United Nations
Educational, Scientific and
Cultural Organization

JAK/2013/PI/H/11

# Beyond 2015 – A Paradigm Shift in Water Management to Realise the Future We Want for All

### Key water challenges:

The Post-2015 Development Agenda needs to respond to new global water realities, which indicate that humanity is facing numerous unprecedented and inter-connected socio-economic and environmental sustainability challenges further complicated by an intensifying hydrological cycle under global change. The most pressing water challenges of the 21st century include:

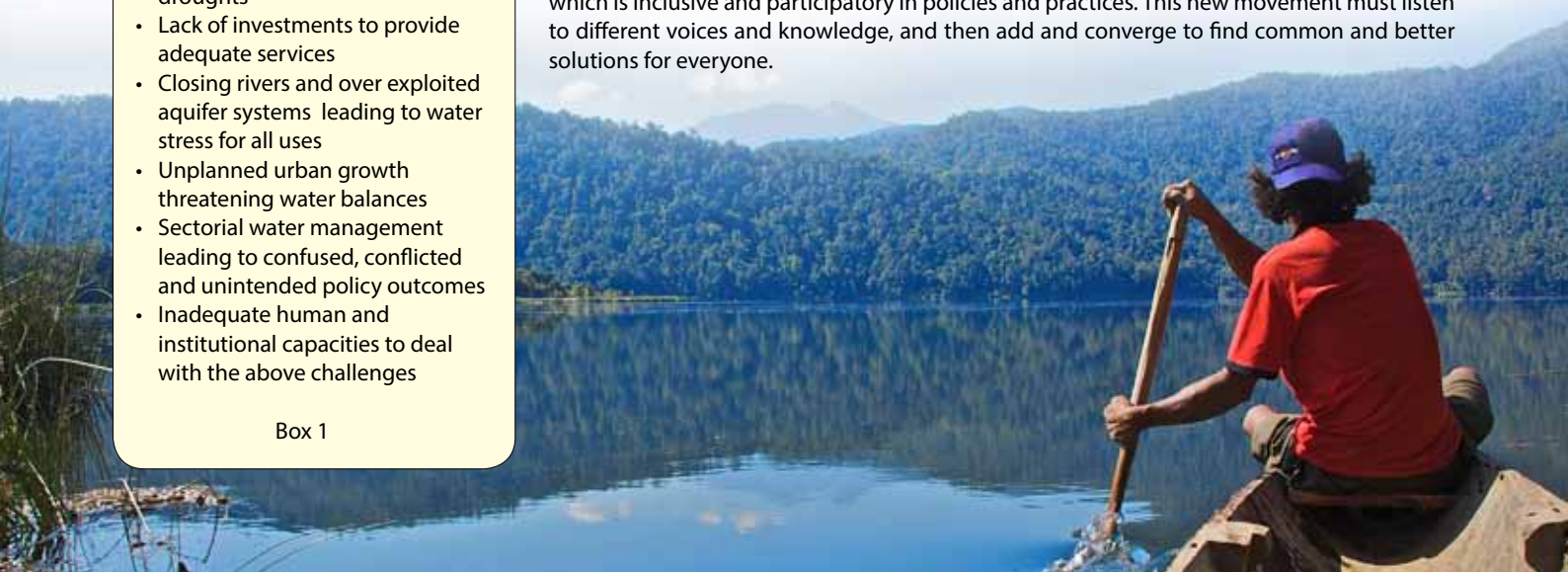
- Intensifying water inefficiencies in food production
- Failing access to water and sanitation
- Stressed aquatic ecosystems and biodiversity loss
- Increasing conflicts on water rights
- Degrading water quality
- Ever increasing human water, energy, and climate foot prints
- Unsustainable groundwater abstractions
- Frequent hydrologic extreme events causing floods and droughts
- Lack of investments to provide adequate services
- Closing rivers and over exploited aquifer systems leading to water stress for all uses
- Unplanned urban growth threatening water balances
- Sectorial water management leading to confused, conflicted and unintended policy outcomes
- Inadequate human and institutional capacities to deal with the above challenges

Box 1

## Background

The United Nations is preparing for the transition from the MDG era to a new framework for international cooperation and sustainable development after 2015, the so called 'Post-2015 Agenda on Realising the Future We Want for All'. The Post-2015 Agenda needs to provide both the vision and the commitment to address and resolve the big issues of our time, including: poverty eradication, peace and security, safe and sufficient food, sustainable energy, pollution prevention and control, water and environmental resources management, disease control, mobility, natural and man-induced disasters, population growth, urbanization and sustainable/liveable cities. The development of solutions to these key global challenges and the overall transition towards a green economy will need to be based on sound science, technology and innovation. Water plays a key role in almost all the global challenges listed above, and therefore water needs to be integrated into the Post-2015 agenda.

There are many challenges that modern society is facing in terms of water management (box 1). The poorest people, mostly women, are suffering the greatest scarcity and deterioration of water quality. This situation is exacerbated by factors such as climate change, the increasing intensification of farming and agriculture, as well as increasing demand on water as a result of population growth and changing lifestyles. On the other hand, in many instances water management policies and practices have ignored the needs of the people who in a daily routine have to face water scarcity, and therefore must design new adaptive strategies to meet their needs. One of the targets of the MDGs is to halve the proportion of the population without sustainable access to safe drinking water between 2000 and 2015. We are still facing several barriers to reach this objective. One of the handicaps is the dissemination of paradigms and technologies developed under differing socio-cultural setting in developed countries to solve water challenges in the developing countries. As a result these are not always accepted or fully incorporated, and even sometimes they become a source of conflict or produce negative effects on the target groups and their ecosystems. Besides, there are other pressing water issues beyond water supply and sanitation that need to be addressed urgently (box 1). This is the time to create new ways to approach water issues in the post 2015 era. We must create a real water democracy, promoted from the grassroots which is inclusive and participatory in policies and practices. This new movement must listen to different voices and knowledge, and then add and converge to find common and better solutions for everyone.



## Complexities and inter-relatedness of water challenges

The water related global challenges listed in box-1 are hugely complex with strong inter-connections. For instance, ensuring food security for a rapidly growing world population depends on availability of water, land and energy, and on scientific breakthrough in enhancing production. Current food production methods, however, are highly polluting, causing eutrophication, greenhouse gas emissions, biodiversity loss and water stress. In addition, climate change and extreme weather events lead to massive crop damage, and pose a growing threat to agriculture yields and food security. The task to address the above water challenges is phenomenally complex, and therefore science has to play a major role in helping to understand the complexities and multi-dimensional character of sustainable development.

## Ensuring water as a human right

On 28 July 2010, through Resolution 64/292, the United Nations General Assembly explicitly recognized the human right to water and sanitation and acknowledged that clean drinking water and sanitation are essential to the realisation of all human rights. Water democracy comes from political democracy enabling the availability of water, making possible that the water is "everybody's business". This is a matter of right to water and life. There is a need to understand economic and legislative aspects of providing water and sanitation as a human right in different hydrogeographical and societal settings. The human right to water has to entitle everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses. A rights-based approach is needed to prioritize non-discriminatory access to water, promote inclusive participation in all decision-making mechanisms and ensure accountability and legal obligations of public institutions.

## Water security beyond water supply and sanitation goals

MDG 7, Target 7c, focuses on the importance of providing safe drinking water and sanitation. But, there are additional water issues beyond Target 7c that also need attention. Water is the main limiting factor preventing increased food production, water quality deterioration affects biodiversity, and many people (especially children) die from water borne disease. It is estimated that over 90% of all climate change impact is water related; we need better flood forecasting, community preparedness, and adaptation measures. The rivers and groundwater systems are becoming increasingly polluted, this creates challenges to society at large for aquifer and river restoration and integrated water resources management. There is an urgent need to go beyond MDG Target 7c, by understanding ecological impacts of water projects, including for drinking water supply, but also for industrial water use, irrigation, and dams and dikes on water quantity, quality and related environment links.

## More crop per drop

More than 70% of all water use globally goes to food production. To secure sufficient food production for an estimated 9 billion people in 2050, we need to consider a paradigm shift in the way we produce food. In the medium term we need to improve water efficiencies (drought resistant crops, high yield/low water use varieties via biotech; efficiency of irrigation systems, etc). In the longer term, there is a need to find new ways of food production with full water and nutrient recycle (e.g. on the extreme end of the scale there is the option to produce meat in factories).

## Intensifying climate, water and energy nexus

Water is needed to produce energy and energy is needed to procure, purify and transport water with significant contribution to greenhouse emissions. Increasing water demands are leading to new challenges for fresh water ecology, climate change and energy production. However our understanding of climate, energy and water policy linkages and trade-offs remains limited. This often leads to confused, conflicting and unintended policy outcomes. There is a need for better knowledge, policies and management frameworks from user to the whole of the river system levels.

## Water culture a sound basis for water management

Water is life because, "there is no life without water", the existence of every society is about the existence of a determined culture of water. There is no society or social group without water culture, every community has its own water values. Every society and every social group has developed a unique water culture, allowing them to live in their territory. Moreover, if we want to change a culture of water into another, this requires necessarily restructuring of the modes of perception, the belief systems and the ways to perceive, to believe, to know, to organize, to live and to plan a common future. We have to build bridges with the past and the present to build better water futures. It is from culture that we can produce a real process of change towards a sustainable development.

## Adaptive water management for better coping with extremes

Climate change affects both the quality and availability of water resources. The consequences are significant. Water-related natural disasters, such as flooding, drought, and landslides, are becoming more frequent and more severe. Rising temperatures, causing increased evaporation and glacial melt, are reducing the reliability and quality of water supplies. Responsible management of water must take into account the real danger of physical water renewability, which not only depends on global climate change (which affect the water cycle in quantitative terms), but also of the local regional and global water management practices. In many parts of the world both the quantity and good-quality water are on substantial decline. The main pollutants of groundwater are nitrates that are generated primarily by intensive farming and agricultural fertilizers and pesticides. Adaptive water management is needed to adjust practices in accordance with anticipated climate change impacts on water resources, to use the limited water efficiently and manage the agriculture water productivity effectively by making every drop counts for social, economic and environmental benefits to society and nature.

## Inclusive and relevant water technologies to avoid unintended consequences

Imported and exclusive technological models which were elaborated under different environmental and cultural conditions can sometimes have negative impacts on both environment and society. For example reservoirs that apart from having a huge impact at social and environmental level can have a limited life because they rapidly accumulate sediments if constructed in unstable watersheds. 100% of the public water supply is treated to make it drinkable while the drinking, food cooking and water washing uses account for less than 35%. This means that 65% of the work and energy used is not necessary. Another example is the use of chlorine. This is used to prevent microbes to proliferate along the way in the supply network, but at the same time it creates new health concerns, producing several toxic compounds, some of them recognized as carcinogenic. Besides, the toxicity of chlorine, it requires a lot of energy to be produced. In some areas the impact of the exploitation of underground aquifers is usually gradual and "invisible". The rate of exploitation of aquifer systems is unsustainable in most areas and can cause irrecoverable land subsidence. The excessive exploitation of coastal aquifers is causing sea water intrusion. There is a need for new forms of technology and innovation as well as improved applications for using different sources of water (such as rain water harvesting, untreated river water, grey water reuse) fit for purpose.

## Paradigm shift in urban water management

Urbanization is keeping domestic water use on an upward trend. Today an average person uses more than double the water than a hundred years before. Domestic water use represents on average 11% of total water withdrawal worldwide and is used to supply towns, cities and rural communities (the vast majority of domestic water consumption is linked to the hygiene). The natural hydrological processes are significantly changed by new built environment. In addition, rainwater collects chemicals and other concentrated forms of pollutant (such as zinc and lead), which are then carried directly into streams and rivers. Rainwater is discharged with no prior treatment, especially in emerging and the least developed regions. In developing countries, more than 80% of wastewater is currently discharged into the environment in an untreated state, polluting rivers, lakes and coastal areas. There is a need for formulating sound policies through learning alliances at different levels aimed at incorporating reduce, recycle, reuse and redesign concepts in water-intensive foods and goods systems to reduce human water foot prints.

## Management needs to be in the hands of women

Women are often the primary users of water in domestic consumption, subsistence agriculture, health and sanitation. Women in many cases also take the primary role in educating children, in child and family health including sanitation and in caring for the sick. They also spend a disproportionate number of hours on labour-intensive, time-consuming and unpaid domestic tasks such as fetching water and firewoods, washing clothes and dishes and preparing meals. Too often, women and girls are disproportionately affected by the lack of access to water and, although women carry most of the water related tasks, play a key role in food production, especially in subsistence farming, their participation in decision making processes on water and food management remains very low. This does not only result in biased and misinformed decision-making, but also it jeopardizes the achievement of women's human rights, reducing their opportunities to education, decent work and political engagement, and perpetuate the intergenerational transfer of poverty and disempowerment. Understanding gender roles can help plan water interventions and policies which are based on the knowledge of how and why people make the choices in water use in order to meet their needs.

## Towards a new hydro-diplomacy for crossing water boundaries

It is well known that water is not distributed equally among different sectors of society and across geopolitical boundaries. The problem of water is vital in all communities; no life or production is possible without water. The use of water, whether it is abundant or not, entails the real possibility of confrontations between social actors. Consequently, before we deal with water, it is necessary to picture the set of tensions that could be generated around it while crossing boundaries. The source of stress may be at local, regional, national or international level. This is due to different positions adopted by individuals based on their subjectivity, which is the result of their cultures and their own relationship with water. The water sharing and use proposals have to include all agents in a major and constructive role.

## Societal responsibility of water businesses

Total water cycle management in businesses is necessary to achieve higher efficiencies and reduce third party impacts to other users and environment. There is a growing role of private capital investments in infrastructure, water management and in maintaining excellence in water science, technology and innovation. Our global water challenge is a formidable one and all stakeholders need to be involved to ensure highest levels of performance in both public and private sectors. Public-private partnerships are crucial to maintain and enhance level of services to all water usages. In meeting the drinking water challenges there is a need for greater corporate social responsibility of the private sector especially the multinational companies working in developing and least developed countries.

## Poor implementation of IWRM plans

The key objective of Integrated Water Resources Management (IWRM) is to re-establish water quality and ecosystem functions through improved storm water management, human and industrial waste management, flood loss reduction, sedimentation and pollution control, improvement of water quality, recreation, education and introduction of natural or manmade cropping systems tailored to deliver solutions at the river basin level. This needs to be set in a human rights-based approach aimed at achieving 'sufficient, safe, acceptable, and affordable water for personal and domestic uses' for all. Despite the best efforts of the governments IWRM has not been implemented in most river basins due to a lack of human capacity and lack of institutional support, There is need to further develop tools and guidelines to implement IWRM in all regions of the water.

## Increasing human capacities at all levels

Locally appropriate formal and informal water education at all levels is needed to address water supply and sanitation-related exclusion issues that are commonly rooted in weak governance, power inequality and poverty, rather than sheer physical availability of water. This needs to be supported by locally customized modular curricula at the university level for ready accreditation of water professionals across borders. Governments and businesses need to create career paths for water professionals to provide incentives for water professionals to avoid loss to other sectors.

## UNESCO Actions in Asia and the Pacific

United Nations Educational, Scientific and Cultural Organization

International Hydrological Programme

UNESCO Regional Science Bureau for Asia and the Pacific in Jakarta is implementing the International Hydrological Programme (IHP) in the region, which is the only intergovernmental programme of the UN system devoted to water research, water resources management, and education and capacity building. The programme is working in partnership with UNESCO category-2 water centres and university chairs to help meet the MDGs on environmental sustainability, water supply, sanitation, food security and poverty alleviation.

Within the Asia-Pacific region UNESCO launched the SWITCH-in-Asia initiative - an innovative regional flagship programme that addresses the challenges faced by cities and rural landscapes in providing efficient, safe and sustainable water and sanitation services for people, while preserving water and environmental resources. The SWITCH-in-Asia initiative calls for a paradigm shift in water management in order to cease using water resources in a way that is not sustainable in a world facing increasing global change pressures. SWITCH-in-Asia is being developed through national demonstration projects interlinked by a Learning Alliance aiming at facilitating communication and experience sharing among the partners (within a country as well as within the region).

## For more information, please contact

UNESCO Office, Jakarta
Jl. Galuh (II) No. 5
Jakarta, Indonesia
Phone: +62-21 7399818
Email: jakarta@unesco.org
www.unesco.org/jakarta