

Wetlands and Lakes – Actions for Climate Protection



Need for Action! Climate change and Variable weather at Lake Balaton

Lake Balaton is the largest freshwater lake in Central Europe and one of the most important natural treasures of Hungary. Similar to other large lakes in the EU, Lake Balaton is also an extremely vulnerable area. It is heavily exposed to environmental changes and the effects of climate change.

We have experienced that weather patterns are changing at Lake Balaton too. Average temperatures are rising and weather conditions are becoming more extreme (e.g. drought, flooding and inland water). The frequency of heat waves is increasing and drought periods are getting longer. Storms with abundant rainfall are becoming more frequent and more intense. No major changes are foreseen in the annual amount of precipitation, but the distribution of it will change, causing less rain in summer and autumn and more in spring and winter.

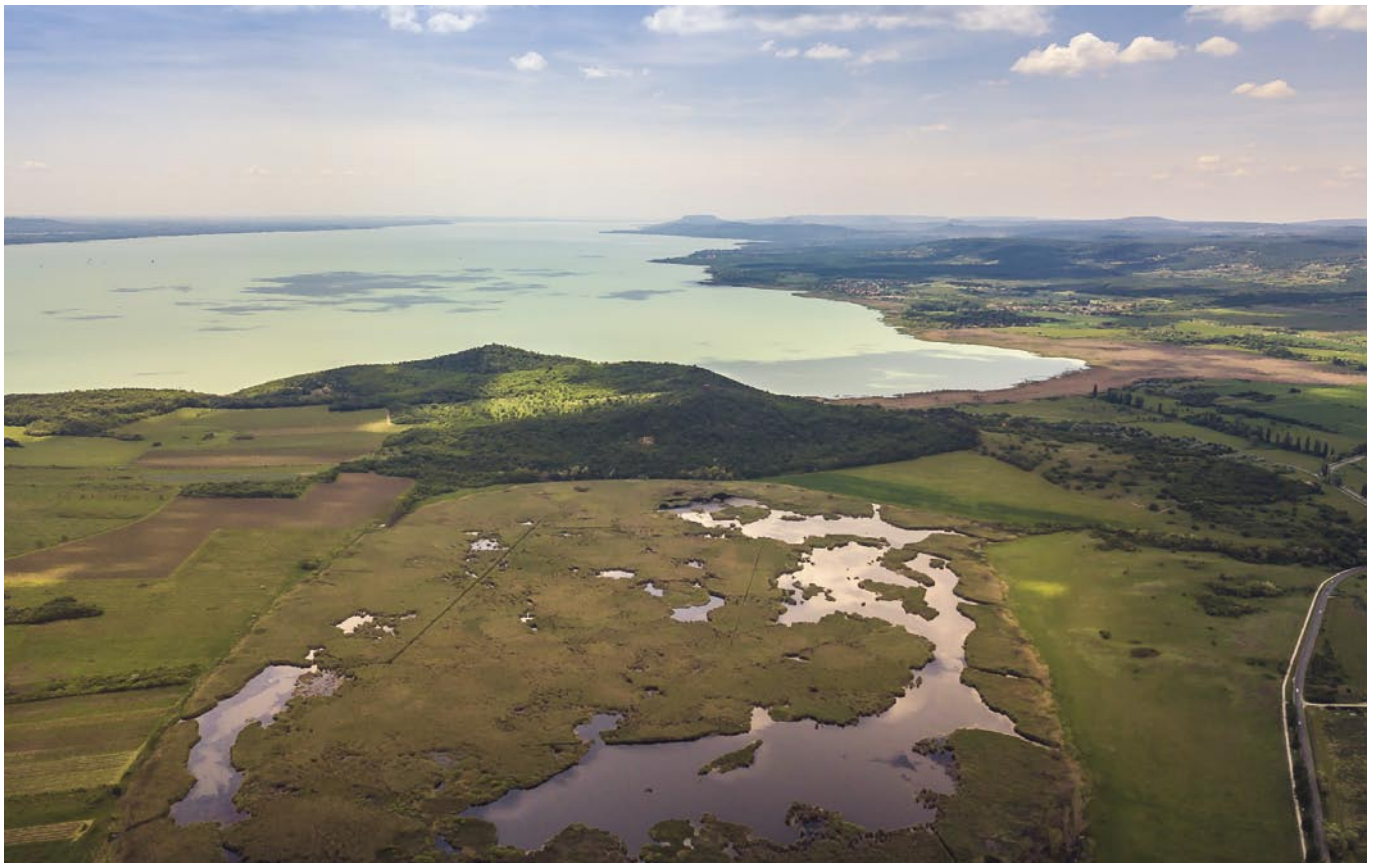
Consequently, there is an urgent need for action. Adaptation to climate change is the key to preserve Lake Balaton as an ecological system and economic potential. The ecosystem of Lake Balaton must be protected since society, infrastructure and economy rely on the living system of the lake.

This means that Lake Balaton has to be analyzed as complex system together with its catchment area, instead of considering it

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simply as a well-defined lake. The Lake Balaton Regional Climate Change Strategy 2020–2030 has been elaborated by also that initiative.

*Geletáné Varga Éva
Lake Balaton Development
Coordination Agency*



Climate protection projects

photo: Udo Gattenlöhner



Mangrove protection is climate protection

From 1 to 12 November 2021, the 26th United Nations Climate Change Conference (COP 26) is scheduled to take place in Scotland. Against the backdrop of the high-profile meeting on achieving the 2°C-target, the international foundation for the environment and nature - Global Nature Fund (GNF) - underlines the importance of mangrove forests for global climate protection.

The increasing human hunger for natural resources and unchecked economic growth are having an increasingly negative impact on valuable habitats and ecosystems. This is especially true for mangrove forests, whose protection still receives too little attention in public perception. More than a third of the world's mangroves in tropical coastal regions have been destroyed in the past 40 years. Overexploitation, e.g. for the extraction of firewood and timber, and the spread of - often illegal - shrimp farms are to blame for the dramatic decline. As a result, the habitats of the salt-tolerant plants are disappearing three to five times faster than tropical rainforests or coral reefs. This is particularly alarming given the immense importance of mangroves for climate protection.

The consequences of deforestation are severe. UNEP experts state that almost 20 % of global emissions from deforestation are due to the destruction of mangrove forests. Given that mangroves account only for less than 0.4 % of the world's forest cover, which again underlines their enormous carbon storage capacity. "Essential components of international climate protection efforts must be the reduction of

greenhouse gas emissions as well as the protection of important carbon sinks, such as forests and peatlands," says Udo Gattenlöhner, Executive Director of GNF. "Mangrove forests are a distinctly important climate gas reservoir that is still largely overlooked."

Mangrove forests of tropical coasts are adapted to the daily change between low and high tide and thrive better in brackish water than competing plants. The trees, whose dense root networks stand like stilts in the water, provide habitats for a variety of rare mammals, reptiles and birds. They serve as a refuge and nursery for countless species of fish and crabs and retain large amounts of sediment. In this way, the mangrove forest protects the coasts from erosion, tropical cyclones and storm surges. Mangroves are also an effective tool against climate change: healthy mangrove forests store more carbon than any other forest - up to 1,000 tonnes per hectare.

The Sundarbans (Bengali for "beautiful forest") are a huge river delta in the Ganges estuary and form the largest contiguous mangrove area on earth. Extensive mud banks of uninhabited islands are home to saltwater crocodiles up to six metres long and countless bird species. Around one hundred wild Bengal tigers can still be found here. But millions of people also live here. The unique ecosystem, which stretches from the eastern coast of India to Bangladesh, is under massive threat. In the Sundarbans region, it is clearly noticeable that the sea level is rising and extreme weather events are putting an ever more dramatic strain on nature and people.

Changing rainfall patterns as a result of Climate change: the case of Senegal

Wetlands cover 6% of the world's land surface, contain about 12% of the global carbon pool and play an important role in the global carbon cycle. However, these ecological data also contain associated subsistence of the people who depend on the ecosystem services.

Global climate change is one of the greatest global challenges, threatening the survival of species and the health of ecosystems in general. Biodiversity loss will lead to the deterioration of ecosystem services and increase vulnerability to climate change impacts. Wetlands are particularly sensitive to climate change, as they suffer alterations of natural and anthropogenic origin, modifying the dynamics of river basins.

The Saloum and Casamance river basins in western Senegal, with their 58,000 km², have been heavily impacted by climate change and human action. Dams, clearing and drainage have resulted in arid and hyper-saline conditions, as well as the loss of thousands of hectares of important wetland complexes, such as mangroves, brackish estuaries, freshwater wetlands and once productive agricultural areas. Mangrove forests, which once stretched from extensive tidal floodplains to the interior of the country, are now restricted to the deltas. Senegal is a low-income, food-deficit, semi-arid country. Of its 14

million people, about 80% are engaged in agriculture, dependent on currently depleted soils and rainfall that fluctuates from year to year. As a consequence of the deep changes in these ecosystems, the livelihoods of thousands of people - who depend on the ecological services of these wetlands - are now at risk.

Particularly, the amount of rainfall has decreased markedly (from over 1,000 mm in the monsoon season years ago, to now about 400 mm). Not only the amount of rainfall, but the inter-annual variation (the timing of rainfall) alters the natural dynamics and the possibility of productive planning. Currently, long periods of drought between heavy rains cause many problems related to erosion and destruction of crops.

In Senegal, what used to be thousands of hectares of productive and healthy wetlands have become arid and unfertile land. Future actions in this region are therefore key, as the sustainability of this region is linked to the successful restoration and management of these systems.

► [Contact for booth articles on this page:](#)
[Global Nature Fund - GNF \(see imprint p.4\)](#)

Wetlands and Lakes

Pantanal and Climate change



The Pantanal encompasses 190,000 km² across Brazil, Bolivia, and Paraguay. Most of this area is in Brazil. The Pantanal is one of the largest and continuous inland wetlands in the world. Located in the Upper Paraguay River Basin (UPRB), the Pantanal is also part of a complex wetland system in South America, covering five countries: Brazil, Bolivia, Paraguay, Argentina and Uruguay.

In 2020, fires devastated almost one-third of the Pantanal's total area, of which 4.3 million hectares corresponds just to the Brazilian part. There were negative impacts on animals and their habitats, as well as on peoples from the Pantanal. Traditional communities, consisting of riverbank dwellers and indigenous peoples, have seen their livelihoods and health at risk. These fires are related to extreme weather events in the region (e.g. long periods of drought), anthropogenic activities (e.g. intensive agriculture) and the weakening of the environmental agenda in Brazil, due to the current politics of the Brazilian government. In general, wetlands are the most effective carbon sinks regions. When they burn, many heat-trapping gases are launched into the atmosphere, contributing to the greenhouse effect (CNN, 2020).

For the Pantanal, large scale fire will continue to happen. Future climate change scenarios predict rising temperatures and alterations

in seasonal and interannual weather extremes, including droughts, heat waves, and floods (Marengo et al., 2015). Based on regional climate change projections for the Pantanal region, it is expected that there will be annual mean warming of up to, or above 5–7°C, as well as a 30% reduction in rainfall by the end of the 21st century (Lázaro et al., 2020).

The main factor that influences the Pantanal's dynamics is the flood pulse which is, in part, a consequence of the rainfall regime from the Amazon in the direction of the headlands and lowlands, where the water is retained and the floodplain formed (Lázaro et al., 2020). This means that climate change still strongly affects the whole pulse of the Pantanal's rivers. Nowadays, the Pantanal is losing water and experiences a more severe drought season than in the past. It is known that wetlands are fragile and threatened ecosystems.

In addition to climate change, many other threats affect the Pantanal, such as agroindustry, reservoirs for hydroelectric power generation (around 180 small hydropower plants are planned just in the UPRB), the Parana-Paraguay Waterway, land-use conversion from native vegetation to exotic pasture, and the attraction of industries with high potential for environmental pollution. It is extremely necessary to contain these threats and implement measures to prevent and restore degraded areas.

*Alcides Faria , Paula Isla Martins
Ecoa – Ecology and Action*

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- ▶ Lázaro, W. L., Oliveira-Júnior, E. S., Silva, C. J. D., Castrillon, S. K. I., and Muniz, C. C. (2020): *Climate change reflected in one of the largest wetlands in the world: an overview of the Northern Pantanal water regime. Acta Limnol. Bras.* 32:104. doi: 10.1590/s2179-975x7619.
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Towards a green Europe to protect European Deltas

85 Members of the European Parliament and 59 associations, academics and research centres from across Europe have signed a manifesto in support of the protection of Europe's deltas. On the 21st of March 2021 it was sent to the Executive Vice-President of the European Commission, Frans Timmermans, and the Commissioner for Environment, Oceans and Fisheries, Virginijus Sinkevicius.

The manifesto was initiated by *Plataforma en Defensa de l'Ebre* (<https://www.ebre.net/bloc/2021/02/cap-a-una-europa-verda-que-protegeixi-els-deltas/>). Global Nature Fund, the Coalition Clean Baltic and GRÜNE LIGA belong to the supporting organisations.

Asks of the Manifesto for the protection of European Deltas

Within the European legal framework, there are several regulatory texts that, directly or indirectly, affect the conservation and management of deltas.

However, the regulatory framework established by the European Union Directives is not sufficient to guarantee the physical protection of the deltas. That is why we call on the European Commission to increase efforts to conserve and restore European deltas, especially

within the framework of the Water Framework Directive and its implementation in the Member States. We ask for:

- ▶ The improvement of the monitoring of the management plans of the river basins of Europe;
- ▶ The development of a specific orientation guide, as part of the implementation of the Water Framework Directive, on the comprehensive management of sediments at the river basin level;
- ▶ The consideration of deltas as priority areas for action within the framework of the European Green Deal and the European Strategy for Biodiversity 2030;
- ▶ The development of an European plan for the restoration and recovery of the deltas.

The deltas show us the true vulnerability derived from the lack of balance between human activity and nature. Improving its management and ensuring its future will involve betting on a true balance that favours nature, delta ecosystems and their biodiversity, in order to protect the health and wellbeing of the people who live in them.

Michael Bender

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Mediterranean Wetlands Management and Restoration as Carbon Sinks: "LIFE Wetlands4climate"

The main objective of the project is to establish management guidelines for Mediterranean wetlands so that they function as carbon sinks while maintaining their ecological integrity, functionality and providing healthy ecosystem services. The project will be developed in 10 Spanish coastal freshwater and inland and saline wetlands to compare their sink capacity according to their typology.

In the Albufera Natural Park, the capacity of rice fields to fix or emit greenhouse gas depending on their flooding regime, will be studied. Rice cultivation, due to the large surface area it occupies, can be a good ally against climate change. However, a bad practice can be an important source of greenhouse gas emissions.

The project contributes to the EU climate change objective of achieving an at least 40% cut in greenhouse gas emissions compared with 1990 by 2030. It also contributes to the objective of recovering at least 15% of the degraded ecosystems included in the EU Biodiversity Strategy 2020, with measures based on restoring and protecting wetlands. The project provides a methodology to quantify greenhouse gas and proposes mitigation measures in wetlands. It contributes to implementing climate policies for Land Use, Land Use Change and Forestry (LULUCF), generating data on carbon sequestration in wetlands and management guidelines that increase their sink

Mangrove protection backgrounds

The Global Nature Fund (GNF) is an international foundation for the environment and nature. The foundation is independent of the state and pursues exclusively and directly charitable purposes. It was founded in 1998 in Radolfzell on Lake Constance. The GNF pays special attention to lake ecosystems and founded the international Living Lakes Network in 1998.

Since 2005, the Global Nature Fund (GNF) has been involved in mangrove conservation in Asia, since 2018 in the Sundarbans region. In current projects, degraded or destroyed mangrove forest is being restored in India, Bangladesh and Sri Lanka to protect people from climate-related natural disasters.

Within the framework of the „SAIME Project“, which is funded by the German Federal Ministry for Economic Cooperation and Development (BMZ), GNF is developing solutions for the sustainable protection of mangrove ecosystems in aquaculture landscapes together with local environmental protection organisations in India (NEWS) and Bangladesh (BEDS). Daimler AG and the Ursula Merz Foundation also support the GNF's diverse activities for mangrove protection in Asia.



photo: Antonio Guillem

function. The management measures will also have impact on adaptation to climate change since they will address Wetland Restoration for Climate Change Resilience.

► <https://fundacionglobalnature.org/wetlands4climate/>

Antonio Guillem
Fundación Global Nature



photo: Udo Gattenlöhner

A manual summarises the most important findings and provides guidance on natural reforestation. It is available free of charge in English under the title „Mangrove Restoration Guide – Best Practices and Lessons Learned from a Community-based Conservation Project“ on the project website of the Global Nature Fund:

► <http://www.globalnature.org/Mangroves>



Forum Umwelt und Entwicklung
Ramona Bruck
phone: +49 (0) 30 - 678 17 75 - 910
email: bruck@forumue.de
website: www.forumue.de



Global Nature Fund
Dr. Marlene Bär Lamas, Udo Gattenlöhner
78315 Radolfzell, Fritz-Reichle-Ring 4
phone: +49 (0) 77 32 - 99 95 - 80
email: baerlamas@globalnature.org
website: www.globalnature.org



GRÜNE LIGA e.V.
Michael Bender, Water Policy Office
10405 Berlin, Greifswalder Str. 4
phone: +49 (0)30 - 40 39 35 30
email: wasser@grueneliga.de
website: www.wrrl-info.de



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