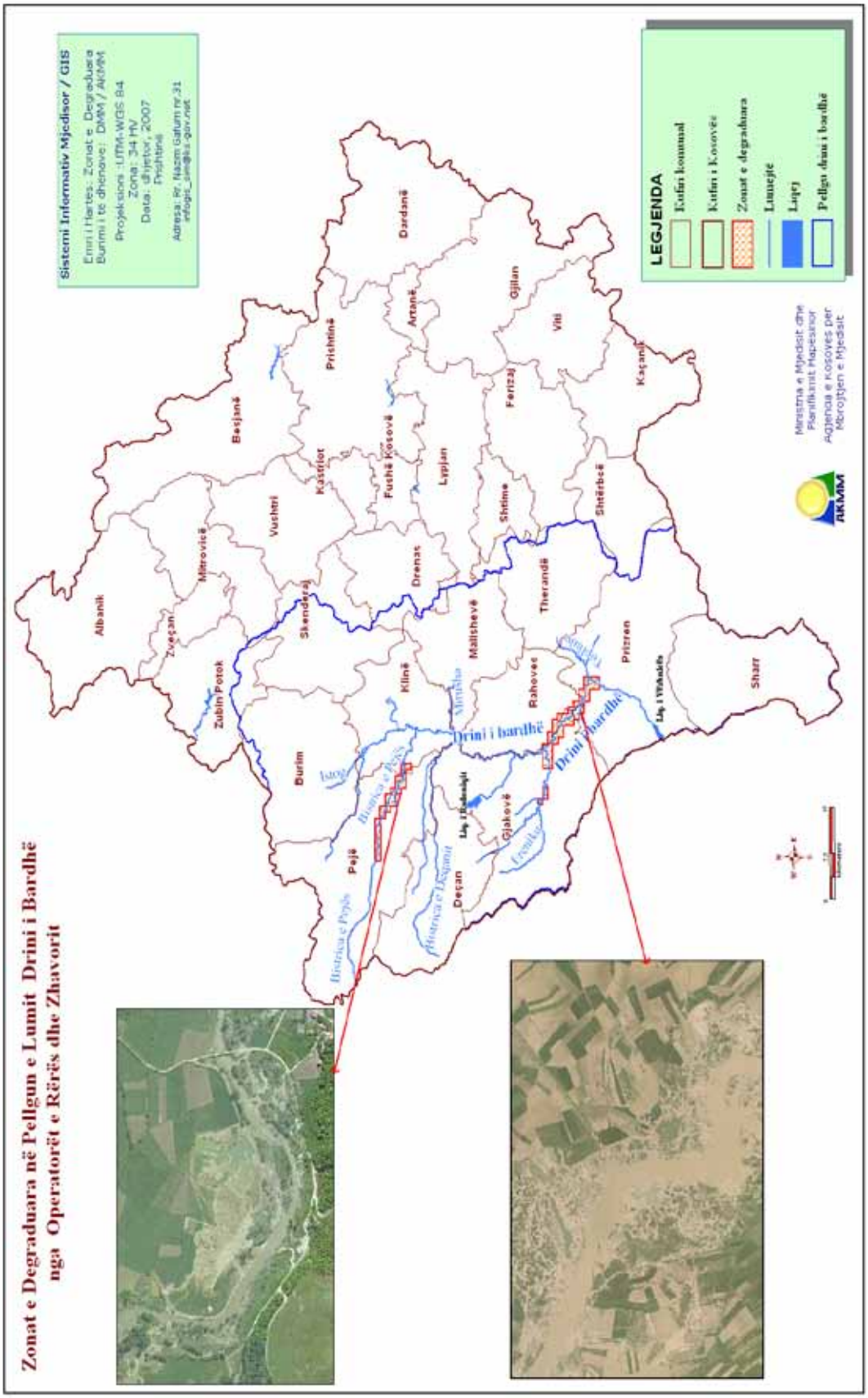


Ravel exploitation from Drini i Bardhë in Luki



Ravel exploitation from Drini i Bardhë in Krushë e Madhe

37 Water Department 2008.



Map 15: Degraded areas in the river basin of Drini i Bardhë

4.6 THE USE OF WATER FOR FISHING AND AQUACULTURE

In most of freshwaters in Kosovo, fishing and recreational activities are evident but without any economical benefit.

Conditions that provide rivers, lakes and fishing accumulations are not satisfactory. Water pollution, damage from river beds due to sand extraction and construction of gravel separators over the river course, has significantly affected the river fishing.

Currently, the fishing sector has considerable lacks in development, due to lack of a strategy for the management of fish resources, at both national and local level.

Fish resources are national assets, which if used correctly will bring increased revenue, and maintain balance between the fishing and fish resources in one hand and environment on the other hand.

Fish cultivation into the water accumulations can be made with fish species that do not require to be fed by man and which guarantee the increase of fishing quantity.

The lack of a full inventory and assessment of the fish fauna, is an obstacle to fisheries management, planning and intensity of fishing, fisheries management and development, protection of endangered and rare fish species etc.. As the most common fish species that are found in our waters are: luce, catfish, trout, perch, roach, sneep, etc.

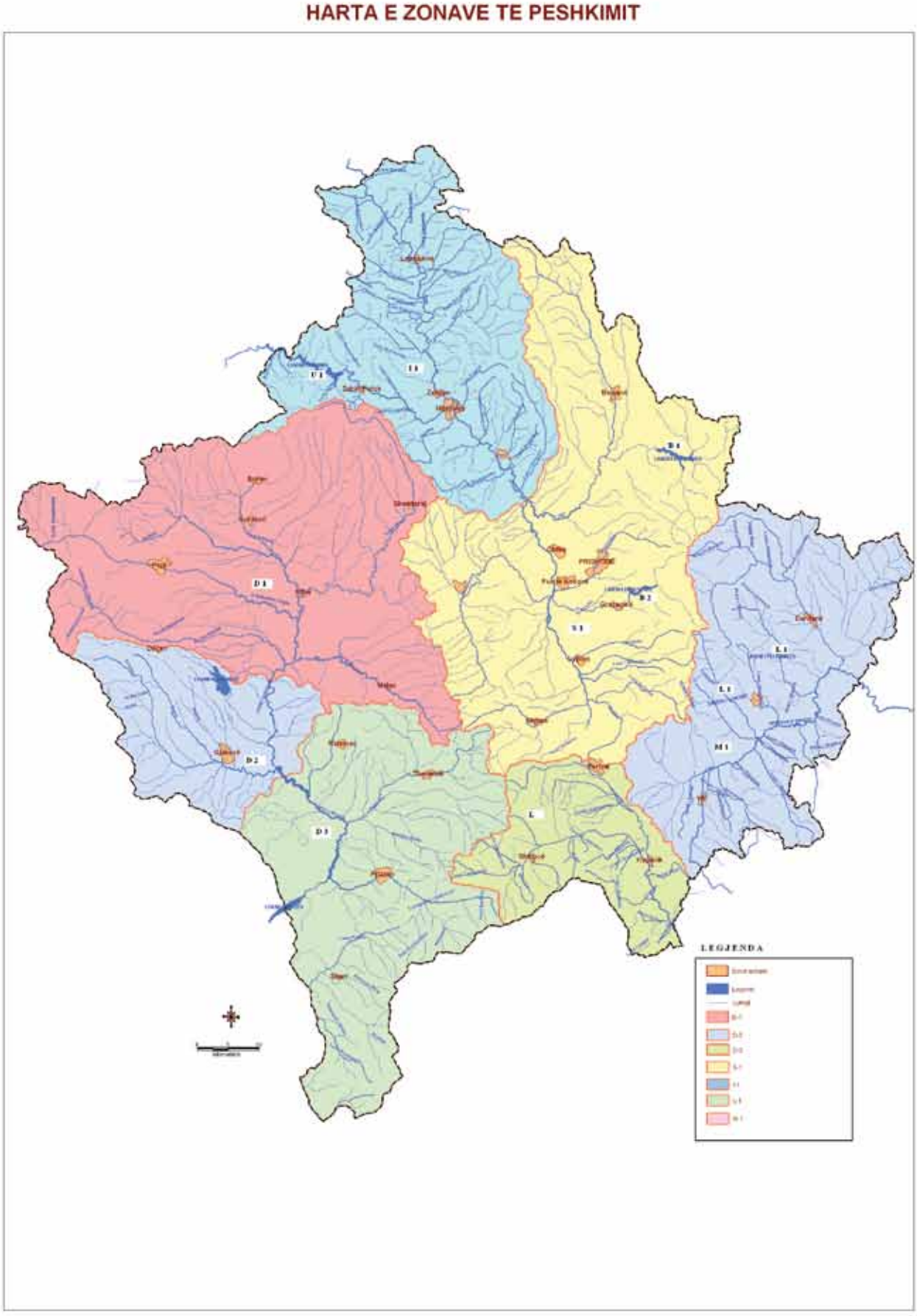
Aquaculture development in Kosovo has started at early 60-es. The quantity of fish production in the basins is minimal, about 300 tonnes / year. Trout produced in Kosovo is mainly consumed by the hotels, but very few is available in the market.

According to analysis made by MAFRD, considering local production of fish in the existing fishpond, and imported fresh and frozen fish, the total fish consumption in Kosovo is 0.8 kg / capita, that is below the fish consumption average of the region.

The potential rivers for trout cultivation in Kosovo are: Drini i Bardhe, Lumbardhi i Pejes, Reqani, Lepenci, Morava e Binçës, Brodi and Restelica in Dragash etc. Apart from the rivers fish production is possible in the lakes by applying the fish cultivation in cages.

Considering the water resources and market demand, with improved technology and production cost reduction, development of aquaculture has good perspective in Kosovo.





Map 16: Fishing areas



5. EROSION AND FLOODING

5.1 EROSIONI AND TORRENTS

Erosion and torrents in the territory of Kosovo threaten the nature, state and private assets that are created and planned by the people. Erosion causes the degradation of agricultural and forest lands, road and rail networks, as well as construction and settlement facilities. Current status of erosion is presented in the following table.

Table 27: Categories of erosion in Kosovo, area in km2 and the share in % by categories[38]

Category e Erosion	Surface km²	%
Category I, II and II	5.973 km²	**55.6 %**
Category IV (low erosion)	3.680 km²	**34.2 %**
Category V (very low erosion)	1.097 km²	**10.2 %**
Total	**10.750 km²**	**100 %**

Thus, the erosion of categories I, II, III and IV include the area of 9653 km² or 89.8% of total erosive area.

The more significant erosive activities are identified in the upstream of the Ibri River (anti-erosive measures should be undertaken). Also, areas of Lepenci River basin are endangered by erosion as well as the river basins of Drini i Bardhe and Morava e Binçës. Lower erosion activities are noted in Sitnica River basin.

The erosive areas in the Kosovo territory are showed in the map 17.

In the river basin of the Drini i Bardhe have been identified torrents that cause erosion. Data for torrents in the Drini i Bardhe river basin by locations are presented in tab. 28.

Table 28: Torrents in the river basin of Drini i Bardhe by municipalities and localities[39]

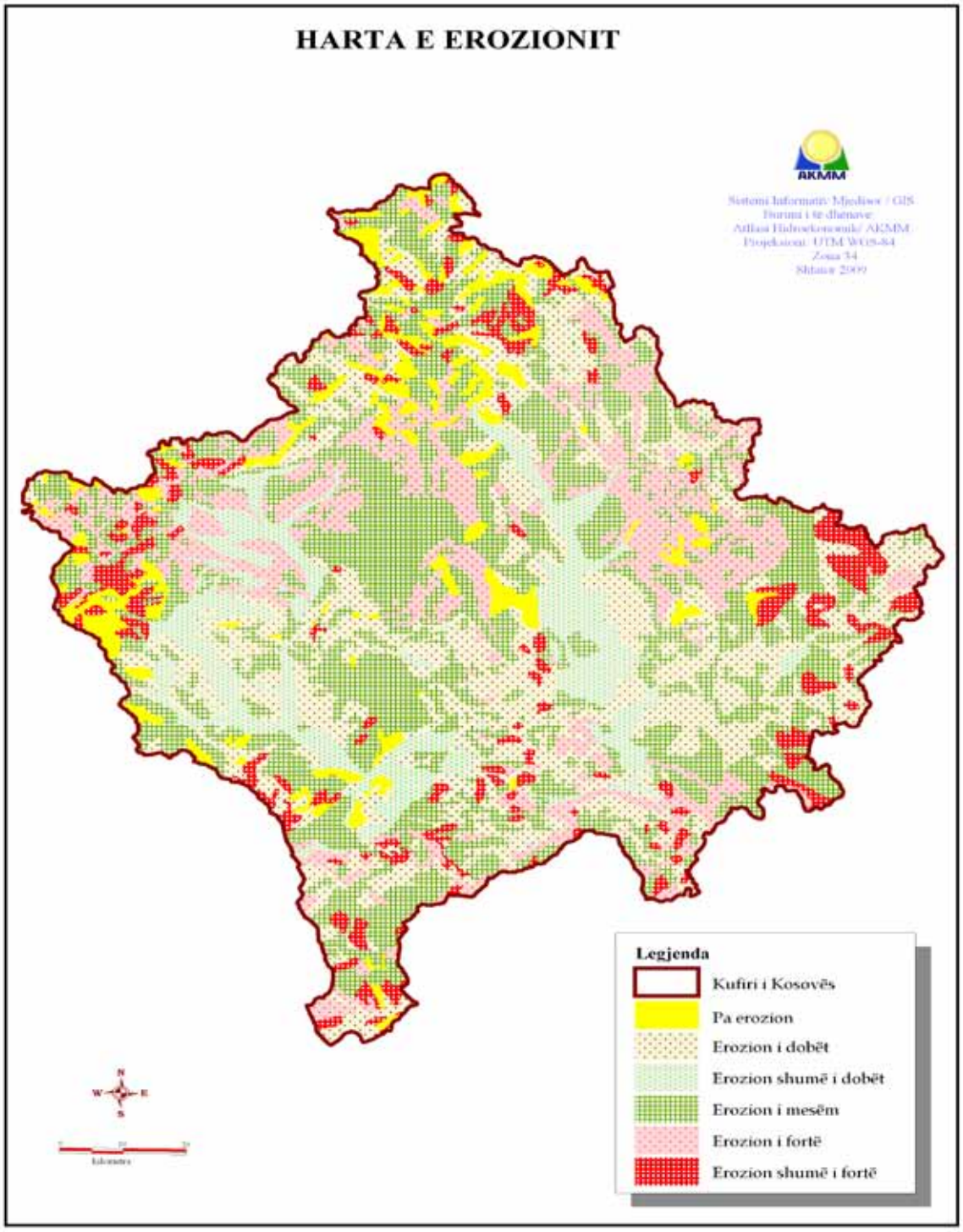
Municipality	Locality	Torrent
Istog	Lubozhdë	Dragiqit
	Cërc	Suhodolit
	Cërc	Perlina
	Vrellë	Lugu i madh
	Vrellë	Lugu i keq i Gërdhecit
	Studenicë	Përroi i Leskovikut
	Kaliqan	Përroi i livadhit

38 Water Department, 2009
39 Water Department, 2008

Pejë	Bellopojë	Përroi i Bellopojës
	Pejë	Përroi i Çokolicës
	Brestovik	Sushicë
	Sigë	Sushicë
Deçan	Hulaj	Lumbardhi i Deçanit
	Srellc i epërm	Përroi i Behovcit
	Strellc i epërm	Përroi i Durakit
	Deçan	Lumbardhi i Deçanit
Prizren	Korishë	Përroi i Kabashit
	Lugishtë	Osojnica
Rahovec	Celinë	Vija e teheve
Suharekë	Vraniq	Përroi i Vraniqit
	Dvoran	Përroi i Dvoranit
	Gjinoc	Përroi i thatë
	Popovlan	Përroi i Popovlanit



Sitnica gjatë vërshimeve



Map 17: Erosive areas

5.2 FLOODS

Protection from the flood and water regime regulation requires serious and long-term approach. Among the main factors leading to the flooding are:

- Unregulated river beds;
- Damage of river beds by inappropriate exploitation of sand and gravel;

- Construction of houses, roads and bridges in places that are threatened by floods;
- Dumping of waste into or around the rivers;
- Cutting of forest near flooding areas;
- Poor maintenance of flood protection facilities;

According to the assessments carried out so far(Water Master Plan 1983), the damages from flooding may be calculated if taken into account the occurrence of floods once in 100 years. According to this kind of estimation, damages from flooding in the Drini i Bardhë River basin would be 50%, in the Ibri River basin of the 24%, in Lepenci Basin 20% and in the Morava e Binçës basin 6%. In order to preventing the floods, projects for river beds rehabilitation are developed.

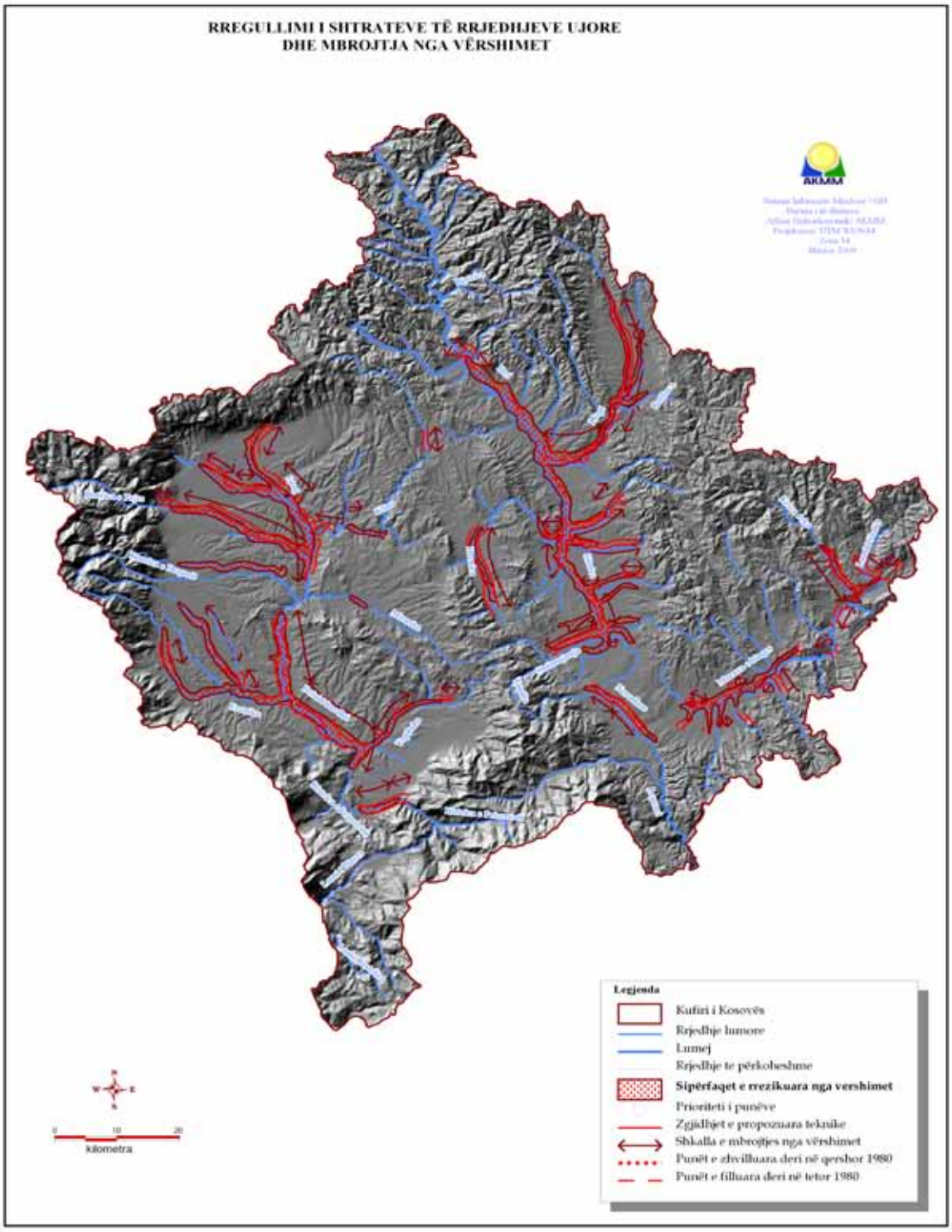
According to previous observations, the length of rivers threatened by flooding in Kosovo is about 491 km. So far, have been regulated only 140 km, or 28% of total planned length for regulation[40] .

In the following table are presented data on the length of the river beds to be regulated and river beds already regulated, by river basins.

Table 29: Length of rehabilitated river beds and those planed for rehabilitation, by river basins

Nr. rn.	Water stream	Length planed for rehabilitation [km]	Length regulated [km]	[%]
1	Morava e Binçës	30.35	22.15	73.00
	Branches of Morava së Binçës	56.45	24.10	42.69
	Total	86.80	46.25	52.28
2	Sitnica	62.37	43.00	68.94
	Branches of Sitnica	141.73	16.70	18.83
	Total	203.10	59.70	29.39
3	Ibri	7.70	4.50	58.44
	Branches (Lushta)	2.60	0.85	32.69
	Total	10.30	5.35	51.94
4	Drini i Bardhë	76.56	13.40	17.50
	Branches of Drini i Bardhë	97.07	12.92	13.39
	Total	168.63	26.32	15.60
5	Lepenci	5.0	-	00.00
	Branches of Lepenci	17.50	2.80	16.00
	Total	22.50	2.80	12.44
Σ	Total	**492.33**	**140.92**	**28.62**

40 Water Department, 2009



Map 18: Rehabilitation of river beds and protection from erosion



Impianti për trajtimin e ujërave në Skenderaj

6. WATER POLLUTION AND WATER TREATMENT

6.1 DISCHARGE OF URBAN WASTEWATERS

There is no urban waste water monitoring in Kosovo. Management of sewerage systems is carried out by seven regional water companies. About 50% of Kosovo population has access to public sewerage systems[41] .

Wastewater discharges represent the main source of pollution of natural waters, because they contain lot of substances that consume dissolved oxygen, soluble compounds of phosphorus and nitrogen (eutrophication), pathogenic bacteria and viruses, and other matters that affect the water quality.

There are no wastewater treatment plants in Kosovo. In Skenderaj, it is constructed a wastewater treatment plant, but it is not operating yet.

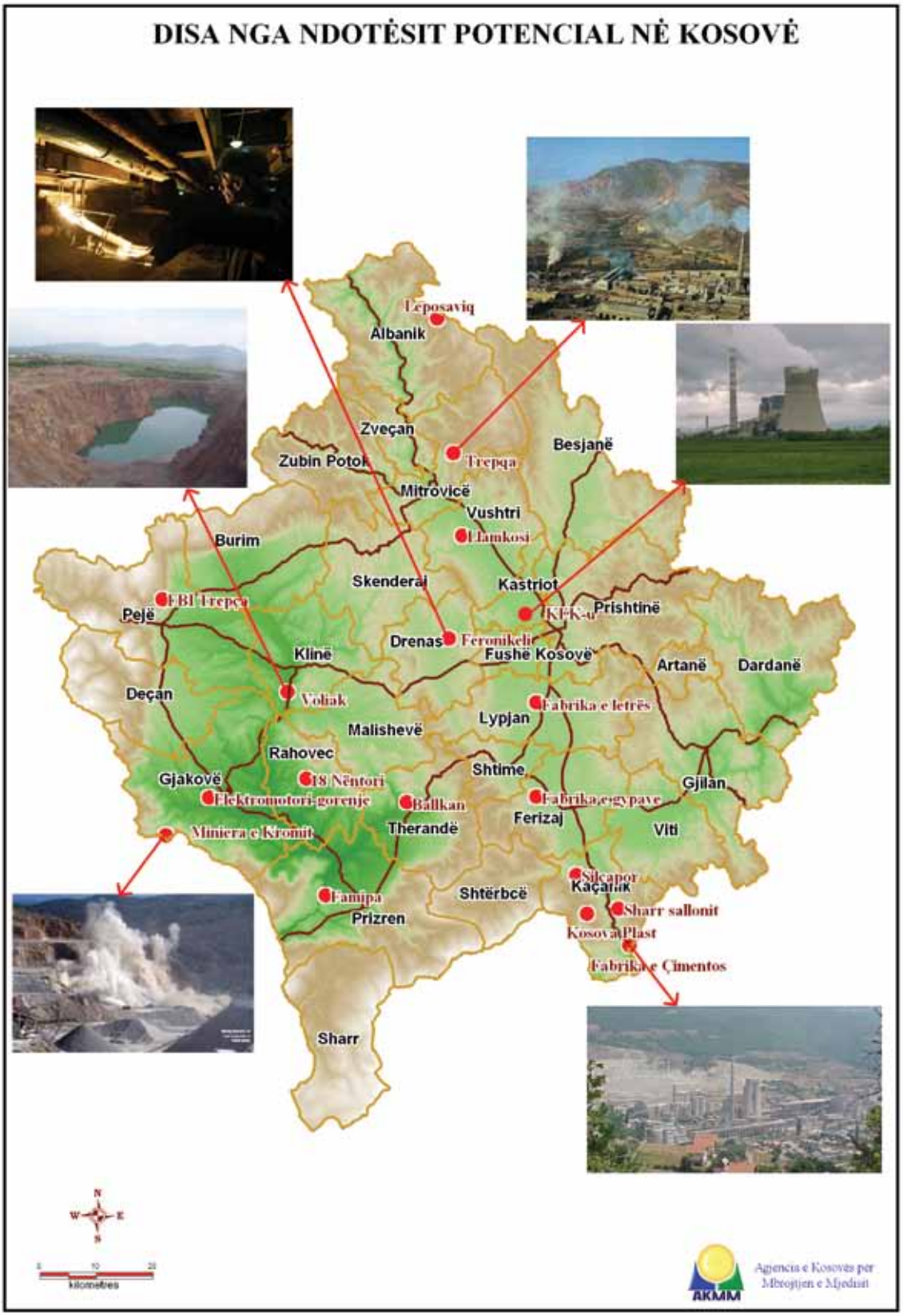
In 2004, MESP in cooperation with the Finnish government has drafted the study for the strategy for wastewater treatment.

In terms of wastewater management, Kosovo will face major challenges, especially in relation to the implementation of EU directives (Directive 91/271/EEC on urban wastewater treatment) and the fulfilment of international obligations. It becomes more important, given the fact that Kosovo's rivers pass through neighbouring countries. However, Kosovo still does not have a strategy for wastewater management and for establishing operational mechanisms to finance wastewater treatment.

6.2 DISCHARGE OF INDUSTRIAL WASTEWATERS

Industrial waters are among the main pollutants of surface and ground waters. The industry needs for water are 150 million m^3 per year, approximately 30% of total water consumption. The largest polluters are KEK, Ferronikeli, Sharrcemi, Trepca mines, Kizhnica, Artana and other mines.

41 AAV – The annual average values are calculated by monthly serial data



Map 19: Discharge of industrial waters in some locations

 © Agjencia e Kosoves per Mbrojtjen e Mjedisit

6.3 WASTEWATER TREATMENT

Kosovo has no facilities for wastewater treatment. The construction of the wastewater treatment plant in Skenderaj is completed, but it has not yet been put into operation[42] .

Except some septic tanks for limited resident areas, or natural Lagunas that are created at the discharging points of wastewater collection systems, there is no wastewater treatment plant in Kosovo. Some camps of KFOR forces and the Pristina Hospitals managed to have biological treatment plants.



Photo 12: A view from Klysyr river next to the Gadime's Cave

42 Water Department, 2009



Drini i Bardhë

7. WATER QUALITY MONITORING

7.1 MONITORING OF SURFACE WATERS

7.1.1 THE DRINI I BARDHË RIVER BASIN

This river basin is the largest among other country river basins. Monitoring network of this basin includes 24 monitoring stations that measures physical-chemical parameters. Three of these stations are based on the Drini i Bardhe river itself, starting from its source in Radavc on top hill of Peja. The next monitoring station is based at the contiguity point of the rivers Burim and Klina and the third station is based after the contiguity of rivers Lumëbardhi i Pejes, Lumëbardhi i Decanit, Mirusha, Ereniku, Rimniku and Toplluhë. More accurately, the third station is placed next to the bridge above the river in Gjonaj i Hasit. The quality of water along its flow varies from station to station. Water at the source is to a good quality (as the first monitoring station shows) and the two other stations show for significant pollution that comes from urban wastewater discharged at above mentioned rivers.

In all river springs the water quality is very good. The data of physical-chemical analysis for the last two years indicate that these waters belong to class I. The situation begins to change on around settlements, due to urban and industrial wastewater discharge over the course of this river basin. Also, Rivers are polluted by waste disposal sites, mostly located near bridges or other locations near rivers.

Up to the contiguity point with the Burimi River, the water quality is mainly good. Drastic changes appear in the area Ruhot-Zllakuqan and Zllakuqan-Kline. At the contiguity point of the Drini il Bardhe and Klina rivers, the situation becomes miserable because the results show for the category IV of water quality.

Hence, the water of Drini i Bardhe River basin is polluted by discharges of sub- basins therein, which sub-basins previously where impacted by urban and industrial wastewaters. This situation continues up to the Lumëbardhi i Prizrenit river discharge in Vllashnje.

GENERAL COMMENTS ON SUB-BASINS OF THE DRINI I BARDHE RIVER BASIN.

Burimi (Istog) - It begin at the mountain above the city of Istog, with great purity, and very good quality in comparison to other rivers. In terms of water quality, this river does not undergo any major changes up to the contiguity point with Drini i Bardhe. Monitoring data so far, show the Istog River is known as the most clean river in Kosovo.

Lumëbardhi i Pejës (Bistrica e Pejës) – It is formed by some sources along Rugova Gorge. The first monitoring station in Kuqishtë shows for good water quality in terms of physical-chemical parameters, while at the next station after the discharge of urban and industrial wastewater shows that the water quality is decreased. This river, during the summer season (and/or irrigation season) runs out of water for a period of approximately two months. The third monitoring station is near Klina before contiguity point with the Drini i Bardhe River. This station show for poor water quality.

The Klina River - There are located two monitoring stations (the first one is located in Siqevë). The water quality is quite poor (showed at both monitoring stations), which is indicated by the results of laboratory tests listed later at this publication by the graphics.

The Mirusha River - It is formed in the hills above the Bllace village (KK Theranda) by many small water sources. At the Banja e Malisheves village, it takes the shape of a real river, by merging with the strong water source known as "Uligja e Banjes". This river is monitored by only one station, located at Volljak, several meters before the contiguity point with the Drini i Bardhe River. Its water quality is characterized by small turbidity, the quantity of dissolved oxygen ranges between 12-13 mg / l, conductivity between 500-600 μS/cm. Therefore, the river water may be considered as medium/high water quality river.

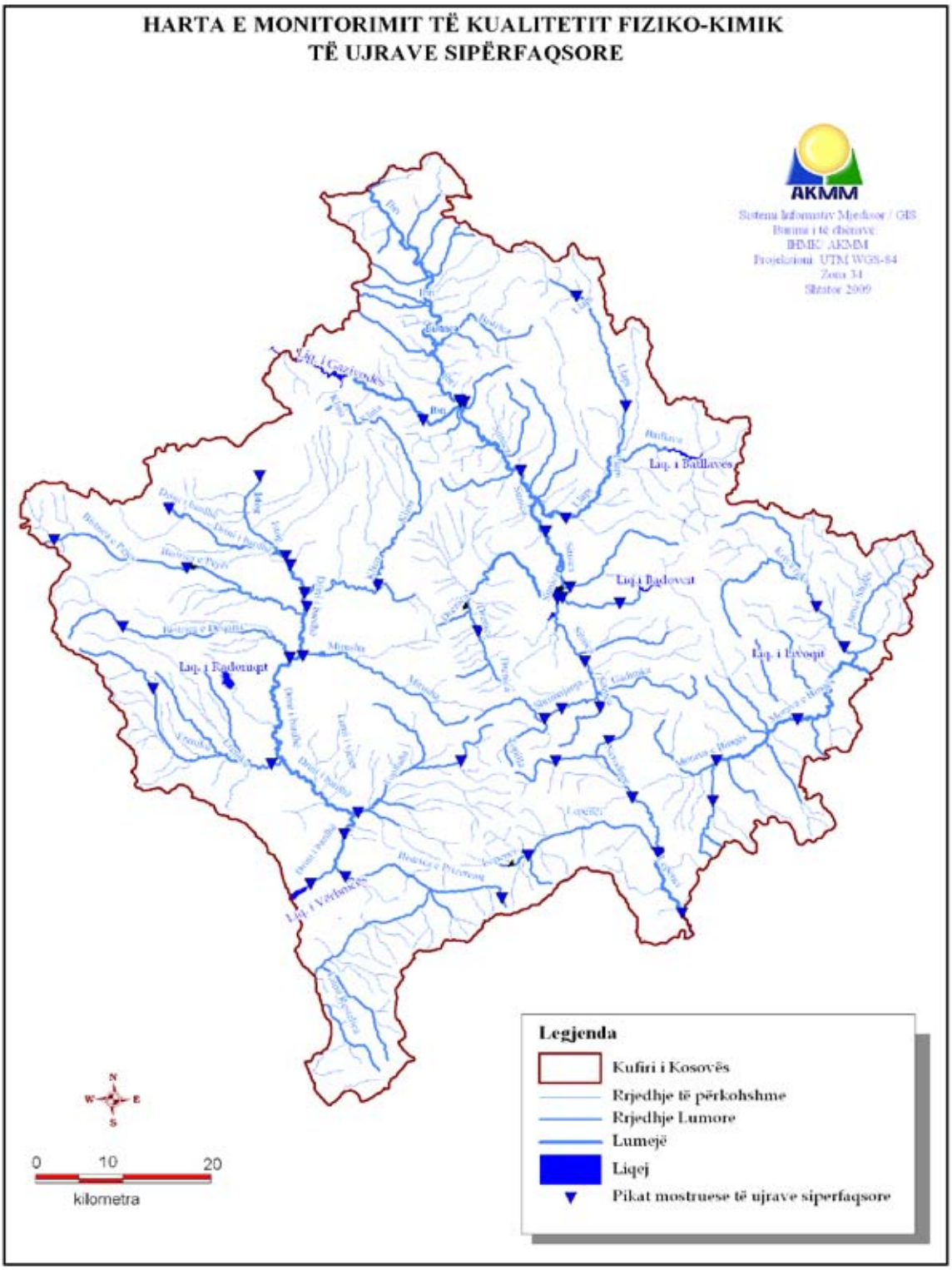
Lumëbardhi i Deçanit - The first monitoring station in this river is located at the the 3rd km of the town of Decani, above the church, where the water quality is shown to be very good. The second monitoring station is located 10 m before the contiguity point with the Drini i Bardhe River, at Kralan village of Gjakova municipality. The water quality in this location is not so alarming, but in comparison with the first station there are indicated increased values of parameters. In this water stream is appeared a significant water turbidity due to extraction of gravel from the riverbed by private companies. It is occurred only a few tens of meters above the monitoring station of this river.

Ereniku - The first water quality monitoring station in this river is located in the mountains above the village Jasiq of Junik Municipality, where no influence from human activities is indicated, and the water quality is very good. The second station is located near to the contiguity point with the Drini i bardhe River, near the "Terzisë" bridge in Gjakova. The quality of the river at this station is poor. By the analysis, it is evidenced the presence of detergents. The river has always froths over the surface, which is the result of any activity for textile washing (clothing), car washing or any use of detergents from other industries operating in the region and that discharge their waters without proper treatment.

Rimniku – monitoring of this river starts at a place called Zhdrellë, not far from its source. It is recognized as a source of higher conductivity than all other sources and content of significant amounts of heavy metals. The next station is a few meters before the contiguity point with the Drini i Bardhe River, in Xerxe, where are indicated small amounts of oxygen and large amount of ammonium ion, phosphates, etc..

Toplluha - the first monitoring station in this river is located at a place called Buqallë, above the tourist complex "Solid", Municipality of Suhareka. The river water is to a good quality in all parameters measured. While the second station is located in the village Piranë, before the contiguity point with the Drini i Bardhe River, where the water quality is poor. This river is known as river with permanent high turbidity due to the extraction of gravel from its bed.

Lumëbardhi i Prizrenit - The first monitoring station is located at the gorge of Prevalla, that shows for very good water quality. Second station is in the Vlashjne village, 3.5 km before contiguity point with the Drini i Bardhe River. The second station show for the poor water quality, due to the wastewater discharges along the river course.



Map 20: Physical-chemical monitoring of surface waters

INTERPRETATION OF RESULTS

To assess the state of Drini i Bardhe river sub-basins, it is considered the same methodology by analysing the monitoring (analyses) data from the beginning to the end of water stream. In the rest of this report, an interpretation of Annual Average Values[43] (AAV) will be presented as graphs, for each parameter, and each river of the Drini i Bardhe basin.

The dissolved oxygen (O2 dissolved) – It consistently stands in considerable values along this river course (basin) where the values have varied from 6.55 mg/l to 13.12 mg/l in 2007. The values in 2008 were from 5.8 mg/l to 14.64 mg/L. The year 2009 shows a shift in the maximum value for dissolved oxygen that is 12.69 mg/L

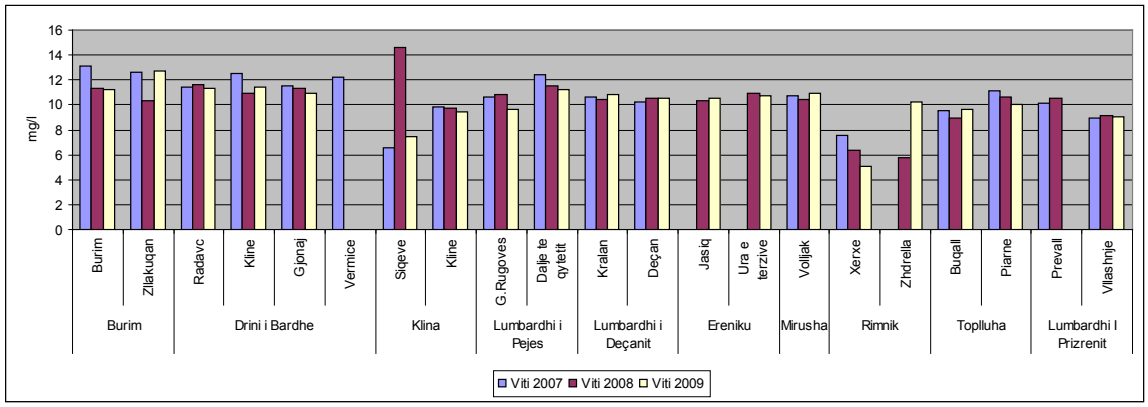


Figure 5: Dissolved oxygen in the Drini i Bardhë river basin

The biochemical oxygen demand (BOD5) – in the measuring station in Vllashnje – Lumëbardhi i Prizrenit, the highest registered values are 6.74 mg/l for 2007, while in 2008 the maximum value reaches 7.22 mg/l in Xerxe (Rimnik river). The same situation is registered in 2009.

If we compare the annual average values with serial values, the BOD5 is found in much higher values.

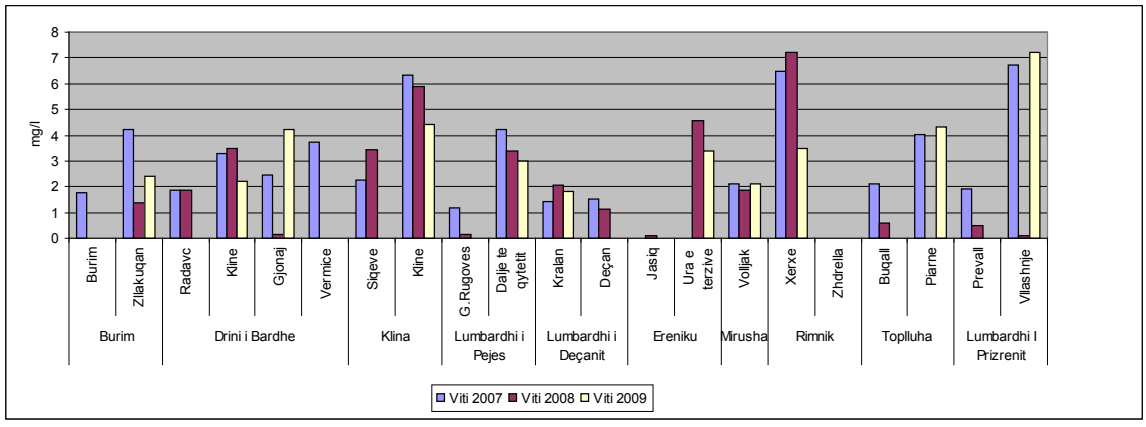


Figure 6: Biochemical oxygen consumption in the Drini i Bardhë river basin

As for the quality, we can say there is no significant pollution registered by any of the monitoring stations.

The Water conductivity – in years 2007, 2008 and 2009 the lowest conductivity values are showed in the Lumëbardhi i Prizrenit River (at Prevallë) 165 µs/cm, 151 µs/cm and 120 µs/cm,

43 AAV – The annual average values are calculated by monthly serial data

 © Agjencia e Kosoves per Mbrojtjen e Mjedisit

while for 2007, the highest value is registered in the Klina River (at Siqevë) 850 µs/cm.

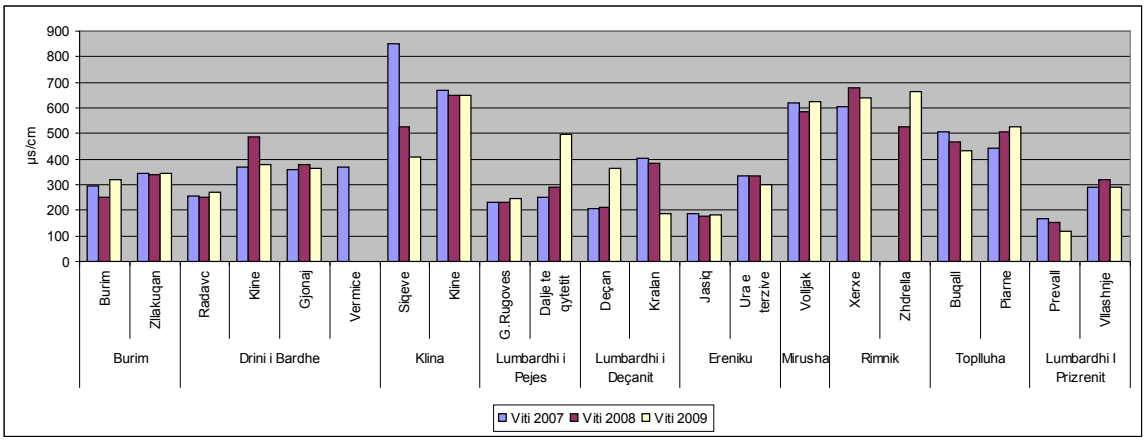


Figure 7: Water conductivity in the Drini i Bardhë river basin

In 2008, the highest values are registered in the Rimnik River (at Xerxe) 681 µs/cm, while in 2009 the maximum value is recorded in the same river Rimnik, (but at Zhdrellë sampling point) 665 µs/cm.

Hydrogen ion concentration (pH) - Generally in 2007 is registered a slight alkaline value, between the lowest value 7.71 to highest value of 8.5, compared with 2008 when values where about neutral. The lowest values is registered in the Burimi river (at river spring) with 7.57 and the highest values is recorded in the Rimnik River (at Zhdrellë).

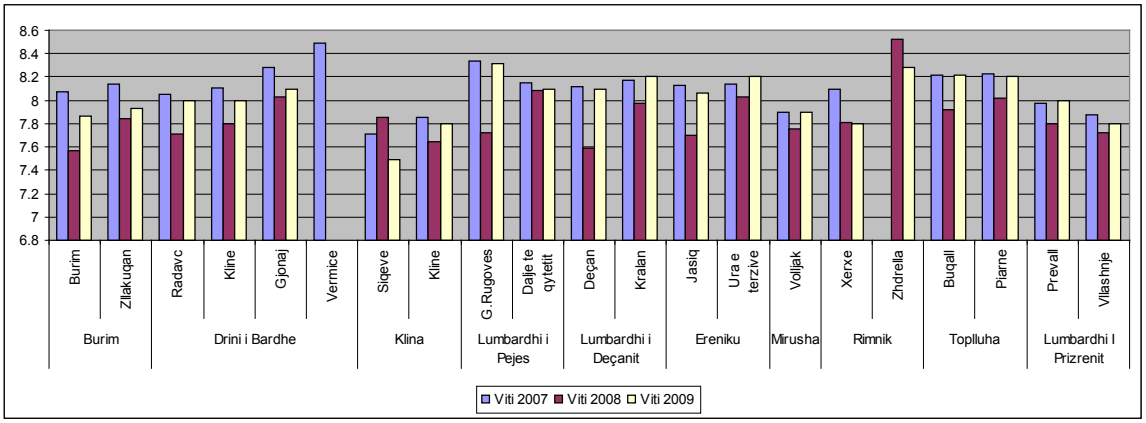


Figure 8: Hydrogen ion concentration in the Drini i Bardhë river basin

Similar values are registered in 2009, with a minimum of 7.49 Klina river (Siqevë) and maximum value 8:31 in Lumëbardhi i Pejes River.

Nitrites (NO2-). In 2007, the annual maximum values of this parameter are registered in the Drini i Bardhe River (Location Gjonaj) and in Rimnik River (location Xerxe) with ~0.15 mg/L, while in 2008 the annual maximum values are registered in the Erenik River (location to the Terzive Bridge). During the serial measurements maximal value of this parameter was 0.94 mg/L in Erenik River (location to the Terzive Bridge) in August. In this case, the water amount was minimal in comparison with previous annual period. The years 2009 and 2008 show a sharp increase of this parameter in comparison with 2007, where at the Rimnik River (samples taken in Xerxe), results with a maximum annual value of 0633 mg/L, which is simultaneously the highest average value recorded in this basin for these three years.

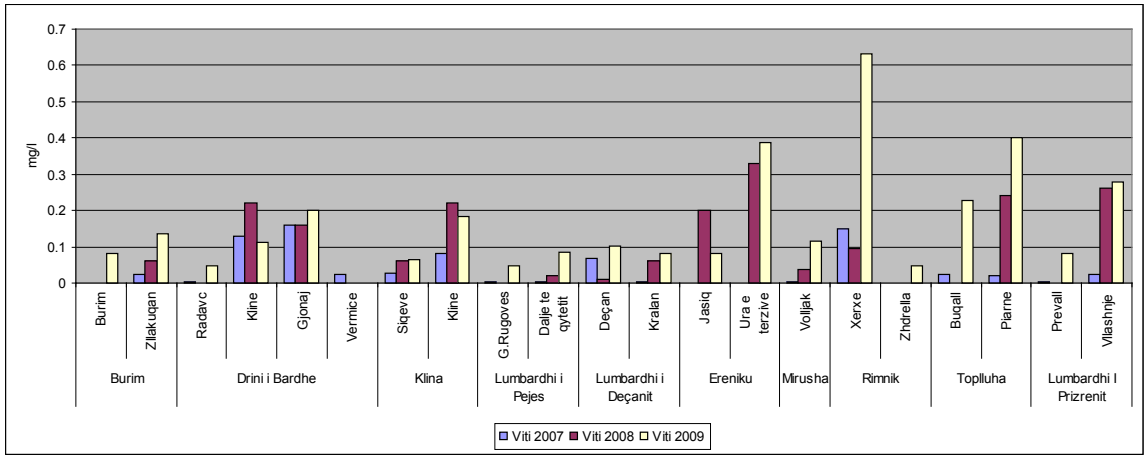


Figure 9: Nitrites in the Drini i Bardhe River basin

Maximum allowed values for nitrites should not exceed the value of 0.01mg/L as it is the case at the water springs, but according to diagram, the values obtained during monitoring in some of these stations exceed the maximum allowed values, showing for the poor water quality.

Ammonia (NH4 +) – The monitoring station at Rimnik River (in Xerxe) shows for high concentration of this parameter for 2007, 2008 and 2009 with the value of 6.38 mg/L, 4.84 mg/L and a slight decrease of 3.76 mg/L for 2009. This results, because the river lies through agricultural lands, but without neglecting the all discharges of urban wastewaters of Rahovec town and surrounding villages that as untreated water, flows into the river stream.

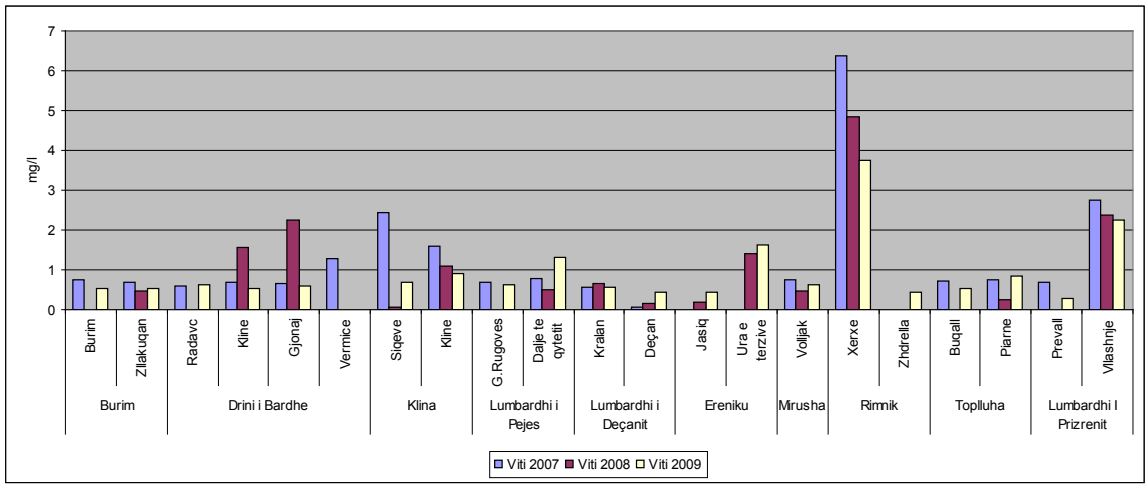


Figure 10: Ammonia in the Drini i Bardhe River basin

Based on the allowed values which must not be higher than 1.5 mg/L, it is noted that except at the water springs where the quality of water is good, at other monitoring stations, the water quality is to a mid-high level.

Sulphates (SO42-) – In the Klina, Toplluha, and Rimnik rivers sulphates are shown to be much highly present than in all other rivers. The values for the year 2007 vary between 5.5 mg/l in Lumëbardhi i Pejes River (at the Rugova Gorge) and 45.15 mg/l in Klina River -Siqevë. In 2008 Sulphates ions varied between 1.8 mg/l in Erenik River (at Jasiq) and 31.4 mg/l in Rimnik River (atXerxe), while in 2009 the Rimnik River (at Xerxe), shows again annual maximum value of 52.2 mg/l and same time this is the maximal value for two previous years.

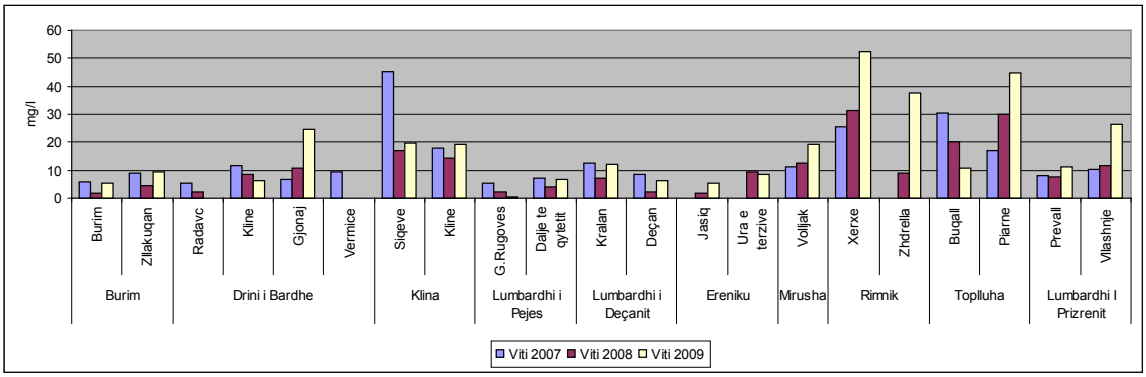


Figure 11: Sulphates in the Drini i Bardhe River basin

According to the results presented in the diagrams the value of sulphates is within the allowed limit values for surface waters, because the limit value of sulphate ion in drinking water is 200 mg/l.

Phosphates (PO43-) - In 2007 the phosphate ion values are ranged between 0.014 mg/l in the Lumëbardhi i Decanit River (Monitoring station near the church) and 2.05 mg/l in Rimnik River (at Xerxe point), while in 2008 the Klina River, (in Klina), showed higher values than other rivers with 2.09 mg/l. The lowest value this year is measured in Erenik River (at Jasiq) ↓0001 mg/l. While, for 2009 the annual maximal value is registered in Rimnik River (at Xerxe) with 1.728 mg/l.

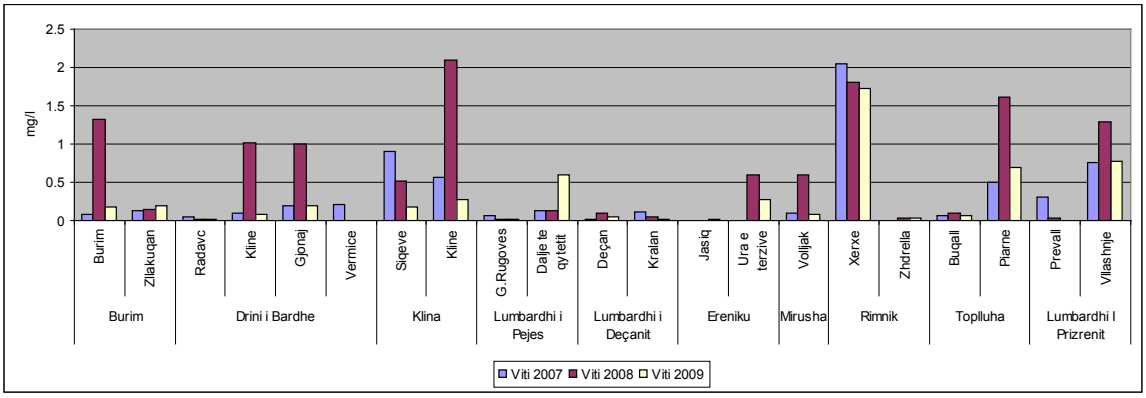


Figure 12: Phosphates in the Drini i Bardhe River basin

Total phosphor (poly and ortho) - The value of total phosphor in the Drini i Bardhe River basin showed high fluctuations. The total phosphorus content for 2007, ranges from 0.014 mg/l in the Mirusha River (at Volljakë station) to 0.94 mg/l in Rimnik River (atXerxe). In 2008 the total phosphorous in Rimnik River (at Zhdrellë) was 0.001mg/l, while at the Xerxe monitoring station (same river) the registered values is 0.56 mg/l. Also in 2009 the highest annual average values of 0.577 mg/l is registered in Rimnik River (at Xerxe)

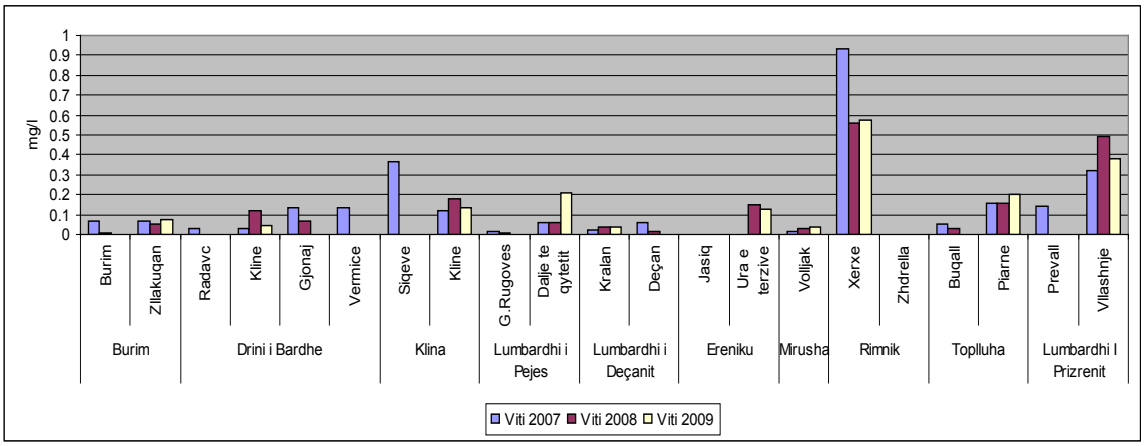


Figure 13: The total phosphorous (poly and ortho) in the Drini i Bardhe River basin

If compared to the Directive 152/99, it is indicated that the Rimniku River is of poor quality, while other monitoring stations of these rivers showed good water quality.

Total Hardness – The total water hardness is monitored at water springs only, because most of them are directly used for drinking water without any prior chemical and/or physical treatment. Based on laboratory analyses obtained, the water quality meets the WHO standard, that is ↓30 d0H. The water springs of Klina and Toplluha rivers are not used as drinking water. The following diagram shows that values of two monitoring stations are higher than in other sources of rivers.

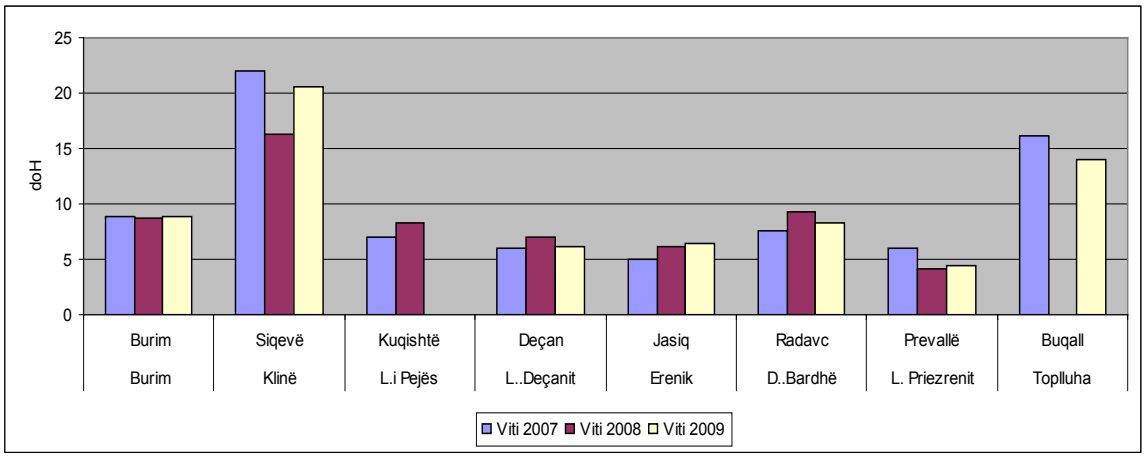


Figure 14: Total water hardness in the Drini i Bardhe River basin

In 2007, the Erenik River (at Jasiq) shows the lowest value 5.06 d0H, while the Klina River (at Siqevë) shows the maximum value 22.05 d0H.

In Lumëbardhi i Prizrenit River (at Prevallë) the registered average water hardness for 2008 was 4.2 d0H, while the highest average values are registered at Klina River (at Siqevë) 16.24 d0H. Same situation appeared for 2009 with an increased average value of water hardness in Klina river (at Siqevë) with 20.51d0H.

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7.1.2 IBRI RIVER BASIN

The Ibri River basin has a total of 17 monitoring stations. Three of them belong to the Ibri River. The first station is located at Kushtovë and it shows for a satisfactory water quality. The next monitoring station is located at the outskirts of town after all urban and other wastewater discharges that affect the water quality. This monitoring station shows for poor water quality. The third station is located in Kelmend after contiguity point with Sitnica River, which includes water from other sub-basins of this river basin. During the monitoring period is not observed any case to be alarmed, since at all monitoring points the results are within the limits values under the category II.

GENERAL COMMENTS ON IBRI RIVER BASIN

Sitnica river - Along its stream from Ferizaj to Mitrovica, it represents the most polluted river in Kosovo. Regarding the physical parameters such as suspended substances are present and exceed the maximum allowed values. This comes from the fact that in this river, are flowed one branch of the Nerodime River as well as rivers: Graqanka, Pristina, Drenica, Llapi, Trepca and other smaller water streams, where all these rivers converge Sitnica River and contain urban and industrial wastewater discharged. The measured chemical parameters such as COD and BOD5 indicate also for the permanent river pollution.

Graqanka - as the result of water pumping of Kishnica and Artana mines into the Graqanka River, the water of this river is continually polluted. There are evidenced high values of heavy metals such as zinc, nickel and lead. Also, there are registered high values of water conductivity and sulphate ion. It has to be mentioned that during the hot summer season this river runs out of water.

Prishtina - monitoring of the river is made in Bresje of Fushë Kosova, before to its flow into the Sitnica River. Actually, it can not be named as a river, because it is rather a water stream that collects all urban wastewater discharged by Pristina town. In this situation it has exceeded quantity of nitrites, suspended materials, COD and CBO5, lack of dissolved oxygen, detergents, etc..

Llapi – This river is monitored since its river spring above the Reçica village, and continues in outskirts of Podujeva town. The last (third) monitoring station is located in Millosevë before the contiguity with the Sitnica River. This river has no exceed of the MAV.

Drenica – monitoring of the river starts from Komoran to the contiguity point with Sitnica in Vragoli. During the spring season it is showed a better quality at the first monitoring station, while the second station in Vragoli shows for significant changes, such as the conductivity is increased for several hundred units, as a result of wastewater discharges from surface mines of KEK.

Shtime - There are two monitoring stations, one at the part where no external influence from human activity is identified and where the water quality is very good and the second station is located after the discharge of all urban wastewater from all surrounding villages and the Shtime city itself, where the water quality of the river belong to a very poor category.

INTERPRETATION OF RESULTS

Through the annual average values presented in the graphics will be interpreted the state of waters in the Ibri River basin, by providing annual average values for each parameter of each river of this basin.

The dissolved oxygen (O2 dissolved) – it varies from one station to the other. But it may be concluded that in all water streams of this basin has O2 dissolved except in Pristina River at Bresje, where lower quantity is registered.

If we compare the values of 2007 with those of 2008, it is not indicated a huge difference. The highest O2 value is measured in the Drenica River (at Krojmir) of 13.8 mg/L, while the minimum value in 2007 is registered in the Prishtina River (at Bresje). It has to be considered that these are annual average values. There have been cases during monthly monitoring dynamics in this monitoring station (Bresje) no dissolved O2 is registered. The same situation is registered for the years 2008 and 2009.

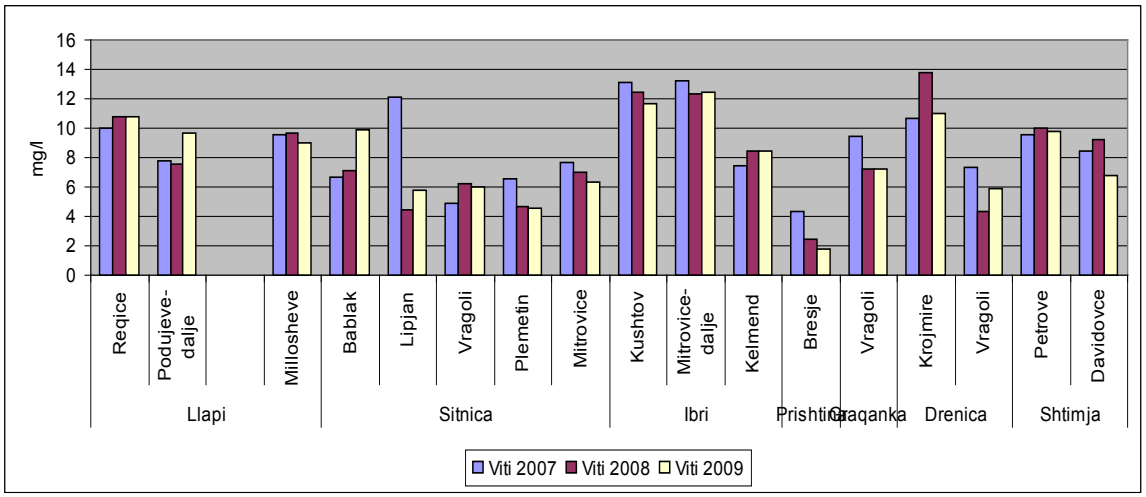


Figure 15: Dissolved oxygen in the Ibri River basin

Biochemical Oxygen Demand (BOD5) – Among all measuring stations, the highest values for 2007 and 2008 are registered in the Prishtina River (at Bresje) where regularly are indicated higher values than in all other stations of the network for surface water quality monitoring in Kosovo. While comparing data between the registered values for 2007, 2008 and 2009, only minor changes are indicated, that means the water quality in this basin continuously is at the same condition. The maximum value of BOD5 is registered in Pristina River (at Bresje station) with an annual average of 19.8 mg/l for 2007 and 18.43 mg/l for 2008, while for 2009 this value was 15.1 mg/l. The lowest values are showed by measurements on river water springs.

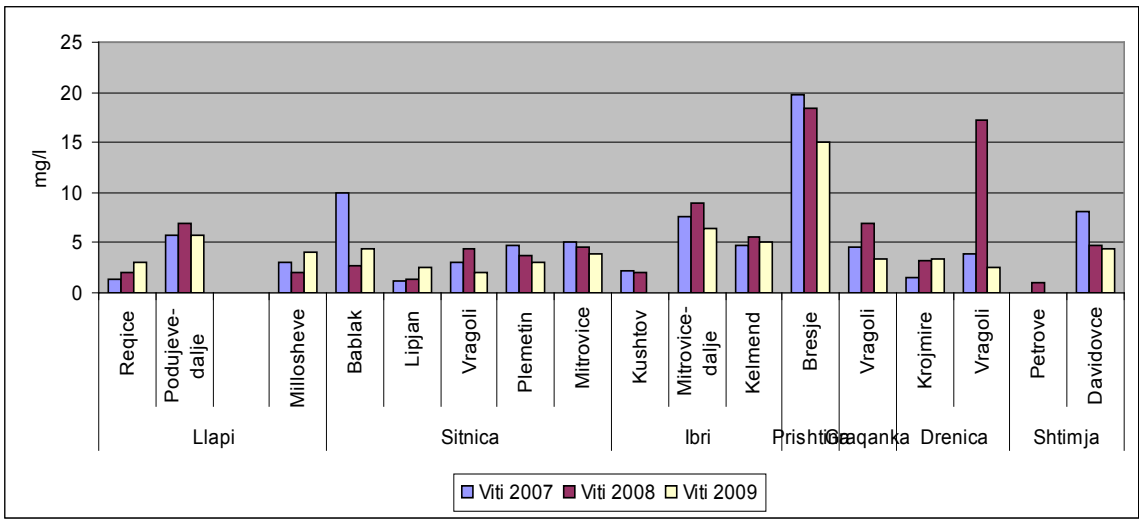


Figure 16: Biochemical Oxygen Demand in the Ibri River basin

Conductivity - in 2007, the lowest value is registered in the Llap River (at Reqicë) 257 µs/cm, while the highest value is registered in Graqanka River (at Vragoli) 1512 µs/cm.

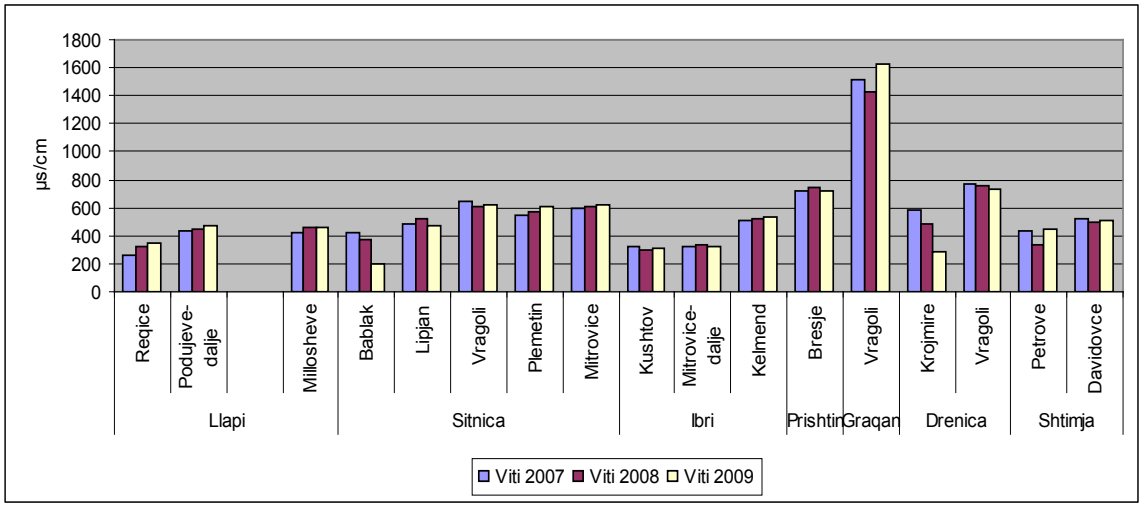


Figure 17: Water conductivity in the Ibri River basin

In 2008, the values range from the lowest in the Shtime River (at Petrove) 304 µs/cm to the highest value in Graqanka River (at Vragoli) 1426 µs/cm.

The lowest recorded value in 2009 is registered in the Sitnica River (at Bablak), while the highest annual average values is registered at the same sampling point the Graqanka River (at Vragoli) 1621 µs/cm.

Hydrogen ion concentration (pH) – The pH values usually range between 7.74 to 8.49 values for 2007, while in 2008 these values were between 7.45 to 8.18. For 2009 the values range from 7.34 to 8.23. Generally, these waters belong to a poor alkaline environment.

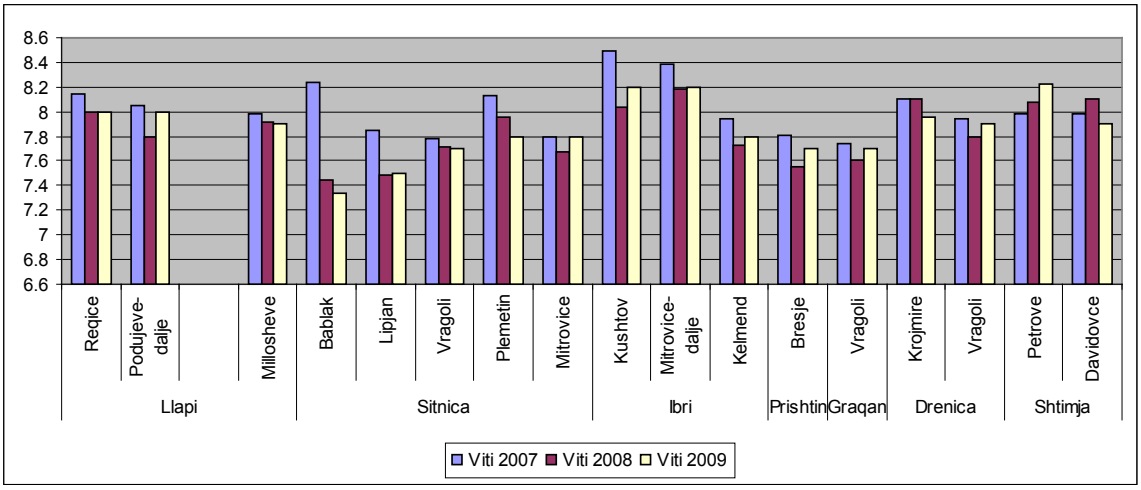


Figure 18: Hydrogen ion concentration in the Ibri River basin

Nitrites (NO2-) - Values of this parameter are increased in 2008 compared with those of 2007. It shows that the amount of flow was lower in 2008 and resulted with the increase of values in some of the monitoring stations for this parameter in about 0.1 mg/l. In Sitnica River (at Mitrovica), the value reaches 0.685 mg/l, and in Vragoli also it is indicated an increased value of 0.575 mg/l. It indicates for the poor water quality of this river. In 2009, an increased values is registered at Sitnica River (at Mitrovica) with 0.548 mg/l, while the lower value measured as annual average is registered in Llapi River (at Reqicë) 0.046 mg/l.

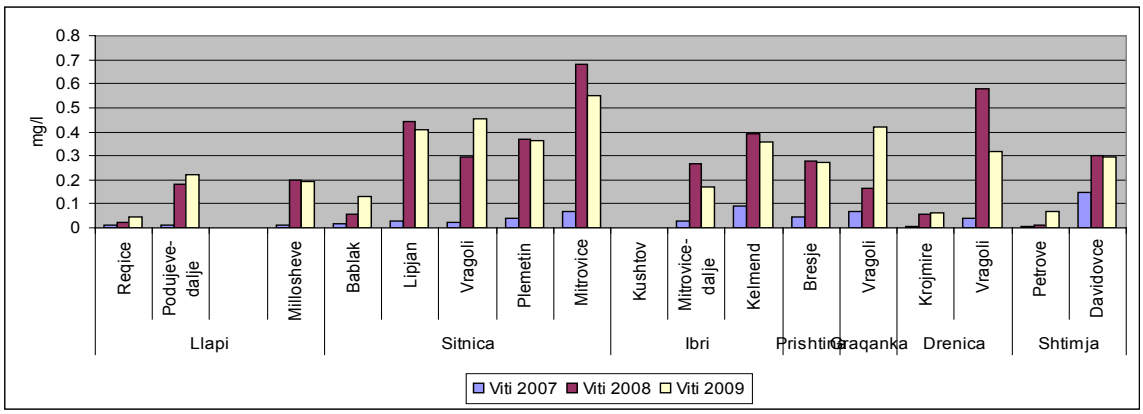


Figure 19: Nitrites in the Ibri River basin

Ammonia (NH4+) – The monitoring station at Bresje in the Prishtina River, showed higher values than other stations of the river basin. In 2007, these values ranged between 0.1 mg/l in the Shtimja River (at Petrovë), to the highest value 13.5 mg/l in the Prishtina River (at Bresje). There are not differences in 2009. Highest values are registered in the Prishtina River (at Bresje) 8.582 mg/l and the minimum value is registered in the Ibri River (at Kushtovë) 0.455 mg/l.

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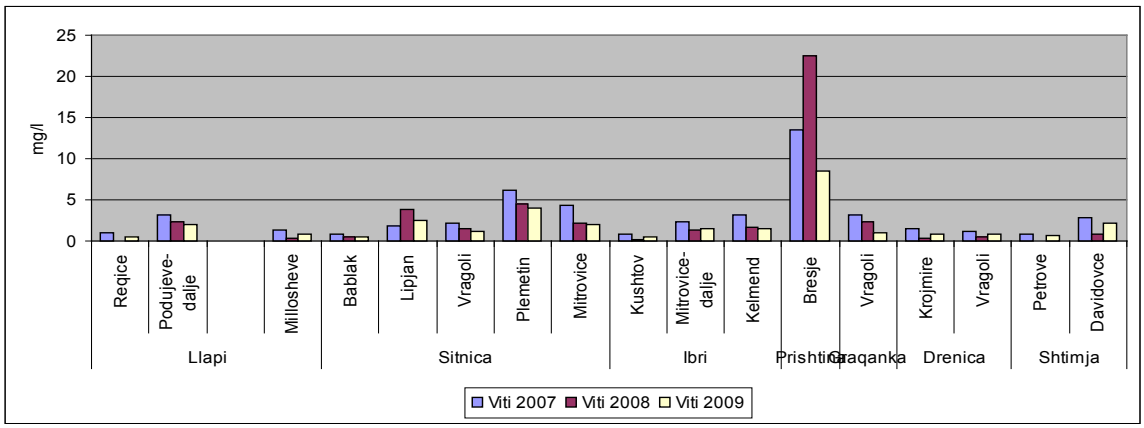


Figure 20: Ammonia in the Ibri River basin

Sulphates (SO42-) – The graph where the rivers of Llap, Sitnica, Iber, Drenica and Shtimje are included, the sulphate values for 2007 ranged between 5.28 to 23.82 mg/l. In 2008 the valued ranged between 2.7-27.5 mg/l, while for 2009 values ranged between 2.5 and 40 mg/l. This values do not show great variability from year to year.

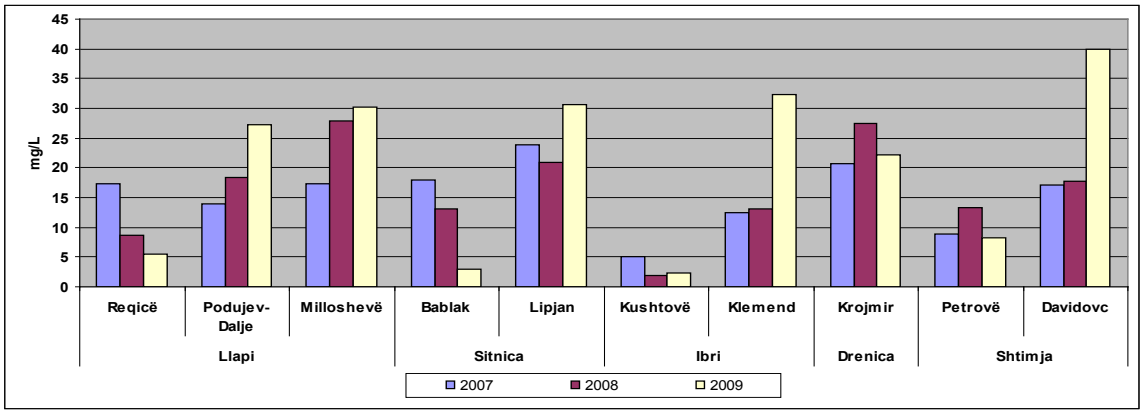


Figure 21: Sulphates in the Ibri River basin (lower values)

This parameter is divided into two diagrams due to the fact that in some stations, its value is tens of times larger than at the stations listed in the first diagram.

In this graph are presented sampling points that showed higher values for SO42-where in the three of years dominates the Graqanka River.

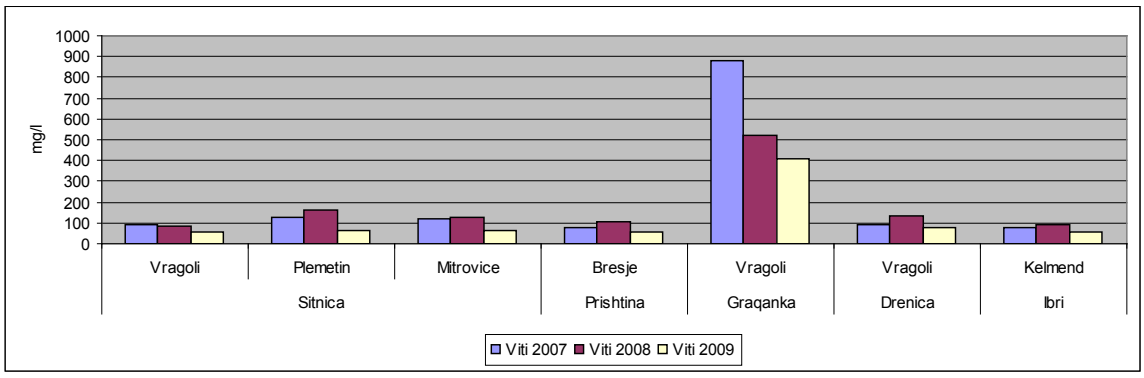


Figure 22: Sulphates in the Ibri River basin (higher values)

Phosphates (PO43-) - In 2007, the lowest values for this parameter are registered in the Ibri River (at Kushtovë) 0.053 mg/l, while the highest value in the Prishtina River (at

Bresje) 2.44 mg/l. In 2008 the lowest value of phosphate ion is registered in the Shtimje River (at Petrove) 0.014 mg/l, while the Sitnica and Drenica rivers (at Vragoli) reaches the highest phosphate ion value with ~ 4.8 mg/l.

In 2009, the Shtime River (at Petrove) resulted with minimal value 0.027 mg/l, while maximal value is registered in the Pristina River (at Bresje) 2.629 mg/l.

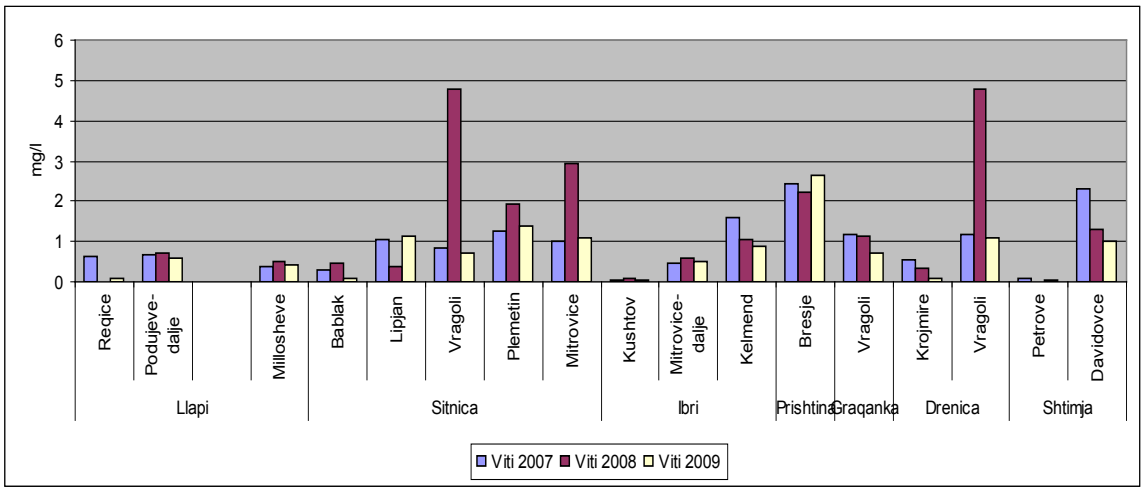


Figure 23: Phosphates in the Ibri River basin

Total phosphorus (poly and ortho) – The presence of total phosphorus in 2007 ranged from 0.013 mg/l in the Ibri River (at Kushtovë) and 1.23 mg/l in the Prishtina River (at Bresje). In 2008, the rivers Llap (at Recica), and Shtimje (at Petrovë) show maximum values of the phosphate ion ↓0.001 compared with the highest value of this parameter 0.67 mg/l in the Pristina river (at Bresje). In 2009, the Pristina River (at Bresje) showed the value of 0.474 mg/l, which is the highest value as the annual average, while the Llapi River showed the lowest value 0.156 mg/l.

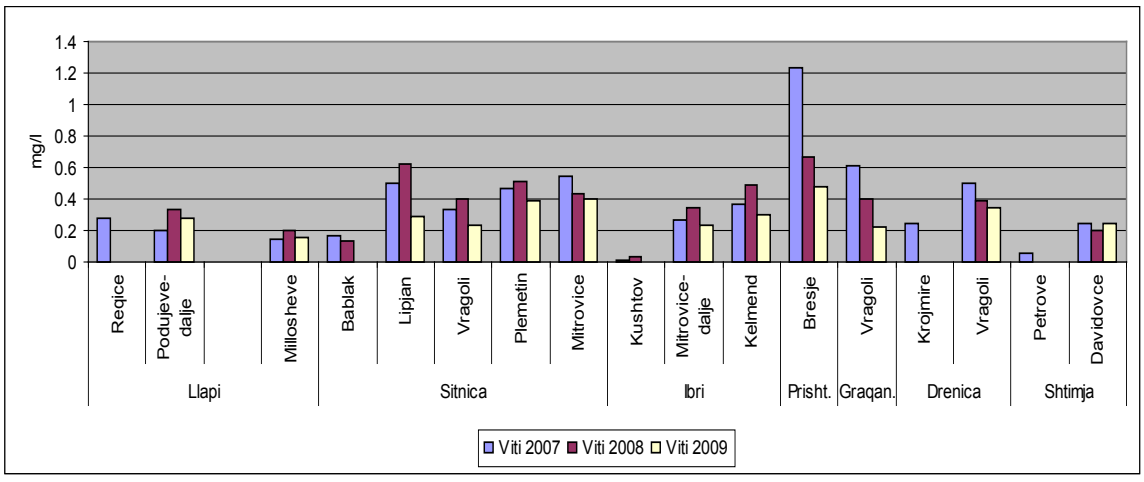


Figure 24: Total phosphor (poli dhe orto) in the Ibri River basin

Total hardness – Same as in the Drini i Bardhe river basin, the total water hardness in this river basin is measured at the water springs only. Based on obtained laboratory results, the total hardness values meet the WHO standards for drinking water ↓30 d0H.

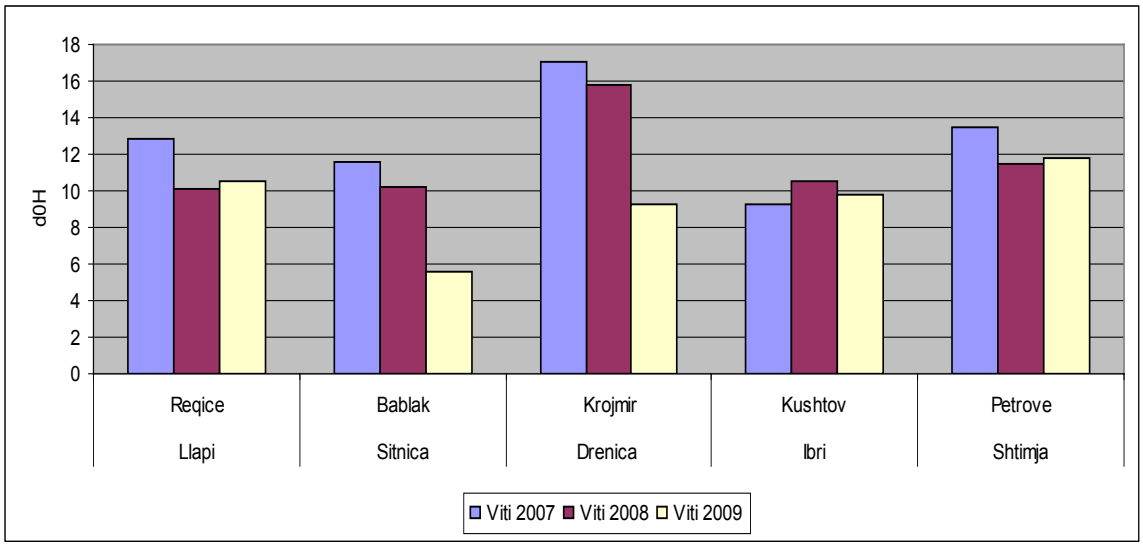


Figure 25: Total water hardness in the Ibri River basin

7.1.3 LEPENCI AND MORAVA E BINÇËS RIVER BASINS

GENERAL COMMENTS ON THE MORAVA E BINÇËS RIVER BASIN

Lepenci River - This river has two sources, one in the Prevalla mountain, and the other in the Brezovica mountain. Both have very good water quality. This situation continues up to the water discharge of the company "Silkapor" where time by time waters discharged by this company significantly impacts the water quality of the river. This phenomenon continues for several kilometres and it is indicated in the second monitoring station of the river, which is located before the river contiguity point with the Nerodime River in Kaçanik.

After converging with the Nerodime River, the measurements are made at the third station at Hani i Elezit, that is positioned at cross border with Macedonia. The water quality at this point is within the tolerable limits.

Nerodime River -The river begins in the Jezerc mountains (where the first monitoring station is located) of Ferizaj municipality with a high water quality, while the second station is located after the discharge of urban and industrial wastewater of Ferizaj. The water quality of this river get decreased along the river flow, up to the next station that is located before the contiguity point with the Lepenci River.

Morava e Binçës River – Monitoring takes place by starting at the Morava e Binçës, and then Kllokot, Ugljare and on the border with Serbia in Domorovc. This river joins the Dardana River. This river collects the urban and industrial wastewaters of Vitia, Gjilan and Dardana.

The Curved River - This river includes two separate streams, where water at the first monitoring point resulted with high quality, while at the second monitoring station in Domorovc, it is indicated a decrease of the water quality. The parameters that resulted in higher pollution are: turbidity, ammonia and nitrites.

INTERPRETATION OF RESULTS

Interpretation of the state of the Morava e Binçës and Lepenci river sub-basins will be presented by graphs with annual average values for each parameter for each of the rivers of these river basins.

The dissolved oxygen (O2 dissolved) - The chart shows the trend of the reduction of dissolved oxygen values at stations after discharges of urban wastewater collectors. In the rivers' upstream, the waters are clean and rich in oxygen. The decrease of the oxygen downstream the rivr is as a result of the wastewater discharges that contain organic matters. _

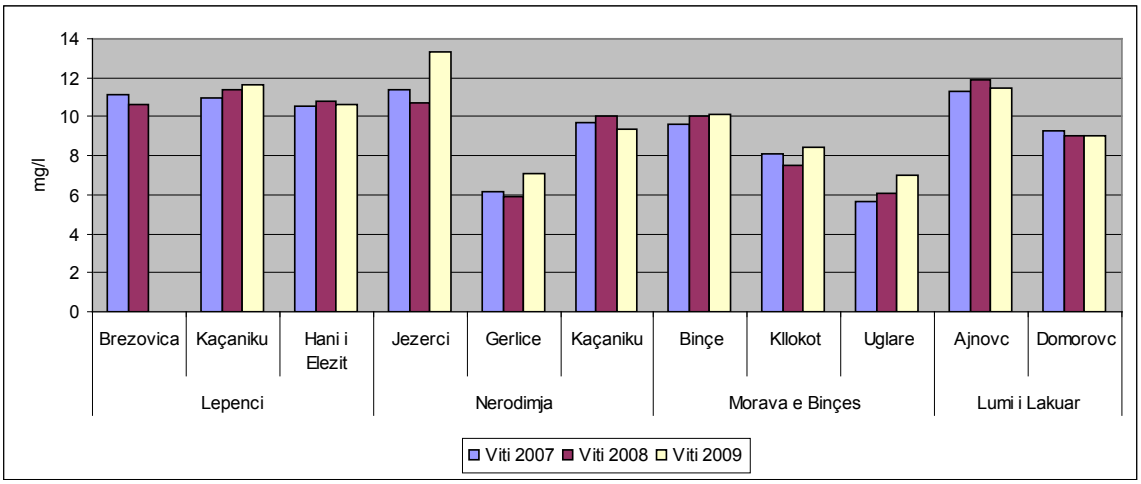


Figure 26: Dissolved oxygen in the Lepenci and Morava e Binçës river basins

The water of Nerodime and Morava e Binçës, in the last three years resulted with small quantity of dissolved oxygen. This is as a consequence of urban and industrial wastewater discharges without any previous treatment. But, still the minimum threshold of 3 mg/l is not exceeded.

Biochemical Oxygen Demand (BOD5) - In 2007, the lowest BOD5 value is registered in the Morava e Binçës River (at Binçë) 1.35 mg/l; and the highest value in the Nerodime River (at Gërlicë) 15.67 mg/l. In 2008, the minimum values are recorded in the Morava e Binçës River (at Binçë) 1.04 mg/l and maximum annual average values are registered in Nerodime River (at Gërlicë) 11.97 mg/l.

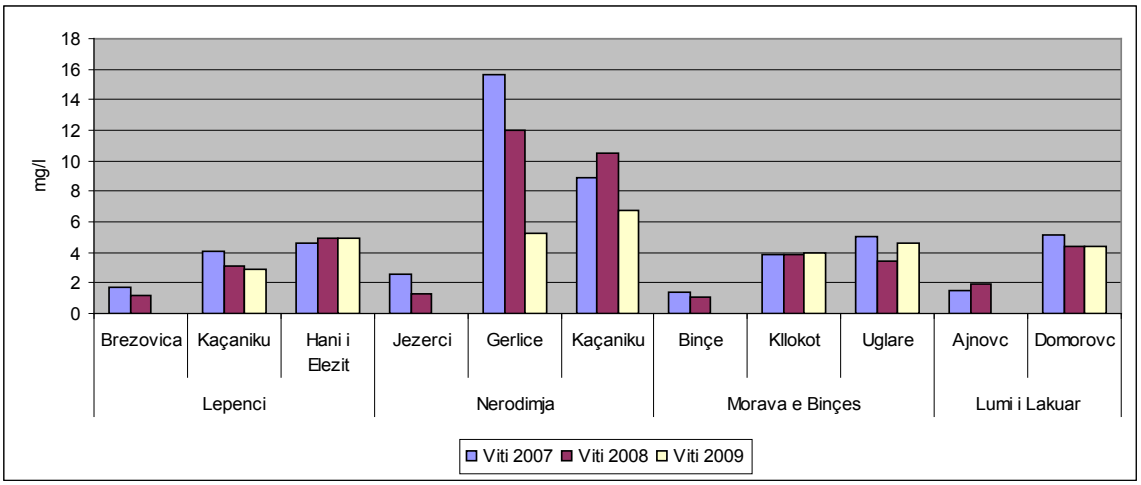


Figure 27: Biochemical Oxygen Demand in the Lepenci and Morava e Binçës River basins

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In 2009, the minimal annual average value in the Lepenci River (at kaçanik) was 2.9 mg/l, while the maximal annual value is register in the Nerodime River (at Kacanik) at 6.8 mg/l.

Conductivity - In 2007, the lowest value is registered in the Lepenc River (at Brezovica) 120 µs/cm, while the highest value is registered in the "Curved" River (at Domorovc) 685 µs/cm.

In 2008, the values range from the lowest in the Nerodime River (at Jezerc) 138 µs/cm to the highest value in the Morava e Binçës River (at Ugljare) 624 µs/cm.

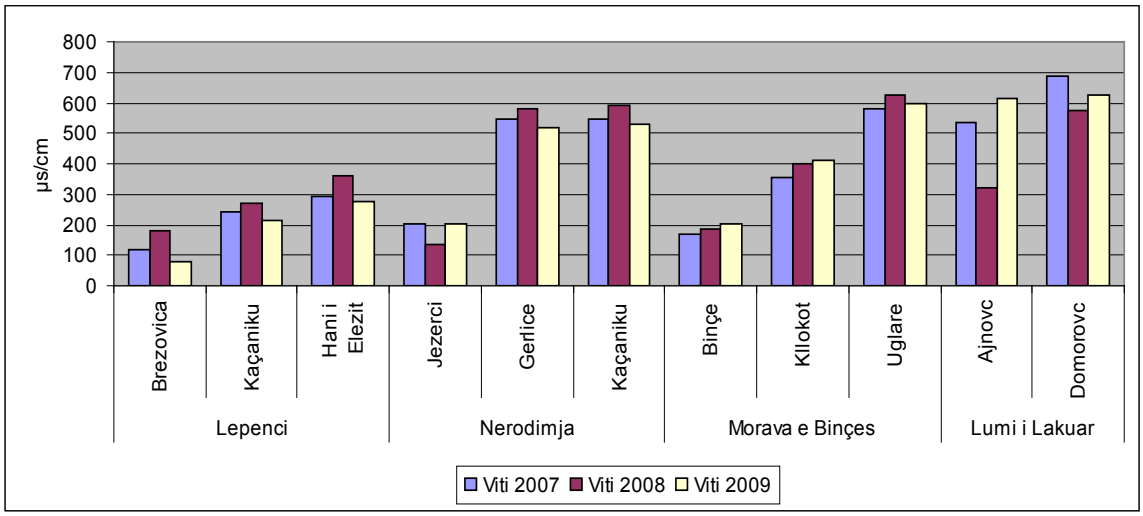


Figure 28: Conductivity in the Lepenci and Morava e Binçës River basins

In 2009, the lowest value is registered in the Lepenc River (at Brezovice), while annual average maximum value is measured in the Curved River (at Domorovc 628 mg/l.

Hydrogen ion concentration (pH) – in 2007, the pH values usually ranged between 7.82 to 8.63. In 2008 these values were between 7.61-8.14, while in 2009 the pH values ranged from 7.6-8.27. Generally the water in these basins belong to a poor middle alkaline environment.

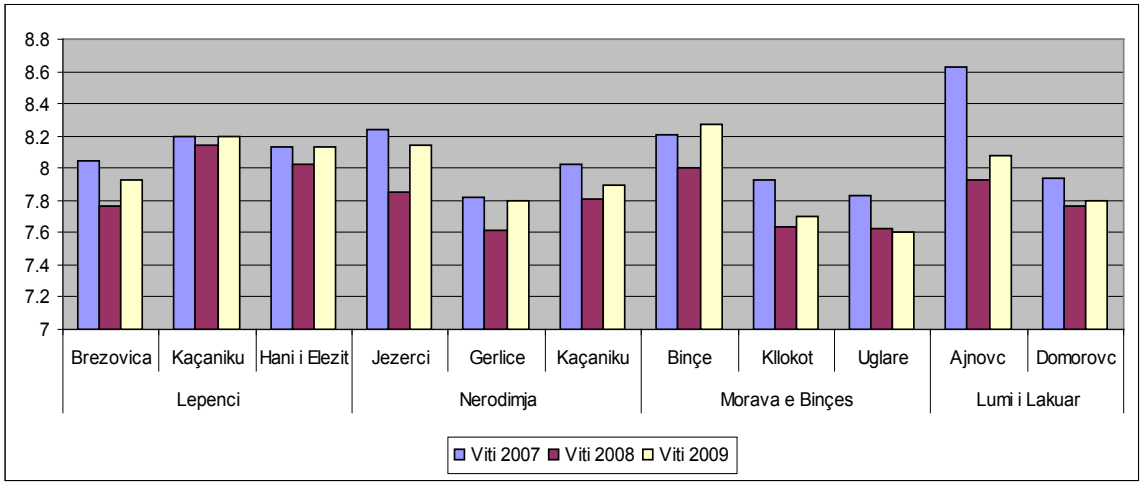


Figura 29: Përqendrimi i jonit hidrogjen në pellgun e Lepencit dhe Morava e BinçësFigure 29: Hydrogen ion concentration in the Lepenci and Morava e Binçës River basins

Nitrites (NO2-) - For 2007, the parameter indicates its minimum in the Morava e Binçës River (at Binçë) 0.001 mg/l, while the maximum annual average is recorded in the Nerodime

River, (at Kaçanik) of 0.774 mg/l. In 2008, at the same sampling point, is indicated the value of 1.085 mg/l, while in 2009 is registered an extreme value of 7.35 mg/l, the same case as in the Curved River (at Domorovc) that reaches the highest value of 5.63 mg/l.

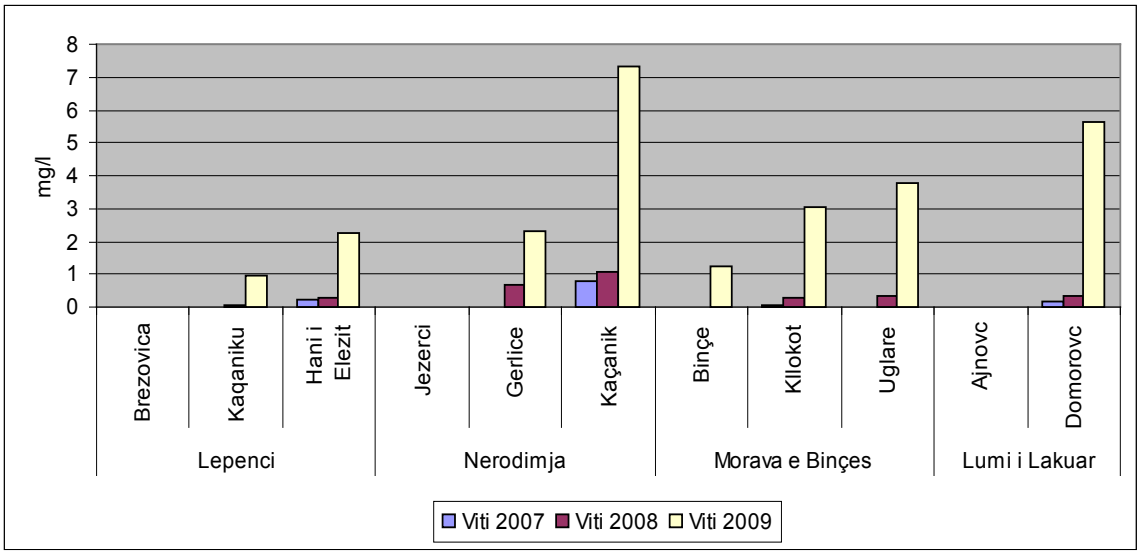


Figure 30: Nitrites in the Lepenci and Morava e Binçës River basins

Ammonia (NH4+) - As a polluting element, its presence is evidenced in large quantities, especially after the discharge of urban and rural wastewater collectors. The ammonia under alkaline pH↑ 10 has damaging effects of the environment and the water fauna. Its presence in the water reflects with unpleasant odour.

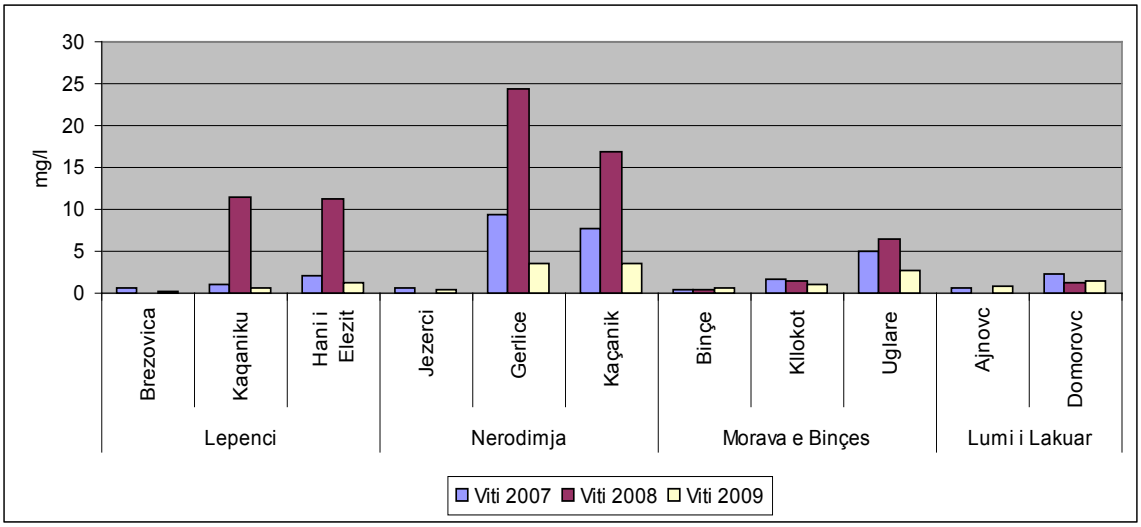


Figure 31: Ammonia in the Lepenci and Morava e Binçës river basins

The lowest values of ammonia in the Morava e Binçës River (at Binçë) are registered in 2007 with 0.47 mg/l, while the highest values are appeared in the Nerodime River (at Gërlicë) 9.32 mg/l. The minimal annual average values in 2008 is recorded in the Nerodime River (at Jezerc) ↓0.001 mg/l and the maximum value sis reached in the Nerodime River (at Gërlicë) 24.32 mg/l. In 2009, the minimum annual value has the Lepenci River (at Brezovica) 0.245 mg/l, while the Nerodime River (at Gerlicë) reaches the maximum 3.556 mg/l.

Sulphates (SO42-) - In 2007, the Morava e Binçës River (at Binçë) shows the lowest value 4.25 mg/l, while the higher value appears in the Curved River (at Ajnovc) 229.5 mg/l. In 2008, the lowest value of this parameter is listed in the Lepenc River (at Brezovica) 1.93

mg/l, and the highest value in the Curved River (at Domorovc) with 147.2 mg/l.

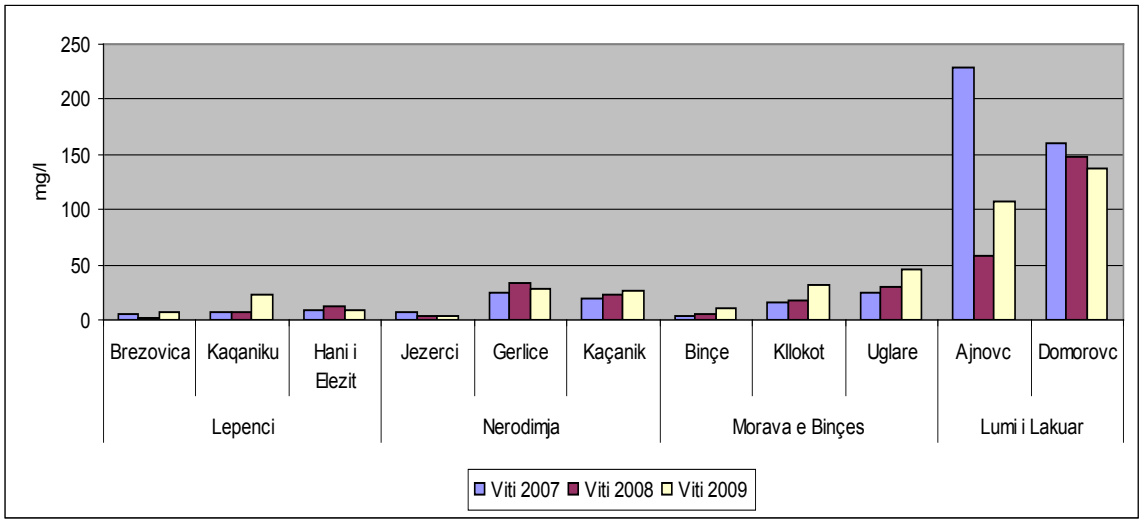


Figura 32: Sulfatet në pellgun e Lepencit dhe Morava e BinçësFigure 32: Sulphates in the Lepenci and Morava e Binçës River basins

In the Nerodime River (at Jezerc), the minimum annual average for 2009 was 3.47 mg/l and the maximum value is registered in the Curved River with 137.9 mg/l.

Phosphates (PO43-) - In 2007 the minimum value of phosphates is registered in the Curved River with 0.005 mg/l, while the maximum value is recorded in the Nerodime River (at Gërlicë) with 1.278 mg/l. In 2008 the lowest values were recorded in the Lepenc River (at Brezovica) 0.015 mg/l and highest values in the Nerodime River (at Gërlicë) 2.288 mg/l.

In 2009, in the Nerodime River (at Jezerc) the minimum annual values were 0.008 mg/l, and the same river in the sampling point at Gërlicë reached the maximum annual value of 1.79 mg/l.

By the results we come to the conclusion that the parameter of phosphate in last three years of monitoring has a maximum value at the monitoring station in Nerodime - Gërlicë.

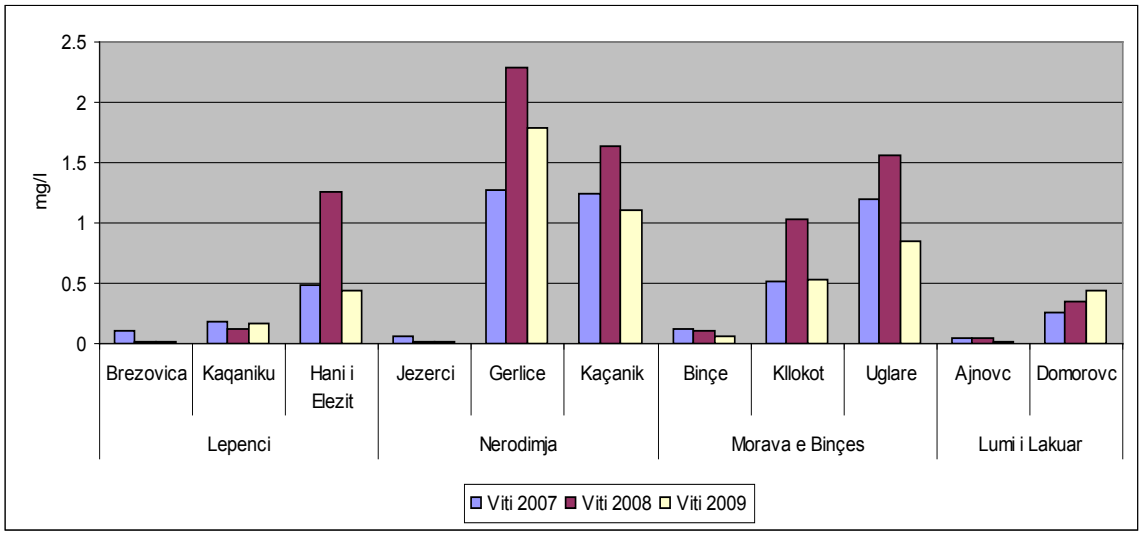


Figure 33: Phosphates in the Lepenci and Morava e Binçës River basins

The increased phosphate ion values are appeared mainly at those monitoring stations located after the urban and industrial wastewater discharges.

Total phosphorus (poly and ortho) – This parameter has also low values at river water springs. In 2007, the lowest value is recorded in the Curved River (at Domorovc) 0.02 mg/l and the highest value in the Nerodime River (at Kaçanik) 0.64 mg/l. In 2008, lowest values have been registered in the Lepenci River (at Brezovica) and Nerodime River (at Jezerc) with ↓0001 mg/l). It means the lowest values were registered at the water springs of these rivers.

In 2009, the lowest annual average values are registered in the Lepenci River (at Kaçanik) with 0.08 mg/l, while the highest annual average values are registered in the Nerodimja River (at Kaçanik) 0.607 mg/l.

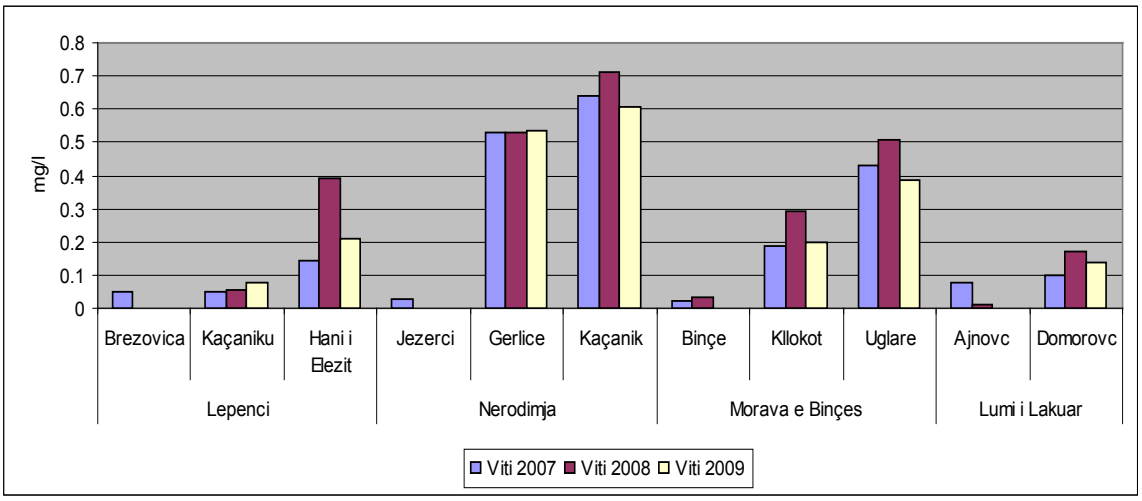


Figure 34: Total Phosphorous (poly and ortho) in the Lepenci and Morava e Binçës River basins

Total hardness - As in other river basins, the water hardness is measured at the river water springs only.

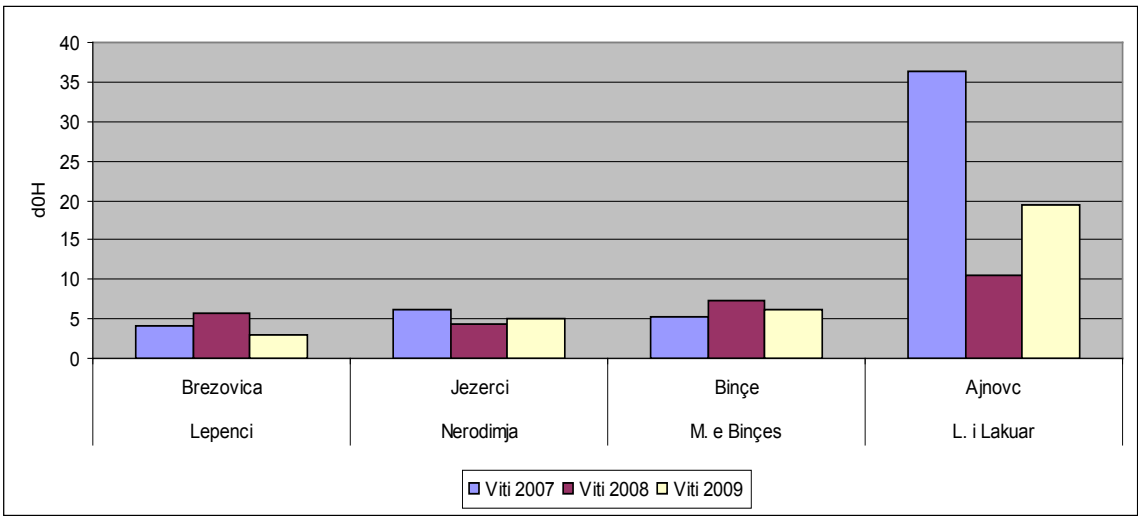


Figure 35: Total Hardness in the Lepenci and Morava e Binçës River basins

POLLUTION BY HEAVY METALS

The KHMI have started to monitoring the heavy metals in surface waters since 2008. Some of them are toxic elements such as: Pb2+, Cd2+, Cu2+, Cr6+, Ni2+ etc. But, among them are included as well the essential elements such as: Fe2+, Zn2+, Mn2+, Cr3+.

The heavy metals such as cadmium and lead are found in water as the result of dumping the remnants from industrial processes.

 © Agjencia e Kosoves per Mbrojtjen e Mjedisit

Table 30: Maximal allowed values (MAV) for some of heavy metals according to the EU directive 152/1999 [44]

Nr	Heavy metals	Symbol	Unit	MAV
1	Chrome	$Cr^{3+/6+}$	mg/L	0.2
2	Cadmium	Cd^{2+}	mg/L	0.02
3	Nickel	Ni^{2+}	mg/L	2.0
4	Zinc	Zn^{2+}	mg/L	0.5
5	Manganese	Mn^{2+}	mg/L	2.0
6	Cooper	Cu^{2+}	mg/L	0.1
7	Iron	Fe^{2+}	mg/L	2.0
8	Lead	Pb^{2+}	mg/L	0.2

The Drini i Bardhe River basin – Based on monitoring results, the values of Chrome are exceeded (as of EU Directive 152/1999) in the Rimnik and Erenik rivers as well as in the Lumëbardhi i Prizrenit River at two monitoring stations.

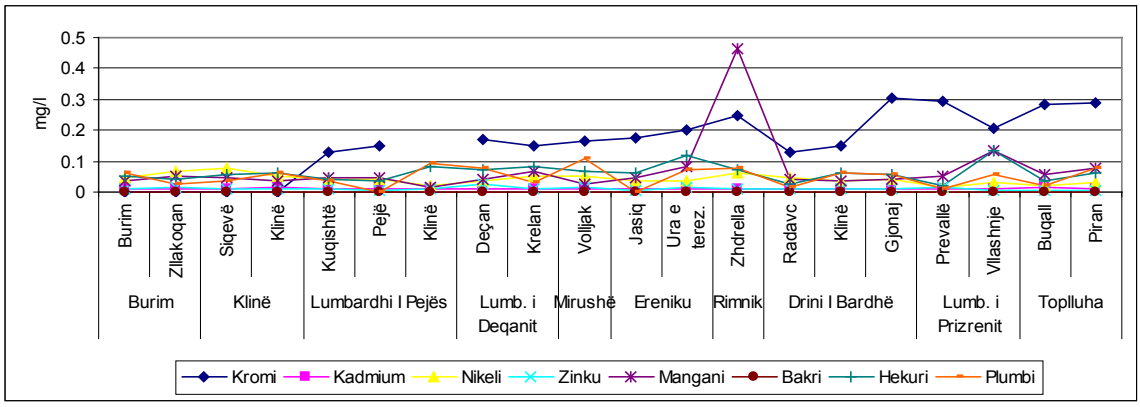


Figure 36: Heavy metals in the Drini i Bardhë River basin

The Ibri River basin – in this river basin is evidenced the presence of heavy metals such as chromium (Cr3+), in both water quality monitoring stations of Shtime River, and in the Sitnica River at Plemetin station. It is indicated as well the influence of cadmium (Cd2+). The graphic shows that in Graqanka River (at its monitoring station in Vragoli) has a difference compared to other monitoring stations. The Zinc (Zn2+) that comes from the pumped waters of Kishnica mine, is within the allowed limit values with respect to the EU directive EU 152/1999

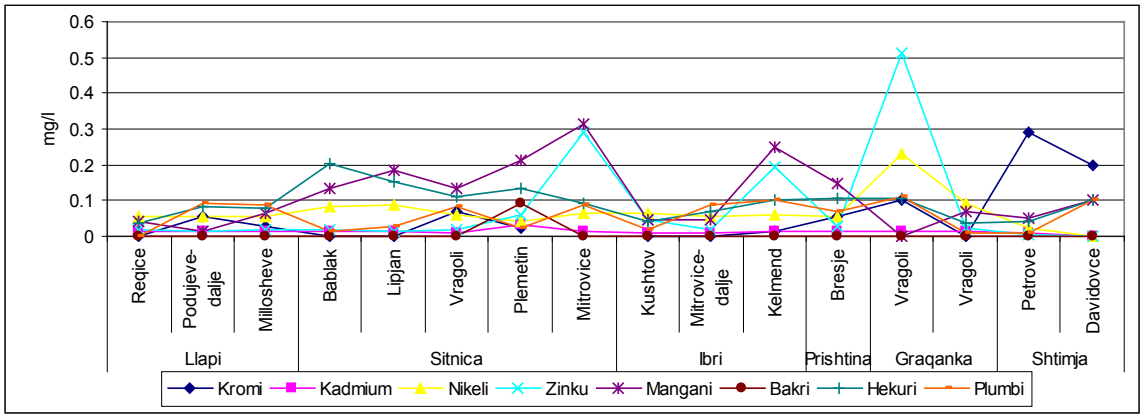


Figure 37: Heavy metals in the Ibri River basin

44 "Legislative decree of 11 MAJ 1999,NR. 152", Provisions for water protection from pollution, Directive 91/271/ EEC on urban wastewater treatment.

The Lepenci and Morava e Binçës river basins - In both these two basins it is indicated the exceed of chrome (Cr3+/6+), while the quantity of other metals is found to be within the MAV.

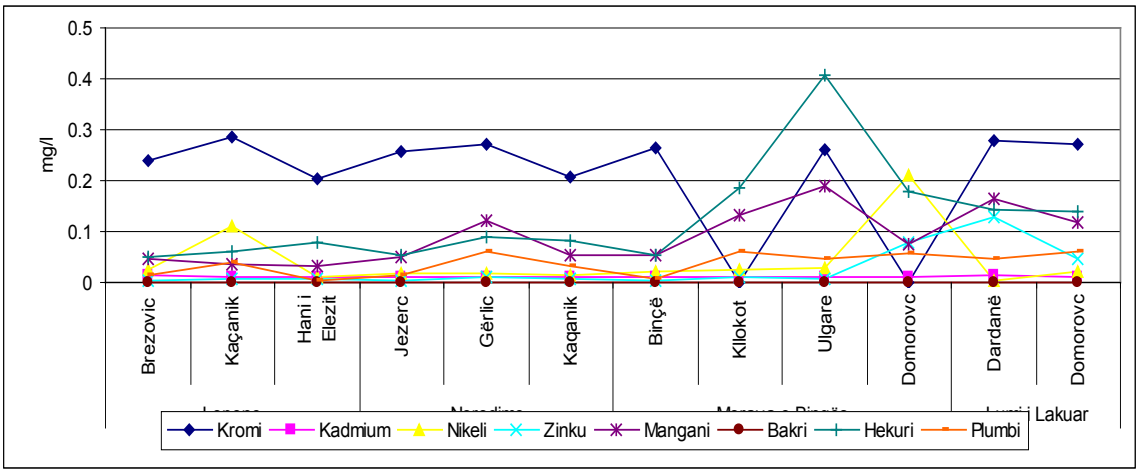


Figure 38: Heavy metals in the Lepenci and Morava e Binçës river basins

7.2 DRINKING WATER QUALITY MONITORING

The surface and ground waters are not protected from contamination and the designed sanitary zones are not followed. The water quality of supply systems differs by a region to another. The content of surface waters depends on the soil mineral composition where the water flows, and from the structure of aquifers. This is a serious problem, given that standards are not respected for sanitary areas. Also, regular water quality and quantity monitoring is not performed.

Water quality monitoring in public water supply systems is the responsibility of NPHIK, which follows on, performs analysis and makes reports on the adequacy of water quality.

Most of bacteria are located in water supply systems of small cities / rural areas (usually wells or springs), but there are reported cases for non-suitability of drinking water quality (mainly bacteriological residues) in public water supply systems.

About 70% of the population are connected to the water supply system, 65% of rural population drink the water from wells, where most of them are not hygienic, while about 40% of the population have access to the sewerage network.

The NPHIK regularly undertakes activities aimed at establishing control over the drinking water quality.

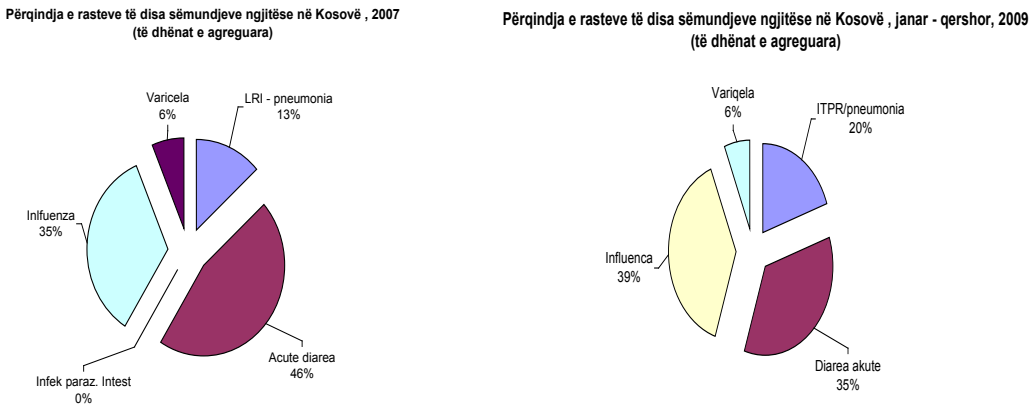
According to the data from the monitoring of drinking water sources from this institution, it is found that pollution of drinking water is highly characterised with bacteriological contamination than from chemical contamination. According to NPHIK, 74% -90% of wells are contaminated with faeces[45] .

Since the post-war period until today, the cases of infectious and parasitic diseases have been decreased significantly.

45 National Institute of Public Health of Kosovo (NIPHK)

Table 31:Report of infectious diseases in Kosovo from January to June 2009, NPHK

Municipality	ITPR-Pneumonia	Diarrhoea acute	Varicella	Suspicion in influence	**Total**
DEÇAN	7	169	14	371	561
SHARR	84	164	43	317	608
FERIZAJI	777	724	221	920	2642
FUSHË KOSOVË	165	385	73	141	764
GJAKOVË	9	316	85	410	820
GJILANI	306	573	80	513	1472
DRENAS	96	321	85	465	967
BURIM	28	135	7	473	643
KACANIK	41	135	38	4	218
DARDANË	227	297	52	708	1284
KLINË	245	669	69	64	1047
LIPJAN	184	418	62	454	1118
MALISHEVË	208	496	117	1880	2701
MITROVICË	787	1908	145	765	3605
ARTANË		1			1
KASTRIOT	144	213	55	190	602
PEJË	482	752	124	269	1627
JUNIK	1	56	7	49	113
PODUJEVË	618	763	91	717	2189
PRISHTINË	1270	2697	375	1877	6219
PRIZREN	927	1313	394	2333	4967
RAHOVEC	965	283	68	1038	2354
SHTIME	123	73	13	351	560
SKENDERAJ	18	467	71	229	785
THERANDË	250	203	40	390	883
VITI	18	478	64	657	1217
VUSHTRRI	119	484	110	359	1072
TOTAL	8099	14493	2503	15944	41039



A) B)

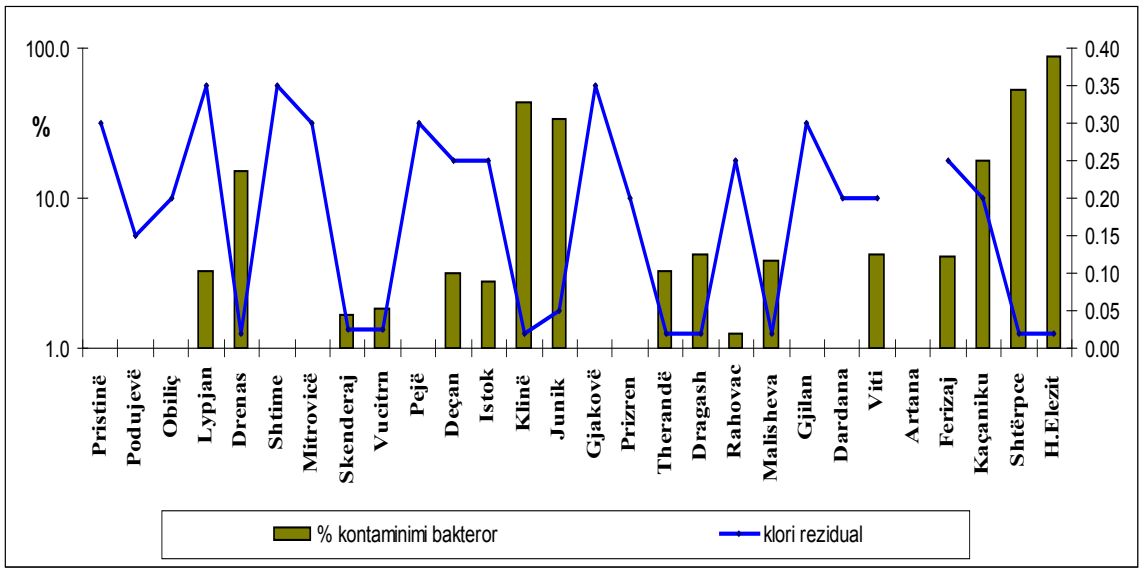
Figure 39: The rate of infectious diseases in Kosovo, A) in 2007 and B)January-June 2009 (aggregated data)

The NPHIK report for the period January - December 2009 for drinking water quality, determines that:

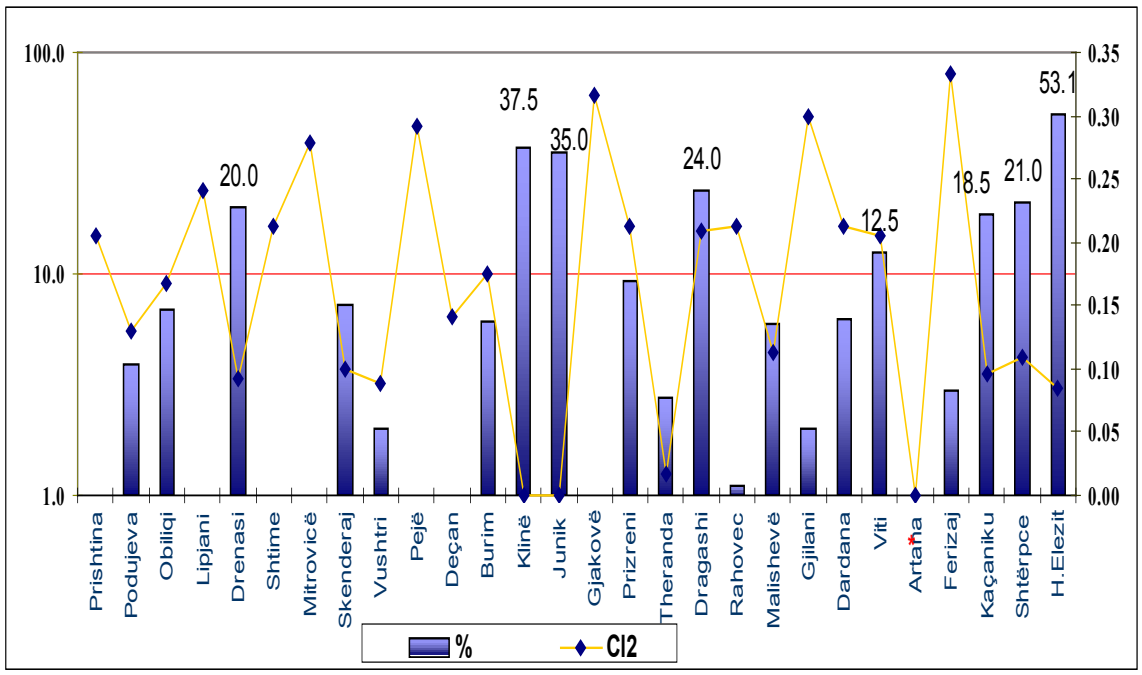
- In the first half of 2009 total 41,039 cases of infectious diseases are reported.
- The number of diseases is lower compared with the same period of 2008 (69,460).
- The water Diarrhoea with 14,493 cases (about 688.5 / 100.000 inhabitants), reported in fairly large numbers. This number can be related to poor economic and hygiene conditions, water supply, lack of sewerage, waste disposal, etc.. that are evident in Kosovo.
- The aggregated group of diseases such as acute diarrhoea is reported with 35% of the total.
- Still large number of cases of Hepatitis A reported. It is an indicator that show for the low level of personal and family hygiene, and use of drinking water from contaminated wells,
- The drinking water quality is still not reliable.
- Disinfection of drinking water is not sustainable.
- The protection areas of water sources are missing in many cases.



Lepenci



A)



B)

Figure 40: Bacterial unsuitableness and values of residual chlorine for drinking water by central water supply systems in Kosovo: A) 2007 and B) January-June 2009

The NPHIK also finds that the correlation between % bacterial contamination and disinfection is evident.

8. GENERAL ASPECTS ON WATER MANAGEMENT

8.1 WATER PERMITS

- Under the Water Law, the Water Permit is required for:
- water abstraction;
- wastewater discharge;
- construction, reconstruction or demolition of structures if such affect water regime;
- mining activities and geological works which affect the water regime;
- extraction of sand, gravel, stones and clay: and
- other activities that may affect the water regime.

Water permit is not required for:

- Using the wells (excluding artery wells), springs, cisterns and familiar facilities for the supply of one household with drinking water;
- Fire extinguishing and undertaking of urgent sanitary measures or other measures in general emergency cases.

Water Permits are issued depending on the requirements of the Ministry of Environment and Spatial Planning and the relevant municipality.

The MESP issues permits for water facilities, plants and works for[46]:

- o Objects in which the technological process use or create radioactive substances;
- o Hydropower plants, thermal power plants, heating with installed power of higher than 5 MGW;
- o water system facilities which are administered by the Government of Kosovo in coordination with other authorities;
- o Construction of facilities for water protection, sewerage and water treatment plants for two or more municipalities;
- o Construction of oil pipelines, gas pipelines, and other conductivity systems that cross Kosovo's border or the region of the river basin;
- o Construction of water accumulations in two or more municipalities and accumulations affecting the territory of another country;
- o Construction of facilities for interstates water stream transfer, or from a river basin to another;
- o Construction of water protection facilities in interstates water streams;
- o Construction of facilities for the use of surface or underground mineral resources in the territory of two or more municipalities, respectively near the interstate rivers;
- o Construction of facilities for disposal of solid, liquid and sterile wastes and of

46 The Administrative Instruction on content, form, conditions and the procedure of issuing and maintaining the water permit

sanitary landfills;

- Construction of economic facilities and other facilities, that may produce waste that affect the regime of interstate water stream and the drinking water supply,
- Construction of fishpond that use the water from Interstate water stream;
- Construction of roads and rails, which extend beyond the border of Kosovo, or that cross the territory of two or more municipalities;
- Extraction of gravel which serve to regulate the water stream;

While the municipality issues the water permits for:

- Water abstraction from the sources that are used for public water supply up to 5000 people;
- Water supply through public water sources;
- Opening of individual or public wells;
- Irrigation of the land area up to 100 ha, and
- Water abstraction from sources of local importance.

Over the period 2005-2008, the Ministry of Environment and Spatial Planning has issued 91 water permits, of which 78 are issued in 2007 only. During this period, 146 applications (requests for permit) were reviewed, the majority of them in 2007.

More detailed data for water permits issued are presented in Fig. 42

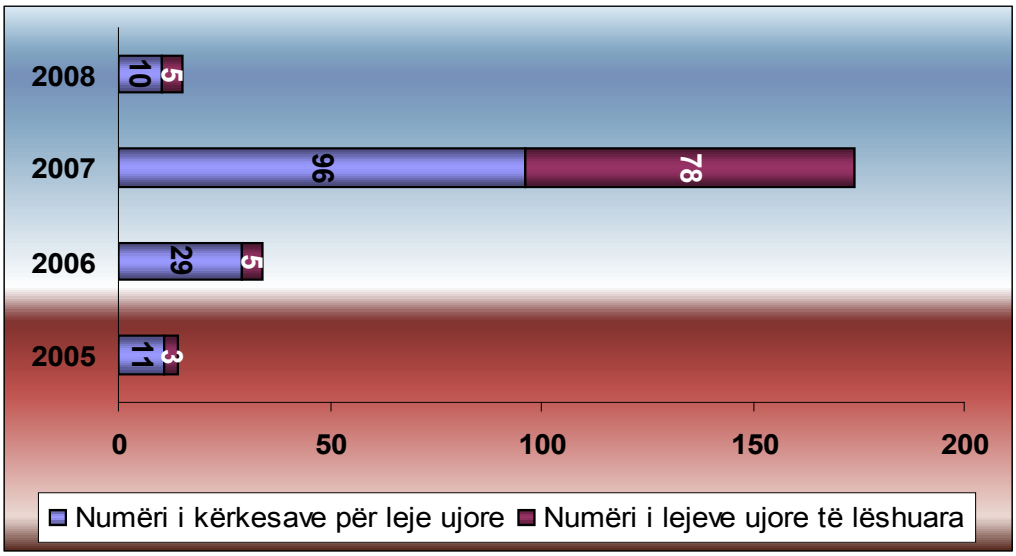


Figure 41: Number of water permits issued and of applications reviewed for the period 2005-2008

8.2 TARIFFS FOR WATER USE

The amount of compensation for the use of water, compensation for removal of wastewater (pollution) and compensation to extract gravel from the river beds and banks is regulated with administrative instruction on the structure of water payment.

The following table provides information on the amount of compensation for the use of surface water, groundwater and mineral water under this Administrative Instruction.

Table 32: The amount of compensation for the use of surface water, ground water and mineral water [47]

Type of water use	The amount of compensation
Untreated waters, taken directly	0.001 € për 1m^3
Waters that are drinking water quality and used for sale	Legal persons 0.003 □ and citizens 0.0015 □ m^3
Waters that are drinking water quality and used for personal needs	0.003 €
Manufacturers who bottle mineral waters and natural waters	0.009 € për një litër ujë të shitur
Irrigation of agricultural lands with water from artificial lakes	10 € / ha
Irrigation of agricultural lands with water from natural sources or water flows	5 € / ha
Fish ponds	0.15 € for every kilogram of fish sold
Electricity producers	2.5% of the selling price for each kilowatt-hour produced in the plant and 1.7% of the selling price for each kilowatt-hour produced at plants with closed cooling system

While data on the amount of compensation for wastewater discharge are presented in the following table

Table 33: The amount of compensation for used water[48]

Type of water use	The amount of compensation
Water used in the technical and technological process for circulation and processing of: oil and oil derivatives, black metallurgy, the textile industry, paper industry, leather, farms, abattoirs and meat industry, vehicles and vehicle services	0.03 € / 1 m^3;
Water from other industries not mentioned above	0.02 € / 1 m^3;
Urban waters that are collected in sewerage systems	0.001 € / 1 m^3;
Other types of used water	0.010 € / 1 m^3;
Water for cooling in power plants with open cooling system	1.5% € / 1 m^3

8.3. TARIFFS FOR WATER AND SEWERAGE SERVICES

The tariffs for water and sewerage services are determined by WWRO, based on principles, criteria and procedures set forth by the regulatory legal framework. Fees for these services are determined on the basis of applications made by regional water supply and sewerage companies and are based on the principle of covering the operational and capital costs needed to provide services. A special attention is paid to increasing the efficiency and level of services, so that WWRO sets performance targets which must be met by regional water and sewerage companies. The table no. 35 shows an overview of tariffs for water and sewerage services which are applicable in Kosovo.

47 Administrative instruction on the structure of water payments.
48 Administrative instruction on the structure of water payments.

Table 34 . Tariffs for water supply and sewerage services for 2007/08 and plans for increase of tariffs in 2009-2011[49]

Type of tariffs	Unit	Household tariffs				Non-household tariffs			
		2007/08	2009	2010	2011	2007/08	2009	2010	2011
RWC "Prishtina" Sh. A. Prishtinë									
Fixed	€/month	1.00	1.00	1.00	1.00	3.00	3.00	3.00	3.00
Water - volume	€/m³	0.25	0.30	0.32	0.34	0.60	0.72	0.76	0.81
Sewerage	€/m³	0.05	0.03	0.04	0.04	0.05	0.07	0.09	0.10
Average volumetric tariffs	€/m³	0.30	0.33	0.36	0.38	0.65	0.79	0.85	0.91
Increase of tariffs / years	%		10.00%	9.09%	5.56%		21.54%	7.59%	7.06%
RWC "Radoniqi" Sh. A. Gjakovë									
Fixed	€/month	1.00	1.00	1.00	1.00	3.00	3.00	3.00	3.00
Water - volume	€/m³	0.25	0.27	0.28	0.29	0.55	0.57	0.62	0.64
Sewerage	€/m³	0.05	0.05	0.05	0.05	0.05	0.11	0.11	0.11
Average volumetric tariffs	€/m³	0.30	0.32	0.33	0.34	0.60	0.68	0.73	0.75
Increase of tariffs / years	%		6.67%	3.13%	3.03%		13.33%	7.35%	2.74%
RWC "Hidrodrini" Sh. A. Pejë									
Fixed	€/month	1.00	1.00	1.00	1.00	2.00	3.00	3.00	3.00
Water - volume	€/m³	0.16	0.17	0.18	0.19	0.41	0.41	0.42	0.43
Sewerage	€/m³	0.05	0.05	0.05	0.05	0.05	0.07	0.08	0.09
Average volumetric tariffs	€/m³	0.21	0.22	0.23	0.24	0.46	0.48	0.50	0.52
Increase of tariffs / years	%		4.76%	4.55%	4.35%		4.35%	4.17%	4.00%
RWC "Mitrovica" Sh. A. Mitrovicë									
Fixed	€/month	1.00	1.00	1.00	1.00	3.00	3.00	3.00	3.00
Water - volume	€/m³	0.26	0.28	0.29	0.29	0.65	0.70	0.72	0.73
Sewerage	€/m³	0.05	0.05	0.05	0.06	0.05	0.13	0.13	0.15
Average volumetric tariffs	€/m³	0.31	0.33	0.34	0.35	0.70	0.83	0.85	0.88
Increase of tariffs / years	%		6.45%	3.03%	2.94%		18.57%	2.41%	3.53%
RWC "Hidroregjioni - Jugor" Sh. A. Prizren									
Fixed	€/noth	1.00	1.00	1.00	1.00	2.00	3.00	3.00	3.00
Water - volume	€/m³	0.19	0.22	0.24	0.27	0.40	0.46	0.51	0.57
Sewerage	€/m³	0.05	0.04	0.04	0.04	0.05	0.08	0.08	0.08
Average volumetric tariffs	€/m³	0.24	0.26	0.28	0.31	0.45	0.54	0.59	0.65

49 WWRO, 2009

Increase of tariffs / years	%		8.33%	7.69%	10.71%		20.00%	9.26%	10.17%
RWC "Bifurkacioni" Sh. A. Ferizaj									
Fixed	€/month	1.00	1.00	1.00	1.00	3.00	3.00	3.00	3.00
Water - volume	€/m³	0.25	0.25	0.27	0.28	0.60	0.60	0.62	0.64
Sewerage	€/m³	0.07	0.09	0.10	0.11	0.10	0.14	0.15	0.18
Average volumetric tariffs	€/m³	0.32	0.34	0.37	0.39	0.70	0.74	0.77	0.82
Increase of tariffs / years	%		6.25%	8.82%	5.41%		5.71%	4.05%	6.49%
KUR "Hidromorava" Sh. A. Gjilan									
Fixed	€/month	1.00	1.00	1.00	1.00	2.00	3.00	3.00	3.00
Water - volume	€/m³	0.25	0.28	0.29	0.30	0.50	0.60	0.62	0.64
Sewerage	€/m³	0.05	0.07	0.07	0.07	0.05	0.10	0.11	0.12
Average volumetric tariffs	€/m³	0.30	0.35	0.36	0.37	0.55	0.70	0.73	0.76
Increase of tariffs / years	%		16.67%	2.86%	2.78%		27.27%	4.29%	4.11%

8.4 WATER INFRASTRUCTURE

Water infrastructure includes facilities and equipment to regulate water, such as protection of embankments from large amounts of water, reservoirs, basin protection and water monitoring; facilities and equipment for water resources use, such as pumping stations, dams, supply canals and discharges including specified equipment and installations dedicated for protection from water damaging effects.

Water Infrastructure, apart from facilities and equipment, should also include channels as result of canal dislocation or adjustment of natural flows, or the accumulations created by suspension of water flows if dedicated for public services.

The classification of water infrastructure by the destination is determined by the administrative instruction for the content of water infrastructure. Classification of water infrastructure facilities according to their purpose and types of infrastructure is presented in the following table.

Table 35: Water infrastructure facilities according to destination[50]

Water infrastructure facilities according to destination	Types of facilities
Hydrotechnic facilities for water protection from erosion	• Embankment; • Regulated water flow beds • Drainage channels • Channels for protection from outside waters; • Discharge tunnels; • Dams with accumulation and their accompanying elements; • Retentions; • Mountainous dams; • Fences; • Groundsels for stabilisation • Pumping stations for water protection; • Other equipment components.
Hydrotechnic facilities to remove and drain the water	• The network of main and secondary channels; • drainage galleries; • pumping stations to remove excess water; • drainages; • other equipment components
Hydrotechnic facilities for water use;	• Facilities for irrigation as accumulations, canals and tunnels that bring the water, water captions pumping stations, regulators, electricity accelerators and dischargers, aqueducts and viaducts, drainage and distribution network, other equipment components • Water supply facilities such as accumulations, lakes, Captions for water capture, conditioning parts for water, pumping stations, reservoirs and facilities for extinguishing power, main tubes, other equipment components • Facilities for using the water power as accumulations, tunnels and accompanying canals, towers and other equipment • Fish ponds • Lakes and swimming pools
Hydrotechnic facilities for water protection	• Collectors for receiving and transporting wastewater; • Facilities and equipment for wastewater treatment; • Landfills for waste materials; • Facilities for discharges at recipient; • Other equipment components
Hydrotechnic facilities for water monitoring	• Hydrometric stations; • Piezometer; • Other equipment components.

But, despite the completed legal framework in the field of water sector and despite some investments made in constructing water infrastructure, there are no detailed data on the number of Hydrotechnic and other accompanying facilities. Data on some of the water infrastructure in Kosovo are presented in the following table

50 Administrative Instruction for the content of water infrastructure

Table 36: Water infrastructure in Kosovo

Water infrastructure facilities	Nr. of facilities
Hydrotechnic facilities for water protection from erosion;	• No detailed information on Hydrotechnic infrastructure for protection from water and erosion, even though some projects have been implemented for example in regulating Sitnica River bed, but it is unknown the number of mountain dams, drainage channels etc.. It is known for: • Six lagoon to drain water from sanitary landfills • 149 km, regulated channel
Hydrotechnic facilities to remove and drain the water;	• Also there is no detailed information on Hydrotechnic infrastructure for water removal and drainage. It is known for: • The number and/or length of main and secondary channels, • The number and/or the length of the drainage galleries, • The number and/or length of drainage • Number of pumping stations etc..
Hydrotechnic facilities for water use;	• 3357 km of water supply network managed by RWC's, • 196 rural water supply systems that are not managed by RWC's, • 938 km of sewerage network managed by RWC's • There are no exact data on the number of channels, but there are data on length in km. So the length of opened channels at the Drini i Bardhe is 415.70 km, at the Ibri and Lepenci is 80,883 km, while in Radoniqi, Dukagjini is 15.08 km. Total number of channels in the three irrigation companies is: 511 663 km • Six lakes of surface accumulations with surface area of 1573 km2 and volume of 565.1 million m3 • About 20 fish ponds • Tens of basins and recreational swimming pools • One hydropower plant with the capacity of 2x17 MW • 5 small hydropower plants with the capacity of 11.82 MW
Hydrotechnic facilities for water protection;	Also there is no detailed information on Hydrotechnic facilities for water protection as: • The number of collectors for the receipt and transportation of waste water; • Number of facilities and equipment for cleaning of waste waters; • Number of landfills for waste materials; • Number of discharging objects at recipient.
Hydrotechnic facilities for water monitoring.	• There are: • 22 hydrometric monitoring stations, • 13 automatic rain-gauge and • 53 manual rain-gauge

8.5 PROJECTS AND INVESTMENTS IN THE WATER SECTOR

The water sector in Kosovo belongs to the sectors where a considerable number of projects and capital investment are oriented in. Especially in the early years of post-war period, many donors have given donations for the rehabilitation and upgrading of water infrastructure in general. In the following table are presented general information about donors, implementers and amount for the projects for rehabilitation and upgrading of water infrastructure.

Table 37: Data on donations for rehabilitation and upgrading of infrastructure in the water sector (1999-2003)

Donor	Implementer	Amount €	Year of implementation
European Reconstruction Agency – AER	UNDP	690.48	**2000-2001**
US government	USAID	353.94	**2000-2001**
USAID	IOM	1,619.14	**2000-2001**
UFORK	UFORK	1,310.06	**1999-2002**
Swiss Government	SDC	646.17	**2000-2001**
Swiss Government	IBG LTD	13,283.73	**2001-2003**
German Government	GTZ	1,424.20	**2001-2002**
European Reconstruction Agency -AER	KFW and AER	10,212.08	**2000-2002**
WB and Dutch Government	CDF	3,793.09	**2001-2003**
European Governments, Swiss Government and ACT	OXFAM	3,326.65	**2000-2003**
Other donors	Different implementers	26,762.74	**1999-2003**
Amount		63,422.28	

According to existing data, the largest investments by foreign donors have been made in the rehabilitation and construction of water supply systems and sewerage networks. In the table 38 are presented data on investments in this field, according to water supply and sanitation companies.

Table 38: Capital investment review conducted in 2008, by donations for water supply and sewerage companies in Kosovo [51]

Company name	Region	Donation €/ CHF	Source of Donation
RWC "Prishtina" Sh. A.	Prishtinë	608,211.00 €	62,790 - MEF 545,421- Norwegian Government
RWC "Mitrovica" Sh. A.	Mitrovicë	470,000.00 €	270,000 - KTA 200,000 - MEF
RWC "Hidrodrini" Sh. A.	Pejë	275,443.71 €	275,443 – KFW
RWC "Radoniqi" Sh. A.	Gjakovë		
RWC"Hidroregjioni Jugor" Sh.A.	Prizren	173,919.00 €	173,919.00 € KFW
RWC "Bifurkacioni" Sh. A.	Ferizaj	45,000 € 4,740,000 CHF	45,000 € - KTS 4,740,000 CHF-Swiss Government
RWC "Hidromorava" Sh. A.	Gjilan	100,000 € 4,350,000 CHF	60,000 € - KTA 40,000 € - MEF 4,350,000 CHF - Swiss Government
Total of investments from donors	1,672,573.71 € 9,090,000.00 CHF		375.000.000 € KTA 302.790.000 € MEF 449.362.000 € KFW 545.421.000 € Norwegian Government 9.090.000.00 CHF Swiss Government

The Ministry of Environment and Spatial Planning, during 2008/2009 has implemented several capital projects in water sector, in the amount of over □ 600,000 (tab.39).

51 WWRO, 2009

Table 39: Projects Implemented by MESP during 2008-2009[52]

Project name	Benefiting Municipality	Donor	Amount in €	Year of implementation
Regulation of Shushica River bed	Istog	MMPH	289,000	2008
Execution of works at Banja e Pejes water supply system	Pejë	MMPH	240,861	2008
Construction of water supply system in Vinarc i ulët	Mitrovicë	MMPH	130,000	2008
Regulation of Klina River bed	Skenderaj	MMPH	459,000	2009
Regulation of Tërstena River bed	Vushtrri	MMPH	1,500,000	2009
Regulation of Mirusha River bed	Gjilan	MMPH	1,000,000	2009

The MESP for the period 2010-2012, has planned implementation of other projects in the water sector. Data on those projects, the budget and benefiting municipalities are given in the table 40.

Table 40: Planned projects by MESP 2010-2012 [53]

Project name	Amount €	Year of implementation
Drafting the elaborates for designation of water protected areas for drinking water	2,000,000.00	2010 – 2012
Rehabilitation and construction of embankment along the Sitnica River	9,400,000.00	2010 – 2012
Groundwater researches	1,300,000.00	2010 – 2012
Advancement of surface waters' system	1,200,000.00	2010 – 2012
Regulation of Lumebardhi I Prizrenit River bed	1,000,000.00	2010 – 2012
Implementation of first phase of the socio-economic projects and wastewater treatment in Prizren	3,000,000.00	2010 – 2012
Feasibility study and wastewater treatment in Peja	70,000.00	2010 – 2012
Feasibility study and wastewater treatment in Prishtinë	150,000.00	2010 – 2012
Study on identification of areas where sand and gravel could be extracted from the Drini i Bardhë River	1,700,000.00	2010 – 2012
Construction of embankment along the Drini i Bardhë River	1,105,000.00	2010 – 2012
The state of safety assessment of dikes and equipment with monitoring instruments	505,000.00	2010 – 2012
Construction of sewerage network at Deçani city and some surrounding villages	1,800,074.00	2010 – 2012
Main project, Main water supply system (tubes) that includes 13 villages of Gjakova	1,642,058.00	2010 – 2012
Regulation of Drenica River bed	1,200,000.00	2010 – 2012
Regulation of Toplluha River bed in Suharekë	1,500,000.00	2010 – 2012
Water Master Plan	2,000,000.00	2010 – 2012
Regulation of river bed in Mamushë	1,000,000.00	2010 – 2012
Regulation of sewerage network for villages Runik and Banjë of Skenderaj Municipality	550,000.00	2010 – 2012

52 Water Department, 2009
53 Water Department, 2009

CONCLUSIONS

The overall water situation in Kosovo in all its aspects and dimensions is unsatisfactory. This is because in one hand, the water resources in Kosovo are relatively insufficient (1600 m3 per year / resident), and in the other hand we have the systematic degradation of waters due to the lack of an effective management system and lack of adequate water protection measures.

Based on data presented in this report, it may be concluded that:

- Kosovo still has not: a strategic plan for water, water management plan, river basin management plan and flood management plan.
- Database for water is still incomplete and it is an obstacle to adequate planning in the water sector;
- It is evident the inappropriate use of water resources and uncontrolled exploitation of gravel from river beds;
- There is a lack of investment for construction of sewerage systems and waste water treatment plants;
- There is a lack of research institutions and consequently lack of scientific researches in the field of water.
- Insufficient cooperation between the responsible institutions in the water sector,
- Insufficient cooperation between government institutions, non-governmental organizations and public.
- There is no integrated system for surface and ground water monitoring

The situation with drinking water supply is not satisfactory as a result of the following factors:

- Low quality maintenance of water infrastructure;
- Amortization of water supply and sanitation networks;
- Lack of a plan to protect water resources;
- Lack of long-term plans to supply drinking water,
- Concentration of population in urban areas due to uncontrolled migration,
- The powers of regional water companies and local governments not clearly defined.
- Illegal connections in water supply and sewerage systems,
- Serious damage to the distribution network and maintenance problems,
- Low levels of payment for water supply services.

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1. Water Department / MESP
2. Kosovo Hydro-Meteorological Institute
3. National Institute of Public Health of Kosovo
4. Institute INKOS
5. Statistical Office of Kosovo
6. Waste and Water Regulatory Office - WWRO
7. Hidrosistemi Iber Lepenc JSC
8. Water supply and Sewerage Association of Kosovo-SHUKOS
9. RWC - Prishtina
10. Ministry of Agriculture, Forestry and Rural Development

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