



REVIEW OF HPP ZHUR FEASIBILITY STUDY INCLUDING PREPARATION OF PRELIMINARY EIA AND PRELIMINARY SA



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REPUBLIKA E KOSOVËS
REPUBLIKA KOSOVA
REPUBLIC OF KOSOVO

Ministria e Energjisë dhe Minierave
Ministarstvo energije i rudarstva
Ministry of Energy and Mining

LPTAP Project Office



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THE TASKS

- Task 1:** Review and update the existing hydrological, hydro-technical, and geological data for necessary for development of HPP Zhur.
- Task 2:** Review, update and optimize **plant installed capacity** and update/complete the existing **preliminary engineering design** of the HPP Zhur;
- Task 3:** Review and update/complete the existing **financial and economic feasibility** of the HPP Zhur, including analysis of financing options;
- Task 4:** Prepare a preliminary EIA (**Environmental Impact Assessment**), including trans-boundary impacts, impact on downstream irrigation and dam safety associated international requirements;
- Task 5:** Prepare a preliminary SA (**Social Assessment**), including a draft Resettlement Action Plan.



preliminary EIA – introduction

The outputs of Task 4 should be the **Preliminary EIA Report** and the proposed **Environmental Management Plan**. The assessment aims at the environmental protection and is based on the state of the environment data available.

ENVIRONMENTAL IMPACT ASSESSMENT

- **Law on Environmental Protection**
 - this Law shall regulate the integral system of environmental protection and risk reduction for life and human health, according to the concept of sustainable development
- **Law on the Environmental Impact Assessment**
 - the aim of this law is to prevent or mitigate the adverse impacts of the proposed projects by an applicant

STRATEGIC ENVIRONMENTAL ASSESSMENT / PHYSICAL PLANNING

- **The Physical Planning Law**
- **Environmental Strategic Law**
 - The purpose of this Law is to ensure through strategic environmental assessment of the plans and programs, high level for protection of the environment and human health

Regulations for an efficient enforcement of the laws mentioned and the majority of other laws relating to the protection of the environment and nature have yet to be adopted



Major deficiencies of environmental legislation of Kosovo arise from:

- partial harmonization of legislation with EU directives,
- absence of a **state of the environment monitoring strategy**,
- absence of a **biodiversity strategy**,
- absence of **basic environmental impact plans** (soil, water and air),
- **shortage of institutions** and vaguely defined responsibilities of institutions according to the law,
- non-existence of **water policies with priorities**.

The EIA report, based on the Law on Environmental Impact Assessment, should be a mandate of Investor before the construction phase.

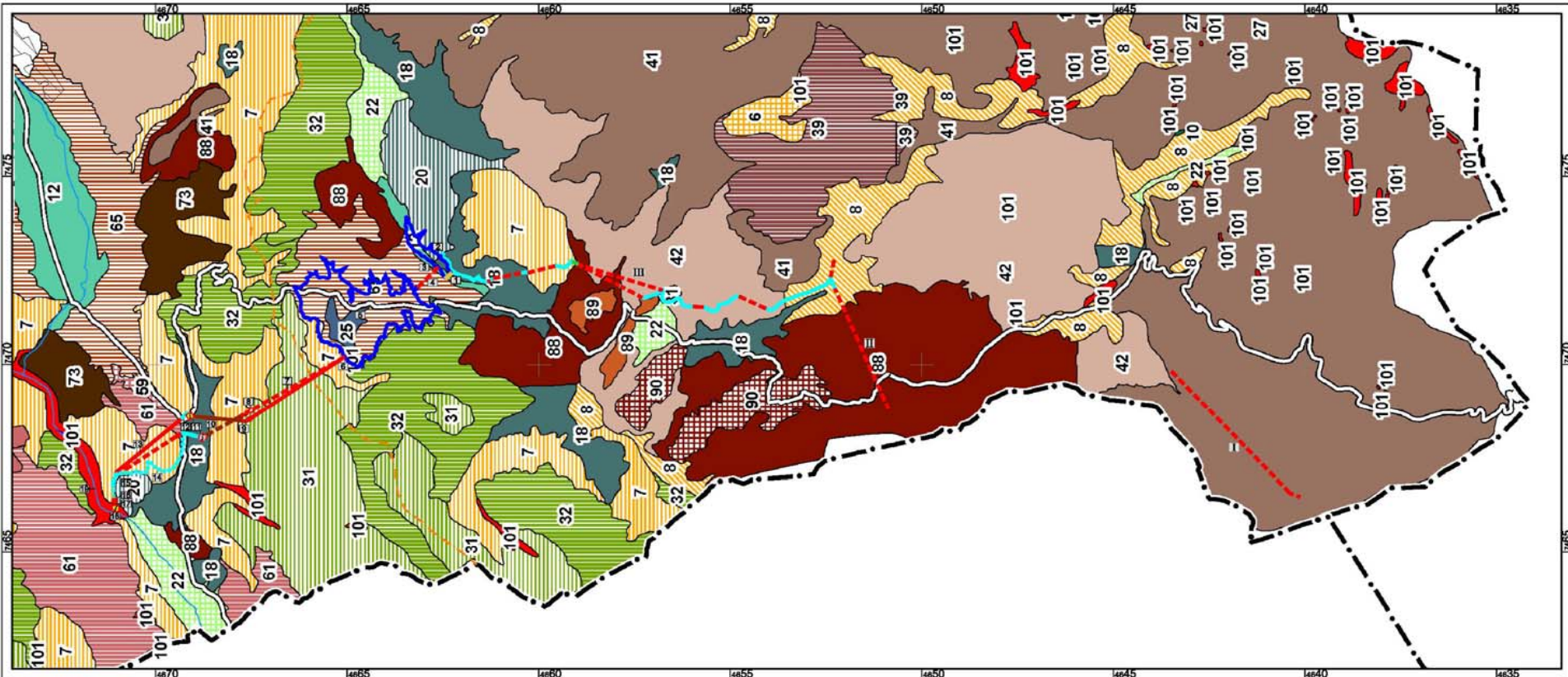


preliminary EIA – project & area description

Project description → task 2

Area description:

- Climate and Meteorological Features
- Hydrological Features
- Geological Features
- Hydrogeological Features
- Seismology
- **Speleological Features** → no registered speleological formations
- **Soil Features**





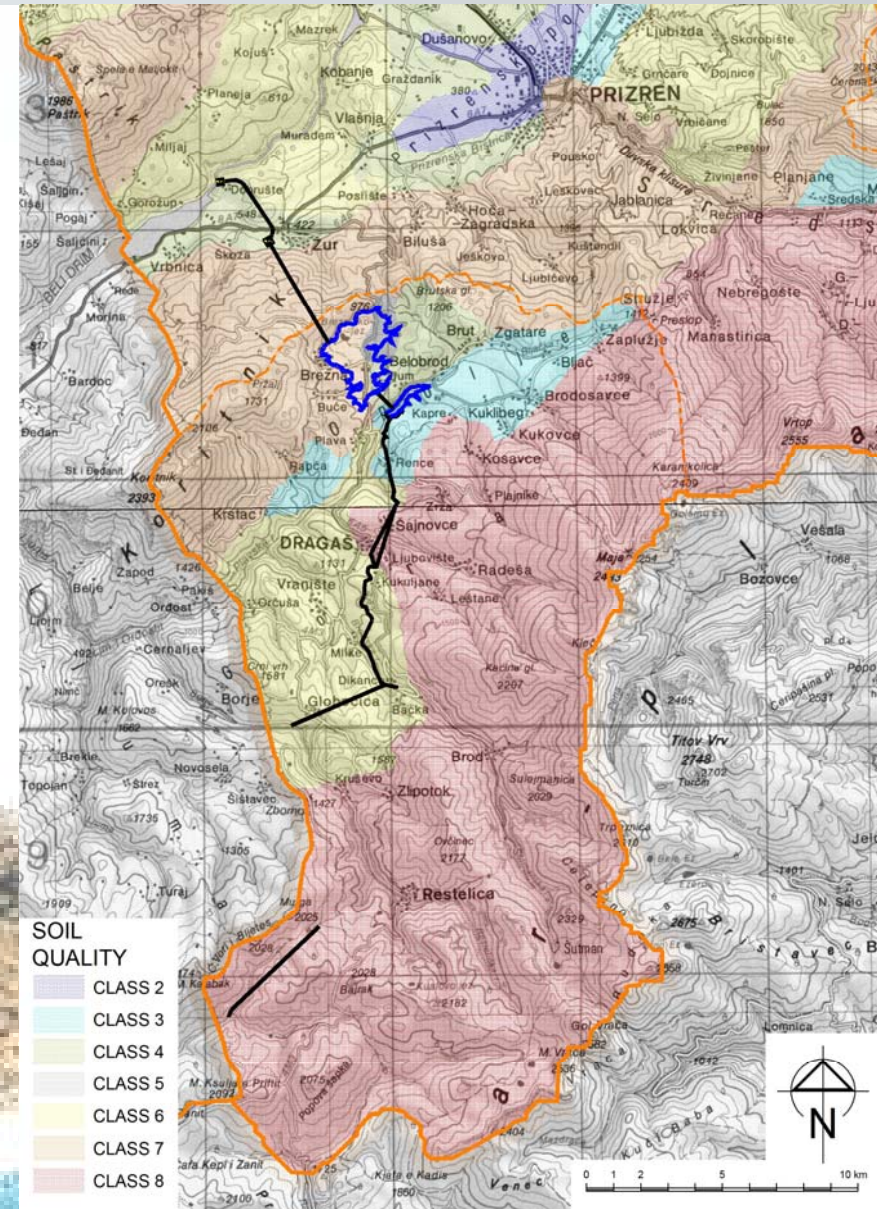
preliminary EIA – project & area description

- **Soil Features (cont'd)**
- average depth,
- diverse skeleton structure,
- contain a lot of humus,
- show an acid reaction,
- poor in phosphorus and nitrogen.

- > 50% of soils → category II and III,
- ≈10% → category IV and
- ≈40% → categories from V to VIII.

(Soils belonging to the quality class IV are low-productive soils and other categories (V÷VIII) are not fit for agricultural production.)

Soil contamination → no adequate monitoring; insecticides and fungicides are most widely used





preliminary EIA – project & area description

- **Surface Waters**
- Drini i Bardhë + Drini i Zi (Albania) → Adriatic Sea
- Major streams:
 - Lumi Plavë,
 - Lumi Radeshë,
 - Lumi Leshtani,
 - Lumi Brod,
 - Lumi Restelic,
 - Lumi Çaljane
- Brezna Lake (2 ha, depth ≈10 m)

Water Quality (surface and ground waters)

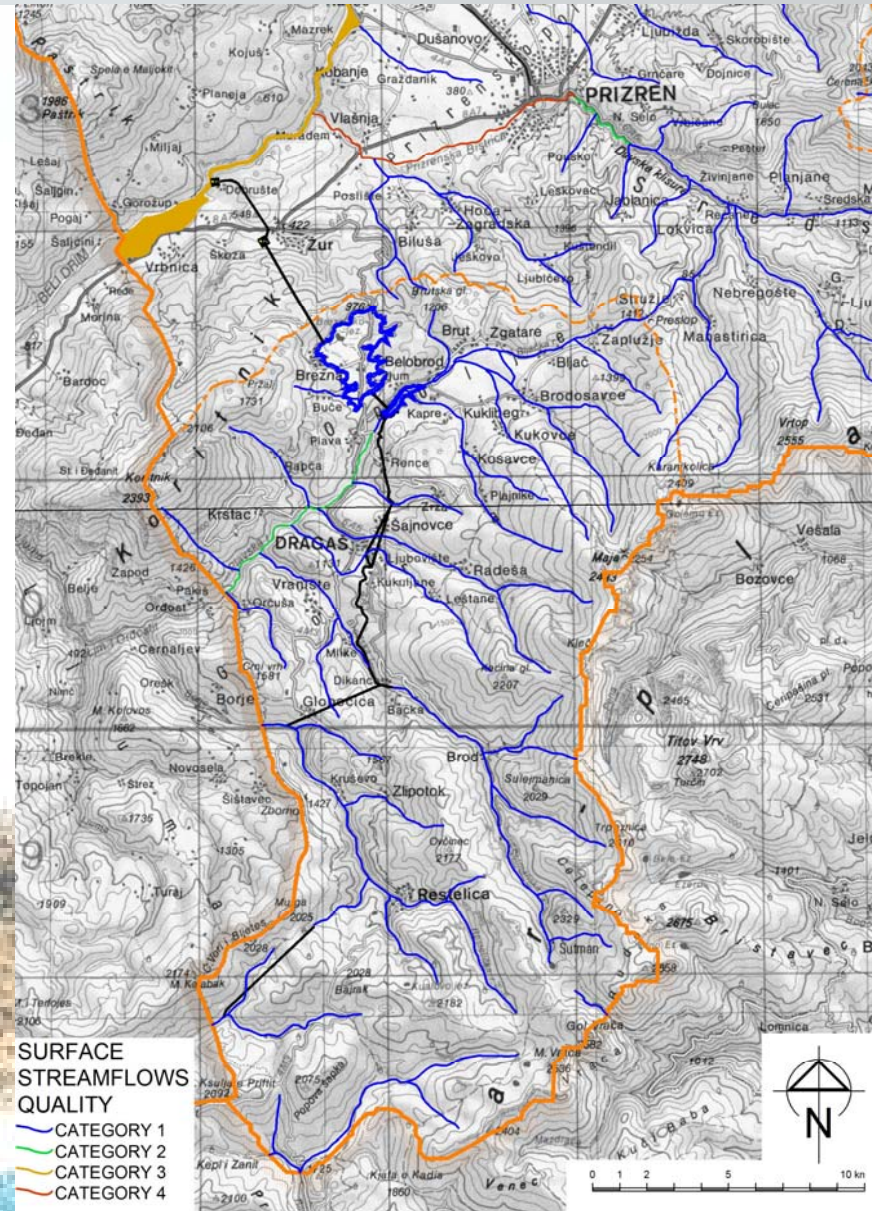
1. physical and chemical properties

- no monitoring

2. biological properties

- no monitoring

At the forthcoming design stages it will be **necessary to identify water quality** of the streams that will be used to feed the reservoirs planned.





preliminary EIA – project & area description

*The Lumi Leshtani River –
state of the environment*



*The Lumi Plavë River –
state of the environment*



*The Lumi Radeshë River –
state of the environment*



*The Lumi Brod River –
state of the environment*





preliminary EIA – project & area description

• Flora and Fauna

- area is inhabited by diverse plant and animal life,
- no detailed vegetation map of the area has been made at this design stage so far

• plant communities:

1. grassland vegetation
2. forest vegetation:

- Dragash/Sharr:

- “Opoja”, “Çestak – Jellaku (Bredhiku)” and “Koritnik I”,

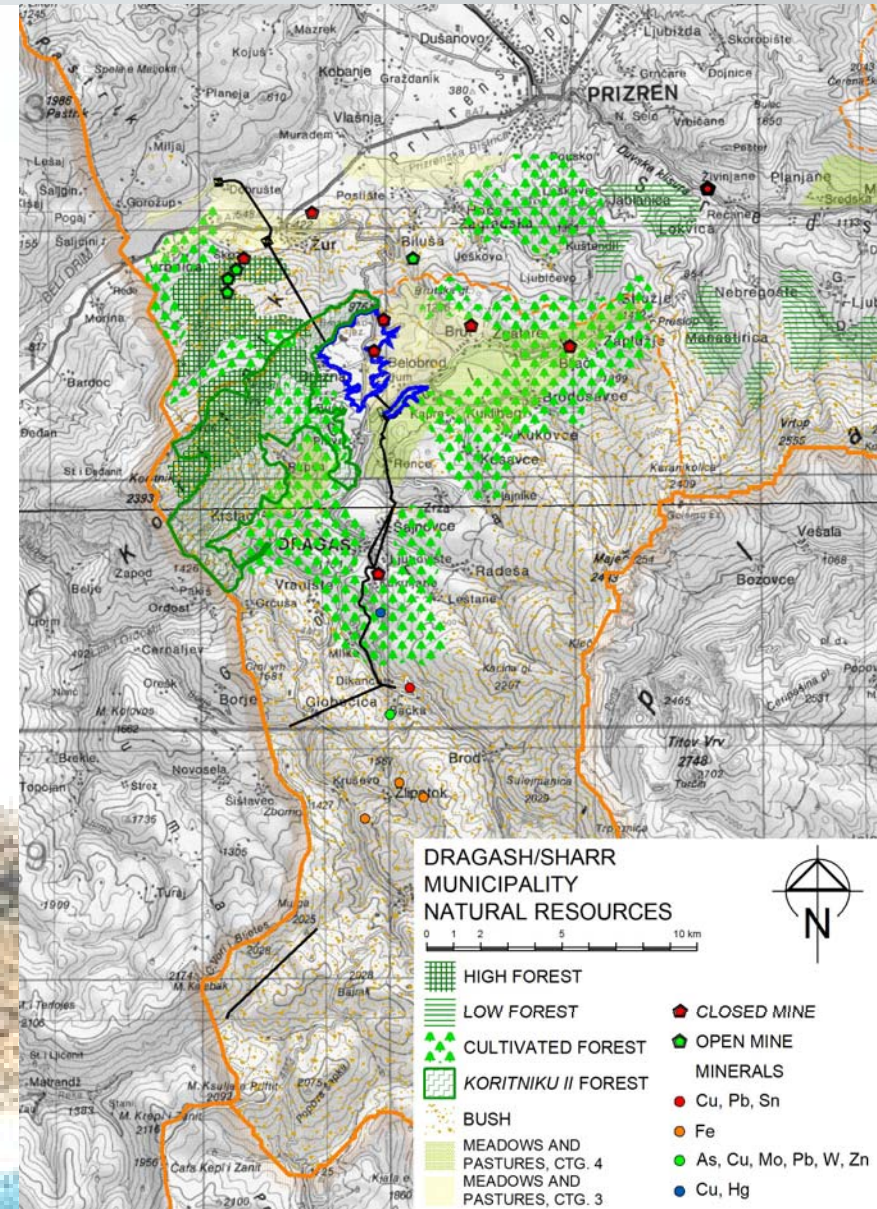
- Prizren:

- “Koritnik II” economic unit

3. mine communities

4. weed communities

5. wetland habitats





preliminary EIA – project & area description



- **animal communities:**

The area is basically characterized by elements of the Central European fauna.

- **Characteristics of Agricultural Production**

Highland relief, the northerly exposition of the area, small agricultural surfaces and a short vegetation period make this activity less attractive.

Due to **favorable natural conditions and livestock breeding tradition**, the livestock number is **constantly increasing** (cattle breeding)



preliminary EIA – project & area description

Forestry

- Forests lie mainly outside the area where the construction of the HPP Zhur is planned (exceptions: the Plavë Reservoir (Opoja e. u.) and HPP Zhur I powerhouse (Koritnik I) e. u.)

Municipality	No.	Economic unit	[ha]	[m ³]	Annual growth [m ³]	[m ³]	
Dragash/ Sharr	1.	Čestak-Jellaku (Bredniku)	2,800	130,000	6,000	2,000	
	2.	Opoja + surface and Bosnian pine (Pinus heldreichii) and birch species (Betula sp.) covering almost 50 per cent of the area.	5,100	110,000	3,500	1,800	
	3.	Koritnik II	3,700	420,000	17,000	3,000	
	4.	Private forest Dragash	1,600	75,000	900	500	
	Total			11,700	735,000	27,400	7,300
	Prizren	1.	Koritnik I	5,500	255,500	7,559	3,520
		2.	Private forest Prizren	400	18,000	230	120
Total			5,900	273,500	7,790	3,640	
Grand total			17,600	1,008,000	391,900	10,940	



preliminary EIA – project & area description



- **Fisheries**

- fisheries are underdeveloped in this area
- at the forthcoming design stages it is necessary to establish the status of the fish stocks in streams from which water is withdrawn for the needs of the HPP Zhur planned

- **Hunting**

- hunting has a long tradition in the area observed
- despite organization through hunting clubs at the institutional level there is a need for additional measures regarding preservation of autochthonous wildlife and rare species inhabiting this area



preliminary EIA – project & area description

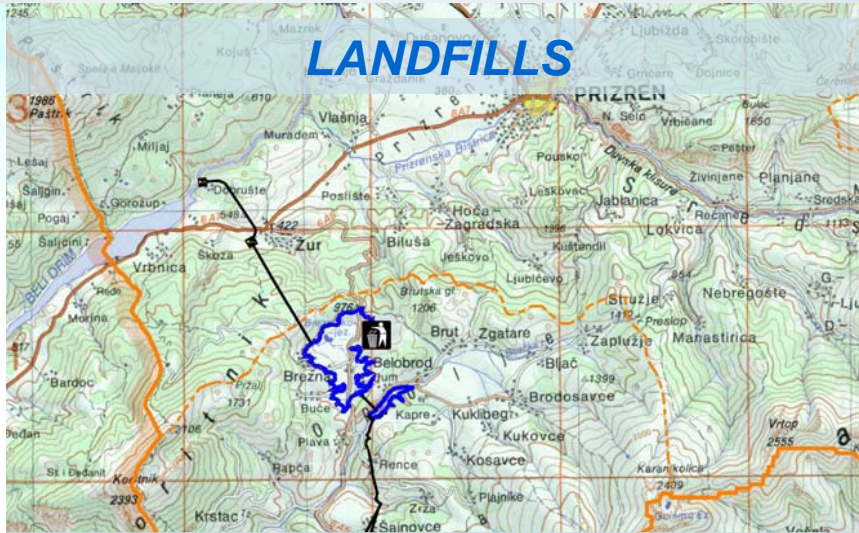
- **Facilities and Infrastructure**

- Zym – Qollopek, Brezna, Buçe, Zhur, Mirzë
- no big industrial facilities in the villages mentioned
- **Brezna:**
 - primary school, mosque, two pubs, three shops, two fast food kiosks and a carpenter's and a locksmith's shop, cemetery (7 hectares, three locations), a football and basketball ground
- **Hani i Llopushnikut:**
 - primary school, health centre
- **Buçe, Zym:**
 - primary school, cemetery (2.5 hectares), mosque

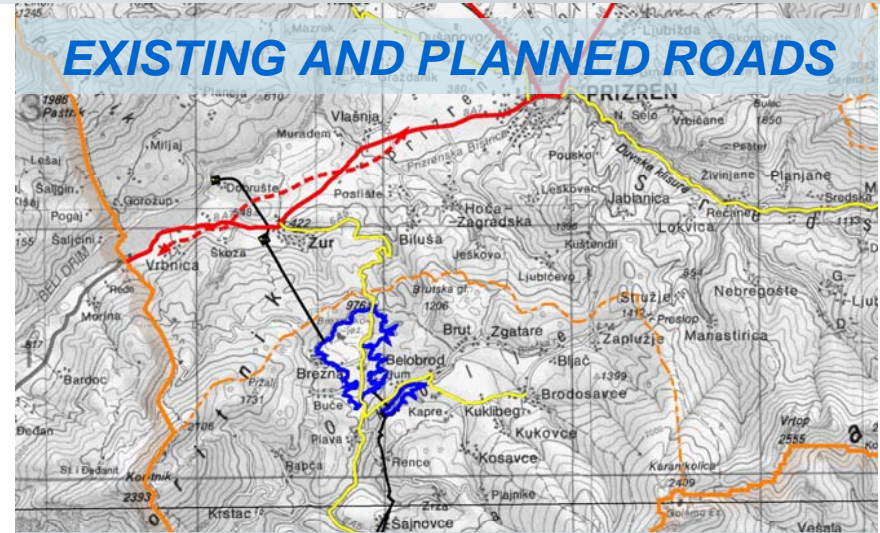
At the forthcoming design stages it is **necessary to check the condition of houses and facilities in the settlements** and close to the site where the construction of individual facilities of the HPP Zhur is planned.



preliminary EIA – project & area description



- sanitary landfill (1.2 ha, intended for disposal of wastes produced by 27,000 inhabitants in the period of 16 years), poorly managed
- small or large **illegal dumpsites** mostly of household wastes may be found all over the observed area of the HPP Zhur planned



- the **Prishtinë – Prizren – Dragash/Shar** trunk road
- local roads connecting the settlements and the main road
- the **Prizren – Kukës** trunk road
- the **Prizren – Republic of Albania** highway (planned)





preliminary EIA – project & area description

- **Facilities and Infrastructure (cont'd)**
 - **Sewage System**
 - settlements Zym, Buçe and Brezna are not connected to any sewage system

Settlement	No. of households	No. of septic tanks
Brezna	380	150
Buçe	120	50
Zym	95	50

- the **method of disposal of excrement from septic tanks** after they are emptied is **disputable**
- the discharge of **precipitation is not solved adequately**
- the data on a possible construction of a sewage network in settlements located close to the reservoirs planned are lacking
- no data on the condition of sewerage coming from the villages Zhur and Mirzë are available
- **there is no wastewater treatment plant** installed



preliminary EIA – project & area description

- **Facilities and Infrastructure**

- **Drinking Water Supply**

- only 44 per cent of the total and 8.4 per cent of the rural population are adequately supplied by drinking water
- drinking water mostly does not meet the standard required for water intended for drinking, because it is loaded with faecal bacteria and nitrates
- there is a local water supply system that provides drinking water for a part of the population of Brezna, Buçe and Zym

- **Energy Supply**

- Zhur – Zym transmission line
- **Zym:** a transformer station with a 3-km power supply line
- **Brezna:** 6 transformer stations and 9 km of the power supply line
- **Buçe:** 2 transformer stations and 4 km of the power supply line
- data on the condition of the power network of Zhur and Mirzë villages are not available

- **Telecommunications**

- there is no fixed telephone network in the area belonging to the Dragash/Sharr municipality
- a telephone exchange is installed in Zhur, but the telephone network has not been switched so far



preliminary EIA – project & area description

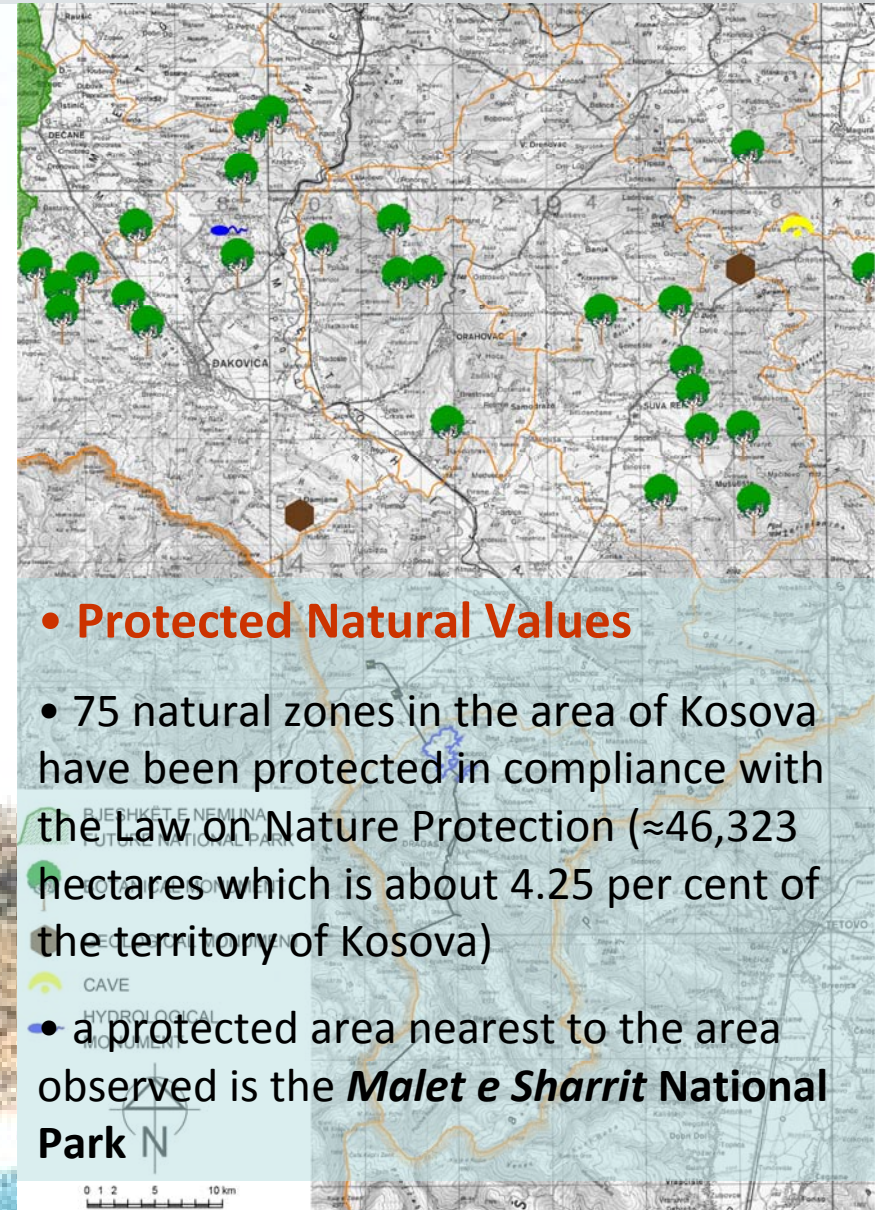
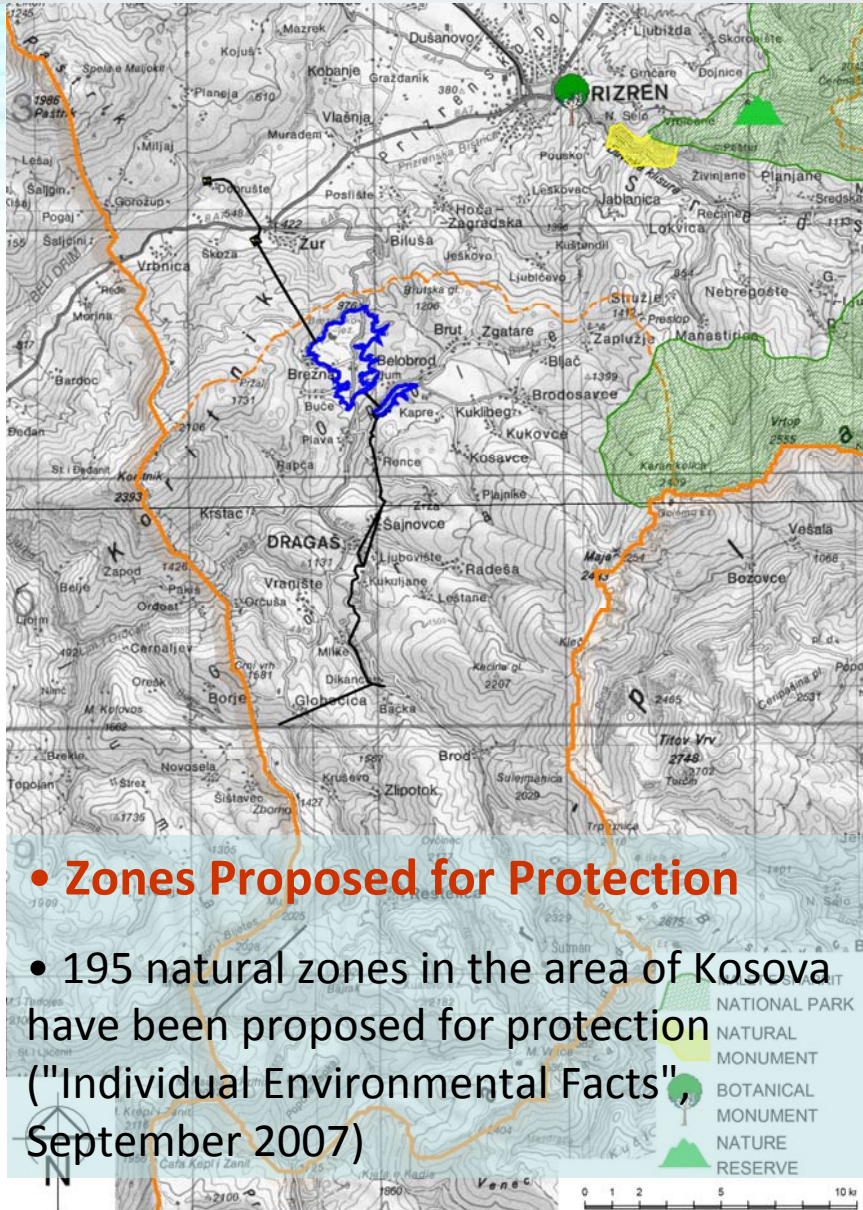


Economy

- due to poor agricultural resources and geographical isolation, Dragash/Sharr is among the most underdeveloped regions in Republic of Kosova
- main employers: the municipality, UNMIK police, private companies
- only 6 per cent of the agricultural land in the area of the Dragash/Sharr municipality are arable
- due to favorable natural conditions and livestock breeding tradition, about 70 per cent of the Dragash/Sharr municipality area are pasturelands and the livestock number is constantly increasing.
- in 2006 there were 24 farms of a size up to 1.5 hectares, 22 farms between 1.5 and 3 hectares, 14 farms between 3 and 10 hectares and only 11 farms covering over 10 hectares in the Dragash/Sharr municipality area
- **this area has great economic potentials for the economic development** owing to the basic conditions available: **clean air, a great number of springs, rivers, streams, valleys, canyons, a rich plant and animal life, the ground suitable for summer and winter sports and a number of recreational areas**



preliminary EIA – project & area description



Area under direct impact...

- ...is the area directly occupied by the structure

- **560.1 ha**

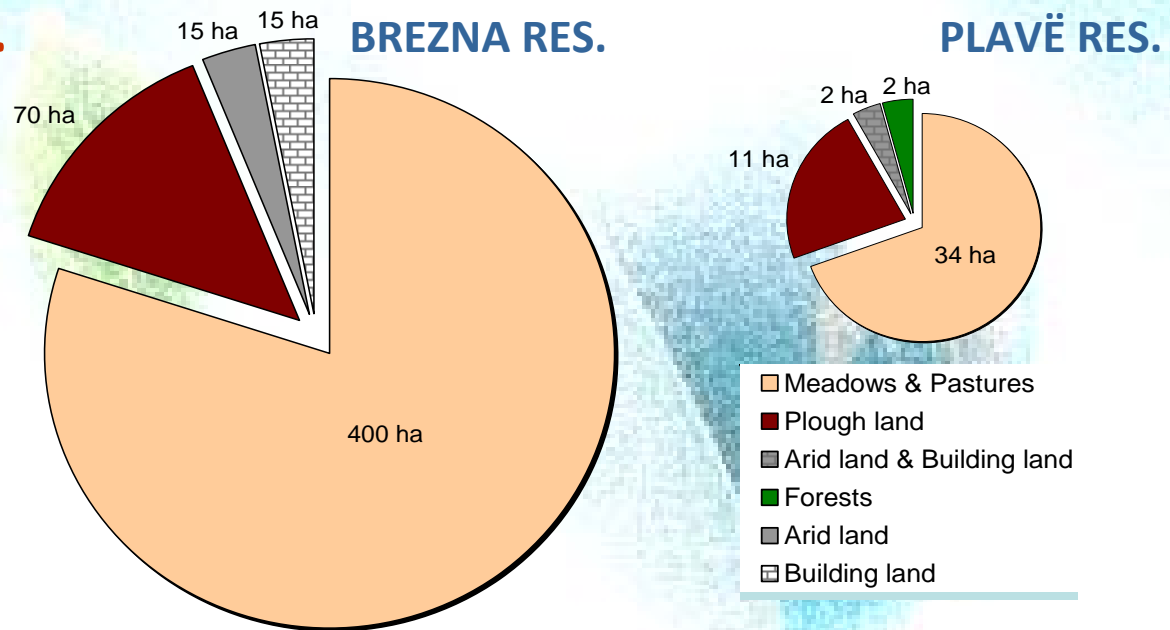
- **the Plavě Reservoir (49 ha),**

- **the Brezna Reservoir (500 ha),**

- the conveyance system from the Brezna Reservoir to the HPP Zhur I with the powerhouse (**3.3 ha**),

- conveyance system between the HPP Zhur I and Zhur II together with the HPP Zhur II powerhouse (**4.0 ha**),

- and the canals within the Lumi Brod River conveyance system during the construction shall occupy about 11.4 ha (restored 7.6 ha, permanently lost **3.8 ha**)



Impacts

- during Project Construction

- during *of limited duration* Hydroelectric Power Plant Operation

- **Noise** (machinery and vehicles),
- **Atmospheric pollution** (dust and exhaust gases),
- **Soil contamination** (fuel and lubricant leaking from the machinery and vehicles),
- **Water contamination**
- **Terrestrial fauna** (temporary migration of some animal species, including hunting game)
- **Agriculture** (decrease in value of crops caused by dust emission etc.)
- **Road traffic**
- **Water supply problems**
- **Energy** (Power transmission and distribution)
- **Landscape**

- *not of limited duration*

- **Habitats** (gradual loss of animal and plant habitats) – **loss of these habitats shall not cause extinction of any animal or plant species**
- **Residential and business buildings** (demolition of some 225 residential and business units)
- **Agricultural land** (gradual loss of about 523 ha of agricultural land – 89 ha highly productive)
- **Forests and forest land** (2 ha)
- **Building land** (17 ha)
- **Other land** (8 ha)
- **Impact on allocation and land use**
- **Cross-impact with other planned facilities**

Impacts

• during Hydroelectric Power Plant Operation

- **Permanent habitat loss** at about 560 ha
- **Climate change** (Brezna Reservoir only, deviations in current temperature values for about 0.5 to 2°C, increase in wind speed between 10 and 30%, and increase in air humidity between 10 and 20 % compared to the present state)
- **Surface water** (change in the water flow hydrological regime in the streams downstream from the dam). **It is uncertain whether the envisaged biological minimum for the environmentally acceptable flow is sufficient to ensure development and preservation of indigenous communities from the streams after all necessary quantities of water have been harnessed! This is an issue to be agreed upon with the Republic of Albania.**
- **Agricultural land**
- **Forests and forest**
- **Building land**
- **Other land**
- **Habitats, flora and fauna** (extinction of plant communities in the project catchment and animal species habitats at the area of about 560 ha)
- **Fish fauna** (dam will cause prevention of fish migrations, which will particularly affect the fish that migrate seasonally for reproduction and feeding)



preliminary EIA – overview of possible impacts

Impacts

• during Hydroelectric Power Plant Operation (cont'd)

Impacts in Case of Emergency and Risk Assessment (the use of the hunting grounds will be considerably reduced; however, these impacts are such that all the game will be able to adapt, so they might be considered as minor)

all the HPP ZHUR structures shall be **designed and constructed in conformity with the existing regulations**

• **Impact on allocation and land use** accidents caused by **"force majeure"** (devastating earthquakes of

• **Sociological and demographic aspect** (→ task 5) magnitude exceeding the design magnitude, wars, intentional damages to

• **Landscape** (change in certain natural and cultural characteristics and assets of a structure parts, or installations)

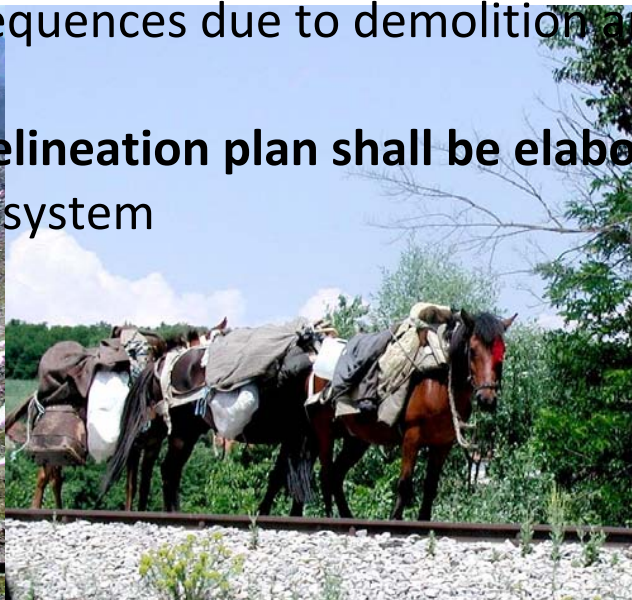
landscape – visually, the water surface mass of uniform rhythm shall dominate and thus reflect on the visual quality in relation to the current landscape units

• **the Plavë Reservoir dam demolition emergency plan will be prepared** defining the consequences due to demolition and protection measures in

the affected area

• **a flooding zone delineation plan shall be elaborated, along with the**

warning and alert system



preliminary EIA – overview of possible impacts

Impacts... an overview

Indicator group	Indicator subgroup	Indicators	Impact during	
			construction	operation
Site	Site characteristics	Geology	0	0
		Hydrogeology	0	0
		Climate	0	-
		Seismology	0	0
		Landscape	-	- (+)
	Running surface water	Quality	-	0
		Hydrology	0	--
	Stagnant surface water	Quality	---	0
		Hydrology	-	--
	Groundwater	Quality	0	0 (-)
	Land use	Hydrology	-	- (+)
	Cross impact	Planned structures	-	0

preliminary EIA – overview of possible impacts

Impacts... an overview (cont'd)

Indicator group	Indicator subgroup	Indicators	Impact during	
			construction	operation
Bioecological	Soil	Arable	--	-
		Quality	-	0
		Building land	-	-(+)
	Air	Quality	-	0
		Noise	-	0
	Flora	Meadows	--	--
		Forests	-	-(+)
		Mine communities	-	-
		Protected species	0	0
		Endangered spec.	0	0
	Fauna	Invertebrates	-	0
		Fish	-	-(+)
		Amphibians	-	+
		Reptiles	-	0
		Birds	-	+
		Mammals	0	0
		Protected species	0	0
		Endangered spec.	0	0

preliminary EIA – overview of possible impacts

Impacts... an overview (cont'd)

Indicator group	Indicator subgroup	Indicators	Impact during	
			construction	operation
Bioecological (cont'd)	Habitats	Wetland	--	+
	Protected natural assets		0	0
	Protected monuments		0	0
	Agriculture	Plant production situation	-	-(+)
		Animal breeding situation	0	0
	Forestry		-	-(+)
Industry		0	0	
Socio-economic	Demography		+	+
	Employment		++	+
	Settlements		--	-(+)
	Cemeteries		--	0
	Schools		--	0
	Health centre		--	0
	Fisheries	Angling	0	+
		Fishing	0	+
	Hunting	Hunting grounds	-	+
		Game	-	-(+)
	Tourism		-	+

preliminary EIA – overview of possible impacts

Impacts... an overview (cont'd)

Indicator group	Indicator subgroup	Indicators	Impact during		
			construction	operation	
Infrastructure	Road traffic		-	0	
	Telecommunications		0	0	
	Power	Transmission		-	+
		Distribution		-	+
	Water supply		-	0	
	Drainage		0	0	
	Waste management	Dump sites		+	+

KEY	
0	no impact
-	minor impact
--	moderate impact
---	major impact
+	low favorable effect
++	moderate favorable effect
+++	high favorable effect
- (+)	possible impact/favorable effect



preliminary EIA – overview of possible impacts

Possible favorable effects

... during Project construction

- **New jobs** (increase in employment during the project implementation which will be primarily felt in the municipalities accommodating the project)
- **Illegal dump sites** (remediation)
- **Landscape** (landscaping design and its implementation as a part of the area and revival of some habitats)

... during HPP Zhur operation

- **Higher order within the planned project area** (better sporting and recreation conditions)
- **Agricultural production** (irrigation, illegal dump sites remediation → avoiding water contamination risk)
- **Fish fauna** (increase in ichthyoproductivity, landscaping of the wider area, construction possibilities of cage fish farming - salmonidae)
- **Forestry** (the increase in air humidity and increase in precipitation volume in the reservoir area → a favorable impact on increase in forest biomass production)
- **Hunting** (development of waterfowl)
- **Impact on Allocation and Land Use**
- **Sociological and demographic aspect** (encouraging immigration and employment)



Preliminary EIA → based on existing documents which **do not suffice for a final assessment of impacts**

Prior to the development of the Environmental Impact Assessment study for the HPP Zhur project, the following documentation needs to be prepared:

- **the Physical Plans** (for the Republic of Kosova and municipalities of Prizren and Dragash/Sharr)
- **a studies:**
 - of the presence of **caves** and **cave fauna**,
 - of the **presence of the invertebrate fauna** (butterfly fauna, terrestrial vertebrates, including the endemic, protected and threatened plant and animal species),
 - of the actual status of **agricultural production**,
 - of the actual status of **forestry**,
 - of **fish stocks status**,
 - of **hunting status**,
 - of **status of houses and other structures** in the settlements in and near the project catchment,
 - on the **water supply, power and telecommunication networks** in and near the project catchment,
 - on the status of **illegal dump sites** in the project catchment,
 - on **equitable compensation or replacement for the facilities and the space occupied**;
 - on the condition of the **discharge system**, i.e. septic tanks used in settlements in and near the project catchment,
- **a conservation study**,
- the **environmentally acceptable flows** downstream from the dam and the intake structure, in agreement with the Albanian requirements
- **a vegetation map** of the area observed,



preliminary EIA – environmental protection measures

Prior to the development of the Environmental Impact Assessment study it is also necessary to have:

- stream hydrological data
- surface water quality data
- basic meteorological data (precipitation, air humidity, fog, wind).

Protection measures

- **during Project Execution**

- **during Project Operation**
 - Protection against dust and noise

- Protection against water contamination

- Measures for the protection of flora and fauna

- Soil protection measures

- Hunting protection measures

- Fishery protection measures

- Agricultural protection measures

- Forest protection measures

- Measures for the protection of natural and cultural assets

- Measures for the protection of facilities and infrastructure

- Landscape protection measures

- Measures for the protection of humans



Protection measures

- **during Project Operation**

Water protection measures

Protection of habitats, plant and animal life

Protection of hunting

Protection of fishery

Protection of forests

Protection of agricultural land

Protection of natural and cultural heritage

Protection of landscape

Maintenance of facilities and infrastructure

Landscaping

Sociology and demography

Measures for the Protection against Accidents

Measures Arising from International Obligations of the Republic of Kosova

(Environmental Protection Measures after the Hydropower Plant Is No Longer in Use)



preliminary EIA – the environmental monitoring program

The Environmental Monitoring...	Costs	
...prior to Execution of the Project	1. equipment purchase and installation costs	63,000 €
<ul style="list-style-type: none"> • meteorological monitoring, • seismic monitoring, • hydrological monitoring and • monitoring of the ecological status of surface waters. 	2. research and preparation of necessary studies	191,000 €
	3. total annual costs	35,000 €/yr
...during Execution of the Project	1. total annual costs	35,000 €/yr
The monitoring activities are equal to the ones prior to the execution of the project.		
...during the Project Use	1. total annual costs	102,000 €/yr
<ul style="list-style-type: none"> • hydrological monitoring • seismological monitoring • water protection and polluters • ecological state of surface waters • status of ichthyofauna • status of terrestrial vertebrates • forests and forest land and • agriculture and agricultural land. 		