

Assessing the risks

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A better place?

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Scarcity, pollution, investment, geopolitics: however murky the challenges ahead may seem, meeting them will require the utmost lucidity. And because the future of water is at stake, everyone is involved.

The county of Kent, known romantically as the “Garden of England”, has suffered its worst winter drought since the 1920s. In response, the UK Environment Agency warned in February 2006 that, unless serious water conservation measures were brought in by April, the county could within months witness scenes of people queuing in the streets for water as domestic supplies were being cut off.

Other western and southern European countries face similar water shortages, with all that this implies not only for hosepipe bans for gardeners, but also for farmers, tourists, electricity generation, food processing, the production of semiconductors, and many more industries. Moreover, the fact that “rainy” Britain is forced to consider tough conservation measures shows just how common the issue of water scarcity and management has become.

What needs to be borne in mind is that, while the earth’s surface consists mainly of

water, most of that is sea water. Just 2.3% of the total endowment is freshwater, and two thirds of that is permanently frozen. Freshwater sources, mainly from precipitation, stored temporarily in natural or man-made reserves, come to some 8,000 km³. That seems quite a modest quantity for an expanding global village of some 7 billion people. With growing populations and rising incomes, expanding irrigation agriculture and rapid rates of industrialisation, the 20th century has seen total water withdrawals and levels of water consumption rise roughly sevenfold. The stresses on this vital natural resource are serious and mounting.

Providing safe water for all is but one side of the challenge ahead. There has been enormous progress in recent decades in improving access worldwide to freshwater supplies and sanitation. For example, between 1990 and 2000, access to adequate water supply in developing countries rose from 73% to almost 80% of the population. But there is still a long way to go.

The Millennium Development Goal on water seems in danger of being missed for a start, particularly if we take as given the WHO/UNICEF view that reasonable access means at least 20 litres per person per day, accessible within 1 km of that person’s dwelling. For comparison, per capita consumption rates in the OECD area are 100-400 litres, depending on the country. Over 1 billion people in the developing world still do not have access to safe water and over 2.5 billion people have no access to

sanitation. About three quarters of all diseases in developing countries are water-related and it has been estimated that each year this leads to 1.7 million deaths.

The other side of the coin is management and investment, and this challenge concerns everyone. In the developed world, access to fresh water and sanitation is generally not a problem, but infrastructures are all too often old and decaying, and leakage rates are often high, ranging from 10% of the total in Austria and Denmark to 33% in the Czech Republic. In London leakage rates from the mains are reported to be up to 40% of total water supplied.

Then there is pollution. Some 2 million tonnes of waste is discharged daily around the globe, polluting some 12,000 km³ of receiving waters. Agriculture, which is the largest user of water in most countries, is also responsible for run-off that seeps down into fragile groundwater resources, which must then be cleaned up at great expense. Water companies are quite transparent about the problems. In France, for instance, water bills provide details on “undesirable” substances, such as nitrates, contained in drinking water and state whether official health thresholds are being respected.

Ageing infrastructure can also affect quality, bringing its own pollutants, such as lead. In other words, providing safe water means upgrading local water systems and domestic pipes, as well as fixing reservoirs and improving treatment plants.

Uneven waters

% world's	North and Central America	South America	Europe	Africa	Asia	Australia and Oceania
Water	15	26	8	11	36	5
Population	8	6	13	13	60	<1
Ratio (%)	1,9	4,3	0,61	0,84	0,6	5

Source: OECD, see references

But while we know many of the problems, political and public determination is needed for action. Without this, the risks associated with water can only increase. In the decades ahead, supplies of fresh, safe water will be subject to ever greater pressures. Some will originate from natural causes, others will be man-made. Climate change in the form of sea level rise, flooding, storm damage and the accentuation of seasonal effects such as winter flooding and summer droughts, will reduce the certainty and increase the vulnerability of water resources, posing severe challenges to the resilience and management of water services not only in developing but also in developed countries. Moreover, rising levels of pollution as well as threats from terrorist activity, physical disruption of supplies, and cyber attacks on critical infrastructures will bring greater focus to water security issues in some countries.

World population will continue to rise, almost all of it occurring in the developing world and accounted for almost entirely by urban growth. By 2025, global water withdrawals and water consumption look set to rise by up to 30% in developing countries and over 10% in the developed world. Added to this, many major water resources are shared among countries. There are now more than 250 international transboundary basins that cover some 45% of the world's land surface, 40% of the world's population, and 60% of the earth's freshwater volume. A good illustration is the hydroconflictual zone along the Tigris-Euphrates which is shared by Turkey, Syria and Iraq.

Water wars are not an immediate prospect, but if competition for scarce resources and diminishing water quantity and quality intensifies, this can at the very least exert a

Stored freshwater sources represent a modest quantity for an expanding global village of some 7 billion people.

destabilising influence on a region's development.

In sum, the population living in water-stressed areas is set to double over the period 1995-2025, and by 2030 some two-thirds of the world's inhabitants may experience moderate to high water stress. Regions of particular concern are the Middle East, North Africa, southern Africa, South Asia and parts of China. Many countries in these regions are ill-equipped to deal with these pressures.

However, no country can be complacent about water supply, and certainly not from a financial point of view. For many developing countries the requirements are stark—many more millions of people quite simply need to have access to safe water and sanitation. This raises key questions around financing, ODA, private sector involvement and appropriate technologies. But equally important, it raises issues of governance, of the institutional changes required to create, modernise and strengthen the legal, policy and administrative arrangements that govern the sector.

Many of the transition countries face similar governance problems (see article by Peter Börkey). But in terms of infrastructure investment, the challenge for them is not so much to extend existing networks and systems, but rather to maintain and/or replace them. Timely action would allow developing countries to capitalise quickly on the huge socio-economic gains that could be

achieved through expansion of provision and basic improvements. It is estimated, for example, that the benefits of halving the proportion of people without access to improved water sources by 2015 would be 9 times the costs incurred achieving that target. Universal access to improved water and sanitation services by 2015 would generate an even higher benefit/cost ratio.

Understandably, much of the policy interest in recent years has focused on meeting the basic needs of developing countries and the transition economies. But the rapidly accumulating problems in the water sector of OECD countries must now be taken seriously. While supply networks and treatment systems are largely in place in OECD countries, many of them are ageing quite quickly. In North America, for example, many urban water supply systems were built from 1830 to 1880! Without action, the costs of water leakages and pollution can only increase. To keep pace with the deterioration of water infrastructures, it is estimated that they need to be replaced at a rate of about 2% a year, but actual rates are usually far lower, at just 0.01% in London and 0.8% in Munich, for instance.

In addition, the cost of meeting increasingly stringent environmental regulations is set to grow sharply, and for some countries water security will remain high on the agenda because it is a potentially vulnerable critical infrastructure. As well as regulation and encouraging better management practices, full cost recovery through appropriate water pricing will also help.

This is a heavy agenda and needs to be tackled quickly. With water scarcity challenges now facing such places as the lush Garden of England, more than ever, no one can say they were not warned. ■

References

- Ashley, R. and Cashman A. (February 2006), "Assessing the likely impacts of socio-economic, technological, environmental and political change on the long-term future demand for water sector infrastructure", prepared as a contribution to the OECD Futures Project on "Global Infrastructure Needs: Prospects and Implications for Public and Private Actors".
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