WWDR4
Managing Water under Uncertainty and Risk

Stakeholder Briefing Notes

Water service providers (utilities and companies)

Providers of water services face an unenviable task of satisfying the growing demand from bigger, richer, urbanizing populations with water from resources that are increasingly fragile, variable and pressured in many ways.

Demand is growing in all the main sectors of water use - energy, agriculture, industry and human consumption:

- **All sources of energy and electricity require water as part of the process of production. Energy is itself a component part of making water available to human and economic uses, whether through pumping, transportation, treatment, desalination and irrigation. Population growth and increasing economic activity are expected to cause a surge of energy consumption, particularly in non-OECD countries.**
- **Production of crops and livestock is water-intensive: agriculture accounts for 70 percent of all water withdrawn. Best estimates of future global agricultural water consumption is that this will increase by about one fifth by 2050.**
- **Water is an integral part of many industrial processes and demand will increase in line with increasing economic activity.**
- **The main source of demand for drinking water, sanitation and drainage comes from urban communities. In poorer cities there is already a sizeable backlog of people without adequate drinking water and household sanitation. This could become much worse, as the urban population of the world is forecast to practically double over the first half of the current century. Growing cities have a voracious appetite for water, which in many cases will need longer and more elaborate supply chains. Wastewater collection and treatment, and urban stormwater drainage, are related areas that will need major investment.**

At the same time, climate change is expected to have a considerable impact on the availability of water. The main effects will be felt through an increasing variability of water supplies and growing extremes of climate. Traditional water sources may well become less reliable. The frequency and impact of water-related disasters is likely to increase, including a greater incidence of floods and droughts.

Better information is important for dealing with increasing uncertainty about future events. Today, as a result of population growth, changing water consumption patterns, economic development and, above all, increasing climatic variability, water managers are having to deal with extremes of events that have not yet been observed and are outside the range of variability described by past experience. The challenge for water authorities is to move from planning for one, reasonably well-defined, future to the use of plans which are responsive to a range of possible future scenarios, presenting with varying degrees of probability.

- ***Scenario analysis*** **is one such tool for dealing with the extremes of uncertainty now encountered, which water companies need to take on board.**

United Nations World Water Assessment Programme
Programme Office for Global Water Assessment
Division of Water Sciences, UNESCO

email: wwap@unesco.org
website:http://www.unesco.org/water/wwap

United Nations Educational, Scientific and Cultural Organization
World Water Assessment Programme
UN WATER

WWDR4
Managing Water under Uncertainty and Risk

Stakeholder Briefing Notes

- An *adaptive strategies* approach selects plans that can be modified over time to achieve better performance as outcomes are gradually realized.
- A *robust strategies* approach seeks to identify plans that will work reasonably well across the full range of possible outcomes. It is particularly important for investment decisions which cannot be easily or cost-effectively modified in the future.

In adjusting to the future challenges described in WWDR4, water providers need to use all options and tools at their disposal. Water management in urban areas can benefit from more comprehensive urban planning and by following integrated urban water management (IUWM) which involves the management of freshwater, wastewater and stormwater.

Technological developments in the delivery of urban water and wastewater handling will need to be taken up at an accelerated rate. The use of desalination and reclamation technologies are alternatives to the continuing abstraction of freshwater from surface sources or aquifers.

Financing such developments will be difficult, unless operating practices change. A more pragmatic and eclectic approach to financing is called for. This should start with attempts to squeeze the financing requirements to a minimum by improvements in efficiency, better collections of revenues due and adjustments to service levels and technological solutions. The second step is to improve the rate of *sustainable cost recovery* by raising tariff revenues, budgetary allocations due from governments, and ODA. The third step is to use these revenues to attract repayable sources of funds, using available devices for the reduction, mitigation and sharing of water financing risks.

United Nations World Water Assessment Programme
Programme Office for Global Water Assessment
Division of Water Sciences, UNESCO

email: wwap@unesco.org
website:http://www.unesco.org/water/wwap

United Nations Educational, Scientific and Cultural Organization
World Water Assessment Programme
UN WATER