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# Integrated Natural Resource Management Plan, Upper Alazani/Ioni Pilot Watershed Area Republic of Georgia

Integrated Natural Resource Management Plan Series



UNESCO-IHE  
Institute for Water Education



Integrated Natural Resources Management in the Republic of Georgia Program



# **Integrated Natural Resource Management Plan, Upper Alazani/Ioni Pilot Watershed Area**

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Republic of Georgia

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## LIST OF ACRONYMS AND ABBREVIATIONS

ADB – Asian Development Bank  
CARE International - Cooperative for Assistance and Relief Everywhere International  
CBO – Community-based Organization  
CENN – Caucasus Environmental NGO Network  
EBRD – European Bank for Reconstruction and Development  
EU – European Union  
GLOWS – Global Waters for Sustainability  
GIZ - Deutsche Gesellschaft für Internationale Zusammenarbeit, the German Society for International Cooperation  
GNERC - Georgian National Energy and Water Supply Regulation Commission  
INRMW – Integrated Natural Resources Management in Watershed  
IWMP – Integrated Watershed Management Plan  
KfW – Kreditanstalt für Wiederaufbau, German Development Bank  
km<sup>2</sup> – square kilometer  
Ltd – Limited Liability Company  
MDF – Municipal Development Fund  
MIA – Ministry of Internal Affairs of Georgia  
MoA – Ministry of Agriculture of Georgia  
MoENRP – Ministry of Environment and Natural Resources Protection of Georgia  
MES – Ministry of Education and Science of Georgia  
MESD – Ministry of Economy and Sustainable Development of Georgia  
MoF – Ministry of Finance of Georgia  
MoH – Ministry of Health of Georgia  
MRDI – Ministry of Regional Development and Infrastructure  
NEA – National Environment Agency, MoE  
NGO – Non-governmental Organization  
PAs – Protected Areas  
Sida – Swedish International Development Cooperation Agency  
WEAP – Water Evaluation and Planning System  
UNDP – United Nations Development Program  
UNESCO-IHE – UNESCO Institute for Water Education  
USAID – US Agency for International Development  
UWSCG- United Water Supply Company of Georgia  
WB – World Bank  
DEMO – demonstration projects

## 1. BACKGROUND

The Alazani River is a major watercourse in the Kakheti region, traditionally the agricultural province of Georgia. Viticulture, the leading field, is supplemented by fruit-growing, cultivation of cereals and intensive stock farming in the Alazani River Valley. Total catchment area of the Alazani River is 11,800 km<sup>2</sup>, with 6,962 km<sup>2</sup> of the area located in Georgia. The upper Alazani pilot watershed area, for which the given Integrated Natural Resources Management Plan (hereafter Integrated Watershed Management Plan-IWMP]) is developed, encompasses the Akhmeta and Telavi municipalities, covering more than 3,300 km<sup>2</sup> area.<sup>1</sup>

The waters and associated resources of the Alazani river basin, including land and biological resources, have various essential and economic functions, involving but not limited to: provision of drinking water, nutritional base, energy and clean environment to the population; provision of water for agriculture, industries, fisheries and power generation; provision of local resources (e.g. fire wood, timber and wood chips as construction materials, non-timber resources, etc.) for subsistence economies; maintaining ecosystem integrity, richness and healthiness (water, soil and climate regulation, etc.); disaster risk reduction (prevention/control of floods, landslides, mudflows and avalanches); and provision of recreational resources to the population.

The upper course of the Alazani river basin, especially the territory located within the boundaries of the Akhmeta municipality, is less urbanized and is still covered with natural ecosystems of high ecological value, including high mountainous forests. These ecosystems are very attractive for tourists. Due to poor access to rural energy, the local population uses timber for heating and cooking purposes. Without a common forest management policy and regulations or a monitoring system, people log in easily accessible areas, which accelerates land erosion in the forests and their vicinities and lead to the deterioration of water, disaster risk reduction and the climate regulation functions of forests.

Protected Areas (PAs) in the pilot areas are under pressure from poaching, grazing, unsustainable tourism and logging. The Tusheti Protected Landscape is bordered by the state reserve and the National Park. Without clear boundaries between these categories of PAs, the wildlife inhabiting the park and the reserve will be threatened by hunters. Illegal hunting is a significant threat to the local wildlife inhabiting the Batsara state reserves and Ilto managed reserve. Hunting intensifies during fall season; the major targets are deer and bears.

The pilot area is very rich in water resources, both surface and ground waters, which are primarily used for irrigation hydropower generation and drinking. Currently, irrigation water use much less, than during the Soviet period. There are plans to build a number of small to medium size hydropower plants on the Alazani River and its tributaries. Therefore, it is necessary to evaluate the cumulative negative impacts on the water, forest and land resources. According to the "Evaluation of the vulnerability of upper Alazani pilot watershed area river runoff to climate

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<sup>1</sup> Hydrologically, Tusheti does not belong to Alazani river basin, but it is included in Akhmeta municipality and has high ecological and economic value for the entire district. Therefore it is included in upper Alazani pilot watershed area. For detailed description of selection process and methodology of pilot watershed areas, please refer to Technical Report 3. Selection of Pilot Watersheds/Areas July, 2011, <http://www.globalwaters.net/wp-content/uploads/2012/12/Technical-Report-3-Selection-of-Pilot-Watershed-Areas-Eng.pdf>

change<sup>2</sup>, by the global hydrological model, river runoff in 2020-2050 will decline by 12%. The regional model, on the other hand, with a scale more relevant for the Upper Alazani pilot watershed areas, shows no change in average annual runoff of the Alazani river. However, it predicts change in seasonal flow as a result of climate change impacts.

In accordance with CENN climate change and disaster vulnerability and risk assessment<sup>3</sup>, conducted under the INRMW-Georgia program, climate change will have an impact on the seasonal and annual regime of precipitation that will be expressed as increased maximum precipitation values and increased number of consequent days with maximum precipitations that may lead to increased occurrences and intensity of flash floods.

It should be mentioned that none of the villages located in the upper Alazani pilot watershed area have centralized sewerage systems or treatment facilities; untreated wastewater is discharged directly on the earth's surface and into the rivers causing the pollution of surface waters. Groundwater is polluted by the seepage of pollutants from pit latrines. In urban areas, where centralized sewerage systems are present, there are no wastewater treatment plants and, as in the rural areas, the untreated wastewater is discharged directly on the earth's surface or into the surface waters.

The rural population has very limited access to safe drinking water due to the poor technical conditions and an obsolescence of existing centralized water supply systems and an absence of drinking water treatment facilities. Drinking water is monitored regularly only in Telavi and Akhmeta; there is no drinking water quality monitoring for rural systems.

Waste management is very poor in the pilot area. Legal and illegal waste disposal sites that do not meet any sanitary requirements are one of the major sources of ambient pollution. Waste collection is also poor in the region, with more or less properly functioning systems present only in the urban areas and some villages. Many villagers dump their waste directly into the ravines and riverbeds. Unsanitary conditions in the villages and the pollution of the surrounding environment, including recreational areas, hinders significant tourism development.

Ambient water quality monitoring is very weak in the targeted watershed. There is no ground water monitoring system and surface water quality is measured at only one point. Therefore, it is very difficult to judge the exact state of the surface and groundwaters.

The planned hydropower development will improve the economic situation in the pilot area. However, it may disturb the ecological balance of the watershed by changing river and sedimentation regimes, transforming existing landscapes, and destroying habitats for many land and aquatic animal species.

In order to address the issues mentioned above, the IWMP for the upper Alazani pilot watershed area was developed under the USAID/GLOWS IRMW program.

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<sup>2</sup> The study - Detailed Assessment of Natural Resources of the upper Rioni pilot watershed area was developed under INRMW project. <http://www.globalwaters.net/wp-content/uploads/2012/12/UpperRIONIdetailedAssesment04-08-13.pdf>

<sup>3</sup> Upper Alazani pilot watershed area -Assessment of the Vulnerability to Natural Disasters and Climate Change. Plan of Mitigation and Adaptation Measures. May 2013



## 2. METHODOLOGY AND LIMITATIONS

The integrated watershed management planning process included the following stages: 1. Identification of priority problems by target communities; 2. Identification of priority problems by local experts hired under the INRMW program; 3. Synthesis of problems identified by experts and local stakeholders and their validation at the community and local authority level; 4. Identification of priority interventions by the INRMW program experts, local communities and authorities; and 5. Compilation of watershed issues, needs, opportunities and interventions into one document – IWMP by the INRMW program team.

In order to identify the priority watershed issues, needs and opportunities as well as to define the priority interventions at the community and/or watershed level, a holistic approach was utilized to incorporate the specific problems recognized in the larger context of the watershed and to achieve a cooperative, integrated watershed resource planning and management. Another conceptual idea in the designing of the planning process was a participatory approach to ensure the engagement of all interested parties in the course of action. The specific steps designed to employ these methods into the process of developing the watershed plans are described below.

Based on the two major principles described above, the planning activity was conducted by means of: 1. Intensive consultations with and engagement of the local stakeholders (members of 16 target communities, selected through an application of multiple criteria<sup>4</sup>, well-representing the rural population of the upper Alazani pilot watershed area and representatives of local authorities) achieved through conducting community questionnaires and a series of stakeholder meetings and workshops; and 2. The work of the expert team, composed of local experts, tasked to characterize and assess the overall condition of the watershed and its resources, including various geographic, geologic, hydrologic, socio-economic, ecological and other considerations. Land and forest use, as well as water body conditions were also assessed, including pollutant sources and monitoring data, although very limited due to the weakness of the monitoring system. Next, based on the expert analysis and recommendations, as well as the stakeholder input ensured by the participatory meetings conducted in Telavi and Akhmeta, the priority problems were identified and the recommendations for the solution were developed.

Along with a number of meetings with local authorities, several workshops hosting the representatives of the local target communities were conducted. The goal of the first workshop was to identify the priority issues of the targeted villages and communities. The priority issues revealed through this collaborative and participatory process were based on the extent of their impact on key ecosystem functions and the services as well as on their economic and health impacts (see Annexes 2 and 3). More specifically, the watershed issues were listed with maximum attainable scores assigned to them as per specially elaborated environmental and socio-economic criteria: 1. Negative impact on the health status of villagers; 2. Negative impacts on the

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<sup>4</sup> Detailed description of the entire process, methodology and outcomes of the selection of target communities is included in the following documents: i) Technical Report 4. Selection of Target Communities in Pilot Watersheds (Ambrolauri, Oni, Telavi and Akhmeta Municipalities), October, 2011. <http://www.globalwaters.net/wp-content/uploads/2012/12/Technical-Report-4-Selection-of-Target-Communities-in-Pilot-Watersheds-October-2011.pdf> and ii) Technical Report 5. Selection of Target Communities in Pilot Watersheds (Khobi, Senaki, Dedoplistskaro Municipalities), October 2012. <http://www.globalwaters.net/wp-content/uploads/2012/12/INRMW-Lower-Pilot-Watersheds-Community-Selection-Report.pdf>

environment of the targeted villages and their surroundings; and 3. Negative socio-economic impacts on the local population. Based on those criteria, target community members and INRMW experts assessed watershed issues to meet the following objectives : Protection of human health; Improvement of environmental quality/natural ecosystem integrity; Promotion of sustainable and effective utilization of natural resources; Disaster risk reduction; Maintaining existing reserve of water resources storage; Maintaining biodiversity; Promotion of organic agriculture and reduction of land degradation; and Development of tourism potential. In accordance with the issues prioritization exercise, at least three major issues were identified as top priorities for each community. On the following workshop, the final list of issues was presented to local stakeholders in order to build a common understanding and secure the agreement of the interested parties on the priority issues. The next step was the synthesizing of the prioritized issues, identified by local communities and experts, by the INRMW program team and its final assessment; during this process, among various evaluation criteria ecosystems values, functions and services impacted by the issues were analysed (Please see Annex 4).

Issues identification and prioritization exercises were followed by the development of recommendations on potential interventions to tackle watershed issues and manage its resources more sustainably. These suggestions were made by the INRMW experts. Based on these recommendations, the INRMW program team elaborated a menu of potential structural and non-structural measures to present to target communities and authorities and prioritize these interventions through active participation of the local stakeholders. Potential interventions were prioritized based on the expected impact of the recommended measures on the environment, local economy and people's health. In the workshop that was conducted, the participants filled in the pre-pared questionnaire (Annex 5), grading the suggested measures by points (maximum possible points of 5 were given to public health; maximum points of 3 were given to the impact on the environment; and maximum points of 3 were given to socio-economic impacts). The list derived out of this exercise was finally merged with the recommendations made by the local experts. The combined list of potential interventions was presented to the local stakeholders, who confirmed the validity of the presented measures (see Annex 6 for the workshop agenda and list of participants).

Based on the priority issues, needs, opportunities and interventions identified through the stakeholder participation and the experts' assessments, the IWMP for the upper Alazani pilot watershed area was developed. Geographically, the plan covers the area located in the north-east of Georgia and encompasses the two municipalities of Akhmeta and Telavi under the Kakheti regional administration. More specifically, the focus is directed on 16 pilot communities, (8 in the Akhmeta municipality and 8 in the Telavi municipality) , selected within the project (Annex 1) as well as the urban areas of the pilot watershed area.

The plan consists of feasible and time-bound structural and non-structural measures that address priority watershed issues at the community, municipality and/or watershed level. Their prioritisation is based on the number and quality of the ecological functions/services that they support, critical importance assigned to the measures by local stakeholders and experts, and the cost of the activity.

During the detailed assessment conducted for developing the IWMP, certain limitations were

noted with reference to many historical and current socio-economic and environmental data. It should be mentioned a very limited network for water quality monitoring and nonexistence comprehensive database on environmental quality in the country. Thus, in many cases, expert analysis and extrapolations of the accessible information were employed to fill the existing gaps in the data.

## 3. INTEGRATED WATERSHED MANAGEMENT PLAN

### 3.1 Goals and Objectives

The long-term development goal of the IWMP for the upper Alazani pilot watershed area is the sustainable development of the pilot watershed through the protection and integrated management of its ecosystems and resources. The development goal of the plan will be attained by achieving the following specific objectives: 1. Reduction of environmental pollution and improvement of environmental quality; 2. Protection of human health through provision of safe drinking water; 3. Maintaining the existing reserves of water resources through sustainable and efficient utilization; 4. Disaster risk reduction; 5. Conservation, recovery and sustainable use of natural ecosystems, including maintaining biodiversity within and outside the PAs; 6. Sustainable utilization of renewable energy resources; 7. Reduction of land degradation through application of sustainable land management practices; 8. Promotion of organic/traditional agriculture; and 9. Development of eco-agro and cultural tourism potential.

### 3.2 Planned Actions

#### 3.2.1 Priority Measures

Findings of the watershed assessments as well as the priority setting exercises indicate that for both the Akhmeta and Telavi municipalities in the upper Alazani pilot watershed area, the measures dealing with the improved quality and quantity of drinking water, effective wastewater collection and treatment, improvement of household solid waste collection and condition of the landfills, improvement of irrigation water supply and the efficiency of its use as well as the measures dealing with disaster risk reduction, reforestation and reclamation of pastures and grasslands, establishment of organic farms, improvement of energy efficiency of buildings, the development of local renewable energies and ecotourism development supportive activities are the most important.

The focus made by the community representatives was reflected in the IWMP. The synergic effect of multiple practices was also considered when determining the measures directed towards attaining each objective. Specific activities suggested for solving the prioritized issues include:

**a) Structural measures:** These measures are those intended for intervention at the village/community/ municipal/watershed level to address and solve the problems especially acute for the Upper Alazani pilot watershed area, e.g., improvement of the waste management system, urban and rural water supply systems, renovation of the irrigation systems, construction of gabions along the river beds, reclamation of pastures and grasslands, restoration of windbreaks for agricultural lands, renovation of the storm water drainage systems, reforestation of severely damaged forests, implementation of energy efficient measures, ecotourism development supportive activities, etc.

The structural measures also include public awareness activities, which include the selected demo-projects planned to be implemented under the small grants component of the INRMW

program or through grass root initiatives other than the INRMW program, to solve the issues that require immediate intervention and can be implemented in shorter time period with relatively low cost requirements, and tangible and easily replicable impacts on the lives of the locals, e.g.: renovation/construction of rural water supply systems, fencing of sanitary zones at the water intakes, installation of water treatment/ chlorination facilities/devices, renovation/arrangement of small-scale rural irrigation systems, introduction of alternative irrigation practices such as drip irrigation schemes at the community/individual farm level, construction of small-scale (rural) sewerage systems, arrangement of drainage system and wastewater treatment facilities on existing landfill, arrangement of dry toilets for public buildings that do not have relevant water treatment plants, reclamation of pastures and grasslands, establishment of traditional organic farms, implementation of energy efficient measures, installation of solar systems, and others (see Table 1 for details).

**b) Nonstructural measures:** These are the higher scale measures that do not involve physical intervention but aim to reduce the identified risks and impacts through improving policies and laws in corresponding spheres, as well as through raising public awareness , trainings and education. The examples of the most vital non-structural measures suggested for the upper Alazani pilot watershed area include: development of a strategy , including an organizational model for the introduction of integrated watershed management; development of regional waste management strategy for the Kakheti region; establishing effective tariffs and their implementation systems in water use and waste management; strengthening law enforcement systems; strengthening the national monitoring network for surface and ground water resources; and development of overall forest policies, corresponding legal basis, including regulations on forest use, GIS-compatible comprehensive forest database, etc.

Furthermore, the suggested measures were categorized as: i) L - Long-term; ii) M - Medium-term; and iii) S - Short-term, considering the existing capacity for their implementation. Short-term activities are those that require immediate intervention and can be implemented in a time period up to one year (including the demo-projects planned under the INRMW project); Medium-term activities are those that require about one- five years for realization; and Long-term activities are those that will need more than five years to be carried out.

The cost ranges for the suggested measures/activities were categorized as: i) L - low-cost (up to \$20,000); ii) M - medium-cost (\$20 000-\$100 000); and iii) H - high-cost (more than \$100,000).

For the list of the measures suggested see Table 1 below.

**Table 1. Matrix of Watershed Management Plan of the Upper Alazani Pilot Watershed Area**

Goal	Objectives	Measures	Scale of the measure	Ecosystem Functions/values influenced	Cost Range \$	Timeline	Responsible Agent	Potential Source of Funding
1. Sustainable development of the pilot watershed area through protection and integrated management of its ecosystems and resources.	<b>Objective 1:</b> <i>Reduction of the environmental pollution/improvement of environmental quality</i>	<b>Structural Measures</b>						
		1. Setting up of waste collection system; Procurement of waste containers and closed trucks for transportation of waste (Akhmeta - 150 and Telavi - 200 containers, and 2 trucks per municipality	Municipal centers – Akhmeta and Telavi and Communities	1. Health protection value 2. Ecological value 3. Economic/commercial value 4. Drinking water quality 5. Agricultural production 6. Aesthetic/recreational value 7. Cultural value 8. Tourism	H >100,000- (~200,000 – 400,000)	M	Regional and municipal governments	Central and local budgets; development agencies (Sida, USAID, EU etc.); development banks (ADB, EBRD, WB, KfW).
		2. Improving management of existing landfills; implementation of low-cost protection measures for controlled existing waste disposal site /landfill: fencing and locking; arranging diversion channels, placing warning signs; constructing drainage and water retention and purification ponds, preparing access roads to landfills, etc.	Existing landfills of Akhmeta and Telavi	1. Health protection value 2. Ecological value 3. Economic/commercial value 4. Drinking water quality 5. Agricultural production 6. Aesthetic/recreational value 7. Cultural value 8. Tourism	M: 20,000 – 100,000 (initial activities) (~2 projects - ~40,000)	M	Central governments: MRDI and MoENRP; Municipal government; LTD “Company of Solid Wastes”.	Central and local budgets
		3. Construction of a new EU-standard municipal solid waste landfill	Municipal, Telavi	1. Health protection value 2. Ecological value 3. Economic/commercial value 4. Drinking water quality	H: >1,000,000	L	Central governments: MRDI and MoENRP;	Development Banks (ADB, EBRD, KfW, WB, etc.);

			5. Agricultural production 6. Aesthetic/recreational value 7. Cultural value 8. Tourism			Municipal government; LTD “Company of Solid Wastes”	Multi-lateral development agencies (EU, USAID, etc); development banks (ADB, EBRD, WB, KfW).
	4. Arranging waste segregation and processing facility	Regional or municipal (1 project – Telavi city)	1. Health protection value 2. Ecological value 3. Economic/commercial value 4. Drinking water quality 5. Agricultural production 6. Aesthetic/recreational value 7. Cultural value 8. Tourism	H: >100,000	L	Central governments: MRDI and MoENRP; Municipal government; LTD “Company of Solid Wastes”.	Central and local budgets; development agencies (Sida, USAID, EU, etc.); development banks (ADB, EBRD, WB, KfW).
	5. Conservation of the existing solid waste landfills (after construction of new landfill)	Akhmeta and Telavi landfills	1. Health protection value 2. Ecological value 3. Economic/commercial value 4. Drinking water quality 5. Agricultural production 6. Aesthetic/recreational value 7. Cultural value 8. Tourism	H: >100,000- (~400,000)	L	Central governments: MRDI and MoENRP; Municipal government; LTD “Company of Solid Wastes”.	Central and/or local government; Development agencies (USAID, Sida, EU, etc.); development banks (ADB, EBRD, WB, KfW).
	6. Construction of municipal/medical waste incinerator	Regional, or Municipal, Akhmeta or Telavi city	1. Health protection value 2. Ecological value 3. Economic/commercial value 4. Drinking water quality 5. Agricultural production 6. Aesthetic/recreational value 7. Cultural value 8. Tourism	H: 100,000-1,000,000	L	Central governments: MRDI and MoENRP; Municipal government; LTD “Company of Solid Wastes”; Private sector.	Private sector Development agencies (USAID, Sida, EU, etc.).
	7. Construction of a waste transfer station in Akhmeta municipality. This is	Telavi	1. Health protection value 2. Ecological value 3. Economic/commercial value 4. Drinking water quality	H: >100,000	M	Central governments: MRDI and MoENRP;	Central government; Development agencies

	relevant for the option when Telavi and Akhmeta municipalities have a common landfill in Telavi		5. Agricultural production 6. Aesthetic/recreational value 7. Cultural value 8. Tourism			Municipal government; LTD “Company of Solid Wastes”.	(USAID, Sida, EU, etc.); development banks (ADB, EBRD, WB, KfW).
	8. Renovation of the urban sewerage systems	Urban-scale: Akhmeta and Telavi	1. Health protection value 2. Ecological value 3. Economic/commercial value 4. Drinking water quality 5. Agricultural production 6. Aesthetic/recreational value 7. Cultural value 8. Tourism	H: >1,000,000	M-L	Central government: MRDI and MoENRP; LTD “UWSCG” Regional and municipal government.	Central budgets; development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.); development banks (ADB, EBRD, WB, KfW).
	9. Construction of urban wastewater treatment plants	Urban-scale: Akhmeta and Telavi	1. Health protection value 2. Ecological value 3. Economic/commercial value 4. Drinking water quality 5. Agricultural production 6. Aesthetic/recreational value 7. Cultural value 8. Tourism	H: 100,000-1,000,000 (2 projects, >200, 000)	M-L	Central governments: MRDI and MoENRP; LTD “UWSCG”.	Central and local budgets; development banks (ADB, EBRD, WB, KfW).
	10. Construction of small-scale (rural) sewerage systems with treatment plants	Village level (at least 10 villages <sup>5</sup> )	1. Health protection value 2. Ecological value 3. Economic/commercial value 4. Drinking water quality 5. Agricultural production 6. Aesthetic/recreational value 7. Cultural value 8. Tourism	H: >100,000 (~20,000-100,000 per each project)	M-L	Central governments: MRDI and MoENRP; LTD “UWSCG”; Water companies of villages; Municipal governments; CBOs.	Central and local budgets; development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.); NGOs.

<sup>5</sup>These are the pilot villages of INRMW-Georgia program which identified the issue as priority



Non-structural measures							
1. Development of regional waste management strategy for Kakheti region, and municipal waste management plans for Akhmeta and Telavi municipalities	Regional and Municipal	1. Health protection value 2. Ecological value 3. Economic/commercial value 4. Drinking water quality 5. Agricultural production 6. Aesthetic/recreational value 7. Cultural value 8. Tourism	M: 20,000-100,000	S	Central government: MoENRP and MRDI; Regional authorities, Kakheti governor's office, local municipal governments.	Central and local authorities Bilateral and/or multilateral development agencies (USAID, Sida, EU, bilateral donors, etc.).	
2. Improvement of fee system for waste management and enforcement of tariff payments	National; Regional.	1. Health protection value 2. Ecological value 3. Economic/commercial value 4. Drinking water quality 5. Agricultural production 6. Aesthetic/recreational value 7. Cultural value 8. Tourism	M: 20,000-100,000	M	Central government: MoENRP, MRDI and MoF; regional government.	Central and local authorities Bilateral and/or multilateral development agencies (USAID, Sida, EU, bilateral donors, etc.).	
3. Strengthening of law enforcement system	National	1. Health protection value 2. Ecological value 3. Economic/commercial value 4. Drinking water quality 5. Agricultural production 6. Aesthetic/recreational value 7. Cultural value 8. Tourism	M: 20,000-100,000	M	Central government: MoENRP and MoF	Central budget; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.)	
4. Strengthening of national network for surface and ground water quality monitoring	National	1. Health protection value 2. Ecological value 3. Economic/commercial value 4. Drinking water quality 5. Agricultural production 6. Aesthetic/recreational value 7. Cultural value 8. Tourism	H: 100,000 - 1,000,00	M-L	Central government: MoENRP, MoA and NEA.	Central budget; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).	
5. Improvement of existing regulations on wastewater discharge in	National	1. Health protection value 2. Ecological value 3. Economic/commercial value 4. Drinking water quality	M: >20,000 (20,000-100,000)	S-L	Central government- MoENRP.	Central budget; Development agencies (USAID, UNDP,	

	harmonization with EU directives		5. Agricultural production 6. Aesthetic/recreational value 7. Cultural value 8. Tourism				EU, bilateral donors, GIZ, Sida, etc.).
	6. Additional inventory of obsolete pesticides, identification of contaminated areas	Watershed pilot area	1. Health protection value 2. Ecological value 3. Economic/commercial value 4. Drinking water quality 5. Agricultural production 6. Aesthetic/recreational value 7. Cultural value 8. Tourism	M: 20,000-100,000	M	Central government: MoENRP; International/local NGOs.	Central budget; Bilateral/multilateral development agencies (UNDP, Sida, bilateral donors).
<b>Awareness raising and DEMO projects</b>							
	1. Awareness raising and capacity building of local population and municipal authorities in waste management	Municipal	1. Health protection value 2. Ecological value 3. Economic/commercial value 4. Drinking water quality 5. Agricultural production 6. Aesthetic/recreational value 7. Cultural value 8. Tourism	M: 20,000-100,000	S-M	Central government: MoENRP; MRDI and MESD; NGOs; Eco-clubs; Development Agencies; NGOs.	Bi-lateral and/or multilateral development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.); NGOs.
	2. Construction of on-site waste water treatment facilities for small industries, hotels and public buildings	Community-level	1. Health protection value 2. Ecological value 3. Economic/commercial value 4. Drinking water quality 5. Agricultural production 6. Aesthetic/recreational value 7. Cultural value 8. Tourism	M: >20,000 (~2 demo-projects, ~40,000)	M	CBOs/NGOs; private sector.	development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc. ); Private sector; NGOs.
	3. Arrangement of dry toilets for public buildings, households and hotels with no relevant wastewater treatment plants	Communities (~5 buildings, )	1. Health protection value 2. Ecological value 3. Economic/commercial value 4. Drinking water quality 5. Agricultural production 6. Aesthetic/recreational value 7. Cultural value 8. Tourism	M: >20,000 per project (~100,000 total)	S	NGOs/CBOs; Private sector.	development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.); Private sector; NGOs.
	<b>Objective 2:</b> <i>Protection of human health</i>	<b>Structural Measures</b>					
	1. Renovation of urban water supply	Urban scale: Akhmeta and	1. Human health 2. Drinking water supply	H: >1,000,000	M-L	Central government:	Central budgets;

through provision of safe drinking water	systems for the cities of Akhmeta and Telavi <sup>6</sup>	Telavi	<ol style="list-style-type: none"> <li>Ecosystem integrity/conservation value</li> <li>Economic/commercial value</li> <li>Cultural value</li> <li>Tourism</li> </ol>			MRDI; LTD UWSCG.	Development banks (ADB, KfW, WB, etc.) development banks (ADB, EBRD, WB, KfW).
	2. Renovation of rural water supply systems	Village-level (~12 <sup>7</sup> villages)	<ol style="list-style-type: none"> <li>Human health</li> <li>Drinking water supply</li> <li>Ecosystem integrity/conservation value</li> <li>Economic/commercial value</li> <li>Cultural value</li> <li>Tourism</li> </ol>	H: > 100,00 - ~50,000 each project (at least 3 villages: Akhshani, Kogoto, Gulgula - ~150,000)	M	Central government: MRDI and UWSCG; Regional governments; local small scale water companies, CBOs.	Local budgets; development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc. ).
	3. Construction of rural water supply systems	Village-level	<ol style="list-style-type: none"> <li>Human health</li> <li>Drinking water supply</li> <li>Ecosystem integrity/conservation value</li> <li>Economic/commercial value</li> <li>Cultural value</li> <li>Tourism</li> </ol>	H: 100,000 - 1,000,000	M-L	Central government: MRDI; Regional governments; local small scale water companies; CBOs/NGOs.	Central and local budgets; development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc. ); development banks (ADB, EBRD, WB, KfW).
	4. Fencing of sanitary zones at the water intakes <sup>8</sup>	Village-level (at least 3 villages: Akhashani, Kogoto, Gulgula); Desirable ~18 villages	<ol style="list-style-type: none"> <li>Human health</li> <li>Drinking water supply</li> <li>Ecosystem integrity/conservation value</li> <li>Economic/commercial value</li> <li>Cultural value</li> <li>Tourism</li> </ol>	M: 20,000 - 100,000 (~5,000 for each intake)	S-M	Central government: MRDI and MDF; UWSCG; local small scale water companies; CBOs/NGOS.	Central and local budgets; development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc. );

<sup>6</sup>See for more detailed list of measures under the Water Safety Plan for Pilot Cities of GLOWS/INRMW program. at <http://www.globalwaters.net/projects/current-projects/inrmw/>

<sup>7</sup>Pilot villages of INRMW program <http://www.globalwaters.net/projects/current-projects/inrmw/>

<sup>8</sup>Pilot villages of INRMW program <http://www.globalwaters.net/projects/current-projects/inrmw/>

							development banks (ADB, EBRD, WB, KfW).
5. Installation of water treatment-disinfection facilities/devices of the villages	Community-level At least 7 <sup>9</sup> villages	1. Human health 2. Drinking water supply 3. Ecosystem integrity/conservation value 4. Economic/commercial value 5. Cultural value 6. Tourism	M: 20,00-100,000 At least 7 villages (< 7,000 each project)	S	Central government: MRDI; Regional and Municipal governments; MDF; local rural water companies; CBOs/NGOs.	Central and local budgets; development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.); NGOs.	
<b>Non-structural measures</b>							
1. Strengthening of state inspection system on drinking water safety	National	1. Human health 2. Drinking water supply 3. Ecosystem integrity/conservation value 4. Economic/commercial value 5. Cultural value 6. Tourism	M: 20,000-100,000	S-M	Central government: MoENRP, MoA and MoH.	Central budget; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).	
2. Establishing effective tariffs and their implementation mechanisms for drinking water supply system	National	1. Human health 2. Drinking water supply 3. Ecosystem integrity/conservation value 4. Economic/commercial value 5. Cultural value 6. Tourism	L: 20,000	M	Central Government: MoF, MRDI, and GNERC; municipal government.	Central budget; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).	
<b>Public Awareness raising and DEMO projects</b>							
1. Awareness raising and capacity building of local population, local water companies and municipal authorities on rational use of	Municipal	1. Human health 2. Drinking water supply 3. Ecosystem integrity/conservation value 4. Economic/commercial value 5. Cultural value 6. Tourism	M: 20,000-100,000	S-M	Central government: MoENRP, MRDI and MoH; Municipal government; CBOs/NGOs.	Central budget; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).	

<sup>9</sup> Pilot villages of INRMW program: Kistauri, Arashenda, Axalsheni, Jokolo, Birkiani, Matani, Omalo

	drinking water resources							
	2. Renovation of small scale water supply system	Villages	<ol style="list-style-type: none"> <li>Human health</li> <li>Drinking water supply</li> <li>Ecosystem integrity/conservation value</li> <li>Economic/commercial value</li> <li>Cultural value</li> <li>Tourism</li> </ol>	L:20,000	S-M	Municipal government; CBOs/NGOs.	Central budget; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).	
<b>Objective 3:</b> <i>Maintaining existing reserves of water resources through sustainable and efficient utilization of water resources</i>	<b>Structural Measures</b>							
	1. Renovation of irrigation systems (Upper Alazani irrigation main and secondary channels and 3 independent channels: Naurdali, Saniore and Lopota channels)	Regional; Municipality.	<ol style="list-style-type: none"> <li>Human health</li> <li>Ecosystem integrity/conservation value</li> <li>Economic/commercial value</li> <li>Drinking water supply</li> <li>Irrigation</li> <li>Energy</li> <li>Livelihood value</li> <li>Agricultural production</li> <li>Cultural value</li> <li>Tourism</li> <li>Recreation</li> </ol>	H: >1,000,000	L	Central government: MRDI/MDF, MoF and MoA.	Central budgets; development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.); development banks (ADB, EBRD, WB, KfW); Private sector; NGOs.	
	2. Renovation of small scale rural irrigation systems	Villages- at least 17 <sup>10</sup> villages in Akhmeta and Telavi municipality	<ol style="list-style-type: none"> <li>Human health</li> <li>Ecosystem integrity/conservation value</li> <li>Economic/commercial value</li> <li>Drinking water supply</li> <li>Irrigation</li> <li>Energy source</li> <li>Livelihood value</li> <li>Agricultural production</li> <li>Cultural value</li> <li>Tourism</li> <li>Recreation</li> </ol>	M: 20,000-100,000  ~20,000 for each project	S-L	Central government: MRDI/MDF, MoF and MoA. municipal governments; Local LTDs of rural water companies CBOs/NGOs.	Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.); Development banks (ADB, EBRD, WB, KfW).	
	3. Construction of new, small scale	Villages	<ol style="list-style-type: none"> <li>Human health</li> <li>Ecosystem</li> </ol>	H: 100,000 – 1,000,000	M-L	Central government:	Development agencies	

<sup>10</sup> Pilot villages of INRMW program

	irrigation systems for the villages (that lack such systems)		<ul style="list-style-type: none"> <li>3. Economic/commercial value</li> <li>4. Drinking water supply</li> <li>5. Irrigation</li> <li>6. Energy source</li> <li>7. Livelihood value</li> <li>8. Agricultural production</li> <li>9. Cultural value</li> <li>10. Tourism</li> <li>11. Recreation</li> </ul>			MRDI/MDF, MoF and MoA; Municipal governments; Local LTDs of rural water companies; CBOs/NGOs.	(USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.); Development banks (ADB, EBRD, WB, KfW).
	4. Renovation of water supply system <sup>11</sup>	Cities and Villages	<ul style="list-style-type: none"> <li>1. Human health</li> <li>2. Drinking water supply</li> <li>3. Ecosystem integrity/conservation value</li> <li>4. Economic/commercial value</li> <li>5. Cultural value</li> <li>6. Tourism</li> </ul>	H> 1,000,000	L	Central government: MRDI/MDF and MoF; Municipal governments; Local LTDs of rural water companies; CBOs/NGOs.	Central budget; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).
<b>Non-structural Measures</b>							
	1. Elaboration of new law and relevant sub-laws on water in harmonization with EU directives; Setting up of a River Basin Management approach	National	<ul style="list-style-type: none"> <li>1. Human health</li> <li>2. Ecosystem integrity/conservation value</li> <li>3. Economic/commercial value</li> <li>4. Drinking water supply</li> <li>5. Irrigation</li> <li>6. Energy source</li> <li>7. Livelihood value</li> <li>8. Agricultural production</li> <li>9. Cultural value</li> <li>10. Tourism</li> <li>11. Recreation</li> </ul>	M: 20,000-100,000	S-M	Central government: MoENRP; International and/local NGOs.	Central budget; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).

<sup>11</sup> Please see for more details under objective 2 of this table

	2. Development of national regulation on ecological flow of surface waters	National	<ol style="list-style-type: none"> <li>1. Human health</li> <li>2. Ecosystem integrity/conservation value</li> <li>3. Economic/commercial value</li> <li>4. Drinking water supply</li> <li>5. Irrigation</li> <li>6. Energy source</li> <li>7. Livelihood value</li> <li>8. Agricultural production</li> <li>9. Cultural value</li> <li>10. Tourism</li> <li>11. Recreation</li> </ol>	L: 20,000	S	Central government: MoENRP.	Central budget; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).
	3. Establishing effective tariffs and their implementation mechanisms for water abstraction	National	<ol style="list-style-type: none"> <li>1. Human health</li> <li>2. Ecosystem integrity/conservation value</li> <li>3. Economic/commercial value</li> <li>4. Drinking water supply</li> <li>5. Irrigation</li> <li>6. Energy source</li> <li>7. Livelihood value</li> <li>8. Agricultural production</li> <li>9. Cultural value</li> <li>10. Tourism</li> <li>11. Recreation</li> </ol>	M: 20,000	S	Central government: MoENRP MRDI, MoF and MoA;	Central budget; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).
	4. Strengthening of law enforcement and inspection system	National	<ol style="list-style-type: none"> <li>1. Human health</li> <li>2. Ecosystem integrity/conservation value</li> <li>3. Economic/commercial value</li> <li>4. Drinking water supply</li> <li>5. Irrigation</li> <li>6. Energy source</li> <li>7. Livelihood value</li> <li>8. Agricultural production</li> <li>9. Cultural value</li> <li>10. Tourism</li> <li>11. Recreation</li> </ol>	H: >100,000	M	Central Government: MoENRP.	Central budget; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).
	5. Strengthening of National hydrological Monitoring network	National Municipal	<ol style="list-style-type: none"> <li>1. Human health</li> <li>2. Ecosystem integrity/conservation value</li> <li>3. Economic/commercial value</li> <li>4. Drinking water</li> </ol>	H: >100,000	M-L	Central government: MoENRP and NEA.	Central budget; Development agencies (USAID, UNDP, EU, bilateral

				5. Irrigation 6. Energy source 7. Livelihood value 8. Agricultural production 9. Cultural value 10. Tourism 11. Recreation				donors, GIZ, Sida, etc.).
		<b>Public awareness raising and DEMO projects</b>						
	1. Awareness raising and capacity building of local population and municipal authorities on sustainable and rational use of water resources	Municipal		1. Human health 2. Ecosystem integrity/conservation value 3. Economic/commercial value 4. Drinking water supply 5. Irrigation 6. Energy source 7. Livelihood value 8. Agricultural production 9. Cultural value 10. Tourism 11. Recreation	L: 20,000-	S-M	Central government: MoENRP, MRDI and MESD; Municipal government; CBOs; NGOs.	Central budget; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).
	2. Renovation of small scale rural irrigation systems	Villages		1. Human health 2. Ecosystem integrity/conservation value 3. Economic/commercial value 4. Drinking water supply 5. Irrigation 6. Energy source 7. Livelihood value 8. Agricultural production 9. Cultural value 10. Tourism 11. Recreation	M: 20,000-100,000	S	Municipal governments; Local LTDs of rural water companies; CBOs/NGOs.	Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.); Development banks (ADB, EBRD, WB, KfW).
	<b>Objective 4:</b> <i>Disaster risk reduction</i> <sup>12</sup>	<b>Structural measures</b>						
	1. Cleaning of river beds	Municipal level: River beds of rivers: Alazani, Tsiplovani-khevi, Samkuristskali,Il		1. Human health 2. Ecosystem integrity/conservation value 3. Disaster Risk Reduction 4. Cultural value 5. Tourism	H: >1,000,000 ~ 700,000 for each project	M-L	Central government: MoENRP and MRDI; Regional and municipal governments.	Central and regional budgets; Development agencies (USAID, UNDP,

<sup>12</sup> For detailed information regarding this objective please see “Assessment of the Vulnerability to Natural Disaster and Climate Change and Plan of Mitigation and Adaptation Measures of the upper Alazani pilot watershed area “ developed under the INRMW-Georgia project.



		to, Stori, Turdo, Lopota	6. Recreation				EU, bilateral donors, GIZ, Sida, etc.); Development banks (ADB, EBRD, WB, KfW).
	2. Construction of gabions along the river beds	River banks: Alazani, Tsiplovaniskhevi, Samkuristskali, Turdo	1. Human health 2. Ecosystem integrity/conservation value 3. Disaster Risk Reduction 4. Cultural value 5. Tourism 6. Recreation	H: 100,000-1,000,000	M-L	Central government: MoENRP and MRDI; Regional and municipal governments.	Central and regional budgets; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.); Development banks (ADB, EBRD, WB, KfW).
	3. Construction of new storm water drainage systems	village scale	1. Human health 2. Ecosystem integrity/conservation value 3. Disaster Risk Reduction 4. Cultural value 5. Tourism 6. Recreation	M: 20,000 – 100,000 ~ 40,000 for each project	S-M	Regional and municipal governments; CBOs.	Regional budgets; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).
<b>Non-structural measures</b>							
	1. Strengthening of natural disaster early warning information systems	National	1. Human health 2. Ecosystem integrity/conservation value 3. Disaster Risk Reduction 4. Cultural value 5. Tourism 6. Recreation	H: > 100,000	M-L	Central government: MoENRP and MIA.	Central budget; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.) Development banks (ADB, EBRD, WB, KfW).
<b>Public awareness and DEMO projects</b>							

	1. Awareness raising and capacity building of local population and municipal authorities on DRR	Municipal	<ol style="list-style-type: none"> <li>Human health</li> <li>Ecosystem integrity/conservation value</li> <li>Disaster Risk Reduction</li> <li>Cultural value</li> <li>Tourism</li> <li>Recreation</li> </ol>	M: 20,000 – 100,000	S-M	Central government: MoENRP, MIA and MRDI; Municipal government; CBOs/ NGOs.	Central budget; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).
	2. Construction/renovation of small size gabions along the river beds	village	<ol style="list-style-type: none"> <li>Human health</li> <li>Ecosystem integrity/conservation value</li> <li>Disaster Risk Reduction</li> <li>Cultural value</li> <li>Tourism</li> <li>Recreation</li> </ol>	M: 20,000 – 100,000	S	Municipal government; CBOs/ NGOs.	Central budget; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).
	3. Renovation of eroded lands/river banks by bioengineering methods	village	<ol style="list-style-type: none"> <li>Human health</li> <li>Ecosystem integrity/conservation value</li> <li>Disaster Risk Reduction</li> <li>Cultural value</li> <li>Tourism</li> <li>Recreation</li> </ol>	M: 20,000-100,000; ~20,000 at list one project	M-L	Regional and municipal governments; CBOs/ NGOs.	Central and local budgets; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.); Private sector.
	4. Renovation of existing small scale storm water drainage systems	Villages	<ol style="list-style-type: none"> <li>Human health</li> <li>Ecosystem integrity/conservation value</li> <li>Disaster Risk Reduction</li> <li>Cultural value</li> <li>Tourism</li> <li>Recreation</li> </ol>	M: 20,000-100,000; ~20,000 at list one project	M-L	Regional and municipal governments; CBOs/ NGOs.	Central and local budgets; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.); Private sector.
<b>Objective 5:</b>	<b>Structural measures</b>						

<p><i>Conservation, recovery and sustainable use of natural ecosystems, including maintaining biodiversity within and outside the PAs</i></p>	<p>1. Afforestation/reforestation activities in the pilot areas with severely damaged forests</p>	Municipalities	<p>1. Human health 2. Drinking water supply 3. Ecosystem integrity/conservation value 4. Economic/commercial value 5. Disaster Risk Reduction 6. Irrigation 7. Energy source 8. Livelihood support value 9. Cultural value 10. Tourism 11. Recreation</p>	H: >100,000	M-L	<p>Central government: MoENRP and National Agency of Forest; Regional and municipal governments.</p>	<p>Central and local budgets; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).</p>
	<p>2. Establishment of open/closed tree nurseries</p>	Communities	<p>1. Human health 2. Drinking water supply 3. Ecosystem integrity/conservation value 4. Economic/commercial value 5. Disaster Risk Reduction 6. Irrigation 7. Energy source 8. Livelihood support value 9. Cultural value 10. Tourism 11. Recreation</p>	M: 20,000 – 100,000	M	<p>Central government: MoENRP and National Agency of Forest; Municipal governments; CBOs/NGOs; Private sector.</p>	<p>Central budget; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).</p>
	<p>3. Building of roads to the lots allocated for communities to extract fuel wood</p>	Municipalities	<p>1. Human health 2. Drinking water supply 3. Ecosystem integrity/conservation value 4. Economic/commercial value 5. Disaster Risk Reduction 6. Irrigation 7. Energy source 8. Livelihood support value 9. Cultural value 10. Tourism 11. Recreation</p>	M: 20,000 – 100,000	S-M	<p>Central government: MoENRP and National Agency of Forest; Municipal governments; CBOs/NGOs.</p>	<p>Central budget; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).</p>
	<p>4. Restoration of degraded forest ecosystems (pest control for forests,</p>	Municipalities	<p>1. Human health 2. Drinking water supply 3. Ecosystem integrity/conservation value</p>	M: 20,000 – 100,000	S-M	<p>Central government: MoENRP and National</p>	<p>Central budget; Development agencies (USAID, UNDP,</p>

	sanitary logging, etc.)		<ol style="list-style-type: none"> <li>4. Economic/commercial value</li> <li>5. Disaster Risk Reduction</li> <li>6. Irrigation</li> <li>7. Energy source</li> <li>8. Livelihood support value</li> <li>9. Cultural value</li> <li>10. Tourism</li> <li>11. Recreation</li> </ol>			Agency of forest; Mmunicipal governments; CBOs/NGOs.	EU, bilateral donors, GIZ, Sida, etc.).
	5. Improvement of the infrastructure of PAs (Waste management, water supply, wastewater treatment, etc.)	Kakheti- Tusheti Batsara, Babaneuli, and Ilto PAs	<ol style="list-style-type: none"> <li>1. Ecological value</li> <li>2. Economic/commercial value</li> <li>3. Livelihood support value</li> <li>4. Aesthetic/recreational value</li> <li>5. Cultural value</li> <li>6. Tourism</li> </ol>	H: > 100,000	M-L	Municipal governments: MoENRP-APA, MESD and Tourism Agency; CBOs/NGOs; Private sector.	Central and local budgets; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).
<b>Non-Structural Measures</b>							
	1. Development of overall forest policies, corresponding legal bases, laws and sub-laws including enhancing law enforcement mechanisms on regulations of forest use	National	<ol style="list-style-type: none"> <li>1. Human health</li> <li>2. Drinking water supply</li> <li>3. Ecosystem integrity/conservation value</li> <li>4. Economic/commercial value</li> <li>5. Disaster Risk Reduction</li> <li>6. Irrigation</li> <li>7. Energy source</li> <li>8. Livelihood support value</li> <li>9. Cultural value</li> <li>10. Tourism</li> <li>11. Recreation</li> </ol>	M: 20,000-100,000	M	Central government: MoENRP and National Agency of Forest.	Central budget; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).
	2. Development of forests management plans for a watershed/ municipality that should include measures for using, maintaining, protection and restoration of forests	Watershed pilot area/municipalities	<ol style="list-style-type: none"> <li>1. Human health</li> <li>2. Drinking water supply</li> <li>3. Ecosystem integrity/conservation value</li> <li>4. Economic/commercial value</li> <li>5. Disaster Risk Reduction</li> <li>6. Irrigation</li> <li>7. Energy source</li> <li>8. Livelihood support value</li> <li>9. Cultural value</li> <li>10. Tourism</li> <li>11. Recreation</li> </ol>	M: 20,000 – 100,000	M	Central government: MoENRP and National Agency of Forest.	Central budget; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).

	3. Implementation of functional zoning of the forests, based on the standards of sustainable management and use of forest resources	National	<ol style="list-style-type: none"> <li>1. Human health</li> <li>2. Drinking water supply</li> <li>3. Ecosystem integrity/conservation value</li> <li>4. Economic/commercial value</li> <li>5. Disaster Risk Reduction</li> <li>6. Irrigation</li> <li>7. Energy source</li> <li>8. Livelihood support value</li> <li>9. Cultural value</li> <li>10. Tourism</li> <li>11. Recreation</li> </ol>	M: 20,000 – 100,000	M	Central government: MoENRP and National Agency of Forest.	Central budget; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).
	4. Inventory of forests, elaboration of forest cadastre	National; Municipalities	<ol style="list-style-type: none"> <li>1. Human health</li> <li>2. Drinking water supply</li> <li>3. Ecosystem integrity/conservation value</li> <li>4. Economic/commercial value</li> <li>5. Disaster Risk Reduction</li> <li>6. Irrigation</li> <li>7. Energy source</li> <li>8. Livelihood support value</li> <li>9. Cultural value</li> <li>10. Tourism</li> <li>11. Recreation</li> </ol>	H: >100,000	M-L	Central government: MoENRP and National Agency of Forest; International and/local NGOs; Private sector.	Central budget; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).
	5. Setting up of forest monitoring systems	National; Municipalities	<ol style="list-style-type: none"> <li>1. Human health</li> <li>2. Drinking water supply</li> <li>3. Ecosystem integrity/conservation value</li> <li>4. Economic/commercial value</li> <li>5. Disaster Risk Reduction</li> <li>6. Irrigation</li> <li>7. Energy source</li> <li>8. Livelihood support value</li> <li>9. Cultural value</li> <li>10. Tourism</li> <li>11. Recreation</li> </ol>	M: 20,000-100,000	M	Central government: MoENRP and National Agency of Forest.	Central budget; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).

		6. Determining the annual demand for fuel wood at the municipality level	Municipalities; villages.	<ol style="list-style-type: none"> <li>Human health</li> <li>Drinking water supply</li> <li>Ecosystem integrity/conservation value</li> <li>Economic/commercial value</li> <li>Disaster Risk Reduction</li> <li>Irrigation</li> <li>Energy source</li> <li>Livelihood support value</li> <li>Cultural value</li> <li>Tourism</li> <li>Recreation</li> </ol>	L: 20,000	S	Central government: MoENRP and National Agency of Forest; Municipal governments.	Central budget; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).
		7. Improvement of biodiversity related legislation policy and planning	National	<ol style="list-style-type: none"> <li>Ecosystem integrity/conservation value</li> <li>Economic/commercial value</li> <li>Tourism</li> <li>Recreation</li> </ol>	M: 20,000 100,000	M	Central government: MoENRP.	Central budget; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).
		8. Establishment of comprehensive and efficient system of biodiversity monitoring and implementation of respective activities	National	<ol style="list-style-type: none"> <li>Ecosystem integrity/conservation value</li> <li>Economic/commercial value</li> <li>Tourism</li> <li>Recreation</li> </ol>	H: > 100,000	M-L	Central government: MoENRP.	Central budget; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).
		9. Strengthening law enforcement system on biodiversity and forest management laws and regulations	National	<ol style="list-style-type: none"> <li>Human health</li> <li>Drinking water supply</li> <li>Ecosystem integrity/conservation value</li> <li>Economic/commercial value</li> <li>Disaster Risk Reduction</li> <li>Irrigation</li> <li>Energy source</li> <li>Livelihood support value</li> <li>Cultural value</li> <li>Tourism</li> <li>Recreation</li> </ol>	H: > 100,000	M	Central government: MoENRP and National Agency of Forest.	Central budget; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).
		10. Capacity building of the protected area	Tusheti Batsara, Babaneuli, and	<ol style="list-style-type: none"> <li>Ecological value</li> <li>Economic/commercial value</li> </ol>	M: 20,000-	M	Central and local	Central and local budgets;

	management staff	Ilto PAs	3. Aesthetic/recreational value 4. Cultural value 5. Tourism	100,000		governments: MoENRP and APA; Academic Institutions e.g. Iliiuni, TSU, etc.	Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).
<b>Public awareness raising – DEMO projects</b>							
	1. Awareness raising and capacity building of local population and municipal authorities on ecosystem functions and protection	Municipal	1. Human health 2. Drinking water supply 3. Ecosystem integrity/conservation value 4. Economic/commercial value 5. Disaster Risk Reduction 6. Irrigation 7. Energy source 8. Livelihood support value 9. Cultural value 10. Tourism 11. Recreation	M: 20,000 – 100,000	S-M	Central government: MoENRP and MES; Municipal governments; CBOs/NGOs.	Central budget; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).
	2. Promotion of using alternative energy sources through implementation of demo project and awareness raising campaigns <i>(Please see more details under objective 6)</i>	Municipalities; Villages; households.	1. Human health 2. Drinking water supply 3. Ecosystem integrity/conservation value 4. Economic/commercial value 5. Disaster Risk Reduction 6. Irrigation 7. Energy source 8. Livelihood support value 9. Cultural value 10. Tourism 11. Recreation	M: 20,000- 100,000	S-M	Central government: MoENRP- National Agency of Forest and Ministry of Georgia; Municipal governments; NGOs/CBOs.	Central budget; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).
	3. Inclusion of local communities, especially youth and children, in the activities related to Pas	Watershed pilot area	1. Ecological value 2. Economic/commercial value 3. Livelihood support value 4. Aesthetic/recreational value 5. Cultural value 6. Tourism	M: 20,000- 100,000	S-M	Central and local governments - MoENRP and APA; MES; academic institutions;CB	Central and local budgets; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ,

							Os/NGOs; Eco clubs.	Sida, etc.).
		4. Installation of information and prohibition/demarcation signs to reduce illegal grazing in protected areas and their buffer zones.	Kakheti- Tusheti Batsara, Babaneuli, and Ilto PAs	1. Ecological value 2. Economic/commercial value 3. Livelihood support value 4. Aesthetic/recreational value 5. Cultural value 6. Tourism	L: <20,000	S	Central government: MoENRP and APA; Municipal governments Eco clubs; CBOs/NGOs.	Central and local budgets; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).
		5. Establishment of fish farms or cooperative farms, including hatcheries, nurseries and grow-out facilities	Communities, Farmers	1. Ecological value 2. Economic/commercial value 3. Livelihood support value 4. Aesthetic/recreational value 5. Cultural value 6. Tourism	H: >100,000; (~4 demo-projects, ~20,000 for each project)	S-M	Municipal governments; CBOs/NGOs; Private sector.	Local budgets;  Private sector; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).
		6. Establishment of hunting farms	Communities	1. Ecological value 2. Economic/commercial value 3. Livelihood support value 4. Aesthetic/recreational value 5. Cultural value 6. Tourism	H: >100,000; (~2 demo-projects, ~200,000)	S-M	Municipal governments; CBOs/NGOs; Private sector.	Local budgets; Private sector; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.); Private sector.
	<b>Objective 6:</b> <i>Sustainable utilization of renewable energy resources</i>	<b>Structural measures</b>						
		1. Implementation of energy efficient measures	Public buildings; Individual households.	1. Human health 2. Ecosystem integrity/conservation value 3. Economic/commercial value 4. Disaster Risk Reduction 5. Energy source 6. Livelihood support value 7. Tourism	M: 100, 000; (~10 projects, ~20,000 for each project)	S-M	Municipal governments; CBOs/NGOs; Private sector.	Central and local budget;  Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.); Private sector.
		2. Construction/	Municipal;	1. Human health	M-H:	S-M	Central	Central and



	renovation of micro to small-size hydropower plants	Communities; households.	<ol style="list-style-type: none"> <li>Ecosystem integrity/conservation value</li> <li>Economic/commercial value</li> <li>Disaster Risk Reduction</li> <li>Energy source</li> <li>Livelihood support value</li> <li>Tourism</li> </ol>	<ul style="list-style-type: none"> <li>Micro: &gt;120,000; (~6 projects, ~20,000 for each project)</li> <li>Small: &gt;200,000 (~2 projects, ~100,000 for each project)</li> </ul>		Government: Ministry of Energy; Regional and municipal governments; CBOs/NGOs; Private sector.	local budgets; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.)Private sector.
	3. Production of wood-waste pellets/briquettes	Municipal; Watershed pilot area	<ol style="list-style-type: none"> <li>Human health</li> <li>Ecosystem integrity/conservation value</li> <li>Economic/commercial value</li> <li>Disaster Risk Reduction</li> <li>Energy source</li> <li>Livelihood support value</li> <li>Tourism</li> </ol>	M: 20,000 – 100,000 (depending on scale)	S-M	Municipal governments; CBOs/NGOs; Private sector.	Central and local budgets; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.); Private sector.
	<b>Public awareness raising – DEMO projects</b>						
	1. Promotion of using alternative energy sources through implementation of demo project and awareness raising campaigns	Municipalities; Villages; Households.	<ol style="list-style-type: none"> <li>Human health</li> <li>Ecosystem integrity/conservation value</li> <li>Economic/commercial value</li> <li>Energy source</li> <li>Livelihood support value</li> <li>Cultural value</li> <li>Tourism</li> <li>Recreation</li> </ol>	M: 20,000-100,000	S-M	Central government: MoENRP- Nation Agency of Forest and Ministry of Energy of Georgia; Municipal governments; NGOs/CBOs; Private sector.	Central and local budget; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.); Private sector.

	2. Installation of solar systems	Public buildings; Individual households.	<ol style="list-style-type: none"> <li>1. Human health</li> <li>2. Ecosystem integrity/conservation value</li> <li>3. Economic/commercial value</li> <li>4. Disaster Risk Reduction</li> <li>5. Energy source</li> <li>6. Livelihood support value</li> <li>7. Tourism</li> </ol>	M: 20,000-100,000; (~10 projects, ~40,000 – 100,000)	S	Municipal governments; CBOs/NGOs; Private sector.	Central and local budget; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.); Private sector.
	3. Construction of biogas digesters	Households; Communities.	<ol style="list-style-type: none"> <li>1. Human health</li> <li>2. Ecosystem integrity/conservation value</li> <li>3. Economic/commercial value</li> <li>4. Disaster Risk Reduction</li> <li>5. Energy source</li> <li>6. Livelihood support value</li> <li>7. Tourism</li> </ol>	M: 20,000-100,000; (~6 projects, ~100,000)	M	Municipal governments; CBOs/NGOs; Private sector.	Central and local budgets; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.); Private sector.
<b>Objective 7:</b> <i>Reduction of land degradation through application of sustainable land management practices</i>	<b>structural measures</b>						
	1. Reclamation of pastures and grasslands	Watershed pilot area –Municipalities Communities	<ol style="list-style-type: none"> <li>1. Human health</li> <li>2. Ecosystem integrity/conservation value</li> <li>3. Economic/commercial value</li> <li>4. Disaster Risk Reduction</li> <li>5. Livelihood support value</li> <li>6. Agricultural Productivity</li> </ol>	H: > 1,000,000	M-L	Central government: MoENRP and MoA; Municipal governments; CBOs/NGOs; Private sector.	Central and local budgets; Development agencies (USAID, UNDP, EU, bi-lateral donors, GIZ, Sida, etc.); Private sector.
	2. Reclamation of degraded agricultural lands by using efficient irrigation practice, etc.	Communities	<ol style="list-style-type: none"> <li>1. Human health</li> <li>2. Ecosystem integrity/conservation value</li> <li>3. Economic/commercial value</li> <li>4. Disaster Risk Reduction</li> <li>5. Livelihood support value</li> <li>6. Agricultural Productivity</li> </ol>	H: > 100,000	L	Central government: MoENRP and MoA; Municipal governments; CBOs/NGOs; Private sector.	Central and local budgets; Development agencies (USAID, UNDP, EU, bi-lateral donors, GIZ, Sida, etc.); Private sector.

	3. Carry out activities against land erosion - terracing, using no-tillage technologies, planting trees, grasses, etc.	Communities	<ol style="list-style-type: none"> <li>Human health</li> <li>Ecosystem integrity/conservation value</li> <li>Economic/commercial value</li> <li>Disaster Risk Reduction</li> <li>Livelihood support value</li> <li>Agricultural Productivity</li> </ol>	H: > 100,000 (~2 projects, ~200,000)	L	Central government: MoENRP and MoA; Municipal governments; CBOs/NGOs; Private sector.	Central and local budgets; Development agencies (USAID, UNDP, EU, bi-lateral donors, GIZ, Sida, etc.); Private sector.	
	<b>Non-structural measures</b>							
	1. Introduction of effective land/agricultural land management policy and its implementation mechanisms (land use zoning, land inventory and monitoring, land use fees, land allocation, etc.)	National	<ol style="list-style-type: none"> <li>Human health</li> <li>Ecosystem integrity/conservation value</li> <li>Economic/commercial value</li> <li>Disaster Risk Reduction</li> <li>Livelihood support value</li> <li>Agricultural Productivity</li> </ol>	M: 20,000 – 100,000	M	Central government: MoENRP and MoA; NGOs/CBOs.	Central budget; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).	
	2. Conducting an inventory of eroded and degraded agriculture lands	National Municipal	<ol style="list-style-type: none"> <li>Human health</li> <li>Ecosystem integrity/conservation value</li> <li>Economic/commercial value</li> <li>Disaster Risk Reduction</li> <li>Livelihood support value</li> <li>Agricultural Productivity</li> </ol>	M: 20,000 – 100,000	M	Central government: MoENRP and MoA; NGOs/CBOs.	Central and local budgets; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).	
	3. Setting up regular state monitoring network for soil quality	National Municipal	<ol style="list-style-type: none"> <li>Human health</li> <li>Ecosystem integrity/conservation value</li> <li>Economic/commercial value</li> <li>Disaster Risk Reduction</li> <li>Livelihood support value</li> <li>agricultural Productivity</li> </ol>	H: >100,000	M-L	Central government: MoENRP and MoA; Local authorities NGOs/CBOs.	Central and/or budget; Development agencies (USAID, UNDP, EU, bilateral	

							donors, GIZ, Sida, etc.).
<b>Public Awareness raising – DEMO projects</b>							
1. Awareness raising and capacity building of local population and municipal authorities on ecosystem functions and protection, sustainable land management and traditional agricultural practice	Municipal	1. Human health 2. Ecosystem integrity/conservation value 3. Economic/commercial value 4. Disaster Risk Reduction 5. Livelihood support value 6. Agricultural Productivity	M: 20,000 – 100,000	S-M	Central government: MoENRP, MES, Municipal government CBOs/NGOs.	Central and/or budgets; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).	
2. Reclamation of pastures and grasslands	Communities	1. Human health 2. Ecosystem integrity/conservation value 3. Economic/commercial value 4. Disaster Risk Reduction 5. Livelihood support value 6. Agricultural Productivity	M: 20,000- 100,000 ≈20 000- 50 000 for each project	S-M	Municipal governments; CBOs/NGOs; Private sector.	Central and local budgets;  Development agencies (USAID, UNDP, EU, bi-lateral donors, GIZ, Sida, etc.); Private sector.	
3. Implementation of land reclamation measures of eroded agricultural lands (through the use of bio fertilizers, irrigation, etc.)	Communities	1. Human health 2. Ecosystem integrity/conservation value 3. Economic/commercial value 4. Disaster Risk Reduction 5. Livelihood support value 6. Agricultural Productivity	M: 20,000- 100,000 ≈20,000- 50,000 for each project	S-M	Municipal governments; CBOs/NGOs; Private sector.	Central and local budgets;  Development agencies (USAID, UNDP, EU, bi-lateral donors, GIZ, Sida, etc.); Private sector.	
4. Carry out activities against	Communities	7. Human health 8. Ecosystem	M: 20,000-	S-M	Municipal governments;	Central and local budgets;	

		land erosion - terracing, using no-tillage technologies, planting trees, grasses, etc.		integrity/conservation value 9. Economic/commercial value 10. Disaster Risk Reduction 11. Livelihood support value 12. Agricultural Productivity	100,00 ≈20,000-50,000 for each project		CBOs/NGOs; Private sector.	Development agencies (USAID, UNDP, EU, bi-lateral donors, GIZ, Sida, etc.); Private sector.
<b>Objective 8:</b> <i>Promotion of organic/traditional agriculture</i>	<b>Non-structural measures</b>							
	1. Development of Central policy and its implementation mechanisms on Georgian agrobiodiversity and regulating GMO materials and products	Watershed pilot area		1. Health protection value 2. Ecological value 3. Economic/commercial value 4. Livelihood support value 5. Agricultural Productivity 6. Cultural value 7. Tourism	H: >100,000	M-L	Central government: MoA; local government; International and/local NGOs.	Central budget; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).
	<b>Public Awareness raising – DEMO projects</b>							
	1. Establishment of traditional organic farms	Communities farmer's level	–	1. Health protection value 2. Ecological value 3. Economic/commercial value 4. Livelihood support value 5. Agricultural Productivity 6. Cultural value 7. Tourism	H: >100,000  20,000 – 100,000 (~10 demo-projects, ~200,000)	M	Municipal governments; CBOs/NGOs; Private sector.	Local budgets; Private sector; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).
	2. Introduction of seed materials to re-establish production of traditional endemic species	Watershed pilot area		1. Health protection value 2. Ecological value 3. Economic/commercial value 4. Livelihood support value 5. Agricultural Productivity 6. Cultural value 7. Tourism	H: >100,000;  Demos: 20,000 – 100,000 (~10 demo-projects, ~100,000)	M	Municipal governments; CBOs; Private sector.	Local budgets; Private sector; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).
3. Establishment of herbal farms	Communities farmer's level	–	1. Health protection value 2. Ecological value	M: 20,000 –	M	Municipal governments;	Local budgets; Private sector;	

				3. Economic/commercial value 4. Livelihood support value 5. Agricultural Productivity 6. Cultural value 7. Tourism	100,000 (~6 demo-projects, ~100,000)		CBOs; Private sector.	Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.).
	<b>Public awareness – Demo projects</b>							
<b>Objective 9:</b> <i>Development of eco, agro and cultural tourism potential</i>	1. Ecotourism development supportive activities - arranging tourist trails, shelters, picnic and camping areas, panoramic views, wildlife tracking spots, placing sign boards and banners, etc.	PA-s: Tusheti, Batsara-Babaneuri and Ilto		1. Health protection value 2. Ecological value 3. Economic/commercial value 4. Livelihood support value 5. Cultural value 6. Tourism 7. Recreation	L: <20,000 (3 projects, ~60,000)	S	Central and regional governments; Private sector.	Central and local budgets; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.; Private sector.
	2. Establishment of environmentally friendly technologies for hotels and guest houses near the protected areas and buffer zones	PA-s: Tusheti, Batsara-Babaneuri and Ilto		1. Health protection value 2. Ecological value 3. Economic/commercial value 4. Livelihood support value 5. Cultural value 6. Tourism 7. Recreation	M: 20,000-100,000 (~5 projects, ~100,000)	S	Central and regional governments; Private sector.	Central and local budgets; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.; Private sector.
	3. Setting up of waste collection system at the protected areas	PA-s: Tusheti, Batsara-Babaneuri and Ilto		1. Health protection value 2. Ecological value 3. Economic/commercial value 4. Livelihood support value 5. Cultural value 6. Tourism 7. Recreation	M: 20,000-100,000 (~3 projects, ~150,000)	S	Central and regional governments; Private sector.	Central and local budgets; Development agencies (USAID, UNDP, EU, bilateral donors, GIZ, Sida, etc.

### *3.2.2 Management and Funding Mechanisms*

This IWMP (Table 1) includes the responsible agents for each suggested measure. They are categorized as: a) those practiced by governmental structures such as central, regional and municipal governments (e.g. MoENRP, MRDI, Kakheti governor's office, United Water Supply Company of Georgia (UWSCG), etc.); and b) those practiced by the private sector such as businesses, CBOs, international and local NGOs, eco-clubs and others. For each measure, a number of stakeholders will be involved in the implementation process, with a responsible party identified according to the specifics of its implementation needs and the accepted management practices of the structures listed above.

Potential funding sources are also recommended in the plan. Again, accepted funding practices were considered and the selection of the funding sources for specific measures was made based on the particulars of the type of activity, e.g., for non-structural measures, the potential funding sources are mostly central budget, bilateral and/or multilateral development agencies such as USAID, Sida, EU, bilateral donors, etc. In some cases, the funds can be supplemented from the local budgets too for these measures. As for the structural measures, the possible funding sources may include but are not limited to: central and local budgets; development agencies (Sida, USAID, EU, etc.); development banks (ADB, EBRD, WB and KfW); multi-lateral development agencies (EU, USAID, etc); private sector – businesses, NGOs, etc.

It should be noted that the current legal and institutional setting does not allow for the management of natural resources within the boundaries of watersheds. Management responsibilities over local natural resource bases are divided between the state government and local municipalities. Therefore, at this stage the most feasible measure is to create a watershed council with two units in each municipal government covered by this IWMP. It will be an advisory and consultative body for the effective monitoring and update of the IWMP. The council will be composed of local government, community and NGO representatives but will be open to other stakeholders including private businesses and donors. The council will be hosted by each local government on a rotational basis.

## **ANNEXES**



**Annex 1: INRMW project list of target communities of the Upper Alazani Pilot Watershed Area**

**Table 1: Communities and villages selected in Akhmeta municipality**

#	Community	Village	population
<b>1</b>	<b>Matani</b>		<b>5560</b>
		1. Matani	5560
<b>2</b>	<b>Zemo Alvani</b>		<b>5070</b>
		2. Zemo Alvani	4986
		3. Khorbalo	84
<b>3</b>	<b>Kvemo Alvani</b>		<b>3647</b>
		1. Kvemo Alvani	3407
		2. Babaneuri	240
<b>4</b>	<b>Kistauri</b>		<b>3350</b>
		1. Kistauri	2304
		2. Akhalsheni	338
		3. Akhshnis Velebi	248
		4. Akhshani	248
		5. Arashenda	174
		6. Sachale	38
<b>5</b>	<b>Ozhio</b>		<b>2139</b>
		1. Ozhio	901
		2. Kogoto	502
		3. Khorkheli	388
		4. Alaverdi	176
		5. Chabinaani	172
<b>6</b>	<b>Jokolo</b>		<b>1742</b>
		1. Jokolo	1060
		2. Birkian-Dzibrakhevi	682
<b>7</b>	<b>Sakobiano</b>		<b>1425</b>
		1. Sakobiano	564
		2. Kvaretskali	299
		3. Koreti	279
		4. Kutsakhta	103
		5. Khevischala	54
		6. Dedisperuli	45
		7. Bakilovani	81
<b>8</b>	<b>Tusheti</b>		<b>58</b>

**Table 2: Communities and villages selected in Telavi municipality**

#	Community	Village	population
<b>1</b>	<b>Tsinandali</b>		<b>3390</b>
		1. Tsinandali	3390
<b>2</b>	<b>Ruispiri</b>		<b>3100</b>
		1. Ruispiri	3100
<b>3</b>	<b>Napareuli</b>		<b>2856</b>
		1. Napareuli	2856
<b>4</b>	<b>Ikalto</b>		<b>2521</b>
		1. Ikalto	2521
<b>5</b>	<b>Kisiskhevi</b>		<b>2246</b>
		1. Kisiskhevi	2246
<b>6</b>	<b>Pshaveli</b>		<b>848</b>
		1. Pshaveli	679
		2. Lechuri	169
<b>7</b>	<b>Gulgula</b>		<b>1250</b>
		1. Gulgula	1250
<b>8</b>	<b>Laliskuri</b>		<b>759</b>
		1. Laliskuri	759

## **Annex 2: Priority problems identified in the target villages**

**Table 1: Target communities of Akhmeta municipality**

Community	Village	Priority problems	Causes of the problems
<b>1. Sakobiano</b>	Sakobiano	Poor quality and insufficient quantity of potable water	1. Water catchment construction of the Damasturi headwork cannot ensure collection of a sufficient amount of water, although the resource is sufficient. The headwork has to be fenced; no chlorination is done. 2. The pipes do not get filled from Kvaretskali due to low pressure and insufficient debit in the water supply system. 3. Water main pipes need repair; the internal network has been rehabilitated and is in relatively better condition.
		Natural disasters such as floods, mudflows and landslides cause damage to roads and population	1. There are no bank reinforcements on the Alazani river. 2. The riverbed is full and water cannot flow during heavy rains. 3. There is no drainage system in the village. 4. Tube-bridges should be constructed on the rivers.
		Pollution of soil and surface and underground water	1. Faulty management of household waste. 2. One landfill near the village school does not have sufficient capacity and endangers the health of schoolchildren.
	Koreti	Poor quality and insufficient quantity of potable water	1. Water is supplied from the Damasturi headwork, where no chlorination takes place and no sanitary zones are defined. 2. The internal network was rehabilitated; however, due to a debit shortage in the water main pipe, the internal networks cannot be filled.
		Natural disasters such as floods, mudflows and landslides cause damage to roads and population	1. There are no bank reinforcements on the Alazani river. 2. The riverbed is full and water cannot flow during heavy rains. 3. There is no drainage system in the village. 4. Tube-bridges should be constructed on the rivers.
		Pollution of surface water resources	1. Two primitive waste holes have been constructed; however, the holes are overfilled and waste is thrown into rivers and ravines.
	Kutsakhta	Poor quality and insufficient quantity of potable water	1. Water main pipes and internal networks need rehabilitation in the Damasturi and Kvaretskali water supply systems. 2. There is no chlorination in the headwork. 3. Sanitary zones are not fenced.
		Natural disasters such as mudflows and landslides cause damage to roads and population	1. There is no drainage system in the village. 2. Dry ravines need cleaning. 3. Tube-bridges should be constructed on the river.
		Pollution of surface water resources	1. Two primitive waste holes have been constructed; however, the holes are overfilled and waste is thrown into rivers and ravines.
	<b>2. Jokolo</b>	Jokolo	Poor quality and insufficient quantity of potable water
Natural disasters such as floods, mudflows and landslides cause damage to roads and population			1. Because the Alazani river has no bank reinforcements in Birkiani village, mudflows threaten Jokolo village. 2. The Alazani riverbed is full of sediments and other waste. 3. Household waste is not managed correctly.
Pollution of underground			1. Household waste is not managed correctly. 2 The two existing simple landfills cannot be accessed by the majority

		water resources	of the local population. Waste is thrown onto the Alazani embankment. 3. Unfenced landfills are located near a school.
	Birkiani	Poor quality and insufficient quantity of potable water	1. There is no shortage of resources at the headwork but there is an insufficient number of drainage systems. 2. There is no tank in the headwork and no chlorination takes place. 3. The territory is not fenced.
		Pollution of surface water resources	1. Household waste is not managed correctly. 2. The primitive landfill is not accessible to the majority of local population. Waste is thrown onto the banks of the Alazani. 3. The landfill is not fenced.
		Natural disasters such as floods, mudflows and landslides cause damage to roads and population	1. The Alazani riverbed is full of earth and waste. 2. There are no bank reinforcements on the Alazani river.
<b>3. Ozho</b>			
	<b>Ozho</b>	Poor quality and insufficient quantity of potable water (water supply available only once every five days)	1. The headwork is on village territory; water is collected in the tank through capitation. 2. The pipes from the headwork are damaged. 3. The internal network is damaged and the rate of loss is high.
		Lack of surface water resources (for irrigation purposes)	1. Main irrigation channels are in satisfactory conditions. 2. Internal channels are completely destroyed; in ground channels, the rate of loss is very high. 3. The irrigation system cannot ensure water distribution.
		Natural disasters such as floods, mudflows and landslides cause damage to roads and population – floods have occurred frequently over the past two years	1. The water level in the Khodashnikhevi and Berkhevi rivers often rises and floods the territory damaging population and farms. 2. Ravines and riverbeds need cleaning.
	Alaverdi	Poor quality of potable water	1. Drainage catchments in the headwork need cleaning. 2. Water catchment basin is open. 3. Sanitary zones are not fenced.
		Natural disasters such as floods, mudflows and landslides cause damage to roads and population	1. The water level in the Khodashnikhevi and Berkhevi rivers often rises and floods the territory damaging population and farms. 2. Ravines and riverbeds need cleaning.
		Reduction of forest cover	1. The village has no access to natural gas, so villagers cut trees for use as firewood. Part of the forest was transferred to the protected territory.
	Khorkheli	Poor quality and insufficient quantity of potable water	1. Shortage of potable water is not related to lack of resources; an insufficient water supply is drawn from two drilled wells. 2. The internal network is damaged and, in some areas, does not function at all.
		Natural disasters such as floods, mudflows and landslides cause damage to roads and population	1. Seasonal heavy rainfall; 2. No bank reinforcements on the Khodashniskhevi. 3. Drainage systems on village territory need cleaning.

		Reduction of forest cover	1. Logging performed by local population for fuel wood.
<b>4. Matani</b>	Matani	Poor quality and insufficient quantity of potable water	1. Water is supplied from filtrate and wells. The existing resource cannot meet qualitative or quantitative norms. 2. The headworks need to be rehabilitated. 3. The internal network is in poor condition. 4. Often water from headwork goes directly into the network (avoiding tank). 5. There is no chlorination. 6. Two tanks, each with 600 tons capacity, need cleaning. 6. The water supply system (from headwork to main pipes) was designed incorrectly and cannot provide water to the population.
		Pollution of surface waters	1. Incorrect management of household waste. 2. Two new landfills and garbage bins are not enough and household waste is thrown into ravines and rivers.
		Natural disasters such as floods, mudflows and landslides cause damage to roads and population	1. Alazani, Ilto, and Kurtanadzeuli rivers are subject to seasonal flooding. 2. The riverbeds are full of sediments and water cannot flow during heavy rainfalls. 3. Existing stone gabions are not enough.
		Lack of surface water resources (for irrigation purposes)	1. Water main and internal irrigation channels are amortized. 2. High rates of loss in the network. 3. Potable water is used for irrigation purposes.
<b>5. Kistauri</b>	Kistauri	Poor quality and insufficient quantity of potable water	1. The water shortage is not related to resource shortage. 2. The irrigation network is damaged. 3. A water main pipe and a collection tank at one headwork need rehabilitation. 4. The second headwork is fully depreciated and needs rehabilitation. 5. The water main and internal network need rehabilitation. 6. There is no chlorination. 6. The headworks are not fenced 7. The local population is connected to the water supply system through the wrong technical means and use potable water for irrigation purposes leaving insufficient debit in the water mains.
		Natural disasters such as floods, mudflows and landslides cause damage to roads and population	1. Seasonal heavy rainfall. 2. The ravines are full of earth. 3. The riverbeds are washed out. 4. There are no bank reinforcements.
		Pollution of rivers and lakes	1. Poor household waste management. 2. There are garbage bins in the villages, but they are not accessible to the whole population and waste is thrown into ravines and onto river banks.
		Reduction of forest cover	1. Logging performed in the past. 2. The village has no access to natural gas, so villagers cut trees for firewood. 3. Logging is performed willfully, mostly on the territory near the village.
	Arashenda	Potable water quality	1. Depreciation of internal and water main pipes.
		Pollution of surface water resources	1. Poor household waste management. 2. There are garbage bins in the villages, but they are not accessible to the whole population and waste is thrown into ravines and onto river banks.
		Reduction of forest cover	1. Logging performed in the past. 2. The village has no access to natural gas, so villagers cut trees for firewood. 3. Logging is performed willfully, mostly on the territory near the village.
	Akhalsheni	Potable water quality	1. Depreciation of internal and water main pipes.
		Reduction of forest cover	1. Logging performed in the past. 2. The village has no access to natural gas, so villagers cut trees for firewood. 3. Logging is performed willfully, mostly on the territory near the village.
		Natural disasters such as floods, mudflows and landslides cause damage to roads and population	1. Seasonal heavy rainfall. 2. Ravines are full of road metal. 3. Riverbeds are washed out. 4. There are no bank reinforcements.

6. Zemo Alvani		
Zemo Alvani	Lack of surface water resources (for irrigation purposes)	1. Irrigation network and headwork need rehabilitation and cannot ensure water supply. 2. Water main and internal channels are depreciated; the locks do not function. 3. The irrigation system consists of open, earth channels and loss is significant. The system provides water to two villages; water shortage is especially noticeable downstream.
	Reduction of forest cover	1. Illegal logging approximately 10 years ago – mainly oak, ash, etc. were cut. 2. The logging was carried out mostly on the plains. (Presently, the situation is rather stable; however, the logged territory needs restoration).
	Pollution of soil and underground water	1. Poor household waste collection. 2. There is a municipal landfill; however, there is an insufficient number of garbage bins and waste is only removed once a week. 3. Illegal disposal of industrial waste.
7. Kvemo Alvani		
Kvemo Alvani	Poor quality and insufficient quantity of potable water	1. The headwork is located on the mudflow zone in Koreti village and it is damaged periodically. 2. The headwork is outdated; the collection tank is depreciated; and the drainage pipes are full and cannot collect water.
	Lack of surface water resources (for irrigation purposes)	1. The irrigation network needs rehabilitation; it is periodically damaged by mudflow. 2. Locking bushings should be installed; channels are in open ground and rates of loss are high.
	Natural disasters such as floods, mudflows and landslides cause damage to roads and population	1. There are no bank reinforcements on the Alazani. 2. Gabions need to be installed. 3. The regulatory channels are full and water cannot flow during floods.
Babaneuli	Poor quality and insufficient quantity of potable water	1. The village has two headworks; they are not well-designed (there is no tank there, etc.) and need rehabilitation. 2. The water main pipes need to be replaced. 3. The water resource in the headwork is not stable (sources are periodically reduced).
	Flooding of agricultural fields	1. Farm land is periodically flooded because of the geographic peculiarities of the water catchment. 2. Swampy landscape. 3. Absence of drainage channels.
8. Tusheti		
	Poor quality and lack of potable water (the problem is mainly in Omalo)	1. The headwork is not perfectly installed and water does not get chlorinated; 2. The water main pipe of Zeda and Kveda Omalo is depreciated. 3. The headwork and networks are periodically damaged by mudflows. 4. The headwork is updated, but the collection tank is depreciated; drainage pipes are full and water cannot flow.
	Natural disasters such as floods, mudflows and landslides cause damage to roads and population	1. Seasonal heavy rainfall and geographic peculiarities; 2. Unstable inclinations. 3. Frequent grazing on the slopes.
	Soil and groundwater pollution	1. Poor management of household waste (especially during tourism season). 2. Landfills are either far from the village or do not exist.
	Construction/ rehabilitation of footbridges and horse trails over the ravines	Due to natural disasters footbridges are periodically damaged, impeding tourism development and worsening social conditions in the region.



**Table 2: Target communities of Telavi municipality**

Community	Village	Priority problems	Reasons causing problems
<b>1. Gulgula</b>	Gulgula	Poor quality and insufficient quantity of potable water	The village gets its water supply from the Telavi water supply system and a headwork located near the village. 1. The water supply is limited. 2. The water resource is sufficient in the headwork, but only one of two drilled wells is functioning. 3. The water main pipe and internal network need rehabilitation.
		Natural disasters such as floods, mudflows and landslides cause damage to roads and population	The village is located near the Alazani, Telaviskhevi and Turdo rivers. 1. The ravines are full. 2. There are no bank reinforcements. 3. There are no drainage channels on village territory. 4. Floods fill the riverbeds with material from erosion of the river banks and forest cover.
		Lack of surface water resources (for irrigation purposes)	1. Water main pipes and internal networks of the irrigation system need rehabilitation. 2. Open ground channels lead to big losses.
		Pollution of soil and water	1. Poor management of household waste: it is not collected in an organized manner, and people throw garbage into dry ravines and onto river banks. 2. The Telavi landfill is located 500 m from the village and does not meet any standards.
		Reduction of forest cover	1. Villagers cut trees for fuel wood. 2. The forest massif is eroded by river floods.
<b>2. Tsinandali</b>	Tsinandali	Poor quality and insufficient quantity of potable water	1. It is not a resource shortage. 2. The headwork is outdated and cannot clean water; the water collection tank is outdated and unprotected and the sanitary zones of the headwork are unfenced. 3. The tanks on the village territory do not have enough capacity. 4. The internal network needs rehabilitation and the water main pipe needs to be replaced.
		Surface water pollution	Poor management of household waste which is thrown into ravines.
		Natural disasters such as floods, mudflows and landslides cause damage to roads and population	Ravines and drainage pipes are full; forests are logged.
		Reduction of forest cover	Villagers cut trees for fuel wood.
<b>3. Pshaveli</b>	Pshaveli	Poor quality and insufficient quantity of potable water	1. Water shortage is not related to lack of resources. 2. The headwork needs rehabilitation and cannot supply sufficient quantity or quality of water. 3. Water main and internal networks need rehabilitation. Water is collected through capitation in the tank on the village territory. 4. The pipes leading from the water main are damaged. 5. The internal network is damaged and loss rates are high.
		Lack of surface water resources (for irrigation purposes)	1. The irrigation network needs rehabilitation. 2. Open and ground channels result in high rates of loss. 3. Absence of a drainage system results in damage to irrigation channels.

		Reduction of forest cover	Commercial logging.
		Natural disasters such as floods, mudflows and landslides cause damage to roads and population	1. Rivers including the Chivchiva flood on a seasonal basis. 2. River ravines are full of soil as a result of erosion. 3. Frequent logging. 4. Cattle graze on the embankments.
		Soil and surface water pollution	1. Poor household waste management. 2. Without landfills, garbage is thrown into ravines and onto banks.
	Lechuri	Poor quality and insufficient quantity of potable water	1. The headwork is out of order. 2. Surface water is used as potable water. 3. No sanitary zones are established. 4. The network needs partial rehabilitation.
		Lack of surface water resources (for irrigation purposes)	1. Irrigation network needs rehabilitation. 2. Open and ground channels result in high rates of loss. 3. Absence of a drainage system results in damage to irrigation channels.
		Reduction of forest cover	Commercial logging.
		Natural disasters such as floods, mudflows and landslides cause damage to roads and population	1. Rivers including the Chivchiva flood on a seasonal basis. 2. River ravines are full of soil as a result of erosion. 3. Frequent logging. 4. Cattle graze on the embankments.
<b>4. Napareuli</b>	Napareuli	Poor quality and insufficient quantity of potable water	1. Headwork cannot supply and clean a sufficient volume of water (not related to shortage of resources). 2. The internal network needs rehabilitation. 3. Two kilometers of the water main will be replaced.
		Pollution of soil, surface and underground water	1. Poor household waste management. 2. Without landfills, garbage is thrown into the ravines and onto banks.
		Reduction of forest cover	1. Forest is logged for fuel wood.
		Natural disasters such as floods, mudflows and landslides cause damage to roads and population	The Lopota riverbed is full of soil, which causes flooding and washes the territory nearby.
		Lack of surface water resources (for irrigation purposes)	1. Poor drainage and irrigation channels (internal and water main networks of the Naurdli irrigation channel). 2. The water main from the Lopota river needs rehabilitation.
<b>5. Laliskuri</b>	Laliskuri	Soil, surface and groundwater pollution	1. Poor household waste management. 2. Without landfills, waste accumulates in river beds and on river banks.
		Lack of potable water	1. The headwork needs rehabilitation; water resources are periodically reduced and no sanitary zones are established. 2. The collection tank of the headwork is out of order and unprotected. 3. The network needs partial rehabilitation.
		Lack of surface water resources (for irrigation purposes)	1. The irrigation system is outdated and needs rehabilitation. 2. There are no sluice gates. 3. Loss rates are high in ground channels and amortized closed channels.

6. Ruispiri		
Ruispiri	Poor quality and insufficient quantity of potable water	1. The headwork is outdated and collection wells need rehabilitation. 2. There are no protected sanitary zones; pipes are damaged during mudflow. 3. The internal network needs rehabilitation.
	Reduction of forest cover	1. Illegal logging for fuel wood.
	Pollution of rivers and lakes	1. There is a landfill in the village, but without organized waste collection and transportation, villagers cannot use it. 2. Waste, including waste from the asphalt/concrete factory, is thrown onto river banks and into ravines.
	Natural disasters such as floods, mudflows and landslides cause damage to roads and population (frequent in the past)	1. The ravines of the Ikalto, Turdo, and Chichkani rivers are characterized by mudflows. 2. Logging. 3. Ravines are full of earth. 4. River beds are full of waste from the local population.
7. Ikalto		
Ikalto	Poor quality and insufficient quantity of potable water	The shortage is not related to a resource shortage. 1. The headworks need rehabilitation; 2. Seasonal floods on the Turdo river threaten the headwork and networks. 3. A landslide damaged one of the headworks. 4. The water main and internal networks need rehabilitation. 5. Collection wells are not protected; sanitary zones of the headworks are not fenced and protected.
	Natural disasters such as floods, mudflows and landslides cause damage to roads and population (frequent in the past)	1. Seasonal flooding of the Ikalto and Turdo rivers. 2. Village drainage channels need cleaning. 3. Frequent logging on the slopes. 4. The ravines are full of earth.
	Lack of surface water resources (for irrigation purposes)	1. Irrigation channels are depreciated; there are no pumps and water cannot be supplied. 2. The system is outdated and cannot function. 3. Potable water is used for irrigation.
	Reduction of forest cover	1. The village has no access to natural gas, so villagers cut trees illegally for firewood. 2. Forest massif erosion due to mudflows and landslides.
	Water erosion of soil (roads leading to agricultural fields and pasture land are damaged)	1. Mudflows and floods. 2. Damaged irrigation and drainage channels.
8. Kisiskhevi		
Kisiskhevi	Poor quality and insufficient quantity of potable water	1. At the headwork the storage reservoir has low capacity and is damaged; 2. Amortized pipes needs replacement in many sections. 3. An observed water shortage at the headwork could be caused by forest cutting and natural disasters.
	Natural disasters such as floods, mudflows and landslides cause damage to roads and population (frequent	1. Illegal logging. 2. Forest massif erosion due to mudflow and landslide. 3. Sand and gravel processing plant on the Kisiskhevi river.

		in the past)	
		Lack of surface water resources (for irrigation purposes)	1. The network was robbed and needs rehabilitation in many sections. 2. Water cannot be supplied because there are no pumps.
		Reduction of forest cover	1. Illegal logging for fuel wood
		Soil and surface water pollution	1. The village does not have a landfill. 2. Waste collection is inadequate. 3. Waste is thrown into ravines and rivers.

**Annex 3: Matrix prioritizing problems identified by experts for Upper Alazani Pilot Watershed Area**

## Topic: Forest resources

#	Priority problems	Criteria of Negative impact	Max score	Evaluation	Causal relation		
					Causes of the problems	Negative results (impact on other resources)	Problem scale
1.	Deterioration in general condition of a high conservation value forest area  <b>(Total score: 19)</b>	On the health of the population.	10	6	Absence of proper legal-regulatory, policy and institutional framework for sustainable forest management; absence of data on the current state of the forests and volumes of timber harvesting; underutilization of alternative (renewable) energy resources such as solar energy, wind energy and biogas; lack of technical, financial and human resources for sustainable forest management.	Deterioration of water balance and shortening of water resources Degradation of ecosystems; Degradation of soil cover; Decreased biodiversity and extinction of rare species; Degradation on natural habitats within the protected areas and its buffer zones.	Whole watershed area
		On the ecological condition of the whole water catchment area.	8	8			
		On socio-economic conditions: dwellings, infrastructure, agriculture.	5	5			
2.	Deterioration of the general condition of forests; decrease of forest stand frequency below the allowable level  <b>(Total score: 18)</b>	On the health of population.	10	6	Failure to implement inventory and functional zoning of forests; Absence of optimal norms (rules) for resources use; Lack of data on demand for resources; Uncontrolled cutting of trees for firewood; Absence of reliable information on forest resources and conditions. Lack of measures on restoration of degraded forest.	Deterioration of water balance and shortening of water resources; Degradation of ecosystems and soil cover; Decreasing of biodiversity and extinction of rare species; Degradation on natural habitats.	Whole watershed
		On the ecological condition of the whole water catchment area.	8	8			
		On socio-economic conditions: dwellings, infrastructure, agriculture.	5	4			

3.	Reduction of timber resources <b>(Total score: 18)</b>	On the health of population.	10	6	Unsustainable use of timber resources; Uncontrolled cutting of trees for firewood; Failure to implementation of a monitoring system; underutilization of alternative (renewable) energy resources such as solar energy, wind energy and biogas; There is no set up optimal quota for timber use, that does not exceed the annual increment of timber; Absence of forest maintenance and restoration measures;	Degradation of forests and soil of adjacent territories; sharp decrease of climate and water regulatory functions; Deterioration of water balance and shortening of water resources; Decreasing of biodiversity and extinction of rare species; Ecosystem degradation.	Whole watershed
		On the ecological condition of the whole water catchment area.	8	8			
		On socio-economic conditions: dwellings, infrastructure, agriculture.	5	4			

**Topic: Land resources**

#	Priority problems	Criteria of Negative impact	Max score	Evaluation	Causal relation		
					Causes of the problems	Negative results (impact on other resources)	Problem scale
1	Soil erosion and degradation <b>(Total score: 17)</b>	On the health of population.	10	6	Loss of forest cover; Incorrect cultivation on the slopes; Grazing large herds of cattle for a long period of time or on land that is not appropriate for grazing (for example, slopes); Unsustainable management of	A major part of the Tusheti economy causes erosion and landslides; Destruction of soil layer; e.g., in Tusheti, on the south slopes near the villages of Jvarboseli, Bochorna, Dochu, Begela, Sabue	Tusheti pasture lands and economic territories in the upper Alazani pilot
		On the ecological condition of the whole water catchment area.	8	7			

		On socio-economic conditions: dwellings, infrastructure, agriculture.	5	4	pasture lands; Active geo-dynamic processes; Abolishment of traditional forms of economy; Change from traditional zoning and rotation of pasture lands.	and Gogrulta; Impedes the natural regeneration of plants and causes changes in the botanical composition of pasture lands; decreases plant density;	watershed area.
2	Loss of high productivity agricultural lands and Changes in land use  (Total score: 17)	On the health of population.	10	7	High losses in irrigation systems; Unsustainable irrigation and agricultural practices; Absence of land reclamation measures; Use of valuable agricultural land for non-agricultural purposes.	Difficulty maintaining the aesthetic value of undeveloped territories and avoiding degradation of valuable ecosystems.	Pilot watershed
		On the ecological condition of the whole water catchment area.	8	6			
		On socio-economic conditions: dwellings, infrastructure, agriculture.	5	4			
3	Soil Pollution  (Total score: 18)	On the health of population.	10	8	Pollutants leaching from waste dumps, open-pit mines, and pit latrines; Urban storm water and agriculture runoff; Untreated wastewater discharge; Absence of regulatory and law enforcement mechanisms for soil quality; Absence of effective waste and wastewater control regulatory and/or economic mechanisms; Absence of soil quality monitoring system; Absence of financial and technical resources for implementing effective waste management and water sanitation policies.	Loss of land productivity;  Pollution of underground and surface waters;  Decreased biodiversity.	pilot watershed
		On the ecological condition of the whole water catchment area.	8	6			
		On socio-economic conditions: dwellings, infrastructure, agriculture.	5	4			



**Topic: Waste management**

#	Priority problems	Criteria of Negative impact	Max score	Evaluation	Causal relation		
					Causes of the problems	Negative results (impact on other resources)	Problem scale
1	Unsanitary (which are not in compliance with environmental norms) legal and illegal landfills in the pilot municipalities  (Total score: 18)	On the health of population.	10	8	Landfills constructed during the Soviet period without any projection of environmental protection measures; Absence of waste collecting and transportation services in the villages; Low level of awareness in the local population; Limited financial and personnel capabilities in the municipalities. Lack of technical equipment (e.g., containers, garbage trucks, etc.); Weak legislation on waste management.	Polluted water, soil, and air in recreational and other territories;  Impedes development of tourism.	Regional
		On the ecological condition of the whole water catchment area.	8	6			
		On socio-economic conditions: dwellings, infrastructure, agriculture.	5	4			
2	Absence of waste recycling and processing systems in the pilot regions.  (Total score: 11)	On the health of population.	10	4	Absence of relevant infrastructure to process waste, including collection stations for recyclable materials; Low level of awareness in the local population; Weak legislation on waste management.	Large quantity of waste, including nondegradable waste in landfills; Loss of land resources for landfills.	Regional
		On the ecological condition of the whole water catchment area.	8	4			
		On socio-economic conditions: dwellings, infrastructure, agriculture.	5	3			

**Topic: Water resources**

#	Priority problems	Criteria of Negative impact	Max score	Evaluation	Causal relation		
					Causes of the problems	Negative results (impact on other resources)	Problem scale
1	Reduction of flood capacity of rivers and development of catastrophic events  <b>(Total score: 16)</b>	On the health of population.	10	6	Non-systemized logging of forest cover; extensive extraction of sand and gravel from riverbanks and beds; Unequal seasonal distribution of river flows; Increased intensity of atmospheric precipitation from climate change; Naturally-occurring tectonic processes specific to the Caucasus mountains and Gombori ranges; Mudflow characteristics of the Turdo and Kisiskhevi rivers.	Loss of a productive layer of soil and agricultural and plot lands;	Municipality
		On the ecological condition of the whole water catchment area.	8	6			
		On socio-economic conditions: dwellings, infrastructure, agriculture.	5	4			
2	Shortage of water for irrigation purposes  <b>(Total score: 10)</b>	On the health of the village population.	10	1	Irrational use of water resources; Unsatisfactory technical condition of faulty and outdated irrigation systems. (60-70% loss in the network; Inadequate funding to rehabilitate existing systems; Inefficient management of water resources; Absence of effective water use tariffs and implementation systems (e.g., proper institutions, billing and bill collection systems, penalties).	Degradation of agricultural lands; Danger of desertification.	Municipality
		On the ecological condition of the whole water catchment area.	8	4			
		On socio-economic conditions: dwellings, infrastructure, agriculture.	5	5			

3	Pollution of water resources (surface and underground)  (Total score: 15)	On the health of population.	10	8	Poor infrastructure of legal and illegal landfills; Amortized centralized sewage systems in the cities and absence of waste water treatment plants; Absence of sewage networks in villages; Agriculture and urban runoff Insufficiently treated/untreated industrial wastewater;	Deterioration of the water ecosystem.  Decreased biodiversity in surface waters;	Spread over the entire pilot territory.
		On the ecological condition of the whole water catchment area.	8	6	Poor monitoring systems for ambient water quality (underground and surface); Absence of effective regulations, including standards for wastewater discharges; Absence of a common effective policy on waste management; Poor law enforcement.		
		On socio-economic conditions: dwellings, infrastructure, agriculture.	5	1			

**Topic: Water supply systems**

#	Priority problems	Criteria of Negative impact	Max score	Evaluation	Causal relation		
					Causes of the problems	Negative results (impact on the status of other resources)	Problem scale
1	Poor quality of potable water  (Total score: 11)	On the health of population.	10	8	Water supply system headworks are not protected; Intakes of the headworks and pipes are depreciated; headworks are faulty: they do not have the capacity for even crude technological processing (purifying, filtering) and they are missing components such as filters, clean water reservoirs, and sediment traps; Absence/insufficient water disinfection; No state monitoring of water quality.	-	The problem is observed in the pilot villages of the pilot area.
		On the ecological condition of the whole water catchment area.	8	1			
		On socio-economic conditions: dwellings, infrastructure, agriculture.	5	2			
2	Unavailability of potable water  (Total score: 9)	On the health of population..	10	7	Insufficient technical condition of intakes; Significant water loss due to depreciated/damaged main pipes and internal networks. Irrational water distribution due to absence of storage reservoirs and, in some cases, due to incorrect construction of the system; Use of drinking water for irrigation. Inadequate funding to rehabilitate existing systems/build new efficient systems; Absence of effective water use tariffs and implementation systems (e.g., proper institutions, billing and bill collection systems, penalties).	Irrational use of underground water resources (due to large losses in depreciated systems).	The problem is observed in the key villages of the pilot area.
		On the ecological condition of the whole water catchment area.	8	1			
		On socio-economic conditions: dwellings, infrastructure, agriculture.	5	1			

**Topic: Biodiversity**

#	Priority problems	Criteria of Negative impact	Max score	Evaluation	Causal relation		
					Reasons causing problems	Negative results (impact on other resources)	Problem scale
1.	Degradation (destruction, modification and/or transformation) of natural ecosystems and biomes (e.g., alpine and subalpine meadows and forests); destruction of habitats. <b>(Total score: 19)</b>	On the health of population.	10	8	Overgrazing, intensive forest cutting, invasive species, poaching, and unsustainable tourism; Poor biodiversity-related legislation, policy, and planning; weak enforcement of biodiversity and forest management laws and regulations; Poor economic conditions of rural communities heavily dependent on local resources for their subsistence; Low public awareness of environmental protection.	Degradation of ecosystems.	municipalities of pilot watershed
		On the ecological condition of the whole water catchment area.	8	8			
		On socio-economic conditions: dwellings, infrastructure, agriculture.	5	3			

**Topic: agriculture**

#	Priority problems	Criteria of Negative impact	Max score	Evaluation	Causal relation		
					Reasons causing problems	Negative results (impact on other resources)	Problem scale
1	Loss of traditional, endemic agricultural species (e.g., lentil, chickpea, flax, wheat) and wide use of GMOs. <b>(Total score: 16)</b>	On the health of population.	10	8	Lack of control of gene-manipulated materials and products; Wide use of mass-production crops; Loss of local knowledge of traditional agriculture.	Agricultural genetic erosion.	National
		On the ecological condition of the whole water catchment area.	8	5			
		On socio-economic conditions: dwellings, infrastructure, agriculture.	5	3			

## **Annex 4: Summary of prioritized problems, Upper Alazani watershed pilot area**

#	Sphere	Priority Issue	Value/function/service impacted by the issue	Max score	Evaluation
1.	Forest resources	<p><b>1. Deterioration in overall quality of high conservation value forests; 2. Reduced timber resources</b></p> <p><i>Underlying causes:</i> unsustainable use of timber resources, including uncontrolled logging for firewood.</p> <p><i>Root causes:</i> 1. Underutilization of alternative energy sources; 2. Poverty of local population gives limited access to secure energy sources (gas, electricity, etc.); 3. Local population's lack of awareness of energy saving and efficiency measures; 4. Absence of a common forest management policy, effective legislation and regulations; 5. Absence of forest inventory and monitoring systems; 6. Absence of forest maintenance and restoration measures; 7. Absence of effective law-enforcement system.</p>	Human health	40	40
			Drinking water supply	40	40
			Ecosystem integrity/conservation value	40	40
			Disaster Risk Reduction	40	40
			Irrigation	30	25
			Hydro-energy	30	-
			Forest resources used as fuel	30	30
			Agricultural production	30	10
			Mineral resources	30	10
			Cultural value	20	15
			Tourism	20	20
			Recreation	20	20
Total score					285



#	Sphere	Priority Issue	Value/function/service impacted by the issue	Max score	Evaluation
2.	Water quantity	<p><b>1. Shortage of water for drinking and irrigation; 2. Reduced flood control capacity of rivers.</b></p> <p><b>Other issues that may emerge in a 20-50-year horizon: 3. Reduction of annual average river runoff; 4. Change in seasonal water flow.</b></p> <p><i>Underlying cause for problem 1:</i> Inefficient existing systems due to outdated and obsolete technologies and inefficient use of water by consumers.</p> <p><i>Root causes for problem 1:</i> 1. Absence of capital to rehabilitate existing systems/build new efficient systems; 2. Absence of effective water use tariffs and implementation systems (proper institutions, billing and bill collection systems, penalties).</p> <p><i>Underlying causes for problem 2:</i> 1. River bank erosion; 2. River bed sedimentation/silting; 3. Change in river morphology.</p> <p><i>Root causes for problem 2:</i> 1. Extensive sand and gravel extraction from river banks and beds; 2. Forest degradation and slope erosion; and 3. Naturally-occurring tectonic processes specific to the Caucasus mountains and Gombori ranges.</p> <p><i>Underlying and root causes for issues 3 and 4 are climate change.</i></p>	Human health	40	30
			Drinking water supply	40	40
			Ecosystem integrity/conservation value	40	40
			Disaster Risk Reduction	40	40
			Irrigation	30	30
			Hydro-energy	30	30
			Forest resources used as fuel	30	-
			Agricultural production	30	30
			Mineral resources	30	-
			Cultural value	20	20
			Tourism	20	20
Recreation	20	20			
Total score					300

#	Sphere	Priority Issue	Value/function/service impacted by the issue	Max score	Evaluation
3.	Water quality	<p><b>1. Pollution of surface and ground waters. 2. Pollution of tap water</b></p> <p><i>Underlying causes for issue 1:</i> 1. Discharge of untreated wastewater from point sources (sewage systems, industries, etc.) into surface waters; 2. Agriculture and urban runoff; 3. Seepage of leachates from controlled and uncontrolled waste disposal sites and pit latrines.</p> <p><i>Root causes for issue 1:</i> 1. Deteriorated or absent sewage systems; 2. Absence of wastewater treatment facilities; 3. Absence of standards-based sanitary landfills and poor condition of existing landfills; 3. Lack of state finances to rehabilitate/build centralized sewage systems and construct WWTPs and standards-based landfills; 4. Poor ambient water quality and soil monitoring; 5. Absence of effective regulations, including standards for wastewater discharge; 6. Absence of a common effective policy on waste management; 7. Poor law enforcement; 8. Low environmental consciousness in local communities.</p> <p><i>Underlying causes for problem 2:</i> 1. Absence of sanitary zones/failure to protect existing zones around water sources; 2. Obsolete and damaged infrastructure; 3. Absence of tap water treatment virtually in all communities with centralized water supply systems.</p> <p><i>Root causes for problem 2:</i> 1. Shortage of funds to rehabilitate existing systems; 2. Absence of effective regulations, law enforcement and monitoring mechanisms and local capacity for tap water quality; 3. Low environmental consciousness in local communities</p>	Human health	40	40
			Drinking water supply	40	40
			Ecosystem integrity/conservation value	40	30
			Disaster risk reduction	40	-
			Irrigation	30	25
			Hydro-energy	30	-
			Forest resources used as fuel	30	-
			Agricultural production	30	25
			Mineral resources	30	-
			Cultural value	20	20
			Tourism	20	20
Recreation	20	20			
<b>Total score</b>					<b>220</b>

#	Sphere	Priority Issue	Value/function/service impacted by the issue	Max score	Evaluation
4.	Waste Management	<p><b>1. Poor sanitary/hygienic conditions in urban and rural settlements as a result of waste dumping; 2. Pollution of streams, rivers, groundwater and soils from dumping wastes in dry ravines, canals and river beds, from seepage of pollutants from controlled and uncontrolled waste disposal sites, and from contamination by obsolete pesticides.</b></p> <p><i>Underlying cause for problem 1:</i> Absence of waste collection systems/presence of poor waste collection systems in most rural areas.</p> <p><i>Root causes for problem 1:</i> Lack of financial, technical and human resources/capacity to organize effective waste collection, transportation and disposal systems; 2. Absence of effective waste collection and disposal tariffs; 3. Poor enforcement of tariff payments.</p> <p><i>Underlying causes for problem 2:</i> 1. Unsanitary legal and illegal waste disposal sites, in both urban and rural areas, that are frequently located very close to streams and settlements; 2. Improper operation and maintenance of existing waste disposal sites.</p> <p><i>Root causes for problem 2:</i> 1. Absence of capital to build standards-based sanitary landfills and/or properly operate and maintain existing ones; 2. Absence of waste recycling and processing capacities; 3. Poor law enforcement; 4. Low environmental consciousness in local communities.</p>	Human health	40	40
			Drinking water supply	40	30
			Ecosystem integrity/conservation value	40	40
			Disaster risk reduction	40	-
			Irrigation	30	20
			Hydro-energy	30	-
			Forest resources used as fuel	30	-
			Agricultural production	30	25
			Mineral resources	30	-
			Cultural value	20	20
Tourism	20	20			
Recreation	20	20			
Total score					215

#	Sphere	Priority Issue	Value/function/service impacted by the issue	Max score	Evaluation
5.	Land resources	<p><b>1. Land erosion and degradation; 2. Loss of high productivity agricultural lands; 3. Land pollution</b></p> <p><i>Underlying causes for problem 1:</i> 1. Uncontrolled, excessive grazing; 2. Active geo-dynamic processes; 3. Uncontrolled forest cutting; 4. High losses in irrigation systems; 5 Use of unsustainable irrigation and agricultural practices; 6. Absence of land reclamation measures.</p> <p><i>Root causes for problem 1:</i> Absence of proper zoning or other regulatory or economic mechanisms for sustainable pasture management; 2. Absence of sustainable forest management laws, policies and effective mechanisms for enforcement; 3. Lack of funds to rehabilitate existing/build new, more efficient irrigation systems and implement erosion control/land reclamation measures; 4. Absence of policy/plan for sustainable land management; 5. Absence of effective water use tariffs and implementation mechanisms; 6. Low awareness among local farmers on sustainable water use and agriculture practices.</p> <p><i>Underlying cause for problem 2:</i> Large areas of high productivity agricultural lands that have lain fallow for years.</p> <p><i>Root cause for problem 2:</i> Absence of effective agricultural land management policy and implementation mechanisms (land use zoning, land inventory and monitoring, land use fees, land allocation, etc.)</p> <p><i>Underlying causes for problem 3:</i> 1. Pollutants leached from waste dumps, open-pit mines, pit latrines; 2. Urban storm water and agriculture run-off; 3. Untreated wastewaters dumped onto the earth's surface.</p> <p><i>Root causes for problem 3:</i> 1. Absence of regulatory and law enforcement mechanisms for soil quality; 2. Absence of effective waste and wastewater control regulatory and/or economic mechanisms; 3. Absence of financial, technical and human resources to implement effective waste management and water sanitation policies.</p>	Human health	40	40
			Drinking water supply	40	35
			Ecosystem integrity/conservation value	40	40
			Disaster risk reduction	30	40
			Irrigation	30	10
			Hydro-energy	30	-
			Forest resources used as fuel	30	10
			Agricultural production	30	30
			Minerals	20	10
			Cultural value	20	10
			Tourism	20	15
			Recreation	20	10
			<b>Total score</b>		

#	Sphere	Priority Issue	Value/function/service impacted by the issue	Max score	Evaluation
6.	Biodiversity	<p><b>1. Degradation (destruction, modification/ transformation) of natural ecosystems and biomes (e.g., Alpine and sub-alpine meadows and forests); 2. Destruction of habitats; 3. Reduced populations of keystone species.</b></p> <p><i>Underlying causes:</i> 1. Overgrazing; 2. Intensive forest cutting; 3. Distribution of invasive species; 4. Poaching and 5. Unsustainable tourism.</p> <p><i>Root causes:</i> 1. Poor biodiversity-related legislation, policy, and planning; 2. Weak enforcement of biodiversity and forest management laws and regulations; 3. Poor economic conditions in rural communities that leave them heavily dependent on local resources for subsistence; 4. Low public awareness of environmental protection.</p>	Human health	40	-
			Drinking water supply	40	-
			Ecosystem integrity/conservation value	40	40
			Disaster Risk Reduction	40	30
			Irrigation	30	-
			Hydro-energy	30	-
			Forest resources used as fuel	30	10
			Agricultural production	30	10
			Mineral resources	20	-
			Cultural value	20	20
			Tourism	20	20
Recreation	20	15			
Total score					145

#	Sphere	Priority Issue	Value/function/service impacted by the issue	Max score	Evaluation
7.	Agriculture	<p><b>1. Land erosion, 2. Loss of high-productivity agriculture land; 3. Loss of traditional/endemic species (e.g., lentil, chickpea, flax, wheat etc.). 4. Wide use of GMOs</b></p> <p><i>Underlying and root causes for issues 1 and 2 are discussed in paragraph 5 – land resources.</i></p> <p><i>Underlying cause for issue 3: Wide use of mass-production crops.</i></p> <p><i>Root causes for issue 3: 1. Absence of state policy and implementation mechanisms on Georgian agrobiodiversity; 2. Loss of local knowledge on traditional agriculture.</i></p> <p><i>Underlying cause for issue 4: Wide availability and low price for GMO materials (e.g., seeds) and agriculture products compared to ecologically clean seeds and products.</i></p> <p><i>Root causes for issue 4: 1. Absence of legal, policy and institutional frameworks for regulating GMO materials and products; and 2. Low public awareness.</i></p>	Human health	40	35
			Drinking water supply	40	-
			Ecosystem integrity/conservation value	40	10
			Disaster Risk Reduction	40	-
			Irrigation	30	-
			Hydro-energy	30	-
			Forest resources used as fuel	30	-
			Agricultural production	30	30
			Mineral resources	30	-
			Cultural value	20	20
			Tourism	20	20
			Recreation	20	-
<b>Total score</b>					<b>115</b>

**Annex 5: Identification of Priority Measures for Upper Alazani Watershed Management Plans - Matrix**



**Integrated Natural Resources Management in Watersheds (INRMW) of Georgia Program**

**Identification of Priority Measures for Upper Alazani Watershed Management Plans**

**Group**

#	Measures	Criteria - Positive Impact on	Maximum possible	Given points
1	Rehabilitation/construction of water supply systems	Population health	5	
		Environment (ecosystems like forests, plains, floodplains, animal species and their habitats)	3	
		Social-economic conditions: (homes, infrastructure, agriculture lands, etc.)	3	
		<b>Total</b>		
2	Construction of small-scale sewerage systems	Population health	5	
		Environment (ecosystems like forests, plains, floodplains, animal species and their habitats)	3	
		Social-economic conditions: (homes, infrastructure, agriculture lands,	3	



		etc.)		
		<b>Total</b>		
3	Construction of on-site waste water treatment facilities for municipal centers of the pilot watershed area	Population health	5	
		Environment (ecosystems like forests, plains, floodplains, animal species and their habitats)	3	
		Social-economic conditions: (homes, infrastructure, agriculture lands, etc.)	3	
		<b>Total</b>		
4	Rehabilitation of irrigation systems	Population health	5	
		Environment (ecosystems like forests, plains, floodplains, animal species and their habitats)	3	
		Social-economic conditions: (homes, infrastructure, agriculture lands, etc.)	3	
		<b>Total</b>		
5	Construction/rehabilitation of drainage	Population health	5	

	systems/channels	Environment (ecosystems like forests, plains, floodplains, animal species and their habitats)	3	
		Social-economic conditions: (homes, infrastructure, agriculture lands, etc.)	3	
	<b>Total</b>			
6	Implementation of river bank/erosion protection measures	Population health	5	
		Environment (ecosystems like forests, plains, floodplains, animal species and their habitats)	3	
		Social-economic conditions: (homes, infrastructure, agriculture lands, etc.)	3	
	<b>Total</b>			
7	Cleaning of river/lake beds: dredging operations	Population health	5	
		Environment (ecosystems like forests, plains, floodplains, animal species and their habitats)	3	
		Social-economic conditions: (homes, infrastructure, agriculture lands, etc.)	3	

		<b>Total</b>		
8	Improvement of waste collection system	Population health	Population health	
		Environment (ecosystems like forests, plains, floodplains, animal species and their habitats)	Environment (ecosystems like forests, plains, floodplains, animal species and their habitats)	
		Social-economic conditions: (homes, infrastructure, agriculture lands, etc.)	Social-economic conditions: (homes, infrastructure, agriculture lands, etc.)	
		<b>Total</b>		
9	Existing waste disposal site/landfill protection/improvement measures	Population health	5	
		Environment (ecosystems like forests, plains, floodplains, animal species and their habitats)	3	
		Social-economic conditions: (homes, infrastructure, agriculture lands, etc.)	3	
		<b>Total</b>		
10	Construction of new municipal solid waste landfill	Population health	5	
		Environment (ecosystems like forests, plains, floodplains, animal	3	

		species and their habitats)		
		Social-economic conditions: (homes, infrastructure, agriculture lands, etc.)	3	
		<b>Total</b>		
11	Arranging waste segregation and processing facility in existing/new landfill site	Population health	5	
		Environment (ecosystems like forests, plains, floodplains, animal species and their habitats)	3	
		Social-economic conditions: (homes, infrastructure, agriculture lands, etc.)	3	
		<b>Total</b>		
12	Construction of municipal/medical waste incinerator	Population health	5	
		Environment (ecosystems like forests, plains, floodplains, animal species and their habitats)	3	
		Social-economic conditions: (homes, infrastructure, agriculture lands, etc.)	3	
		<b>Total</b>		

13	Conservation of the existing landfills/waste disposal sites	Population health	5	
		Environment (ecosystems like forests, plains, floodplains, animal species and their habitats)	3	
		Social-economic conditions: (homes, infrastructure, agriculture lands, etc.)	3	
		<b>Total</b>		
14	Afforestation/reforestation activities	Population health	5	
		Environment (ecosystems like forests, plains, floodplains, animal species and their habitats)	3	
		Social-economic conditions: (homes, infrastructure, agriculture lands, etc.)	3	
		<b>Total</b>		
15	Reclamation of pastures	Population health	5	
		Environment (ecosystems like forests, plains, floodplains, animal species and their habitats)	3	

		Social-economic conditions: (homes, infrastructure, agriculture lands, etc.)	3	
		<b>Total</b>		
16	Establishment of tree nurseries	Population health	5	
		Environment (ecosystems like forests, plains, floodplains, animal species and their habitats)	3	
		Social-economic conditions: (homes, infrastructure, agriculture lands, etc.)	3	
		<b>Total</b>		
17	Establishment of farms for utilizing forest non-timber resources	Population health	5	
		Environment (ecosystems like forests, plains, floodplains, animal species and their habitats)	3	
		Social-economic conditions: (homes, infrastructure, agriculture lands, etc.)	3	
		<b>Total</b>		
18	Establishment of traditional/organic farm(s)	Population health	5	

		Environment (ecosystems like forests, plains, floodplains, animal species and their habitats)	3	
		Social-economic conditions: (homes, infrastructure, agriculture lands, etc.)	3	
		<b>Total</b>		
19	Establishment of hunting farm(s)	Population health	5	
		Environment (ecosystems like forests, plains, floodplains, animal species and their habitats)	3	
		Social-economic conditions: (homes, infrastructure, agriculture lands, etc.)	3	
		<b>Total</b>		
20	Establishment of fish farm(s)	Population health	5	
		Environment (ecosystems like forests, plains, floodplains, animal species and their habitats)	3	
		Social-economic conditions: (homes, infrastructure, agriculture lands, etc.)	3	

		<b>Total</b>		
21	Implementation of low-cost energy efficiency measures (thermo insulation, furnaces of complete burning)	Population health	5	
		Environment (ecosystems like forests, plains, floodplains, animal species and their habitats)	3	
		Social-economic conditions: (homes, infrastructure, agriculture lands, etc.)	3	
		<b>Total</b>		
22	Rehabilitation/construction of micro to small hydropower plants	Population health	5	
		Environment (ecosystems like forests, plains, floodplains, animal species and their habitats)	3	
		Social-economic conditions: (homes, infrastructure, agriculture lands, etc.)	3	
		<b>Total</b>		
23	Installation of solar systems	Population health	5	
		Environment (ecosystems like forests, plains, floodplains, animal species and their habitats)	3	



		Social-economic conditions: (homes, infrastructure, agriculture lands, etc.)	3	
		<b>Total</b>		
24	Construction of biogas digesters	Population health	5	
		Environment (ecosystems like forests, plains, floodplains, animal species and their habitats)	3	
		Social-economic conditions: (homes, infrastructure, agriculture lands, etc.)	3	
		<b>Total</b>		
25	Production of woodwaste pellets/briquettes (construction of pellet/briquette mill or installation of pellet/briquette production line)	Population health	5	
		Environment (ecosystems like forests, plains, floodplains, animal species and their habitats)	3	
		Social-economic conditions: (homes, infrastructure, agriculture lands, etc.)	3	
		<b>Total</b>		

26	Eco-tourism development supportive measures (setting up tourist trails, shelters, picnic and camping areas, panorama views, wildlife viewing spots, placing signboards and banners, etc.)	Population health	5	
		Environment (ecosystems like forests, plains, floodplains, animal species and their habitats)	3	
		Social-economic conditions: (homes, infrastructure, agriculture lands, etc.)	3	
		<b>Total</b>		

### List of participants

#### Names:

- 1.
- 2.
- 3.
- 4.
- ...

Annex 6: List of Participants and Agenda of the Workshop on Identification of INRMW Priority Actions, Upper Alazani Pilot Watershed Area



## Integrated Natural Resources Management in Watersheds (INRMW) of Georgia Program

**Workshop on Identification of INRMP Priority Actions  
Pilot Territory of the Upstream Areas of the River Alazani Watershed  
28 June, 2012  
Venue: Hotel “Lopota”**

The workshop is organized by GLOWS consortium members - *Representative Office of Florida International University in Georgia* (ROFIU-GE) and *CARE International in Caucasus* (CARE) with content wise contribution from all INRMW partners

**Purpose of INRMP Priority Actions Identification Workshop** is to discuss with local stakeholders the INRMP potential interventions and prioritize them through stakeholder participation

**Agenda**

**Participants - Local authorities, Trustees of Selected Communities and CIG representatives of Telavi and Akhmeta Municipalities, GLOWS/INRMW program team, USAID**

- 12.00-12.30 Registration
- 12.30-13.15 Welcoming & introduction by ROFIU-GE and Care
- 13.15-13.45 Presentation of watershed interventions, ROFIU-GE team
- 13.45-14.00 Q&A, discussion
- 14.00-15.00 Break
- 15.00-15.30 Presentation of INRMP actions prioritization methodology, including criteria, FIU-GE
- 15.30-16.00 Q&A
- 16.00-17.00 INRMP actions prioritization exercise (work in 2/3 break-up groups)
- 17.00-17.45 Five minute Presentations by breakup groups, Q&A
- 18.00 Wrap-up and closing remarks

**List of Invitees**

#	Name/Title
	Mariam Shotadze, USAID/GLOWS INRMW Program Country Director, ROFIU-GE
	Eliso Barnovi, USAID/GLOWS INRMW Program Country Deputy Director, ROFIU-GE
	Malkhaz Adeishvili, USAID/GLOWS INRMW Program Community Engagement Component, Grants Manager, Care International
	Nato Dakishvili, USAID/GLOWS INRMW Program Community Engagement Component, Field Coordinator, Care International
	Malkhaz Talakhadze, USAID/GLOWS INRMW Program Community Engagement Component, Community Mobilizer, Care International
	Shorena Chapurishvili, USAID/GLOWS INRMW Program Community Engagement Component, Community Mobilizer, Care International
	Nana Kvrivishvili, USAID/GLOWS INRMW Program Community Engagement Component, Governance Officer, Care International

Mariam Bakhtadze, USAID/GLOWS INRMW Program Energy Analysis Component, Team Leader, Winrock International
Paata Gagnidze, USAID/GLOWS INRMW Program Energy Analysis Component, Power Engineer, Winrock International
Irakli Kobulia, USAID/GLOWS INRMW Program DRR and CC component, Manager, CENN
Tamar Mamulashvili, INRMP Team Leader, ROFIU-GE consultant
Davit Iukuridze, head of legal entity, Akhmeta Municipality
Davit Kaadze, trustee of territorial unit, Upper Alvani
Davit Avazashvili, head of “Kistauri XXI” legal entity
Genadi Tandilashvili, trustee of Sakobiano territorial unit
Gia Kvitsishvili, trustee of Kistauri territorial unit
Ioseb Pshavelishvili, member of Kistauri territorial unit
Gela Mutoshvili, committee member, Jokolo territorial unit
Otari Mutoshvili, committee member, Jokolo territorial unit
Tsisana Makhatelashvili, Ambulance doctor, Tsinandali
Lali Kistauri, CIG member, Pshaveli territorial unit
Lia Ajishvili, CIG member, Jokolo
Mikheil Ninelashvili, CIG member, Gulgula
Lia Botkoveili, member of Ikalto CIG
Giorgi Gigolashvili, trustee of Ikalto
Nata Sumbadze, CIG member
Tamar Lazarishvili, member of Kisiskhevi CIG
Zakaria Grishikishvili, trustee of Kisiskhevi community
Gocha Tchotorishvili, trustee of Gulgula community
Murad Kutalashvili, specialist, Sakobiano territorial unit
Ivane Abulashvili, trustee of Matani community

Teimuraz Terterashvili, head of “Matani XX” legal entity
Zurab Okromchedlishvili, trustee of Napareuli territorial unit
Ramaz Chekurishvili, trustee of Pshaveli territorial unit
Soso Javakhishvili, member of Ozhio CIG
Shorena Barkhudanashvili, member of Laliskuri CIG
Ushmagi Nakulidze, trustee of Laliskuri territorial unit
Archil Tcholokidze, trustee of Lower Alvani
Iuri Mrelashvili, head of “Alvani XXI” legal entity
Davit Akhalkatsishvili, trustee of Ozhio community
Archil Megutnishvili, trustee of Tsinandali community



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