

»»» Materials on Development Finance

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The synergy of biodiversity and water: crucial for sustainability

The COP15 Biodiversity Conference held in Montreal at the end of 2022 was considered a breakthrough in international sustainability policy. It once again demonstrated that biodiversity forms the basis of people's livelihoods, making its preservation crucial. The summit was also a clear testament to the fact that the political sphere has become far more conscious of the pressure to act in order to preserve biodiversity. This is another reason why the German Federal Government is increasing international financing for the conservation of biodiversity to EUR 1.5 billion per year by 2025. This is the equivalent of double the previous funding amount.

Water crucial to achieving nature goals

In terms of concrete measures, the signatories attending the summit in Montreal, Canada, undertook to follow an ambitious programme based on the statements "Water is life" and "No future without biodiversity". The long-term goal: to return to a harmonious co-existence with nature by 2050. This vision is underpinned by 23 concrete targets to be achieved by 2030. These include, for example, the requirement to place 30% of the Earth's surface under conservation, to effectively restore 30% of degraded land and to reduce the risk of pesticides. These goals are closely linked to water as a resource.

In particular, the sustainable management of water resources, including the harmless disposal of

waste water and process water into the environment or its reuse, is essential for keeping ecosystems intact as well as species diversity and genetic diversity within species.

KfW Development Bank's activities in the water (drinking water supply and waste water management) and agriculture/irrigation sectors are already helping to preserve biodiversity. In the future, it will be even more important to consider useful interactions and to take into account structural relationships regarding biodiversity, for example, from the outset, as has been the case with climate change.

Close interactions between biodiversity and water

Humans depend on nature. Almost everything that we need comes from nature in some form. In addition to air, water and food, this also includes all kinds of materials as well as medicinal products. Wildlife and farm animals as well as plants, microorganisms and fungi both on land and in water are of the utmost importance for human nutrition, livelihoods and well-being. Intact ecosystems and biodiversity are therefore an essential basis for life for humans and animals. However, we are already pushing our planet beyond its limits with our lifestyles. Preserving natural resources is essential, and the water sector is a good place to start.

Water supply: Intact ecosystems are the foundation of a sustainable water supply. Preventing the pollution of water bodies and

reducing raw water turbidity, for example, through erosion control, is essential. Ongoing overuse of water resources should also be prevented. Measures to increase water efficiency, e.g. through the reduction of water losses in the network, help make clean water more readily available, including for ecosystems and especially in regions that suffer from water shortages.

Waste water management: Much of the world's waste water remains untreated and constitutes a danger to ecosystems. This pollution must be eliminated through integrated waste water management and sustainable sanitation. Meanwhile, water bodies that are already polluted must be made cleaner. Sewage treatment plants are an important component for the protection of aquatic biodiversity. Waste water networks protect surface water and ground water. A sustainable strategy for handling the resulting sewage sludge is also required.

Flood protection: Modern, climate-resilient urban planning counteracts flood risks, for example by creating near-natural surfaces for water retention. This allows water to be stored in the soil and reused in dry periods. Not only do these measures protect people from the effects of climate change, they also help cities make a positive contribution to promoting biodiversity. At the same time, urban greenery, for example, contributes to improving the local climate and protecting against heat. Modern coastal protection measures combine, for example, traditional dykes with mangrove afforestation, thereby constituting an effective way to prevent flooding.

Water catchment areas: The protection, sustainable use and restoration of biodiverse ecosystems in water catchment areas are the cornerstone of integrated and sustainable water resource management. This also includes measures such as reforestation and wetland restoration. Not only does this benefit the ecosystems themselves, but surface water and groundwater sources are also protected.

Agriculture: Agriculture is heavily dependent on water resources. This is especially true for irrigated agriculture, which accounts for around 70% of fresh water use globally. At the same time, agricultural practices can lead to the degradation and destruction of soils and biodiversity, such as through soil salinity and erosion as well as waterlogging caused by overirrigation. This also has an adverse effect on water availability and water quality. Efficient water use in irrigation systems combined with soil-friendly cultivation methods, increased vegetation in agricultural landscapes, reduced use of fertilisers and pesticides as well as other agroecological measures are important starting points for increasing biodiversity and water availability.

Example: Serbia

The ecosystem of the two neighbouring lakes Palic and Ludas, along with their shorelines, was in a constant state of deterioration due to human



Ecosystem regeneration has made this Serbian lake a true beauty spot.
KfW/Stefanie Rauprich

influences, mainly related to waste water that was being emptied into the lakes. Water quality was suffering and biodiversity was being placed under increasing threat. On behalf of the German Federal Government, KfW supported the Ministry of Construction and Infrastructure in modernising the Subotica waste water treatment plant as well as the waste water network, creating a green strip along the shore with cycle tracks and footpaths to act as a protective belt and reducing the number of Prussian carp, an invasive fish species in the lakes. The measures are contributing to the conservation of biodiversity in this nature reserve in accordance with the Ramsar Convention (lake area) and to the promotion of tourism in the neighbouring villages.

Disadvantaged local residents benefit from the measures

People are particularly dependent on nature in poorer countries: plant cultivation, animal husbandry and natural resources such as water, wood, game and fish form the basis for their livelihoods. At the same time, these are the areas where more and more nature is being lost as humans encroach on previously untouched natural spaces as well as due to changes in land use. For example, more and more areas of tropical forests are being cut down to make way for agriculture. This increases the pressure on land and water resources as well as on the

wildlife that lives there. However, overexploitation of water resources leads to an imbalance, resulting in the destruction of ecosystems and the loss of biodiversity.

This in turn reduces ecosystem services such as clean water, microclimate, soil health, medicinal plants, etc., each with its own effects on human existence. Their greater dependence on natural resources means that people in poorer countries are more vulnerable to the effects of reduced biodiversity, which further jeopardises their livelihoods.

Example: Kenya

Lake Nakuru is a delicate ecosystem rich in birdlife, situated in Lake Nakuru National Park. It is seriously threatened by the discharge of untreated waste water from the fast-growing city of Nakuru. On behalf of the German Federal Government, KfW Development Bank is supporting the Central Rift Valley Water Development Agency in order to improve the situation. To this end, the Njoro waste water treatment plant is being modernised and the sewage system in the city is being expanded. This will give the



This Kenyan lake is once again a natural paradise thanks to improved waste water disposal and treatment. [stock.adobe.com / Grispb](https://www.stock.adobe.com/Grispb)

inhabitants of Nakuru better access to networked sanitation. Waste water will be treated in accordance with legal standards in the future, thereby reducing the risk of a further reduction in biodiversity in the area.

Investments in the water industry: important for biodiversity

The water sector can have a positive effect on the interaction between biodiversity and water with targeted investments in the areas presented here.

KfW Development Bank's involvement in the water sector helps to:

- Achieve sustainable water management in order to provide drinking water and sanitation for all and to have a positive impact on sustainable development, health, the climate as well as the environment, and especially on water bodies and ecosystems.
- Curb the reduction of biodiversity, or even restore biodiversity, and preserve natural resources (soil, forest, water) by sustainable use.
- Also preserve water resources, including by designating water protection areas, for example as part of integrated water resource management (IWRM) measures.
- Strengthen global partnerships with other organisations that combine climate protection with environmental and biodiversity protection.

Example: Nicaragua

The water quality of Lake Managua had deteriorated as a result of the discharge of inadequately treated waste water from the capital city of Managua, so that the people living near the lake were increasingly being put at risk of suffering from health problems. Fisheries and the local tourist industry were also being adversely affected. On behalf of the German Federal Government, KfW supported the national water company ENACAL first in the building and later in the optimisation and expansion of the sewage treatment plant, including with an innovative plant for the solar powered drying of sewage sludge. The aim was to reduce the health risks to the population by sustainably protecting Lake Managua. The treated waste water now meets the standards, and the water quality and biodiversity of the lake have also improved. Moreover, complaints about odour problems are now a thing of the past, while the local area benefits from a thriving tourist industry: the city is once again helping the lake to thrive.

Natural solutions: important components for investments

In order to achieve biodiversity goals in the water sector, in addition to conventional solutions for sustainable infrastructure ("grey" infrastructure), nature-based

solutions ("green" infrastructure or Nature-based Solutions, NbS) can also be used. NbS are measures inspired by nature and based on natural processes, such as harnessing the self-cleaning power of wetlands or using mangroves as flood defences. Depending on the context, these can either serve as advantageous alternatives or as additions to conventional infrastructure. To this end, involving stakeholders and authorities, and discussing NbS with them as a possible solution, is crucial.

It is important that stakeholders consider NbS as part of the solution for regulating the water balance in different areas and habitats.

The measures must be based on suitable data collection/evaluations, solid planning bases and, above all, a convincing implementation and operating concept.

Example: Mozambique

The effects of climate change were placing the city of Beira under increasing strain: the Rio Chiveve kept bursting its banks as the existing storm water drainage system did not function properly. The coastline was also being steadily eroded, placing the shoreline's ecosystem and biodiversity under threat too. On behalf of the German Federal Government, KfW Development Bank supported the city's infrastructure management with the construction of a tidal barrier, the restoration of the Rio Chiveve, the creation of additional flood plains, the planting of mangroves and the creation of a public city park along the river. The building of grey infrastructure in combination with the above-mentioned near-natural measures helped to improve the natural drainage system, flood control and

the living conditions of local people. In addition, biodiversity has increased in the coastal area.

Improving the integration of biodiversity into the water sector

If water sector projects are to play a role in species conservation, an early assessment of the current situation regarding biodiversity as well as its future development in the entire surrounding area is an important success factor. This involves carrying out comprehensive hydrological and ecological fundamental studies and assessing impacts on biodiversity and ecosystem services.

The question of how declining biodiversity affects water availability, quality and safety and vice versa is also crucial. Consideration should additionally be given to the consequences that the overuse of surface and/or groundwater resources could have on biodiversity. Inadequate treatment of waste water and contaminated rain water is also of interest in this context.

The institutional and organisational framework in terms of water, the environment and biodiversity constitute an important part of the analysis. Here, it helps to take into account any economic incentives or disadvantages (such as subsidies or taxes) for the population and the authorities. Additionally, it is essential that all parties involved agree on the planned measures, which may not traditionally have been regarded as relevant to water sector projects.

Example: Rwanda

The sprawling capital Kigali is densely populated. During torrential downpours, poorly drained rain water poses a risk. Climate change is further exacerbating the problem, and could cause temperatures in the city to skyrocket. On behalf of the German Federal Government, KfW Development Bank is supporting Kigali in implementing the “Green City” approach with the Green City Kigali Company and the Rwanda Green Fund. The project aims to contribute to the construction of environmentally



Thanks to a combination of green and structural infrastructure, the city of Beira in Mozambique now has effective flood control. KfW/TPF

friendly and climate-adapted infrastructure as well as affordable housing in a pilot district, in addition to improving institutional capacities for green urban development. A residential district with all services (water, sewage, electricity, public transport, educational facilities) will be created, taking into account environmentally friendly and climate-relevant aspects. The focus is on the following objectives: Reducing CO₂ emissions through resource-conserving soil compaction; expanding and strengthening the blue-green network (networking of surface water, ground water, handling rain water, green areas); increasing the proportion of infiltration areas for better climate resilience through blue-green infrastructure.

Conclusion: Thinking of water and biodiversity together

In order to create better living conditions for human beings and nature, it is essential to think of water and biodiversity aspects together. This calls for an interdisciplinary policy framework in which, for example, water companies work together with urban management, town and country planning, and stakeholders in nature conservation.

It is important to carefully analyse interactions and take them into account at an early stage in project planning. Specifically, this requires basic hydrological and ecological

studies to be performed and the inclusion of local experiences.

Investments in both “grey” and “green” infrastructure should be considered to ensure a strong synergy between the water sector and biodiversity. Measures for participation, education and acceptance among those affected are also particularly important here so that the environmental measures implemented can be upheld by the local inhabitants over the long term.

Once these conditions are created, measures in the water sector can have a positive effect on biodiversity and ecosystem services, and preserve or even improve our livelihoods.

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