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Swiss Agency for Development  
and Cooperation SDC



## RESTORATION OF THE PRESPA LAKE ECOSYSTEM PROGRESS REPORT for the period 1 July – 31 December 2015



**Photo:** Over 5,000 people directly benefit from the successful completion of eleven small-scale environment/water infrastructure project

**Project Number:** 00083375

**Donor:** Swiss Agency for Development and Cooperation (SDC)

**Total Budget:** 5,400,000 CHF

**Project dates:** 01 July 2012 – 30 June 2016

**Reporting Period:** 01 January 2016 – 30 December 2016

**National counterparts:** Municipality of Resen, Ministry of Environment and Physical Planning, Public Enterprise 'Proleter', Public Forest Enterprise 'Makedonski sumi', State High-School Center 'Car Samuil', Resen, farmers associations and other NGOs

## PROJECT DESCRIPTION

### THE CHALLENGE

The Prespa Lakes Basin is an area of rich biodiversity that has been subject to intense pressures from human activities over the past decades. Unsustainable farming practices, erosion, and the unregulated disposal of untreated waste have reduced the health of the ancient freshwater lake and depleted the habitat of many rare endemic species, endangering a unique ecosystem that has evolved over five million years.

Comprehensive investigations into the ecological status of the Lake have helped to better identify and quantify the main environmental challenges and their root causes. The findings have revealed that the most acute problem currently facing the ecosystem is eutrophication, a process that accelerates the growth of aquatic biomass and upsets the balance of the entire ecosystem. This has a severe impact on key sectors such as tourism, water and fisheries, negatively affecting the socio-economic wellbeing of the local population.

### OBJECTIVES

To tackle these processes of degradation, the 'Restoration of the Prespa Lake Ecosystem' project was launched in July 2012, implemented by UNDP in partnership with the Municipality of Resen and with the financial support of the Swiss Agency for Development and Cooperation.

The project introduces a comprehensive set of measures to improve the overall health and resilience of the Lake and bring the eutrophication processes under control. These measures have been elaborated in the Prespa Lake Watershed Management Plan developed with UNDP's support in 2012—the first plan of its kind in the country designed in accordance with the EU Water Framework Directive.

The project implements practical solutions to reduce the pressures on the vulnerable ecosystem from agriculture, forest land, polluted rivers, wastewaters and solid waste. The watershed-scale measures include the introduction of sustainable agro-ecological practices, control of human-induced erosion processes, ecological restoration techniques, upgrading solid waste management systems and introducing a lake and watershed monitoring system.

### PROJECT RESULTS MULTIPLY THE BENEFITS FOR THE REGION

The project brings many benefits to the environment and to local communities. Reducing the pressures on the ecosystem greatly helps to restore the health and resilience of the lake. A growing number of farmers are being taught about more environmentally responsible methods of irrigation, fertilizer application, and plant protection. Strengthening the local waste management systems generates direct environmental and economic benefits.

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 turns 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.

Investing in the capacity of the Municipality of Resen not only prepares them for a transition toward a more independent completion of outstanding project activities, but it also greatly contributes to the sustainability prospects of all achievements.

**PROGRESS TO DATE:**

**OUTCOME 1**

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**Output 1.1: A solid basis for long-term active management of the lake's eutrophication processes**

**TARGETS FOR 2016:**

**STATUS:**

Finalization of the eutrophication model

■ Achieved

User training on model application

■ Ongoing

**Output 1.2: Control of erosion processes**

**TARGETS FOR 2016:**

Locally implemented forest regeneration activities in priority erosion areas with plant material produced at project-backed the forest nursery

■ Achieved

**Output 1.3: Reducing adverse impacts of apple farming**

**TARGETS FOR 2016:**

Completion of all three cycles of the grants programme to support agro-ecological farming practices

■ Achieved

Finalization of the feasibility study on irrigation options for the Prespa Lake Basin

■ Achieved

**Output 1.4: Wetland restoration for flood control, filtering of polluted tributaries wastewater treatment upgrades**

**TARGETS FOR 2016:**

Launching wetland restoration activities

■ Ongoing

**Output 1.5: Upgrade of the agricultural waste management system**

**TARGETS FOR 2016:**

Continuation of operation of the composting plant in Resen

■ Achieved

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**Output 1.6: Nature based solutions (wetlands, river corridors, buffers)****TARGETS FOR 2016:**

None

■ N/A

**Output 1.7: Small-scale infrastructure and other community-driven projects****TARGETS FOR 2016:**

Completion of all initiated  
small-scale  
environmental/water  
infrastructure projects

■ Achieved

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**OUTCOME 2**

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**Output 2.1: Sustainable monitoring and management capacities at local level****TARGETS FOR 2016:**

Completion of the pilot  
monitoring programme (by the  
Hydrobiological Institute) and  
continuation of regular  
monitoring programme by the  
Lake Monitoring Station

■ Ongoing

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**Output 2.2: Strengthening integrated watershed management capacities****TARGETS FOR 2016:**

Delivery of upgraded/advanced  
capacity development  
programme for the  
representatives of the new  
Sector on Environment

■ Achieved

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**Output 2.3: Sharing and replicating lessons learnt and best practices****TARGETS FOR 2016:**

Support exchanges and  
partnering with the existing  
relevant professional networks  
and lake regions

■ Ongoing

## HIGHLIGHTS

- Over 5,000 people have already experienced direct benefits from the successful implementation of the small-scale environmental and water infrastructure projects.
- The eutrophication modelling work has been completed. The responsible personnel from the municipality and the project are currently involved in a training programme for the use and application of the model in assessing management scenarios and monitoring progress toward achieving the ecosystem objectives for the region
- The feasibility study on irrigation options has been completed, proposing revolutionary approaches that will limit the necessary investments, improve irrigation efficiency, increase the use renewable energy sources, b at the same time preserving Basin's water resources
- The Public Forest Enterprise pursues forest regeneration campaigns on eroded land that not only has positive environmental effects, but also generates financial savings
- Thanks to the greatly enhanced capacity the Municipality of Resen they successfully completed the transition toward greater responsibility in implementation of the remaining phases of the project, by starting to implement directly Donor funds for specific project activities

## NARRATIVE REPORT

### PROGRESS UPDATE AND KEY ACHIEVEMENTS

#### **OUTCOME 1: Water and soil quality in the Prespa Lake watershed are improved**

The latest water quality monitoring data confirm once more the previously detected positive trend in the improvement of ecosystem health parameters (physico-chemical and biological monitoring data). A more comprehensive presentation of the findings of the monitoring programme will be provided in a special report that will be compiled after the final monitoring campaign is completed by the Hydrobiological Institute, scheduled for the third quarter of the year.

##### **1.1. ESTABLISHING A SOUND BASIS FOR THE LONG-TERM ACTIVE MANAGEMENT OF EUTROPHICATION**

The eutrophication modeling work has been completed and the reliability of the model has been proven after a long process of model validation and calibration. Basin-scale management scenarios have been evaluated not only for the current conditions, but also for the most probable climate scenarios for the region. As such, the goal has been achieved that the model becomes a powerful and dynamic tool for adapting management responses to the dynamic changes in the natural and socio-economic conditions.

An on-the-job training for UNDP and municipal personnel is at advanced stages leaving behind valuable skills and knowledge on the model application and maintenance. Two persons from the newly introduced Sector on Environment who will assume roles in operating the model are being involved in the training programme. The entire process is expected to be completed in the second half of the year.

##### **1.2. CONTROLLING THE EROSION PROCESSES**

The Public Forest Enterprise continues producing planting material at the project-supported native forest nursery that is used for planned forest regeneration activities on eroded areas. Considering the financial benefits for the Enterprise (savings as a result of own production of planting material for mandatory afforestation/reforestation work), it is assumed that the nursery has very solid sustainability prospects. For later in 2016, new forest regeneration campaign is planned on an area of app. 35 hectares. By this the area the total area under new forest erected with planting material from the nursery will increase to app. 110 hectares. The estimated annual savings the Public Forest Enterprise generates amount to nearly 20,000 USD.

### **1.3. REDUCING THE ADVERSE IMPACTS OF APPLE FARMING**

#### ***Grants programme for agro-ecological farming***

All three cycles of the grants programme on agro-ecological farming practices have been nearly completed. The total number of grantees increased to 77 (20 of which are women thanks to a special call for female farmers) and the total area under new project-supported farming techniques amounts to app. 75 hectares. While it is difficult to assess the size of new area on which these farming methods are replicated, based on information from the municipality, there are a few hundred additional hectares (newly erected and renewed apple farms).

The entire programme focused on ensuring better control over the use of pesticides, fertilizers and irrigation water, to reduce nutrient/pesticide loadings and consequently production costs.

The effects of the use of the new practices and modern technologies (e.g., insect monitoring kits, soil/temperature/water sensors with data loggers, efficient dripping systems and planting material) have been documented and presented to local farmers in support to the replication/scaling-up efforts. The findings show significant reduction in the use of water, pesticides and fertilizers, which besides the environmental effects has an important socio-economic dimension.

#### ***Feasibility study on irrigation options***

The feasibility study on basin-scale irrigation options for Prespa has been completed. The study looked into different options and compared them against a comprehensive set of feasibility factors. The analyzed options included combinations of various infrastructure developments, including construction of dams, new irrigation pipeline, and rehabilitation of the old irrigation system.

As a final outcome, the study proposes a single (the most feasible), and revolutionary irrigation development alternative. After comparing the variabilities in the demand and supply of irrigation water in space and time and in the most probable climate scenarios, and conducting comprehensive economic analyses, the study suggests linking the existing individual irrigation wells into an organized basin-scale system. This would avoid considerable investments in new infrastructure development (for example tens of millions of EUR would be required to build a system of dams), as the major investment have already taken place in the past through individual contributions of farmers.

Instead of building new structures, the study recommends introducing an irrigation scheduling system based on the use of the existing agro-meteorological monitoring stations. Additionally, micro-meteorological modeling would be required and an upgrade of the existing information system for farmers based on the use of existing applications used for early warning about spraying of plants.

In order to further improve the economic and environmental effects of the proposed development, the study proposed using photovoltaic/solar pumps instead of the standard pumps using fuel or electric power. Generic business plans were developed for this purpose to assist farmers accessing funding mechanism (e.g., credits, loans or grants).

The study has been shared with the relevant institutions responsible for irrigation management in the country for review and further consideration.

Such an outcome of the study was made possible thanks to the findings of the grants programme for agro-ecological farming which revealed that farmers in Prespa can save up to 60% of the total volume of water they annually use for irrigation, by applying the newly promoted methods.

### **1.4. WETLAND RESTORATION FOR FLOOD CONTROL AND FILTERING OF POLLUTED TRIBUTARIES**

Upon completion of the wetland restoration design and review stage a procurement procedures were organized for the selection of a construction contractor and a supervising engineer. In parallel to the process, the Municipality of Resen pursues regular communication with the local communities as part of the preparations for project implementation. This facilitation work is critical in ensuring that the necessary restoration works can be implemented without major constraints, having in mind that minor part of the intervention needs to be realized on a privately owned land. The start of the works is anticipated to take place in the next half of the year, and to be completed in the first quarter of 2017.

### **1.5. BIODEGRADABLE WASTE MANAGEMENT**

The composting plant in Resen continues operating as planned. Minor difficulties are being overcome through a dedicated action of the Public Enterprise 'Proleter' and the Municipality of Resen, in recognition of its importance for the region. There is a growing number of local farmers who are interested in using the compost, testing it firstly on smaller plots. The expectation is that the demand for compost would increase as more farmers of Prespa witness the benefits of using compost.

The composting plant already represents a national/regional model for biodegradable waste management. The experiences and lessons learnt are shared within and outside the country. Additional support aiming at increasing the capacity and procession efficiency of the plant will be provided through the project component that will be implemented by the Municipality of Resen.

### **1.6. DEVELOPMENT OF AN ENVIRONMENTAL INFRASTRUCTURE**

All eleven selected small-scale water/environmental infrastructure projects have been completed, some of them ahead of the anticipated deadline. As a result over 5,000 people are benefiting directly from the improved water supply and sanitation, improved irrigation efficiency, removed dumpsites and newly created recreational areas.

As part of this programme, the following small-scale infrastructure projects were completed: five water supply systems (Jankovec, Nakolec, Dolno Dupeni and two in Resen), two dumpsite remediation/eco-parks projects (Krani and Strbovo), one integrated sewerage and stormwater drainage solution (Resen), and two irrigation systems (Kurbinovo and Krani). The remaining identified projects will be implemented as part of the component that will be implemented by the Municipality of Resen.

In addition to the SDC-funded interventions in the municipal environmental infrastructure, the Municipality of Resen completed the works for construction of the wastewater collection system in the village of Drmeni with government funding. The village (app. 500 people) is being 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 progressed significantly with their 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. Over US\$ 600,000 are provided by EBRD to replace the main pipeline in the town of Resen and the village of Jankovec. The Donor responded positively to the request of the Municipality of Resen to financially support this project by allocating funds, through UNDP, for the construction of the secondary water supply network. As a follow-up the project initiated the preparations for organizing these works, including review of existing design documentation and tender procedures. The works are expected to be launched in the next half of the year, and to be completed by early 2017.

These rehabilitation works will help greatly reduce losses/leakages, which besides the more rational use of the resource will also result in a better economic performance of the Public Enterprise 'Proleter' – a key stakeholder of the project in charge of the majority of investments in water and solid waste management infrastructure.

**OUTCOME 2:** Performance of authorities at national and local level for integrated watershed management is improved

Thanks to the greatly enhanced capacity the Municipality of Resen they successfully completed the transition toward greater responsibility in implementation of the remaining phases of the project, by starting to implement directly Donor funds for specific project activities. The results that the municipality is supposed to deliver have been defined and incorporated in a Project Document signed with the Donor. By this, the very important project objective of creating local water resources management capacity – seems to be achieved.

### **2.1. SUSTAINABLE MONITORING AND MANAGEMENT CAPACITIES AT LOCAL LEVEL**

The Lake Monitoring Station (LMS) in Stenje is gradually taking over the key role in the regular monitoring of Lake Prespa and its tributaries thanks to the on-the-job training of the hired local personnel and combined financing secured



by the project and the Municipality of Resen. The financing of LMS is to a great extent secured by the municipality's savings from the project-supported energy efficiency measures. In the second half of the year, the Hydrobiological Institute will complete the pilot monitoring programme, after which the regular monitoring will be completely undertaken by LMS.

## **2.2. STRENGTHENING CAPACITIES FOR INTEGRATED WATERSHED MANAGEMENT**

The Municipality of Resen is pursuing the procedures for hiring the necessary staff of the Sector on Environment, some of which were previously project supported. So far, the three park rangers and the technician at the LMS have been employed regularly, while the procedures for the two new personnel (one from LMS and other from the Natural Capital Resource Center) are underway. Based on the information from the Municipality, these employments are expected to be completed by the end of the year or early in 2017. The personnel from LMS and the Natural Capital Resource Center are already contracted by the municipality but on a temporary basis, which needs to be transformed into permanent contracts.

The personnel from the Sector on Environment is continuously undergoing different trainings on relevant topics, either organized by the project or by other complementary projects/initiatives (e.g., Bregalnica and Strumica River Basin projects, IPA projects on NATURA 2000, and other).

## **2.3. SHARING AND REPLICATING LESSONS LEARNT AND BEST PRACTICES**

The project continues implementing its communication and outreach programmes as planned. The media coverage of the project still remains high, besides that the project is in the mature stages of implementation, and the number of ongoing activities is reducing over time. The project actively participates in all relevant national level processes in the specific programmatic areas (e.g., water management, waste management, monitoring, and WFD implementation).

In order to better systematize and promote results, the project is working both on final publication and a documentary film. These products are expected to be completed by the end of 2016, along with a plan for their international and national promotion.

## **CONCLUSION**

The new monitoring data confirm the trend of improvement of the ecosystem health parameters in the lake that is largely attributed to the project-supported pollution reduction and capacity development interventions in Prespa.

The transition toward greater role of the Municipality of Resen in the project implementation has been successfully completed. Very important project activities has been assigned to the municipal administration that has demonstrated the commitment and the capacity to deal with the complex projects of this nature. This has been one of the main goals of the project. UNDP will remain active in the region, continuing to reduce its assistance to the municipality toward a fully autonomous implementation of the project and long-term management of the Basin.

Overall, project implementation is progressing as planned, and the results achieved are often beyond initial expectations, mainly because of the long-term commitment of all key stakeholders.



**FINANCIAL REPORT:**

**Project:** Restoration of the Prespa Lake Ecosystem  
**Donor:** 00232 Government of Switzerland  
**Source of Fund:** 30000 Programme Cost Sharing  
**Currency:** USD

**Financial status – 30.06.2016 (in U.S. Dollars)**

<u>Income:</u>		<u>Expenditures*:</u>	
<u>Date/Period</u>	<u>Amount</u>	<u>Date/Period</u>	<u>Amount</u>
Opening Balance:	0,00	01.07.2012	<b>0,00</b>
Advance Received (30.07.2012):	553,765.54	31.12.2012	<b>549.846,87</b>
Advance Received (28.02.2013):	537.403,00	31.12.2013	<b>1,894,954.62</b>
Advance Received (31.07.2013)	1,394,101.88		
Advance Received (28.02.2014)	1,135,203.00	31.12.2014	<b>2.004.277,07</b>
Advance Received (31.08.2014)	523,615.00		
Advance received (28.02.2015)	533,561.00	31.12.2015	<b>1,049,612.58</b>
Advance received (03.12.2015)	491,380.69		
Advance received (28.12.2015)	404,578.21		
		30.06.2016	<b>126.615,86</b>
<b>Total Budget 01.07.2012 – 30.06.2016</b>	<b>5,573,608.42</b>	<b>Expenditures</b>	<b>5.625.307,00</b>
		<b>Balance:</b>	<b>-51.698,58</b>

\* Expenditures include the amount of fixed assets.

**Financial status as of 30.06.2016 (in U.S. Dollars)**

Amounts without assets, as per the final annual CDR

<u>Income:</u>		<u>Expenses:</u>	
<u>Date/Period</u>	<u>Amount</u>	<u>Date/Period</u>	<u>Amount</u>
Advance Received (30.07.2012):	553,765.54	31.12.2012	<b>408,491.18*</b>
Advance Received (28.02.2013):	537.403,00	31.12.2013	<b>1,785,988.05*</b>
Advance Received (31.07.2013)	1,394,101.88		
Advance Received (28.02.2014)	1,135,203.00	31.12.2014	<b>1,971,143.62*</b>
Advance Received (31.08.2014)	523,615.00		
Advance Received (28.02.2015)	533,561.00	31.12.2015	<b>1,019,877.69*</b>
Advance Received (03.12.2015)	491,380.69		
Advance Received (28.12.2015)	404,578.21		
<b>Total Budget 01.07.2012 – 31.12.2015</b>	<b>5,573,608.42</b>	<b>Expenditures</b>	<b>5.625.307,00</b>
<b>Current Value of Active Assets</b>			<b>65.851,15</b>
		<b>Balance:</b>	<b>-51.698,58**</b>

\*The amounts do not include active assets. Values of assets depreciate over time, and the cost of the depreciated asset is transferred to the expenditure accounts once the asset is transferred to the beneficiary.

\*\* Cash balance is the amount of balance minus active assets as although the assets are not undepreciated to the expenditure accounts, they have been purchased.

**Detailed Expenditures for the period 01.01.2016 – 30.06.2016**

<b>Expenditures by Sub-line:</b>		
<b>Description</b>	<b>CMBL</b>	<b>Exp.</b>
<b>Activity 1</b>		
Salaries _NP Staff	61100	581.22
Contr. Joint Staff Pension	62110	117.07
Contr. Medical	62115	18.02
Annual Leave Expens.	62140	-4.22
Insurance and Security Costs	63500	77.04
After Service Insurance	65100	49.86
Intl Consultants –Sht Term –Tech	71205	0
Local Consult.-Sht Term-Tech	71305	271.95
Service Contracts-Individuals	71405	9849.97
Travel Tickets-International	71605	0
Daily Subsistence Allow-Intl	71615	0
Daily Subsistence Allow-Local	71620	334.16
Travel – Other	71635	42.20
Svc Co-Construction & Engineer	72105	47191.10
Svc Co-Agricultural Manage	72110	477.29
Svc Co-Natural Resources & Env	72115	0
Svc Co-Trade and Business Serv	72120	0
Svc Co- Studies & Research Serv	72125	1933.98
Svc Co-Transportation Serv	72130	1153.25
Svc Co-Communications Serv	72135	0
Svc Co-Information Technology	72140	1385.72
Svc Co-Training and Educ S	72145	580.88
Svc Co-Social Scs, Social Sci	72160	560.43
Machinery	72210	0
Furniture	72220	0
Agri & Forestry Products	72305	5048.87
Land Telephone Charges and Internet	72420	20.46
Mobile Telephone Charges	72425	78.61
Connectivity Charges	72440	0
Common Services-Communications	72445	0
Stationery & other Office	72505	261.86
Publications	72510	2554.10
Acquis of Computer Software	72805	55.93
Inform Technology Supplies	72815	0
Maintenance of Equipment	73406	0
Maint, Oper of Transport E	73410	697.51
Capacity Assessment	74120	0
Audio Visual Productions	74205	0
Printing and Publications	74210	0

Promotional Materials and Dist	74215	0
Translation Costs	74220	0
Other media costs	74225	67.56
Contrib.To CO Common Security	74325	0
Sundry	74525	207.26
Facilities & Admin – Implement	75105	5158.45
Facilities & Admin – OH &	75115	0
Realized Loss	76125	0
Learning Costs	75705	80.00
<b>SUBTOTAL:</b>		<b>78.850,53</b>
<b>Activity 2</b>		
Learning Costs	64300	356.57
Local Consult.-Sht Term-Tech	71300	9.486.46
Contractual Services – Individ	71405	8.573.63
MAIP Premium SC	71410	18.23
Contribution to Security SC	71415	309.85
Daily Subsistence Allow-Lo	71620	3.257.75
Travel – Other	71635	244.23
Svc Co-Construction & Engineer	72105	13.615.13
Svc Co-Studies & Research Serv	72125	126.01
Svc Co-Transportation Serv	72130	236.20
Svc Co-Communications Service	72135	2.767.59
Svc Co-Information Technology	72140	0
Svc Co-Training and Educ Serv	72145	735.66
Land Telephone Charges	72420	355.00
Mobile Telephone Charges	72425	98.53
Stationery & other Office	72505	249.92
Maint. Transport Equipment	73410	1.169.83
Sundry	74525	1.187.95
Direct Project Costs	74590	152.82
Facilities & Admin – Implement	75105	3.005.89
Realized Loss	76125	0.01
Realized Gain	76135	-0.00
<b>SUBTOTAL:</b>		<b>45.947.26</b>
Facilities & Admin – Implement	75105	118.93
Dep Exp. Owned –Vehicle	77660	1699.14
<b>SUBTOTAL:</b>		<b>1.818.07</b>
<b>TOTAL Expenditures: 01.01.2016 – 31.06.2016</b>		<b>126.615,86</b>
<b>Undepreciated Fixed Assets (purchased until 31 June 2016)</b>		<b>28.036,01</b>
<b>Total Expenditures + Fixed Assets</b>		<b>154.651,87</b>