

ENVIROMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) FOR THE SUB- COMPONENT 3 (a): REHABILITATION OF RADONIQI IRRIGATION SCHEME

Prishtina, 03.12.2019

Contents

| | |
|--|----|
| 1. INTRODUCTION | 7 |
| 1.1 Project objectives | 8 |
| 1.2 Project scope | 8 |
| 2. BACKGROUND INFORMATION AND PROJECT CONTEXT..... | 9 |
| 3. LEGAL AND POLICY REQUIREMENTS FOR THE ESIA | 10 |
| 3.1 National Legislation of Relevance for the ESIA | 10 |
| 3.2 ESIA Procedure and Permitting..... | 13 |
| 3.3 Land Acquisition / Expropriation | 14 |
| 3.4 World Bank ESIA policy | 15 |
| 3.4.1 Environmental Assessment (OP/BP 4.01) | 15 |
| 3.4.2 Involuntary Resettlement (OP/BP 4.12) | 16 |
| 3.4.3 Natural Habitats (OP/BP 4.04) | 16 |
| 3.4.5 Physical Cultural Resources (OP/BP 4.11)..... | 16 |
| 4. PROJECT DESCRIPTION AND CONSIDERATION OF ALTERNATIVES | 17 |
| 4.1 Project Description..... | 17 |
| Technical Characteristics of Radoniqi Scheme | 19 |
| Main channel system | 21 |
| Outlet structure | 23 |
| Basins | 24 |
| Regulating structure (radial gates)..... | 24 |
| Pump stations | 24 |
| 4.2. Radoniqi irrigation network..... | 25 |
| 4.3. Dukagjini Irrigation Network..... | 26 |
| Technical Characteristics of Dukagjini Irrigation Scheme..... | 28 |
| Main Canal System..... | 28 |
| 4.4 Project alternatives | 29 |
| 4.5.1 Zero Alternative | 29 |
| 4.5.2 Rehabilitation of existing irrigation network alternative..... | 30 |
| 5. ENVIRONMENTAL AND SOCIAL BASELINE | 30 |
| 5.1. Environmental Baseline | 31 |
| 5.2. Topography and Landscape | 31 |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| | |
|--|----|
| Landscape Baseline Conditions..... | 33 |
| 5.3 Climate | 33 |
| 5.4. Climate change..... | 34 |
| Impact of Climate change on irrigation water demands | 35 |
| CONCLUSIONS:..... | 37 |
| 5.5 Air Quality | 37 |
| Air quality in the project area | 42 |
| 5.6 Geology and hydrogeology | 42 |
| 5.7 Hydrology | 43 |
| 5.7 Water Quality..... | 46 |
| 5.8 Floods | 48 |
| 5.9 Seismic characteristics | 48 |
| 5.10 Landslides and Erosions | 49 |
| 5.11 Land use | 51 |
| 5.12 Soil Quality | 53 |
| 5.13 Soil Pollution | 53 |
| 5.13 Natural Protected Areas and Biodeversity Features..... | 54 |
| 5.14 Waste management..... | 57 |
| 5.15 Review of Social Baseline Data | 57 |
| 5.15.1 MUNICIPALITY BRIEFINGS | 57 |
| 5.15.2 REVIEW ON LOCAL INSTITUTIONAL SETUP AND ECONOMY IN THE MUNICIPALITIES | 59 |
| 5.15.3 Health care | 61 |
| 5.15.4 Education | 61 |
| 5.15.5 Cultural Heritage | 61 |
| 5.15.6 Religious and Cultural Sites..... | 62 |
| 6. Environmental and Social Impact Assessment | 62 |
| 6.1 Impacts on Landscape | 66 |
| 6.1.1 Rehabilitation phase | 66 |
| 6.1.2 Operation phase | 66 |
| 6.2 Impacts on Soil and Erosion | 67 |
| 6.2.1 Rehabilitation works | 67 |
| 6.2.2 Operational phase..... | 67 |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| | |
|---|----|
| 6.3 Impacts on the Water | 68 |
| 6.3.1 Rehabilitation phase | 68 |
| 6.3.2 Operation Phase..... | 68 |
| 6.4 Impacts on Climate and Air Quality, vulnerability of the project to climate change..... | 69 |
| 6.4.1 Rehabilitation Phase | 69 |
| 6.4.2 Operation Phase..... | 69 |
| 6.5 Impacts on Noise and Vibration..... | 69 |
| 6.5.1 Rehabilitation Phase | 69 |
| 6.5.2 Operation Phase..... | 70 |
| 6.6 Impacts on Biodiversity..... | 70 |
| 6.6.1 Rehabilitation phase | 70 |
| 6.6.2 Operation phase | 71 |
| 6.7 Waste Impact | 71 |
| 6.7.1Rehabilitation phase | 71 |
| 6.7.2 Operation phase | 71 |
| 6.8 Hazardous materials impact | 71 |
| 6.8.1 Rehabilitation phase | 71 |
| 6.8.2 Operation phase | 72 |
| 6.9 Possible social impacts..... | 72 |
| 6.9.1 Labour and working conditions | 72 |
| 6.9.1.1 Rehabilitation phase | 72 |
| 6.9.1.2 Operation phase | 73 |
| 6.9.2 Community health and safety..... | 73 |
| 6.9.2.1 Rehabilitation phase | 73 |
| 6.9.2.2 Operation phase | 74 |
| 6.9.3 Cultural heritage | 74 |
| 6.9.3.1 Rehabilitation phase | 74 |
| 6.9.4 Land acquisition | 74 |
| 6.9.4.1 Rehabilitation phase | 74 |
| 6.9.4.2 Operation phase | 75 |
| 7. ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES..... | 75 |
| 7.1 Introduction | 75 |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| | |
|--|-------------------------------------|
| 7.2. Mitigation Measures for Landscape | 75 |
| 7.2.1 Rehabilitation Phase | 75 |
| 7.2.2 Operation Phase..... | 75 |
| 7.3 Mitigations Measures for Soils..... | 76 |
| 7.3.1 Rehabilitation phase | 76 |
| 7.3.2 Operation Phase..... | 78 |
| 7.4 Mitigations Measures for Waters | 78 |
| 7.4.1 Rehabilitation Phase | 78 |
| 7.4.2 Operation Phase..... | 79 |
| Establishment of Protected Zoning..... | 79 |
| A- Total protection zone: | 79 |
| B- Buffer zone | 79 |
| C- Catchment Protection Zone..... | 80 |
| 7.5 Mitigation Measures for Air..... | 80 |
| 7.5.1 Rehabilitation phase | 80 |
| 7.5.2 Operation phase | 80 |
| 7.6 Mitigation measures for Noise and Vibration..... | 81 |
| 7.6.1 Rehabilitation phase | 81 |
| 7.6.2 Operation Phase..... | 81 |
| 7.7 Mitigation measures for Physical and Cultural Heritage | 81 |
| 7.7.1 Rehabilitation phase | 81 |
| 7.7.2 Operation phase | 82 |
| 7.8 Mitigation Measures for Biodiversity | 82 |
| 7.8.1 Rehabilitation works | 82 |
| 8. Environmental and Social Management Plan | Error! Bookmark not defined. |
| 9. INSTITUTIONAL RESPONSIBILITIES FOR IMPLEMENTATION OF MITIGATION MEASURES AND MONITORING | 115 |
| 9.1 Competent institutions and communication | 116 |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

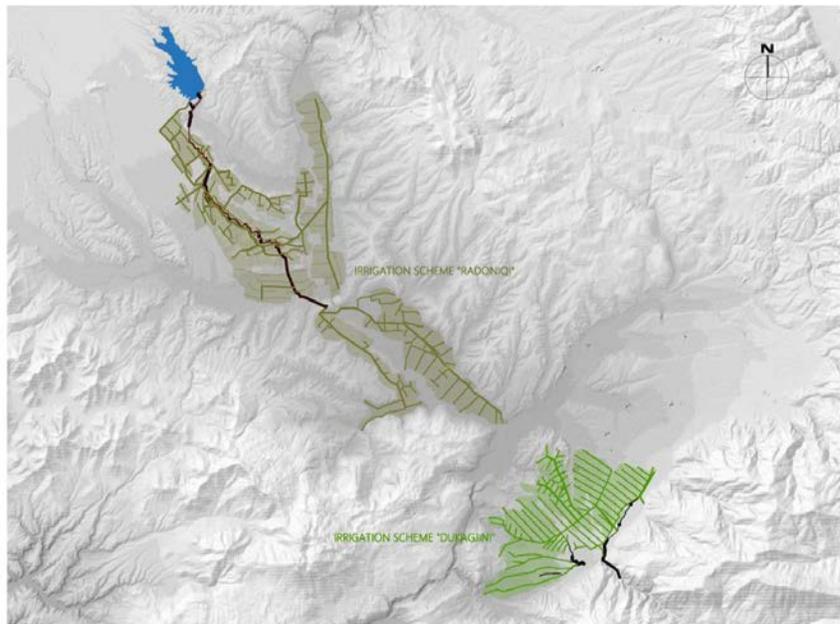
| | |
|-------------|---|
| ARDP | Agricultural and Rural Development Project |
| CERC | Contingency Emergency Response Component |
| ESIA | Environmental and Social Impact Assessment |
| ESMF | Environmental and Social Management Framework |
| RPF | Resettlement Policy Framework |
| RAP | Resettlement Action Plan |
| RDIS | Radoniqi-Dukagjini Irrigation Scheme |
| EU | European Union |
| IPA | Instrument for Pre-accession |
| MESP | Ministry of Environment and Spatial Planning |
| HMIK | Hydro Meteorological Institute of Kosovo |
| KES | Kosovo Environmental Strategy |

1. INTRODUCTION

The Agriculture and Rural Development Project (ARDP) is implemented by the Additional Financing Agreement between the Republic of Kosovo and the International Development Association (Credit number 6017-XK). The development objective of the project is to improve productivity of and access to markets by project beneficiaries in the horticulture and livestock subsectors of Kosovo through the implementation of selected measures of its agricultural strategy and strengthen the institutional capacity of the Ministry of Agriculture, Forestry and Rural Development.

In the frame of the Agriculture and Rural Development Project (ARDP) a Feasibility Study for the Rehabilitation Works in the Radoniqi-Dukagjini Irrigation Scheme (KARP-CS-5) has been prepared including the planning of construction works to improve and modernize the scheme. The project is going to be implemented by the Ministry of Agriculture, Forestry and Rural Development (MAFRD) jointly with Radoniqi-Dukagjini Irrigation Company as main stakeholder supported by the ARDP-PIU. Project value is estimated to be 5.4 million Euros while implementation timeframe is foreseen to be 16 months upon contract signature.

Radoniqi-Dukagjini Irrigation Scheme (RDIS) covers two separate irrigation infrastructures, which together represents the Regional Irrigation Scheme “Radoniqi-Dukagjini” as one integral irrigation system. Both schemes are operating on separate basis, as two different working units. The schemes are located in the different municipalities with different manners of water supplying for irrigation. Namely, the Radoniqi irrigation scheme is located in the territory of Gjakova and Rahoveci municipalities and the intake structure is Dam Radoniqi in the municipalities of Gjakova and Rahoveci with irrigated area of 8,600 ha. The Dukagjini irrigation scheme is located in the Municipality of Prizren with area of 5,000 ha and the water is captured directly from River Lumbardhi i Prizrenit.



Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

Figure 1 Irrigation scheme Radoniqi-Dukagjini (source: Feasibility Study for the Rehabilitation Works in the Radoniqi-Dukagjini Irrigation Scheme)

1.1 Project objectives

The objective of this assignment is to develop an Environmental and Social Impact Assessment (ESIA) that will be based on the valid environmental legislation in force in Kosovo, together with the requirements set forth in the World Bank safeguard policies that are triggered for this project namely Operational Policy OP 4.01 on Environmental Assessment.

1.2 Project scope

The project has following scope:

- Task 1: Review of Policy, Legal and Administrative Framework including review of Kosovo EIA law and bi-laws and World Bank Safeguard Policies.
- Task 2: Project Review.
- Task 3: Review and update of available baseline data
- Task 4: Preparation of the Environmental and Social Impact Assessment for the Radoniqi-Dukagjini scheme
- Task 5: Support the Client in Consultations and Disclosure
- Task 6: Revisions to the document as proposed by the Ministry, following the inputs from the public consultations and review from the World Bank team, until the final document is accepted both by the Ministry and the World Bank team.

2. BACKGROUND INFORMATION AND PROJECT CONTEXT

Radoniqi system is situated in the Municipality of Gjakova located in the south-western part of Kosovo. It covers urban area of 13.19km² and municipal area of 586.91km². According to the 2011 census, the resident population was 94,556, of which urban inhabitants numbered 40,827 and rural 53,729. The city of Gjakova is the municipal centre. Municipality of Gjakova built an economy based on farming and agriculture, lower trade and some types of manufacturing workshops which mainly produce for the needs of city-based products as imported cases. The irrigation system Radoniqi construction started in 1977 and it was completed in 1986. Despite all of the challenges faced in the irrigation sector, as a whole this is the best performing scheme in the country, it represents the largest share of actual irrigated area and most of the high value crop production¹. The main crops grown under the Radoniqi irrigation scheme are vegetables (peppers, tomatoes, cucumber), corn, fodder crops. Wheat may be irrigated once a year in May, only if there is insufficient water in the soil. Silage corn and vegetables may also be irrigated as secondary crops after harvest.

The Radoniqi irrigation scheme is located in the centre part of the municipality. The original project design of the irrigation scheme was planned to cover a total area of about 21,000 hectares. The construction of the scheme was planned to be realized in two Phases, Phase 1 with total area of 10.250 ha and Phase 2 with total area of 10.750.

The first Phase was completed in 1986, but until now, Phase 2 has not been realized. Subsystems of Phase 1 were constructed in phases.

For the water needs of the region, dam Radoniqi was built, that forms the Lake Radoniqi. This dam was built to meet the water demands of the Radoniqi scheme (Phase 1 and 2) as well to meet the water supply demands for Gjakova, Rahovec and other settlements in this region.

The main goal of the Project is to improve irrigation conditions by rehabilitation and modernization of irrigation scheme which is managed by Radoniqi – Dukagjini irrigation Company with command irrigable area of 9,350 ha located in Gjakova and Rahoveci municipalities and round 5,000 ha located in Prizren municipality. The water for irrigation in Radoniqi is captured from Radoniqi Lake while water for irrigation is captured from two intake structures in Lumbardhi I Prizrenit.

¹ Feasibility Study for the Rehabilitation Works in the Radoniqi-Dukagjini Irrigation Scheme)

3. LEGAL AND POLICY REQUIREMENTS FOR THE ESIA

3.1 National Legislation of Relevance for the ESIA

According to the Law on Environmental Impact Assessment², which transposes the requirements of the EU EIA Directive (85/337/EEC amended³), the potential environmental impacts of a Project shall be evaluated by an Environmental Impact Assessment (EIA) process and documented in an Environmental Impact Statement (EIA Study).

In responding to environmental issues, the Ministry of Environment and Spatial Planning (MESP) updated the Kosovo Environmental Strategy (KES) and the National Environmental Action Plan (NEAP) for 2011–15 working with ministries, nongovernmental organizations, and other stakeholders. The environmental priorities for the period 2011-2015 are identified as completing environmental legislation in harmony with the EU “acquis”; gradually fulfilling EU standards and efficiently carrying out and incorporating environmental legislation and methodologies in all sectors; and setting up and expanding institutions for the implementation of environmental policies (including capacity building).

The environmental legal framework within Kosovo contains overarching laws covering such areas as Environmental Protection, Water, Waste, Nature Protection, Noise Protection, Air Quality and Cultural Heritage, which transpose the main obligations of the environmental EU Directives. In addition, the Law on Integrated Prevention and Pollution Control (IPPC) is fully aligned with the Council Directive 96/61/EC concerning integrated pollution prevention and control ("IPPC Directive").

With regards to social aspects, there are national laws covering Health Protection, Occupational Health & Safety, Labour Relations, Occupational Safety, Employment, Social Protection, Land Acquisition, Cadaster etc.

Kosovo has not been recognized by treaty depositaries as a state that can ratify treaties and international conventions. However, most of the International Conventions with regard to the Environment, Public Participation and Labor issues have been translated in the Kosovo national legislation.

- UNESCO World Heritage Convention (November 1972) is not adopted as the Kosovo is not member of UNESCO however the principles of the Convention are embedded on Kosovo Cultural Heritage Law (No: 02/L-88);
- Conventions of International Labor Organization (ILO) are present in Kosovo legislation: efforts are directed to strengthening the capacity of employers' and workers' organizations in addressing

² <https://gzk.rks-gov.net/ActDetail.aspx?ActID=2708>

³ <http://ec.europa.eu/environment/eia/eia-legalcontext.htm>

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

economic and social issues, including the integration of Child Labour Convention (no:138 and 182) principles into the Kosovo Legislation.

- International Convention on Economics, Social and Cultural Rights (New York, 16 December 1966). Its principles and the rights deriving from the Universal Declaration of Human Rights (UDHR), Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) and Convention on the Rights of the Child (CRC) are enshrined in the Constitution of Kosovo, article 22;

Table.1 List of Environmental and Social Issues covered by local laws

| Legislation | ENVIRONMENTAL ISSUES | Regulated issues |
|--|----------------------|---|
| Law on Environmental Protection | 03/L-025 | Art. 9 - Makes a reference to the Environmental Impact Assessment (EIA) as a means for the protection of natural resources; Art. 29 - EIA shall be an integral part of the technical documents; the Project execution cannot commence if the EIA procedure is not properly implemented. |
| Law on Waters | 04/L-147 | Stipulates Good surface waters and Groundwater chemical status - the chemical status required to meet the environmental objectives for surface waters and does not exceed environmental quality standards. Art. 26 – Sets a requirement for any interventions aimed to improve, rehabilitate and maintain the water status to be aligned with plans for management of river basins. Art. 58 and 59 – Define the need for classification of surface and ground waters as per their chemical and ecological status. |
| Law on Nature Protection | 03/L –233 | Establishes a national ecological network of protected areas. Art. 33 and 34 – Regulates that an assessment of impacts deriving from plans / measures / interventions on conservation goals and integrity of the ecological network is obligatory |
| Law on Waste | 04/L-060 | Art 40 – Regulates the managing of construction & demolition waste: operators managing this waste stream shall hold special license; the management procedures, including the location of storage, are defined by the municipalities. |
| Administrative Instruction on hazardous waste management | 06/2008 | Art. 12 - sets the responsibilities of any holder of hazardous waste, including waste originating from road construction; Art. 14 – defines that only authorised company can collect and transport hazardous waste; Art. 19 – collected and transported hazardous waste can be kept up to 30 days at Collection Centres, which must meet the environmental criteria; Art. 31 – defines the preparation of hazardous waste for exporting, in the absence of any facility for treatment in Kosovo. |
| Law on Hydro-meteorological activity- | 02/L-79 | Article 5 – Defines the monitoring network and processes and activities that need to take place to characterize and monitor the quality of the environment. |
| Law on Noise Protection | 02/L-102 | Art. 1 – Sets obligation for developing measures to reduce noise emitted by the major sources, in particular road and rail traffic aircraft, outdoor and industrial equipment, mobile machinery and other sources of environmental noise pollution and annoyance |
| Administrative Instruction on permitted noise emission values and sources of pollution | 08/2009 | Sets limit values for noise levels per different land use categories |
| Law on Air Protection | 03/L-160 | Article 23 - Monitoring of air quality |
| SOCIAL ISSUES | | |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| Legislation | ENVIRONMENTAL ISSUES | Regulated issues |
|--|----------------------|---|
| Law on Cultural Heritage | 2006/52 | <p>Art. 1 –Regulates the scope of Cultural Heritage regarding preservation, protection, public access, communication and provision of necessary resources in order that the heritage is enjoyed by current generations and forwarded to future generations.</p> <p>Art. 4 – Protected Cultural Heritage may be expropriated in accordance with relevant legislation.</p> |
| Law on Labour | 2010/03-L-212 | <p>Art. 1 - Regulates the rights and obligations deriving from employment.</p> <p>Art. 4 - Provisions of the Collective Contract, Employer's Internal Act and Labour Contract shall be in compliance with the provisions of this Law.</p> <p>Art. 5 - Discrimination is prohibited in employment and occupation in respect of recruitment, training, promotion of employment, terms and conditions of employment, disciplinary measures, cancellation of the contract of employment or other matters arising out of the employment relationship and regulated by Law and other Laws into force.</p> |
| Law on Occupational Safety | 2003/19 | <p>The objective of the Law on Occupational Safety, Health and the Working Environment is to prevent occupational injuries and diseases at the workplace and to protect the working environment</p> |
| Safety and health at work | 2012/04-L-161 | <p>Art. 1 - Sets measures for improving occupational the safety and health of employees.</p> <p>Art. 2 - General principles for prevention of occupational hazards, elimination of hazardous and accidents factors, information, consultation, balanced participation in improving the occupational safety and health, treatment of employees, their representatives and general guidelines for implementing such principles.</p> <p>Art. 4 - Government of the Republic of Kosovo establishes the National Council on Safety and Health at Work, which proposes, recommends and develops policies regarding the improvement of occupational safety and health and continuously monitors employees' occupational safety and health.</p> |
| The Law on Expropriation of Immovable Property | 2010/03-L-139 | <p>Art. 3 - Law regulates the formal expropriation and acquisition of immovable property by a Public Authorities.</p> <p>Art. 4 - The Expropriation is related to the implementation of project of public interest. The Government shall have the authority to expropriate property for any legitimate public interest, including construction of national or inter-municipal roads and toll roads. Property expropriated by the Government shall, upon completion of the expropriation process, become the property of the Republic of Kosovo.</p> |
| Law on Cadastre | 2011/04-L-013 | <p>Art. 1 - The Law regulates the Cadastre of immovable property, national and cadastral surveys, geodesic and cadastral works as affixed to the land, business buildings, residential buildings etc.). as well as acquisition, registration, record keeping, maintenance and use of cadastral data.</p> <p>Art. 4 - Immovable property – specific part of the land surface, which has boundaries (land, natural objects</p> |
| Law on Property and other Real Rights | 03/L-154 | <p>The Law governs the creation, content, transfer, protection, and termination of real rights. It also regulates ownership and, as limited real rights, possession, real security rights and real rights of use.</p> |

3.2 ESIA Procedure and Permitting

ESIA Procedure

The Environmental Impact Assessment procedure has been referenced into the Law on Environment Protection (Chapter II, Articles 9, Chapter IV, Article 29 and Chapter VI, Article 57) and prescribed on the Law on Environmental Impact Assessment (No. 03/L-214). The public disclosure is regulated with the Administrative Instruction for information, public participation and interested parties (No: 09/2011). The Consultant shall prepare a notice for public debates and ensure it is published in at least one daily newspaper and placed on the notice board of the Municipal Assembly in which the project will be implemented. The required content of the Notice is presented in Article 8(2) of the AI MESP № 16/2015. The public debate(s) shall be held within thirty (30) days after publishing of the notice in the newspaper and the placement of the Notice on the notice board of the Municipal Assembly. The Consultant shall bear all the costs of preparing the EIA Reports, the public debate(s), the review and consultation process;

In compliance with Article 7 of the Law No.03/L-214 “on Environmental Impact Assessment” an environmental consent shall be required for every public or private project listed in Annex I or Annex II of this Law, which is likely to have significant effects on the environment by virtue, inter alia, of its nature, size or location. All projects which are listed in Annex I shall be obliged to implement an EIA, asking the corresponding authorization from the Ministry of Environment and Spatial Planning (MESP), while projects listed in Annex II shall be examined, case by case and in accordance with the criteria set out in Annex III, in order to determine whether they must require an EIA.

The procedures for the approval of an EIA are defined by Chapter III of the Law No.03/L-214 “On Environmental Impact Assessment”. According to this Kosovan Law, the EIA procedure includes the following phases: (1) selection; (2) scoping; (3) review of EIA Report. In addition to these phases, other phases not specifically mentioned as EIA phases, like the application, consultation, and approval have been considered by this Law.

Permitting

The Ministry of Environment and Spatial Planning is in charge of issuing various consents, approvals and permits at different stages of the Project planning process:

- Environmental Consent (approval of the ESIA Study), in accordance with the EIA law (please see Table 1 above);

Managing of hazardous waste is regulated in such a way that only authorised companies can be involved in the collection, storage and export. Temporary storage of hazardous waste is envisaged at so called “Collection Centres”, but none has been installed in Kosovo to date. Any temporary storage of hazardous waste generated during the construction of the Project shall be at locations that have obtained a permit for this purpose. Moreover MESP has also produced administrative instruction on management of asbestos waste AI 22/2015 which explains the procedures on handling and disposal of this type of waste. For non-

hazardous waste there are licensed companies as well providing services for handling and proper disposal of those wastes.

There isn't any permit required for establishing surplus material disposal sites according to the current Kosovo legislation, however there is a need for environmental authorization which serves as temporary permit⁴.

According to the present practice, the locations of the temporary surplus material disposal sites are agreed between the Design and Build Contractor and the municipality on which territory the excess material will be disposed of. The temporary sites, will be built in accordance with requirements of the Administrative Instruction 08/2017 on management of the landfills, which means that all necessary precautions needs to be taken, so that any negative environmental impacts are prevented. Since the site is for temporary use, the authorization is also valid temporary, meaning that after project related activities are finished the land reclamation process should take place. The MESP on the other hand monitors the disposal site selection process, the disposal methods and land reclamation of the site.

3.3 Land Acquisition / Expropriation

Kosovo legislation that regulates involuntary resettlement and livelihood restoration is based on the legal framework for expropriation. The expropriation process of immovable property in Kosovo is governed by the Law on amending and supplementing the Law no. 03/L-139 for the expropriation of immovable property, namely the Law No: 03/L-205 approved by the Kosovo Assembly in 2001. The law guarantees that the expropriation of private property occurs for public interest only and within a fair compensation process.

As the project involves just the rehabilitation works of an existing infrastructure there is no need for permanent land expropriation. As in Kosovo there is no specific law on temporary expropriation then the temporary occupation of land during the implementation of rehabilitation activities will be used Seasonal Servitude right with fair damage compensation regulated by the Law on Agriculture Land No. 02/L-26 promulgated by the Kosovo assembly in 2005. In our case Radoniqi-Dukagjini already has Seasonal Servitude right and standard procedures in place.

According to the article 9 of the Law on Agriculture Land No.02/L-26 the right of the Seasonal Servitude right will be realized:

- Through a short procedure and serves until field work is completed (tillage, sowing, harvesting, transport of products and other works).
- Seasonal servitude, damage assessment and height of compensation is provided by the municipal body competent for agriculture, whereas damage compensation shall be done by the user of seasonal servitude.
- Complaint against the decision of competent body for agriculture shall not stop the execution of decision.

⁴ <https://gzk.rks-gov.net/ActDocumentDetail.aspx?ActID=10735>

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

Works during rehabilitation of the channel will be taking place off irrigation season so that in case there is a need for temporary land access, the damage to the crops is minimal, therefore the compensation from the company will be lower as well as effect on the farmer.

The Radoniqi-Dukagjini Irrigation System (RDIS) is an existing project that will undergo rehabilitation works only, therefore it is not foreseen that there will be any physical resettlement however there might be need for temporary land acquisition to accommodate working machines or workers camp if needed.

3.4 World Bank ESIA policy

According to World Bank Environmental and Social Policy in this project there is only one operational policy (OP) triggered (OP 4.01) Environmental Assessment.

3.4.1 Environmental Assessment (OP/BP 4.01)

Often referred to as the “umbrella” safeguards policy, it is aiming to:

- Ensure that Bank-financed projects are environmentally sound and sustainable
- Improve decision-making by promoting integration of environmental and social criteria into project decision-making process
- Takes into account: natural environment, human health, safety, social aspects, physical cultural resources, trans-boundary and global aspects, overall legal framework, obligations under relevant international treaties and institutional capacities

The Bank will classify all projects (including projects involving Financial Intermediaries (FIs) into one of four classifications **High Risk, Substantial Risk, Moderate Risk or Low Risk**. In determining the appropriate risk classification, the Bank will take into account relevant issues, such as the type, location, sensitivity, and scale of the project; the nature and magnitude of the potential environmental and social risks and impacts; and the capacity and commitment of the Borrower (including any other entity responsible for the implementation of the project) to manage the environmental and social risks and impacts in a manner consistent with the ESSs. Other areas of risk may also be relevant to the delivery of environmental and social mitigation measures and outcomes, depending on the specific project and the context in which it is being developed. These could include legal and institutional considerations; the nature of the mitigation and technology being proposed; governance structures and legislation; and considerations relating to stability, conflict or security. The Bank will disclose the project’s classification and the basis for that classification on the Bank’s website and in project documents.

The Bank will review the risk classification assigned to the project on a regular basis, including during implementation, and will change the classification where necessary, to ensure that it continues to be appropriate. Any change to the classification will be disclosed on the Bank’s website.

In accordance to the Kosovo Law No.03/L-214, on Environment Impact Assessment (EIA) this activity falls under the Annex II paragraph 1.2 “Water management projects for agriculture, including irrigation and land

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

drainage projects". Also, in accordance with the Environmental and Social Management Framework (2017), i.e. World Bank Policy, the Project falls under environment category B hereby, in both situations triggers the safeguard policy on Environmental Assessment.

3.4.2 Involuntary Resettlement (OP/BP 4.12)

This policy is intended to avoid the long-term hardship, impoverishment, and environmental damage that may be caused by involuntary resettlement. The policy does this through: (a) avoiding involuntary resettlement where feasible, or minimized, exploring all viable alternative project designs; (b) where feasible conceiving and executing involuntary resettlement programs as sustainable development programs, providing sufficient investment resources to enable the persons displaced by the project to share in project benefits and (c) assist displaced persons in their efforts to improve their livelihoods and standards of living or at least to restore them.

In the case of RDIS canal rehabilitation project as mentioned above there is no foreseen resettlement due to works taking place in the property already owned by Radoniqi and Dukagjini Irrigation Companies.

However if temporary land acquisition is required due to contractor's needs for accommodation of workers camp and/or machinery, it should be subject of Resettlement Policy Framework.

3.4.3 Natural Habitats (OP/BP 4.04)

The classification of protected areas in Kosovo is established by Nature Protection Act (Regulation 2006/22). Protected areas of nature are announced with the purpose of protection and conservation of biodiversity, landscape, natural characteristics and cultural heritage and for offering effective management. Classification of protected areas within the Law on Nature Protection is in accordance with the International Union for Nature Conservation IUCN3 (The World Conservation Union).

National network of nature protected areas covers 97 nature protected areas with surface of 47.842.34 ha or 4.39 % of Kosovo's territory and more than 195 proposed area for protection, including a National Park "Bjeshkët e Nemuna" with surface of 62.488 ha.

Protected areas also include: 11 Strict Nature Reserves, one National Park, 82 Nature Monuments, two Regional Parks and one Forest Park. None of those are in the project area or its proximity.

The RDIC does not pass through or in vicinity of any protected areas or sensitive or critical habitats. Therefore the policy is not triggered.

3.4.5 Physical Cultural Resources (OP/BP 4.11)

There are no cultural heritage sites or objects in the vicinity of RDIC according to available data therefore the policy is not triggered. However, during the works there might be chance findings, therefore chance findings clause will be included in the environmental management documentation.

4. PROJECT DESCRIPTION AND CONSIDERATION OF ALTERNATIVES

4.1 Project Description

Radoniqi-Dukagjini Irrigation Scheme (RDIS) covers two separate irrigation infrastructures, which together represents the Regional Irrigation Scheme “Radoniqi-Dukagjini” as one integral irrigation system. Both schemes are operating on separate basis, as two different working units. The schemes are located in the different municipalities with different manners of water supplying for irrigation. Namely, the Radoniqi irrigation scheme is located in the territory of Gjakova and Rahoveci municipalities and the intake structure is Dam Radoniqi in the municipalities of Gjakova and Rahoveci with irrigated area of 8600 ha. The Dukagjini irrigation scheme is located in the Municipality of Prizren with area of 5000 ha and the water is captured directly from River Lumbardhi i Prizrenit.

Radoniqi is a modern irrigation system. The system is situated in the Municipality of Gjakova. The municipality geographically is located in the south-western part of Kosovo. It has urban area of 13.19km² and municipal area of 586.91km². According to the 2011 census, the resident population was 94,556, of which urban inhabitants numbered 40,827 and rural 53,729. The city of Gjakova is the municipal center. Municipality of Gjakova built an economy based on farming and agriculture, lower trade and some types of manufacturing workshops which mainly produce for the needs of city-based products as imported cases. The irrigation system Radoniqi construction started in 1977 and it was completed in 1986. Despite all of the challenges faced in the irrigation sector, as a whole this is the best performing scheme in the country, it represents the largest share of actual irrigated area and most of the high value crop production. The main crops grown under the Radoniqi irrigation scheme are vegetables (peppers, tomatoes, cucumber), corn, fodder crops. Wheat may be irrigated once a year in May, only if there is insufficient water in the soil. Silage corn and vegetables may also be irrigated as secondary crops after harvest.

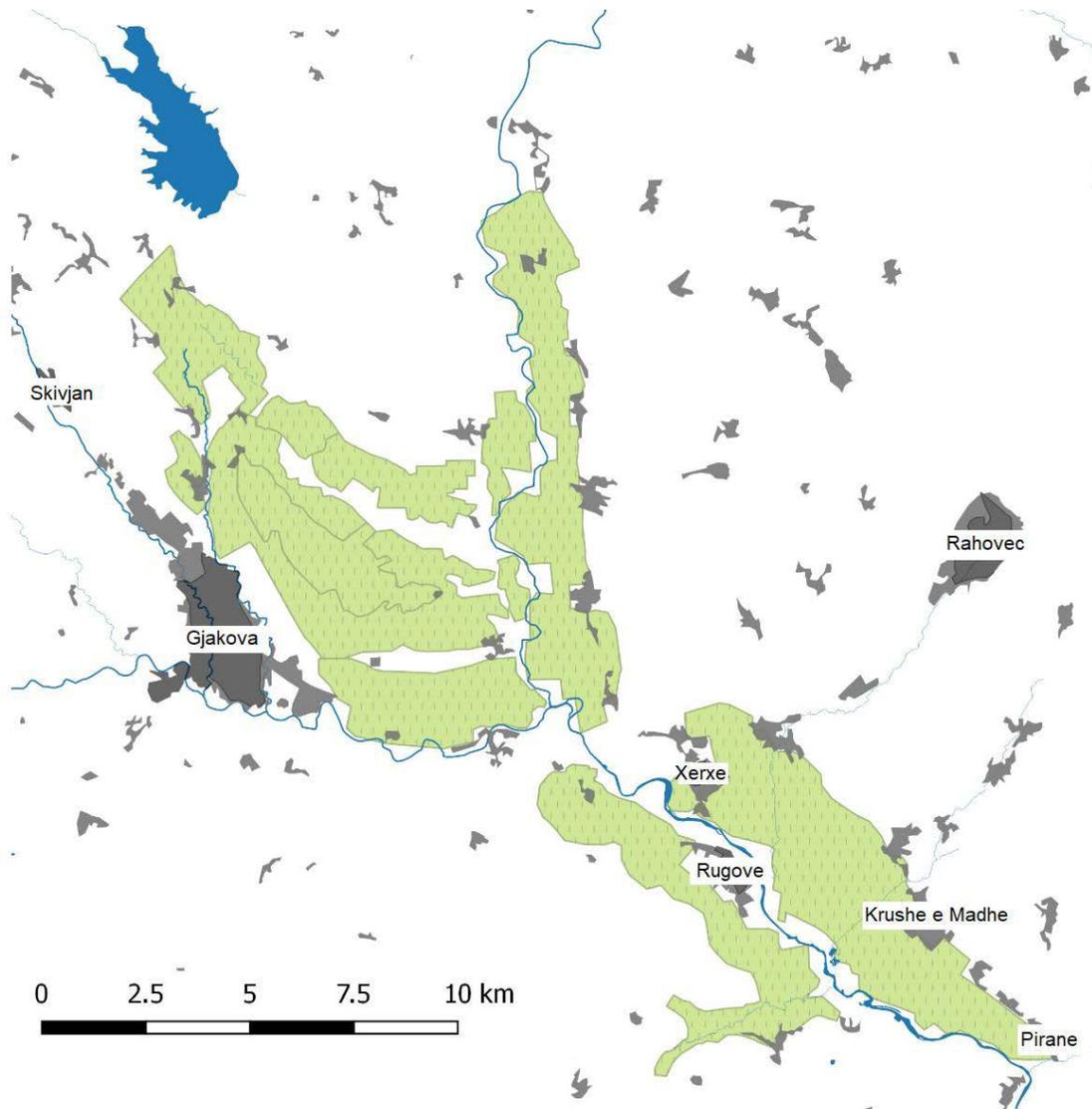


Figure 2 Overview Map of Radoniqi irrigation areas, and nearby settlements (source: Feasibility Study for the Rehabilitation Works in the Radoniqi-Dukagjini Irrigation Scheme)

The first Phase was completed and it is operational, while, Phase 2 has not been realized.

For the water needs of the region, dam Radonoqi was built, that forms the Lake Radoniqi. This dam was built to meet the water demands of the Radoniqi scheme (Phase 1 and 2) as well to meet the water supply demands for Gjakova, Rahovec and other settlements in this region.

From the dam, the irrigation scheme spreads to the village Marmull covering the rural area of the settlements Skivjan, Tarkaniqi, Qerim and Gjakova. From the village Marmull the scheme separates in two direction, one expanding to north upstream of River Drini i Bardhe covering areas of the settlements Radoste, Ratkoc, Dejne and Qiflak. The second part spreads downstream along the course of River Drini i Bardhe to the village Pirane. In this area are the settlements Xerxe, Fortese, Rogove, Romaje and Krushe e Mahdi.

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

Radoniqi scheme – Phase 1 is comprised of eight subsystems: Janosh, Qerim, Ciflak, Ratkoc, Doblbare, Ura e Terezive, Anadrini and Rogove. In Phase 2 are planned six subsystems: Skivjan, Cermjan, Vranic, Polluzhe, Rahovec and Rogovo II. In Table 2 are presented main characteristics of the subsystems for both phases⁵.

Table 2. Main characteristics of the subsystems for Phase I (source: Feasibility Study for the Rehabilitation Works in the Radoniqi-Dukagjini Irrigation Scheme)

| Sub-system | Area | Hydromodule/FWS-q | Q |
|--|------|-------------------|---------|
| | Ha | l/s/ha | l/s |
| Irrigation sub-system – Phase I | | | |
| Janosh | 1400 | 0.8 | 1120 |
| Qerim | 1800 | 0.8 | 1440 |
| Cifllak | 770 | 0.8 | 616 |
| Ratkoc | 890 | 0.8 | 712 |
| Doblbare | 290 | 0.8 | 232 |
| Ura e Terezive | 800 | 0.8 | 640 |
| Anadrini | 2200 | 0.8 | 1760 |
| Rogove | 1200 | 0.745 | 893.6 |
| Total I | 9350 | | 7413.60 |

Technical Characteristics of Radoniqi Scheme

The technical solution for Radoniqi scheme Phase 1, consists of intake on the reservoir Radoniqi, main canal (open and closed sections), pump stations and basins on which sub systems are connected. The main canals is constructed with design flow $Q=15.6\text{m}^3/\text{s}$ for both phases 1 and 2. Also all main and distribution pipelines are designed and constructed for Phase 2.

Water supply to the main canal is regulated thought needle valves downstream of the dam. Along the main canal there are three basins (B9, B10, B11) and one regulating structure which are dividing the canal in four characteristic sections: Ratkoc, Qerim, Marmull and Bistrazin.

⁵ Feasibility Study for the Rehabilitation Works in the Radoniqi-Dukagjini Irrigation Scheme, Hydro Energo Engineering DOO, Skopje

Agriculture and Rural Development Project (ARDP)
Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

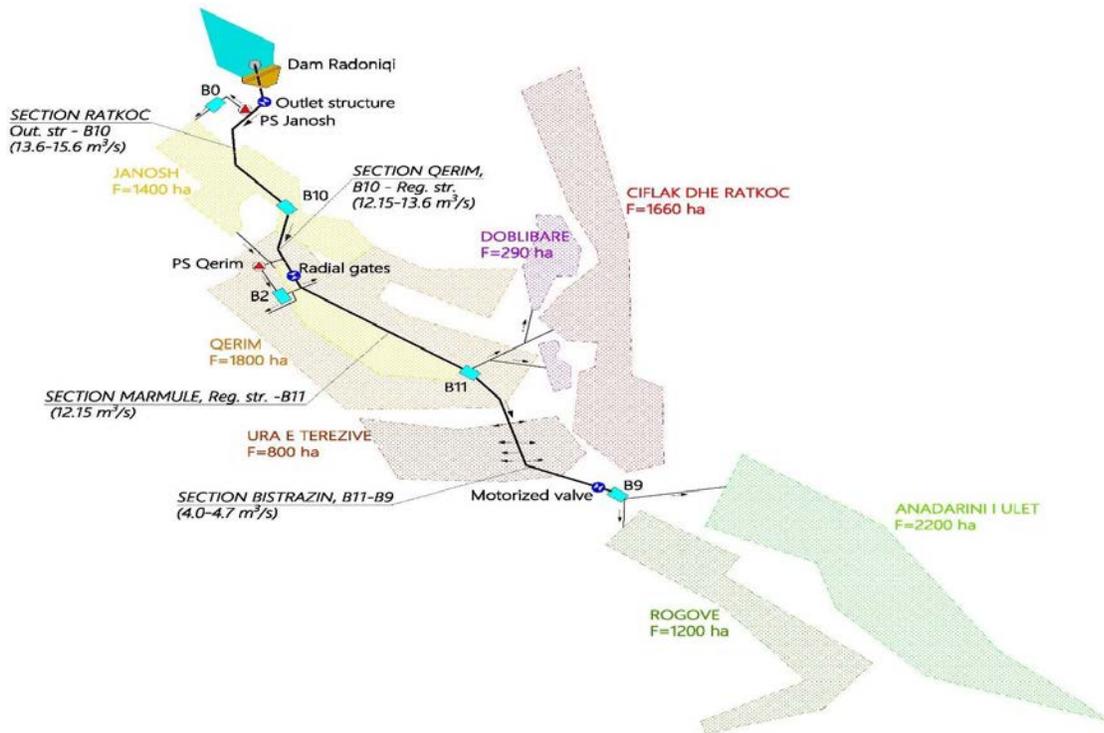


Figure 2 Radoniqi Irrigation scheme - Phase 1 (source: Feasibility Study for the Rehabilitation Works in the Radoniqi-Dukagjini Irrigation Scheme)

While for phase 2 of Radoniqi, additional 6 subsystems with complete accompanying structures such as basins open canals or underground network, valves etc. but which has not yet been designed and is not part of this project as seen in figure below.

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

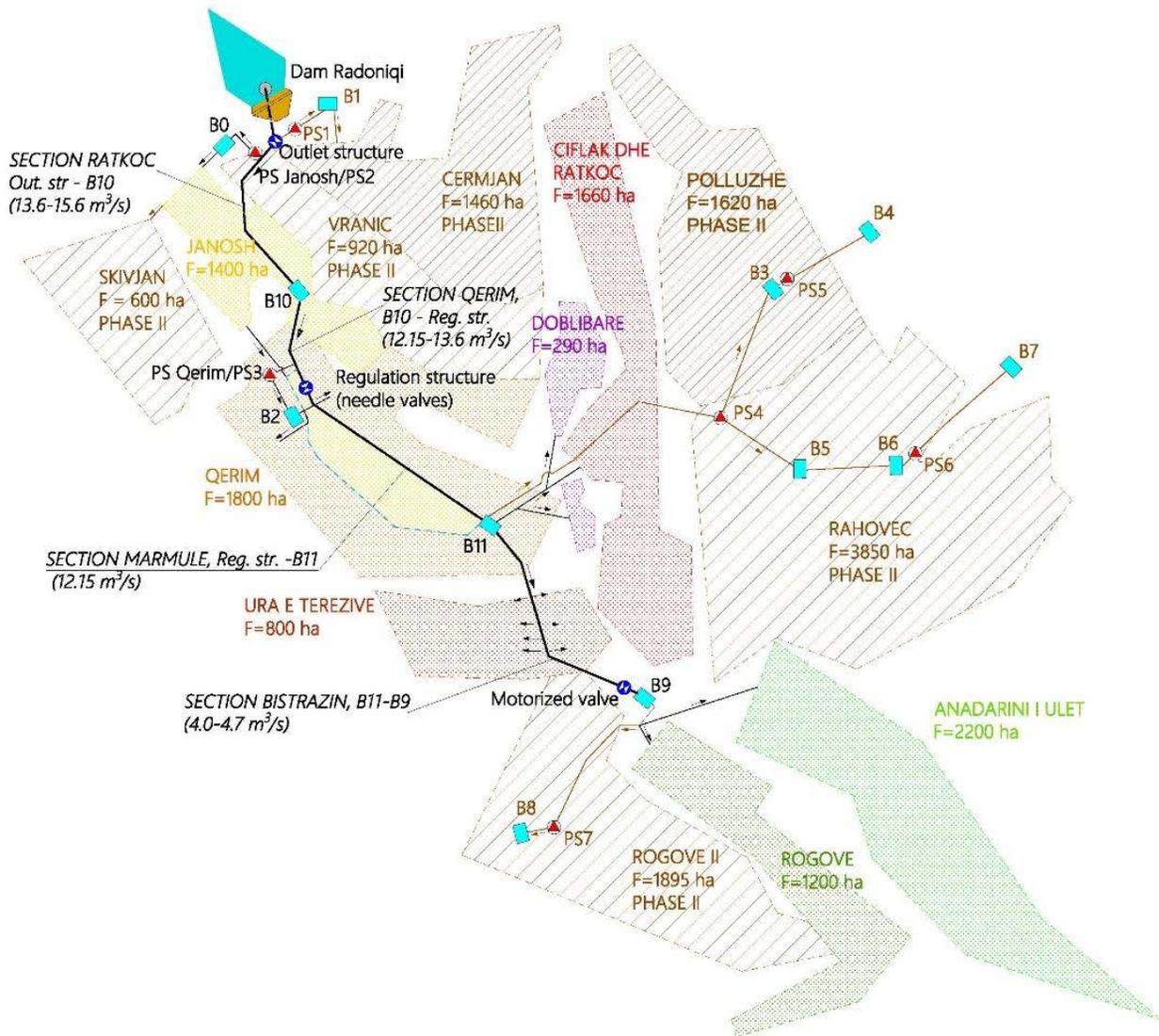


Figure 3 Radoniqi Irrigation scheme - Phase 2 (source: Feasibility Study for the Rehabilitation Works in the Radoniqi-Dukagjini Irrigation Scheme)

Main channel system

The main channel is 19.6km long, built on a complex topographic terrain, crossing rivers, ravines, roads etc. At the beginning canal have slope 2.0 ‰ up to the first syphon, after which alignment passes flatter terrain where slope of canal is 0.7 ‰ up to basin B10, end of section Ratkoc. Section Qerim is a large syphon connecting open canals Ratkoc and Marmull with denivelation of more than 10m. It ends with regulation structure, in order to sustain minimum pressure for PS Qerim.

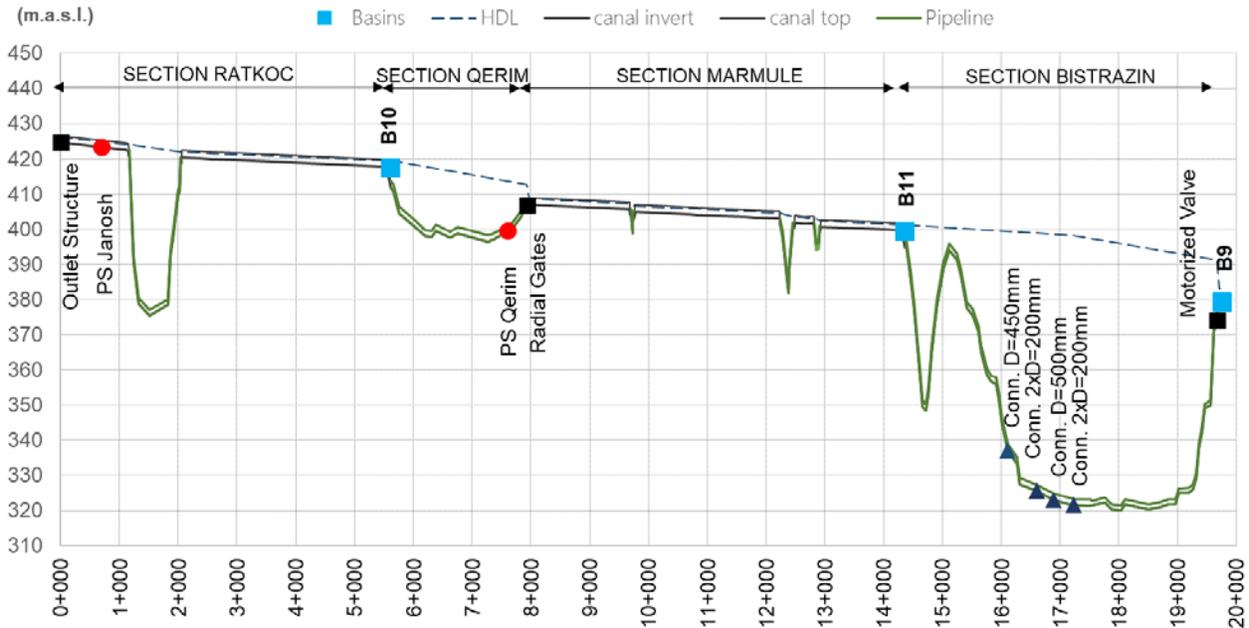
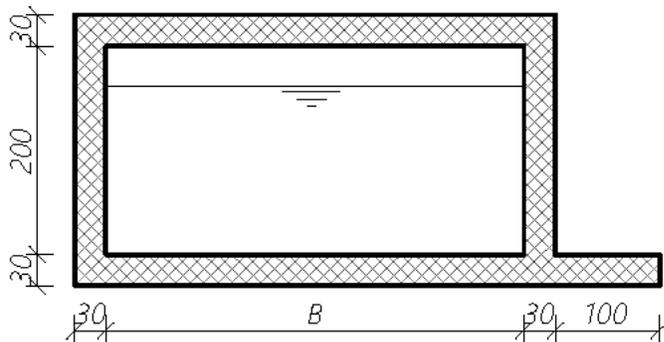


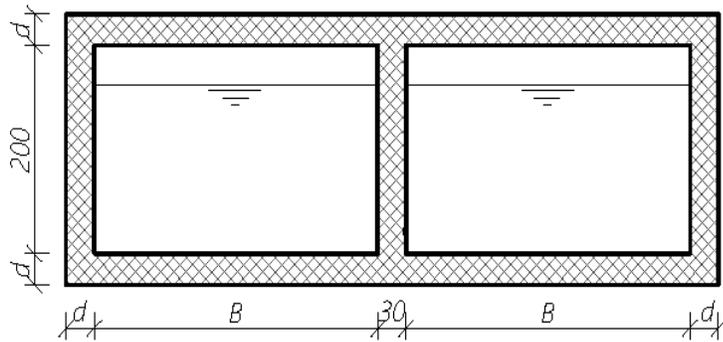
Figure 4 Cross sections of main canal M=1:125 (source: Feasibility Study for the Rehabilitation Works in the Radoniqi-Dukagjini Irrigation Scheme)

The main canal is constructed with open canals, closed canals and pipelines depending on terrain conditions, with variable dimensions of the cross sections in the function of the water quantity. There are three types of reinforced concrete canals: closed rectangular, double box and trapezoidal. All are made from reinforced concrete with minimum wall and slab thickness of 0.3m, except for trapezoidal canal which is tick 0.1m in 4m sections. Along the canal there is drainage pipe network with filter material to protect canal from groundwater⁶.

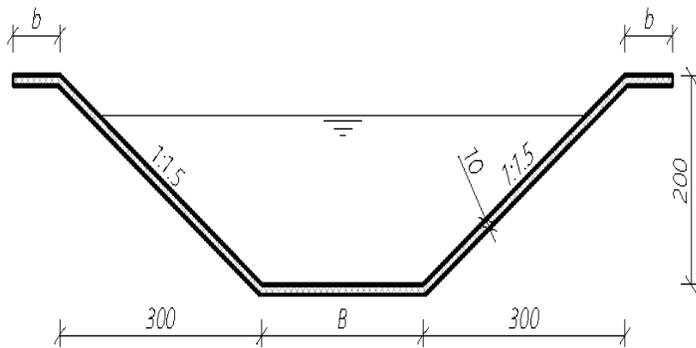


CLOSED RECTANGULAR
 Section Ratkoc
 km 0+000.0 – 0+700.0
 B=4.0m
 Km 0+700.0 – 1+109.0
 B=3.5m

⁶ Feasibility Study for the Rehabilitation Works in the Radoniqi-Dukagjini Irrigation Scheme, Hydro Energo Engineering DOO, Skopje



DOUBLE BOX
 Section Ratkoc
 km 2+059.0 – 2+575.0
 B=3.0m, d=0.4m
 Km 2+575.0 – 3+000.0
 B=3.0m, d=0.3m



TRAPEZOIDAL
 Section Ratkoc
 B=2.8m, b=0.6m
 Section Marmull
 B=2.4m, d=0.7m

Depending on the maximum flow, syphons have one to three parallel pipelines.

Outlet structure

Quantity of water released at the beginning of main canal is released at an outlet structure with $Q=8.4\text{m}^3/\text{s}$. It is constructed from three parts: machine hall, stilling basin, transition part. Regulation of flow is done with two motorized valves DN1400mm, placed in machine hall. Flow is measured on one of the outlet pipelines with ultrasonic flow meter. Data taken from flow meter is used to adjust valve opening for desired flow rate. On transition part side spillway is constructed for evacuation of excess water.

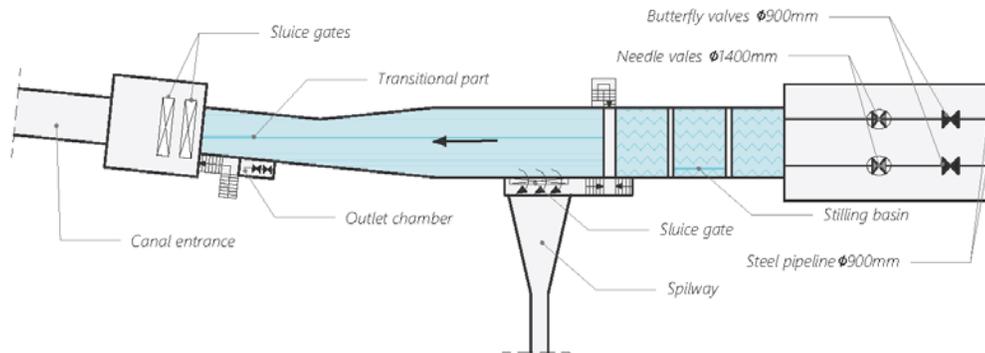


Figure 5 Outlet structure (source: Feasibility Study for the Rehabilitation Works in the Radoniqi-Dukagjini Irrigation Scheme)

Basins

Built at intake points for sub systems regulate the differences between demand flow and canal flow and are designed with storage volume to reduce overflows and shortages. They allow a buffer time to irrigation subsystems at start, compensating for the time required of water released from the outlet structure to reach sub system intakes. Storage volume is also used to operate pumps working (on-off) regime⁷.

Regulating structure (radial gates)

This structure is controlling outlet flow and at the same time minimum water level of basin 10 required for PS Qerim to work. Control of flow is done with two radial gates, regulated manual or automatic. After radial gates there is a stilling basin before water enters in the main canal. On the upstream side two aeration pipes are installed with height above ground up to maximum level in basin 10.

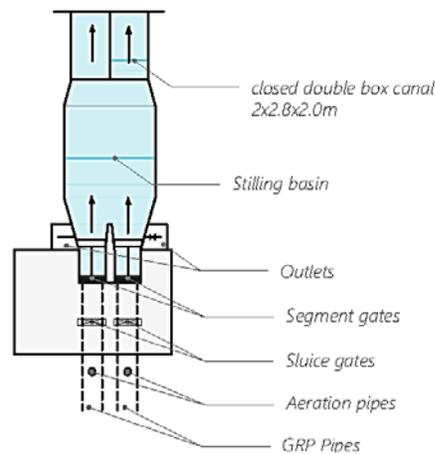


Figure 6 Outlet structure (source: Feasibility Study for the Rehabilitation Works in the Radoniqi-Dukagjini Irrigation Scheme)

Pump stations

First pump station is Janosh, only 700m after outlet structure. It takes water from main canal with two Off takes, after which main canal reduces width from 4.0m to 3.5m. Water is pumped with 5+1 pumps, each with a flow of 440l/s, or total flow 2200 l/s. Water is pumped through steel pipeline long 427m, with inner diameter of 1104mm. It ends in basin B0, with maximum water elevation of 480 m.a.s.l⁸.

⁷ Feasibility Study for the Rehabilitation Works in the Radoniqi-Dukagjini Irrigation Scheme, Hydro Energo Engineering DOO, Skopje

⁸ Feasibility Study for the Rehabilitation Works in the Radoniqi-Dukagjini Irrigation Scheme, Hydro Energo Engineering DOO, Skopje

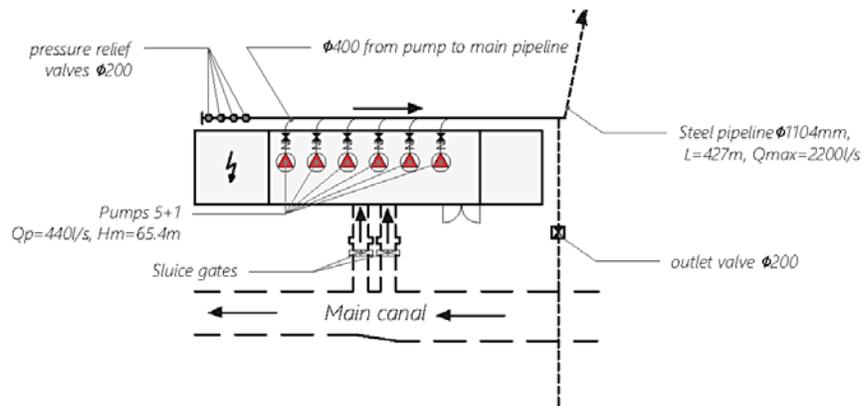


Figure 6 Scheme of Pump Station in Janosh (source: Feasibility Study for the Rehabilitation Works in the Radoniqi-Dukagjini Irrigation Scheme)

4.2. Radoniqi irrigation network

Based on the topology and water supply basins the Radoniqi irrigation scheme is divided into eight sub-systems (presented in Figure 16): sub-system “Janosh”, sub-system “Qerim”, sub-system “Ciflak”, sub-system “Ratkoc”, sub-system “Doblibare”, sub-system “Ura e terezive”, sub-system “Rogove” and sub-system “Anadrini i ulet”.

From a hydraulic point of view, all of the eight sub-systems can be analyzed separately. To the sub-systems “Qerim” and “Janosh” the water is pumped from the main canal. The other six sub-systems are gravity supplied with water from the main canal. In Radoniqi there are more than 3,000 ha not privatized which belongs to ex Socially Owned Enterprise “Ereniku” and currently managed by Kosovo Privatization Agency. The water requirements are determined in the technical documentation from 1978 to 1982.

Below is presented the map of the system including all sub-systems.

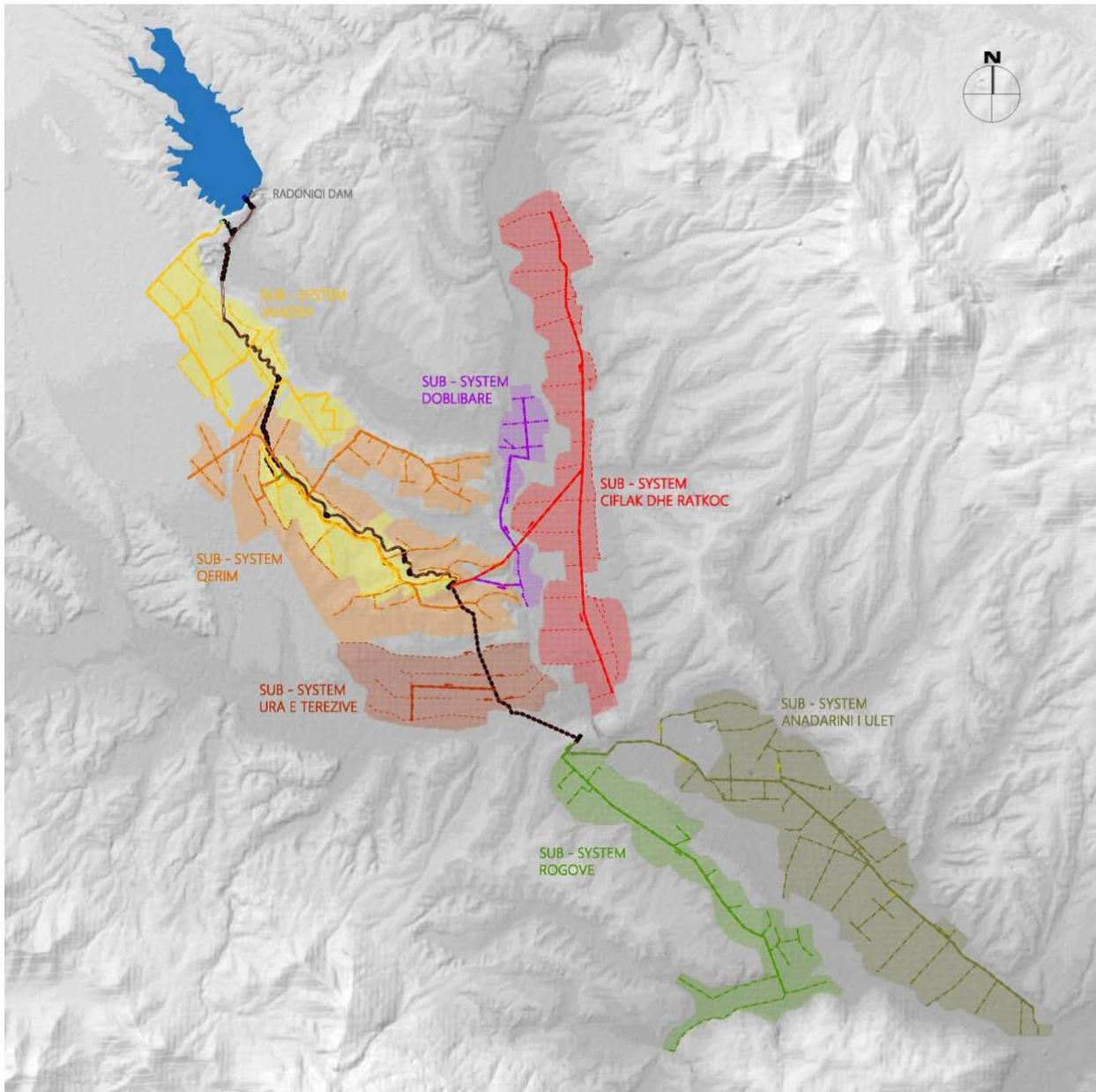


Figure 7 Map of Radoniqi Irrigation Scheme (colors by sub-system) (source: Feasibility Study for the Rehabilitation Works in the Radoniqi-Dukagjini Irrigation Scheme)

4.3. Dukagjini Irrigation Network

The Dukagjini irrigation scheme is partially traditional partially modern irrigation system meaning that it is ex surface irrigation with open earth canals and furrows, while modern is with concrete open canals or pressurized pipes and sprinklers. The system is situated in the Municipality of Prizren. The scheme does not has an accumulation reservoir. It derives water from River Prizren before the river crosses the city of Prizren, and therefore the quality is good for distribution to the fields (with the exception of a limited area of about 150 -250 hectares that derives water by means of a weir after Prizren). Similar to the Radoniqi scheme,

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

there is still an area of about 700-800 ha that has not been privatized: in case it is bought by few large farmers, it could be irrigated again.

The technical solution of the irrigation system Dukagjini consists of intake structures on Prizren River, main canal systems (open and closed) and pump stations on which sub systems are connected.

Water supply to the main canal is regulated through regulating structures and valves placed at the Prizren River. There are two main canals, one for sub-system "R" and one for sub-system "D". Along the main canals there are regulating structures with whom the systems were operated.

Two sub systems are connected directly to intake structures at Prizren River, several sectors are connected to two pump stations. Water supply to the main canal is regulated through regulating structures and valves placed at the Prizren River. There are two main canals, one for sub-system "R" and one for sub-system "D". Along the main canals there are regulating structures with whom the systems were operated.

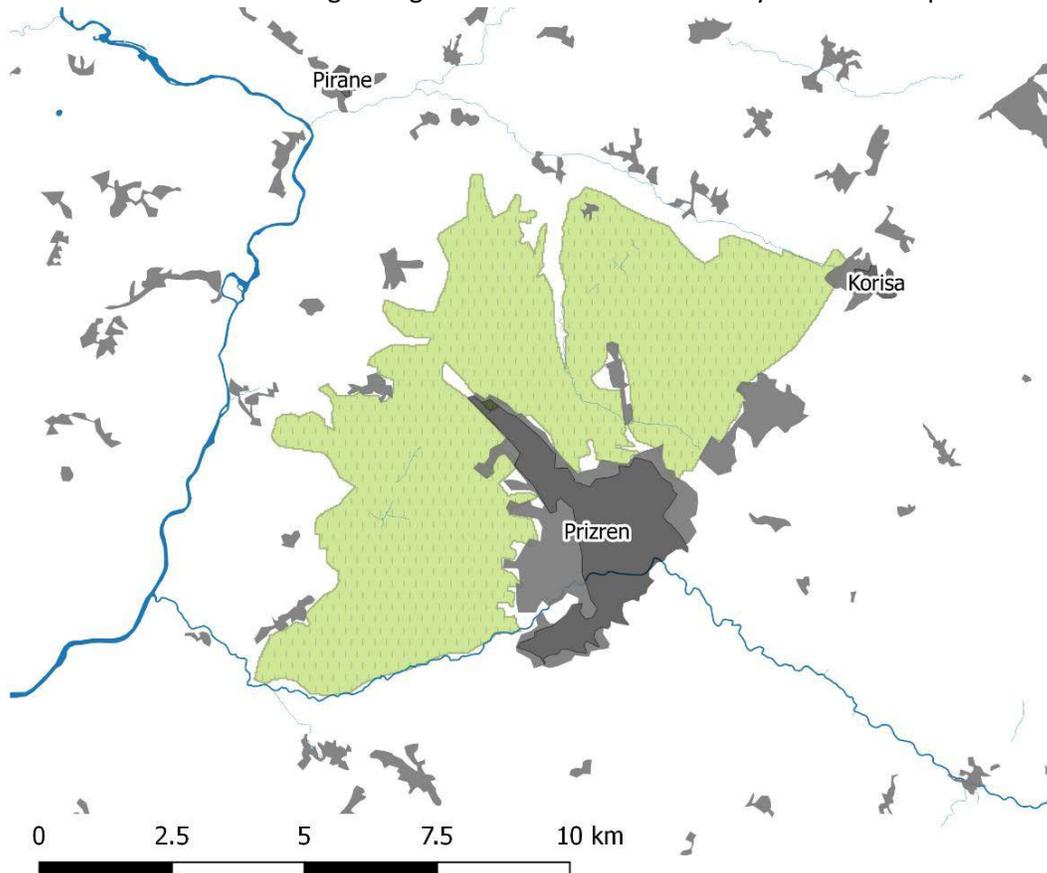


Figure 8 Overview Map of Dukagjini irrigation areas, and nearby settlements (source: Feasibility Study for the Rehabilitation Works in the Radoniqi-Dukagjini Irrigation Scheme)

Any investment in Dukagjini scheme should be based on future viability and should not include areas that will be lost to urbanization in the near future, therefore out of 5000 ha originally designed, just 2400 ha under irrigation area will be rehabilitated. Good harmonization with city planning is therefore important. Similar to the Radoniqi scheme, there is still an area of about 700-800 hectares that has not been privatized: in case it is bought by few large farmers, it could be irrigated again.

Technical Characteristics of Dukagjini Irrigation Scheme

The technical solution of the irrigation system Dukagjini consists of intake structures on Prizren River, main canal systems (open and closed) and pump stations on which sub systems are connected. Water supply to the main canal is regulated through regulating structures and valves placed at the Prizren River. There are two main canals, one for sub-system “R” and one for sub-system “D”. Along the main canals there are regulating structures with whom the systems were operated.

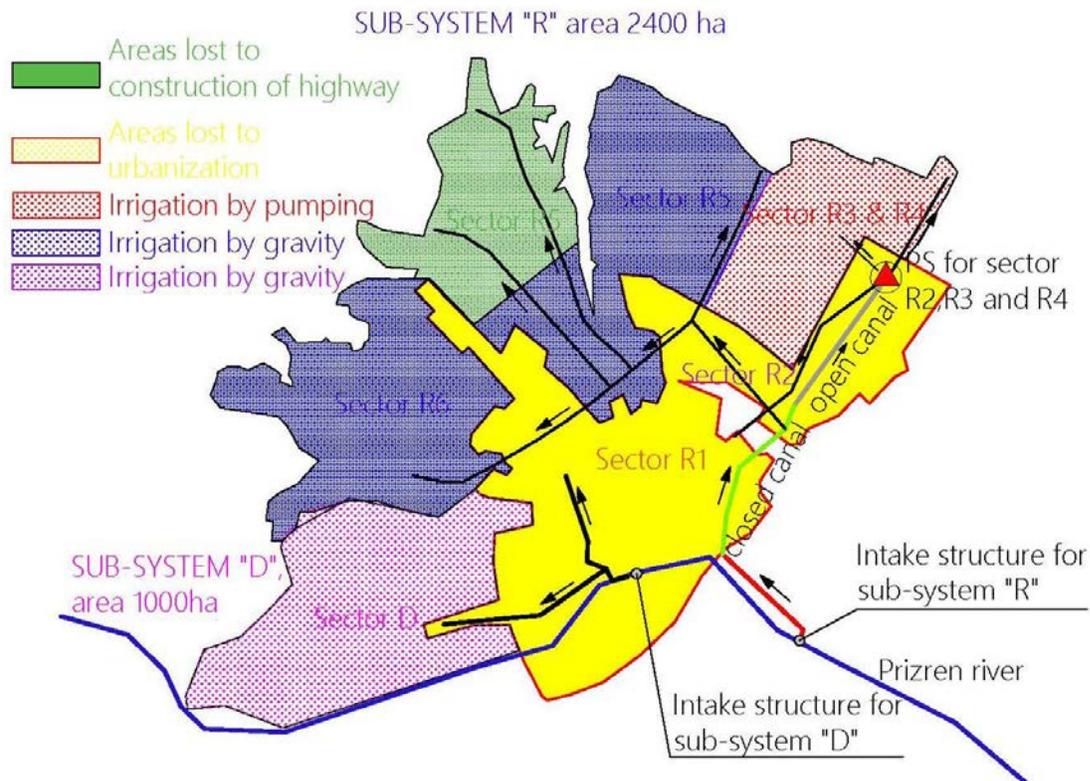


Figure 9 Dukagjini Irrigation scheme (source: Feasibility Study for the Rehabilitation Works in the Radoniqi-Dukagjini Irrigation Scheme)

Main Canal System

The sub-system “R” derives water from intake structure on River Prizren above the town of Prizren. The intake structure was reconstruct few years ago and it is in good condition except the hydro mechanical equipment. Afterwards the water is distributed through concrete tunnel with trapezoid profile constructed in 1960. The tunnel has length of 1660m, functional and in good condition. After the tunnel there are closed and opened sections of the canal. The closed canal (trapezoid) is in good condition with length of 2660m. The section with opened canal is divided in three parts because of the constructed siphons. The open canal is in good shape with trapezoid form and length of 2266m. There are two siphons with length of 12m and 60m.

For the sub-system “D” the intake structure is located near the town center. The structure and the hydro mechanical equipment is in poor condition. The distribution of the water is done similar like sub-system “R”

with concrete trapezoid opened and closed canal. The closed canal has length of 1300m and is in good condition. The opened canal has length of 1050m in average condition.

From the way how the water is delivered the system can be divided in two sub-systems. The first one, sub-system "R" with area of 3,500 hectares is located in the upper part of the scheme. This part of the irrigation is based on an asbestos cement pipe network and the farmers irrigate by gravity or using sprinklers. The second sub-system "D" with area of 1,500 ha is located in the lower part of the scheme.

It consists of an open canal network which suffers of poor maintenance and is partly used to deposit urban waste.

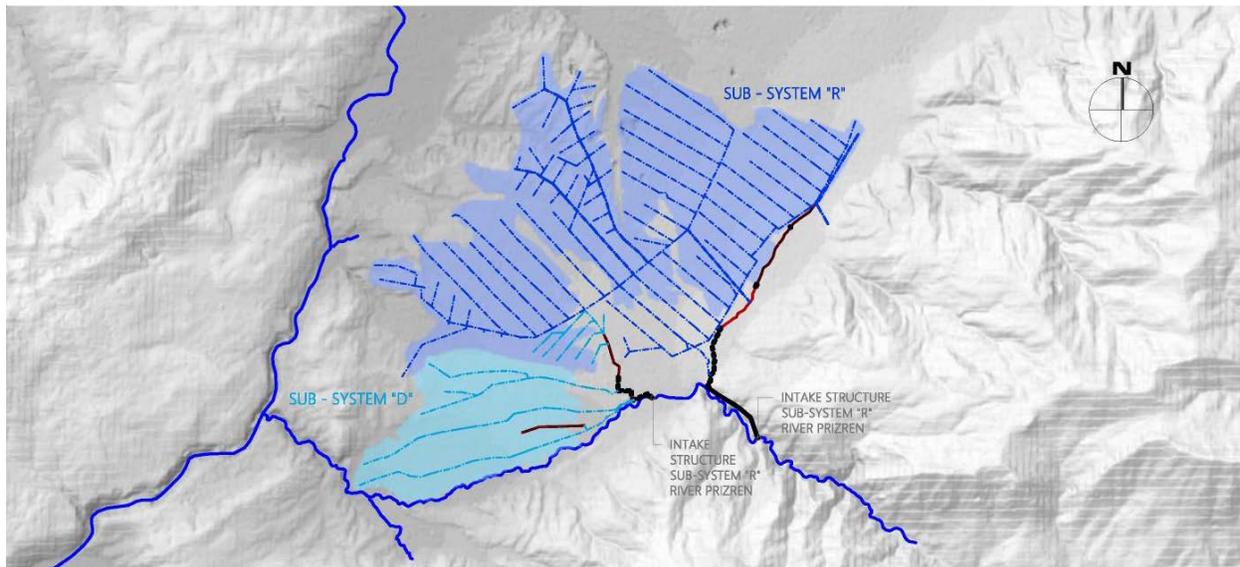


Figure 10 Dukagjini Irrigation map (source: Feasibility Study for the Rehabilitation Works in the Radoniqi-Dukagjini Irrigation Scheme)

4.4 Project alternatives

The following alternatives have been identified and assessed:

- A. Zero Alternative ("Doing Nothing" Scenario)
- B. Rehabilitation of existing irrigation network alternative

4.5.1 Zero Alternative

Under the Zero Alternative the existing situation will continue without large investments taking place. With continued normal maintenance works and small adjustments where and when required. The Zero Alternative is the point of reference to which the established environmental, social and economic criteria of the project alternatives are compared.

For this alternative the existing channel will continue to serve the irrigation purposes. On the positive side, there will be no noise, air pollution or habitat destruction as a result of the rehabilitation works for the channel.

However there will be continuing loss of water due to poor maintenance which is estimated to be more than 50%, no further expansion of irrigated lands, high maintenance costs due to old and out of date pumps and other auxiliary equipment.

4.5.2 Rehabilitation of existing irrigation network alternative

Although there might be small environmental impacts due to rehabilitation works e.g. noise, air pollution, dust, habitat destruction, they are negligible due to nature of works, since only rehabilitation of existing network is foreseen. On the other hand, water losses will be minimized, thus enabling further delivery of high quality irrigation water to sub-systems with desired pressure and quantity. With rehabilitation works for existing channel there will be high possibility to increase the irrigated areas in Dukagjini region. This investment foresees as well an increase in energy efficiency of pumps (due to replacement) and replacing of other old electrical-mechanical structures meaning less costs for operating company due to decreased maintenance needs.

An advantage to this alternative is that no resettlement is foreseen by this project as all the works will take place in Radoniqi-Dukagjini owned property/plots, which includes main infrastructures such as main open canal and siphons and basins to access to those structures for their operation, maintenance and rehabilitation, while along the secondary and tertiary network the company has the right of servitude which gives the right of company to do repairs but with compensation of damages.

5. ENVIRONMENTAL AND SOCIAL BASELINE

Chapter 5 provides data and information on the existing state of environment, economic and social conditions of the Study Area. Based on the environmental and social conditions and on the sensitivity of receptors, the impacts arising from the Project are identified and adequate mitigation measures for the most significant impacts are defined.

5.1. Environmental Baseline

The Baseline Conditions for the key environmental resources have been analysed and presented so as to:

- Describe the important environmental resources and their sensitivity with regards to the Project
- Deduce information gaps and propose additional studies where appropriate
- Meet the requirements of national and international laws and standards and lenders` requirements

Baseline information has been obtained by desk research and field observations and presented within following chapters, where all relevant studies/documents were referenced for reader`s convenience.

5.2. Topography and Landscape

Kosova is spread along 10.887 km² (or 1.1 million ha) of which 53% is arable agricultural land, 41% is forested area, and 6% is miscellaneous types of areas. It is divided into two agro-ecological areas: Rrafshi i Dukagjinit (Dukagjini Plain) (48% of the total land-area), and Fusha e Kosovës (Kosovo Plain), (52% of the total territory).

The topography of Kosovo ranges from the lowest point above sea level, 265 m at Lake Vermice, to the highest point above sea level at 2,656 m, the Gjeravica mountain peak, among the Bjeshkët e Nemuna (Damned Mountains).

The landscape in Kosovo is characterised by high mountains Bjeshkët e Nemuna – Alpet Shqiptare (Albanian Alps); Malet e Sharrit (Sharr Mountains); M. e Kopaonikut (Kopaonik Mountains), M. Qendrore (Central Mountains) and low plains - Rrafshi i Dukagjinit (Dukagjini Plain) and Fusha e Kosovës (Kosovo Plain), which are intersected by several river valleys.

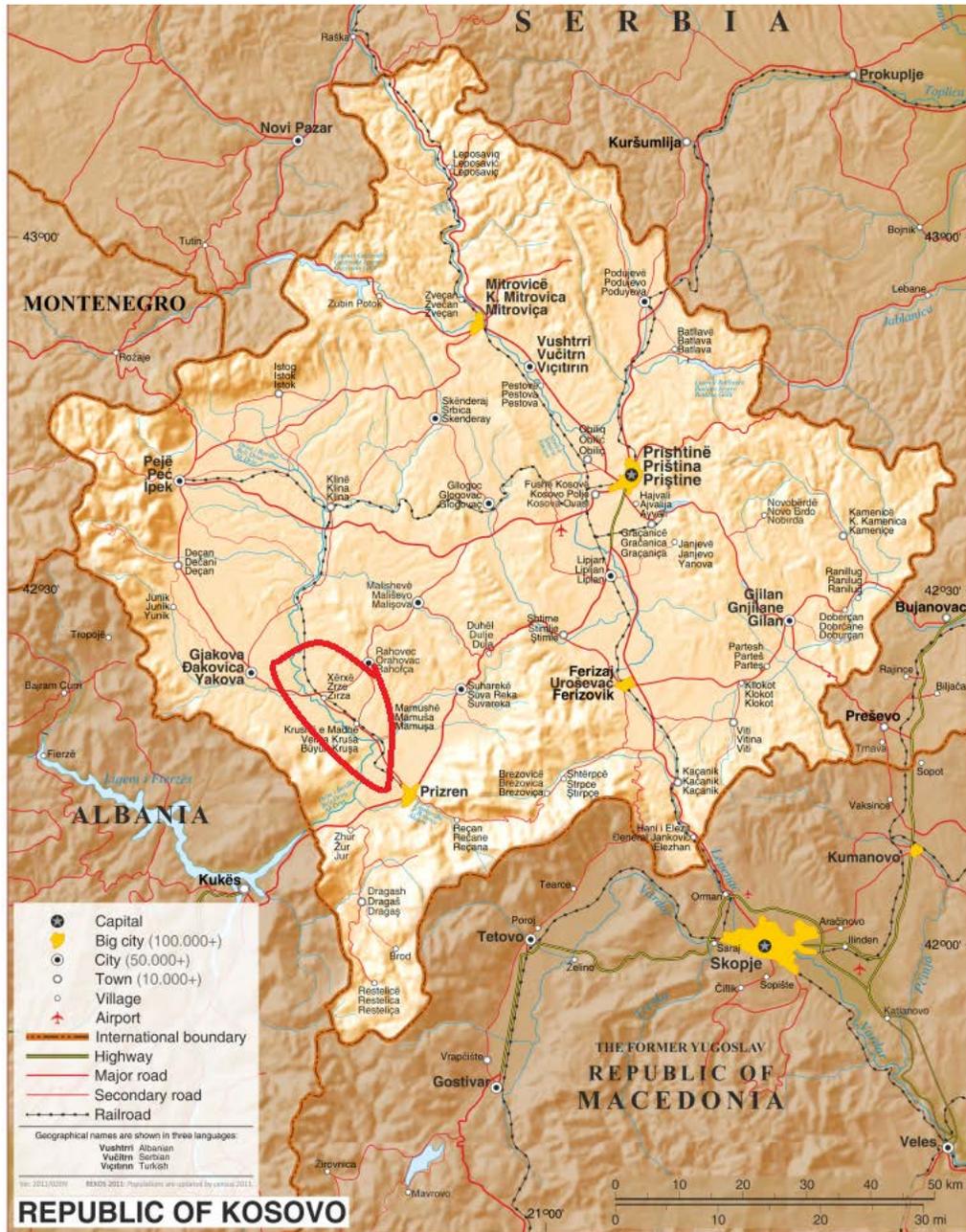


Figure 11 Topography of Kosovo and the Project Location

Radoniqi irrigation area spans by height from altitude 293 m.a.s.l near Drini i Bardhe river and up to altitude 455 m.a.s.l above the village Janosh. Average altitude in the project area is 362 m.a.s.l. In terms of height distribution, 33% of the area is with altitude in the range of 390 to 455m, 67 % is in the range of 290 to 390 m from the total arable areas.

In terms of present area slopes, project area belongs to a zone with minimal slopes around 0.2% that enable application of all types of irrigation. Only small part of the area has steeper slopes around 12% in parts of sub-systems Janos and Qerim where the terrain is steeper.

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

Dukagjini irrigation area spans by height from altitude 291m.a.s.l near River Prizren and up to altitude 441 m.a.s.l north of Prizren. Average altitude in the project area is 375.4m.a.s.l. In terms of height distribution, 25% of the area is with altitude in the range of 390 to 441m, 75 % is in the range of 291 to 390m from the total arable areas.

Landscape Baseline Conditions

In the Study Area three types of landscapes are distinguished based on the extent of anthropogenic influence:

- anthropogenic (agricultural land, human settlements, roads and associated facilities)
- semi-natural (degraded patchy forests)
- natural (Oriental hornbeam and White oak forests, as well as parts of the valley of where riparian woodlands and meadows are present).

5.3 Climate

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

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

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

The average length of snowfall is 26 days in lower parts and 100 days in higher areas of Kosovo. The average wind speed in Kosovo is 1.3 m/s in Peja to 2.4 m/s Ferizaj. Extreme wind speeds in Kosovo are around 31 m/s which occur during March and April.

Kosovo has on average 2,066 hours with sun per year or approximately 5.7 hours per day. The highest insolation value is in Pristina with 2.140 hours for 1 year, while Peja with the smallest insolation value of 1.958 hours. The maximum insolation in Kosovo occurs during July, while the lowest insolation occurs in December.

5.4. Climate change

Kosovo has already approved the Climate Change strategy and action plan. The Climate Change Strategy 2018-2027 sets out policies to reduce greenhouse gas emissions (GHGs) and adaptation to climate change. It also presents an opportunity to identify and define measures - to reduce greenhouse gas emissions and adapt to climate change.

As it is stipulated in the strategy, it will serve as the initial step in the management policy process of the mitigation of GHG and adaptation to climate change for the next ten years. It is also an opportunity to see the mitigation and adaptation measures that will stimulate sustainable development. According to this strategy current and expected impacts related to the project include:

- Exposure to hazards such as droughts, floods, and forest fires will become greater with climate change. Climate variability has already increased in Kosovo;
- Higher temperatures will make heat waves and forest fires more likely. Since 2000 there have been an increasing number of forest fires in Kosovo;
- Increased temperatures, more uncertain rainfall, and reduced runoff combined with socio-economic developments and increased use of water resources will heighten exposure to drought;
- Ecosystem degradation and reduction of ecosystem services;
- Increase and new forms of pollution and water-related diseases

Due to more recent analysis on regional impacts on climate change, while elaborating this chapter, authors will be looking closely to the “Study on climate change in the Western Balkans region”, Publisher: Regional Cooperation Council Secretariat, Sarajevo, Bosna and Hercegovina, May-2018 (web site: www.rcc.int), which gives a thorough analysis on the impact of global warming by future Climate Change throughout the Western Balkan Region. In the document are selected two meteorological parameters, as: temperature and precipitation. The analyzed period is 1961-2015, where the period 1961-1980 is define as the “past” climate baseline period, while the period 1996-2015 as the “present” climate period. The trend of increasing temperature became significant since the 1980s in the Western Balkan Region.

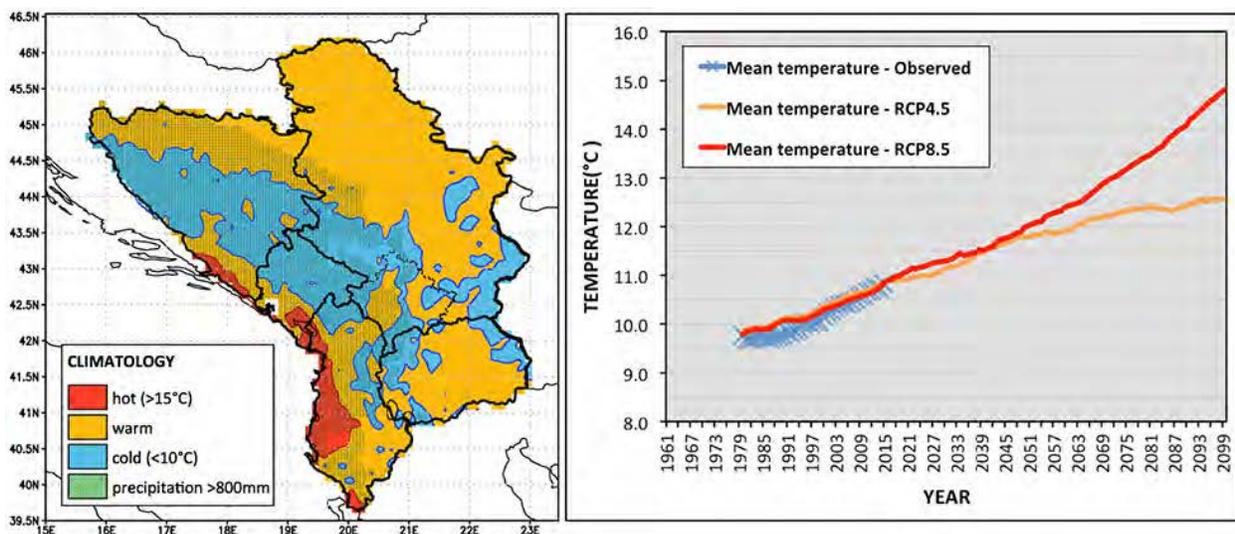


Figure 12 Climatology of the WB region (left panel), with distinguished coastal areas (marked as “hot” – red), mountain areas (marked as “cold” – blue) and areas with temperate and temperate-warm climate (marked as “warm” – orange). The area with highest annual precipitation is shaded (green dots). Mean annual temperature, averaged over the WB region, is shown on the right panel. The data represents average values for the 20-year period, assigned to the last year of the period (“moving average” approach), and are calculated for the period 1961-2100. Values obtained from observations are in blue, from regional climate models median according to stabilisation (RCP4.5) scenario are in orange, and according to continuous rise (RCP8.5) scenario are in red (source: *Study on climate change in the Western Balkans region, May 2018*)

From what is concluded in above mentioned study, in the future there might be important regional high risk changes as follows:

- intrusion of sub-tropical climate to the north;
- increase of heat waves, dry days and extreme precipitation;
- more pronounced rotation of severe drought and heavy rains, with appearance of extreme storms in summer that most likely cause flash floods, severe high winds and hail damage.

Impact of Climate change on irrigation water demands

In order to evaluate the impacts of the climate change on the irrigation water demands, consultant has used the methodology and outcomes from the „*Feasibility Study for the Rehabilitation Works in the Radoniqi-Dukagjini Irrigation Scheme*“ Analyzes were done on the base of the Climate change scenarios (Representative Concentration Pathways-RCP4.5 scenario and Comparatively high greenhouse gas emissions-RCP8.5 scenario) for Western Balkan, prepared by Regional Cooperation Council Secretariat, Sarajevo, Bosna and Hercegovina, may-2018. For this current analysis is used the RCP8.5 scenario. All the analyses are based on monthly measurements (period of 50 years) in the meteorological stations: MS Prishtina and MS Prizren. It is evident (on the both meteorological stations: MS Prizren and MS Prishtina), that the significant increase of air temperature is occurring during the summer months with special emphasis of the temperature difference between summer and winter periods, where the maximum is greater than the minimum gradient, directly reflects to the potential evaporation.

On the base of the presented above, it is expected that the water demands for irrigation will be higher in the summer period. In general, the increase of potential evaporation almost linearly reflects on irrigation water demands

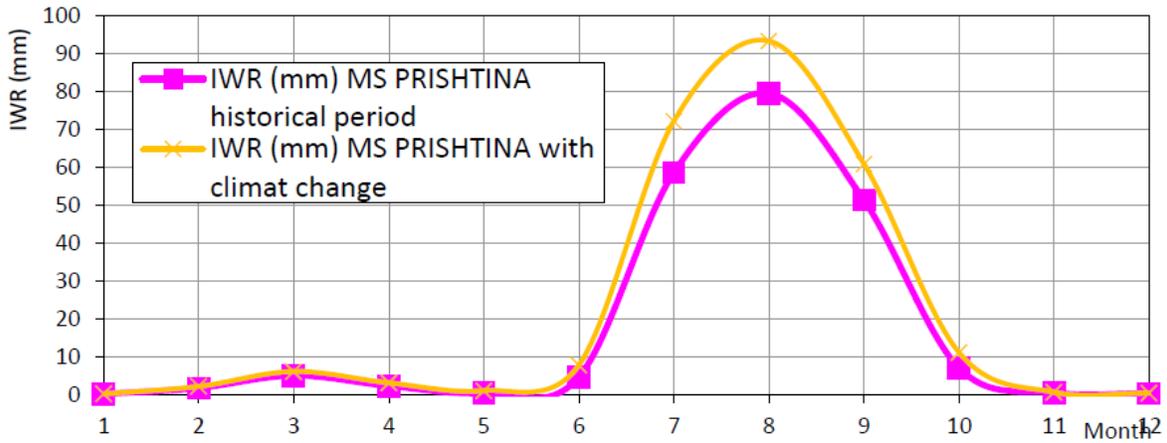


Figure 13 Diagram of historical (1949-2017) and predicted irrigate water requirements for HMS Radoniqi for the period of 2020-2070 (source: Feasibility Study for the Rehabilitation Works in the Radoniqi-Dukagjini Irrigation Scheme)

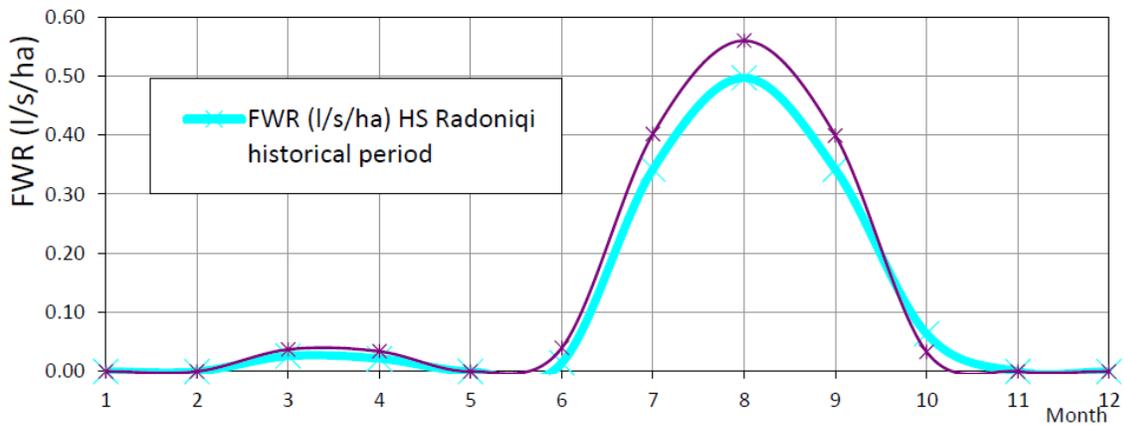


Figure 14 Diagram of historical (1949-2017) and predicted flow water requirements for HMS Radoniqi for the period of 2020-2070 with 75% probability (source: Feasibility Study for the Rehabilitation Works in the Radoniqi-Dukagjini Irrigation Scheme)

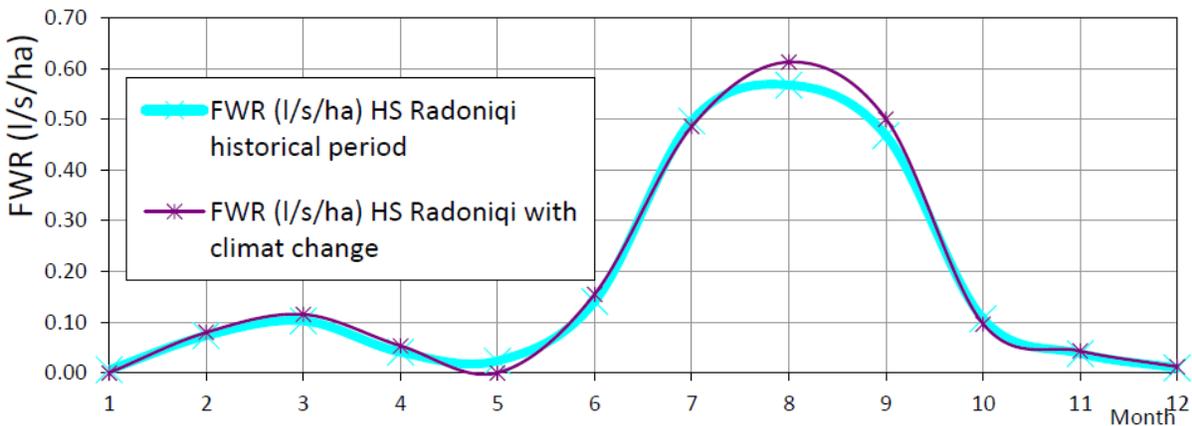


Figure 15 Diagram of historical (1949-2017) and predicted max flow water requirements for HMS Radoniqi for the period of 2020-2070 (source: Feasibility Study for the Rehabilitation Works in the Radoniqi-Dukagjini Irrigation Scheme)

CONCLUSIONS:

- The expected Climate changes, decreasing of precipitations and modifications in distribution, may cause increasing of water demands for 20%.
- Complete hydro module calculations were done for Radoniqi Irrigation Scheme. Example, Cropping pattern from Agricultural analysis (chapter 6 of the Feasibility study) in hydro module 75% probability (with climate change) of 0.57 l/s/ha and max hydro module, 0.61 l/s/ha.
- In Dukagjini Irrigation Scheme, climate change has only a minor impact. For example, IWR increased by 4%, and the maximum hydro module (FWR) remained the same (0.50 l / s / ha for 24 homes).
- The Radoniqi irrigation network is designed with a 0.80 l/s/ha hydro module.
- The Dukagjini irrigation network is designed with a 0.60 l/s/ha hydro module.
- The Radoniqi lake can provide water for irrigation of 19,000 hectares (first and second phase) and provide water for max 200,000 inhabitants.

As this is rehabilitation of the existing irrigation scheme meaning that hydro module can't be changed either. Referring to the above mentioned conclusions the climate change will impact in increased water demand by 20% but still the designed hydro module 0.80 l/s/ha can cover the forecasted increased demand in Radoniqi. In Dukagjini the increased water demand impacted by the climate change is 4% and the hydro module there too will cover the increased water demand in the forecasted time period of 50 years.

5.5 Air Quality

Air quality monitoring is carried out by the Kosovo Hydro-meteorological Institute (KHMI), which manages all air quality monitoring stations in Kosovo.

The air-quality data from KHMI show that PM, notably, exceeds the EC limit value of average annual concentrations of 40 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) for PM10, both in the city centre (the Rilindja building) and in the suburban area (the KHMI station), and often exceeds the one-day limit value (not to be exceeded more than 35 times a year) of 50 $\mu\text{g}/\text{m}^3$.

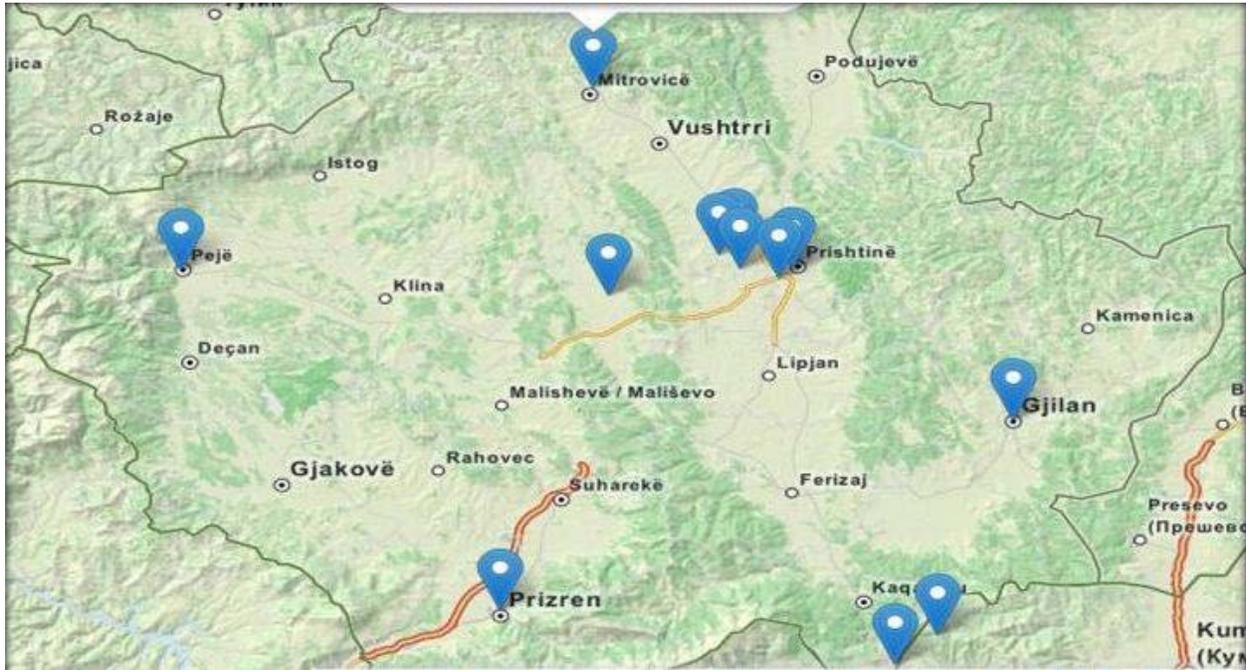


Figure 16 Location of the Air Quality Monitoring Stations in Kosovo (Source: Kosovo Environmental Protection Agency)

Below are the baseline conditions of air quality showing the level of PM₁₀ and PM_{2.5} throughout the year and respective exceedings (source: Air Quality Monitoring Report 2018, KEPA)

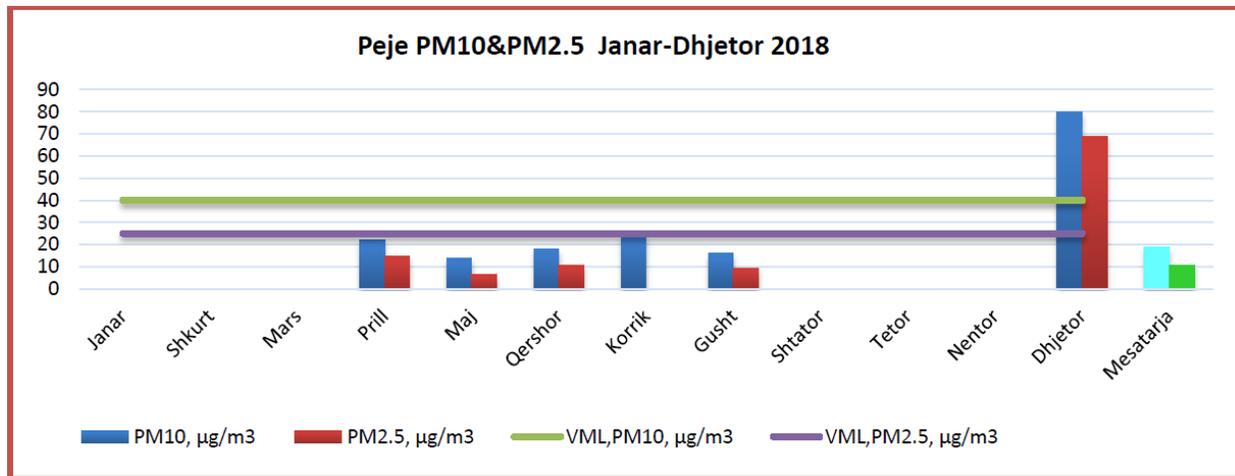


Figure 17 Yearly average of PM₁₀ and PM_{2.5} in Peja station (Source: Kosovo Environmental Protection Agency)

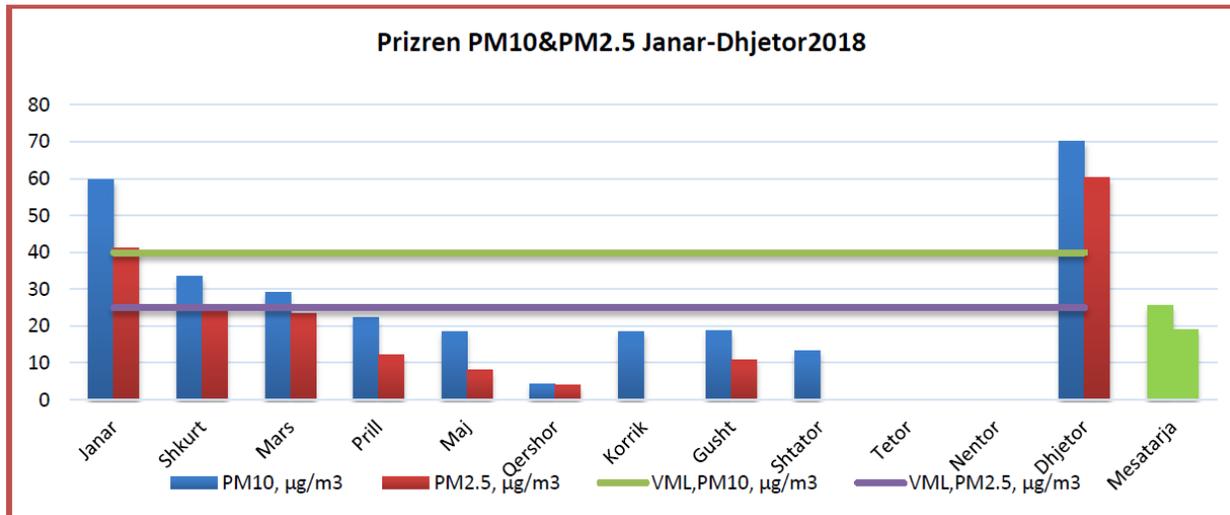


Figure 18 Yearly average of PM10 and PM2.5 in Prizren station (Source: Kosovo Environmental Protection Agency)

From what was observed from two graphs above (Peja and Prizren), the increase in PM10 and PM 2.5 is evident during heating seasons and this is due to the fact that there is contribution from fossil fuels burnt during this season.

Based on the data available from Kosovo Hydro Meteorological Institute (KHMI), the annual averages for 2013-2018 for SO_2 , NO_2 , O_3 , CO, PM10 and PM2.5 are calculated at country level. Trend presented in graph form highlights shows the increasing trends of SO_2 and NO_2 , while in PM10 and PM2.5 and other parameters show a tendency for the mean values to fall.



Figure 19 Trend of values of SO_2 (2013-2018) as country average (source: Air Quality Monitoring Report 2018, KEPA)



Figure 20 Trend of values of NO₂ (2013-2018) as country average (source: *Air Quality Monitoring Report 2018, KEPA*)



Figure 21 Trend of values of O₃ (2013-2018) as country average (source: *Air Quality Monitoring Report 2018, KEPA*)

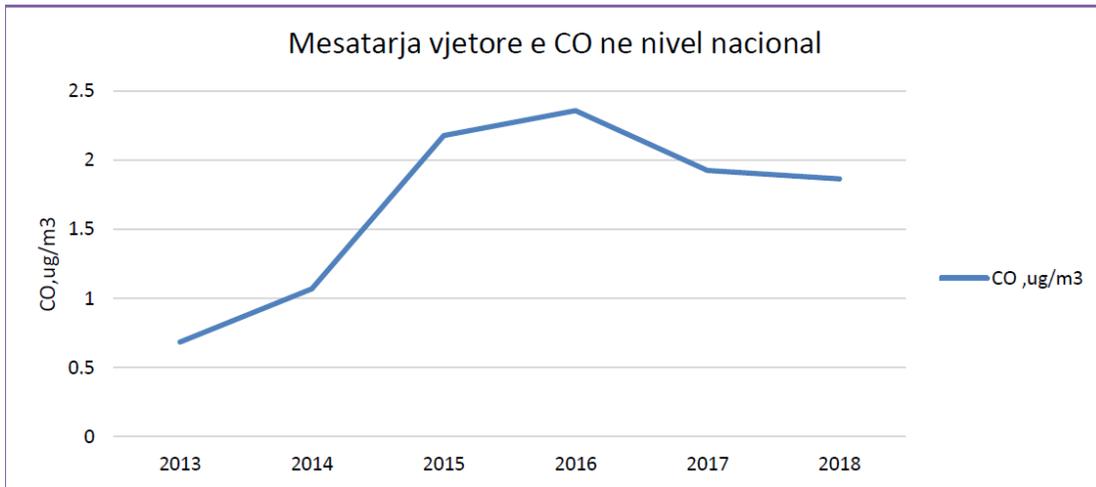


Figure 22 Trend of values of CO (2013-2018) as country average (source: *Air Quality Monitoring Report 2018, KEPA*)



Figure 23 Trend of values of PM10 (2013-2018) as country average (source: *Air Quality Monitoring Report 2018, KEPA*)



Figure 24 Trend of values of PM2.5 (2013-2018) as country average (source: *Air Quality Monitoring Report 2018, KEPA*)

Air quality in the project area

Many cities in Kosovo suffer from poor air quality, with ambient concentrations of particulate matter with a diameter of 2.5 micrometers or less (PM2.5) significantly exceeding the national and European Union (EU) standards and global air quality guidelines for PM2.5 established by the World Health Organization (WHO). Especially in winter, urban areas face severe smog episodes, caused by the increased demand for heat from the residential and commercial sector, which is mainly provided by burning solid fuels⁹.

But referring to the above graphs the air quality in the project area is within the set limits due to absence of polluting sources such as industry and/or road-traffic. Based on the analysis of pollution sources as well as the monitoring results, it can be concluded that the energy, industry and traffic are considered the main sources of air pollution in Kosovo¹⁰¹¹.

In the municipality of Gjakova, the air is considered polluted mainly by the traffic, generators, heating of the city, burning of the landfills. The municipality has a shortage in terms of air management; there is a lack of monitoring station, and no accurate data on this issue. While there are no intensives housing and industry, moreover the channel is located far from the main roads, it can be considered that the air quality through project area is good.

5.6 Geology and hydrogeology

Kosovo has a varied geology that ranges in age from the Neo-Proterozoic to the Holocene. The geology is characterised by substantial structural features on a regional scale, including normal faulting and thrusting.

A general simplification of the stratigraphic sequence is as follows.

Holocene: scree formed from weathering of mountains and alluvium deposited by the rivers.

Pliocene: andesitic chert.

Upper Miocene-Pliocene: formation of lignite from the accumulation and subsequent decay of vegetation in sedimentary basins.

Oligo-Miocene: conglomerates, clays and limestones, accompanied by acidic to intermediate magmatism.

Late Cretaceous "molasses": shallow-water carbonates and clastic.

Upper Cretaceous "flysch": marly limestones, sandstones and conglomerates.

Early Cretaceous: conglomerates, sandstones and silts.

Late Jurassic: massive limestones.

Triassic-Jurassic: basic and acidic magmatism, and associated ophiolitic crustal rifting and obduction of ultrabasic rocks.

Triassic: clastic with volcanic giving way to carbonate platforms that grade up into dolomites, some of which have been metamorphosed to marble.

⁹ <http://documents.worldbank.org/curated/en/214511576520047805/Air-Pollution-Management-in-Kosovo>

¹⁰ https://indep.info/wp-content/uploads/2019/08/INDEP_June-2019_Air-Quality-in-Kosovo.pdf

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

Perm-Triassic: carbonates, clastic, phyllite, schists and quartzite that have been invaded by acidic magmatism (quartz porphyries).

Late Palaeozoic: schists.

Neo-Proterozoic-Palaeozoic: basement of schists, gneisses and amphibolite that have been invaded by granitic plutons.

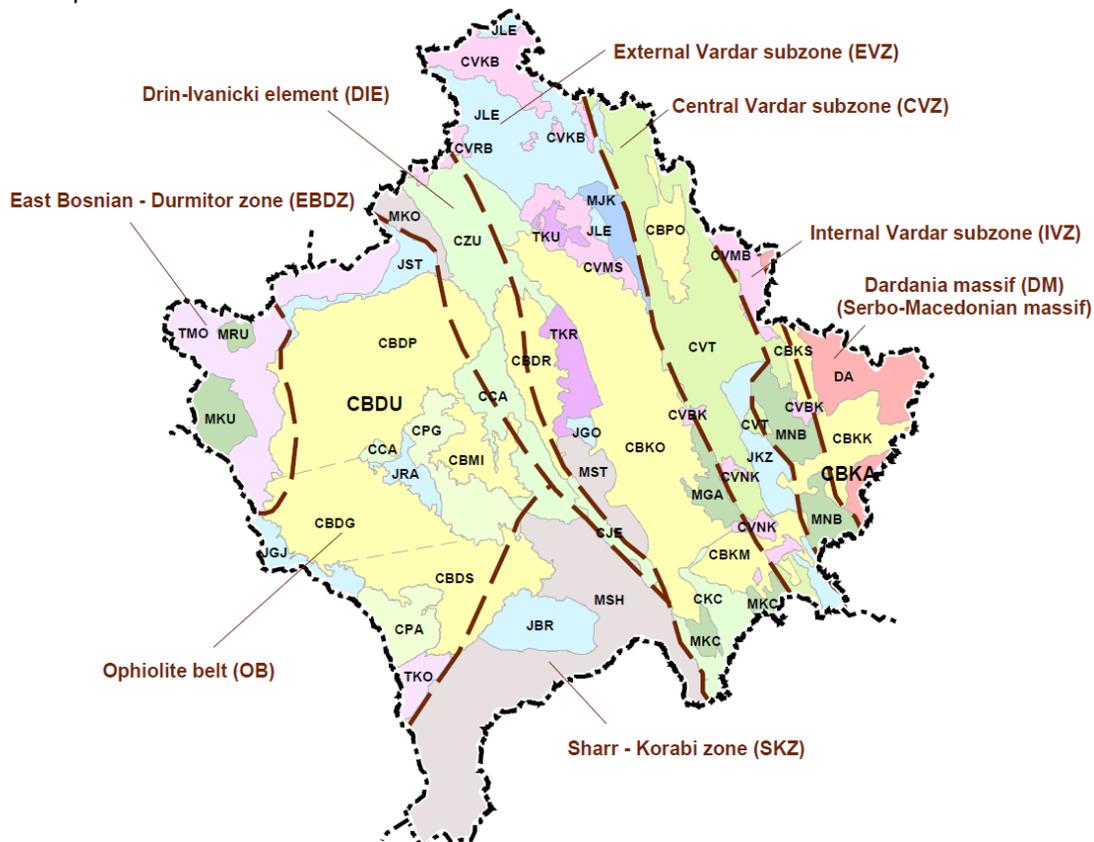


Figure 25 Geological map of Kosovo

From the above map it can be observed that project area is located within two zones: Gjakovë Cenozoic subbasin CBDG and Suhareka Cenozoic subbasin CBDS both belonging to Ophiolite belt (OB)

5.7 Hydrology

Kosovo has limited water resources divided into four main water basins and they are set to represent a constraint to the country's socio-economic development in light of rising demand for water. All rivers and smaller watercourses belong to the four main river basins: The White Drin (Drini i Bardhe); the Iber; the Morava e Binces; and the Lepenc.



Figure 26 Kosovo Hydrological map in context of main river basins (source: Kosovo Water Security Outlook, World Bank, 2018)

Rivers with the greatest annual flow are located in the basin of Drini i Bardhe in the Dukagjini Plain.

The main hydrological feature in Kosovo is the unequal and inadequate distribution of water resources in relation to demand. The main reserves of groundwater are located in the western part of Kosovo, where reserves of surface water are also greater compared to the eastern and southeastern parts where demand for water is very high.

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

Rivers and mountains in Gjakova are part of the basin water Drini i Bardh. This river basin flow into Adriatic Sea. Drini i Bardh is the largest river of Kosovo, it forms the boundaries of Gjakova with the municipality of Rahovec in the east. Ereniku River has its source of Bjeshket e Nemuna, flowing through the territory of the municipality and joins Drini i Bardhe. Several rivers and small streams as Lukac, Neci, Trava, Krena and Trakaniqi flow from north to south and streams in Ereniku River.

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

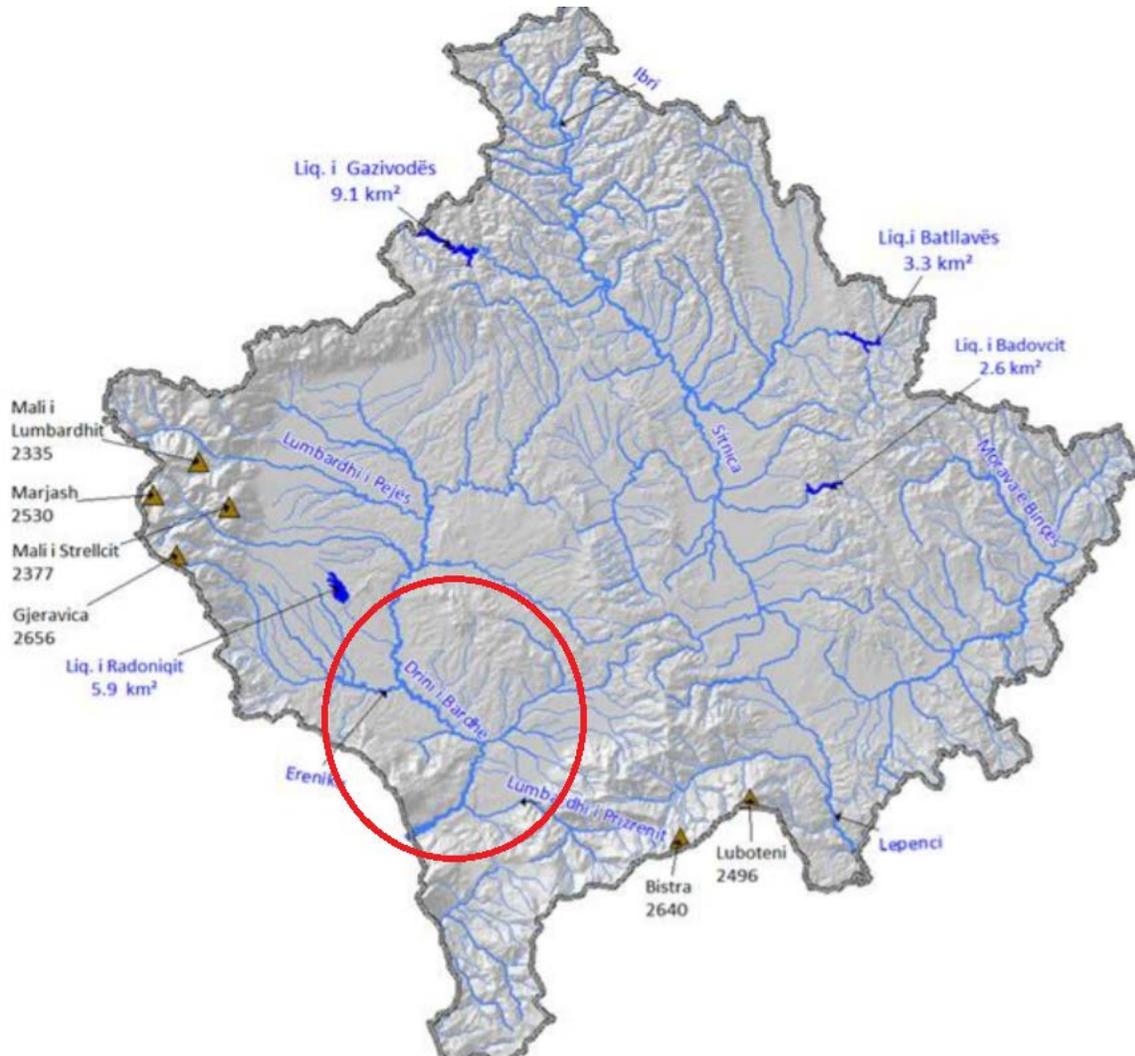


Figure 27 Kosovo Hydrological map in context of rivers flowing at or near project (source: Kosovo Statistics Agency, Water Statistics Report 2016)

Kosovo Rivers empty into three seas: The White Drin belongs to the Adriatic basin; the Lepenc belongs to the Aegean basin; and the Iber, Sitnica and Morava e Binces belong to the Black Sea basin. All rivers in Kosovo have a slow flow rate, typical of lowland rivers, and land use is determined by the location in the basin.

For irrigation of the Radoniqi, water accumulated at Radoniq Lake (dam) is used, as noted earlier it is located near to the Gjakova town. This lake today supplies Gjakova and Rahovec municipalities with drinking water too. In the project area passes the following river: Drini i Bardhe, Ereniku and Trakaniq (tributary of the Drini i Bardhe). Beside these bigger rivers in the project area passes small unnamed rivers.

The Drini i Bardhe River enters Prizren from the north and continues towards the southwest to Albania into Adriatic Sea.

In the project area in Dukagjini flow the following rivers: Prizren and Drini i Bardhe and other small unnamed rivers. The river Prizren is the main tributary of the river Drini i Bardhe.

5.8 Water Quality

All major river basins are recognized and reported as moderately or heavily polluted. Water use and pollution are expected to grow with economic development. The Drini i Bardhe is the healthiest river as it has fewest pressures and highest water flows, but this river also gets severely polluted in its lower reaches from industrial and urban wastewater, but also agricultural nitrates and phosphates¹².



Figure 28 River Water Quality – (source: Kosovo Environmental Database)

According to the WFD (Water Framework Directive) the classification scheme for the ecological status of water bodies includes five status classes: 1: very good, 2: good; 3: moderate; 4: poor and 5: bad¹³.

The Basin of Drini i Bardhe has the greatest area of all river basins in Kosovo. The monitoring network of this basin consists of 23 monitoring stations of the physical and chemical quality. Three of these are base stations belonging to the Drini i Bardhe River: one at the river source in Radavc mountain above Peja, one at the

¹² Kosovo Water Security Outlook, World Bank, 2018

¹³ Kosovo Water Strategy - Summary

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

confluence of Istog and Klina rivers in Klina, and the last one at the confluence of the rivers of Lumbardhi i Pejes, Decani, Mirusha, Erenik, Rimnik and Toplluha, located at the bridge in Gjonaj village of Has.

The quality of water varies as it flows through stations. Thus, water at the source has a good quality, but at the other two stations there is pollution caused by untreated waters discharged into the main river and into the rivers mentioned above which are sub-basins of this river. Pollution is also caused by water used to wash agricultural land which in other terms can be explained as washing of fertilizers from agricultural land through rain/participation and flowing to nearby rivers. Results of physical-chemical analyses for the last five years show that the quality of water at all river sources is good. The situation starts to change when approaching settlements due to the discharge of wastewater and water from industrial collectors along the flow of this river basin.

Another cause of pollution is the throw of waste especially at locations of bridges. Water has a good quality up to the point of confluence with Istog River. Drastic changes begin in the regions of Zllakuqan–Ruhot and Zllakuqan–Klina. At the point of confluence of Drini i Bardhe and Klina Rivers, the quality of water is very poor. To conclude, water of the basin of Drini i Bardhe is polluted by discharges into the sub-basins, which have beforehand been subject to human action. This situation continues up to Vllashnje at the point of flow into Lumbardhi i Prizrenit. The use of fertilizers in agriculture affects surface waters. The actual impact of agricultural activities on surface waters is assessed to be low. The average quantity of used fertilizers is 346 kg/ha. The average quantity of used organic fertilizers is 2,845 kg/ha, which is much lower than the rate of use in many EU member states. Supposing that 20% of fertilizers consists of Nitrogen (equivalent to 70 kg per hectare) and the content of 7 kg/T Nitrogen (20 kg per hectare) in organic fertilizers, this implies an equivalent to a combined application Nitrogen rate of 90 kg per hectare, which is much lower than the threshold of 170 kg determined in the Nitrates Directive.

In accordance with the Kosovo Water Polluters Cadastre, phase I, in the Region of the “White Drin” Pond, a total of 154 polluters were registered, out of which 99 are collective polluters and 56 are individual polluters. The most loaded rivers by the number of pollutant discharge points are: the Istog River with 12, “Lumbardhi” River of Prizren with 11, “White Drin” with 9, “Lumabardhi” River of Peja with 7, and Klina with 5 polluters, while, by the quantity, river Lumbardhi – Prizren is the leading one. However, all of these rivers are eventually merged with “White Drin” and then continue towards the Adriatic Sea.

The basin of Drini i Bardhë: rivers, Ereniku, Lumëbardhi i Pejës (Bistrica), Lumëbardhi i Deçanit, Mirusha, Klina, Lumëbardhi i Prizrenit (Bistrica) until at the entrance of the towns, are waters of first and second category, whereas at the exit from the towns belong to the third category.

While quality of the water from Radoniqi lake which is used for irrigation is of good quality due to low anthropogenic effects, same cannot be said for Lumbardhi I Prizrenit which feeds some part of the Dukagjini irrigation scheme, is considered to be polluted due to anthropogenic sources, but it is still within acceptable range (within limits) in case used for irrigation.

Monitoring of river waters in the territory of the Republic of Kosovo is done by the Hydrometeorological Institute of Kosovo. The quality of these rivers is determined on the basis of physical, chemical and heavy metal analyzes. In the Drini i Bardhe Basin the selection is made for the two rivers: Drini i Bardhe, where as

an annual average value is presented the chemical oxygen demand/mg/l O₂ (GOI), while the Ereniku river results in an annual average increase in value of total suspended solids/mg /L (MTS) parameters¹⁴.

5.9 Floods

Almost all municipalities of Kosovo, more or less, are affected by flood risk which are manifested in the form of: floods after storms in mountain areas, floods after heavy rains in lowland areas, floods after the snowmelt followed or not by cold weather¹⁵. Floods by river basins: Drini i Bardhë: 50 % Ibri: 24 %, Lepenci: 20 %, Morava e Binçës: 6 %. Most considerable damages caused by floods are marked at Drini i Bardhë river basin 50,7% (by Master Plan 1983-2000). Damages caused by floods only from river Drini i Bardhë amounted to 9,7%. Recent floods in Kosovo are registered in February, 2006, January, 2010 and April, 2014. In accordance with this could be concluded that the project area belong to area which is vulnerable on floods. In the lowlands along the riverbeds, floods are more frequent almost every year in the spring or late autumns. Rahovec municipality is more affected by flooding along Drini i Bardhë River area¹⁶.

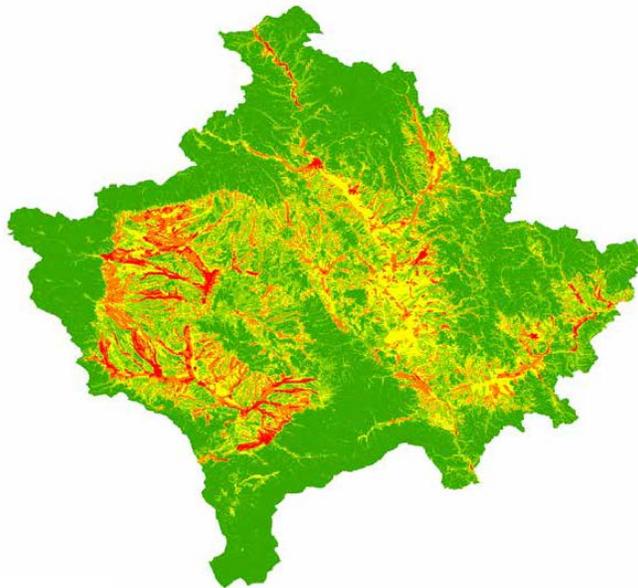


Figure 29–Flood hazards in Kosovo (source: Assessment of Hazards from Natural Disasters), where red areas show areas which are heavily exposed to flood, yellow-moderate, while green-low risk.

5.10 Seismic characteristics

In the worldwide seismic zoning, Kosovo takes place in Alpine-Mediterranean seismic belt. This seismic belt includes a broad area of contact between the African and the Eurasian lithospheric plates, from the Azores isle to the eastern border of the Mediterranean basin. The concept of plate tectonics is particularly

¹⁴ Kosovo Water Polluters Cadaster-First Phase, Kosovo Environmental Protection Agency

¹⁵ Kosovo Water Security Outlook, World Bank, 2018

¹⁶ Report from [International Federation of Red Cross And Red Crescent Societies](#), 2017

complicated in this area due to the presence of a large number of blocks, and the manner of release of accumulated energy during the process of plastic deformation in most of its part. From the seismological standpoint, the territory of Kosovo represents a region of relatively high seismic activity, which has been hit in the past and could be hit even in the future by very strong indigenous earthquakes, which have shallow hotbeds, generated in the land crust, in maximum 15-20 km deep underground. The region of Peja-Gjakova Prizren-Dragash represents seismic source where is registered the earthquake of 1456 with magnitude 6.6 Richter scale (Sulstarova et al., 2001)¹⁷.

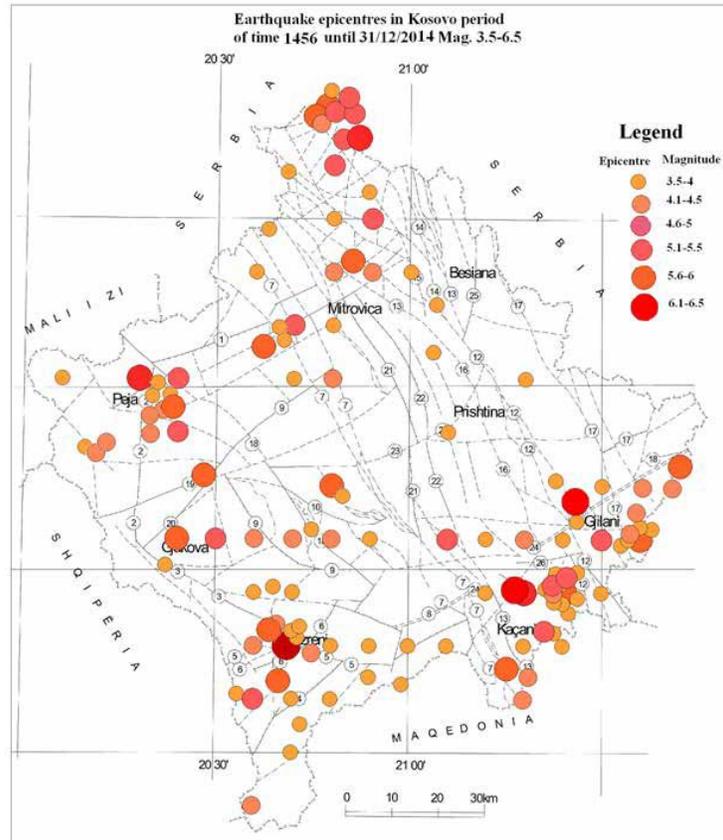


Figure 30 Seismicity map of Kosovo (Map of earthquake epicenters in the territory of Kosovo, period of time 1456 until 2014), source: Assessment of Hazards from Natural Disasters in Kosovo, Ministry of Internal Affairs, Agency for Management of Emergencies

5.11 Landslides and Erosions

Based on the lithological, tectonic, morphological, climatic, hydrologic structure of land, it can be concluded that many parts of the territory of Kosovo are covered by a number of ecodynamic processes, mainly represented by landslides terrain. Beside others, the phenomena of landslides appear in the lower part of

¹⁷ Assessment of Hazards from Natural Disasters in Kosovo, Ministry of Internal Affairs, Agency for Management of Emergencies

the ground in the areas of neogene basins (Dukagjin, Kosovo, Llap, Drenica, Morava e Binçes) and other parts.

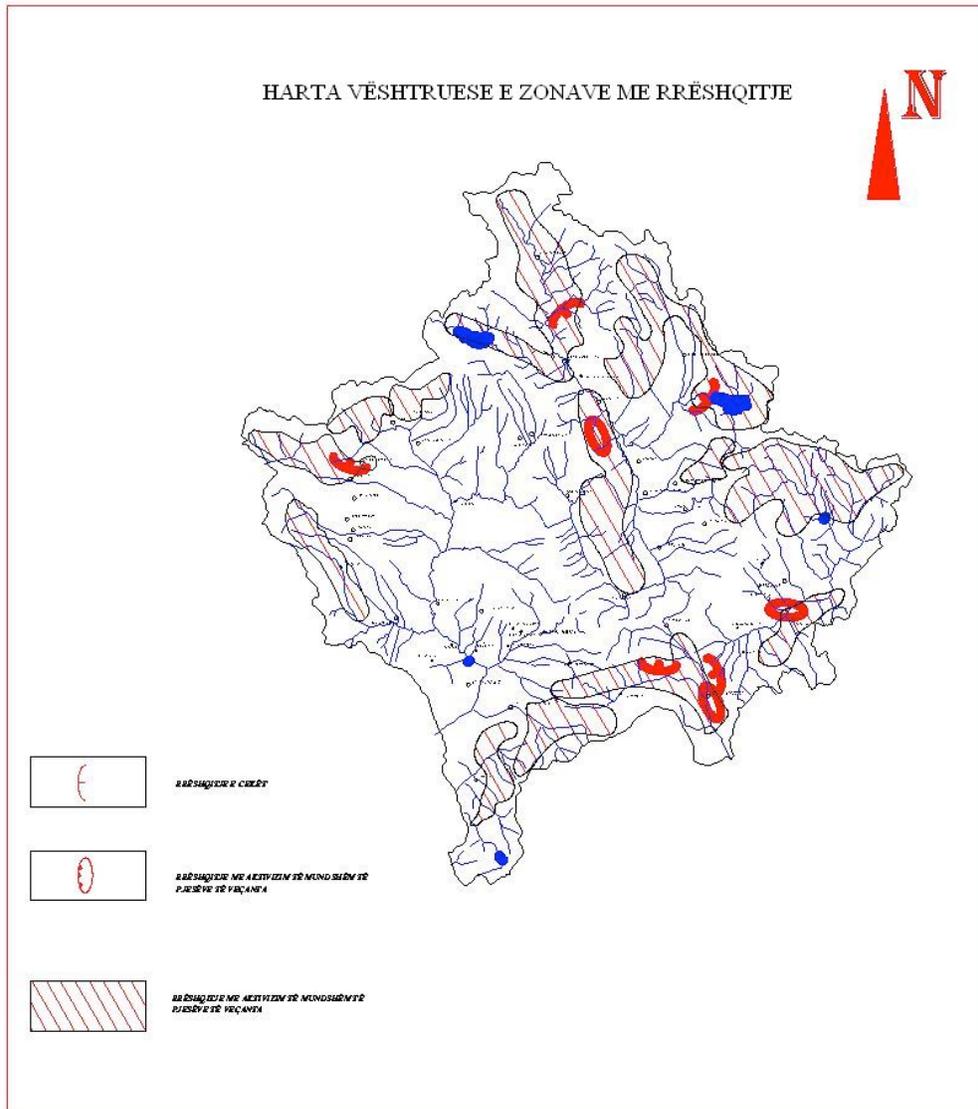


Figure 31 Landslide zones of Kosovo (source: Assessment of Hazards from Natural Disasters in Kosovo, Ministry of Internal Affairs, Agency for Management of Emergencies)

Erosion is present in the hilly terrain, as well on the top cover composed of deluvial-proluvial sediments. According to the Erosion Map of Kosovo shown in figure below can be concluded that the project area is in the area where the intensity of erosion is classified from low to medium erosion risk.

(light orange-low erosion risk, orange-high risk)

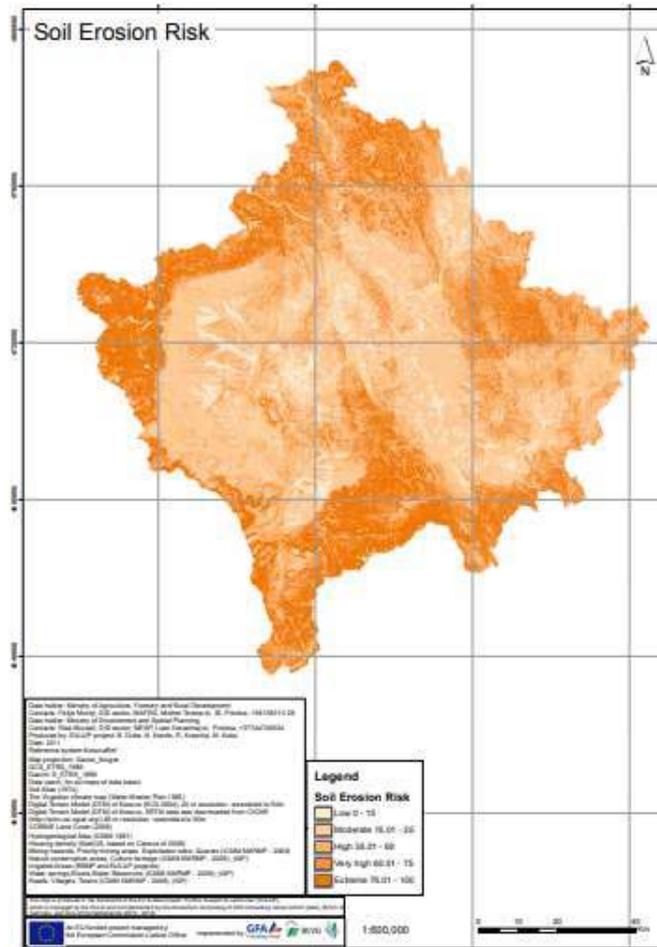


Figure 32 Soil Erosion map of Kosovo (source: Assessment of Hazards from Natural Disasters in Kosovo, Ministry of Internal Affairs, Agency for Management of Emergencies)

5.12 Land use

Based on the main results of the National Forest Inventory in 2012, it was concluded that the forests and forest lands represent the main category of land use with about 47%, arable land about 29%, meadows and pastures 15%, settlements with about 4.5 %, water and wet lands about 0.6% and other lands with about 3.9%. Compared to the inventory conducted in 2002, it is concluded that there has been an increase in land area used as: forests, meadows and pastures and settlements. On the other hand, there has been a decrease in land areas used as agricultural land and other land areas¹⁸.

¹⁸ Kosovo land cover country fact sheet 2012, EEAS

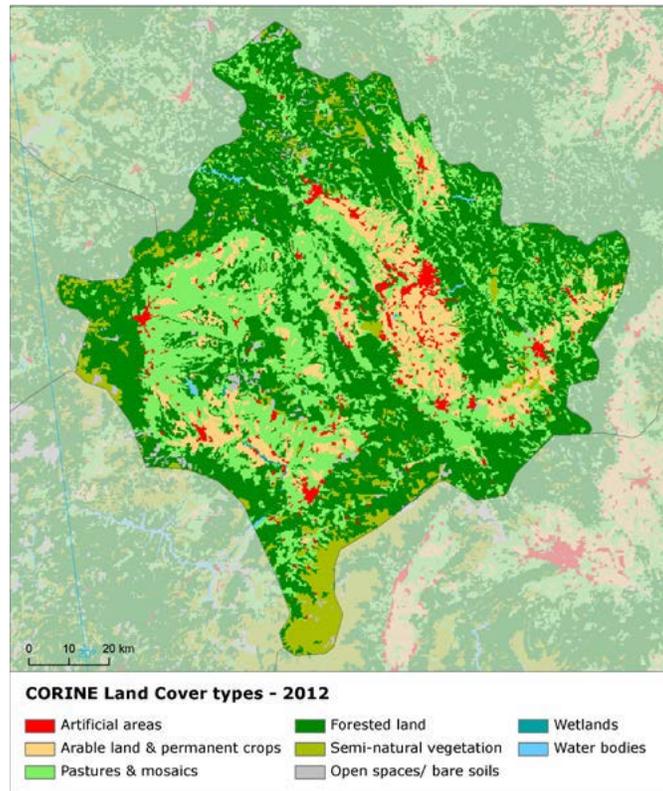


Figure 33 Kosovo land cover country fact sheet 2012, EEAS

The total area of agricultural land in Kosovo is 512,000 ha of land. The utilized land area for agricultural production in 2018 was 416,072 ha or 80% of the total land area.

The use of land for agricultural produce is of a good level and with an increased awareness of farmers in recent years as well as support from numerous grants and grants given by local and international institutions. The average size of Agricultural Economies in Kosovo in terms of arable land is much smaller than in most EU countries but is similar to neighboring countries. The average size of Agricultural Economics in Kosovo is 8 times lower than the EU average. There is still no land quality monitoring system in Kosovo.

The land use pattern in the Municipality of Gjakova shows that rural character is dominant¹⁹. Total settled areas are 1479 ha making up only 2.5 % of the total municipal area. Agricultural areas cover 28433 ha or 48.5%, forests cover 26973 ha or 43.0 % of the municipal borders. Landfill cover 3284 ha or 5.6 % of the total area.

The land use pattern in the Municipality of Prizren as well shows a rural character dominancy. Total settled areas are 3,392.72 ha making up only 5.3% of the total municipal area. Agricultural areas and forests cover 90.05% of the municipal borders with a total area of 57,434.1 ha. The forests in Prizren cover approximately 8,500 ha including high and low intensity forest areas which are only 13% of the municipal borders²⁰.

¹⁹ State of environment of Kosovo, 2015

²⁰ Prizren Municipality Development Plan, 2013-2025

5.13 Soil Quality

Soil pollution is considered to be the presence of hazardous waste, which is usually not a product of normal pedogenic processes and which causes soil functions to collapse. Land degradation in Kosovo occurs especially along the main roads and is one of the most widespread and threatening forms of damage to land and the environment. Various reports indicate land occupation by construction, land degradation for economic activities and benefits, and unfavorable land-use decision-making, indicating a negative trend of land conservation for future generations. Land degradation is the result of several specific factors such as: Natural Factors (Large Precipitation and Floods, Erosion and Sliding of Earth and Drought) and Human Factor (Continuous building pressures from chaotic urbanism, soil compression, pollution from Economic and industrial activity (chemical pollution, corrosion interventions, road openings and river exploitation, etc.).

A survey on agricultural land contamination was carried out through EU funds and implemented by GIZ and NIRAS. The project is implemented within 2 years 2013-2014. This project monitored agricultural lands of 17 Kosovo municipalities which included 214,749 ha. In this area 2,840 soil samples were taken. According to the final report, findings that the pollution of agricultural land in Kosovo is limited in certain areas in which were previously identified by MESP/KEPA. These sites are not used for agricultural crops.

The key project results were the following:

- Heavy metal concentrations (Zn, Cu, Cr, Ni, Cd, Pb, Hg, Zn, Cu, and Ni) for 17 municipalities show within standards of land pollution.
- Heavy metal presence at higher levels (e.g. Cr, Ni, Pb and Cd) were noted in fields other than agriculture land or land used for non-agriculture/urban purposes.
- No crop pollution has been noted (vegetables, cereals and fruit) from heavy metals (specifically Cr, Ni, Pb, Zn) in the agriculture land samples in 17 municipalities.
- As part of Food Management Safety System, it is recommended that all agricultural produce should be regularly and systematically checked to ensure public safety and trust.

It must be noted that there were no land contaminations in the project area.

5.14 Soil Pollution

From the environmental hotspot report, published by Kosovo Environmental Protection Agency, around 0.091 km² of Kosovo's territory is contaminated from different pollutants, either inherited before the war or created due to different activities. But referring to the EPA there are no hotspot in the vicinity of the Project area (see map below).

When it comes to spatial distribution of these hotspots, it can be observed from the map below:

Where areas in green represent non-contaminated sites, and from this map and spatial distribution of the hotspots it can be observed that there is no such pollution in project area.

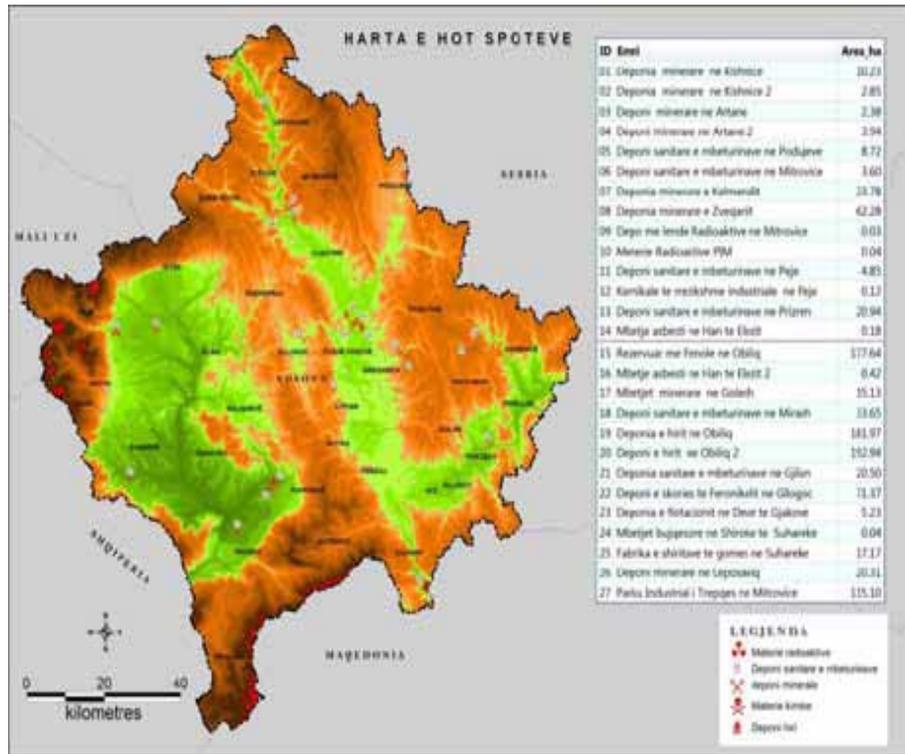


Figure 34 Hotspot map of Kosovo 2012, Kosovo Environmental Protection Agency

5.15 Natural Protected Areas and Biodiversity Features

Kosovo within its small territory is rich in high natural values. Last decade in Kosovo progress is being made in the in the area of nature conservation. The nature protection through protected areas is an important legal tool that enables protecting the values of natural heritage and biodiversity. Conservation of the natural areas in Kosovo through the network of protected areas was initially regulated in the late 1950s with the designation of the first nature reserves such are: Kozhnjeri (1955), Rusenica (1955), Gubavci (1959) etc. (Veselaj & Mustafa 2009). More developments in this respect were made in the second half of 1980s, respectively, in 1986, when after the complete scientific assessment of feasibility from biodiversity and other natural values; the Law on the “Sharr Mountains” national park was adopted. In 1988 was approved the Law for the preservation of natural and manmade environments in Kosovo. However, major developments have occurred in the postwar period (after year 1999), and particularly after 2003 when the first institutions of self-government were established and the Law on environmental protection and other relevant legislation was adopted (Mustafa et al. 2013).

The protected area network that in 2003 was about 4.36 % of the territory was increased to 10.9%, reaching a satisfactory degree of protected areas. The current Protected Area System (PAS), including two national parks, natural monuments, strict nature reserves and protected landscapes, classified according to IUCN protected area designation criteria. The bulk of protected areas was till 2003, Sharr Mountain National Park. The Parku Kombëtar "Bjeshkët e Nemuna" new national park double the PAS area, almost reaching the internationally accepted norm of 10% of land area protected.

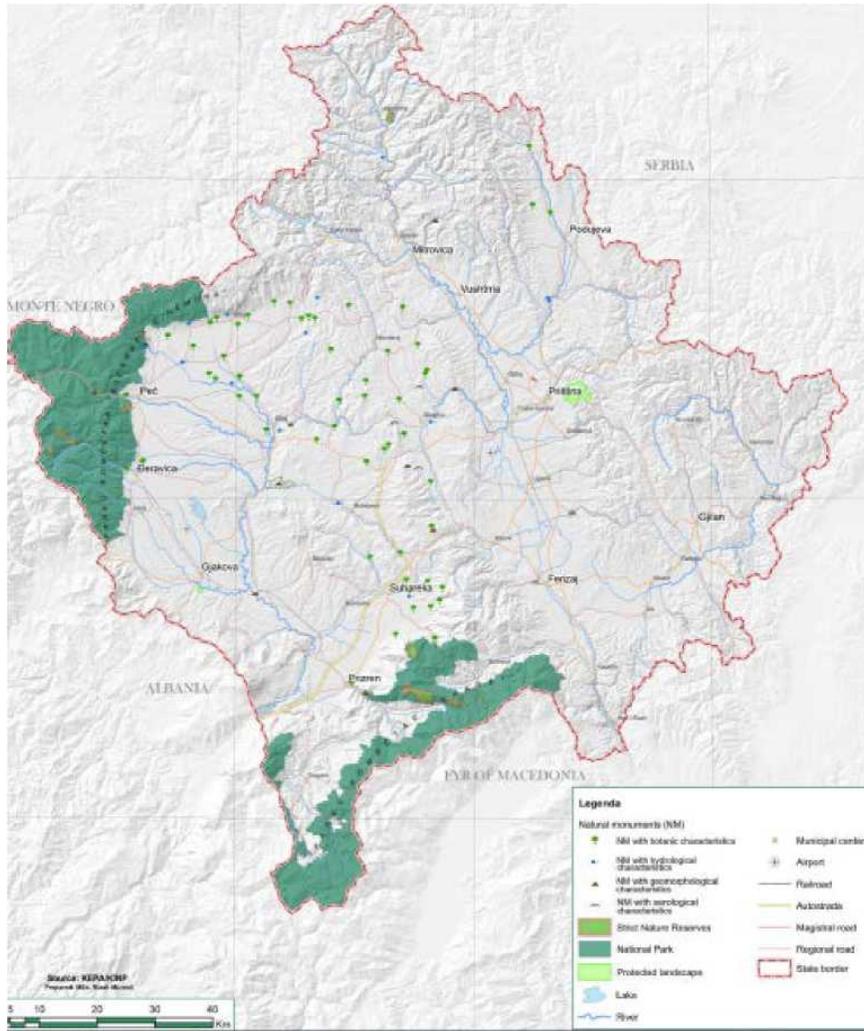


Figure 35 Map of Protected areas in Kosovo, Kosovo Environmental Protection Agency

Table 3 Protected areas network in Kosovo²¹

| Category (IUCN Category) | Type of PA-s | Number |
|---------------------------------|------------------------|--------|
| Strict Nature reserves (Cat. I) | Strict Nature Reserves | 11 |
| | Botanical reserve | 7 |
| | Fauna species reserve | 2 |
| | Hydrologic reserve | 1 |
| | Geological reserve | 1 |
| National Parks (Cat. II) | Natural parks | 2 |
| Natural monuments (Cat. III) | Natural monuments | 99 |
| | Botanical monuments | 66 |
| | Hydrological monuments | 17 |

²¹ Kosovo Environmental Protection Agency, Nature Protection Institute

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| | | |
|---------------------------------|--------------------------|---|
| | Speleological monuments | 9 |
| | Geomorphologic monuments | 7 |
| 5.Protected landscapes (Cat. V) | Protected landscapes | 4 |
| | Natural park | 1 |
| | Protected landscapes | 2 |
| | Special area for birds | 1 |

Forests and forest lands in the territory of Gjakova municipality includes 25,589 ha or 43% of the overall surface. Approximately 5% (approximately 3000 ha) of the Bjeshkeve te Nemuna area is proposed for protection as a national Park located in the territory of the municipality of Gjakova. The most important zones are: the mountains' "Pashtrik", forest park "Maja e Gllaves", complex of black pine in Shkukez, communities of Chestnut and branches of Bjeshkeve i Nemuna, and the Location of Bujgeri Diskore and location of flowers Pashtric. The richest zone of diversity of plants and animals are part of Pashtrik and Bjeshkeve I Nemuna that lies on the territory of the municipality of Gjakova. In the municipality of Gjakova kinds of mammals that can be encounter are the Brown Bear (*Ursus arctos*), wolf (*Canis lupus*), Jackal (*Canis aureus*), fox (*Canis vulpes*), ringleted (*Mustela nivalis*), Opportunistic (*Meles Meles*), Stinger (*Mustela putorius*) etc.

From birds must be distinguished: eagle of the mountains (*Aquila chrysaetos*), Falcon (*Falcon naummani*) Quail quarry (*Alectoris graeca*), some types of singing birds and birds of other characteristics for this region.

In the water resources of this municipality these species can be found: brook trout (*Salmo trutta*), Bërcaku (*Squalius cephalus*), Carp (*Cyprinus Carpio*), Mlyshi (*Esox Lucius*). Underwaters present are: Picrraku (*Salamandra salamandra*), black Picrraku (*Salamandra gold*), Tritoni of mountains (*Triturus alpestris*), frogs (*Bombina veriegata*), toad (*Bufo bufo*), frogs of the red forest (*Rana temporaria*), mountain frogs (*Rana graeca*), frogs of the marshes (*Rana ridibunda*), etc.

From reptiles can be distinguished: Mountain turtle (*Testudo hermani*), the green lizard (*Lacerta viridis*), the brown lizard (*Podarcis muralis*), viper (*Vipera ammodytes*), large water snake (*Natrix natrix*) home Aesculapian Snake (*Elaphe longisima* etc).

Municipality of Prizren is located on the slopes of Sharr Mountains. The periphery of Prizren is characterized with rich natural beauties and great diversity of landscapes, as well as a rich variety of plant and animal species. In Prizren, there are three natural reserves as, Maja e Arnetit, Oshljaku and Pisha e Madhe which are important with their plant reserves of endemic-relict specie Bosnian Pine (*Pinus Heldreichii*). The largest surface of protected areas is the National Park "Mali Sharr" which is located in Prizren Municipality.

In regard of the biodiversity, the Drini i Bardhe River is diverse and complex. It includes one rare species (*Salmo marmoratus* Cuv. 1829) endangered and listed as a protected species in Habitat Directive 92/43/EEC Annex II (Animal and plant species of community interests whose conservation requires the designation of special areas of conservation)²². The middle sector of the Drini i Bardhe River (village Klina and area in the

²² THE ICHTHYOFAUNA OF DRINI I BARDHË RIVER (KOSOVO) L. Grapci-Kotor, F. Zhushi-Etemi, H. Sahiti, A. Gashi, R. [krijelj], H. Ibrahim

vicinity of Gjakova Town) the fish fauna composition comprises of 13 different species. The fish resources in this area include migratory species such as European eel (Anguillidae family, *Anguilla anguilla* L). Protected area in the Municipality are: Memorial Park "Çabrati", Natural Monument (GZK 14/84) and Drini i Bardhe Region at Ura e Fshejte, Natural Monument (GZK 27/86). In the project area there are not important flora and fauna, except the biodiversity in River Drini i Bardhe River, as well are nor identified protected natural area. The project area is located mainly in the hilly and flat agricultural landscape terrain. Most of the project area has natural appearance, but it is considerably degraded at certain places. Numerous anthropogenic objects, related to rural living agricultural land use are distributed in the project area, especially along the irrigation systems.

The terrain of the project area is covered with vegetation especially along the rivers, i.e. hilly thermophilous broadleaved forests toward the Drini i Bardhe River and Prizren River valley, but on some places there is degraded ruderal vegetation. The project area mainly is characterized by the dominance of agricultural land with patches of human settlements and of riparian and wetland vegetation.

5.16 Waste management

According to the Report on Municipal Waste (KEPA, GIZ 2018) overall service coverage by the end 2018 of Kosovo stands at 75.6%. The region with the highest coverage rate is the Prizren region (80.8%), and the highest coverage of the rural area is in the Prizren region as well (71.4%). The region with the lowest coverage rate is the Ferizaj region (58.3). Regional Waste Company "Çabrati" operates only in the municipal territory of Gjakova. Municipality of Gjakova temporarily disposes the collected waste in their own transfer station, which thereafter is transported to the Prizren landfill. In Gjakova Municipality there are 118 illegal dumpsites²³.

Prizren (Landovicë) regional landfill (PRL), operated by the KLMC. This landfill serves to the municipalities of: Prizren, Rahovec, Malishevë, Suhareka, Dragash, Mamusha and Gjakova. In this landfill the water pumping system is out of order and the water from the landfill and surface water may get mixed, causing an environmental threat. The waste compression is not carried out in line with standards. Prizren region has the highest number of illegal dumpsites in Kosovo²⁴.

The Municipality of Gjakova will provide suitable location for dumping of the construction waste generated during the rehabilitation works.

5.17 Review of Social Baseline Data

5.17.1 MUNICIPALITY BRIEFINGS

The information presented below is extracted from OSCE Kosovo Municipal Profiles of the Compendium of all Municipal Profiles 2018 Factsheet, complemented by findings from field visits

²³ REPORT ON MUNICIPAL WASTE MANAGEMENT IN KOSOVO REPORTING YEAR 2018, KEPA-GIZ

²⁴ REPORT ON MUNICIPAL WASTE MANAGEMENT IN KOSOVO REPORTING YEAR 2018, KEPA-GIZ

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| Municipality | Area (in km ²) | Population (as per 2011) | Ethnic Composition | Villages | City/Village Councils | Economy |
|----------------|-------------------------------|--------------------------------|---|----------|--|--|
| Gjakova | 586 | 94,556 | Albanians – 87,762 Egyptians – 5,117 Roma – 738 Gorani – 13 Bosniaks - 73 Serbs – 17 Turks – 16 Other – 92 Not specified – 205 | 91 | 35 (4 urban and 91 village councils) | Predominantly based on small businesses. There are around 7,358 registered businesses in the municipality, which employ approximately 15,069 people. |
| Prizren | 640 | 177,781 | Albanians – 145,718 Bosnian – 16,896 Turks – 9,091 Serbs – 237 Roma – 2,899 Gorani – 655 Ashkali – 1350 Egyptian – 168 Other – 386 Not specified – 381 | 74 | 41 | The economy of Prizren municipality is mainly based on agriculture, trade, construction and food processing, all private enterprises. There are some 5,400 registered private businesses operating in the municipality. There is no reliable data on the number of people employed in the private sector |

| | | | | | | |
|----------------|-----|--------|--|----|----|--|
| Rahovec | 275 | 56,208 | Albanians – 55,166 Bosnian – 10 Serbs – 134 Roma – 84 Ashkali – 404 Egyptian – 299 Turks - 2 Other – 11 Not specified – 98 | 35 | 35 | The economy of Rahovec/Orahovac municipality is mainly based on agriculture, particularly viticulture, and production of plastic, heaters, freezers and recycling. There are around 1,120 registered private businesses operating in the municipality. |
|----------------|-----|--------|--|----|----|--|

Source: OSCE, 2018

5.17.2 REVIEW ON LOCAL INSTITUTIONAL SETUP AND ECONOMY IN THE MUNICIPALITIES

Gjakova Municipality

Legislative - The municipal assembly has 35 seats distributed among nine (9) political entities, all members are Kosovo Albanian; 15 are women. The Municipal Assembly Chairperson is Anton Shala

(PSHDK).

Economy - Industry - Prior to the last war, Gjakova had mainly light food and textile industries, while other heavy industry factories such as Metalwork, Gorenje "Elektromotori" etc. were active from 1974.

The shifts that the economy suffered at the end of the 1999 war have been reflected in the economic structure of transition societies. Gjakova now has an economic structure, which is based on two pillars: private business and social business, which is under privatization. Private business is expanding and the indicators qualify as the main constituent structure of the economy.

Agriculture - The municipality of Gjakova also had a very developed agriculture. With an area of 29420 ha of agricultural land, out of which about 8000 ha with irrigation system, intensive agricultural crops have been cultivated and orchards, viticulture etc. have been developed. As well as livestock, poultry and forestry.

The high unemployment rate is one of the main problems and challenges for the future development of Gjakova. The unemployment rate is estimated at 50%, although in the official figures of the Employment

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

Center 2016 data speak of a number of 6500 unemployed. The main employers are: the private sector, enriched by the public sector and socially owned enterprises.

In Gjakova 50% of the registered companies and 40% of the employees are from the sector of service companies such as: lawyers, various agencies, auto schools, pharmacies, private clinics, private companies, limited liability companies etc.

In this regard, there is a need for new areas of development of this activity, with regular access to water and electricity as well as skilled labor in business, trade and crafts.

Prizren Municipality

Legislative – The municipal assembly has 41 seats distributed among eight (8) political entities, 34 members are Kosovo Albanian, four (4) are Kosovo Bosniak and three (3) are Kosovo Turk; 16 are women. The Municipal Assembly Chairperson is Artan Abrashi (Vetëvendosje!) and the Municipal Assembly Deputy Chairperson for Communities is Sencar Karamuço (KDTP).

Agriculture – According to Prizren Municipal Development Plan 2013-2025 in Prizren, there is no first class land. While 30% of the surface the total belongs to the second, third and fourth class, which are located in the plain of Prizren. These surfaces are fertile and the restriction of their use and the need for protective measures is increased from the first to the fourth level. The plain of Prizren is surrounded by sixth-grade land to the east and seventh-grade land to the south. Eighth-grade land extends over the Sharr and Pashtrik Mountains and is not intended for agricultural use but is used as pasture for wildlife, forestry, recreation and aesthetic purposes.

The economy of Prizren municipality is mainly based on agriculture, trade, construction and food processing, all private enterprises. There are some 5,400 registered private businesses operating in the municipality. There is no reliable data on the number of people employed in the private sector. The industrial zone is still under pending process of expropriation of the properties located under this zone.

Rahovec Municipality

Legislative - The municipal assembly has 31 seats distributed among eight (8) political entities, 30 members are Kosovo Albanian and one (1) is a Kosovo Serb; 11 are women. The Municipal Assembly

Chairperson is Mr.Afrim Dina (AAK).

Agriculture - Rahovec can be considered as the capital of agriculture. It is known for grape and vegetable production. For a few years now, farmers were faced with damage from frost, hail, and floods, and they never received the compensation they deserved. A large part of agricultural lands is under the irrigation system, but there are still parts outside of it, especially the hilly part, right where the vineyards are. Rahovec has a budget of 11.5 million euros, 3.5 million of which were spent on capital investments in 2016.

Economy - The economy of Rahovec/Orahovac municipality is mainly based on agriculture, particularly viticulture, and production of plastic, heaters, freezers and recycling. There are around 1,120 registered private businesses operating in the municipality.

There is no reliable data on the number of people employed in the private sector.

5.17.3 Health care

The primary health care system in the Municipality of Gjakova includes one (1) mental health care centre, one (1) main family health care centre located in the town, ten (10) smaller health centres and 16 health houses located in the villages. In the Municipality of Gjakova there is also one (1) regional hospital. The health sector has 353 employees, 249 females and 104 male, including doctors, nurses and support staff.

All communities have access to health care and all facilities.

In the Municipality of Prizren the primary health care system includes 14 municipal family health centres and 26 health houses. The primary health sector has 475 employees, including doctors, nurses and support staff, 264 female and 211 male.

Regional hospital in Prizren offers services to approximately 250,000 residents. The hospital employs 778 workers, including 155 doctors, and is equipped with emergency and intensive care units. In addition, Kosovo Serbs also have access to the Serbia-run primary health care facilities in Mushnikovë/ Mushnikove village.

5.17.4 Education

Gjakova municipality there are 42 primary schools with 14,468 pupils including 1,539 from non-Albanian communities and 1,036 teachers; seven (7) secondary schools with 4,729 students including 49 from non-Albanian communities and 308 teachers, and one (1) kindergarten with six (6) units and 557 children including 45 from non-Albanian communities and 49 educators.

Municipality of Prizren there are 51 primary schools with 26,810 pupils, six (6) secondary schools with 9,608 students, kindergartens are privately run. There is also a public university in Prizren, offering lectures in Bosnian, Albanian and Turkish languages²⁵

5.17.5 Cultural Heritage

Gjakova as a city of Kosovo had an adequate geographical position and favorable conditions for its development during the past historical periods. The town of Gjakova is located at the important transversal junction road Via de Zenta, or Zeta (South Kosovo) with the longitude of Dukagjini. Apparently, there are indications and evidence of material culture, that the town of Gjakova was inhabited even during the ancient period. However, the current city belongs to the Ottoman period.

However, according to sources of material culture, monumental architectural constructions, it is known from decades past century. Today Gjakova has: Museum, Archive, Palace of culture, Institute for protecting monuments, Library, Gjakova National theatre, while none of them are near the project area.

City of Prizren has always been a crossroad of cultures and different ethnic groups and therefore Prizren reflects a remarkable history of the Kosovo Territory. There are numerous significant monumental buildings inherited from different civilizations, especially from the Ottoman era, when the city gained importance as a prosperous trade city owing to its strategic position. There are 291 cultural monuments and sites in the Prizren Municipality, which are listed by the Institute for Protection of Monuments (2009). Prizren town has the most quantity and variety of monuments and sites which represent historical background of its territory. As the architectural monument classification, there are 50 public buildings in the use and /or ownership of public or state parties in the Prizren Municipality.

²⁵ OSCE Municipal Profile, 2018

In the Municipality of Prizren there are 24 archaeological localities, 46 Islamic sacral buildings, 39 Christian sacral buildings and 74 civilian architectural buildings (such as bridges, roads, houses, water sources and canals).

The Historic Centre of Prizren is protected through a special law, the aim of which is to determine the rules for protection, administration and sustainable modern development of Historic Centre of Prizren as a site of cultural and historic heritage permanently protected and classified as a Special Protected Zone that has local, national and international values.

The Special Protective Zone for the Historic Center of Prizren is established by the municipal authorities of Prizren in cooperation with the IMC, and includes Serbian Orthodox, Ottoman, Catholic, vernacular and other sites of historic and cultural significance. In accordance with the Law on historic center of Prizren total 104 buildings and 4 architectural complexes are evident in the Center.

5.17.6 Religious and Cultural Sites

Municipality of Gjakova has 33 mosques. Most of them were renovated after the 1999 conflict. There are two (2) Catholic churches in the town. A Serbian Orthodox church in the town was damaged during the 1999 conflict then destroyed and a public park built in that spot. Another Serbian Orthodox Church, which was damaged during the March 2004 riots has been reconstructed in the town center and inaugurated in 2011²⁶. Prizren has 75 mosques. Seven (7) mosques have been renovated since the 1999 conflict. There are also 20 Serbian orthodox churches. Five (5) catholic churches are currently in use²⁷ while none of the religious sites mentioned above are in vicinity of the project area.

6. Environmental and Social Impact Assessment

6.1 Impact Identification and Assessment Method

The impact identification and assessment process were operated with the following premises: (i) Baseline conditions and value/ sensitivity of resources/ receptors, and (ii) Project activities as a source of impacts. As a result of this process, appropriate significance level to each impact was assigned.

Notwithstanding, the significance of each impact was considered a function of the assessed Sensitivity of the resources / receptors and the impact's Magnitude or more specifically:

- The **Value** of the resource or the sensitivity of the receiving environment / community / receptor and numbers affected (where relevant);
- The **Magnitude** of the impact (low / medium / high), and whether it will be adverse or beneficial is assessed based on:
 - Type (direct / indirect / cumulative);

²⁶ Municipal development plan

²⁷ Islamic community center, Ministry of Culture, Youth and Sports of Kosovo

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

- Geographic extent (local / regional / national);
- Reversibility (reversible / irreversible impact);

Value (sensitivity) of the receptors and resources: analyzed environmental and social resources likely to be impacted include soil, water, landscape quality, habitats, cultural heritage, public health and livelihoods. Applied descriptors and criteria for assessing value (sensitivity) of resources / receptors are listed in Table 4.

Table 4. Generic Environmental / Social Value (or Sensitivity) Criteria

| Value (sensitivity) | Typical descriptors |
|---------------------|---|
| Very High | Very high importance and rarity, international scale and very limited potential for substitution. |
| High | High importance and rarity, national scale, and Limited potential for substitution |
| Medium | High or medium importance and rarity, regional scale, limited potential for substitution. |
| Low (or Lower) | Low or medium importance and rarity, local scale. |
| Negligible | Very low importance and rarity, local scale. |

Magnitude of the impacts: Used descriptors and criteria to define magnitude of an impact due to the Project are listed in Table 5.

Table 5: Magnitude of Impact and Typical Descriptors

| Magnitude of impact | Typical criteria descriptors |
|---------------------|---|
| Major | <p><i>Adverse:</i> Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements</p> <p><i>Beneficial:</i> Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality</p> |
| Moderate | <p><i>Adverse:</i> Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements</p> <p><i>Beneficial.</i> Benefit to, or addition of, key characteristics, features or elements, improvement of attribute quality.</p> |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| Magnitude of impact | Typical criteria descriptors |
|---------------------|--|
| Minor | <p><i>Adverse:</i> Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements.</p> <p><i>Beneficial:</i> Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring (Beneficial).</p> |
| Negligible | <p><i>Adverse:</i> Very minor loss or detrimental alteration to one or more characteristics, features or elements.</p> <p><i>Beneficial:</i> Very minor benefit to or positive addition of one or more characteristics, features or elements.</p> |
| No change | No loss or alteration of characteristics, features or elements; no observable impact in either direction. |

Significance of effect: Five significance categories (very large, large, moderate, slight and neutral) have been used to assess significance of each impact (Table 6).

Table 6: Descriptors of the Significance of Effect Categories

| Significance category | Typical descriptors of effect |
|-----------------------|--|
| Very Large | Only adverse effects are normally assigned this level of significance. They represent key factors in the decision-making process. These effects are generally, but not exclusively, associated with sites or features of international, national or regional importance that are likely to suffer a most damaging impact and loss of resource integrity. However, a major change in a site or feature of local importance may also enter this category |
| Large | These beneficial or adverse effects are considered to be very important considerations and are likely to be material in the decision-making process. |
| Moderate | These beneficial or adverse effects may be important, but are not likely to be key decision-making factors. The cumulative effects of such factors may influence decision-making if they lead to an increase in the overall adverse effect on a particular resource or receptor. |
| Slight | These beneficial or adverse effects may be raised as local factors, they are unlikely to be critical in the decision-making process, but are important in enhancing the subsequent design of the project. |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| | |
|----------------|---|
| Neutral | No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error. |
|----------------|---|

Lastly, appropriate significance category has been attributed to each impact against aforementioned criteria: sensitivity (value) of the resources (receptors) and the magnitude of impacts (Table 7).

Table 7: Concluding the Significance of Effect Categories

| | | MAGNITUDE OF IMPACT (DEGREE OF CHANGE) | | | | |
|-----------------------------------|------------|--|-------------------|--------------------|---------------------|---------------------|
| | | No Change | Negligible | Minor | Moderate | Major |
| ENVIRONMENTAL VALUE (SENSITIVITY) | Very High | Neutral | Slight | Moderate or Large | Large or Very Large | Very Large |
| | High | Neutral | Slight | Slight or Moderate | Moderate or Large | Large or Very Large |
| | Medium | Neutral | Neutral or Slight | Slight or Moderate | Moderate | Moderate or Large |
| | Low | Neutral | Neutral or Slight | Neutral or Slight | Slight | Moderate |
| | Negligible | Neutral | Neutral | Neutral or Slight | Neutral or Slight | Slight |

For each resource / receptor, impacts have been distinguished based on the period of occurrence: **Construction/Rehabilitation** and **Operation** phases.

The assessment is made without considering the application of preventive and corrective measures that could attenuate the magnitude of the impact.

The project for rehabilitation and modernization of the Radoniqi-Dukagjini Irrigation System was classified as B category, taking into consideration the type of the interventions, which are expected to and productivity, diversification of agricultural crops and commercialization of agriculture from subsistence, improved land conditions due to improved land and water management and conservation generate positive impacts by offering reliable opportunity that can support livelihood activities that employment opportunities. In addition rehabilitation of the protective fence along the open canals and some objects will contribute for avoiding accident for people and cattle.

In this chapter, the information on the assessment of the environmental and social impacts is organized in subchapters for each environmental resource / receptor impacted.

The aim of the impact identification and assessment process is to:

- Identify possible adverse and beneficial environmental and social impacts based on the knowledge of rehabilitation and operation regime of the Project and the relevant baseline information in the Study Area;
- Set out design proposals to mitigate adverse impacts and enhance beneficial impacts.

This impact identification and assessment was based on the World Bank and Kosovo's laws requirements. Opinions of stakeholders obtained during the engagement activities have been considered as well.

6.2 Impacts on Landscape

Anticipated impacts on the landscape will arise from the presence of new elements that will change the landscape temporarily due to nature of rehabilitation works. Temporary changes will generally be associated to the physical presence of workers and construction machinery and materials during the rehabilitation phase.

In this section, the impacts during rehabilitation phase refer to those that have a temporary character. Long-term impact on the landscape are analyzed as part of the operation phase.

6.2.1 Rehabilitation phase

Alteration of landscape scenery by the presence of construction works, construction camps and other auxiliary facilities.

The main activities of the rehabilitation phase that are anticipated to have short term effects on the landscape include:

- The construction site itself, where the presence of the workers, the heavy machinery, the earth movements, the deposits of construction material, the piles of waste, the nude soil, etc. will impair the local landscape, especially for nearby residents. This landscape impairment will disappear as the construction front advances to other areas.
- The construction camps for workers, where the site huts for offices, toilets and accommodation will occupy a previously bare space. This type of camps will also be perceived as an impairment of the landscape at a local scale.
- Ancillary areas for vehicle and machinery maintenance and the installation of other temporary structures such as the concrete plant or the crushing plant, etc., which may have a high visual impact due to their size and height.

Solid waste will be generated during rehabilitation of the Project. The magnitude of the impact on the landscape is anticipated to be minor during rehabilitation stage, due to the fact that the above-mentioned activities are not expected to be observed by a large number of people; they will occupy limited extensions of land, will have relatively small dimensions and will be located next or close to the channel alignment.

Impact assesment : The magnitude of the impact is minor.

6.2.2 Operation phase

The impacts on landscape and visual aspects are related with: presence of equipment and structures for irrigation, as well as increased area of farming land.

Due to current functional value of the landscape, it is not expected that the irrigation activities and farming may have negative impact on the landscape.

Impact assesment : The magnitude of the impact is minor.

6.3 Impacts on Soil and Erosion

6.3.1 Rehabilitation works

There could be impairment of soil quality (soil contamination) due to the introduction of pollutants during rehabilitation works.

The rehabilitation works will induce increased traffic of vehicles and machinery and inadvertent leaks of oil and lubricants may occur. Hazardous materials` storage areas could cause even more serious effect; these events would be unlikely if an adequate storage would be organized for.

Construction activities and areas affected will be limited in time and space and therefore the soil functions will not alter in a wider area. Heavy metal contents in soil along motorways are usually found within 5-10 m distance from the Alignment. The magnitude of impacts caused by potential leaks from equipment and material storage is considered to be minor.

Soil erosion will emerge as a result of exposure to wind and water runoff, removal of topsoil, exposure of buried structures, sedimentation, increased turbidity levels in waterways and the local stormwater system. Clearance of vegetation, setting new access roads, movement of vehicles, equipment and personnel, storage and handling of waste and materials, earth and construction works, may cause adverse impacts on the geology, soil and topsoil.

The above-mentioned activities may cause disturbance and degradation of geology and soil due to erosion, compaction, modification of morphology (especially along sections of elevated areas and rivers), and soil pollution.

Impact assesment : negative, local, minor to moderate, short-term to medium term.

6.3.2 Operational phase

Maintenance of the irrigation system, irrigation and intensification of the farming activities may cause changes of the physical and chemical composition of the soil, such as: soil erosion, soil salinity, soil fertility, soil properties, agrochemical pollution. Soil erosion, soil salinization and water logging may reduce soil productivity and endanger the long-term sustainability.

Improvement of the irrigation system will contribute for increasing of farming activities i.e. will cause land use changes as a result of increasing arable land.

Having in mind the current conditions in the project area and the fact that the operation of the irrigation system will be accompanied with training of the involved staff and users of the systems, as well as implementation of the GAP (good agricultural practice), it is expected that the significant impacts to geology and soil, during the operation of the system, will be reduced.

Impact assesment : negative, moderate, regional, long term.

6.4 Impacts on the Water

6.4.1 Rehabilitation phase

Surface water bodies are vulnerable to pollution. Water quality and flow characteristics (level and volume) can change as a result of project activities, during both - rehabilitation and operation phases.

Rehabilitation activities can be a source of pollutants:

- Suspended solids may be swept by storm water runoff from the construction/rehabilitation site devoid of vegetation or accidentally released during construction of the motorway structures, dumping of waste, or cleaning of equipment. The washout from concrete batching plants or ready-mix concrete lorries is particularly damaging due to the highly alkaline nature of uncured concrete. The release of significant volumes of sediments to the water bodies by storm water runoff or direct disposal, can lead to changes in water courses` flow patterns.
- Hydrocarbons lubricants, paints, solvents, resins, acids, or uncured concrete, which are released upon accidental leaks and spills from machinery and material storage sites, can contaminate water. Contamination of the water body may occur either directly (e.g. if the construction site is taking place very close to or on the river or stream) or indirectly, though soil and groundwater transport to the surface water body.

Impact assesment : negative, minor to moderate, local to regional, short term to long term.

6.4.2 Operation Phase

Maintenance and operation of the irrigation system will not generate waste water, except in a case of incident and not proper implementation of the activities.

It is very important to be mention that improvement of the irrigation system will cause increasing of farming activities and drainage of the irrigated area which may cause water pollution (surface and groundwater), as a result of usage of fertilisers and pesticides which contain nitrogen and phosphorus compounds and substances which are on the list of priority substances (Water Framework Directive).

The above risk may cause water pollution and impact on fauna and flora, as well downstream water users. Taking into account that in the project area agricultural activities are already carried on, currently the surface water is affected by these activities. Intensification of farming activities may increase these impacts if good agricultural practices are not applied.

Maintenance of the irrigation system, near water bodies or in the water bodies (as Drini i Bardhe and Prizren River) may cause adverse impacts as in the rehabilitation phase.

Impact assesment : negative, minor to moderate, local to regional, short term to long term.

6.5 Impacts on Climate and Air Quality, vulnerability of the project to climate change

6.5.1 Rehabilitation Phase

The construction during rehabilitation activities will generate dust and combustion gases from fuel powered machinery and vehicles along the construction site (air and particulate pollutants include are mainly the following: PM10, PM2,5, CO2, NOx, PAH, SO2 and CO).

Dust will mainly be generated from earth movements (excavation, levelling, dumping), wheels of trucks and machinery moving /travelling along unpaved surfaces, handling and transport of soil, wind erosion from exposed surfaces and crushing plants.

Emissions from these activities can cause direct impacts on the air quality and indirect impact on local people from the settlements in the project area, especially the local people that live near the facilities that have to be reconstructed, route of the channel and pipelines and roads, users of the local roads, workers, farmers, agricultural land, biodiversity, soil and surface water as a result of deposition of air sediment.

In the case of buildings renovation/rehabilitation, it implies the risk of finding asbestos containing materials that might have been used for their construction. If this happened a highly dangerous asbestos air contamination could occur. Therefore, a procedure must be designed for the inspection of the building before their demolishing. In cases dangerous materials are found, their removal must be dealt with by an authorized company.

Impact assesment : negative, minor, local, short term.

6.5.2 Operation Phase

During irrigation, some part of the water used for irrigation will evaporate and may cause meteorological changes of the project area. In addition, farming activities (cultivation, use of mechanisation and transport, biodegradable waste) will be source of greenhouse gases that will contribute for climate changes.

Impact assesment : negative, minor, local, short term-long term

6.6 Impacts on Noise and Vibration

6.6.1 Rehabilitation Phase

The magnitude of the noise impact from the outdoor equipment will depend on:

- construction machinery, transportation vehicles and equipment's noise emission levels,
- the number of machinerics in one area used at the same, and

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

- distance of the source to the sensitive receptors.

Increased noise levels may affect the local people that live near the location where the rehabilitation activities will be performed, the route of the roads, domestic animals, existing fauna of the entire project area and the engaged workers. Because of the increased level of noise, certain animals and birds might leave (temporary) their habitats. Increased level of noise and vibration may cause adverse impacts on public health.

Most of the construction activities will be performed outside the populated areas, with no sensitive receptors. Additionally, the noise during construction is a nuisance of a temporary (short-term) nature, so the impacts are not significant, except in the immediate vicinity of the construction sites.

Impact assesment : negative, minor to moderate, local, short term.

6.6.2 Operation Phase

Maintenance and operation of irrigation system (usage of mechanization for maintenance, as well working of the irrigation equipment) may increase the noise level and vibration. Increased level of noise and vibration may cause adverse impacts on public health, domestic animals, existing fauna, etc.

Impact assesment : negative, minor, local, short term

6.7 Impacts on Biodiversity

6.7.1 Rehabilitation phase

The rehabilitation activities, presence of workers, increased noise level, moving of mechanization, supplying row materials, generation of waste and wastewater, storage and handling of materials, possible risk of accident may cause degradation, destruction and transformation of habitats, i.e. loss of flora habitats, especially riparian habitats, fragmentation of habitats, loss of species (injury/mortality) or disturbance and/or displacement fauna species such as: reptiles, amphibians, small mammals and birds during the breeding period, etc. Illegal hunting and fishing in the project area, during the rehabilitation phase, is possible to cause impact on mammals, birds and other fauna species. Most of the project activities will be performed on agricultural land, fallow land and meadows and may affect small mammals, reptiles, and amphibian individuals and cause mortality. Rehabilitation activities may pose some fire risk (during welding or because of human negligence) to habitats, during the drier summer months.

Great part of the rehabilitation activities will be performed along the irrigation channels, rivers (permanent and temporary streams) or in the riverbeds that may result with direct and indirect negative impacts on the close riparian and aquatic ecosystems. Rehabilitation activities in the project area may cause adverse impacts on the aquatic ecosystems and hydro morphology of the rivers, as a result of changes on the river flow, increased turbidity and sediment or disturbed water quality, degraded soil, etc.

Planned project activities include clearing of earth irrigation and drainage channel and its rehabilitation.

While for the Dukagjini irrigation scheme is planned concreting of some earth channel. These channels are overgrown with vegetation, grass and cane which are habitats for wild species which may be affected by the project activities. Concreting of earth channel may cause modification of the water body.

Impact assessment: negative, minor, regional, short-term.

6.7.2 Operation phase

Due to nature of the project there is no foreseen negative impact in surrounding flora or fauna during operation phase of the irrigation channel.

Impact assessment: minor, short-term.

6.8 Waste Impact

6.8.1 Rehabilitation phase

Rehabilitation activities, such as clearing and removal of vegetation on the sites, cleaning of existing waste presents in the channels and rivers, dismantling or demolition of some existing buildings, structures, equipment, pipelines; earthworks, concreting, welding, use of mechanization, presence of workers and others will be source of different types of waste as: inert waste, municipal waste, biodegradable waste, packaging waste, hazardous waste, etc. Improper waste management may cause adverse impact on the environment and human health.

Assessment of impact: negative, minor to moderate, local, short-term to medium term.

6.8.2 Operation phase

Different types of waste, generated during the operational phase of the irrigation system will originate from regular operation and its maintenance. It is expected to be generated: sediment, waste from maintenance of the systems, which includes consumables, spare parts and equipment, biodegradable waste as a result of maintenance of the irrigation network, packaging waste, waste oil, filter, adsorbents, waste of wiping towels, contaminated soil from accidental leakage. Improper waste management can cause adverse impact on the environment and human health.

Impact Assessment: negative, minor, local, short-term to medium term.

6.9 Hazardous materials impact

6.9.1 Rehabilitation phase

On the rehabilitation sites the hazardous materials can appear in the form of raw materials supplied for the use of the on-going construction activities and regular maintenance of the machinery and equipment, and as waste from the used hazardous materials.

During the rehabilitation and construction activities of the irrigation system, it is expected on the construction site to be transported and used the following chemicals and hazardous materials: fuels, lubricants, antifreeze, flammable gases, concrete additives, asphalt coating, plasticizers and insulation materials (bitumen), colours, etc.

As a result of the rehabilitation activities will be generated different type of hazardous wastes, construction and demolition waste, including asbestos, packaging waste, waste oils and liquid fuels, oil filters and saturated absorbent materials, waste from welding, electronic and electrical waste, etc. Improper transport, storage and handling with hazardous materials may cause adverse impact on the environment, community and worker health and safety.

Impact of Assessment: negative, minor to moderate, local, short-term to medium term.

6.9.2 Operation phase

During the operation and maintenance of the irrigation system will be used hazardous material similar to the rehabilitation phase, but in limited quantities. Improper transport, storage and handling with Environmental and Social Management Plan hazardous materials or waste generated by used hazardous materials, may cause adverse impact on the environment, community and worker health and safety.

Impact of Assessment: negative, minor to moderate, local, short-term to medium term.

6.10 Possible social impacts

6.10.1 Labour and working conditions

6.10.1.1 Rehabilitation phase

The rehabilitation activities will generate a number of job opportunities for the local people, however if adequate measures are not implemented during selection of workforce (wrong selection of contractors, unskilled and low qualified person by the Contractor) there is a risk of appearance of negative socioeconomic impacts, related to loss of land and properties.

Besides possible damage that can be caused by unskilled workers in addition they need to undergo good training in order to meet international standards for workers that will take additional time and financial resources.

Implementation of project may cause abuse of vulnerable people and child if they are used as a labor, than gender discrimination, but they will not be tolerated.

As a result of rehabilitation activities there is a possibility on adverse impact on workers as a result of:

- Stress caused by noise related working environment;
- Endangered workers' health due to the work at heights;
- Disabling workers' visual contact;
- Endangered workers' health due to the use of rotating and moving equipment;
- Endangered workers' health during industrial vehicle driving and site traffic;
- Stress and personal security caused by climate changes in the working environment;

- Stress caused by exhaust gasses' related working environment;
- Endangered workers' health due to the diseases caused by vector spores;
- Endangered workers' health due to exposure of chemicals and asbestos containing materials;
- Endangered workers' health due to fire and explosion;
- Endangered workers' health due to flooding;
- Inappropriate accommodation of non-resident workers, etc.

Due to a fact that in a certain period of time not only general but also skilled workers will be required to work on rehabilitation of the irrigation system, there is a risk of lack of work force. In that case will be necessary to engage, workers with place of residence away from the project area. These workers will have to be accommodated, temporarily, in the close vicinity of the construction site. For this purpose, the contractor will have to provide suitable premises that will be in accordance with all international and national standards and regulations.

Impact Assessment: negative, with unpredictable effects.

6.10.1.2 Operation phase

During the operation phase, the employee which operate and maintenance the irrigation system, may be exposed at the similar occupational risk as in rehabilitation phase.

Impact Assessment: negative, with unpredictable effects.

6.10.2 Community health and safety

6.10.2.1 Rehabilitation phase

During rehabilitation of the irrigation scheme, in the both municipalities, the community health and safety could be at risk as a result of existence of active construction sites which will be located on different areas, such as settlements, fields, infrastructures, pastures and other types of land.

The risks on community health and safety are related to: construction sites and camps for workers; presence of workers and workers' behaviour towards the local environment and inhabitants; increased volume of traffic across settlements; disturbance from generated dust, noise and vibration; possible pollution of water and soil; risk of floods and other type of incidents; disruption of everyday life, caused by limited access to settlements, land and property; livestock disturbance due to noise; possible impacts on material assets (agricultural land, built infrastructure-road, water supply, sewerage, electricity distribution, gas pipeline etc.) in the project area.

The temporary labor influx may cause adverse impacts on local communities and affect the public facilities available in the project areas. The impacts may include increased demand and competition for local social and health services, as well as for goods and services, which may lead to price hikes and crowding out of local consumers, increased volume of traffic and higher risk of accidents, increased demands on the ecosystem and natural resources, social conflicts within and between communities, increased risk of spread of communicable diseases, and increased rates of illegal behaviour and crime.

Uninformed employees, including influx of external foreign workers, cannot identify and warn about a location rich with archaeological significance, which makes it possible to lose or destroy important or undiscovered archaeological sites, including potentially valuable artefacts.

The illegal access of people and livestock to the construction sites can endanger their health and safety, as well as the health and safety of workers involved in the construction process. Increased intensity and volume of traffic could affect the normal traffic regime in the project area. Increased presence of heavy goods vehicles, as well as an increase in the volume of traffic on local roads can cause an increase in the local road traffic accidents, especially during the spring and summer season when there is the greatest mobility to and from the local fields.

In addition, rehabilitation activities may cause disturbance during a period of religious holidays and practices for the local population may mean disrespect for their values and can easily be resisted by such practices.

Impact Assessment: negative, with unredictable effects.

6.10.2.2 Operation phase

Maintenance of the irrigation system may cause negative impact on the community health and safety similar as in rehabilitation phase, but limited.

During the operational phase there is a chance of defect/fault of the system. If it happens near other infrastructure network, the spilled water can endanger supply with water/electricity/telephone thus causing additional financial losses not only to the companies that own the affected infrastructure, but also to their end users. In addition possible operational accident may cause economic loss.

The project's area for decades is irrigated and used for agricultural purpose, so the potential impacts will be limited.

Impact Assessment: negative, with unredictable effects.

6.10.3 Cultural heritage

6.10.3.1 Rehabilitation phase

Regarding cultural heritage baseline it can be concluded that the both municipalities have a rich cultural heritage. Taking into consideration that the project area has been inhabited since ancient times, during rehabilitation work it possible to be discovered an unknown archaeological site. Rehabilitation activities, as well inconsiderate and unskilled worker may cause impact on cultural heritage.

Impact Assessment: negative, with unpredictable effects.

6.10.4 Land acquisition

6.10.4.1 Rehabilitation phase

The great part of the project area is private, but there are some parcels which are in a state ownership. There is no evidence for eventually additional affected parcels during rehabilitation of the system. Rehabilitation activity of the irrigation system, besides other, includes setting construction sites, access roads, labour camps, locations for storage of materials and temporary waste disposal required a temporary occupation of the land. Unpredicted temporary seizure of land may cause temporary seizure of the nearby agricultural land for possible storing the excavated soil, waste or storage of construction materials and/or machines. This may cause temporary obstacle of the owners to cultivate their land and cause negative financial impact to the landowner.

In addition, there is possibility for property damage or loss, due to the rehabilitation activities or negligible behavior by the contractor's employees. Some of the project activities are nearby populated areas, so the use of heavy machinery may endanger closest dwelling objects.

All mentioned activities may cause temporary loss of agricultural land, loss of crops properties and cause financial and social impact.

Impact Assessment: negative, local with unpredictable effects

6.10.4.2 **Operation phase** Maintenance of the irrigation system or more precisely repairing of some damages of the system may cause loss of agricultural land, goods and property i.e. temporary to affect the surrounding agricultural land that may cause temporary financial loss and social impact.

Impact Assessment: negative, local with unpredictable effects.

7. ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES

7.1 Introduction

Chapter 7 describes detailed mitigation measures in response to adverse effects arising from the Project activities. It also addresses enhancement measures to maximise benefits that the Project will generate for the economy and wellbeing of Kosovo's population.

Some outlined measures aiming to mitigate impacts on environmental and social resources require further studies and/or are dependent on the progress of the design. They are currently based on best design and construction practices; however, such measures will be updated upon the availability of necessary information.

7.2. Mitigation Measures for Landscape

7.2.1 Rehabilitation Phase

During construction operations, the landscape impact can be mitigated by utilising techniques to screen the operations from observers the construction site, the camp and ancillary areas. For this, hard or soft screens can be installed around the perimeter of these sites.

7.2.2 Operation Phase

No measures are foreseen during the operation phase.

7.3 Mitigations Measures for Soils

7.3.1 Rehabilitation phase

The Pre-Construction (rehabilitation) phase will comprise of design related activities and development of relevant plans by the Contractor prior to the start of construction. Measures to prevent soil, surface and groundwater contamination, as well as erosion, will be part of the following plans to be developed by the Contractor:

- Safe Management of Hazardous Materials and Spill Prevention Program, and
- Waste Management Plan.

The **Spill Prevention Plan** should address issues such as:

- Keep all roads and hard standings clean and tidy to prevent the build-up of oil and dirt that may be washed into a watercourse or drain during heavy rainfall;
- Keep spill kits close to the construction sites in case there is an incidental spill off, so that it can be immediately cleaned up;
- Do not permit any refueling, storage, servicing or maintenance of the equipment within 100 m of drainages, water courses, alluvial plains or other sensitive environmental resources. If these activities have to be done at the construction site, all precautionary measures shall be taken to prevent leaks or spills from reaching the soil or nearby watercourses;
- Wherever possible these activities (refueling, storage, servicing or maintenance) should take place in construction camps adequately prepared for these purposes (adequately lined for preventing any soil and groundwater contamination, and equipped with culverts along the perimeters to collect water runoff that will be directed to wastewater treatment facilities);
- Do not allow ready-mix concrete trucks containing alkaline cement or residues of cement to enter any watercourse. Washout of the concrete trucks shall be performed at the concrete batching plant camp, where appropriate facilities will be provided. If the washout of concrete trucks were necessary at or near the construction site, this shall be done at distance greater than 200 m of any watercourse and never in a very high or high habitat sensitivity area. The washout area will be clearly signposted and drivers shall be aware of the designated locations for washout;
- Avoid setting up camps on alluvial terrains because of the high levels of the underground water table and the risk of pollution;
- Organize proper handling and storage of lubricants, solvents as well proper usage of construction equipment;
- Minimize the storage of substances that are harmful to soils and waters (e.g. fuels for construction machinery) on the construction site. All hazardous substances either products to be used or waste, shall be stored in adequate places, far from sensitive areas (e.g. water courses, habitats with a rich biodiversity) and adequately equipped to prevent any soil, surface water or groundwater contamination);
- Undertake regular preventive maintenance of vehicles and construction machinery so as to reduce leakages of lubricants, motor oil and fuel.

The **Waste Management Plan** shall include the following tasks:

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

- ❖ Waste segregation, collection, transportation and disposal
 - Identification and classification of the different waste types that could be generated at the construction site (due to the materials used and waste generated in different sections) according to the Annex 1 of the national Law on Waste (Law No. 02/L-30) which is aligned with the EU Catalogue of Waste and specifies all relevant hazardous and non-hazardous waste streams;
 - Segregation of hazardous from non-hazardous waste streams at the construction site;
 - Immediate removal of waste material (concrete, iron, rocks, etc.) accidentally deposited, from highly sensitive habitats;
 - Collection and of municipal solid waste generated at the construction site and camps (food, beverages, packaging waste such as paper, bottles, glass, etc., glass bottles, batteries) according to national legislation (segregation of recycling waste materials from the waste stream that will be disposed of at the regional sanitary landfill in Pejë). Recyclable waste should be delivered to an authorized recycling company;
 - Sign a contract with an authorized company for the collection of the waste generated at the construction site, its transportation and disposal at the regional sanitary landfill in Prizren;
 - Segregate, collect and transport the inert waste to a site designated by the competent authority (the municipality, with an agreement obtained by the Ministry of Environment and Spatial Planning; sign a contract for the service with an authorized company, if the Contractor is not positioned to perform this activity;
 - Ensure that the contracts signed with the companies authorized for handling the recyclables will take into account an appropriate frequency of their collection so that the construction sites remain clean at any time;
 - Segregate hazardous waste (motor oils, lubricants etc.) and deliver this waste to an authorized company for managing hazardous waste;
 - Establishing Temporary Hazardous Waste Storage Points in line with the national legislation specifying appropriate handling, labelling, packing, storage etc.;
 - Ensuring that the access to these temporary hazardous waste storage points will be allowed only to trained staff wearing appropriate protective clothes; take care that the entrance of all unauthorized staff and the general public will be prohibited;
- ❖ Accidental disposal of waste in sensitive areas:
 - Immediately removing any waste material (concrete, iron, rocks etc.) accidentally deposited in highly sensitive habitats;
- ❖ Spill Control
 - Promptly cleaning up All waste spills;
- ❖ Closure and remediation:
 - Close and remediate the site used for the disposal of inert waste, in case it was created specifically for the Project purposes;
 - Close and remediate borrow pits, in case they were created specifically for the Project purposes;
- ❖ Topsoil:
 - Reuse excavated soil and construction waste as much as possible;
 - Undertake selective removal and ensure for an appropriate storage of topsoil;

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

- Offer the humus from the topsoil to the affected land owners or any other land owner within the project corridor;
- Reuse the topsoil to restore cuttings, embankments, as well as to remediate the soil disturbed by the temporary works and facilities (access roads, construction camps, borrow pits, excess material disposal sites etc.);
- Collect and store the removed topsoil on ridges which are protected from weather agents, (wind and rain) so as to avoid any loss of the organic and biotic properties of the soil and / or erosion. The ridges shall be signaled and maintained in proper condition until the topsoil reuse takes place

7.3.2 Operation Phase

The only impact of the project on soils during the operational phase is the rather remote possibility that localized landslides may occur in the proximity of the canal.

Should such risk be detected, supplementary mitigating measures may be implemented (additional planting and/or uphill drainage) and should the phenomena continue, the areas at risk will be fenced off, and an adequate compensation will be provided to the land owners on the basis of involuntary resettlement.

7.4 Mitigations Measures for Waters

7.4.1 Rehabilitation Phase

In order to avoid negative impact on the water quality of the canal, hazardous material management will be planned, aiming at preventing leakage of heavy metals or other toxic materials into the canal.

In that field, the Contractor will carry out all appropriate measures such as:

- Isolating canal, ground water and other natural water streams from the run-off coming from the work platforms and by keeping material further from the streams and on impermeable surfaces;
- Preventing any hazardous spillage of tanks, construction equipment and vehicles;
- Installing and maintaining proper sanitary facilities for workers;
- No waste, materials or other substances should be disposed to water flows;
- Hazardous materials should be kept in containers with secondary containment system.

During the terrestrial works, stockpiles of material will be isolated from the canal so that no spillage of materials, directly into the canal or via run-off, may occur.

Previous measures (see above) will also be carried out to avoid negative works effects on natural surface water quality and groundwater quality in the vicinity of the project.

Any run-off coming from the works area with potentially high charges of suspended matter will be filtered before spillage into the natural flows. The water run-off potentially contaminated with hazardous substances will be collected on site (in a temporary retention basin) and transported towards the adequate treatment plant or storage by a licensed company.

7.4.2 Operation Phase

General implementation of the drainage system along the canal will have local effects on watersheds and breakdown of natural flows between streams passed over by the canal.

Hydrological studies, carried out as a part of the ESIA will aim to check that the changes introduced by the canal rehabilitation and construction works would not affect human needs or uses and will not increase flood risks or riverbed erosion downstream. The conclusions of the studies will be reflected in the designs. During the operation, Radoniqi-Dukagjini Company, will conduct a periodic monitoring of the watercourses downstream and the canal drainage system outlets. An annual complete survey will be carried out after the rain season (at least).

After finalization of the rehabilitation works, RDIC will ask the local population to signal any disturbance downstream that could be due to the canal drainage implementation. Claims and information will commonly be sent by post, but a phone number and email contact will be available in case of an emergency alert. For such cases and any other potentially accidental cases, RDIC will prepare Emergency Response Action Plan defining emergency situations, procedures, actions and responsible persons.

Establishment of Protected Zoning

The RDIC Canal watershed areas will need to be protected against pollution resulting from anthropogenic activities and natural causes.

This objective is pursued by the establishment of an appropriate zoning in the canal area, with the use of a three-level zoning; each zone being characterized by different levels of regulation. It is expected that the application of the zoning will actually result in the overall improvement of the quality of the environment and the water quality of the reservoir specifically.

The proposed zoning is planned as follows:

A- Total protection zone:

This zone will cover an area of at least 5 meters radius from both sides of canal edges (which in many parts of the open canal are defined by the right of way road slopes).

No activities are allowed within this area, except for those strictly necessary to the operation of the canal. Extreme care is exercised to avoid spillage of fluids or products of any kind. The area should be expropriated and better yet, fenced off (depending on the funding and public participation agreement). However, where possible, planting of low native bushes could be another alternative to be considered.

B- Buffer zone

This zone extends to a radius of 20 m around the canal waters with special attention to the upper slope side. Here, limitations are imposed to anthropogenic activities, in order to prevent pollution of the reservoir.

Within this area, the following activities are forbidden:

- a. Disposal of wastewater and waste mud
- b. Stocking of pesticides and fertilizers

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

- c. Use of pesticides and fertilizers, unless authorized by KEPA and ILC after a specific assessment case by case (taking into account the specific products and soils)
- d. Infiltration of runoff from roads and parking lots
- e. Cemeteries
- f. Opening of quarries with deep excavations in contact with the reservoir
- g. Drilling of wells, except if authorized by ILC
- h. Stocking of toxic chemicals or products and of radioactive materials;
- i. Centers for the storage and demolition of decommissioned vehicles
- j. Dispersion wells;
- k. Wastewater treatment and dispersion facilities
- l. Roads (other than ILCs right of way), or other infrastructures

Special attention must be given to those parts where buildings enter the buffer zone. Institutional enforcement measures must be considered from the ILC on any illegal intervention.

C- Catchment Protection Zone

Activities in this area will be regulated in order to prevent the infiltration of toxic materials into the canal and aquifer, with special regards to in situ activities, agricultural usage of pesticides and fertilizers, solid waste and wastewater disposal.

This should take place via two sets of actions:

1. Regulatory implementation towards the existing activities,

This will include a review of all activities taking place within the catchment area (activities mentioned above) to ensure the stringent application of existing regulations, and prescribe adaptation measures as required. This activity should be conducted by the KEPA and RDIC.

2. Preventive actions for future developments, in terms of land use planning and licensing requirements.

This activity should occur through the cooperation of KEPA, the RDIC and the Local Authorities responsible for land use planning.

7.5 Mitigation Measures for Air

7.5.1 Rehabilitation phase

Air quality is only slightly affected by the project. During the works the main impacts can be minimized or even removed through common mitigation actions generally related to civil works contracts (General Prescriptions to Contractors Environmental Good Practices).

7.5.2 Operation phase

Impacts on the local context during the canal life cycle will be related to emissions of chemicals and pollutants (i.e. PM10, CO, SO2, NO2, etc.) due mainly to the movements of service's means (trucks, etc.) and partially due to the operation of the pumping station. Here, air quality will be slightly affected by the functioning of the pumps and complementary gears.

The use of stand-by generators to ensure that water pumping station operation is not interrupted during power outages will produce some exhaust emissions but these are not expected to significantly affect ambient air quality. However there are no facilities or sensitive receptors nearby that can be disturbed (schools, hospitals, houses etc.) nor other buildings.

The application of the same common mitigating measures (General Prescriptions to Contractors Environmental Good Practices) for ordinary and extraordinary maintenance will also provide adequate mitigation of project impacts on Air during the Operation Phase.

7.6 Mitigation measures for Noise and Vibration

7.6.1 Rehabilitation phase

Noise emission from construction activities will be reduced and prevented by using equipment fitted with appropriate noise muffling devices, and in accordance with manufacturers' recommendations. Vehicles that are excessively noisy due to poor engine adjustment, damage to noise amelioration equipment or other inefficient operating conditions, shall not be operated until corrective measures have been taken.

Construction-related noise impacts are temporary and can be mitigated through a good construction practice and effective site supervision (General Prescriptions to Contractors Environmental Good Practices)

7.6.2 Operation Phase

Noise caused by the canal operation is related to point sources such as electricity cabs, pumps site, well fields. The emissions from these sources will be limited to a restricted area in the proximity of these sites. The canal mainly passes through rural areas with wide cultivations, grassy fields, small villages and scattered houses.

The impact will consist in nuisance caused by the routine operational hum, enhanced noise levels from stand-by generators, and noise generated during the excavation of repair sections. The following mitigation measures shall apply:

- Pumps and other mechanical equipment to be effectively maintained and where possible inside of the buildings / structures;
- Manufacturer's noise suppression and vibration equipment on generators to be kept in place and in good condition;
- In the case of exceeding noise limits set in the national legislation, steps such as installing noise-screens should be taken

7.7 Mitigation measures for Physical and Cultural Heritage

7.7.1 Rehabilitation phase

The obligations of the Kosovo Law on Cultural Heritage will be followed in all these cases and it should be part of the contractual duties.

Based on the "Law on Cultural Heritage", the Contractor prior to starting the works on site should receive a written approval letter from the National Archaeological Council (NAC) after the conduct of a superficial survey on the site. In addition the Contractor should sign a pre contract agreement with the NAC. All construction work will be confined to the smallest area possible. Construction compounds will be placed in areas free from known archaeological sites or archaeologically sensitive areas.

If archaeological or religious artifacts are discovered (chance finds) then the Kosovo Archaeological Service (KAS) of the Ministry of Culture (MoC) should be immediately informed (within 24 hours). A team of field specialists of KAS should then visit the site in order to identify the relicts. The site will be protected by substantial fencing to prevent inadvertent or negligent damage to the archaeology. During the works for the construction phase, constant collaboration will take place with specialized archaeologists of KAS in order to minimize potential damage to the sites and monuments.

7.7.2 Operation phase

There are no possible impacts during operation phase, therefore no proposed mitigation measures.

7.8 Mitigation Measures for Biodiversity

7.8.1 Rehabilitation works

To minimize damage to fauna in the area, a combination of measures was suggested. Specifically the Contractor will be required to:

- Minimize loss of greenery from construction activities and restrict the area of movement to a minimum;
- Minimize destruction of nests;
- Prevent the capture and trade;
- Prevent hunting, trapping and egg collecting by construction workers;
- Prohibit the collection of firewood from working areas; and
- Minimize damage to watercourses from earthworks and improper waste disposal.

These will be achieved by:

- Using only defined and approved liquid and solid waste disposal sites;
- Educating construction crews on the impact of disturbance and damage to habitats;
- Providing construction crews with facilities that do not require them to light fires;
- Ensuring Terms of Employment include severe penalties for the unnecessary disturbance of environmentally significant sites and hunting; and
- Enforcing such penalties on all workers, including sub-contractors.

Other aspects of impact mitigation, such as the appropriate storage and disposal of solid and liquid wastes will also prevent many indirect impacts upon vegetation and wildlife.

The Engineer will also ensure the Contractor is held liable for any non-compliance with the Environmental Legislation on wildlife protection and endangered species and Kosovo's international commitments by any staff or parties.

8. Environmental and Social Management Plan

This Environmental and Social Management Plan (ESMP) is being prepared to manage the environmental and social impacts through and specific mitigation actions required to implement the project in accordance with the requirements of applicable national and World Bank legislation and regulations. It provides an overview of the environmental and social baseline conditions on the routes of the proposed fist segment of the project, summarizes the potential impacts associated with the proposed construction and pavement works and sets out the management measures required to mitigate any potential impacts in a series of discipline specific Environmental & Social Management Plan (ESMP). This ESMP is to be implemented by the contractor to be commissioned by PIU-ARDP/MESP for the project.

Objectives of the ESMP are:

- Minimizing any adverse environmental, social and health impacts resulting from the project activities
- Prevent or compensate for any loss of the affected persons
- Conducting all project activities in accordance with the relevant Kosovo Laws and World Bank Safeguard operational policies and guidelines
- Enhance positive environmental and social outcomes
- Ensure that the ESMP is feasible and cost-efficient
- To act as an Action Plan in order to ensure that the project impact mitigation measures are properly implemented and monitored
- Ensure that all stakeholders concerns are addressed

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| Phase | Issue | Mitigating Measure | Estimated Cost (Euro €) | | Institutional Responsibility | | Comments (e.g. secondary impacts) |
|---------------------------------------|--|--|--|---------|---|---------|--|
| | | | Install | Operate | Install | Operate | |
| Air Quality and Climate Change | | | | | | | |
| Rehabilitation | Air emission (dust, exhausts emission from fuel) as a result of production and use of raw materials (concrete base, borrow pits), generation of waste as well and its storage and disposal | Stationary air emission sources should be located as far as possible from the sensitive receptors | / | / | Contractor Subcontractor Supervisor | | Impact on residents health, workers, soil, water, flora and agricultural crops |
| | Dust emission as a result of rehabilitation work as well movement of vehicles | Setting up protection fences around the construction sites on the sensitive locations especially in the inhabited places and location with sensitive receptors | Protection fence for dust protection 1m ² -1 € | / | Contractor Subcontractor Supervisor | / | Impact on residents health, workers, soil, water, flora and agricultural crops |
| | Dust emission as a result of storage of materials, surplus excavated soil, storage of waste | Stabilizing or covering the heaps of inert material (earth and waste from Construction activities), daily taking out from the construction sites and their transportation and disposal on locations specified by the local self government in covered transportation vehicles. | Transport cost 1 km~0.5 € | / | Contractor Subcontractor Supervisor | / | Impact on residents health, workers, soil, water, flora and agricultural crops |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| Phase | Issue | Mitigating Measure | Estimated Cost (Euro €) | | Institutional Responsibility | | Comments (e.g. secondary impacts) |
|----------------------------|--|--|---|---------------------------------------|---|--|--|
| | | | Install | Operate | Install | Operate | |
| | Dust emission as a result of storage of materials and waste | Spraying with water (manually or with sprinklers) should be used during the time of excavation and storage of materials and waste | Cost for water for dust suppressing 1m ³ ~0.02 € | Cost for engaged environmental expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on residents health, workers, soil, water, flora and agricultural crops |
| | Generation dust emission that contain asbestos particles, from demolition of buildings and pipes | Demolition debris shall be kept in controlled area and sprayed with wetting agent to reduce debris dust (see measures for hazardous material) | Construction cost (see part: Waste) | | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on residents health, workers, soil, water, flora and agricultural crops |
| | Dust emission during preparation of concrete | The use of premixed plasters and masonry compounds is recommended | / | Cost for engaged environmental expert | Contractor Subcontractor Supervisor | | Impact on residents health, workers, soil, water, flora and agricultural crops |
| | Dust emission as a result of transport of material and waste | During the transport, raw and waste materials should be covered, while the roads should be sprayed with water. Also it is recommended washing the wheels of the vehicles after leaving the construction sites. | Cost for water for dust suppressing 1m ³ ~0.02 € | Cost for engaged environmental expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on residents health, workers, soil, water, flora and agricultural crops |
| | Dust and exhausts emission as a result of movement of vehicles and combustion of flues | Vehicles and construction machinery should be maintained properly and should fulfill the standards for discharge of emissions etc. | Construction cost | Cost for engaged environmental expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on residents health, workers, soil, water, flora and agricultural crops |
| NOISE AND VIBRATION | | | | | | | |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| Phase | Issue | Mitigating Measure | Estimated Cost (Euro €) | | Institutional Responsibility | | Comments (e.g. secondary impacts) |
|----------------|--|---|----------------------------|---------------------------------------|---|---|--|
| | | | Install | Operate | Install | Operate | |
| Rehabilitation | Increased noise and vibration level, generated as a result of using equipment and heavy mechanization for transport and rehabilitation works | All construction equipment and mechanisation will comply with the requirements of EU Directive 2000/14/EC on noise emission in the environment | Construction cost | Cost for engaged environmental expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on residents health, workers, soil, water, flora and agricultural crops |
| | | Construction works in/or in close vicinity of the settlements will not be permitted during the night; the operations on site shall be restricted in the period 07.00-19.00h | / | Cost for engaged environmental expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on residents health, workers, soil, water, flora and agricultural crops |
| | Increased noise level as a result of using Pneumatic equipment | Select silenced compressors or use quieter Hydraulic equipment. | / | Cost for engaged environmental expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on residents health, workers, soil, water, flora and agricultural crops |
| | Increased noise level as a result of poor engine adjustment or damage | The vehicles that are excessively noisy due to poor engine adjustment, shall not be operated until corrective measures will be undertaken. Also all mechanical equipment should be silenced appropriately and regularly maintained. | / | Cost for engaged environmental expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on residents health, workers, soil, water, flora and agricultural crops |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| | | | Estimated Cost (Euro €) | | Institutional Responsibility | | Comments (e.g. secondary impacts) |
|----------------|--|--|----------------------------|---------------------------------------|---|--|---|
| Phase | Issue | Mitigating Measure | Install | Operate | Install | Operate | |
| WATER | | | | | | | |
| Rehabilitation | Impact on water regime (surface and ground water) in a case of possible dewatering of the excavated ditches, holes etc. (where there is occurrence of groundwater or accumulated surface runoff) | The pumped water should be discharged in a controlled manner, i.e. in a way that will minimize the physical impacts on the water, as well the morphology of the recipient, or to be used as a technical water for reduction of dustemission. Water pumping management should be done in accordance with water permit for use and water permit for discharging. | Construction Cost | Cost for engaged environmental expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on downstream users of the rivers, river ecosystem, arable land, crops |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| Phase | Issue | Mitigating Measure | Estimated Cost (Euro €) | | Institutional Responsibility | | Comments (e.g. secondary impacts) |
|-------|---|--|----------------------------|--|---|--|---|
| | | | Install | Operate | Install | Operate | |
| | Impact on river water flow and its quality, as a result of diversion of river flow and rehabilitation works in the river bed/body | Maintenance of the biological minimum of the rivers. Downstream and upstream of the river where the rehabilitation works are performed no dry trough or flood should arise as a result of the rehabilitation work. Setting of earth embankments or barriers for diverting the flow to be performed only if there is no other way to perform the construction work. | Construction Cost | Cost for engaged environmental expert Physico-chemical analyzes of water ~200 € per unit | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on downstream users of the rivers, river ecosystem, arable land, crops |
| | Impact on surface and ground water quality as a result of possible discharging of sanitary wastewater | Frilly discharging of sanitary waste water (construction sites and camps, as well production material plans) into rivers or channel without treatment is not allowed | / | Cost for engaged environmental expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on downstream users of the rivers, river ecosystem, arable land, crops |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| Phase | Issue | Mitigating Measure | Estimated Cost (Euro €) | | Institutional Responsibility | | Comments (e.g. secondary impacts) |
|-------|--|---|---|---------------------------------------|---|---|---|
| | | | Install | Operate | Install | Operate | |
| | Impact on surface and ground water quality as a result of possible discharging of sanitary waste water | The working camp should be provided with chemical portable toilets and tanks, which will be adequately managed by the certified Company, as well the construction sited should be provided by chemical portable toilets. The placement of mobile toilets Distances of more than 100 meters from water body and drainage lines. | The mobile toilet cost will depends on its capacity | Cost for engaged environmental expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on downstream users of the rivers, river ecosystem, arable land, crops |
| | Impact on water quality as a result of possible washing of equipment and vehicles | Washing of mixers for prefabricated concrete that contain concrete with alkali cement or cement residues is not allowed as well as washing of the equipment and vehicles in the rivers or in their vicinity. Washing of equipment and vehicles to be done only at special sites designed to avoid surface and groundwater contamination, as well soil. | / | Cost for engaged environmental expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on downstream users of the rivers, river ecosystem, arable land, crops |
| SOIL | | | | | | | |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| Phase | Issue | Mitigating Measure | Estimated Cost (Euro €) | | Institutional Responsibility | | Comments (e.g. secondary impacts) |
|----------------|--|--|----------------------------------|---------------------------------------|---|---|---|
| | | | Install | Operate | Install | Operate | |
| Rehabilitation | Impact on soil quality (degradation, erosion, compaction, destruction of the topsoil) as a result of rehabilitation activities | Rehabilitation activities to be performed in a period of low rainfalls in order to minimize the possibilities of flooding and spreading of sediment | / | Cost for engaged environmental expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on surface and Ground water, biodiversity, crops |
| | Impact on soil quality (compaction) as a result of moving of mechanisation | Access areas to heavy machinery to be restricted to the construction zone and access roads | / | Cost for engaged environmental expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on surface and Ground water, biodiversity, crops |
| | Impact on soil quality (erosion, destruction of the topsoil) as a result of excavation of humus | The topsoil (humus) should be properly removed before the excavation begins, stored and used after the completion of the activities, for the purpose of recultivation and stabilization of the slopes. | Construction cost | Cost for engaged environmental expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on surface and Ground water, biodiversity, crops |
| | Soil quality degradation (contamination) as a result of possible generation of washed concrete | The surplus quantities of washed concrete can be disposed as inert solid waste or to be reused as filler in certain construction activities. | Transport of waste 1 km~0.5 € | Cost for engaged environmental expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on surface and Ground water, biodiversity, crops |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| Phase | Issue | Mitigating Measure | Estimated Cost (Euro €) | | Institutional Responsibility | | Comments (e.g. secondary impacts) |
|-------|--|---|----------------------------------|--|---|--|---|
| | | | Install | Operate | Install | Operate | |
| | Soil quality degradation (contamination) as a result of storage and handling of hazardous materials and waste | The storage and handling of hazardous materials and waste should be a rigorously controlled process that includes taking measures for prevention of soil contamination in compliance with the Hazardous materials and spill control management plan and Waste management plan | Construction cost | Cost for engaged environmental expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on surface and Ground water, biodiversity, crops |
| | Soil quality degradation (contamination) as a result of accidental spillage of fuel chemicals, hazardous waste | In case of soil contamination, the contaminated soil should be removed and managed as a hazardous waste. | Transport of waste 1 km~0.5 € | Cost for engaged environmental expert Analysis of contaminated soil during incidents (50-150 € per sample) | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on surface and Ground water, biodiversity, crops |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| Phase | Issue | Mitigating Measure | Estimated Cost (Euro €) | | Institutional Responsibility | | Comments (e.g. secondary impacts) |
|--------------|---|---|----------------------------|--|---|--|---|
| | | | Install | Operate | Install | Operate | |
| | Revealed contaminated soil on the project sites | In a case of revealed contaminated soil on the construction sites, the Contractor should be determined and prepared | Construction cost | Cost for engaged environmental expert Analysis of contaminated soil during incidents (50-150 € per sample) | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on surface and Ground water, biodiversity, crops |
| | Chance findings | In case during works chance findings may occur, the contractor should immediately stop the works and notify the authorities | Construction cost | Cost of engaged cultural heritage expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impacts on cultural heritage objects/site |
| BIODIVERSITY | | | | | | | |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| Phase | Issue | Mitigating Measure | Estimated Cost (Euro €) | | Institutional Responsibility | | Comments (e.g. secondary impacts) |
|--------------------|--|--|--|---------------------------------------|---|---|--|
| | | | Install | Operate | Install | Operate | |
| Pre-Rehabilitation | Status of the existing biodiversity, terrestrial and aquatic biodiversity (flora, fauna and habitats) which may be affected by rehabilitation activities | In order to be provided relevant information about possible sensitive areas and species i.e. flora, fauna and habitats in the project area, and its surrounding, as well as its status for protection on national or international levels, prior starting with rehabilitation activities the Contractor should contact the responsible authority for nature protection in Republic of Kosovo | Construction cost | Cost for engaged environmental expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on environment And community |
| | | The Contractor should organize monitoring on the ecosystems, habitats and species in the project area. On the base of the status/results by the performed bio monitoring, the Contractor should develop Biodiversity management plan. | 3000 € per Plan 3000 € for monitoring investigation The cost of the measures that will arise from the Plan will be included in the construction costs | Cost for engaged biology expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on environment And community |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| Phase | Issue | Mitigating Measure | Estimated Cost (Euro €) | | Institutional Responsibility | | Comments (e.g. secondary impacts) |
|----------------|---|---|----------------------------|---------------------------------|---|--|--------------------------------------|
| | | | Install | Operate | Install | Operate | |
| Rehabilitation | Biodiversity impact, terrestrial and aquatic biodiversity (flora, fauna and habitats) caused by rehabilitation activities | Implementation of the Biodiversity management plan Clearing of minimum level in sensitive areas, such as riparian zones or where significant vegetation is encountered. The construction activities to be executed in the smallest possible area around the site/route and to be avoided use of herbicides. | / | Cost for engaged biology expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on environment and community |
| | Biodiversity impact, terrestrial and aquatic biodiversity (flora, fauna and habitats) caused by rehabilitation activities | The Contractor should avoid habitats fragmentation during tracing the new access roads for the purpose of rehabilitation activities or organizing working camps, placement of the machinery, storage the raw materials and waste materials. | / | Cost for engaged biology expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on environment and community |
| | | Cleaning of the construction site and the ancillary structures, immediately after completion of the construction activities and remediation of the destructed areas. | Construction cost | Cost for engaged biology expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on environment and community |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| Phase | Issue | Mitigating Measure | Estimated Cost (Euro €) | | Institutional Responsibility | | Comments (e.g. secondary impacts) |
|----------------|---|--|--|---------------------------------------|---|---|--|
| | | | Install | Operate | Install | Operate | |
| | | Mortality of wild(cultivated) animals caused by excavations and direct killings by workers, in the case of amphibians and reptilians is not allowed. Also, fishing in the rivers in the close vicinity of the construction site and hunting of birds is not allowed. | / | Cost for engaged biology expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on environment and community |
| WASTE | | | | | | | |
| Rehabilitation | Impact on environmental media and social impact as a result of generated waste from rehabilitation activities | The Contractor should prepare Waste Management Plan prior to commencement of construction activities addressing issues such as location and methods of storage, transport and disposal, as well procedure for waste management. | 3000 € The cost of the measures that will arise from the Plan will be included in the Construction cost | Cost for engaged environmental expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on human health, water, soil, biodiversity, crops |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| Phase | Issue | Mitigating Measure | Estimated Cost (Euro €) | | Institutional Responsibility | | Comments (e.g. secondary impacts) |
|-------|-------|---|--|---------------------------------------|---|---|--|
| | | | Install | Operate | Install | Operate | |
| | | Before starting of rehabilitation activities the Contractor should identify and classify the types of waste that could be generated at the construction site and to provide proper landfill sites for deferent types of waste (communal, inert, industrial etc.), as well to obtain permissions from relevant institution for storage or disposal of waste, as well to sign agreement with authorized company | Construction cost | Cost for engaged environmental expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on human health, water, soil, biodiversity, crops |
| | | Establishing waste Management procedure and evidential list for generated waste and its management | Preparation of procedure should be part of Waste management plan Cost for engaged expert who will prepare evidence list | Cost for engaged environmental expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on human health, water, soil, biodiversity, crops |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| Phase | Issue | Mitigating Measure | Estimated Cost (Euro €) | | Institutional Responsibility | | Comments (e.g. secondary impacts) |
|-------|-------|---|--|---------------------------------------|---|---|--|
| | | | Install | Operate | Install | Operate | |
| | | The building site will be cleaned and all debris and waste materials will be disposed of in accordance with clauses specified in the bills of quantities. | Transport of waste 1 km~0.5 € | Cost for engaged environmental expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on human health, water, soil, biodiversity, crops |
| | | Burning or illegal dumping of wastes are strictly forbidden | / | Cost for engaged environmental expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on human health, water, soil, biodiversity, crops |
| | | For hazardous wastes (paints, enamels, oils, tires, insulation materials, asbestos, electronic waste, etc.) Contractor has to follow procedure for hazardous wastes management, this implies assessment by authorized company for hazardous wastes, packaging and labelling, making agreement with company that have license for collection and transport of hazardous waste. | Transport of waste 1 km~0.5 € Cost for collection bins will depend on types and its capacity | Cost for engaged environmental expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on human health, water, soil, biodiversity, crops |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| Phase | Issue | Mitigating Measure | Estimated Cost (Euro €) | | Institutional Responsibility | | Comments (e.g. secondary impacts) |
|-----------------|---|---|---|---------------------------------------|---|---|--|
| | | | Install | Operate | Install | Operate | |
| | | The Contractor should prepare Asbestos Management Plan for Rehabilitation phase which will clearly identify the locations where the asbestos containing material is present, as well as proposing the handling methods | 3000 € for the Plan and additional cost for asbestos management that will arise by the plan | Cost for engaged environmental expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on human health, water, soil, biodiversity, crops |
| | | Vegetation, which will be cleaned from construction site, should be managed as organic waste and submitted to the Local communal enterprise or certified physical/private entity. | Transport of waste 1 km~0.5 € | Cost for engaged environmental expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on human health, water, soil, biodiversity, crops |
| Hazardous Waste | | | | | | | |
| Rehabilitation | Impact on environmental media as a result of usage of hazardous material and generation of hazardous waste from rehabilitation activities | The Contractor should prepare Hazardous Material management plan and spill prevention control prior to commencement of rehabilitation activities addressing issues such as location and methods of storage, transport and disposal, as well procedure for its management. | 3000 € The cost of the measures that will arise from the Plan will be included in the construction costs | Cost for engaged environmental expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on human health, water, soil, biodiversity, crops |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| Phase | Issue | Mitigating Measure | Estimated Cost (Euro €) | | Institutional Responsibility | | Comments (e.g. secondary impacts) |
|-------------------------------|-------|---|----------------------------|---------------------------------------|---|---|--|
| | | | Install | Operate | Install | Operate | |
| | | Hazardous material storage facilities, especially fuel storage, should be located as far as practically possible from river channels or other water resources | Construction cost | Cost for engaged environmental expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on human health, water, soil, biodiversity, crops |
| | | Temporarily storage on site of all hazardous or toxic substances should be in safe containers labeled with details of composition, properties and handling information. The containers of hazardous substances shall be placed in leakproof container to prevent spillage and leaching. Paints with toxic ingredients or solvents or leadbased paints will not be used. | Construction cost | Cost for engaged environmental expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MESP | Impact on human health, water, soil, biodiversity, crops |
| SOCIAL ISSUES | | | | | | | |
| LABOUR AND WORKING CONDITIONS | | | | | | | |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| Phase | Issue | Mitigating Measure | Estimated Cost (Euro €) | | Institutional Responsibility | | Comments (e.g. secondary impacts) |
|------------------------------------|---|---|----------------------------|------------------------------------|---|---|--------------------------------------|
| | | | Install | Operate | Install | Operate | |
| Pre-Rehabilitation /Rehabilitation | Problems related to the organization of the workforce | Contractor should prepare an Employment Plan for the needs of the project, in cooperation with the local PIU office, where special attention should be given to engaging the local workforce. | 1000 € | Cost for engaged OHS/social expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MLSW Inspectorate for Occupational Safety and Health | Impact on community and environment |
| | Problems related to the organization of the workforce: abuse of vulnerable people, gender discrimination child labour, wages, benefits and conditions of work | The Contractor should provide employment of the local people, so that should respect gender and equal opportunities and works in compliance with national legislation. The Contractor must not engage minor or to accept services and goods that come from suppliers who accept child labour. | / | Cost for engaged OHS/social expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MLSW Inspectorate for Occupational Safety and Health | Impact on community and environment |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| Phase | Issue | Mitigating Measure | Estimated Cost (Euro €) | | Institutional Responsibility | | Comments (e.g. secondary impacts) |
|-------|--|--|----------------------------|------------------------------------|---|---|--------------------------------------|
| | | | Install | Operate | Install | Operate | |
| | Non-compliance with IFI standards regarding workers and Working conditions | Contractor should prepare Occupational, health and safety risk assessment and Occupational Health and Safety Plan with an implemented grievance mechanism, in accordance with national laws, as well as with the requirements of the IFIs. | 3000 € | Cost for engaged OHS/social expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MLSW Inspectorate for Occupational Safety and Health | Impact on community and environment |
| | Worker accommodation | If there is a need for workers accommodation, then the Contractor must create Plan for Workers' accommodation where good international process and standards will be set and later implemented. | 1500 € | Cost for engaged OHS/social expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MLSW Inspectorate for Occupational Safety and Health | Impact on community and environment |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| Phase | Issue | Mitigating Measure | Estimated Cost (Euro €) | | Institutional Responsibility | | Comments (e.g. secondary impacts) |
|-------|---|--|--|------------------------------------|---|---|--------------------------------------|
| | | | Install | Operate | Install | Operate | |
| | Worker health and safety | Proper training of employees for project activities and using, servicing and integrity of PPE (personal protection equipment) | Approximately 10 € per employee for training | Cost for engaged OHS/social expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MLSW Inspectorate for Occupational Safety and Health | Impact on community and environment |
| | Health problem related with stress, dusty and noise environment, risk of occupational accidents and injuries. | Contractor should prepare Risk assessments on temporary and mobile construction sites that includes implemented grievance mechanism for workers and Security statement with risk assessment for jobs on a construction site and provide special training | 3000 € | Cost for engaged OHS/social expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MLSW Inspectorate for Occupational Safety and Health | Impact on community and environment |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| Phase | Issue | Mitigating Measure | Estimated Cost (Euro €) | | Institutional Responsibility | | Comments (e.g. secondary impacts) |
|-------------------|---|--|---------------------------------|------------------------------------|---|---|--------------------------------------|
| | | | Install | Operate | Install | Operate | |
| | Threatened health of Workers exposed to Chemical hazards. | Contractor must provide a special training for workers which are exposed to chemical hazard | Approximately 10 € per employee | Cost for engaged OHS/social expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MLSW Inspectorate for Occupational Safety and Health | Impact on community and environment |
| | Threatened health of Workers exposed to Asbestos containing material. | The Contractor should implement measures proposed in the Asbestos Management Plan and to conduct training of the staff who can potentially come into contact with the material to avoid damage and prevent exposure. The Plan should be made available to all persons involved in rehabilitation working activities. | Approximately 10 € per employee | Cost for engaged OHS/social expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU MLSW Inspectorate for Occupational Safety and Health | Impact on community and environment |
| CULTURAL HERITAGE | | | | | | | |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| | | | Estimated Cost (Euro €) | | Institutional Responsibility | | Comments (e.g. secondary impacts) |
|-----------------------------------|--|--|----------------------------|--------------------------------|---|---|--------------------------------------|
| Phase | Issue | Mitigating Measure | Install | Operate | Install | Operate | |
| Pre-rehabilitation/rehabilitation | Lost or damage of cultural heritage (known and undercover) | Before starting with implementation of the project the Contractor is obliged to provide opinions by the relevant institutions for possible cultural heritage in the project area and to follow directions for performance of works activities. | Construction cost | Cost for engaged social expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU Ministry of Culture, youth and sport MESP Other relevant ministries and inspectorates | Impact on community |
| | Lost or damage of cultural heritage (known and undercover) | If during the construction activities a new archaeological site or archaeological valuable evidence is discovered, the procedure for archaeological discovery must be carried out by the competent institutions for protection of cultural heritage. | Construction cost | Cost for engaged social expert | Contractor Subcontractor Supervisor | Contractor (engaged expert) Supervisor PIU Ministry of Culture, youth and sport MESP Other relevant ministries and inspectorates | Impact on community |
| LAND ACQUISITION | | | | | | | |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| Phase | Issue | Mitigating Measure | Estimated Cost (Euro €) | | Institutional Responsibility | | Comments (e.g. secondary impacts) |
|-----------------------------------|--|---|--|---|---|---|--------------------------------------|
| | | | Install | Operate | Install | Operate | |
| Pre-rehabilitation/rehabilitation | Loss of agricultural land and property for Rehabilitation of the irrigation system | The process of regulating the ownership status of the land that should be used for project purpose must be finalized in a fair manner before starting of the construction activities. | Construction cost | Cost for engaged social expert | Contractor Subcontractor Supervisor | Client PIU Relevant ministries and inspectorates and agencies | Impact on community and environment |
| | | Identification of additional parcels, if there is a need to be used for project implementation and conducting all required procedures for its compensation. Any land take that includes acquisition of private land, must be screened throughout a separate document named Resettlement Action Plan (RAP) | Construction cost | Cost for engaged social expert Preparation of RAP 1500 € (if is required) | Contractor Subcontractor Supervisor | Client PIU Relevant ministries and inspectorates and agencies | Impact on community and environment |
| | | The Contactor is obliges to provide fair compensation for damages for possible material asset, damage to the population or financial compensation | Cost for compensation of possible damage or other type of compensation | Cost for engaged social expert | Contractor Subcontractor Supervisor | Client PIU Relevant ministries and inspectorates and agencies | Impact on community and environment |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| Phase | Issue | Mitigating Measure | Estimated Cost (Euro €) | | Institutional Responsibility | | Comments (e.g. secondary impacts) |
|---------------------------------------|---|--|--|---------------------------------------|---|--|--|
| | | | Install | Operate | Install | Operate | |
| | | Implementation of Stakeholder engagement plan | Construction cost | Cost for engaged social expert | Contractor Subcontractor Supervisor | Client PIU Relevant ministries and inspectorates and agencies | Impact on community and environment |
| | | Engagement certified Agriculture assessor to estimate crop damages and sign a contract for crop damage compensation and obligation that the used land is put back in original condition. | 100 € per/day for agriculture assessor | Cost for engaged social expert | Contractor Subcontractor Supervisor | Client PIU Relevant ministries and inspectorates and agencies | Impact on community and environment |
| AIR QUALITY AND CLIMATE CHANGE | | | | | | | |
| Operation | Dust and exhausted gas emissions as a result of usage of equipment and mechanization for maintenance of irrigation system | Implementation of good operation practice as well implementation of Measures prescribed for rehabilitation phase | Operation cost | Cost for engaged environmental expert | Client or Contractor | Client (engaged expert) Contractor MESP Other relevant ministries and inspectorates | Impact on residents health, workers, soil, water, flora and agricultural crops |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| | | | Estimated Cost (Euro €) | | Institutional Responsibility | | Comments (e.g. secondary impacts) |
|----------------------------|---|--|----------------------------|---------------------------------------|------------------------------|---|--|
| Phase | Issue | Mitigating Measure | Install | Operate | Install | Operate | |
| | Farming activities (cultivation, use of mechanization and transport will be a source of biodegradable waste) will be a source of greenhouse gases, which will contribute to climate changes | Use of appropriate irrigation techniques and practices in order to achieve high water use efficiency and avoid meteorological changes; Implementation of good agriculture practice; Promotion of organic manure in place of chemical fertilizers should be intensified. The use of organic manure will contribute to reduction of ammonia emissions; | Operation cost | Cost for engaged environmental expert | Client or Contractor | Client (engaged expert) Contractor MESP Other relevant ministries and inspectorates | Impact on residents health, workers, soil, water, flora and agricultural crops |
| NOISE AND VIBRATION | | | | | | | |
| Operation | Maintenance and operation of irrigation system (usage of Mechanization for maintenance, as well working of the irrigation equipment) may increase the noise level. | Implementation of good operation practices, as well use low noise level equipment | Operation cost | Cost for engaged environmental expert | Client or Contractor | Client (engaged expert) Contractor MESP Other relevant ministries and inspectorates | Impact on residents health, workers, soil, water, flora and agricultural crops |
| WATER | | | | | | | |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| Phase | Issue | Mitigating Measure | Estimated Cost (Euro €) | | Institutional Responsibility | | Comments (e.g. secondary impacts) |
|-----------|--|--|----------------------------|---------------------------------------|------------------------------|---|--|
| | | | Install | Operate | Install | Operate | |
| Operation | Maintenance of the irrigation system near water bodies or in the water bodies as Drini i Bardhe and Prizren river, channels may cause water pollution. | Implementation of good maintenance and operation practise of the system and implementation of Measures proposed for rehabilitation phase | Operation cost | Cost for engaged environmental expert | Client MAFRD Farmers | Client (engaged expert) Contractor MESP Other relevant ministries and inspectorates | Impact on downstream users of the rivers, river ecosystem, soil, crops |
| | No proper irrigation may cause adverse impact on surface and ground water | Implementation of appropriate irrigation practices, with high water use efficiency | Operation cost | Cost for engaged environmental expert | Client MAFRD Farmers | Client (engaged expert) Contractor MESP Other relevant ministries and inspectorates | Impact on downstream users of the rivers, river ecosystem, soil, crops |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| | | | Estimated Cost (Euro €) | | Institutional Responsibility | | Comments (e.g. secondary impacts) |
|-------------|---|--|----------------------------|---------------------------------------|------------------------------|---|--|
| Phase | Issue | Mitigating Measure | Install | Operate | Install | Operate | |
| | Increasing of Farming activities and drainage of the irrigated area may cause water pollution of the rivers and other water bodies. | Promotion of good pest management practices in compliance with the European list, approved for application in Republic of Kosovo. More precisely, usage and application of pesticides to be in compliance with the Integrated pest management plan which is prepared within the project KARDP and training of the farmers. | Operation cost | Cost for engaged environmental expert | Client, MAFRD Farmers | Client (engaged expert), MAFRD, MESP, as well Kosovo Water Department Other relevant ministries and inspectorates | Impact on soil, biodiversity, crops, people |
| SOIL | | | | | | | |
| Operation | Changes of the physical and Chemical composition of the soil, such as: soil erosion, soil salinity, soil fertility, soil properties agrochemical pollution. | Implementation of good maintenance, operation, as well implementation of agricultural practices. | Operation cost | Cost for engaged environmental expert | Client, MAFRD Farmers | Client (engaged expert), MAFRD, MESP, as well Kosovo Water Department Other relevant ministries and inspectorates | Impact on water, biodiversity, crops, people |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| | | | Estimated Cost (Euro €) | | Institutional Responsibility | | Comments (e.g. secondary impacts) |
|---------------------|--|--|----------------------------|---------------------------------------|------------------------------|---|--|
| Phase | Issue | Mitigating Measure | Install | Operate | Install | Operate | |
| | Soil pollution as a result of increased use of pesticide by the farmers on the irrigation land. | Promotion of good pest management practices in compliance with the European list, approved for application in Republic of Kosovo. More precisely, usage and application of pesticides to be in compliance with the Integrated pest management plan which is prepared within the project KARDP and training of the farmers. | Operation cost | Cost for engaged environmental expert | Client, MAFRD Farmers | Client (engaged expert), MAFRD, MESP, as well Kosovo Water Department Other relevant ministries and inspectorates | Impact on water, biodiversity, crops, people |
| BIODIVERSITY | | | | | | | |
| Operation | Maintenance of the irrigation system, i.e. removal of vegetation of channel and intakes may affect the wild species. | It is forbidden use of herbicides and burning of vegetation along the channel and intake. | / | Cost for engaged environmental expert | Client, | Client (engaged expert), MAFRD, MESP, as well Kosovo Water Department Other relevant ministries and inspectorates | Impact on environment, and community health and safety |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| | | | Estimated Cost (Euro €) | | Institutional Responsibility | | Comments (e.g. secondary impacts) |
|---------------------------|--|---|---|---------------------------------------|------------------------------|---|---|
| Phase | Issue | Mitigating Measure | Install | Operate | Install | Operate | |
| | Intensified farming activities may initiate disappearance of pre-existing ecosystems on the sites that have not been used long years ago for farming purposes. | Farmers have to preserve the natural boundaries of their agricultural parcels, which are habitats of certain species of animals | Operation cost | Cost for engaged environmental expert | Client, MAFRD Farmers | Client (engaged expert), MAFRD, Other relevant ministries and inspectorates | Impact on environment, and community health and safety |
| WASTE | | | | | | | |
| Operation | Waste from operation and maintenance of the irrigation system | The Operator should prepare Waste management plan for operation phase and implement measures during operation phase of the project. | 3000 € for the Plan and additional cost that will arise by the plan | Cost for engaged environmental expert | Client, MAFRD Farmers | Client (engaged expert), MAFRD, Other relevant ministries and inspectorates | Impact on environment, workers, community health and safety |
| | Replacement of asbestos pipes or demolition of objects that may contain asbestos material during maintenance of the system | The Operator should prepare Asbestos Management Plan for operation phase and implement measures proposed in the Plan | 3000 € for the Plan and additional cost that will arise by the plan | Cost for engaged environmental expert | Client, MAFRD Farmers | Client (engaged expert), MAFRD, Other relevant ministries and inspectorates | Impact on environment, workers, community health and safety |
| HAZARDOUS MATERIAL | | | | | | | |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| Phase | Issue | Mitigating Measure | Estimated Cost (Euro €) | | Institutional Responsibility | | Comments (e.g. secondary impacts) |
|---------------------------------------|---|---|---|-----------------------------|------------------------------|---|---|
| | | | Install | Operate | Install | Operate | |
| Operation | Impact on environmental media as a result usage of Hazardous material and generation of hazardous waste | The Operator should develop procedures for the labelling, handling, storage and disposal of hazardous materials, | Operation Cost | Operation cost | Client, MAFRD Farmers | Client (engaged expert), MAFRD, MESP Other relevant ministries and inspectorates | Impact on environment, workers, community health and safety |
| SOCIAL IMPACT | | | | | | | |
| OCCUPATIONAL HEALTH AND SAFETY | | | | | | | |
| Operation | Worker health and safety | The Client should prepared Risk assessments and Occupational Health and Safety Plan and provide special training for employees for using, servicing and integrity of PPE (personal protection equipment). | 3000 € per plan Training: Approximately 10 € per employee | Cost for engaged OHS expert | Client MAFRD | Client (engaged expert), Inspectorate for Occupational Safety and Health MLSW | Impact on environment, workers, community health and safety |
| COMMUNITY HEALTH AND SAFETY | | | | | | | |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| Phase | Issue | Mitigating Measure | Estimated Cost (Euro €) | | Institutional Responsibility | | Comments (e.g. secondary impacts) |
|------------------------|--|---|--|-------------------------|--|--|--|
| | | | Install | Operate | Install | Operate | |
| Operation | Increased anxiety among the population because of the lack of communication with local settlements and property owners near the irrigation system | The Operator of the irrigation system should implement the Stakeholder engagement plan and effective grievance mechanism, i.e. process/procedure to receive and facilitate resolution of stakeholders' concerns and grievances. | Operation cost | Cost for engaged expert | Client MAFRD | Client (engaged expert), Inspectorate for Occupational Safety and Health MLSW | Impact on environment, workers, community health and safety |
| | Disruption in water, telephone and electricity supply as well road and property access as well economic loss due to the operational and Maintenance incidents | Any induced damage must be fully compensated | Operation cost | Cost for engaged expert | Client MAFRD | Client (engaged expert), Inspectorate for Occupational Safety and Health MLSW | Impact on environment, workers, community health and safety |
| LAND AQUISITION | | | | | | | |
| Operation | Maintenance of the irrigation system or more precisely repairing of some damages of the system may cause loss of agricultural land and property that may cause temporary financial loss. | The Client/Contractor is obliged to provide fair compensation for possible damages on material asset, damage to the population or financial compensation | Cost for compensation of possible damage or other type of compensation | Cost for Engaged expert | Client Contractor Subcontractor Supervisor | Client (engaged expert) Contractor Relevant ministries, inspectorates and agencies | Impact on environment, workers and community health and safety |

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

| Phase | Issue | Mitigating Measure | Estimated Cost (Euro €) | | Institutional Responsibility | | Comments (e.g. secondary impacts) |
|-------|-------|--|----------------------------|-------------------------|---|---|--|
| | | | Install | Operate | Install | Operate | |
| | | Engagement certified agriculture assessor to estimate crop damages and sign a contract for crop damage compensation and obligation that the used land is put back in original condition. | 100 € per/day | Cost for engaged expert | Client Contractor Subcontractor MAFRD | Client (engaged expert) Relevant ministries, inspectorates and agencies | Impact on environment, workers and community health and safety |

9. INSTITUTIONAL RESPONSIBILITIES FOR IMPLEMENTATION OF MITIGATION MEASURES AND MONITORING

The Environmental and Social Management Plan (ESMP) propose preparation of specific plans that will address the management of specific media, areas and aspects of the environment and community. The plans will refer to each phase of the project cycle (rehabilitation and operational phase) and will contain actions and programs for their implementation, related to the requirements of the respective regulatory framework.

Each plan, as a basis, will have the following content: a) objectives of the plan; b) management actions; c) responsibilities in carrying out activities; d) monitoring over the implementation of the activities; e) reporting; f) criteria, objectives to be achieved and monitoring indicators; g) timeframe for implementation.

Each plan will propose a way of control and communication, as well as topics for employee training. Part of each plan/program will be checklists for the purpose of keeping records/monitoring the compliance of the measures and activities of the plans and their implementation with the legal requirements and requirements defined in each plan/program.

Informing about the level of implementation of each particular plan will be through regular reports. The form of the reports will be proposed by appropriate experts (and will be defined in each plan). In the rehabilitation phase, the measure for EMSP will be implemented by the Contractor in cooperation with the Client Irrigation Company Radoniqi and Dukagjini and Ministry of Agriculture, Forestry and Rural Development (MAFRD) and PMU. For this purpose, it is required to be prepared the following plans:

- Water Management Plan,
- Biodiversity Management Plan,
- Waste Management Plan,
- Asbestos Management Plan,
- Employment Plan,
- Occupational Health and Safety Plan,
- Stakeholder Engagement Plan,
- Community Health and Safety Plan,
- Plan for organization of construction sites and traffic,
- Plan for emergency evacuation and rescue,
- Plan for Workers' accommodation,
- Resettlement Action Plan (RAP) (if there is a need).

In the operational phase, EMSP will be implemented by Irrigation Company Radoniqi and Dukagjini in cooperation with the Ministry of Agriculture, Forestry and Rural Development (MAFRD). For these needs, the Irrigation Company Radoniqi and Dukagjini will implement a system for environmental management and social aspects, and prepare the following plan:

- Waste Management Plan,
- Asbestos Management Plan,
- Occupational Health and Safety Plan.

9.1 Competent institutions and communication

In the rehabilitation phase of the irrigation system the main competence for the implementation of the measures envisaged for mitigation of the possible impacts and obligations arising from the Environmental and Social Management Plan will be on the Contractor (the future contracting entity) and the supervision on the performance of the works.

The Contractor and the Supervisor shall be obliged to employ a person, an authorized environmental expert, occupational health and safety expert and social expert who will have relevant work experience in the field (not less than 5 years) and the capacity to respond to all requests from (ESMP), with the opportunity to engage (for the whole period of rehabilitation) a private company that possesses human and technical resources and licenses to implement the ESMP and report adequately on the achievements, make updates and timely identify the needs for these activities.

The Contractor and the Supervisory Authority will be in close communication with the major beneficiary of the activities-Irrigation Company Radoniqi and Dukagjini and Ministry of Agriculture, Forestry and Rural Development (MAFRD).

This communication will be realized through a direct contact-Project Manager (Contractor)/Controller with Supervisor with a designated Coordinator from the beneficiary (Irrigation Company Radoniqi and Dukagjini) and through regular monthly meetings.

For that purpose, the Contractor will prepare weekly and monthly work plans with Method Statement and reports that will be submitted to the designated Coordinator of the Project beneficiaries.

Accordingly, the developer and beneficiary of the project will refer to the Ministry of Environment and Physical Planning, Ministry of Labor (and their local offices, if any), Local self-government of Gjakova and Prizren and other relevant institutions, to inform them about the predicted project activities, to provide certain permits/approval, etc., to inform them about possible incidents or injuries or regular information on the progress of the works, on the manner as will be requested by the aforementioned institutions.

Throughout the project implementation process, project beneficiaries, through their coordinators, will facilitate the process of communication with the aforementioned ministries and the local self-government in order to ensure the implementation of all project activities without delay or procrastinating and their real implementation.

The relevant state (local) inspectors (Ministry of Environment and Spatial Planning, Ministry of Transport and Communications, the Ministry of Labor) and other competent bodies as well as local government of Gjakova and Prizren, should control whether the contractor fully implement the recommended mitigation or avoidance measures and obligations arising from ESMP.

During the whole process, daily meetings of the Contractor team will be held regularly, as well as weekly meetings (and more frequent, if required) between the Contractor and the Supervisor and monthly meetings between the Contractor, the Supervisor and the beneficiaries of the Project.

In the operational phase of the Project, for the successful implementation of the ESMP, the Irrigation

Agriculture and Rural Development Project (ARDP)

Draft- ESIA for Rehabilitation of Radoniqi-Dukagjini Irrigation Scheme

Company Radoniqi and Dukagjini will arrange an environmental / occupational health and safety expert and will conduct regular employee training for the successful implementation of the provisions/ requirements of the Plan (and specific plans), since the capacities within the company are very limited when it comes to following international (World Bank) environmental and social safeguard standards. Therefore it is recommended that apart from capacity building, the irrigation company employs an external staff with proven knowledge and experience in following World Bank funded projects in terms of environmental and social safeguards.

Last but not least the consultant shall prepare a notice for public debates and ensure it is published in at least one daily newspaper and placed on the notice board of the Municipal Assembly in which the project will be implemented. The required content of the Notice is presented in Article 8(2) of the AI MESP № 16/2015. The public debate(s) shall be held within thirty (30) days after publishing of the notice in the newspaper and the placement of the Notice on the notice board of the Municipal Assembly. The Consultant shall bear all the costs of preparing the EIA Reports, the public debate(s), the review and consultation process.