



## HUNGARY CASE STUDY

August 2010

### LAKE BALATON INTEGRATED VULNERABILITY ASSESSMENT, EARLY WARNING, AND ADAPTATION STRATEGIES

<b>Country</b>	Hungary [ <a href="http://www.adaptationlearning.net/country-profiles/hu">http://www.adaptationlearning.net/country-profiles/hu</a> ]
<b>Region</b>	Eastern Europe
<b>Key Result Area</b>	Water Resources Coastal Zone Management Natural Resource Management  Key words: Lakes, Regional Development, Tourism, Ecosystem Management, Adaptive Management
<b>Project ID</b>	2630
<b>Project Activity Dates</b>	Start: January 2006 End: December 2008
<b>Key Stakeholders</b>	Business community (tourism, fishing, transportation, industry, consulting, agriculture, media), Individuals (emphasis on high profile opinion leaders in local communities), Municipalities, permanent population, NGOs.

## **ABSTRACT**

**In January 2006, the United Nations Development Programme (UNDP) and the Global Environment Facility (GEF) –Strategic Priority on Adaptation (SPA) partnered with key actors in Hungary to address growing concerns about the ecological condition of Lake Balaton. Using a GEF grant and substantial national co-financing through the Lake Balaton Development Coordination Agency (LBDCA), the overall purpose of the project was to gain a better understanding of Lake Balaton’s ecological and socio-economic vulnerability in order to build resilience to the multiple forces of global and local change. Lake Balaton, a fragile area with high human interaction, is sensitive to both natural and man-made influences. Challenges brought about by climate change include frequent and severe water balance problems, lower levels of annual precipitation and problems concerning the biodiversity of the lake. From an ecological and economical perspective, recent changes in water levels have alarmed both regional authorities and local stakeholders. To appropriately address these challenges, and in order to effectively adapt to the effects of climate change, a need to strengthen research on Lake Balaton’s vulnerability was identified. For the project, integration of ecological and engineering knowledge with social and policy sciences was deemed equally essential. Key lessons learned from the project implementation indicate that while it is important to establish partnerships with international networks, it is also imperative to target local stakeholders and rely more on local capacities.**

## **BRIEF DESCRIPTION OF ISSUES**

### ***Background***

Located in western Hungary, Lake Balaton is the largest freshwater lake in Central Europe and one of the shallowest large lakes in the world. With a mild climate, the flora and fauna of the surrounding landscape is particularly diverse and a large number of rare and protected plant species can be found in the area. Additionally, the Lake Balaton Resort Area (LBRA) has significant agricultural and recreational value. Arable land, vineyards and orchards take up some 80% of agricultural land (49.1 % of LBRA’s land is agricultural), but the economy of LBRA is driven predominantly by highly seasonal tourism. Summer tourists, concentrated in lakeside communities, can temporarily triple the area’s population, exerting substantial stress on the environment and infrastructure.

Due to its shallow profile and precarious water quality and water balance situation, Lake Balaton is uniquely sensitive to both natural and anthropogenic influences. While the ecological parameters of the Lake and its watershed have long been in constant change, current trends appear to indicate the beginnings of a new trajectory, characterized by accelerated change increasing the vulnerability of both ecological and socio-economic subsystems. Adverse changes in environmental variables in the watershed have already led to increased costs. Following many years of water quality problems, including eutrophication, a negative water balance caused water shortages, starting in 2000, which lasted for four years. The exact causes are still being debated, as multiple forces of change are at play, including climate change.

Given Lake Balaton’s heavy reliance on tourism as a primary source of livelihoods, the socio-economic consequences of ecological deterioration can be severe and immediate. If the frequency of years with negative water balance increases in the future, as predicted by applicable climate change scenarios, Lake Balaton and its coupled socio-economic system is expected to emerge as a highly sensitive indicator of vulnerability to global change.

### ***Problem***

Regional authorities and stakeholders are already alarmed about the short and potential long-term economic, environmental, and public health consequences of water level changes in Lake Balaton. The impacts of this phenomenon are being combined with long-standing concerns such as water quality and permanent alteration of natural landscapes through overbuilding. Should these trends persist or the frequency of water deficit situations increase, without appropriate adaptation measures, both the socio-economic and ecological systems of the lake will be stressed beyond their current adaptive capacity.

Although Lake Balaton is well researched and intensively managed, solving the current problems exceeds the capacity of regional and

national organisations. To date, no systematic effort has been made to understand the incremental impact of climate change on baseline vulnerability at the regional level, to mobilize stakeholders in mapping out the range of emerging vulnerabilities and adaptation options, and to bring the lessons to bear on regional and national sustainable development policy processes.

There is a need not only for strengthening research on vulnerability and adaptation, but also for connecting its results to policymaking and the emerging discourse on the condition and future direction of the lake systems. Forward looking integrated assessment, involving the participation of science and a wide range of stakeholders is an essential next step to review existing knowledge in light of new concerns, assess policy implications and options, and engage affected stakeholders in constructive dialogue about adaptation.

## BRIEF DESCRIPTION OF PROJECT

### *Solution: Adaptation Approach, Components and Description*

The project's specific objectives were to contribute to a better understanding of the Lake Balaton ecological and socioeconomic system's vulnerability and resilience arising from multiple forces of global and local change, including climate change, and build capacity for more effective policy-making and adaptation measures in response.

The project complemented ongoing policy initiatives and scientific research and had a clear niche by focusing on better understanding of the vulnerability of the Lake and its watershed from an integrated perspective. Since 2002, the Lake Balaton Development Coordination Agency (LBDC), the organization responsible for development planning around the lake, has been working with domestic and international partner organizations, including IISD, to launch a forward-looking initiative focused on regional sustainability. LBDC has a long-term conceptual development plan for 2002-10 and a grant facility to support on-the-ground initiatives.

The project led to measurable improvements in vulnerability assessment and adaptation capacity, and on-the-ground results were achieved through initiatives financed by a small grants programme using innovative financing mechanisms, such as public-private partnerships. Long-term impacts will be ensured by integrating criteria related to adaptation to global change into the regular grant-making activities of the LBDC, which receives funding from the national government budget.

Through the project a wide range of stakeholders were involved in identification of adaptation responses and needs for adaptive capacity development, they were trained on how to formulate and implement adaptive strategies, and how to use the developed tools. The project aimed to engage stakeholders in the following actions:

- Developing lake- and watershed-specific information systems which interface with national information systems to help identify, understand, and track issues critical for vulnerability and sustainable development;
- Identifying and analyzing adaptive strategies and policy initiatives;
- Formulating and implementing pilot adaptation initiatives to capture global environmental benefits, and increase social and ecosystem resilience;
- Synthesizing lessons learned and sharing them with relevant local, national and international audiences; and
- Short- and long-cycle project monitoring and evaluation.

### *Mainstreaming Components*

The project was designed specifically to support long-term strategic priorities of national, regional, and local governments. Reviews of several regional and national policy initiatives and instruments presented a unique opportunity for mainstreaming project lessons learned related to vulnerability and adaptation. At the national level, inputs were provided to the new documents of National Climate Change Strategy and its two-year action plan. Recommendations were made to integrate adaptation approaches specific to Lake Balaton into the documents. Based on the project results, the most important recommended strategies were retention and treatment of rainwater, introduction of sustainable water management practices, limitation of non-native invasive species, establishment of a UV radiation monitoring system and its integration into the national climate and health information system; promotion of adaptation pilot projects in the field of agriculture and water management; establishment of a fund to finance the implementation of municipal climate change strategies.

## SUCCESSFUL PRACTICES

### Key Successes

Adaptation measures have been integrated into 18 Environmental Management Programmes (in addition, the elaboration of 6 more programmes is in progress) and 11 Waste Management Plans

<b>What Factors Supported Success</b>	Project outcomes have been incorporated into the processes of other programmes, policies and projects. The creation of partnership agreements with international networks and strong collaboration with local stakeholders are among the factors that supported successful integration.
<b>Relevant Information</b>	At the municipal and micro-regional level, environmental management programmes and waste management plans have been informed by project outcomes. At the regional and national level related programmes and plans include the Long-term Regional Development Plan for the Lake Balaton region, River Basin Management Plan for Lake Balaton catchment (in progress), and the third national Environmental Protection Plan of Hungary.
<b>Successful Practice</b>	A customized Soil and Water Assessment Tool (SWAT) was created.
<b>Key Successes</b>	The database (developed in Excel for the organization of statistical indicator data and metadata) was structured and finalized to keep developing and improving SWAT with sensitivity towards long-term viability of the tool.
<b>What Factors Supported Success</b>	SWAT is a decision support tool that will be owned and maintained by the Central Trans-Danubian Environmental and Water Management Directorate and the National Water Research Institute and, among others. SWAT will also be used by the LBDCA.  These advanced tools have been developed with engagement and consultations of national experts and a wider group of stakeholders.

## LESSONS LEARNED

### Results and Learning

#### Key lessons learned:

**1. Establish partnership agreements among international networks with similar interests and problems:** In the framework of the project a list of key audiences was developed involving stakeholders and organizations that are interested in the project and could ensure long term sustainability of project results. Partnership agreements among international networks (e.g. Living Lakes Network) with similar interests and problems can be mutually beneficial.

**2. Limit international partnerships to deliver know-how and methodology; rely more on local capacities for actual implementation:** Relying on and utilizing the existing local capacities in implementation creates sustainability and replicability of project outcomes.

**3. Target local stakeholders, facilitate dialogue, and help cooperation between local governments and NGOs:** The project contributed to the development of some of the key regional and national development frameworks. In particular, at the regional level it provided inputs to the Long-term Regional Development Plan (RDP). Cooperation provided the basis for the integration of adaptation recommendations to the River Basin Management Plan of the Lake Balaton catchment area. For implementing adaptation measures, it is imperative to facilitate dialogue and establish cooperation between key stakeholders, including local governments and NGOs.

**4. Offer direct grants and funding to local stakeholders for the direct implementation of adaptation measures:** Under the, pilot project, initiatives were implemented to facilitate adaptation to the impacts of climate change through direct action. As part of the evaluation of project results, the final beneficiaries were encouraged to periodically (on a quarterly basis) submit technical and financial reports, as well as submit a final report to the LBDCA. To ensure sustainability, it was proposed to sign cooperation agreements between local partners, such as the NGO and local governments. Altogether, 39 such agreements were signed.

### Sustainability

Project sustainability has been established by improved awareness and increased ability of individuals to take action. The project developed several advanced modelling tools and instruments to assess the vulnerability of Lake Balaton to climate change and the impact of future adaptation scenarios. In the last year of project implementation, the National Water Management Directorate took over the developed tools and plans to apply it for integrated water management planning.

### Replicability

Project outcomes have been incorporated into other programmes and projects. For example, at the municipal and micro-regional level, there are environmental management programmes and waste management plans that have incorporated elements of the Lake Balaton project's outcomes.

## Funding

GEF (SPA): US\$985,000

Government of Hungary: US\$3,000,000

UNEP: US\$50,000

IISD (in kind): US\$40,000

TOTAL: US\$4,075,000

*(As detailed in the 2009 Annual Performance Report/ Project Implementation Review)*

## Time Frame

2006-2008

Profile Updated: September 2010

Previously Updated: September 2008

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Adaptation Learning Mechanism: [www.adaptationlearning.net](http://www.adaptationlearning.net)

## Main project websites:

Homepage: <http://www.balatonregion.hu/adaptation/>

Balatontrend: <http://test.balatontrend.org/>

## Project pages on partners' website:

LBDC: <http://www.balatonregion.hu>

IISD: <http://www.iisd.org/measure/knowledge/national/balaton.asp>

GRID: <http://www.grid.unep.ch/activities/sustainable/balaton/index.php>

## Additional sites:

Online-monitoring: <http://bir.webeye.hu/>

Adaptation Learning Mechanism: [www.adaptationlearning.net](http://www.adaptationlearning.net)

Adaptation Learning Mechanism – Hungary Project Profile: <http://www.adaptationlearning.net/alm-climate-change-adaptation-profile-lake-balaton-integrated-vulnerability-assessment-early-warning>

