

World Water Day 2016

Water and Sustainable Livelihoods

Importance of water

The importance of water for human well-being and sustainable livelihoods cannot be overstated. Water is the critical natural resource which underpins all social and economic activity. Without water food production stops, cities cease to function, economic activity halts, forests turn to desert.

As demand rises and competition for this precious resource increases, all users across the planet can no longer guarantee uninterrupted access to water supplies and therefore the water dependent benefits such as agriculture, energy and health. While seemingly abundant, only a minuscule amount of the total water on our planet (0.03%) is available as liquid freshwater at or near the land surface. This water supports all terrestrial and freshwater biodiversity, underpins most aspects of human welfare and is essential for sustainable development.

For too many, water is literally a matter of life or death. Climate change exerts its impacts on people and ecosystems largely through water and therefore increases the already significant risks. Water is recyclable but not replaceable; we have options to replace current energy and food resources, but not water. Water is essential for basic human needs, food security and most economic activities. Water is, therefore, our most precious natural resource.

Sustainable Livelihoods:

“A livelihood is sustainable when it can cope with and recover from the stresses and shocks and maintain or enhance its capabilities and assets both now and in the future without undermining the natural resource base”

(Chambers & Conway)

Like any resource, water is not distributed equally among countries. Developing countries face the severest challenges, though water is becoming increasingly scarce in rich nations too. We live in a progressively more water-insecure world where demands often outstrip supply and water quality often fails to meet minimum requirements.

Under current trends, future demands on water to feed growing human populations, increasing consumption of water for intensive production of goods and to support growing economies will not be met. Widespread droughts and floods already reflect the starkest of realities.





Water is an ecosystem service. As they play a key role in the water cycle, ecosystems, especially forests and wetlands, influence the local, regional and global availability and quality of water. This means that ecosystem management has a central role to play in managing water. Forests can help regulate soil erosion and protect water supplies. Soil biodiversity is critical for maintaining water availability for plants, as well as supporting nutrient availability, and together these attributes not only underpin food security but also reduce agricultural impacts on water.

Water moves around the planet in the water cycle, which is heavily influenced by ecosystems and the life associated with them. Forests, grasslands, soils, wetlands all influence water. Vegetated land cover regulates water movement across land and water infiltration into soils.

Biodiversity supports water and nutrient cycling in soils and therefore plants, including all food crops. Together these processes control land erosion and regulate water quality.

Plant transpiration, in turn, is a major contributor to local and regional humidity and rainfall. Wetlands in particular have visible hydrological functions such as the ability to store water and hence some can assist in helping us regulate floods. These functions of ecosystems operate at local, regional and global scales and offer us opportunities to consider them as “natural water infrastructure” to be used in ways to achieve the same objectives as hard engineered infrastructure such as dams, pipelines, water treatment plants, irrigation systems, drainage networks and flood management embankments.

In most cases natural and hard-physical infrastructure would work in parallel with the benefits of each approach delivering optimal benefits overall in a mutually reinforcing way. Most economic models do not value the essential services provided by freshwater ecosystems, often leading to unsustainable use of water resources and ecosystem degradation.

Water and ecosystems are fundamentally linked through processes, structure and function. Human society is responsible for the management of these ecosystems and, de facto, the management of water. Ecosystems should not be viewed as consumers of water, but rather they are essential elements of natural infrastructure within water management. Biodiversity, in terms of richness and diversity of species, is highly variable across different ecosystems. Impacts upon these systems generate commensurate impacts on the water cycle.

There is now substantial evidence that natural infrastructure and ecosystem restoration can work and in most cases offer cost-effective and sustainable solutions to water scarcity.

For example:

- Using forests to protect water supplies;
- Wetlands or forest serving as buffer strips to recycle pollutants and hence improve water quality;
- Rehabilitating soil biodiversity and functions to deliver improved water availability to crops and hence improve food security, whilst simultaneously reducing water use and off-farm impacts; replacing, or reducing running costs of, water treatment facilities by rehabilitating landscapes;
- Reducing flood, drought and erosion risks by restoring natural water storage in catchments, in particular using wetlands but also through restoring land cover and soil health;
- Protecting coastal communities from storms through strengthening coastal ecosystems as buffers; and
- Addressing desertification through restoring land cover and soils to keep water where it is needed (in the ground).

In addition to improved water outcomes, natural infrastructure and ecosystem restoration can also deliver substantial co-benefits to livelihoods.

These include:

- Tourism, recreation and cultural benefits;
- Improved resilience; and
- Biodiversity conservation.

There is a rapidly expanding knowledge base demonstrating that biodiversity conservation and development objectives can be aligned through simple, practical and cost-effective approaches to achieving water security.



Water for livelihoods

The impacts of climate change are mediated largely through water. Current projections show that crucial changes in the temporal and spatial distributing of water resources and the frequency and intensity of water-related disasters rise significantly with increasing greenhouse gas emissions. Climate change affects the mean availability of water but in particular will worsen the extremes of drought and flood.

Using the natural water infrastructure of ecosystems is therefore a primary response to adapt to climate change in order to protect both human society and biodiversity from increasing risks. Because water and carbon cycles are inter-dependent, using natural infrastructure forges strong links between climate change mitigation (carbon) and adaptation (water).

Water and the global economy are linked. The daily requirement for every human on the planet is to have access to 20-50 litres of clean water, free from harmful chemical and microbial contaminants, for drinking, cooking and hygiene purposes.

The demand for water is influenced by a range of local and global factors including population growth, which has already seen the amount of available freshwater per person reduced by 60% between 1950 and 2000.

While access to household water supplies is critical for a family's health and social dignity, access to water for productive uses such as agriculture and family-run businesses is vital to realize livelihood opportunities, generate income and contribute to economic productivity.

Nearly all jobs are related to water and other ecosystem services. Worldwide, ecosystem-dependent industries employ great numbers of people: 1 billion work in the agriculture, fishing and forestry sectors alone. Estimates suggest that 5% of jobs in the agriculture sector, 60% of jobs in the industry sector and 30% of jobs in the services sector are moderately dependent on water. Many more are employed in water-intensive industries such as food and beverage, chemical and pharmaceutical manufacturing, and electronics.

Water is an essential resource in the production of most types of goods and services including food, energy and manufacturing. Global water demand for the manufacturing industry is expected to increase by 400% from 2000 to 2050, leading all other sectors, with the bulk of this increase in emerging economies and developing countries.

But global water resources are facing increasing pressure from rapidly growing demands and climate change. As demand for water increases, the availability of freshwater in many regions is likely to decrease.

Thus sustainable water management is a key global concern intricately linked to many livelihoods worldwide.





• Agriculture livelihoods

Water increasingly limits farmers' livelihoods and food security. Production of crops and livestock is water intensive. Agriculture alone accounts for 70% of all water withdrawn by the combined agriculture, municipal and industrial sectors.

Booming demand for livestock products in particular is increasing the demand for water. Meat production requires 8-10 times more water than cereal production and the increase in demand for animal feed adds to the current pressure on water resources.

Further, global demand for food is expected to increase by 70% by 2050. Agriculture will therefore need to produce 60% more food globally, and 100% more in developing countries.

The challenge is to improve water efficiency in agriculture, sustainably using water resources and improving water management in the processes from field to fork, thus increasing the total food supply chain efficiency.

As current growth rates of global agricultural water demand are unsustainable, the sector will need to increase its efficiency by reducing water losses and, most importantly, increase crop productivity with respect to water. In other words, to sustain the human population, agriculture must produce "more crops from fewer drops" while lessening its environmental impact. The sustainability of increasing agriculture production will depend on the adoption of ecosystem approaches, such as conservation practices and higher quality and diversity in crops.

• Women's livelihoods

Lack of water supply, sanitation and hygiene takes a huge toll on health and well-being and comes at a large financial cost, including a sizable loss of economic activity, especially for women.

Limited access to water is a major hindrance to women's economic empowerment, as women and young girls in many countries continue to carry the full burden of water inequality.

Surveys from 45 developing countries show that women and children bear the primary responsibility for water collection in 76% of households. Time lost due to walking and waiting for water has a ripple effect on women's lives, their communities and whole economies. This is time not spent carrying out income generating activities which could contribute to poverty alleviation and social and economic development.

Ensuring that water is accessible and used sustainably is key to promoting livelihoods for women and to keeping children, especially girls, in school.

Without access to clean water, the world's poorest people will stay poor. Investing in improved water management and services can help reduce poverty and sustain economic growth.

In developing countries especially, ensuring access to clean water opens possibilities for sustainable development, with every US\$1 spent on water and sanitation yielding a US\$4 economic return.





• *Natural infrastructure and livelihoods*

Using natural infrastructure, and the ecosystem services that biodiversity provides, to manage water sustainably is not new, but there is a growing willingness to consider such approaches by an increasingly diverse range of stakeholders, such as agriculture, business, drinking-water supply engineers and urban authorities.

What stimulates this interest is the increasing evidence base for the approach. For instance, reports from The Economics of Ecosystems and Biodiversity have lent credence to the local and global economic value of well-managed ecosystems and there is a growing list of examples where a monetary value can be accurately assigned to the benefits.

Ecosystem valuation demonstrates that benefits far exceed costs of water-related investments in ecosystem conservation. Economic advantages include reduction in capital and maintenance costs for hard infrastructure; reduction in insurance premiums and damages from flooding and storms; boost to fisheries, aquaculture and agriculture; reduction in cost of damage from carbon emissions; and boost to tourism.

Agriculture, fishery and tourism livelihoods could thus be sustained long-term by integrating a holistic approach to ecosystems for water and development that maintains a beneficial mix between built and natural infrastructure.

Cities are highly motivated to manage water better, with many open to solutions that demonstrate cost-effectiveness through an integration of natural infrastructure in their planning. Central to this is to see cities as ecosystems themselves, and hence their problems amenable to ecosystem-based solutions.

Increasingly, measures are being introduced to increase water efficiencies to work with biodiversity and manage urban water issues; reduce their impact on the hydrological cycle; mitigate and adapt to climate change; and produce water sensitive urban design solutions.

Cities are increasingly and successfully addressing catchment-based solutions; for example through payments for ecosystem services schemes.

There are widespread examples including forest restoration to manage upstream erosion, wetland restoration to reduce flood risk, and multiple interventions for improving the quality of water delivered by ecosystems to cities. In New York City it proved around six times more cost effective for authorities to pay landowners in the Catskill Mountains to improve land management and to prevent waste and nutrient runoff reaching watercourses, instead of building a new water treatment plant.



The CBD and the Sustainable Development Agenda

Water is high on the public and political agenda. Human health, food and energy security, urbanization and industrial growth, as well as climate change are critical challenge areas where policies and actions at the core of sustainable development can be strengthened, or weakened, through water.

In 2010, the tenth meeting of the Conference of the Parties (COP 10) to the Convention on Biological Diversity (CBD) recognized the important links between water, biodiversity and sustainable development, with water being incorporated into the Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets.

In 2012, COP 11 further recognized the importance of the water cycle, and the influence of climate change upon it, to most areas of work of the Convention and to achieving most of the Aichi Targets. They also recognized the role of the water cycle, as a cross-cutting theme, when implementing the Strategic Plan. A call was also made for a cooperative partnership to promote awareness of, and capacity building for, ecosystem based solutions for water resources management as a means to enhance the implementation of the Strategic Plan by the broadest range of stakeholders. The CBD Secretariat is actively working to mainstream biodiversity and ecosystems into development.

2016 presents an unprecedented opportunity to bring the countries and citizens of the world together to embark on a new path to improve livelihoods everywhere. Countries adopted the 2030 Agenda for Sustainable Development as well as a global agreement on climate change. Water is mentioned 22 times in 5 separate Sustainable Development Goals (Goals 3, 6, 11, 12 and 15) that touch climate change, biodiversity, food security, energy security, health, gender equality, urbanization, institutional capacity and sustainable consumption and production.

Goal 6, with six targets on outcomes across the entire water cycle and two targets on the means of implementing the outcome targets, is the dedicated goal on water and sanitation that sets out to “ensure availability and sustainable management of water and sanitation for all.” Because water is at the very core of sustainable development, Goal 6 does not only have strong linkages to all other SDGs, it also underpins them. Meeting Goal 6 would go a long way towards achieving much of the 2030 Agenda for Sustainable Development.



Water is also noted in the 2015 Sendai Framework for Disaster Risk Reduction 2015-2030, specifically in Priority 4: Enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction.

“To support, as appropriate, the efforts of relevant United Nations entities to strengthen and implement global mechanisms on hydrometeorological issues in order to raise awareness and improve understanding of water-related disaster risks and their impact on society, and advance strategies for disaster risk reduction upon the request of States.”

To achieve Priority 4, governments need to “promote the resilience of new and existing critical infrastructure, including water, transportation and telecommunications infrastructure, educational facilities, hospitals and other health facilities, to ensure that they remain safe, effective and operational during and after disasters in order to provide life-saving and essential services.”

Water is at the core of sustainable development. Water resources, and the services they provide, help underpin poverty reduction, economic growth and environmental sustainability.

Having access to water for productive uses such as agriculture and family-run businesses is critical to realize livelihood opportunities, generate income and contribute to economic productivity. Water and jobs have the power to transform people’s lives.

Water is central to human survival, the environment and the economy and decent work can provide income and pave the way for broader social and economic advancements. Ensuring a clean, healthy and sustainable water supply is now the highest of natural resources management issues.

More information: www.cbd.int

All information sourced from FAO, UNDP and the CBD.

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Convention on
Biological Diversity