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Strategic environmental assessment (SEA) in the water management sector

EXPERIENCE WITH SEA PILOT APPLICATION FOR THE DRAFT ALAZANI-IORI RIVER BASIN MANAGEMENT PLAN

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International Office for Water

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MAPS:

The thematic maps presented in the borchure are produced by *Mr. Irakli Kobulia* on the basis of the GIS database provided by the EUWI + programme. The SEA Report also includes a map developed in the framework of the EUWI + programme (under result 2) by the REC Caucasus, subcontractor of the EUWI+ programme.

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GEO
Georgia`s Environmental Outlook

1. WHAT IS SEA

1.1. PURPOSE AND OBJECTIVES

SEA is internationally recognized as the key instrument for integrating environmental and health considerations into strategic planning and decision-making to prevent and mitigate possible damage from economic and regional development.[1] It sets out the obligatory consultation of environmental and health authorities and the public to provide decision-makers early warning of unsustainable options and contributes to the reduction and management of health risks. It promotes sustainable development goals and principles, supports efforts towards the transition to a green economy, and increases the legitimacy of planning and decision-making processes and their outcomes. Moreover, it may allow countries to consider health risks and mitigation measures for pandemics as part of their planning processes, promoting healthy lifestyles, enhancing socioeconomic conditions to enable people to thrive and improving access to good quality health and social care.

The UNECE Protocol on SEA[2] defines SEA as "…the evaluation of the likely environmental, including health, effects, which comprises the determination of the scope of an environmental report and its preparation, the carrying-out of public participation and consultations, and the taking into account of the environmental report and the results of the public participation and consultations in a plan or programme." (Article 2.6).

According to the Protocol on SEA, the objective of SEA is to ensure that environmental, including health, considerations are thoroughly taken into account in the development of plans and programmes in support of environmentally sound and sustainable development. In particular, SEA assists authorities responsible for plans or programmes, as well as decision-makers, to take into account:

- Key environmental trends, potentials and constraints that may affect or may be affected by the plan or programme.
- Environmental objectives and indicators that are relevant to the plan or programme.
- Likely significant environmental effects of proposed options and the implementation of the plan or programme.
- Measures to avoid, reduce or mitigate adverse effects and to enhance positive effects.
- Views and information from the relevant authorities, the public and, as relevant, potentially affected States.

SEA can be applied to a wide range of governmental plans, programmes, policies, and other strategic documents, which establish the basis for future decisions on projects (which may require Environmental Impact Assessment (EIA or OVOS, as it is abbreviated in Russian language) in such diverse fields as agriculture, forestry, fisheries, energy, industry (including mining), transport, regional development, waste management, water management, telecommunications, tourism, town and country planning, and land use.

(1) See e.g. Manual for Trainers on Application of the Protocol on Strategic Environmental Assessment (UNECE, 2018, https://www.unece.org/index.php?id=48758) or Protocol on Strategic Environmental Assessment: Facts and Benefits (UNECE, 2016, https://www.unece.org/index.php?id=42853).

(2) Protocol on Strategic Environmental Assessment to the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention).

1.2. BENEFITS OF SEA

In general, the effective and consistent application of SEA to economic and regional development planning can considerably assist countries in attaining sustainable development goals, greening their economies, and addressing climate change. Particular benefits include:

- Higher level of environmental and health protection: SEA identifies likely significant environmental and health effects of proposed strategic development options, and it equips planning authorities with suggestions to mitigate adverse effects and opens the planning to alternative development opportunities early in decision-making cycle.

- Promoting sustainable economic development and facilitation of the green economies: SEA helps reaching green economy targets by considering sustainable alternatives and innovations and encouraging the search for win-win options for further economic development within the carrying capacity of ecosystems.

- Improved planning by encouraging planners to consider a full range of risks and opportunities for more sustainable forms of development: introducing a well-structured SEA framework makes national planning more systematic, less sporadic and ultimately more effective.

- More efficient decision-making: Decision-making at the strategic level, which considers SEA outcomes, usually leads to fewer appeals and less discussion at the operational level. Such decision-making processes save time and are thus cost-effective.

- Improved governance by fostering higher transparency in planning and programming: SEA provides clear procedures for consultation and communication between the key national and local planning authorities, business and civil society (including CSOs).

- Prevention of costly mistakes that arise from neglecting environmental and health effects by providing early warning signals about environmentally unsustainable development options. SEA reduces the risk of costly remediation of harm or corrective actions, such as relocating or redesigning facilities.

- Strengthened environmental assessment processes at the project level: SEA can address effects that are difficult to grasp at the project level; in particular, SEA can provide an early warning of large-scale and cumulative effects. Therefore, certain aspects can be solved already at the strategic level, which streamlines application of environmental assessment at the project level.

- Prevention of intersectoral conflicts between various economic sectors within the country by examining the relationship of a plan or programme to other plans and programmes at the earliest stage of planning and offering alternatives that can help to avoid conflicts.

- Providing a tool for climate change adaptation and mitigation by introducing climate change considerations into development planning.

- Promotion of effective regional cooperation to address environmental issues and facilitation of transboundary consultations between the relevant national authorities and the public concerned regarding a plan or programme that could have adverse transboundary effects on the environment of a neighbouring state (e.g. shared protected areas, waterways, transport connections or and transboundary pollution).

1.3. KEY PRINCIPLES OF SEA APPLICATION

To leverage on its benefits described above, SEA should be conducted effectively following a set of general guiding principles[3] below providing that SEA should:

- Be undertaken by an authority responsible for a plan or programme and be integrated into and customized to the logic of the plan- or programme-making process.
- Be applied as early as possible in the decision-making process, when all the alternatives and options remain open for consideration.
- Focus on the key issues that matter in the relevant stages of the plan- or programme-making process. This will facilitate the process being undertaken in a timely, cost-effective and credible manner.
- Evaluate a reasonable range of alternatives, recognizing that their scope will vary with the level of decision-making. Wherever possible and appropriate, it should identify the best practicable environmental option.
- Provide appropriate opportunities for the involvement of the authorities, the public and other key stakeholders throughout the process, starting from its earliest stages, and in accordance with clearly formulated procedures. Ideally, it should employ easy-to-use consultation techniques that are suitable for the target groups.
- Be carried out with appropriate and cost-effective methods and techniques of analysis. It should achieve its objectives within the limits of the available information, time and resources, and should gather information only in the amount and detail necessary for sound decision-making.

(3) Adapted from UNECE Resource Manual on SEA (2012) and IAIA. 2002. Strategic Environmental Assessment: Performance Criteria. Fargo, ND: International Association for Impact Assessment.

2. EVOLUTION AND CURRENT STATUS OF SEA IN GEORGIA

Georgia initiated reforms of its environmental assessment system already back in 1996. A significant progress towards a fully developed SEA and EIA system in Georgia was made between 2013 – 2017. By signing the EU Association Agreement in 2014 Georgia committed itself to fulfill a number of obligations in the field of environmental protection, including in the area of environmental assessment. The effort made resulted in the adoption of a new national Code on Environment Assessment (hereinafter also 'EA Code' or 'EAC') in 2017, which represented an important step towards establishing a modern EIA and SEA procedure in the country. The Code transposes requirements of the Espoo Convention, its Protocol on SEA, and the EU SEA and EIA Directives into the national legislative framework. It needs to be noted that while EIA is widely applied in the country, only several SEAs have been carried out so far.

2.1. THE NATIONAL LEGAL FRAMEWORK FOR SEA

The EAC requires that strategic and policy documents prepared in certain sectors, including in the water resources management sector, are subject to the SEA. Besides, the EAC defined project-based procedures to examine potential impacts on the environment of the planned projects that fall within the scope of the activities provided by Annex I to the EAC, and of the activities provided by Annex II according to a screening decision.

According to the EA Code, the SEA is defined as ***a systematic process, to be undertaken to analyze likely environmental and health effects related to a strategic document[4] and to integrate findings into strategic planning for better decision-making.***

As outlined in the EA Code, the SEA includes following main steps:

- Screening to decide whether a strategic document has to be a subject to SEA;
- Scoping e.g. preparation of a scoping application, scoping consultations, and issuing the scoping opinion[4];
- Preparation of a SEA Report;
- Carrying out of public participation and consultations with relevant public authorities and stakeholders on the draft strategic document and the SEA report;
- Preparation of recommendations by the Ministry of Environmental Protection and Agriculture (MEPA) and the Ministry of Internally Displaced Persons from the Occupied Territories of Georgia, Labour, Health and Social Affairs according to the Art. 27.7 of the EA Code based on the findings of the SEA process, which should be taken into account during adoption/approval of the strategic document.

[4] Strategic document – a legal normative act adopted/approved by the public authority, which sets a framework for future development projects in the specific sectors as defined by the Environmental Assessment Code (EA Code) of Georgia.

2.2. SEA AND THE WATER RESOURCES MANAGEMENT SECTOR

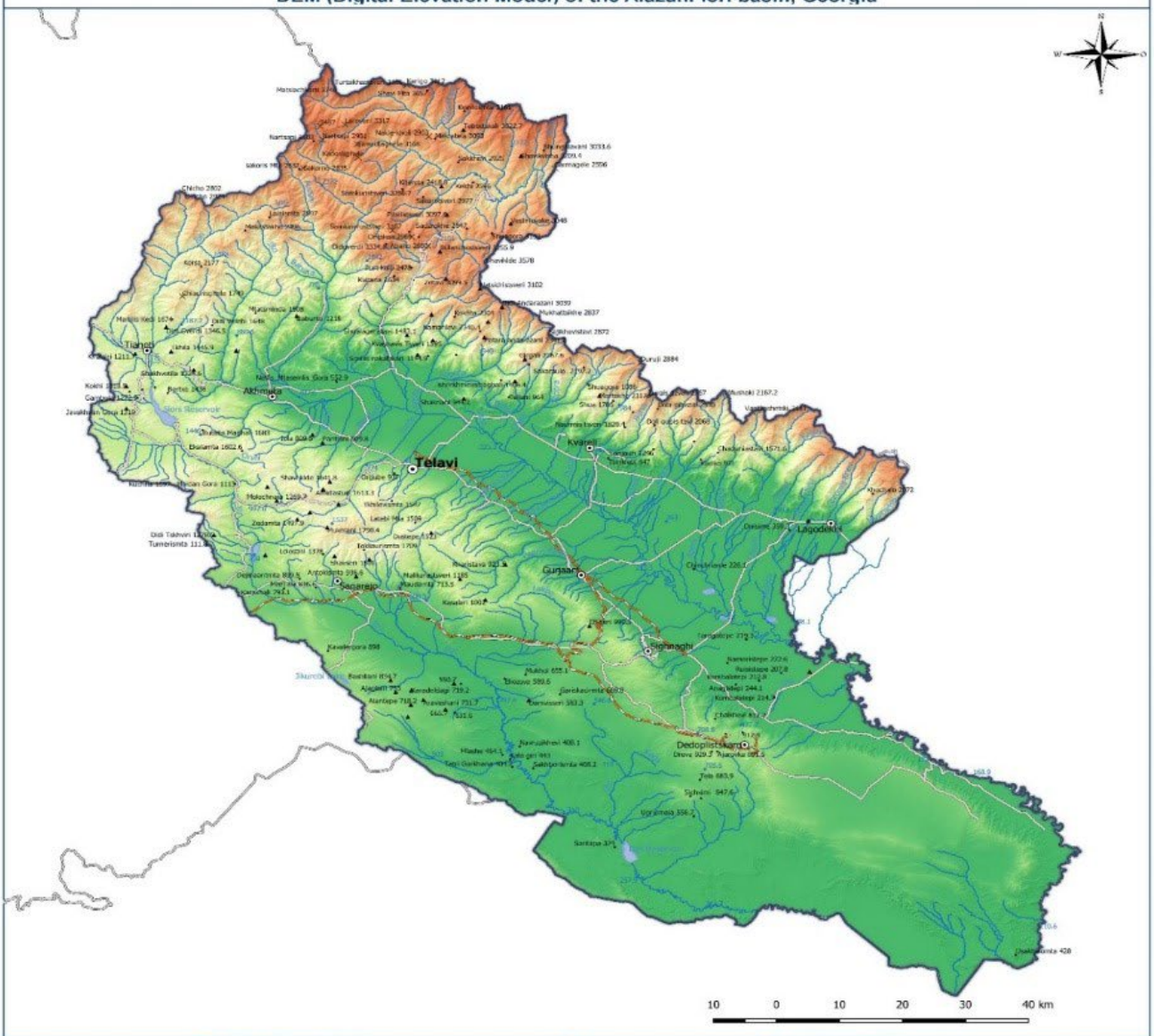
In the EU countries, the SEA is widely conducted for the strategic documents related to the water resources. The scope of application includes the strategic documents directly addressing water resources – in particular the River Basin Management Plans, which preparation and implementation is required by the EU Water Framework Directive[5] – as well as plans and programmes, which may affect the water resources e.g. spatial or land-use planning documents, or strategic documents in the field of energy and transport.

Preparation of the draft Law on Water Resource Management was initiated by the Ministry of Environmental Protection and Agriculture of Georgia (MEPA) and was prepared through donor assistance within the different projects and initiatives including the EUWI+ programme. the draft Law on Water Resource Management is currently ongoing intergovernmental consultations with the aim to adopt the Law in the nearest future.

The draft Law on Water Resource Management (WRM) introduces a river basin management approach in water sector and requires to develop and implement river basin management plans (RBMPs) for six basin districts. The draft Law identifies the MEPA as key planning authority for the RBMPs. Once the law is adapted, the RBMPs according to the EA Code will be subject to the SEA procedure.

(5) Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy

DEM (Digital Elevation Model) of the Alazani-Iori basin, Georgia



Thematic symbology

Scale of height (metre)

223 500 1000 1500 2000 2500 3000 3500 4500

Elevation (metre)

- Tops (m)
- Pass (m)
- Geodetic points (m)
- Water level mark (m)

Background layer legend

- State border
- Alazani-Iori basin
- River
- Lake / Reservoir
- Main road
- Rail road

Settelment

- Regional center
- District center

Location Map

Systeme Coordination Reference
UTM WGS 84

Scale
1:650000

Data source

DEM has been elaborated using SRTM (Shuttle Radar Topography Mission) data. Resolution 30m

"European Union Water Initiative plus for Eastern Partnership Countries"

EaP Eastern Partnership

REC Caucasus

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umweltbundesamt
ENVIRONMENT AGENCY AUSTRIA

3. SEA PILOT APPLICATION FOR THE DRAFT ALZANI-IORI RBMP

In order to enhance capacities of the Ministry of Environmental Protection and Agriculture of Georgia and to further build the national expertise in the SEA application, the United Nations Economic Commission for Europe (UNECE) within the framework of the project EU Water Initiative Plus[6] assisted Georgia in piloting the SEA for the draft Alazani-Iori River Basin Management Plan (RBMP).

The implementation of the SEA pilot project for the draft Alazani-Iori RBMP started in December 2019. The pilot project consisted of two main stages i.e. the scoping stage from December 2019 until April 2020 (including preparation of the scoping report and scoping consultations), and the SEA report preparation (April – September 2020), which was followed by the consultations on the draft RBMP and the SEA report (October – November 2020).

The approach to the SEA took into consideration the very nature of the RBMP, which is an environmentally oriented document. Therefore, the major focus of the SEA was to enhance the likely positive effects of the RBMP on the environmental including socio-economic and health issues relevant to the Alazani-Iori RBMP.

It needs to be noted that preparation of the RBMPs is not yet required by the national legislation (as of November 2020) and its preparation is of a pilot nature. Therefore, consequently the SEA for the Alazani-Iori RBMP could not be considered as a formal SEA under the EA Code. However, it had been agreed with the Ministry during initial stages of the SEA that the SEA for the draft Alazani-Iori RBMP pilot should – to the extent possible – follow the SEA main steps outlined in the EA Code and to meet the key requirements stipulated by the national SEA legislation.

3.1. BASIC INFORMATION ABOUT THE DRAFT ALAZANI-IORI RBMP

In accordance with the draft Law on Water Resource Management and the EU Water Framework Directive, the Alazani-Iori RBMP aims to achieve good status of water bodies, prevent deterioration of water status and ensure sustainable water management.

Following major water management issues in the Alazani-Iori River Basin were identified by the RBMP:

- Point source pollution from urban wastewater discharges;
- Point source pollution from industrial waste water discharges (sand-gravel extraction);
- Diffuse source pollution from agriculture-crop production;
- Diffuse source pollution from agriculture-animal live stocking;

[6] European Union Water Initiative Plus (EUWI+) programme: With financing from the European Union, the EUWI+ programme specifically supports the Eastern Partnership countries to move towards the approximation to EU acquis in the field of water management with a focus on trans-boundary river basin management. The overall objective of the project is to improve the management of water resources in the EaP countries, which is consistent with the EU Water Framework Directive (WFD). One of the specific objectives of the EUWI+ in Georgia is the development of River Basin Management Plans (RBMPs) in line with the EU Water Framework Directive. In particular, the project is supporting developments of the RBMPs for the Alazani-Iori and Khrami-Debeda River Basins.

- Diffuse source pollution from illegal landfills;
- Excessive water abstraction (irrigation, public water supply, hydropower plant (HPP), fish farm, and etc.);
- Hydro morphological alteration (hydrological flow changes, longitudinal river, habitat continuity interruption, morphological alterations).

The Alazani-Iori RBMP consists of following components: i) report on characteristics of the Alazani and Iori River Basins, ii) report on Pressures and Impact of Human Activities on Water Resources, iii) economic analysis of the RB, iv) programme of measures for water bodies of the Alazani-Iori RBMP, (v) economic analysis of proposed RBMP measures and vi) environmental objectives.

A programme of measures (PoM) represents one of the main components of the RBMP. It is derived from findings of the pressure/impact analysis and corresponding risk assessment and aims to address the impacts of above-listed water management issues. The PoM consists of two types of measures – ***Basic Measures,*** which are obligatory minimum requirements to be included in the PoM, and ***Supplementary Measures*** designed in addition to the basic measures to achieve the environmental objectives of the Water Framework Directive. Supplementary measures include additional legislative acts, fiscal measures, research and educational campaigns that go beyond the basic measures.

3.2. THE KEY ENVIRONMENTAL AND HEALTH ISSUES IN THE ALAZANI-IORI RIVER BASIN

Based on the analysis of the past development and current status of the environment and health in the Alazni-Iori River Basin, the SEA identified following key environmental and health issues, which are relevant to the RBMP i.e. the issues which may be affected (both positively or adversely) by the implementation of the RBMP (and in particular by the programme of measures):

KEY ISSUES	SPECIFIC CONCERNS
WATER RESOURCES	Industrial and urban wastewater discharges and run-offs Agriculture diffuse sources of pollution Other discharges
	Potentially contaminated groundwater
	Weak groundwater monitoring
	Insufficient hydrological monitoring network
	Dilapidated and inefficient irrigation systems
	Structural issues of dams and reservoirs
NATURAL HAZARDS	Hails
	Floods/flashfloods
	Riverbank erosion
	Mudflows
	Landslides
SOIL	Soil pollution
	Soil degradation
CLIMATE CHANGE AND RELATED RISKS	Prolonged drought and associated water deficit
	The potential increase of climate induced natural hazards
BIODIVERSITY, HABITATS AND PROTECTED AREAS	Population of fish, in particular endangered species
	Population of other water dependent species especially vulnerable and endangered species
	Iori floodplain forests
	Alazani floodplain forests
	Protected Areas
	Emerald Sites and Biosphere Reserves

PUBLIC HEALTH	Quality and safety of drinking water and water used for households
	Quality and safety of water used for agricultural processes
	Undisturbed supply of water to medical and public health infrastructure
	Access to healthcare services in case of emergencies
	Knowledge, attitudes, and practices (KAP) of local communities
SOCIO-ECONOMIC FACTORS	Economic growth & pressure on the quality of water Demographic transition & depopulation, especially in mountain areas Unemployment & low income
	Low awareness of local stakeholders/Unsustainable economic activities/ practices Inefficiency/Inadequate infrastructure and services
CULTURAL HERITAGE	Potential physical damage to the cultural heritage assets and its features

Water bodies at risk and Emerald network sites in the Alazani-Iori river basin district

Thematic symbology

Emerald network

- Emerald network

Risk category

- At risk
- Possibly at risk
- Not at risk

Background layer legend

- Regional center
- District center
- River
- Lake/ Reservoir
- Alazani-Iori river basin

Location Map

Systeme Coordination Reference

UTM WGS 84

Scale

1:650,000

Activity implemented by UNECE, Austria & International Office for Water, France

Data source

Alazani-Iori RBMP / Ministry of Environmental Protection and Agriculture

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3.3. MAIN SEA FINDINGS REGARDING THE LIKELY ENVIRONMENTAL AND HEALTH EFFECTS

WATER RESOURCES: The RBMP provides a coordinated framework for improving the water quality and water resources management in the Alazani-Iori River Basin through comprehensive measures and interventions. The implementation of the RBMP measures such as construction of Waste Water Treatment Plants (WWTPs) and sewage system and rehabilitation of wastewater network, replacement of the water supply network, wells, and collectors, as well as other indirect measures proposed by the RBMP, such as development of the Actions Plans for Nitrate Vulnerable Zones, Codes of Good Agricultural Practices for Protection of Waters against Agricultural Nitrate Pollution, etc., will have direct positive effects on the water quality.

The implementation of measures specified in the Alazani-Iori RBMP will have a positive effect on the hydrology of the basin. The measures specified in the RBMP aim to address current and future issues related to hydrology in the river basin, including rehabilitation of irrigation systems to reduce water loss, regulation of water abstraction/impoundment, and determination and maintenance of moderate flow to ensure that sufficient water is available for water-dependent ecosystems, as well as climate change impacts on water bodies is considered. Besides, it envisages the improvement of hydrological monitoring network, which can provide additional data to assess water balance in rivers. This will serve as a basis for informed decision making on the water quantity to be released into irrigation canals, as well as to plan other water abstraction activities appropriately e.g. development of new hydropower plants.

SOIL: Implementation of the RBMP will have overall positive effect in terms of reduced soil pollution and degradation. The measures including the establishment of organic farms, setting up vermikompost (producing bio humus), supporting good practices for applying fertilizers, and managing livestock in the Alazani-Iori River Basin will contribute to improved soil structure and quality in the basin, where the agriculture is one of the leading economic sectors.

NATURAL HAZARDS: The rehabilitation and construction of protective hydraulic structures will contribute to the reduction of river bank scouring and inundation during floods/flash floods. Periodical removal of solid sediments from rivers and deepening-alignment of their channels will mitigate the negative effect of mudflows. Adequate hydrological monitoring network will help also to identify the areas that are prone to floods/flash floods and select proper locations for installing early warning systems. The RBMP addresses issues such as riverbank protection and other control measures, which in turn will facilitate the restoration of the river channel and its morphology to ensure the maintenance of near-natural state of rivers. Thus, the implementation of the RBMP will significantly improve the current situation; however, additional measures need to be introduced in the plan for reducing the risk of natural hazards in the basin.

CLIMATE CHANGE: As it can be concluded from the baseline analysis, climate change will affect the Alazani-Iori Basin in the future and there is a number of risks associated with this, including water deficit and increased frequency and magnitude of climate-induced natural hazards. Therefore, it is important that climate change impacts are well studied and climate change adaptation is addressed in the RBMP in short- and long-term perspectives. There are RBMP measures directly focused on consideration of climate change impact on water bodies, as well as other indirect measures e.g. those related to water abstraction regulation. It is obvious that the implementation of those measures will contribute to improved preparedness and adaptation of the basin regarding the consequences of climate change.

BIODIVERSITY, HABITATS AND PROTECTED AREAS: It is expected that RBMP implementation will have positive impacts on floodplain forests especially along the Iori river. Most important measures in this regard are those related to the enhancements of environmental flow level in the river by reviewing water abstraction quantities and development of methodology for the assessment of environmental flow levels. Direct measures of floodplain forests restorations are envisaged also by the PoMs with expected significant positive impacts.

Implementation of RBMP will have indirect positive impacts on aquatic species, especially on fish fauna and other water related species through promotion of improvement of water quality, restoration of ecological flow reducing fragmentation of water bodies. However, PoMs do not envisage direct measures for the improvement of conservation status of water related species, including endangered species. Most of the supplementary measures is expected to have positive indirect effects on species and habitats conservation status through improvement of water quality and hydromorphological conditions.

HEALTH: Water resources represent an essential aspect of human health and its improved supply and quality – as a result of the RBMP implementation – will improve health of the population in the basin. Access to water and sanitation are essential for the functioning of medical facilities, which, in turn, also play a significant role in ensuring the health of the population. Besides, water treatment and rational use of water for agricultural purposes promotes not only water conservation, but also the management of crop contamination from chemical and biological pathogens. However, there are interim risks (mainly at the local level) associated with the implementation of proposed measures.

SOCIO-ECONOMIC DEVELOPMENT: The measures proposed by the draft RBMP have a potential to significantly support the sustainable socio-economic development of the Alazani-Iori river basin.

The RBMP actions will considerably support the employment and revitalization of certain economic areas in the river basin, especially in mountainous areas and the places with proposed new communal services. These RBMP actions will support sustainable development of local communities, facilitating provision of proper social-economic conditions (increased employment and income as well as improved living conditions) necessary for improved life quality.

CULTURAL HERITAGE: Construction works needed for the implementation of certain RBMP measures (e.g. construction of wastewater treatment facilities, flood defenses, channels, crossings, etc.) may potentially disturb previously undiscovered archeological remains near or within water bodies thus leading to potential negative impacts of the RBMP implementation. However, based on the assessment carried out in the SEA, it can be concluded, that the impact of these processes on water resources (and vice-versa - the impact of the state of water resources on the process of managing cultural heritage), will be minimal.

Water bodies at risk and Protected areas in the Alazani-Iori river basin district

Thematic symbology

Protected areas

- Protected areas

Risk category

- At risk
- Possibly at risk
- Not at risk

Background layer legend

- Regional center
- District center
- River
- Lake/ Reservoir
- Alazani-Iori river basin

Location Map

Systeme Coordination Reference

UTM WGS 84

Scale

1:650,000

Activity implemented by UNECE, Austria & International Office for Water, France

Data source

Alazani-Iori RBMP / Ministry of Environmental Protection and Agriculture

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3.4. MITIGATION MEASURES PROPOSED BY SEA

In a response to identified likely effects, the SEA formulated measures to avoid, mitigate or compensate the likely adverse effects of the RBMP as well as measures to enhance the likely positive effects. There are two types of mitigation measures proposed by SEA:

1. Measures to be considered in the RBMP (i.e. before it's approval or adoption): these include the proposals for additional measures or activities to be considered when finalizing the RBMP (and in particular the PoMs with measures selected for the first implementation cycle);
2. Measures and conditions that should be followed up by a relevant agency when implementing RBMP measures. It includes also studies and research to be conducted – as a part of the RBMP implementation – to provide a solid basis for decisions on specific RBMP projects and activities. Implementation of these measures and conditions should be supervised by the MEPA.

Although the RBMP does not promote further development of the hydropower in the basin, the construction of new Hydropower Plants (HPPs) that is planned in the basin, will have significant impacts on certain environmental and health issues addressed in the SEA. Therefore, SEA formulated also specific mitigation measures to address selected environmental aspects of the future hydropower development in the basin.

The list below summarizes the main measures proposed by SEA.

3.4.1 MEASURES TO BE CONSIDERED IN THE RBMP

WATER RESOURCES

- Considering the intensive mining of the sand/gravel in the basin, it is important to address the sustainable management of sand/gravel extraction. Therefore, an emphasis should be placed on setting up the monitoring plans/measures that will provide data/information on changes in sand/gravel extraction or sediment transport capacity. Such information will enable the authorities to evaluate the long-term effect of mining activities on water bodies both upstream and downstream of the sand extraction sites and propose relevant mitigation measures or management measures e.g. regulations to keep natural conditions of rivers in the basin.
- In order to enhance efficiency of water resources use, the training and awareness-raising programs envisaged by the draft RBMP should also include best practice examples and knowledge sharing activities on how to optimize the use of irrigation water (e.g. irrigation at critical stages of crop growth, during droughts, irrigating at night, etc.). Also, pilot projects on efficient use of water resources for all type of water users in the region should be supported to disseminate and increase the knowledge and strengthen skills of the local population, which will also contribute to better preparedness to mitigate or adapt to the likely consequences of climate change.

NATURAL HAZARDS

- In order to improve preparedness to natural hazards (in particular floods/flash floods), preparation of the action plan for the rehabilitation of dams/reservoirs should be proposed in the RBMP, along with a dedicated study on the technical conditions of the dams/reservoirs (especially those used

for irrigation purposed) to determine the state of potential structural damage of dams/reservoirs.

CLIMATE CHANGE

- Implementation of activities (i) on testing and promoting new drought-resistant crop varieties in Kakheti is advised; and (ii) to increase the awareness on such approaches among farmers respective measures should be included in the RBMP.

BIODIVERSITY, HABITATS AND PROTECTED AREAS

- To increase positive impacts on biodiversity, establishment of the organic farms should be promoted in agriculture areas within the Sea Pilot Application (SPAs) and around the Korugi and Iori Managed reserves, as well as around Alazani proposed emerald sites (rivers Inaboti, Apeni, Ole, etc.) and adjacent areas to the Alazani Natural Monument and Vashlovani National Park (villages Sabatlo, Pirosmani).
- Special studies to identify the most threatened freshwater species, as well as to assess the main impacts and threats on freshwater biodiversity within the Alazani-Iori river basin should be included among the RBMP measures for the first implementation cycle.
- Special measures are proposed by the RBMP for the Dali Reservoir that will have a positive effect on the Iori floodplain forests. However, none of these measures are selected to be implemented during the 1st implementation cycle. Considering the importance of the Dali reservoir for biodiversity composition, it is highly recommended to include measures related to the Dali reservoir in the first implementation cycle of the RBMP.

HEALTH

- In order to strengthen the positive effects of the public campaigns promoting efficient water use by domestic customers, the communication plan (preparation of which is proposed by the RBMP) should also address (i) information regarding the risks associated with discharging household wastewater; and (ii) advantages of the use of modern appliances (such as a dishwasher, washing machine, etc.) for efficient use of water;
- Preparation of a system of monitoring and elimination of incidences (including their timely detection, reporting, etc.) should be included to the supplementary measures proposed by the RBMP "Implementation of water resources monitoring program and environmental inspection controls".

SOCIO-ECONOMIC ASPECTS

- Development of a system of environmental fees to cover costs related to the implementation of measures should be included among the Alazani-Iori RBMP measures gradually with a short- and long- term perspectives.

3.4.2. MEASURES AND CONDITIONS FOR THE RBMP IMPLEMENTATION

PRIORITY AREAS AND LOCATIONS

- Mudflow control structures shall be built in the middle course of all rivers that are prone to the occurrence of mudflows to protect human settlements and infrastructure, in particular in Duruji, Telaviskhevi, Kabali, Lagodekhiskhevi, Shromiskhevi, Ninoskhevi, Avaniskhevi, Turdo, and Khodashniskhevi river channels. Preference should be given to the Kherkheulidze type protection dams.
- Sagarejo city should be among the priority areas for constructing the WWTP.
- Early warning systems shall be implemented downstream of all water reservoirs and in the gorges of high-risk rivers including Duruji, Lagodekhiskhei, Ninoskhevi, Shromiskhevi, Chelti, Stori, Telaviskhevi, Tudro, and Khodashniskhevi.
- Rehabilitation of existing and setting up new irrigation systems is recommended to be implemented first in Sagarejo and Dedoplistskaro, where drought represents the most significant problem within the basin, followed by Sighnagi, Akhmeta, and Gurjaani municipalities.

DESING AND ASSESSMENT OF SPECIFIC PROJECTS TO BE IMPLEMENTED UNDER THE RBMP

- It is recommended to identify ecological priority zones, trade-off zones, and zones with no particular restrictions or conservation interest of the floodplain forest areas along the entire length of the Iori and Alazani Rivers. This zonation scheme may serve as the basis for complying with development targets and improving the rivers' ecological status[7]. Zonation scheme also may set a foundation to identify priority areas for floodplain forests restoration measures.
- Maintenance of the environmental flow as well as lifecycle and conservation requirements of the key species and habitats should be considered in the design of the abstraction licensing /control system.
- Limits for the water abstraction should be defined and licenses should be issued within the limits to ensure that sufficient amount of water is maintained in the water bodies enabling a long-term survival of water dependent species and habitats.
- Selection of the locations for the new infrastructure (e.g. waste-water treatment plants or sewerage systems) should be based on the analysis of the site alternatives (optimally to be carried out as a part of EIA), which should consider following criteria:
  - sites with already modified habitats and secondary vegetation should be preferred;
  - sites with sensitive habitats (forests, wetlands, less modified areas) should be avoided;
  - sites with the presence of Red Listed species should be avoided.
- EIAs to be carried out for rehabilitation or construction of new drainage systems should consider suitable drainage water treatment methods and discharge points location and analyze reasonable alternatives. The alternatives may include e.g. treatment lagoons, constructed wetlands, and stabilization ponds.

[7] The recommendation is developed based on the case study – *Hydromorphological restoration priorities in Austria* presented in the Guidance document on the requirements for hydropower in relation to EU Nature legislation, European Commission, 2018.

- EIAs for new waste-water treatment plans project should include a detailed analysis of impacts on biodiversity, including the Red List species. Field surveys should be conducted as a part of the assessment to identify flora and fauna species, especially the Red Listed species that may be affected by the construction activities.
- As a part of the infrastructure project preparation, the medical emergency management plans should be prepared to address specific health hazards the workers can be exposed to. The plans should provide a scheme of actions to (i) timely detect injury or exposure, (ii) provide immediate medical assistance at the site, (iii) ensure the transport to nearest, adequately equipped and staffed healthcare facility for additional medical assistance, if needed.
- Temporary shortage of water output to household and healthcare facilities, which represents a risk during construction works, should be addressed by ensuring alternative water supply as well as proper and early communication and public information campaigns.

MONITORING AND DATA COLLECTION

- Additional hydrological observation stations shall be deployed in the basin in areas that are prone to mudflows and floods, close to the water intake-discharge points, as well as downstream and upstream of water reservoirs (for hydropower plants). In particular, hydrological observation stations (water level measurements) should be located along the Iori river: in the upper and lower reaches of the Sion Reservoir, in the lower and upper reaches of the Paldo Reservoir, in the upper and lower reaches of the Dali Mountain Reservoir, and on the irrigation canals of the Iori river basin. Hydrological observations stations should be located in the Alazani basin: on main irrigation canal of the Alazani river, lower and upper reaches of the Samkuristskali 1 HPP, on the rivers Ilto, Stori, Turdo, Lopota, Intsoba, Chelti, Shromiskhevi, Duruj, Bursa, Chermistskali, Kabali, Ninoskhevi, and Lagodekhiskhevi.

RESEARCH AND DEDICATED STUDIES

- To ensure the improvement of sediments transport continuity via dam management, it is important to conduct research and identify the condition of dams/reservoirs e.g. conditions of spillway gates. Spillway gates of the water reservoirs shall be rehabilitated to ensure sediment transport continuity. A relevant study covering the direction and velocity of sediment transport, volumes of transported materials shall be carried out. It is also important to study and determine the near-natural conditions (velocity and amounts) of rivers based on which proper continuity of sediment transport can be ensured.
    - Special studies could be recommended to be carried out to assess the impacts of hydromorphological alteration of rivers, water abstraction and water pollution on species and habitats protected within Korugi and Iori Managed reserves, based on which appropriate conservation measures should be planned.
    - Detailed studies and assessments on fish and invertebrate fauna should be carried out as a part of planning and designing the projects on sediment transport improvement. For example, such studies should be conducted before implementation of the measures related to Dali Reservoir such as restoration of the natural flooding regime and improvement of the infrastructures (for instance shield restoration).
    - Protection of spawning areas for fish species should be addressed by material removal and sediment extraction regulation. The operation of machinery for material removal and sediment extraction into the river stream must be restricted. Arrangement of protective barriers between excavation areas and water stream should be required.

STAKEHOLDERS' INVOLVEMENT

- The Agency of Protected Areas, administrations of the Iori and Chachuna Managed Reserves and other stakeholders active in the field of nature protection should be involved in the planning and design of the projects on riparian habitats improvement and diversification to avoid any unexpected impact on the natural tugay forest habitats along the Iori River.
- Employment of the local community members in implementation of the RBMP-related activities (e.g. construction works, operation of WTTPs) should be a priority. In order to enhance working skills and capacities of the local population, a special campaigns and capacity development activities (trainings, workshops, etc.) should be provided to the local workforce.

3.4.3. MEASURES REGARDING FUTURE HYDROPOWER DEVELOPMENT

- Up to 5 HPPs are planned to be built in the Alazani-Iori Rives Basin in 5-year period and additional HPPs are expected to be built in a long-term perspective. Therefore, in order to address likely cumulative effects, a dedicated SEA should be assigned for the relevant strategic document prepared in energy sector, which will address hydropower development in the basin. The SEA should include analysis of the likely cumulative impacts of existing and planned hydropower plants, in particular addressing (i) surface water availability, (ii) likely consequences of the climate change (including its likely effects on the water flows), and (iii) fish migration.
- Environmental flow is crucial for maintaining the river morphology and its habitats, as for the determination of amounts of water to be released into irrigation systems and impounded in water reservoirs. The rate of environmental flow established in the Georgian legislation (10% of average multiannual flow) does not ensure the maintenance of river morphology as the approach of calculation of environmental flow is outdated (it is based on the Soviet standards and norms, and does not meet modern requirements). Therefore, the calculation of environmental flow (carried out separately for each river) should be based on international practice/methodology and formulated as a law (the value of environmental flow should be integrated into the legislation and subjected to regulation). It is also important to strengthen the monitoring of environmental flow at upstream and downstream of water reservoirs, HPPs and irrigation systems.

4. LESSONS LEARNED

The SEA for the Alazani-Iori RBMP represents the first attempt to conduct the SEA for RBMP in Georgia, and one of a few SEA pilot applications in the country. It revealed following main lessons learned:

- There are certain similarities between the RBMPs and SEA – they both:
  - Aim to improve the quality of the environment;
  - Include analyses of various environmental aspects;
  - Requires public participation and consultations with stakeholders.

Therefore, the design of and approach to SEA for the RBMPs has to ensure that possible overlaps between the two processes are minimized, and that SEA is carried out in a way which focuses on providing maximum benefits and added value to the preparation of the RBMPs.

- In accordance with above point, the SEA for the draft Alazani-Iori RBMP concluded that there are mainly positive effects related to the RBMP implementation, while the likely adverse effects will be related to the implementation of the specific projects and are expected to be only of a local nature and can be effectively addressed by relevant mitigation measures .

- Most of the mitigation measures formulated by SEA aim to enhance expected environmental and health benefits and positive effects of the RBMP.

- It is essential to ensure communication with the authority coordinating preparation of the RBMP as well as with the experts preparing the document in order to discuss proposals by SEA and the way of their integration in the draft RBMP.

- The SEA pilot application represents also a tool for capacity building and awareness raising on SEA among the actors involved, including the national experts conducting the SEA i.e. the national SEA team.

- In this context, it must be noted that restrictions imposed due to COVID 19 pandemic affected the SEA pilot project implementation process. Although the project envisaged an extensive training events to be organized for the national experts and other main stakeholders, the full-scale implementation of these events was hindered due to the restrictions imposed to public life (including gatherings). Therefore, the second training for national experts was provided only in a form of the webinar that turned out to be less effective than 'face-to-face' meeting. The COVID-19 related travel restrictions also did not allow organization of the mission of national experts to the Alazani-Iori River Basin and international expert to Georgia during preparation of the SEA report and thus limited opportunity of the joint work of the entire team. Although partially replaced by online communication means, similar to the webinar, this approach did not enable a full-scale knowledge and practice sharing.

- Analyses carried out within the SEA revealed certain gaps in data and information, in particular:
  - Biodiversity monitoring system is developing only now and data on the status of endangered and vulnerable species in the basin are very limited or not available;
  - Groundwater monitoring was resumed in 2013 and since then the monitoring network is being subject to gradual extension. Currently, there are 33 monitoring stations. These monitoring stations and data are not sufficient to allow adequate assessment of the quality and quantity of groundwater in the basin.

- Current soil monitoring in the Kakheti region is not systematic and does not allow for quantitative analysis and assessment.
- Impacts of water pollution by chemical substances on human health are generally not well studied in Georgia. The national systems to investigate and identify the source of outbreaks of common conditions which could be caused by water pollution, such as diarrheal diseases, are not fully functioning. The National Center for Disease Control and Public Health (NCDC), which is the governmental agency responsible for outbreak investigations, is expected to improve the monitoring system by 2022.

5. RECOMMENDATIONS FOR FURTHER DEVELOPMENT OF SEA IN THE WATER RESOURCES MANAGEMENT SECTOR

After adoption of the Law on Water Resource Management, preparation of the RBMP should become a standard planning scheme, and individual RBMP will be a subject to SEA. Also, SEA should be applied for other strategic documents, which may have effects on the water resources including hydropower development, water transport, as well as spatial plans. In order to ensure effective future application of SEA in the water management sector, following actions can be recommended:

- Preparation of the guidance: General guidelines on practical application of SEA were drafted in Georgia in 2016. However, considering a special nature of the RBMP, preparation of a dedicated guiding document on SEA for the RBMP can be recommended. This guidance should provide specific recommendations on how to carry out SEA for the RBMPs, both from substance and procedural aspects point of view.

- Enhancing SEA-related capacities of the planning authorities: The authority responsible for preparation of the strategic document has to ensure the SEA is conducted in accordance with the Environmental Assessment Code. Therefore it is important there are sufficient capacities to perform SEA-related tasks including selection of SEA experts, ensuring communication with the MEPA and other governmental agencies during the SEA, addressing suggestions formulated by SEA in the draft strategic documents, etc. Specific activities may include organization of awareness raising events (i.e. a series of a small workshops and dissemination of information materials) as well as the training courses on SEA for planning authorities in the water management sector.

- Facilitating the discussion on the budgetary aspects: SEA application requires finances to be allocated from the budgets of the respective planning authorities. Therefore, it is important to ensure the necessary funds are available when the SEA will be legally required for the RBMPs. As allocation of finances may be relatively long process, it would be important to launch an initial discussion together/soon after adoption of the Law on Water Resources Management.

- Experience sharing: an experience sharing workshop may be organised after several SEAs are carried out in the water management sector to discuss the lessons learned and outline future steps of SEA development in this field.

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