ValuES

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FACTSHEET

Fresh Water

In a nutshell

Ecosystems play a vital role in providing humans with drinking water. They influence the flow and storage of water. The extent of vegetation and forests has an impact on the quantity and quality of water available locally.

1. Role for human well-being

No water, no life. Fresh water is important for direct consumption and for most types of human land use. Topography, vegetation cover, climate, land use and water infrastructure together determine the quality and quantity of water available locally. Cities and metropolitan regions rely heavily on the ability of more distant ecosystems to provide fresh water. For example, the Miyun Reservoir ensures 80% of Beijing's drinking water supply. The role of ecosystems in providing a stable supply of fresh water is particularly important in regions with low rainfall or high seasonal variations with draught periods.

2. Typical threats

Water quality and availability are directly influenced by human activities:

Agricultural activities such as water usage for irrigation upstream or other changes in watershed management may impair the amount of available fresh water for downstream water users during the year. The use of pesticides, herbicides and fertilizers in intensive agriculture pollutes ground and surface water bodies and can lead to their eutrophication.

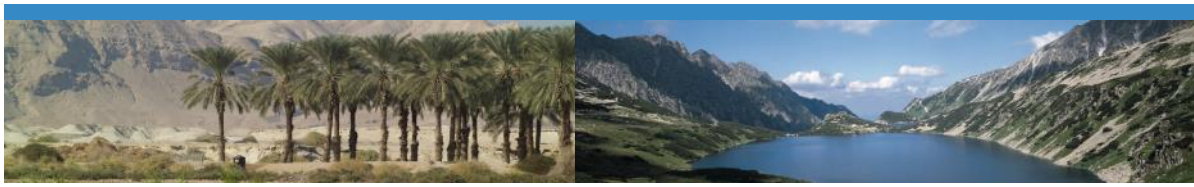
Unsustainable forest management, especially clear cutting, impacts on the availability and quality of fresh water by increasing sediment load, dissolved organic carbon content, nitrification and evaporation.

Sewage from human settlements or industries that is discharged into rivers harms their ecology and also worsens conditions for fresh water provision downstream.

Climate change will alter rainfall regimes and can cause extreme events. For the links between climate change and freshwater provisioning see the CBD issue paper: Dealing with too much, too little and both.

3. Example indicators

- See the UN-Water set of key indicators for 15 quantitative 'key indicators' at national level (some are suitable for the regional, basin or local level) which provides a snapshot of the water sector.
- Annual surface water availability (km^3/year, m^3/capita, m^3/year) can be assessed using the indicator 'water availability'. For further information see CBD TCS No. 58, p. 88.
- The indicator 'water yield' is based on the contribution of different parts of the landscape to annual water yield (mm/year). For further information see CBD TCS No. 58, p. 95.
- Demand for water by all sectors (million m^3/year) can be measured using the indicator 'potable water use'. For further information see CBD TCS No. 58, p. 97.



- Potential water flow regulation can be measured in millions of m^3 of groundwater recharge per 1 km^2 grid cell. For further information see CBD TCS No. 58, p. 105.
- The indicator 'water flux' (e.g. rainfall, evapotranspiration and river flow) can be used to assess the condition, status and trends of the water cycle, an important supporting ecosystem service. For further information see CBD TCS No. 58, p. 115
- Global available sources for national data:
- AQUASTAT (FAO) hosts comprehensive water related national statistics such as water use for most countries.
- The UN-Water portal provides maps, tables and charts for indicators at country or global level, as well as additional geographic information.
- The GEOSS Portal hosted by GEOBON is producing comprehensive sets of data and further information products.
- UNSD Environmental Indicators provides indicators related to inland water resources and use of fertilizer per ha.

4. Example methods

For **assessing the value** of this ecosystem service:

- Direct market price
- Avoided damage costs and replacement costs
- Contingent valuation
- Choice experiments
- Household questionnaires and surveys, e.g. to estimate water use or transport costs or time taken to gather water
- Protocol for social valuation of ecosystem services
- Costing Nature is a conservation prioritization tool for identifying and mapping the potential services of a site and for calculating the number of downstream beneficiaries of these services (TESSA toolkit, p. 197).

For **assessing the condition** of this ecosystem service:

- Spatially explicit models such as InVEST, ARIES or SWAT can help to predict future changes in fresh water provision under different scenarios.
- A questionnaire to enable a better understanding of dependence on water based ecosystem services deriving from a specific site and how these services could be affected under different scenarios is provided in the TESSA toolkit, p. 217 ff.
- The method `assessing water supply services´ helps you where to find existing water supply data and how to calculate water usage. See TESSA toolkit, p. 215.
- The web-based spatial modelling system WATERWORLD helps to estimate the quantity of water at a given site. For a detailed description see TESSA toolkit, p. 223 ff.

5. Managing this service

Typical instruments for managing this service include:

Intersectoral ecosystem-based management and restoration of ecosystems

- The Hunter River Salinity Trading Scheme in Australia is an intersectoral economic instrument to control the flow level and the amount of salt discharge into the river and is responsible for restoring the water body to meet water quality standards.
- In Sumatra, Indonesia integrating ecosystem services into spatial planning has helped to ensure a more regular supply of clean water. The InVEST model was used to model the quantity and location of annual water yield under two scenarios.

Consider water-related PES schemes

- At the Ranchería river basin in Colombia a PES was implemented and designed using information from an current land´s management plan and involving relevant stakeholders from the beginning of the process.
- In the Upper Tuul example, the evidence generated by an ecosystem service assessment study played a key role in making the case for improved investment in ecosystem conservation, and has been followed by a number of changes in the government's stated policies and plans for watershed conservation and financing.
- The city of Moyobamba in Peru depends on three micro-watersheds. To secure water quality and quantity, municipal water users are financing upstream watershed protection.
- On the website Watershed Markets hosted by the ieed several case studies are available in addition to information on PES schemes in developing countries.

Identify and tackle water risk hotspots

- The Aqueduct Water Risk Atlas by WRI and the Global Water Tool (GWT) by WBCSD are comprehensive water risk mapping tools that highlight water risk hotspots for a company's direct operations and supply chains.

There is plenty of further guidance dealing with fresh water provisioning. See for example:

- The CBD Good Practice Guide on drinking water, biodiversity and development.
- The International Institute for Environment and Development offers guidance and reports on topics related to this ecosystem service.
- UN WATER provides reports, case studies and statistics on all freshwater related issues.

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