

BMZ Strategy for Interlinkages¹ between Water, the Environment and Climate Change

Synergies and conflicts between goals

1. BACKGROUND

Water is a vital natural resource and, as such, an **integral part of our environment and climate system**. However, water resources are dwindling, meaning that we are edging closer to the planetary boundaries. There are numerous interlinkages between water and wastewater, the environment – including biological diversity – and climate change. The protection of water as a natural resource is therefore a common concern of the Sustainable Development Goals dealing with **water (SDG 6)**, the **climate (SDG 13)** and the **environment (SDGs 14 and 15)**.

Aquatic ecosystems such as rivers and lakes, and terrestrial ecosystems such as forests, moors and marshes, and natural grasslands are the habitats of a great number of **species**. Furthermore, these ecosystems are of direct and indirect benefit to humankind because they supply, naturally purify and store water for us. Thus, they make a vital contribution to ensuring human survival. Other **ecosystem services** include the prevention of droughts and erosion, and flood control. What is more, habitats such as forests, moors and marshes and natural grasslands, help to sequester large quantities of carbon, thus contributing to climate protection.

Biological diversity is one feature amongst several ensuring that ecosystems remain intact. In the case of freshwater and marine ecosystems, this depends

largely on **water quality**, as well as on keeping the water bodies as natural and diverse as possible. Ecosystem services can be impaired by human activities such as changes in land-use, the withdrawal of water, or the construction and operation of hydro-power or shipping-related infrastructure projects, if the activities are not planned and implemented in a sustainable manner.

As many water catchment areas and their ecosystems are **transboundary**, changes related to them such as water withdrawal or pollution can also have an international impact. Thus, for example, pollutants that are discharged into inland water bodies that flow into the sea become a huge problem for the marine environment too.

Water is the medium through which climate change **impacts the lives of people most directly**, affecting not only their everyday environment but also various sectors of the economy, such as agriculture (irrigation) and power generation (water for cooling and hydro-power). Climate change becomes particularly noticeable when there are changes in water availability and quality, and when there are extreme weather events. In many regions, climate change is already exacerbating existing problems of water shortages, or heavy rains and flooding, for instance.

¹ The content of this strategy for interlinkages is determined by the BMZ divisions responsible for German development cooperation activities in the sectors concerned, who are jointly responsible for its elaboration. The strategy shall be taken into account when framing documents such as country strategies, short statements and programme proposals for official development cooperation, and in international policymaking.

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Water supply and wastewater management are two processes that use a great deal of energy, causing considerable amounts of **greenhouse gases** to be released into the atmosphere. Furthermore, if the treatment of sewage and faeces is poorly managed, this causes the release of methane (CH₄) and nitrous oxide (N₂O) – both extremely damaging greenhouse gases – into the atmosphere. These gases are also released in the course of certain agricultural activities, such as rice cultivation and animal farming. At the same time, hydropower is playing an increasingly important role in some countries as a source of renewable energy.

2. PRINCIPLES

Water, the environment and climate change are often linked by a relationship of **co-benefits**. An **eco-system-based approach** to climate change adaptation generally helps both to rehabilitate and sustainably protect ecosystems such as wetlands, forests, alpine ecosystems and urban green spaces, and to protect the climate through carbon storage. Such comprehensive, multi-pronged approaches are to be given priority. This requires strengthened cross-sectoral collaboration and the integration of strategic policies on water, the environment and climate change.

Germany's development cooperation activities support and make possible the implementation of the goals set out in **international agreements** – for example in the **Convention on Biological Diversity (CBD)**, the **Convention to Combat Desertification (UNCCD)**, the decisions of the **Framework Convention on Climate Change (UNFCCC)**, including the decisions adopted in the 2015 Paris climate agreement, the **1997 UN Convention on the Law of the Non-Navigational Uses of International Watercourses**

and the **1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes** (referred to as the "Water Convention") by the **United Nations Economic Commission for Europe (UNECE)**.

Water sector projects which aim to protect the environment and the climate and conserve biodiversity, or which aid adaptation to climate change, must present their **contributions to these goals in a transparent manner**. Furthermore, they must respect all applicable human rights and satisfy specific financing criteria. Projects relating to biodiversity have to visibly support at least one of the aims of the Convention on Biological Diversity, namely conservation, sustainable use or benefit sharing.

The key guiding principle for German development cooperation in the water sector is **Integrated Water Resources Management (IWRM)**, which promotes concepts of water resources management that are socially, economically and environmentally sustainable. Potential transboundary impacts of Germany's development cooperation projects are also taken into account. In its development cooperation programmes concerned with wastewater management, Germany is guided by the **idea of a circular economy**. Therefore it is keen to support the management (i.e. collection and treatment) of wastewater, faecal and other sewage sludge, and especially their safe use to generate energy or their re-use, in pre-treated form, in agriculture (e.g. for irrigation). Furthermore, water sector solutions with aims in the area of environmental protection, biodiversity conservation, climate protection and climate change adaptation, are to reflect the **human-rights-based approach** adopted in German development cooperation.

² See also: Published by GIZ on behalf of the BMZ (2016): General Orientation and Guidelines on how to integrate biodiversity conservation in water and wastewater programmes.

³ This is in accordance with the BMZ strategy paper on "Human Rights in German Development Policy" of 2011 and the BMZ guidelines on incorporating human rights standards and principles, including gender, in programme proposals for bilateral German Technical and Financial Cooperation, published in February 2013.

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Projects in the water sector related to climate change adaptation and mitigation of greenhouse gas emissions are **in line with national climate change planning and instruments** such as the **Nationally Determined Contributions (NDCs)** and the **National Adaptation Plan (NAP)** process, and contribute to their human-rights-based implementation.

In addition, projects in the water sector – as well as projects in the environmental and climate sectors – should make use of opportunities for **bilateral and multilateral climate financing** (for example through the **Green Climate Fund** or the **Global Environment Facility**) available for water-related activities.

The **planning of climate change adaptation activities** is based on an analysis of the risks and potential benefits, if any, that accompany extreme climate variability and/or climate change. The specific vulnerability is to be described in accordance with the BMZ Guidelines on the use of Rio markers KLA (climate change adaptation) and KLM (reduction of greenhouse gases), and with current climate change projections. Complex factors that have an influence on planning, such as uncertain climate projections, population dynamics or land-use changes, are to be communicated in a transparent manner. Activities suitable for reducing climate risks will be identified on the basis of the results of the risk analysis. If the impacts of climate change also bring potential benefits for development (such as increased water availability), then these are to be utilised. Activities known as **“no regret measures”** – i.e. measures that are useful from a development point of view regardless of whether climate change has the expected impacts or not – as well as modular infrastructure solutions that can be extended in a flexible manner (such as decentralised or semi-centralised sewage treatment plants) should be the measures of choice if there is a large degree of uncertainty in the climate change vulnerability models.

Where **activities to reduce greenhouse gases** are undertaken, the targeted reduction is to be contrasted with a “business as usual” scenario. And in the case of activities in the water sector which require energy, it will be investigated whether that energy can be generated using renewable energy sources, and whether energy efficiency can be improved. In the case of wastewater management, ways must be sought to reduce emissions of the greenhouse gases nitrous oxide (N₂O) and methane (CH₄), which are extremely detrimental to the climate. When building man-made water reservoirs, consideration must be given to the fact that the anaerobic degradation of organic material in the water will also release greenhouse gases.

3. FIELDS OF ACTION

When planning projects and priority areas, or engaged in international sector dialogue on interlinkages between the topics water, the environment and climate change, the following areas of action are to be taken into account, as far as is possible and reasonable in the given context.

3.1. FIELDS OF ACTION IN THE WATER AND ENVIRONMENTAL SECTOR AND WITH REGARD TO BIODIVERSITY⁴

3.1.1. Legal framework and institutional capacities

→ **Advice on the legal, political and institutional framework** needed – in environmental legislation and regulation, for example, – in order to protect ecosystems and biodiversity through sustainable water resource security; such advice is to cover:

- Standards and regulatory limits governing discharges into water bodies, ecological standards in water quality, and minimum run-offs in order to maintain intact ecosystem services, or

⁴ Section 3.1 relates to development support activities by the BMZ that come under the CRS purpose code 140* for water supply and sanitation, purpose code 31140 for agricultural water resources, markers UR for environmental protection and resource conservation, BTR for the Biodiversity Convention and/or CRS code 410* for environmental protection, also wherever environmental protection is the main sector.

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- Environmental principles (e.g. “polluter pays principle” and “no harm principle”), support for schemes to introduce “payments for ecosystem services” (PES) and for “source-to-sea” schemes that encourage integrated management of water all the way from its source to the sea (e.g. when constructing treatment plants in order to protect flora and fauna).
 - Support for **collaborative and human-rights-based schemes** – for example in order to reconcile the interests of different users and to secure water resources for people and the environment as well as for business and industry.
 - Support for **transboundary water management**:
 - Consideration of the transboundary effects which the activities of one riparian country may have on the other riparian countries;
 - Support for regional arrangements and agreements on transboundary water resources management as well as for river and lake basin commissions;
 - Support for regional agreements on exchange of information and joint management of transboundary catchment areas.
- 3.1.2. Activities relating to green and grey infrastructures**
- Rehabilitation and conservation of natural water reservoirs, such as lakes and groundwater.
 - Support for the protection, or restoration of **ecosystems** in order to restore their original functions (as in, for example, the restoration of wetlands or flood plains alongside rivers).
 - Measures that directly protect **water quality** (including groundwater protection) and ensure adequate water quantity, for example by establishing conservation areas.
 - Implementation of **sustainable land use planning**, for example by creating water retention areas (flood plains) that are practical in hydrological terms and useful in ecological terms.
- Opportunities for **ecological methods of sewage treatment**, which can lead to increases in biodiversity (e.g. by using constructed wetlands).
 - Assessment and, if necessary, improvement of hydraulic engineering in waterways infrastructure in order to ensure that **fish can migrate**.
 - Finding the **best location for water supply and wastewater infrastructure** in order to reduce negative impacts on wetlands and other ecosystems, among other things.
- 3.2. FIELDS OF ACTION AT THE INTERFACE BETWEEN WATER SECTOR AND CLIMATE CHANGE⁵**
- 3.2.1. General water-related climate change interventions**
- Support in elaborating water-related **climate strategies and programmes**, e.g. in the context of NDCs and NAP, also within the context of proposals for climate finance projects.
 - Emphasis on **water-related topics in the context of international climate change negotiations and in climate financing mechanisms**.
- 3.2.2. Fields of action in the water sector to enhance climate change adaptation (KLA marker)**
- **Measures to strengthen governance**: Support for flexible and effective schemes for water allocation as a key measure for adapting to changing climate conditions and greater variations in water availability, among other things. Such support is to be provided with the help of appropriate capacity building activities at various levels within the institutions and groups concerned, such as water user groups, government authorities, regional associations and regulatory authorities.

⁵ Section 3.2 relates to development support activities by the BMZ that come under the CRS purpose code 140* for water supply and wastewater, purpose code 31140 for agricultural water resources, combined with the markers KLA for climate change and/or KLM for reducing greenhouse gases.

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- **Measures to be taken where water resources are dwindling:** Measures in this context are to be human-rights-based and designed to make the use of water resources more efficient and sustainable, as well as designed to protect water resources so as to strengthen water resource security.
 - **Management of the demand for water:** Introduction of water-efficient irrigation methods for agriculture; reduction of water losses due to physical or administrative deficiencies in the water supply system (for instance, as a result of a lack of accountability within government authorities); adequate tariff systems; and public awareness campaigns regarding the effects of climate change.
 - **Management of the water supply:** Extension of the infrastructure needed to store water, including ecosystem-based approaches; wastewater treatment to sustainably protect soil and water bodies; ecosystem-based means of protecting water resources, for example afforestation; use of alternative water resources, for example by re-using treated wastewater; sustainable methods of desalinating brackish water or seawater.
 - **Whenever extreme weather events – such as droughts, floods and surge tides – become more violent and/or more frequent,** comprehensive climate risk management must be put into place.
 - This includes ecosystem-based or technical solutions to **storing water** and technologies for **tapping into water resources** in the event of droughts, for example by drilling wells for use in emergencies.
 - **Adapting the water infrastructure,** for example by building protective structures.
 - **Combining grey and green infrastructure,**
 - to protect against flooding, such as retention areas/flood plains, municipal drainage or specially adapted sanitation systems; and
 - to protect coastlines, such as dikes or the preservation or restoration of vegetation cover that is species-rich and resilient (for example mangroves).
 - **Measures to cope with an increasing loss of predictability as a result of climate change:**
 - Devising and developing **data, information and analysis systems** that will provide better insight into climate and weather factors, and more insight on surface water and ground-water resources, including their quantity and quality.
 - Capacity development **to aid decision-making in the face of increasing uncertainty,** for example with regard to the application of complex simulation models such as the *Economics of Climate Adaptation* model, and with regard to optimum utilisation of available funds in combination with regulatory and behavioural and, if necessary, complementary measures such as climate risk insurances.
- 3.2.3. Fields of action in the water sector in order to reduce emissions (KLM marker)**
- Optimisation of **energy efficiency and emission control in projects relating to water supply and treatment and wastewater management,** for example by improving the efficiency of pumps, reducing water losses and using renewable energies.
 - **Low-emission wastewater management** (reduction in methane and nitrous oxide emissions) and the use of biogas to produce heat and energy.
 - Use of water as an important **source as well as reservoir of renewable energies,** such as sustainable hydropower.

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4. EXAMPLES OF IMPACTS

These are general outcomes (not examples of best practice) in the context of interfaces between water, the environment and climate. In order to formulate indicators at the impact level, the outcomes need to be specified on a case-by-case basis.

- **Greenhouse gas emissions** in the water sector are reduced (thereby contributing to climate change mitigation).
- **Ecosystem services** are preserved through improved and more effective regulation of the water and environmental sector.
- The restoration of ecosystems helps to provide **natural means of water purification**, thereby ensuring that drinking water supplies are of high quality.
- The **water supply** of a specific target group can be assured despite the likelihood of water scarcity developing as a result of climate change.
- Enhanced **data, information and analysis systems** used for water resources management will flow into infrastructure planning and will increase the **ability to predict** water-related risks, thereby offering a basis for appropriate planning.

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