

## GLOBAL WATER SECURITY

SUBMISSION BY THE GLOBAL WATER PARTNERSHIP

TO

ICE/RAE/CIWEM REPORT TO PROFESSOR JOHN BEDDINGTON, CHIEF SCIENTIFIC ADVISER TO HM GOVERNMENT

### Background

This submission is a contribution to a Report on Global Water Security being prepared by the Institution of Civil Engineers, Royal Academy of Engineering and the Chartered Institution of Water & Environmental Management. The Report is being prepared at the request of Professor John Beddington, the Chief Scientific Adviser to the UK Government and Head of the Government Office for Science.

**The Global Water Partnership (GWP)** is an international network of partners created in 1996 to foster the implementation of integrated water resources management (IWRM): the coordinated development and management of water, land, and related resources by maximising economic and social welfare without compromising the sustainability of ecosystems and the environment. It is a non-profit multi-donor funded action network focused on facilitating and supporting the sustainable management of water resources at all levels. The legal representative of the GWP network is the Global Water Partnership Organisation (GWPO), an inter-governmental organization established in 2002 and hosted by the Government of Sweden.

The Global Water Partnership's vision is for a water-secure world. Its mission is to support the sustainable development and management of water resources at all levels.

### Water Security

The essence of water security is that concern for the resource base itself is coupled with concern that services which exploit the resource base for human survival and well-being, as well as for agriculture and other economic enterprise, should be developed and managed in an equitable, efficient and integrated manner. Achieving water security thus requires cooperation between different kinds of water users, and between those sharing river basins and aquifers, within a framework that allows for the protection of vital eco-systems from pollution and other threats. Water security is a pre-condition of any effective poverty reduction strategy, and of effective environmental sanitation, wastewater management and flood control. Water security will only be reached when high level decision-makers actually take the lead, make the tough decisions about the different uses of water and follow through with financing and implementation.

A water-secure world integrates concern for the intrinsic value of water and its use for human survival and well-being, and includes the use of water for agriculture, economic activity and environmental protection. Both water quantity and water quality aspects must be considered, as poor water quality affects its use value and its impact on the environment. Water security means harnessing the potential of water so that every person has enough safe, affordable water to lead a clean, healthy and productive life, while, at the same time, protecting the natural environment.

Making the world water-secure means tackling the destructive effects of water – the damage caused by floods, droughts, landslides, erosion, pollution and water-borne diseases. It also means addressing the negative results of poor management, and this will become more challenging as climatic variability increases.

Finally, a water-secure world means a better quality of life. The poorest countries and, within them, the

most vulnerable people (usually women and children) will benefit most from good water management. And, although water-related problems manifest themselves locally, they interconnect with other problems at other levels and cannot be solved independently. Achieving water security means that water users, and those who share river basins and aquifers, must cooperate within a framework that protects vital ecosystems.

### **Global Issues**

By the middle of this century, the world's population is projected to reach 9.1 billion, 34 percent higher than today. Furthermore, the world is now more urban than rural. Some regions face severe and increasing resource scarcity. South Asia and the Near East/North Africa have exhausted much of their rain-fed land potentials and depleted a significant share of their renewable waters. More than 1.2 billion people live in river basins where absolute water scarcity and increasing shortages are serious concerns.

Water is central to the world's development challenges. Whether it is food security, nutrition security, poverty reduction, economic growth, energy production, human health—water is the nexus. Water is a key factor in the achievement of each of the Millennium Development Goals. Without water security, there will be no food security, energy security will be compromised and poverty reduction and economic growth will not be sustainable.

Feeding the world's growing population and finding the land and water to grow the food continues to be a basic and sizeable challenge. It is an enormous task because the required increase in food production to meet future needs will have to be achieved with fewer land and water resources. Expanding land under cultivation is possible in sub-Saharan Africa and Latin America but requires adequate farming practices, increased investments and sustainable management of land and water resources.

The steps and actions needed to move towards achieving water security needs to be embedded into national development plans, such as poverty reduction strategies and comprehensive development frameworks. There is a need to bring together fragmented institutional responsibilities and interests in water, such as finance, planning, agriculture, energy, tourism, industry, education and health.

Sound economic and social arguments influence decision makers. This means that we must demonstrate why water, and better water resources management in particular, is important for development. Simply drafting water resource management plans does not solve water problems. What counts is how realistic the plans are, what political buy-in they have, what funds are available to implement them, and how much they contribute to development priorities, poverty alleviation and ecosystem health. Making the economic case for management of our water resources and investing in water is crucial if Governments and decision makers are to understand the irreplaceable contribution that water and its sustainable management make to the way we live.

### **Food Security**

Agriculture uses more water than any other area of human activity. Food and water security are therefore inextricably linked. Without water security, there will be no food security. Producing enough food for one person for one day requires about 3,000 litres of water – or about 1 litre per calorie. When compared with the 2–5 litres required for drinking, it is clear that water for food production is a critical issue as populations and wealth grow.

Progress in enhancing food security has been slow and seriously undermined by the drastic rise in world prices from 2007 to mid-2008 and the global financial crunch which unfolded in the second half of 2008. The number of hungry people in the world rose by more than 115 million, bringing the total number of people suffering from chronic hunger to more than one billion people or 15% of the world population. Social unrest occurred in a number of countries and cities. This is an early warning sign of what is to come, possibly on much larger scale, in the event of future food shortages.

Distrust in markets, pressure on natural resources, and the re-examination of the “merits” of self-sufficiency have led many countries to start rebuilding their national stocks and investing in agriculture in other countries to secure supplies. Large-scale acquisitions of farmland in Africa, Latin America, Central Asia and South East Asia have made headlines in a flurry of media reports across the world. For people in recipient countries, this new context may create opportunities for economic development and livelihood improvement in rural areas. But, in the absence of a code of conduct, it may also result in local people losing access to the land and water resources on which they depend for their food and water security.

In addition to this “hunger for land” and “thirst for water,” global agriculture will have to cope with the burden of climate change whose likely impacts have been documented in great detail in many reports. Most of them conclude that the global food production potential is expected to contract severely, yields of major crops like wheat and maize may fall globally and prices for the most important crops - rice wheat, maize and soybeans – may rise. In addition, severe weather occurrences such as droughts and floods are likely to intensify and cause greater crop and livestock losses. Increasing food insecurity might lead to more competition over water resources, migration, difficulties of supplying cities and ultimately state failures and international conflicts.

Some 60 percent of agriculture in developing countries is rain-fed. Rain-fed agriculture has a considerable untapped production potential. Irrigated agriculture, the source of much of the additional food needed, must in addition be modernised. Divergent perceptions of irrigation – on the one hand essential for food production, on the other a wasteful and polluting water user – must be reconciled. Institutional structures, cost recovery, subsidies, and operation and maintenance systems all affect water use efficiency and productivity.

Increased water productivity in agriculture is a key element in achieving both water and food security. Concerted action to achieve more crop productivity from every drop of water used for agriculture is essential. However, production is only part of the story. Food security in many countries will increasingly depend on food trade. This is a highly political and complex international issue that needs to be given urgent attention and needs to include the critical linkage to water security. The trade–food–water nexus and virtual water are significant issues in water for food production. The drive towards food security will have a better chance of success if the water security challenge is addressed.

### **Climate Change**

The rising awareness, though late, of the serious impacts of climate change on our planet has challenged our optimistic vision of continuing progress and the relevance of the current world economic model. We have not only come to realize that the earth’s resources cannot, in the long run, meet the demand of a world population following the model of developed societies, but we have become, at the same time, conscious of the immense risks associated with the negative impacts of climate change on the sustainability of the world’s natural resources. So much of the attention has been on low-carbon emitting energy supplies and the technological race to find new energy sources is intense. With energy there are alternatives. With water there are none – and climate change is a disrupter to achieving water security.

Climate change is arguably the most severe long-term threat to development facing this and future generations. By altering the hydrological cycle, climate change will exacerbate the water management problems that countries already face. Climate change will have significant, often dramatic, consequences – higher sea levels, more variable rainfall, more frequent and intense floods and droughts, and rapid desertification. Risks related to climate change impede agricultural development. The consequences of climate change are a major challenge to the management of natural resources and barriers to the transition from poverty to prosperity.

However, adaptation to climate change creates unprecedented opportunities for fundamental changes (economic, institutional, technological, social and political) that have been for a long time deferred. In

this context, Integrated Water Resources Management - IWRM - offers a glimmer of hope. IWRM calls for integration of actions affecting drinking water and sanitation supply, agriculture and irrigation, hydropower and other energy production, and maintenance of environmental water flows to protect habitats and sustain groundwater supplies. The approach recognizes the interconnectedness of water resources issues; from promoting wise uses of water that preserve long-term sustainability to arranging for fair and economical sharing of scarce resources among competing users. IWRM leads toward the recognition that water policy is bound together with government policies on security, economic development, food security, public health and other essential governance missions.

### **Floods & Droughts**

Floods are the most common natural disaster and cause more deaths and damage than any other type. Yet floods also sustain aquatic life and riverine biodiversity, recharge aquifers, enrich soils and, in some of the world's poorest areas, provide an important means of irrigation.

One of the most severe by-products of global warming and climate change is increasing and widespread drought, which will affect a large number of nations in the future, especially those in regions already prone to experiencing such phenomena. Droughts have a major impact on food security, especially for vulnerable populations, and also can have major long-term socio-economic impacts. Countries reliant on hydropower for electricity generation experience power shortages. Countries reliant upon rain-fed agriculture can find that the GDP for the country as a whole is significantly reduced in times of drought.

The challenge is to reduce the negative impact of floods and droughts on human lives and livelihoods by reducing the risk of such disasters, and by building resilience of people and communities. Prediction and monitoring are key to developing early warning systems and disaster preparedness. Approaches should be holistic, taking into account the needs of communities, the built environment, and aquatic ecosystems within the catchment or river basin where they occur. Hence water-related disaster management needs to be integrated with other planning spheres at the catchment level, and also address the fact that many poor people live in high risk locations.

### **The Challenges of Urbanization**

Today, 50 percent of the world's population lives in urban areas and, with changing demographics characterised by massive migration into cities, by 2025 the percentage is projected to be 60 percent. Urban water and wastewater management is a serious threat in most developing countries. Most cities are unable to expand basic water services or manage growing competition among users. Growing high density, low-income areas of cities pose additional challenges to sustainable service delivery. Given the trends in urbanisation, the need to improve water supply, wastewater treatment and waste management services in cities is urgent. But, this must take impacts over a wide area into consideration, both upstream and downstream, as well as across basin and aquifer boundaries. Much more must be done to ensure that urban water and waste management is seen as a vital key component of urban planning.

### **Resource Related Conflict**

For centuries, mankind has struggled to allocate the earth's water, and at times, competition for the resource has led to conflict. Today, population growth, surging demands for food and bio-fuels, global increases in living standards, rising demand for water, degradation of water resources, and changing weather patterns mean there is even less water to go around. Development will increase the risk of serious conflicts over water and the negative impact on the poor and vulnerable that these conflicts will have. Ensuring the availability of water is becoming an ever more difficult task.

### **Resource Related Benefits**

Surface and underground water do not respect political boundaries. This means that states must cooperate to manage water. They must share responsibilities for managing water, protecting water quality, managing environmental flows and promoting harmony among states. In some cases, river basin organisations provide an institutional structure for functions such as coordinating decision

making, establishing water allocation mechanisms, reducing water pollution, and handling floods and droughts. Good national policies and plans are prerequisites for serious cooperation in transboundary waters, including shared aquifers that are often neglected.

### **Improving support for water management**

Critical development problems can provide an entry point for galvanising action to address water management problems. For example, not only do rising food prices threaten poverty reduction gains, they also increase demand for water for agricultural production. So water management is a crucial element in these development problems.

Protection of the water resource base lies at the heart of future water sustainability. Surface and groundwater quality, and the threats posed by pollution, are problems both for people and for the ecosystems on which all life depends. Governments should take the lead and provide incentives; but everyone must also take some responsibility.

### **Infrastructure and Financing Water Resources Management**

Along with institutional reform, there is a critical need, particularly in poorer countries, to develop and manage appropriate and sustainable water infrastructure, both large and small. A great deal of attention has been paid to financing water infrastructure. Strong links need to be built between water and finance experts to tackle chronic underinvestment and the waste of scarce funds. However, little is known about funding water resources *management* despite increased insecurity due to scarcity, pollution, climate change and other threats. Financing water resources management relates directly to good water governance. Strong links need to be built between water and finance experts to tackle chronic underinvestment and the waste of scarce funds.

### **Conclusion**

Water security is the gossamer that links together food, energy, climate, economic growth and human security challenges that the world faces. Achieving a water secure world requires:

- Water policies and plans to be incorporated into national and international development processes;
- World leaders and funding agencies to appreciate that, in the long term, investment in water, is an opportunity and a solution rather than a problem.
- Partnerships for action and innovation at all levels among communities, nations, river basins, and globally;
- Going beyond what is normally considered “water business”. This will entail major changes in the way that sectors (e.g. water supply and sanitation, agriculture, energy, industry) and human settlements are managed;
- Balancing social, environmental and economic priorities as well as balancing “soft” (institutional) and “hard” (infrastructure) solutions such as investments, small and large scale, in storing and transporting water and in protecting the resource itself.

Managing and investing in water is cost-effective: it delivers immediate benefits as well as long-term social, economic and environmental resilience. Today’s investments in water should be seen as part of a strategy to build a climate resilient world: mitigating against floods, droughts and other threats, while contributing right now to poverty reduction and sustainable development.

Global Water Partnership  
Drottninggatan 33  
11151 Stockholm  
Sweden  
29 January 2009