

## **RESTORATION OF THE PRESPA LAKE ECOSYSTEM**

### **- Implementation of the Prespa Lake Management Plan -**

This project document describes the measures to be implemented by UNDP during the final stage of the SDC-funded Lake Prespa Restoration Programme. The measures are going to be implemented in parallel to the complementary component of the same Programme entrusted by the Donor to the Municipality of Resen.

The prioritization of interventions to be implemented as part of both components has been based on stakeholder inputs, the new programme of measures of the updated Prespa Lake Watershed Management Plan, as well as the sustainability needs of previous achievements.

Diverse set of measures will be implemented as parts of this component ranging from continuation of the programme for agro-ecological farming, introduction of basin-scale irrigation scheduling system, developing maintenance plan for the restored wetland to completion of important water infrastructure projects such as the rehabilitation of Resen's water supply system.

Structured in such manner the measures will enable continuation and upgrade of previous results of the Programme, as well as additional contribution to building local capacities for integrated watershed management. It will further amplify the major achievements from the past years, contributing to the environmental and socio-economic sustainability of the entire watershed and its communities.

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## **Background / Context**

The multitude of combined SDC-funded pollution reduction and capacity development interventions in Prespa have contributed measurably to restoring ecosystem functions and natural values of the unique lake ecosystem. The latest results from the monitoring campaigns repeatedly verify the positive changes in water quality in the Lake and its tributaries that is directly linked to the effects of the reduced loadings of nutrients and pollutants from the key economic sectors.

The local management capacities are being considerably improved. The newly introduced management structure, the new lake monitoring station, and trained personnel are better able to respond to the challenging task of securing the sustainable development of the watershed. The successful implementation of the project turned Prespa into a model for integrated watershed management. Various pioneering project initiatives are being studied by and transferred to other watersheds and river basins across the country.

Some of the main achievements of the Lake Prespa Restoration Programme that have direct positive effects on watershed's socio-ecological functions include:

### **1. Reducing the adverse impacts of agriculture**

Environmentally-friendly apple farming practices have been introduced on a vast area of agricultural land in Prespa, contributing directly to the reduction of agricultural runoff, and the transport of sediment from agricultural land. This has been achieved by supporting directly local farmers to modify their farming practices, through series of trainings and grants.

Besides the existing quantifiable achievements of the Programme in terms of reducing the environmental impacts and improving yields and quality of production, its implementation has revealed additional opportunity for further modernizing agriculture and bringing in better balance between its development and ecosystem health.

For instance the feasibility study on irrigation options revealed that only by modifying the irrigation practices by introducing irrigation scheduling, existing water resources will be more rationally used and the agricultural runoff will be greatly reduced. This will also prevent the need of multi-million investments in irrigation infrastructure that also has high environmental costs.

### **2. Improved waste management**

The composting plant in Resen evolved into a national/regional model for biodegradable waste management. The experiences and lessons learnt are studied by a number of interested waste management operators from the country and the region.

By introducing the system considerable quantities of organic waste that used to pose great pressures to water ecosystem are now transformed into a product of economic value – compost. The internal capacity of the Public Enterprise 'Proleter' has been considerably enhanced to enable the enterprise to run the new system effectively.

The composting plant in Resen continues operating at optimal capacity. The supply of organic waste by major producers (e.g., industry operations, poultry farm and businesses) is stable and slightly increasing. There is a growing number of local farmers that buy the compost and apply it in their orchards as a fertilizer and soil conditioner. Part of the compost is sold to outside Prespa that ensures important revenues for the composting plant operations.

### **3. Development of environmental infrastructure**

Number of environmental infrastructure projects has been implemented as part of the programme contributing greatly to reducing pressures to water bodies (e.g., wastewater management systems and restored dumpsites), more efficient use of water (e.g., rehabilitation of water supply schemes and introduction of community-level drip irrigation systems) and securing savings/revenues for the

municipality that are required for the sustainability of the new systems introduced and continuation of future investments (e.g., energy efficiency project and biodegradable waste management system).

These SDC-funded projects were complemented by similar investments secured by the Municipality of Resen through various funding schemes, mainly by using state budget (e.g., the construction of sewerage networks in the villages of Dolna Bela Crkva and Drmeni, rehabilitation of Resen's water supply system).

Besides the major infrastructure projects such as the wastewater management system in Nakolec and the municipal energy efficiency project, number of community-driven small-scale environmental/water infrastructure projects have been identified and implemented benefiting about 5,000 people of Prespa and contributing greatly to the achievement of Programme's objectives.

In addition to the SDC-funded interventions in the municipal environmental infrastructure, the Municipality of Resen continues upgrading the systems with funding secured from other sources that also helps multiply positive effects. The construction of the wastewater collection system in the village of Drmeni is underway. Once completed this village will be connected to the main collector and the wastewater treatment plant in Ezerani, wherefrom the effluent will be additionally 'polished' in the restored wetland. The municipality has also launched a major capital investment for the reconstruction of the main water supply system in the town of Resen that is the first such intervention in the system since it was constructed some forty years ago. EBRD funding is used to replace main pipeline, and additional funding will be sought to complete the secondary network and put the system in function. These rehabilitation works will help greatly reduce losses/leakages, which besides the more rational use of the resource will result in a better economic outcome for the Public Enterprise 'Proleter' – project's key stakeholder in charge of majority of investments in water and solid waste management infrastructure.

#### **4. Controlling erosion processes**

Thanks to the previous planning efforts and building local capacity for production of planting material (e.g., by building a modern forest nursery), a set of measures to control erosion processes are being implemented by the Public Forest Enterprise. Besides anticipated long-term benefits in reducing soil loss and sediment transport processes, forest regeneration actions are expected to improve the health of the forest ecosystem, bringing additional significant ecosystem benefits (e.g., providing valuable habitats to support the biodiversity of the region, increasing opportunities for the production of timber and carbon sequestration, as well as helping to improve the hydrological regime of the watershed).

The production of own planting material also enables the Public Forest Enterprise to make considerable savings that contribute to their overall sustainability. Around 75 hectares of eroded land has been afforested by the Public Forest Enterprise during 2014 and 2015.

#### **5. Wetland restoration**

Through a highly participatory process, a single restoration option has been identified and developed to the necessary level of detail for the restoration of the degraded/canalized delta of Golema Reka – the largest tributary of Lake Prespa. The proposed alternative is believed to adequately balance ecological goal with the economic interests of the local population. The actual implementation of the wetland restoration plan is about to start. Once implemented the restored wetland will not only secure extremely important filtering function for the polluted waters carried by the river, but will also ensure important ancillary ecosystem benefits (e.g., tertiary treatment for the existing central municipal wastewater treatment plant, greater habitat diversity, and production of biomass with an economic potential).

One of the key preconditions for restoring the natural values and filtering function of the wetland area is the operationalization of the protected area's management system. As part of the Programme the Municipality of Resen has established the first ever management body for *the Ezerani Nature*

*Park.* The three park rangers employed by the municipality have already assumed their duties, helping greatly in the enforcement of the regulations regarding the Park.

The work of the newly introduced management structure of Ezerani Nature Park has produced very positive results. The Municipality of Resen has been able to introduce effective management of the protected area and enforce the various protection regimes as defined in the legal documents and the management plan. Thanks to the physical protection of the area by park rangers, many illegal and harmful activities within the park boundaries—including sand extraction, poaching and logging—have been prevented.

## **6. Sustainable watershed management capacities at local level**

Building local capacities for integrated watershed management has helped greatly in transforming a centralized management system into a water governance structure. This included strengthening the watershed management capacities through organizational maturation at local level (mainly the Municipality of Resen) and improving the cross-sectoral participatory mechanisms (e.g. Prespa Watershed Management Council).

An important breakthrough in introducing integrated watershed management capacities at local level is the new organizational structure of the Municipality of Resen. Recognizing the importance of introducing effective management of water and other natural resources, the Municipality has introduced a new Sector on Environment, raising the municipality's environmental functions to the highest possible level. The new environment sector, comprising one unit for Nature and Water and a second unit for Pollution and Waste, provides the necessary structure to successfully fulfil the municipality's decentralized environmental responsibilities and ensuring institutional sustainability of all newly introduced systems (e.g., monitoring station and protected areas management bodies).

The introduction of the Lake Monitoring Station is a critical element to the sustainable future management of the entire watershed. Station's staff have been capacitated to implement regular monitoring of the Lake, informing decisions on future measures. The monitoring datasets feed into the eutrophication model – the most important decision-support tool for watershed management developed over the past years.

### **1.1. Upgrading results**

According to the original plans, the last two years of the Lake Prespa Restoration Programme were supposed to be implemented only by the Municipality of Resen. However, besides the significant improvement of their capacities, based on the recommendations of the SDC-commissioned independent review, and the official request sent by the municipality to SDC, the implementation responsibilities for this stage of the Programme will be shared between the municipality and UNDP. UNDP will keep certain technical assistance role for a period 18 out of 24 months, while the municipality, besides having the overall management responsibility for the Programme, will complete it independently during the last 6-months of its implementation. This document describes only those activities that will be implemented by UNDP that are complementary to the parallel activities to be implemented by the municipality.

The overall objective of the proposed 18-months Programme component to be implemented by UNDP is to ensure continuation and an upgrade of the existing achievements in order to further reduce pressures to water bodies, build additional capacities at local level and guarantee the sustainability of the existing and new results. The prioritization of the implementation actions is based on a thorough understanding of the current status and sustainability needs of all introduced systems, stakeholder inputs as well as priorities identified in the updated Prespa Lake Watershed Management Plan, valid for the period 2016 – 2021.

All proposed measures and activities are in line with the key objectives of the Programme, as well as with the specific results areas (Outcomes/Outputs) for the period 2012-2016. Therefore, in the de-

tailed elaboration on the measures, the formulations about the result areas remain the same, and only the specific activities are adjusted.

The small grants scheme for farmers will be continued in order to further expand the area under agro-ecological farming practices. In addition, based on the recommendations of the recent feasibility study on irrigation options, a basin-scale centralized irrigation scheduling system will be introduced capitalizing on the possibilities offered by the existing agro-ecological monitoring system. On-line and mobile-based system will help farmers adequately schedule irrigation campaigns in order to improve water use efficiency. Based on previous experience, the introduction of such system has the potential to reduce the use of irrigation water by nearly 60%.

The wetland restoration activities initiated in the previous stage of the project will be completed as part of this component. A new wetland monitoring system will be designed and introduced so as to better detect changes in the newly created ecosystem, and control the phosphorus removal efficiency of the restored wetland. The monitoring data will provide critical input in the creation of wetland maintenance programme (e.g., biomass removal rate) that will ensure high phosphorus removal levels. The anticipated increased quantities of biomass will be used for the composting process. At later stages options for using this biomass as a renewable energy source will also be considered.

As part of this component the ongoing rehabilitation works of Resen's water supply system, financed by the European Investment Bank, by the construction of the secondary network and operationalization of the system. This is a project of paramount importance for the municipality as no such rehabilitation works have taken place since the system was built in the 1970s.

Considering the previous and anticipated great results, this component of the Programme will continue the communication work, including the participation in the most important international professional networks in the areas of river basin management, ecosystem management and ecological restoration.

Both the UNDP and MoR- implemented components of the project will provide important impetus to the implementation of the new programme of measures of the updated Prespa Lake Watershed Management Plan.

The implementation of this component will be carried out by the existing management structure, mechanisms and tools developed by UNDP that will be adjusted in line with the size, complexity and time distribution of anticipated measures. However, the Municipality of Resen will be ultimately responsible and accountable for the success of the project implementation that has already greatly improve capacities in the course of the previous stages of the Programme. The broader stakeholder participation throughout the project implementation phases would be provided through the Prespa Watershed Management Council (WMC).

The transition of programme implementation responsibilities will continue in the course of this stage of the project. While the entire stage of the Programme will extend until the end of June 2018, UNDP will be present only until the end of 2017. During the last 6-months of the Programme, the Municipality of Resen will assume sole responsibility in bringing to the end all outstanding activities and ensuring full sustainability of the results.

## **2. Project Objectives**

### **Impact / Overall Goal of the Project**

Contribution to the improvement of the Prespa Lake's Ecological State and its Resilience
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### **Project Outcomes**

<b>OUTCOME 1:</b> Water and Soil Quality in the Prespa Lake Watershed have Improved
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This outcome encompasses a complex set of measures, designed to upgrade the reduction of the nutrient and organic inputs to the lake to control the eutrophication processes and improve the Lake's ecosystem health. These measures are based on the priorities of the updated Prespa Lake Watershed Management Plan, as well as feasibility studies and planning documents produced during the previous stage of the Programme.

**Output 1.1** A solid basis for long-term active management of the Lake's eutrophication processes established at local level (**Completed**)

Activity 1.1.1 Development of a comprehensive study to thoroughly investigate the eutrophication processes and their root causes

- The eutrophication model will be finalized and 'institutionalized' in the new Sector on Environment as a key decision-support tool for integrated watershed management in the course of the early stages of this Programme component. All new measures and monitoring results will feed into the model so as to better tailor future implementation strategies and priorities.

**Output 1.2** Erosion processes controlled and sediment load in the Lake reduced

Activity 1.2.1 Mapping priority erosion prone areas and quantifying the sediment transport rates to assess their impact on the eutrophication processes (**Completed**)

Activity 1.2.2 Implementation of prioritized set of erosion / sediment control measures by improving the forest cover and regulating the main torrents in the watershed

- The future forest regeneration activities carried out by the Public Forest Enterprise will be monitored and reported about, along with the detectable positive changes resulting from the improved forest cover.

**Output 1.3** Adverse impacts of apple farming reduced

Activity 1.3.1 Support in extending the apple production area with Good Agricultural Practices (GAP) and agro-ecological measures

- Building upon the previous achievements of the Programme, series of measures will be implemented to expand the area under sustainable farming practices in Prespa. This will include continuation of the grants programme for agro-ecological farming and its upgrade with additional measures (e.g., promotion of solar pumps for irrigation).

Activity 1.3.2 Modifying irrigation practices in apple production to reduce agricultural runoff and to ensure more sustainable use of water resources at watershed level

- Based on the recommendations of the feasibility study on irrigation options for Prespa as well as the experiences from the implementation of the grants programme for agro-ecological farming, a decision support system for irrigation scheduling has been conceptualized and will be operationalized as part of the Programme. Based on monitored meteorological data (by the agro-meteorological monitoring system), micro-meteorological modeling, soil and cadastral data, a system will be developed that will inform farmers on the time to start and end irrigation, and the quantity of water to be added to the plants. Based on the findings of the previous grants programme, the potential to reduce irrigation water are nearly 60%. Such a system will not only help preserve valuable

Activity 1.3.3 Preserving the agro-biodiversity by (re)introducing varieties of fruits traditionally grown in the Prespa region (**Completed**)

**Output 1.4** Flood control, retention and filtering of polluted tributaries ensured and existing wastewater treatment technology for enhanced nutrient removal upgraded

Activity 1.4.1 Restoring the river delta of Golema Reka and turning the adjacent abandoned fish ponds into viable wetlands to support river restoration, flood control, retention and filtering of water

- The wetland restoration work will be initiated and completed in the early stages of the new phase of the Programme. Once implemented the restored wetland will not only secure extremely important filtering function for the polluted waters carried by the river, but will also ensure important ancillary ecosystem benefits (e.g., tertiary treatment for the existing central municipal wastewater treatment plant, greater habitat diversity, and production of biomass with an economic potential).
- A new wetland monitoring system will be designed and introduced so as to better detect changes in the newly created ecosystem, and control the phosphorus removal efficiency of the restored wetland. The monitoring data will provide critical input in the creation of wetland maintenance programme (e.g., biomass removal rate) that will ensure high phosphorus removal levels. The anticipated increased quantities of biomass will be used for the composting process. At later stages options for using this biomass as a renewable energy source will also be considered.

Activity 1.4.2 Establishing wetlands in the abandoned fish ponds in the vicinity of Golema Reka River, to provide for nutrient removal from the existing municipal wastewater treatment system

- In addition to the multitude of beneficial ecosystem services from the restored wetland, it will also be used for providing tertiary treatment for the existing central municipal wastewater treatment plant. This will additionally reduce the phosphorus loading to the lake from the wastewater from the majority of the population of the Municipality of Resen.

**Output 1.5** Agricultural waste management systems for reduction of organic load and prevention of input of pesticide residues to the Lake and its tributaries are upgraded

Activity 1.5.1 Support in extending the existing pesticide packaging and biodegradable waste management system in the Prespa Lake watershed (**Completed**)

**Output 1.6** Nature-based solutions (wetlands, river corridors, buffers) at watershed level are implemented

Activity 3.3.1 Improving the watershed's hydrological and ecological processes by applying nature-based approaches (**Completed**)

**Output 1.7** Small-scale infrastructure and other community-driven projects are implemented

Activity 1.7.1 Implementation of community-driven small-scale investments to protect water and other related ecosystems (**to be implemented by the Municipality of Resen**)

Activity 1.7.2 Construction of wastewater management system in the lakeshore village of Stenje (**to be implemented by the Municipality of Resen**)

Activity 1.7.3 Completion of Resen's water supply system rehabilitation works

- The ongoing works financed by a 600,000 EUR loan from the European Investment Bank focus only on the primary pipeline network. In order the entire system to become SDC funding will be used for the construction of the secondary network. This is a project of paramount importance for the municipality as no such rehabilitation works have taken place since the system was built

in the 1970s. The intervention will greatly minimize water losses and increase revenues of the Public Enterprise 'Proleter', whose financial capacity is the key for the sustainability of virtually all communal services in the municipality, including solid waste management, wastewater treatment and water supply. Additional financial gains for 'Proleter' will be produced by the reduced repairs of frequent defects in the network. The optimized water use will also contribute to a greater resilience of the communities against climate change.

**OUTCOME 2: Improved Performance of Authorities at National and Local Level for Sustainable Management of Watershed Management Plans**

The outcome is designed to further strengthen local capacity for restoring and maintaining the Lake's ecosystem health by applying the integrated watershed management concept. This will entail additional trainings for the municipal administration, application of the eutrophication model and monitoring data for evidence based decision making and similar. This will enable the Municipality of Resen to fully take over implementation responsibilities of the Programme and ensure sustainability of all results.

**Output 2.1 Sustainable monitoring and management capacities at local level are created**

Activity 2.1.1 Establishing and operationalizing monitoring system at watershed scale (**Completed**)

Activity 2.1.2 Establishing a modest Lake Management Service (**Completed**)

**Output 2.2 Long-term watershed management capacities of the municipal administration and of the Watershed Management Council are strengthened**

Activity 2.2.1 Strengthening the watershed management capacities through organizational maturation at local level and improving the cross-sectoral participatory mechanisms (**Completed**)

**Output 2.3 Lessons learnt and best practices are shared and replicated at national and international level**

Activity 2.3.1 Contribute to and participate in existing knowledge networks

- The Programme will continue sharing its lessons learned and best practices through various national and international networks and ensure active participation in global events in the areas of freshwater ecosystem restoration, watershed management and other relevant ones.
- In parallel to the ongoing activities, the project pursues a comprehensive effort to quantify its effects and impacts and link them with the detected changes in the water quality and ecosystem health parameters. This will be summarized in a report that will be published during the early months of the stage of the Programme.

Activity 2.3.2 Support in strengthening the legal and regulatory enabling environment for integrated watershed management (**Completed**)

Activity 2.3.3 Communication, education and public awareness raising for modifying resource management practices at local level

- By building on previous achievements, modest awareness raising activities will continue to be implemented until the end of the Programme.

**OUTCOME 3:** Watershed restoration and protection processes are further improved.

Outcome 3 was originally designed to be a conditional Outcome that would be activated should additional funding becomes available. The Donor has secured such additional funding of 1.3 million CHF in January 2013 when the realization of this outcome was initiated. All activities under this outcome, which actually represented an upgrade of selected measures and results from the Outcomes 1 and 2, have already been completed in the previous stage of the project.

Structured in such manner, the project is expected to further amplify the multitude of tangible results at local, national and transboundary level. Besides the direct benefits for the local community, the implementation of the project would significantly support the national priorities for restoring the Prespa Lake ecosystem, as provided in the WMP. Given the transboundary character of the area, the benefits of the improved function of the Lake ecosystem will be felt across the national borders.

### 3. Programme stakeholders

The main stakeholders and partners of the Programme remain the same with the earlier stages, as presented in *Table 2*.

**Table 2.** Stakeholder involvement plan

	Stakeholder	Role in Project
1.	Municipality of Resen	<ul style="list-style-type: none"> <li>• Ultimately responsible for project implementation and main beneficiary</li> <li>• Member of the WMC and the transboundary Prespa Park Management Committee (PPMC)</li> <li>• Management authority of Prespa Lake (according to the Law on Designation of Prespa Lake as a Monument of Nature)</li> <li>• Management authority of Ezerani protected area (according to the Law on Re-designation of "Ezerani" as Nature Park)</li> <li>• Process of decentralization gives it a key role in environmental management and economic development.</li> </ul>
2.	Ministry of Environment and Physical Planning (MoEPP)	<ul style="list-style-type: none"> <li>• 'Owner' of the WMP (on behalf of the Government)</li> <li>• Chairs the WMC</li> <li>• Member of the transboundary PPMC</li> <li>• Responsible for reporting progress in improving the status of water bodies according to the Law on Waters, but also toward the EU integration</li> </ul>
3.	UNDP (Resen based Project Management Unit)	<ul style="list-style-type: none"> <li>• Will provide technical support in realization of this project component in the period of 18 months</li> </ul>
4.	Natural Capital Resource Center	<ul style="list-style-type: none"> <li>• A hub for information and education, as well as organization of seminars and workshops</li> <li>• Marketplace of knowledge regarding the Prespa environment, as well as a visitor information center.</li> <li>• Already integrated in the municipal administration together with the UNDP locally based PMU on a mid-term</li> </ul>
3.	Farmers Association of Resen	<ul style="list-style-type: none"> <li>• Main stakeholder organization for project's work in reducing impacts of agriculture on water quality (role in implementation of agro-ecological measures, establishing nursery of important agro-biodiversity and other)</li> </ul>
4.	Watershed Management Council (WMC)	<ul style="list-style-type: none"> <li>• The main cross-sectoral stakeholder body involved in the preparation of the WMP</li> <li>• Advisory and oversight role during the implementation of the WMP (mainly toward the responsible MoEPP)</li> <li>• Integrates all sectors contributing to and/or affected by water quantity and quality in Prespa</li> </ul>
5.	Public Forest Enterprise (branch office in Resen)	<ul style="list-style-type: none"> <li>• Responsible for forest management in Prespa</li> <li>• Will take part in the implementation / supervision of the forest regeneration / erosion control works</li> <li>• Beneficiary of project support in adopting better forest management prac-</li> </ul>

		tices to control the impact of forest land to the lake ecosystem
6.	Hydrobiological Institute, Ohrid	<ul style="list-style-type: none"> <li>• Responsible for monitoring the health of Prespa aquatic ecosystem</li> <li>• Took important part in the establishment and operationalization of the lake management service and monitoring system</li> </ul>
7.	NGOs, CBOs and individuals	<ul style="list-style-type: none"> <li>• Beneficiaries of the project results (environmental, agricultural, tourism NGOs and similar)</li> <li>• Partners and supporters to the project implementation.</li> </ul>

The Programme is designed so as not exclude any stakeholder based on gender, age, ethnicity, or religion. It will particularly attempt to mainstream gender aspects in different interventions by recognizing the differential impact on the gender groups. It consider the latest relevant strategies, policies and incentives to address the gender issues and enable both men and women to benefit equally from the efforts.

Based on the previous positive experience from mainstreaming gender issues in the agro-ecological farming programme, this component will continue applying similar approaches to ensure that more female farmers benefit from the Programme. This will further strengthen their role in farming in Prespa as the key economic activity for the local population.

#### 4. Implementing Strategy

The ultimate goal of this Programme's component is continue improving the Lake's ecological status and strengthen its resilience by introducing an effective eutrophication control system, which will ensure conservation of the globally significant biodiversity and provide a sustainable basis for the watershed's development.

**The ultimate responsibility for the project implementation will be taken by the Municipality of Resen.** UNDP will continue providing technical assistance for the implementation of part of the measures, in full coordination with the parallel component of the Programme to be implemented by the Municipality of Resen over a period of 24 months.

##### *Sustainability measures, scaling-up and exit strategy*

The activities elaborated in the project are designed to fully respond to the sustainability requirements. Achieving sustainability at the environmental, social, institutional and financial levels is an ongoing long-term process in the Prespa Lake watershed. The project is designed to support the stakeholders in applying practical models to anticipate ecosystem changes and manage the anthropogenic impacts accordingly. This is recognized as a key prerequisite for the long-term sustainability of past, current and future efforts.

The analysis of the sustainability aspects of the different proposed activities organized by project outputs is provided in the table below:

**Table 4.** Sustainability considerations of the project

Project Outcome	Project Output	Sustainability measures
OUTCOME 1	<b>Output 1.1</b> A solid basis for long-term active management of the Lake's eutrophication processes established at local level	Completed
	<b>Output 1.2</b> Erosion processes controlled and sediment load in the Lake reduced.	Continue monitoring and reporting about the forests regeneration activities of the Public Forest Enterprise

	<b>Output 1.3</b> Adverse impacts of apple farming reduced	Being designed to help reduce the use of agrochemicals and Irrigation water, the activities in the agriculture field, will also result in reduction of the production costs, and better marketability of the products
	<b>Output 1.4</b> Flood control, retention and filtering of polluted tributaries ensured and existing wastewater treatment technology for enhanced nutrient removal upgraded.	Completed
	<b>Output 1.5</b> Agricultural waste management systems for reduction of organic load and prevention of input of pesticide residues to the Lake and its tributaries are upgraded.	Completed (to be supported directly by the Municipality of Resen)
	<b>Output 1.6</b> Nature-based solutions (wetlands, river corridors, buffers) at watershed level are implemented	Completed
	<b>Output 1.7</b> Small-scale infrastructure and other community-driven projects are implemented	The increased revenues of the Public Enterprise 'Proleter' from the rehabilitated water supply system will ensure the future operation and maintenance of the system
<b>OUTCOME 2</b>	<b>Output 2.1</b> Sustainable monitoring and management capacities at local level are created	Completed (to be continued by the Municipality of Resen)
	<b>Output 2.2</b> Long-term watershed management capacities of the municipal administration and of the Watershed Management Council are strengthened	Completed (to be continued by the Municipality of Resen)
	<b>Output 2.3</b> Lessons learnt and best practices are shared and replicated at national and international level.	The locally established capacities will continue participating in different knowledge networks and partnerships beyond project closure

The proposed project has a great *scaling-up* and *replication* potential which is considered throughout the project design. The practices to be developed and demonstrated are directly relevant to the existing or emerging challenges faced at national level, but also in much broader context.

The lessons learnt and best practices will continue to be shared in a way that contributes to the latest international developments in the field of freshwater ecosystems restoration and management by applying an integrated approach.

#### a. Organization, Management and Administration

This stage of the Programme will be implemented during a period of 18 –months. It will start in July 2016 and will last until December 2017. A tentative work-plan for the lifespan of this stage is presented in *Table 5*. The table presents the schedule only of those activities that will be implemented by UNDP.

**Table 5.** General tentative schedule of project activities by years

Expected Outputs & Monitoring Activities	Key Activities	Timeframe (Schedule of Activities by Years)					
		Q3	Q4	Q1	Q2	Q3	Q4

<b>Output 1.3</b> Adverse impacts of apple farming reduced	Activity 1.3.1 Support in extending the apple production area with Good Agricultural Practices (GAP) and agro-ecological measures		X	X	X		
	Activity 1.3.2 Modifying irrigation practices in apple production to reduce agricultural runoff and to ensure more sustainable use of water resources at watershed level		X	X	X		
<b>Output 1.4</b> Flood control, retention and filtering of polluted tributaries ensured and existing wastewater treatment technology for enhanced nutrient removal upgraded	Activity 1.4.1 Finalization of wetland restoration activities (*ongoing from the previous stage*)	X					
	Activity 1.4.2 Introducing monitoring of restored wetland area and defining wetland management programme		X	X	X		
<b>Output 1.7</b> Small-scale infrastructure and other community-driven projects are implemented	Activity 1.7.3 Completion of Resen's water supply system rehabilitation works	X	X	X			
<b>Output 2.3</b> Lessons learnt and best practices are shared and replicated at national and international level.	Activity 2.3.1 Contribute to and participate in existing knowledge networks	X	X	X	X	X	X
	Activity 2.3.3 Communication, education and public awareness raising for modifying resource management practices at local level	X	X	X	X	X	X

While this table presents only the UNDP-implemented activities of the new stage of the project, the logical framework remains the same as it refers to the entire SDC-funded Lake Prespa Restoration Programme.

The existing project management structure, based on the latest result based management approaches, will be adjusted for use throughout the entire lifespan of this stage of the Programme (*Figure 3*).

The Project Board is the group responsible for making management decisions by consensus when guidance is required by the project manager, including approval of project work plans and revisions. In order to ensure accountability, the Project Board decisions should be made in accordance with standards that shall ensure the project's integrity and transparency.

The Project Board approves the Annual Work Plans (AWP). It also reviews and approves quarterly project plans when required, and authorizes any major deviation(s) from the agreed quarterly plans. While the Project Board practices authority to sign off the completion of each quarterly plan and start the next quarterly plan, it also ensures that required resources are committed, and arbitrates any conflicts within the project or negotiates a solution to any problems between the project team and external bodies. In addition, it approves any delegation of Project Assurance responsibilities.

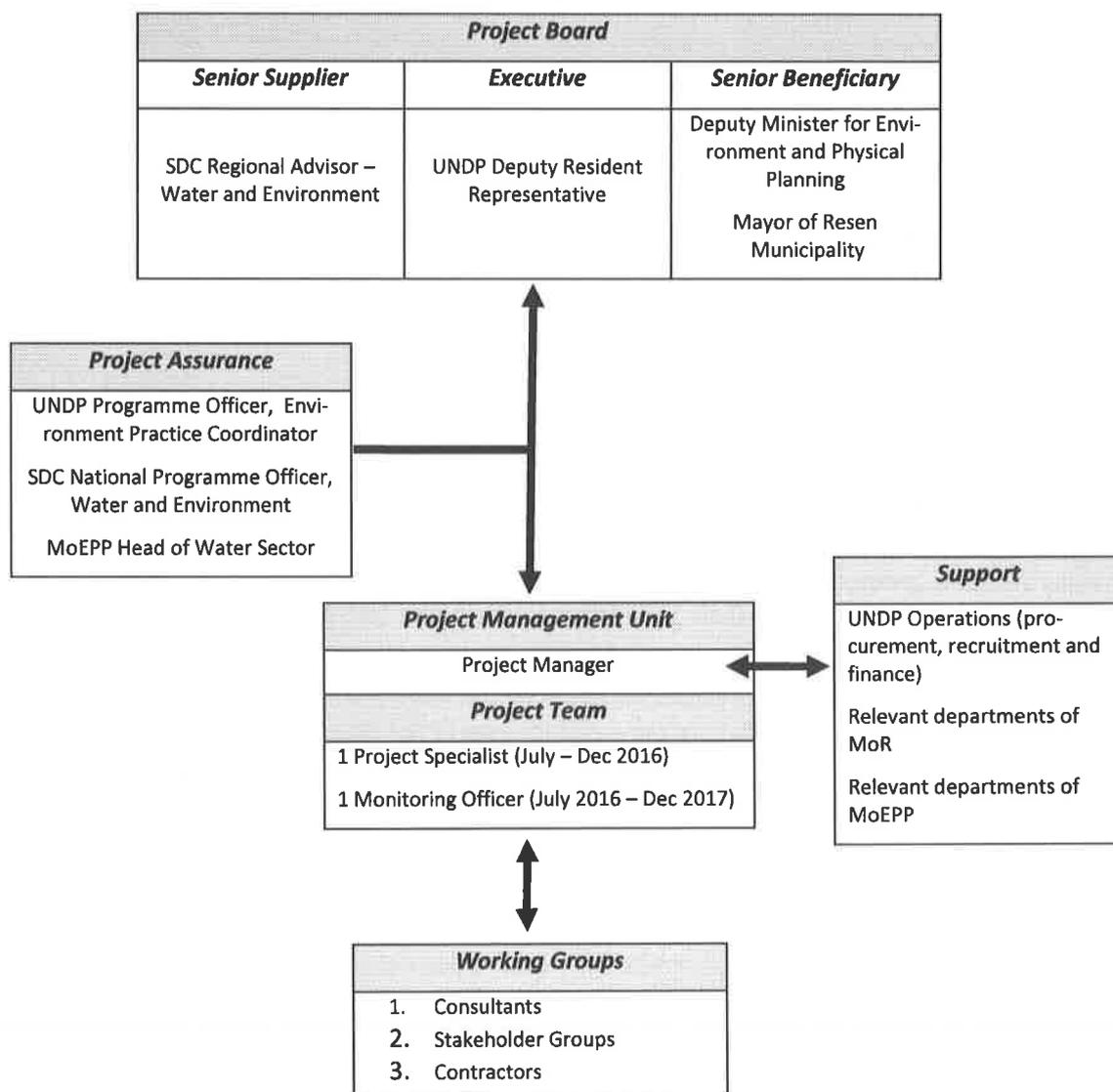
The Executive function is ultimately responsible for the project. The Executive's role is to ensure that the project is focused throughout its life cycle on achieving its objectives and delivering outputs that will contribute to higher level outcomes. The Executive has to ensure that the project gives value for money, ensures a cost-conscious approach to the project and balances the beneficiary-supplier demands.

The existing UNDP PMU will be adjusted to fit the needs of implementation of the proposed activities. Initially, the PMU will consist of a Project Manager, 1 Project Specialist and 1 Monitoring Officer.

The PMU will be responsible for the day-to-day management of the project, preparation and submission of work-plans and progress reports to the Project Board. The Project Manager will be shared with other ongoing relevant projects of UNDP, so as to reduce management costs of the Programme.

Since the most intensive implementation activities are anticipated in the earlier stages of the new stage, the PMU will have two full time employees (Project Specialist and Monitoring Officer) only during the first 6 months (July – December 2016). By the end of 2016/beginning of 2017 the Project Specialist will be transferred to the Municipality of Resen wherefrom he will have critical role in the implementation of the Programme component implemented by the Municipality. In the last year of project implementation (January – December 2017) the local UNDP PMU will be staffed by only one full time employee – a Monitoring Officer.

**Figure 3.** Composition and structure of the project management



### **b. Risk Analysis**

The main risks and assumptions for the project are presented in the project log-frame (Annex I).

### **c. Monitoring and Evaluation**

In order to create effective monitoring and evaluation system, the following reporting mechanism will be developed:

#### *Semi-annual Progress Report*

This report will have the role of the main oversight, monitoring and project management tool. It will be a self-assessment report prepared and submitted to the. It will include information on: project performance over the reporting period (including outputs produced); the constraints experienced in the progress towards results and the reasons for these; expenditures analysis; lessons learned and recommendations for future orientation in addressing key problems.

#### *Periodic Thematic Reports*

Whenever required by the Donor, or other relevant entity, the PMU will prepare Thematic Reports, focusing on specific issues or areas of activity. These reports can be used as a form of lessons learnt exercise, specific oversight in key areas, or as troubleshooting exercises to evaluate and overcome obstacles and difficulties encountered.

#### *Project Final Report*

During the final stages of the project, the PMU will prepare the Project Terminal Report. This comprehensive report will summarize all activities, achievements and outputs of the project, lessons learnt, objectives met, structures and systems implemented, and will be the definitive statement of the Project's activities during its lifetime. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replication of the project activities.

## Annex I: Logframe

Hierarchy of objectives Strategy of Intervention	Key Indicators	Data Sources Means of Verification	
<b>Impact (Overall Goal)</b>	<b>Impact Indicators</b>		
To contribute to the improvement of the Prespa Lake's ecological status and resilience	<p>Measurable improvement of the Lake's ecological status (in terms of positive changes of the water quality monitoring parameters)</p> <p>Financial mechanism for long-term protection and maintenance of the Lake's ecosystem health in place</p> <p><u>Baseline:</u> There is considerable gap between the current ecological status of the lake and its tributaries and the natural reference conditions</p> <p>The existing financial mechanisms are insufficient to ensure restoration and long-term maintenance of the Lake's ecosystem health</p>	<p>Results / reports from the water quality monitoring programmes</p> <p>MoEPP reporting to EC on WFD implementation progress</p> <p>Reports containing evaluation of the financing mechanisms for Lake protection</p>	
<b>Outcomes</b>	<b>Outcome Indicators</b>		<b>External Factors (Assumptions &amp; Risks)</b>
<b>Outcome 1:</b> Water and soil quality in the Prespa Lake watershed have improved	<p>Measurable reduction of nutrient loads to the lake as a result of the gradual increase of project supported measures</p> <p><u>Baseline</u> The current nutrient loads of anthropogenic origin exceed the levels the</p>	<p>Project final report / Terminal evaluation report</p>	<p>Please see assumption &amp; risk analysis at the relevant outputs (Output 1.1 to Output 1.5)</p>

Hierarchy of objectives Strategy of Intervention	Key Indicators	Data Sources Means of Verification	
	lake ecosystem can absorb without further degrading		
<b>Outcome 2:</b> Improved performance of authorities at national and local level for sustainable management of watershed management plans	Functional dynamic watershed management system supported by adequate financial mechanisms established at local level  <u>Baseline</u> The management capacities and financial resources to support them are insufficient to support long-term integrated watershed management	Project final report / Terminal evaluation report  Evaluation of financial mechanisms to run the system	MoR and the relevant government institutions introduce long-term financing mechanisms to support the active management of the Prespa Lake ecosystem  The local / national institutions integrate the watershed management capacities created / supported by the project, ensuring their sustainable operation
<b>Outcome 3:</b> Watershed restoration and protection processes are further improved.	Increased reduction of nutrient loads and more advanced restoration of the watershed's natural functions towards the WMP's reference conditions  <u>Baseline</u> Same as for Outcome 1	Project final report / Terminal evaluation report	Additional finances are made available by the donor of through other sources to support ongoing or other similar measures
<b>Outputs (per outcome) and costs</b>			
<b>For outcome1:</b> Water and soil quality in the Prespa Lake watershed have improved			
<b>Output 1.1</b>  A solid basis for long-term active management of the Lake's eutrophication processes established at local level	Comprehensive studies and other technical documentation for establishing long-term watershed management system completed by EoY 2  <u>Baseline</u> The necessary technical documentation for establishing long-term water-	Completed studies and other technical documentation  Project reports	

Hierarchy of objectives Strategy of Intervention	Key Indicators	Data Sources Means of Verification	
<p><b>Output 1.2</b></p> <p>Erosion processes controlled and sediment load in the Lake reduced.</p>	<p>shed management system doesn't exist at present</p> <p>Comprehensive erosion control measures are elaborated by EoY 2</p> <p>Selected priority erosion control measures are implemented by the end of the project (to be defined in the study)</p> <p><b>Baseline</b></p> <p>The current level of erosion in the watershed results in unsustainable loads of nutrients rich sediment to the lake and its tributaries</p>	<p>Completed technical documentation</p> <p>Independent review (supervision) reports on the implementation of the erosion control measures</p> <p>Project reports elaborating on erosion control measures</p>	
<p><b>Output 1.3</b></p> <p>Adverse impacts of apple farming reduced</p>	<p>Area (in hectares) under GAP and/or agro-ecological measures (the size to be defined by EoY 1)</p> <p>Detailed technical documentation elaborating irrigation impacts on water resources including improvement proposals completed by EoY 3</p> <p>Early warning system for irrigation introduced by EoY 2</p> <p>A demonstration orchard / nursery of important agro-biodiversity established by EoY 3</p> <p><b>Baseline</b></p> <p>The existing farming practices (especially pesticides, fertilizers and irriga-</p>	<p>Reports from the implementation of GAP and agro-ecological measures in apple orchards</p> <p>Completed technical documentation</p> <p>Results from the irrigation early warning system (disseminated information on irrigation needs amongst farmers)</p> <p>Project reports</p>	

Hierarchy of objectives Strategy of Intervention	Key Indicators	Data Sources Means of Verification	
Output 1.4	<p>Flood control, retention and filtering of polluted tributaries ensured and existing wastewater treatment technology for enhanced nutrient removal upgraded</p>	<p>Specific technical documentation on wetland restoration and adaptation of the fish ponds (e.g. feasibility assessment reports, designs, EIA documentation and similar) Other project reports (reports from site visits)</p>	<p>The MoR and the other responsible institutions resolve the outstanding land-ownership related issues in a timely manner</p>
Output 1.5	<p>Wetland based system resulting from the adaptation of the abandoned fish ponds and ecological restoration of former river delta established by EoY 4</p> <p><u>Baseline</u> The former wetland area in the delta of Golema Reka was lost as a result of (illegal) conversion for other purposes (e.g. sand extraction, apple farming, timber)</p>	<p>Increase of the quantity of collected pesticide packaging and biodegradable waste (to be specified by EoY 2)</p> <p><u>Baseline</u> Considerable quantities of pesticide packaging and biodegradable waste are disposed in the watershed's rivers and lakeshore</p>	<p>The pesticide packaging and biodegradable waste management systems (introduced by the SDC funded pilot project) are established and made operational prior to the new project</p>
Output 1.6	<p>tion water) are the considered to be the main source of pressure to the lake ecosystem</p>	<p>Review / technical reports (including analysis of collected and processed waste)</p>	
Output 1.7	<p>Total area under nature-based systems (wetlands, river corridors, buffers)</p> <p>Number of people with better water supply coverage Reduced water losses in the water supply system</p>	<p>Review / technical reports</p>	
Output 1.7	<p>Nature-based solutions (wetlands, river corridors, buffers) at watershed level are implemented</p> <p>Small-scale infrastructure and other community-driven projects are implemented</p>	<p>Review / technical reports</p>	

Hierarchy of objectives Strategy of Intervention	Key Indicators	Data Sources Means of Verification	
	<p><b>Baseline:</b> Significant losses in the water supply system; frequent defects in the network that result in increased operations and maintenance costs for the Public Enterprise 'Proleter'</p>		
Costs of outputs for Outcome 1: 435,000 CHF			
<b>For outcome 2: Improved performance of authorities at national and local level for sustainable management of watershed management plans</b>			
<p><b>Output 2.1</b></p> <p>Sustainable monitoring and management capacities at local level are created.</p>	<p>Fully functional monitoring and management capacities established by EoY 3</p> <p><b>Baseline</b> No sufficient monitoring and management capacities exist at present</p>	<p>Reports from the operation of the lake monitoring and management systems</p> <p>Other project reports</p>	<p>MoR and/or other relevant institutions provide the necessary space and ensure long-term financing of the LoMS and LMS</p>
<p><b>Output 2.2</b></p> <p>Long-term watershed management capacities of the municipal administration and of the Watershed Management Council are strengthened</p>	<p>Reorganization of the existing municipal and/or other structures to integrate project created / supported capacities by EoY 4</p> <p>WMC becomes formal cross-sectoral participatory mechanism for integrated watershed management</p> <p><b>Baseline</b> The current organizational structure and capacity of MoR and other responsible organizations / institutions doesn't meet the needs of an inte-</p>	<p>Project reports</p>	<p>MoR and other national institutions realize their commitments to integrate LoMS, LMS, NCRC, PMU and other project created / supported capacities</p> <p>The necessary subsidiary legislation regulating the work of the River Basin Management Councils is adopted by the central authorities</p>

Hierarchy of objectives Strategy of Intervention	Key Indicators	Data Sources Means of Verification	
	<p>grated watershed management system</p> <p>The WMC operates as an informal stakeholder involvement mechanism because the necessary subsidiary legislation isn't adopted by the authorities</p>		
<p><b>Output 2.3</b></p> <p>Lessons learnt and best practices are shared and replicated at national and international level</p>	<p>Number of knowledge products (manuals, guidance documents, lessons learnt booklets, fact sheets and articles) shared</p> <p><u>Baseline</u> Insufficient number of knowledge products to raise awareness and raise the profile of the watershed both nationally and internationally</p>	<p>Project reports</p> <p>Published knowledge products</p> <p>Legal acts drafted</p>	<p>(For legal acts only) The relevant authorities recognize the need and require support in scaling-up and replicating project best practices / models at national level</p>
<p><b>Costs of outputs for Outcome 2: 10,000 CHF</b></p>			
<p><b>For Outcome 3: Watershed restoration and protection processes are further improved</b></p>			
<p><b>Output 3.1</b></p> <p>Erosion control works are upgraded and sediment load further reduced.</p>	<p>Selected priority erosion control measures are implemented by the end of the project</p> <p><u>Baseline</u> Same as for Output 1.2</p>	<p>Independent review (supervision) reports on the implementation of the erosion control measures</p> <p>Project reports elaborating on erosion control measures</p>	<p>Additional funds are made available</p>
<p><b>Output 3.2</b></p> <p>Apple production area under agro-ecological farming practices is extended-</p>	<p>Area (in hectares) under GAP and/or agro-ecological measures</p>	<p>Reports from the implementation of GAP and agro-ecological measures in apple orchards</p>	<p>Same as above</p>

Hierarchy of objectives Strategy of Intervention	Key Indicators	Data Sources Means of Verification	
ed	<b>Baseline</b> Same as for Output 1.3	Project reports	
<b>Output 3.3</b> Nature-based solutions (wetlands, river corridors, buffers) at watershed level are implemented.	<b>Baseline</b> Total area under nature-based systems (wetlands, river corridors, buffers) <b>Baseline</b> Important natural landscape elements (ecotones) are being destroyed over the past decades as a result of development pressures	Project reports	Same as above
<b>Output 3.4</b> Agricultural waste management systems for reduction of organic load and prevention of input of pesticide residues to the Lake and its tributaries are further upgraded.	Increase of the quantity of collected pesticide packaging and biodegradable waste <b>Baseline</b> Same as for Output 1.5	Review / technical reports Other project reports	Same as above
<b>Output 3.5</b> Early warning system for harmful algal blooms is introduced	EWS for HAB is integrated in the LOMS and LMS <b>Baseline</b> No EWS for HAB for Prespa Lake is currently in place	Project reports Results of the EWS (recommendations for preventive actions)	Same as above
Costs of outputs for Outcome 3: <i>as available</i>			
<b>Activities (per output)</b>			
List of activities for Output 1.1:			(Risk & assumptions for each of the activities listed below are described

Hierarchy of objectives Strategy of Intervention	Key Indicators	Data Sources Means of Verification	previously at the relevant outputs)
<p>Activity 1.1.1 Development of a comprehensive study to thoroughly investigate the eutrophication processes and their root causes</p>			previously at the relevant outputs)
<p>List of activities for Output 1.2:</p> <p>Activity 1.2.1 Mapping priority erosion prone areas and quantifying the sediment transport rates to assess their impact on the eutrophication processes</p> <p>Activity 1.2.2 Implementation of prioritized set of erosion / sediment control measures by improving the forest cover and regulating the main torrents in the watershed</p>			
<p>List of activities for Output 1.3:</p> <p>Activity 1.3.1 Support in extending the apple production area with Good Agricultural Practices (GAP) and agro-ecological measures</p> <p>Activity 1.3.2 Modifying irrigation practices in apple production to reduce agricultural runoff and to ensure more sustainable use of water resources at watershed level</p> <p>Activity 1.3.3 Preserving the agro-biodiversity by (re)introducing varieties of fruits traditionally grown in the Prespa region</p>	<p>Expertise PM support Basic facilities and equipment</p>		
<p>List of activities for Output 1.4:</p> <p>Activity 1.4.1 Restoring the river delta of Golema Reka and turning the adjacent abandoned fish ponds into viable wetlands to support river restoration, flood control, retention</p>	<p>Expertise PM support Basic facilities and equipment</p>		

Hierarchy of objectives Strategy of Intervention	Key Indicators	Data Sources Means of Verification	
<p>and filtering of water</p> <p>Activity 1.4.2 Establishing wetlands in the abandoned fish ponds in the vicinity of Golema Reka River, to provide for nutrient removal from the existing municipal wastewater treatment system</p>			
<p>List of activities for Output 1.5:</p> <p>Activity 1.5.1 Support in extending the existing pesticide packaging and biodegradable waste management system in the Prespa Lake watershed</p>			
<p>List of Activities for Output 1.6</p> <p>Activity 3.3.1 Improving the watershed's hydrological and ecological processes by applying nature-based approaches</p>			
<p>List of Activities for Output 1.7</p> <p>Activity 1.7.1 Implementation of community-driven small-scale investments to protect water and other related ecosystems</p> <p>Activity 1.7.2 Construction of wastewater management system in the lakeshore village of Stenje</p> <p>Activity 1.7.3 Completion of Resen's water supply system rehabilitation works</p>	<p>Construction contractors PM support</p>		
<p>List of activities for Output 2.1:</p> <p>Activity 2.1.1 Establishing and operationalizing monitoring system at watershed scale</p>			

Hierarchy of objectives Strategy of Intervention	Key Indicators	Data Sources Means of Verification	
Activity 2.1.2 Establishing a modest Lake Management Service			
List of activities for Output 2.2: Activity 2.2.1 Strengthening the watershed management capacities through organizational maturation at local level and improving the cross-sectoral participatory mechanisms			
List of activities for Output 2.3: Activity 2.3.1 Contribute to and participate in existing knowledge networks Activity 2.3.2 Support in strengthening the legal and regulatory enabling environment for integrated watershed management Activity 2.3.3 Communication, education and public awareness raising for modifying resource management practices at local level	Expertise PM support		
List of activities for Output 3.1: Activity 3.1.1 Upgrade of the erosion / sediment control measures by improving the forest cover and regulating the main torrents in the watershed			
List of activities for Output 3.2: Activity 3.2.1 Support in further extending the apple production area with Good Agricultural Practices (GAP) and agro-ecological measures			
List of activities for Output 3.3: Activity 3.3.1 Improving the watershed's hy-			

Hierarchy of objectives Strategy of Intervention	Key Indicators	Data Sources Means of Verification	
drological and ecological processes by applying nature-based systems			
List of activities for Output 3.4: Activity 3.4.1 Support in further extending the existing pesticide packaging and biodegradable waste management systems			
List of activities for Output 3.5: Activity 3.5.1 Designing and implementing a dynamic harmful algal blooms early warning system			

## ANNEX II: Detailed Project Budget Breakdown

	Expected Outputs & Monitoring Activities	Key Activities	Budget (CHF)
<b>OUTCOME 1:</b> Water and soil quality in the Prespa Lake watershed have improved	<b>Output 1.3</b> Adverse impacts of apple farming reduced	Activity 1.3.1 Support in extending the apple production area under Good Agricultural Practices (GAP) and agro-ecological measures  Activity 1.3.2 Modifying irrigation practices in apple production to reduce agricultural runoff and to ensure more sustainable use of water resources at watershed level	100,000  30,000
	<b>Output 1.4</b> Flood control, retention and filtering of polluted tributaries ensured and existing wastewater treatment technology for enhanced nutrient removal upgraded.	Activity 1.4.2 Introducing monitoring of restored wetland area and defining wetland management programme	25,000
	<b>Output 1.7</b> Small-scale infrastructure and other community-driven projects are implemented	Activity 1.7.3 Completion of Resen's water supply system rehabilitation works	280,000
	<b>TOTAL OUTCOME 1:</b>		<b>435,000</b>
<b>OUTCOME 2:</b> Improved performance of authorities at national and local level for sustainable management of watershed management plans	<b>Output 2.3</b> Lessons learnt and best practices are shared and replicated at national and international level	Activity 2.3.1 Contribute to and participate in existing knowledge networks  Activity 2.3.3 Communication, education and public awareness raising for modifying resource management practices at local level	8,000  2,000
	<b>TOTAL OUTCOME 2:</b>		<b>10,000</b>
			<b>TOTAL: 445,000</b>

**NOTE:** the budget breakdown analysis refers only to the activities that will be implemented by UNDP in the period July 2016 – December 2017

## **List of acronyms/abbreviations**

**EWS – Early Warning System**  
**GAP – Good Agricultural Practices**  
**GEF – Global Environment Facility**  
**HAB – Harmful Algal Blooms**  
**IRBM – Integrated River Basin Management**  
**IWM – Integrated Watershed Management**  
**LMOs – Lake Monitoring System**  
**LMS – Lake Management Service**  
**MoEPP – Ministry of Environment and Physical Planning**  
**MoR – Municipality of Resen**  
**NCRC – Natural Capital Resource Center**  
**PMU – Project Management Unit**  
**SDC – Swiss Development Cooperation Agency**  
**SECO – State Secretariat for Economic Affairs**  
**UNDP – United Nations Development Programme**  
**WMC – Watershed Management Council**  
**WMP – Watershed Management Plan**