Implementing Water Resources Management

Information brief

Freshwater is central to all development efforts. Yet it faces growing pressures across the world – from urbanization and overconsumption, to underinvestment and lack of capacity, poor management and waste, and the demands of agriculture, energy and food production. While it is generally considered that there is enough freshwater on the planet for 7 billion people it is distributed unevenly and too much of it is wasted, polluted and unsustainably managed.

Quick facts

- Around **1.2 billion** people live in areas of physical scarcity, and 500 million people are approaching this situation.

- Another **1.6 billion** people face economic water shortage (where countries lack the necessary infrastructure to take water from rivers and aquifers).

- Drought, desertification and other forms of water scarcity are estimated to affect as many as **one-third** of the world's people.

- If current consumption patterns continue, **two-thirds** of the world's population will live in water-stressed conditions by 2025.

- **Water scarcity** is forecast to worsen where population growth is still high, as in sub-Saharan Africa, South Asia and some countries in South America and the Middle East.

- Growing **uncertainty** regarding water resources – particularly linked to climate change – is expected to exacerbate water scarcity trends.

Source: WWAP

Commitment to progress

In July 2014, the Open Working Group (OWG) on Sustainable Development Goals (SDGs) proposed a global goal for water that includes specific targets related to water resources management.

Targets related to WRM adopted by the Open Working Group

6.4 by 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity, and substantially reduce the number of people suffering from water scarcity.

6.5 by 2030 implement integrated water resources management at all levels, including through transboundary cooperation as appropriate.

Source: OWG (2014

There has been significant progress made in improving **water resources management**. For example, a recent UN survey showed that more than 130 countries confirmed the widespread adoption of integrated approaches to water management. In addition, water resources management programmes (including allocation systems, groundwater management, environmental impact assessment, demand management among others) are being implemented in more than 84% of the highest Human Development Index (HDI) group countries but only 40% of other countries.

Challenges and tools for implementation

1. Investment and financing

Investment in water infrastructure, in both its physical and natural assets, can be a driver of growth and a key to poverty reduction (UNEP 2011).

Many countries already suffer **infrastructure deficit**, quite apart from new infrastructure needs. For example, a UNEP assessment found that US$ 191 billion per year until 2030 and US$ 311 billion per year until 2050 of additional investment is needed to meet the MDGs. "The Africa Infrastructure Country Diagnostics" (AICD) estimates that US$ 22 billion per year (approximately 3.3% of Africa's GDP) is the amount required to attain the water and sanitation MDG targets. While much of this infrastructure deficit will be met by governments there is a significant opportunity to increase **private investment** in water infrastructure.

Infrastructure development: much investment; more coordination needed

Some countries are making concerted attempts to consider multiple uses when prioritizing water infrastructure development (Uruguay, Sri Lanka, Rwanda, and Mexico) but others identify coordination as an on-going challenge (Mexico).

Source: UNEP (2012)

Financing instruments (cost recovery mechanisms, subsidies and charges for water resources management) are also expected to play a more significant role in future water resources management. At present, these approaches are being implemented in less than 50% of countries. However, little progress has been made on **payment for water resources services and ecosystem services**, although there has been some progress raising revenues for water resources management from users and polluters. More is also needed to enhance **coherence and consistency** in the key areas such as financial and economic policy coordination, **illicit financial flows**, and **tax evasion and avoidance**.

Water tariffs in Brazil

While revenue collection at the federal level in Brazil has been considered a success and covers agency costs, it is a bigger challenge at basin level where "Only a few cases where water tariffs were implemented, with varying success." (Brazil).

Source: UNEP (2012)

Payment as an economic instrument

In some countries water tariffs are used to change water use practices. Charges can help to promote better practices, make more effective use of scarce finance and raise revenues to supplement budgets. Much greater attention should be given to support country actions on tariffs.

Source: UNEP (2012)

2. Implementing appropriate technologies

Green technologies have the potential to create new business opportunities, markets and jobs. They can also increase the amount of water available for drinking, agriculture, and manufacturing; boost resource efficiency; and contribute to achieving development goals. This can be done by technologies in areas such as water resources assessments, reduction of water losses, waste water treatment, efficiency of water utilities, bio technologies, and others. Technology development – if combined with public awareness – can also contribute to increased conservation, reuse and recycling, and greater efficiency in most water using sectors.

While **water use efficiency** is a priority in a majority of countries, it is clear that introduction and implementation of water efficiency measures lags behind, particularly in low HDI countries. In the lowest three HDI categories water efficiency is not perceived to be integrated into water resources management, while less than 50% of very high HDI countries have advanced implementation or full implementation. Few countries have advanced implementation for irrigation and rainwater harvesting, and many **lack sufficient or appropriate equipment**, and several mention the need for **advanced technology transfer**.

Benefits of water efficient technologies

Potential efficiency savings from more productive use of water in irrigated agriculture could reach US$115 billion annually by 2030 in 2011 prices, globally. Total net benefit of providing more **efficient water technologies** for an estimated 100 million poor farmers worldwide has been put at US$100-200 billion.

Source: UN-Water (2014)

While the North-South divide in access to technology remains a central issue that must be tackled based on global equity, equally important **"technology divides"** must be addressed to ensure technology becomes an effective and equitable means to attain socially and ecologically sustainable development: 1) Traditional versus new technologies, 2) Gender and technology, 3) Beyond technology transfer: technology assessment, 4) Ownership and control of technology and innovation, 5) Intellectual property rights.

According to the UN General Assembly we must:

1. Conduct broad, methodical and periodic examinations of needs, gaps and achievements in the development, transfer and dissemination of clean and environmentally sound technologies.

2. Strengthen the capacity to help all countries converge to best practice in data availability in science, research and development and technology inputs and outcomes according to internationally comparable methodologies.

3. Build/foster a global reporting system covering all multilateral and bilateral capacity-building activities, as well as demonstration and pilot projects on clean and environmentally sound technologies.

4. Mobilize United Nations support for agreed technology bank for least developed countries.

5. Facilitate intergovernmental dialogue on the transfer of publicly owned or funded technologies.

Source: UN General Assembly (2013a)

"Technology divides" could be addressed by:

1. Improved recognition and development of indigenous and local knowledge systems and technological developments.

2. Improved local and community control over the commons – traditionally critical to women's well being and to their pursuit of life and livelihoods.

3. Conserving indigenous and local knowledge systems, practices and languages, and embedding these in the concept of Human Rights, including the Right to Food and Health and protection of genetic and biological diversity and integrity of ecosystems.

4. Ensuring developing countries and countries in transition have fair access to technologies proven to be environmentally sound, including removing intellectual property barriers and applying strict regulation of cartel-like practices, enforcement of competition policies.

5. Applying precautionary principle on technology development, transfer and deployment.

6. Establishing an international mechanism for evaluation of ecological, social, cultural and economic impacts of technologies with attention to the participation of affected groups.

7. Strengthening capacity at the regional, national and local levels to evaluate potential impacts of new technologies.

8. Banning development/deployment of technologies with potential to damage Earth systems, such as geo-engineering.

9. Increasing and enabling active participation of women in decision-making in all stages of technology development, including assessment.

10. Increasing to at least 30% the share of global peer-reviewed scientific papers originating in developing countries and countries in transition by 2030, including studies from indigenous and local knowledge systems.

Sources: Women's Major Group (2013)

We need a **technology mechanism** that can accelerate progress on a global scale and is commensurate with the sustainable development challenge.

Effective technology facilitation mechanism must:

(a) Address gaps throughout the technology cycle, from research to development, demonstration, market formation and diffusion.

(b) Address gaps in all countries, poor and rich.

(c) Provide special support to least developed countries, and poorer, smaller, or vulnerable countries, which have been marginalized despite development success elsewhere.

(d) Promote partnerships to reduce poverty, by enabling the poorest to contribute to knowledge and technology development.

(e) Foster a global, cooperative undertaking that engages all interested Governments and groups, including the private sector.

(f) Be practical and flexible in order to adjust to challenges and opportunities.

(g) Take national action at sector and cluster levels, but monitor progress against global, cross-sectoral, technology-related sustainable development goals.

(h) Take action across sectors and countries to address issues related to technology convergence and underpinning technologies.

(i) Improve technology transfer, including between developing countries.

(j) Pragmatically address intellectual property rights constraints for technology transfer, by exploring innovative voluntary approaches.

(k) Promote voluntary technology assessment through a global network.

(l) Build and expand international networks of collaboration in research, development and demonstration that allow for the participation of all countries.

(m) Coordinate capacity-building work by the United Nations through partnerships to achieve global reach.

(n) Build partnerships to coordinate and support the implementation of technology-related international commitments, agreements and conventions.

Source: UN General Assembly (2012)

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3. Improving capacity

The Rio+20 outcome document emphasizes the need for enhanced capacity-building for sustainable development and, in this regard, for the strengthening of technical and scientific cooperation, including North-South, South-South and triangular cooperation. It reiterates the importance of human resource development, including training, the exchange of experiences and expertise, knowledge transfer and technical assistance for capacity-building, which involves strengthening institutional capacity, including planning, management and monitoring capacities.

Insufficient capacity is a problem for many countries (e.g. Albania, Armenia, Costa Rica, Guatemala, Bangladesh, Ghana, Namibia, and Rwanda (UNEP 2012)). Typical problems relate to **lack of human capacity both in numbers and knowledge** to plan and manage. 35% of countries have an advanced level of action across most of the capacity building areas however the need for capacity to implement an integrated approach is felt across all of the HDI groups.

Priority action areas:

(a) Ensuring inclusion of sustainable development knowledge and capacity building in planning processes.

(b) Spreading the understanding that knowledge and capacity-building needs to be fully integrated from national to local levels.

(c) Focusing capacity building efforts on long-term development of organizations and institutions, to ensure continuity and long term impact.

(d) Creating an enabling environment for knowledge sharing and capacity-building by: (i) integrating sustainability principles into legislative frameworks and actions, (ii) revitalizing national sustainable development councils and roundtables, and (iii) facilitating peer learning, whether between countries at similar levels of development, cities, rural communities, or individual farmers.

(e) Maintaining a map of initiatives and programs, and facilitating cooperation, collaboration, and partnership among them.

(f) Cataloguing successful working models, and sharing them, acknowledging that models need to be adapted to national and local conditions, including areas where peace building and conflict resolution efforts are underway.

(g) Developing a practical language to communicate about knowledge sharing and capacity-building across cultures, disciplines, and institutions.

(h) Emphasizing an integrated approach to addressing core sustainability challenges of climate change adaptation and mitigation, water management, food security, and sustainable energy in anticipation of the adoption of Sustainable Development Goals.

Source: UNOSD (2013)

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4. Improving water governance

Water governance has been defined as "the range of political, social, economic and administrative systems that are in place to develop and manage water resources, and the delivery of water services, at different levels of society". Its importance for the new development framework has been stressed by many international organizations, including the UN, OECD and the World Bank. A key factor is the need to improve the implementation of integrated water resources management at all appropriate levels. Strengthening water governance has many dimensions, ranging from education, knowledge and skills development; the collection, analysis, and use of data; and tools for project preparation, monitoring, and management.

There is evidence that **legal frameworks** may be **weak or conflicting**. For example, experiences from Albania highlight the disparity between the EU Water Framework Directive and its current legal system; or Peru and Samoa, where national laws conflict with traditional practices and customs. 25% of the total number of countries reporting on constraints noted they faced management obstacles relating to legal frameworks (e.g.

Mozambique, El Salvador, and Angola and Republic of Korea) and strategic planning (e.g. Congo, Costa Rica and Australia).

In addition, **strategic planning, national policies, transboundary agreements and integrated water resources plans** are often **non-existent or inadequate**. For example, Congo reports that it lacks a clearly formulated national water policy; and Azerbaijan, which is heavily reliant on water flow from other countries, reports that it is the only Southern Caucasus country to sign the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Helsinki Convention). A number of countries, including Denmark, Germany, Lithuania and Portugal report challenges in balancing agricultural, industrial and environmental interests.

Sustainability remains a challenge

In an EU report on 23 WASH projects in Sub-Saharan Africa it was found that equipment was generally installed as planned, but fewer than half of the projects met the needs of beneficiaries.

The Global Corruption Report 2008 outlines the ways **corruption can impact on water**, in particular in the supply of services and hydropower. The report estimates between 10% and 30% of finances may be siphoned-off annually through corrupt practices.

Source: UN-Water (2014)

Institutional reforms have been undertaken in many countries, correlating well with countries implementing legal and policy reforms. The aim is to increase joint decision-making at national level, facilitate management at basin level (71% of countries) and legitimize stakeholder structures at community level. Institutional reform is slow but improving. In addition, almost one third of countries reporting on management constraints noted inadequate participation and awareness of decision makers, users and other key stakeholders.

At a more practical level, **management constraints** are also a commonly noted issue. For example, some countries report that overlapping or unclear responsibilities may lead to competition and management conflicts. In terms of administrative boundaries, problems of spatial "fit" often arise from efforts to manage water resources based on the river basin, while existing political administrative territories often have different boundaries. **Coordination and cooperation** constraints can occur because of inadequate planning, insufficient resources, a lack of awareness, and conflicting stakeholder agendas which may lead to partisan or sectoral approaches. One result of a lack of coordination and cooperation is fragmented approaches to WRM, with sector silos discouraging collaboration and cross-sectoral coordination.

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