



*All know the way, but
few actually walk it.*

Bodhidharma, 6th Century

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CHAPTER 15

Conclusions and Recommendations

Flooded slum on the edge of Pasig River, Manila, Philippines

Key Recommendations:

- 1. We need to recognize that access to clean water is a fundamental right.** In 2002, the UN Committee on Economic, Social and Cultural Rights affirmed that 'sufficient, affordable, physically accessible, safe and acceptable water for personal and domestic uses' is a fundamental human right of all people and a pre-requisite to the realization of all other human rights. Although not legally binding for the more than 140 countries ratifying the International Covenant on Economic, Social and Cultural Rights, this decision carries the weight of a moral obligation on the signatories to progressively ensure that all the world has access to safe and secure drinking water and sanitation facilities, equitably and without discrimination. As the world is currently falling short of meeting the targets set to ensure adequate water services for all, it is our shared responsibility to maintain vigilance and continue to monitor our progress towards this goal.
- 2. Poverty remains the biggest problem facing the world today.** The Millennium Development Goals (MDGs) adopted at the 2000 United Nations Millennium Summit focused world attention on this issue. Inadequate drinking water and sanitation services are key aspects of poverty with serious implications – death, disease and delayed development in the populations immediately affected. Broader ramifications include wasted economic opportunities, social and political unrest and environmental pollution. These problems are especially acute in the fast-growing human settlements of the developing world, particularly in shanty towns and slums with little if any water services. Rapid industrial growth and pollution in this context exacerbate the competition for water resources, often without providing the needed jobs for migrants. **We need to focus on better water governance that embraces all stakeholders and civil society, in both the public and private sectors, with strong support from the international community as the only plausible solution to these expanding problems.**
3. Climate change with increased variability exacerbates the spatial and temporal variability of water resources and intensifies the urgent need for the sound management of water resources. Given the finite quantity of freshwater, the current business-as-usual approach to development can only limit usable water resources as a result of continual and widespread physical and chemical pollution from virtually all sectors. Inadequate data collection, poor reliability of existing data and our limited understanding of the functioning of hydrological systems are a serious handicap to good planning and management. **We need to better understand complex environmental systems and the impacts of human activities, if society is to anticipate, mitigate and adapt to environmental changes and changing circumstances.**
- 4. We need to recognize that sectorally and geographically, water problems and challenges are neither independent nor isolated.** Their solutions thus need to be addressed in a comprehensive and holistic manner, taking into account a variety of circumstances with solutions tailored to the situation. Hence we see the emergence and broad acceptance of the concept of Integrated Water Resources Management (IWRM). While IWRM may vary in different socio-economic settings and should be flexible enough to fit the attitudes and principles of local people, its core principles of equity, efficiency and environmental sustainability are invariable. Yet only a very few countries were able to meet the Johannesburg target calling for IWRM to be incorporated into national plans by 2005.
5. It is increasingly recognized that healthy ecosystems have importance far beyond their amenity or biodiversity preservation value. Healthy ecosystems are integral to the proper functioning of the hydrological cycle, thus environmental preservation must be at the heart of IWRM. Environmental pollution and the disruption of natural flows from all sectors (municipal, agricultural, industrial, energy, transport, etc.) must be addressed both in terms of detrimental impacts on aquatic habitats and the broader implications for the sustainable availability of clean freshwater resources. **We need to understand that water moves within natural limits, which usually do not correspond to the administrative units within which societies organize themselves.** Addressing water management issues from the perspective of natural boundaries, rather than political administrative units, will facilitate the consideration of environmental issues in IWRM. The urgent need for the integration of environmental and socio-economic concerns must be overcome with the greater collection and use of geo-referenced data.
- 6. With growing demand and decreasing supply, competition among different sectors and users is increasing, requiring greater wisdom in the allocation of the resource and greater efficiency of water use.** The implementation of an IWRM approach with transparent mechanisms, e.g. tariffs, for allocating water among competing sectors is necessary to ensure sustainable widespread availability of limited freshwater resources. More efficient water use must be accomplished not only through the adoption of a variety of new technologies and the application of proven traditional knowledge, but also, and most importantly, through better water governance and the recognition that demand management must be a shared responsibility across all sectors.
- 7. With fast changing socio-economic conditions occurring against the backdrop of unprecedented environmental change, water crises in many parts of the world are becoming increasingly severe.** Whether the problem is too much water or not enough, extreme pollution or excessive diversion, water remains a critical necessity for social and economic development. The solution to many, if not most, water-related problems lies first and foremost in better governance. Regardless of the particular mix of characteristics within a society or polity, the principles of transparency and accountability should prevail. Monitoring and indicator development at all levels are critical to supporting these critical aspects of good governance and informing important policy decisions.
- 8. We must increase focus on the governance aspects of water management.** Good governance, although increasingly recognized as the key to more equitable, efficient and sustainable resource management, continues to encounter problems on the ground. Inadequate institutions, weak and ineffective legal frameworks, and limited human and financial resources continue to plague implementation and impede reform in water resources management. We need to enhance capacity across all sectors, and build awareness so that citizens and policy-makers may be better informed about water issues in order to encourage responsible decision-making at all levels.

Chapter 1 sets out a wide range of the issues at stake in the water sector and the global contexts in which they are taking place. These are further discussed, as appropriate, in the different water challenge areas covered by subsequent chapters. The many aspects of water, as they relate to poverty and environmental degradation, are briefly reintroduced together here, before moving on to recommendations for the future, such as ensuring that water-related factors do not contribute to the prolongation of poverty and environmental decay; facilitating the productive and sustainable use of water to reach the MDGs' aims of socio-economic development and environmental protection; and ensuring the use of a holistic approach to water and land-use management, which embraces Integrated Water Resources Management (IWRM) as its central principle.

As we have seen throughout the Report, even though there is plenty of freshwater at the global scale, it is unevenly distributed over time and space. For example, many of the relatively rich and sparsely populated countries in temperate zones have bountiful freshwater resources and rainfall throughout the year in addition to low evaporation, whereas poorer, more densely populated areas in tropical zones generally have less water per capita, and the bulk of their precipitation often occurs during a period of several weeks each year. In the tropics, water evaporation is high due to warmer climate, and dry spells occur frequently in some areas. It is expected that climate change and variability will have the most dramatic effect on tropical zones. Floods and hurricanes are already increasing in number and severity in many countries in the tropics. The hydrology and climatology of these regions differ from those of the rest of the world and thus may require completely different institutional and technological means of providing sufficient water throughout the year.

Uneven distribution of water resources also occurs between regions, communities and income groups within countries. In many cases, large- and small-scale infrastructure development, such as irrigation canals, water reservoirs and water transfer canals, has made it possible to distribute water more evenly both over time and space, benefiting households and various productive uses of water. However, many regions, such as the Middle East and North Africa, have reached a point where it is too expensive or logistically unfeasible from a hydrological point of view to respond to water crises by increasing the supplies of water.

Increases in water shortages and stress are a pressing problem in many countries. Although in absolute terms, water in many countries is not scarce, many people still lack sufficient and reliable access to clean water and sufficient water for food production and other productive uses. For example, water is wasted by inefficient irrigation and the poor operation and maintenance of water works. In many places of the world, a staggering 30 to 40 percent of water or more goes unaccounted for due to water leakages and illegal tapping. The Food and Agriculture Organization (FAO) has estimated that the overall water-use efficiency for irrigated agriculture in developing countries averages 38 percent. A basic insight – which has not yet attracted enough attention – is that the insufficiency of water, particularly drinking water supply and sanitation, is primarily driven by an inefficient supply of services rather than by water shortages (see **Chapter 2**).

A lack of basic services is often due to mismanagement, corruption, lack of appropriate institutions, bureaucratic inertia and a shortage of new investments in building human capacity as well as physical infrastructure. Water supply and sanitation have recently received more international attention than water for food production, despite the fact that in most developing countries, agriculture accounts for 80 percent of total water use. It is increasingly agreed that water shortages and growing pollution levels are to a large extent socially and politically induced challenges, which means that they are issues that can be addressed by changes of water demand and uses through, for example, increased awareness, education and water policy reforms. The water crisis is thus increasingly about how we, as individuals, and as part of a collective society, govern the access to and control over water resources and their benefits.

This final chapter draws on some of the key issues identified in the previous chapters and references of the Report, looking at them through the lenses of poverty, the environment and governance.

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Freshwater ecosystem, Cambodia



Many poor families suffer from housing insecurity, because they are in rented property or occupying land illegally

Part 1. Water and Poverty

The lifestyle of the extreme poor is almost literally hand-to-mouth; what they earn, in an urban area on a good day, will buy food and water for the family for that day. In rural areas, the food and water needed by families is taken largely from the natural environment: water carried from a distant spring or water body and some not very nutritious food grown on or gathered from marginally productive land, insufficient to satisfy hunger and provide needed nourishment. Very poor people struggle to pay for adequate food and water, rent for housing, medicines and drugs to treat sick family members, transport to get to places of work or carry sick family members to treatment centres, the education of their children and so forth. Very often, the quantity of water needed for good personal and domestic hygiene, laundry, etc. is too expensive to buy from street water vendors, too far to carry in the case of distant water sources, or necessitates the use of polluted water from nearby, heavily used rivers and streams. Rarely do they have access to improved sanitation, and where this may be available from a public facility in towns and cities, the cost to the whole family may be prohibitive.

The payment structure for many utility services like water and electricity, including up-front connection and monthly consumption charges, are often too expensive for the poor (see **Chapter 12**). Water-related disease (**Chapter 6**) and threats from water-related hazards (floods, landslides, droughts, etc., see **Chapter 10**) add to the precarious nature of their environments and lifestyles. Very poor farmers, working marginal farms, cannot afford the soil nutrition additives (agricultural chemicals) and the irrigation services needed to improve the reliability and productive capacity of their land (**Chapter 7**). On top of all of this, indebtedness frequently adds to the burdens of poor households.

1a. Insecure and overcrowded housing

Many poor families occupy land over which they have no formal legal rights – in a squatter community or slum, or farming on marginal lands owned by others with limited access to reliable water (see **Chapter 3**). They lack the savings and stores of surplus food and water to tide them over during lean times. In fact, most official statistics probably over estimate the savings of the poor, because they make no allowance for the depletion of natural

capital by poor communities – excessive cutting down of trees for fuel wood, exhausting the nutrition of soils, over fishing, among many others (Sachs, 2005). Most of the extremely poor are illiterate and unskilled. Women and girls in particular often have the least entitlement to household or family assets (see **Chapters 12 and 13**).

In urban areas, the land occupied by the poor is mainly the most marginal, prone to flooding, steep hillsides, etc. Often, they live right alongside streams and rivers that are grossly polluted, frequently by small-scale industries, involved in metal finishing, textiles, tanning, etc., using older chemical-based processes inherited from the industrialized countries and for which there is little or no affordable treatment technology. Chronic overcrowding is common, and the close proximity of households provides opportunities for the transmission of a range of infectious diseases. Many poor families suffer from housing insecurity, because they live in rented property or occupy land illegally (see **Chapter 3**).

1b. Inadequate access to public infrastructure and basic community services

Very poor households are rarely connected to urban infrastructure – piped water and sanitation, electricity supply, etc. The latter is a significant problem; in many parts of the world, access to electricity lags far behind access to improved water supplies. Drainage systems for urban rain and storm water are frequently inadequate; no formal systems for solid waste collection are provided; and there is a lack of paved areas – footpaths, roads etc. The latter are important not just for movement, they also provide a location for the installation, operation and maintenance of network utility services, such as water, drainage and electricity. There is a lack of flood protection infrastructure. All of this creates an ideal environment for disease transmission, vulnerability to loss of housing and possessions and, overall, a low quality of life.

For the rural poor, the lack of paved roads makes access to markets and health services very difficult. Water plays a very big role in transportation – many waterways, large and small, provide essential transport corridors, while many key roads and bridges are washed away in the rainy season. The rural poor are often at the end of irrigation systems, and dependent on richer upstream users for

water, or pushed out onto land dependent totally on what may receive increasingly erratic rainfall as a result of growing climate variability.

Whether because of inadequate provision of basic community services by local authorities – health care, transport, education and training, emergency services, law enforcement, etc. – or their inability to pay for some of these, the poor are excluded from many vital opportunities. Confronting water-related disease – including malaria, which causes 300 to 500 million episodes of sickness and 1.6 to 2.5 million deaths each year – must also be done. While the urban poor may be close to many of these services, the rural poor often face the added burden of distance and transport costs. All of this increases vulnerability and prevents the development of much needed livelihood skills and, collectively, the capacity needed for greater self sufficiency and enhanced resilience.

1c. Lack of safety nets and adequate legal protection of rights

Poor families find it difficult to accumulate any surpluses, be they nutritional or financial, which means that it is hard to maintain consumption when their incomes are interrupted or their crops fail. In such circumstances, it can be a big problem to find ways to ensure access to water, food, healthcare, education, essential transportation and other necessities. The insurance provisions that are part of the way of life in higher-income countries are almost always denied to poor people.

In addition, there is a common lack of protection, while laws, regulations and procedures that concern legal and political rights, environmental health and protection, occupational health and safety, crime prevention and safeguarding from exploitation and discrimination are often limited or unenforced. Many rural poor suffer from limited rights to land, water and other natural resources. Indigenous people frequently have to struggle for rights to the water they have been using and protecting for generations. Deep well water abstractions by richer farmers and industries can lower water tables to the extent that poorer families and communities cannot then access groundwater. Untreated municipal and industrial effluents pollute the surface and groundwater sources relied on by the poor for their water supplies. Unbridled competition from richer farmers and industrial concerns for water, productive land and fisheries often puts the poor at a serious disadvantage. The implementation of national food policies (through subsidies, taxes, tariffs,

food aid, etc.) can distort markets and marginalize the rural poor, and inadequately organized and non pro-poor international trade liberalization can exacerbate this.

1d. Lack of voice and power within political and administrative systems

It is often very difficult for the poor to assert their rights and needs in order to receive a fair entitlement to public goods and services and hold service providers, NGOs and bureaucracies accountable. Local authorities fail to identify and put in place measures to protect poor communities from water-related hazards and disease. Indigenous communities find their detailed understanding of local water resources and its management is often ignored, while gaining access to information on water-related hazards and water resources is difficult. Many local authorities have little experience in dealing with poor community groups and may indeed be afraid to enter slum and squatter areas. Corrupt practices, in all aspects and levels of society, further complicate matters. These matters affect the approximately 1 billion people worldwide (one-sixth of the total population) in extreme poverty, who through sickness, hunger, thirst, destitution and marginalization find it nearly impossible to climb out of the cycle of poverty (Bass et al., 2005).

Other water-related factors further inhibiting economic growth, such as landlocked countries with poor transportation links, inadequate roads prone to water-related damage, lack of navigable waterways and good natural harbours. Widespread poverty and a lack of savings mean that governments cannot borrow from domestic sources or collect tax to provide essential public goods and services, so they borrow heavily, creating international debt burdens, which they cannot then service. Governments may fail to create the environment favourable to private business investment, both foreign and domestic.

Cultural barriers that discourage an active role for women marginalize an invaluable productive resource and prolong the demographic transition from high to low fertility. This exacerbates the problems of affordable education for all the children in a poor family and providing enough food and healthcare as well as reducing the amount of land per person to be passed on to the next generation. Poor countries tend to be very low on innovation, as they do not have the financial resources for the research and development needed to support economic growth. Trade sanctions put barriers in the way of trade by poor countries, often, remarkably, between adjacent poor countries (Sachs, 2005).



Slum in Jakarta, Indonesia



Public water pump in Amboseli Reserve, Kenya

Untreated municipal and industrial effluents pollute the surface and groundwater sources relied on by the poor for their water supplies



The time when countries could industrialize with no regard for pollution and then invest in a massive clean-up, once and if they could afford to do so, is long gone

Part 2. Water and the Environment

2a. The worrying deterioration of natural capital

Chapter 6 points to an alarming deterioration in freshwater aquatic ecosystems and species. In addition, the Millennium Ecosystem Assessment (MEA), in a review of some twenty-four ecosystem services (including a stable climate, freshwater replenishment, fresh air, soil fertility, pollination of crops, waste clean-up and nutrient recycling) highlighted the fact that fifteen of these are being degraded or used unsustainably.

In 2000, the total forest area of the planet was about 3.9 billion hectares (ha), or around 30 percent of the world's total area. During the 1990s, FAO estimated that some 94,000 square kilometres of forest (km²), an area roughly the size of Portugal, was lost to clearances of one sort or another each year. Forests contribute directly to the lives and livelihoods of over a billion people living in great poverty, providing them with freshwater, food, meat, medicines and building materials. As a result of such deterioration, poor communities face reduced levels of food protein, clean water and income-generating potential, which undermines poverty reduction strategies and is causing unprecedented rates of species extinction rates. Normal aquatic biodiversity is very rich, with high levels of endemic species. As species decline, biodiversity is reduced and essential ecosystem resilience diminishes.

The UN Millennium Project has made plain that long-term success in meeting the MDGs depends on environmental sustainability. Without it, any gains will be short-lived and inequitable. Yet, apart from climate change and warning systems for natural hazards, very little is being done on an international scale. Part of the problem is the very modest political effort devoted to sustainable development, compared with global economic growth. Although specific action programmes for forests, climate change and biological diversity were put into place in the latter part of the last century, they were mostly agreed before the MDGs and retain rather limited backing now (Concern/*Guardian*, 2005).

2b. The growing pressures on natural systems

As this Report points out, there has been a significant growth in freshwater-related disasters since the turn of the century in rich and poor countries alike, with over 400,000 lives lost and 1.5 billion people affected.

Some 13 percent of the world's population, over 800 million people, do not have enough food to live healthy and productive lives. Providing the water needed to feed a growing population and balancing this with all the other demands on water, is one of the great challenges of this century. Providing water for environmental flows and industry will tax water resources even more. Extending water services to the 1.1 billion unserved with improved water supply and the 2.6 billion lacking improved sanitation, will enlarge the challenge even further. Energy's water needs also need to be recognized: whereas some 90 percent of the urban world has access to improved supplies, only 37 percent has access to energy.

Water pollution worldwide is of huge concern, but has not received adequate attention. **Chapter 4** indicates the vast amount of water used to dilute and transport wastes. It has now become clear that dilution is not a viable solution to managing pollution. **Chapter 1** explains that the world's sinks for pollution are filling up fast – rivers, seas, atmosphere. The water sector has done little long-term forecasting or scenario development, but what has been done suggests that 'the problem of water is the most important global scale issue of the present century' (Simovic, 2002). In particular, the current use of clean water for the dilution and transport of wastes is not sustainable.

Yet the world has a vast knowledge of a wide variety of wastewater treatment systems – at all scales, many different degrees of ease of use and a wide range of affordability. We can treat household and industrial wastes, we have farm management practices which inhibit the polluting run-off from the use of agricultural chemicals into rivers, streams, the sea and groundwaters. Urgent steps must be taken worldwide to begin to implement tried and tested methods of wastewater treatment before the situation gets out of control. The time when countries could industrialize with no regard for pollution and then invest in a massive clean-up, once and if they could afford to do so, is long gone. The world no longer has the sinks for pollution that can accept this approach.

The net effect of this broad range of increasing pressures on water is a serious worsening of global water quality and a steady reduction of available per capita quantities of clean freshwater.

Part 3. Water and Governance

As made plain in this report, water is absolutely central to alleviating poverty, protecting the environment, promoting socio-economic development and achieving the MDGs. Yet despite this, not very many lower-income countries include water as a key feature of their national planning and budget processes, according to the Poverty Reduction Strategy papers and the outputs from the UN World Summit in 2005. Furthermore, the evidence suggests a widespread mismanagement of water in many countries, characterized by a lack of integration, sectoral approaches and institutional resistance to change by large public agencies in a context of increasing competition.

The available information alarmingly suggests that very few of the world's many significant and often transboundary rivers (of which there are 264, with 40 percent of humanity living in shared river basins) have well resourced, competent basin management commissions. The same is true for many of the world's important aquifers. Along the same lines, too few competent, properly resourced, independent basin regulatory agencies are operating with the needed powers. Too few water and electricity utilities in lower-income countries function even moderately well or are even close to recovering their full operating costs, not to mention depreciation. Much of their infrastructure is run down and degraded, and additional capacity – infrastructure and human and other resources – needed to meet the MDGs is lacking.

In many countries there is a huge deficit of water storage and flood protection infrastructure at all levels and scales, which will be aggravated, especially in the light of increased climate variability and volatility.

Only a minority of local authorities and water associations have the resources needed to carry out the delegated responsibilities they have inherited from central governments. Yet it is at the local level that authorities can empower community groups to self-manage the installation and operation of water supply and sanitation systems and safely collect and dispose of solid waste.

Just what is the total demand for community health and agricultural extension services in lower-income countries worldwide? Given that the knowledge to solve many, if not most, of the world's pressing water-related problems

exists, how well is this knowledge shared with those who really need it? Again, it is difficult to be precise, but general demand for advice, expertise and skills vastly outstrips the resources to provide it.

Previous chapters provide clear and convincing evidence that data on almost every subject related to water issues is usually lacking, unreliable, incomplete or inconsistent. We have learned that merely collecting data is not enough. It must be brought together, analysed and converted into information and knowledge (see **Chapter 13**), then shared widely within and between countries and stakeholders to focus attention on water problems at all scales. It is only when the data has been collected and analysed that we can properly understand the many systems that affect water (hydrological, socio-economic, financial, institutional and political alike), which have to be factored into water governance.

To facilitate understanding, advocacy and access to needed resources, the sector's many challenges need to be summarized and presented in simple but realistic terms. Trends must be discerned and progress monitored so that those who are falling behind can be helped, successful experiences can be identified and the lessons shared. The key to this is good, robust indicators, an ongoing iterative process that is impeded by a lack of good, reliable and consistent data, which needs input from sources external to the UN system to expedite the process.

3a. Awareness and advocacy

Each of the Report's chapters point to the challenges facing the water sector in order to raise awareness and advocate early action to tackle the world's outstanding water problem – poor water governance – by reminding the world that its water problems are not going away.

The lack of coverage of water in the Poverty Reduction Strategy Papers and the UN World Summit in 2005 is a matter of serious concern to the water sector, which must rigorously investigate the reasons for these omissions and set out systematically to change perceptions about water, while making clear that it occupies a central place at the head of the development agenda.

Lack of such understanding has contributed to serious under-investment and inadequate donor aid to the sector.



...there seems to be a huge deficit of water storage and flood protection infrastructure at all levels and scales...



Children playing in the river, Cambodia

Investment in improved water supply and sanitation has a strong potential for yielding three to thirty-four times the original investment...

Private investors are deterred because they feel that the water sector offers higher risks, but longer and lower returns on investment, than other sectors. Both public and private sector investors are deterred by what they perceive to be inadequate governance. Yet the cost-effectiveness of water investments is plain to see, as discussed below. This evidence and their supporting arguments need to be better organized and more forcefully projected to secure needed resources.

3b. The cost-effectiveness of water investments

Recently, an impressive range of information has become available relating to the cost-effectiveness of investments in water resources, water supply and sanitation service delivery, and in ecosystem protection.¹

Investment in improved water supply and sanitation has a strong potential for yielding three to thirty-four times the original investment, depending on the local circumstances. By adding rapidly deployable interventions targeted at the poor, such as improved household water treatment and storage, returns can go up to sixty times the original investment. It has been estimated that 322 million working days per year, with an annual value of US \$750 million, would accrue from meeting the MDG water and sanitation targets. Furthermore, the World Health Organization (WHO) has estimated that meeting these targets would yield time and convenience savings of US \$7 billion and a further US \$340 million in savings due to the costs avoided in seeking treatment, including the costs of care, drugs and transport and the opportunity costs of time spent in seeking medical attention.

By comparison, the annual per capita costs of meeting the MDG water and sanitation targets are extremely low: somewhere between US \$4 and \$7 in countries like Bangladesh, Cambodia, Ghana, Tanzania and Uganda. Illustrating the effect this can have on a country, those with improved water supply and sanitation enjoyed an annual growth rate of 3.7 percent of GDP, whereas those without grew at a paltry 0.1 percent.

For the irrigation sector, drip irrigation and treadle pumps (see **Chapters 1 and 7**) are two ways in which access to small-scale water technology can be provided to poor farmers. Research has shown that the direct total net benefit of promoting small-scale water technologies to 100 million poor farmers would mean gains estimated at US \$100 to \$200 billion.

Well-managed ecosystems more than pay for themselves, while providing a wide range of services, as indicated earlier. Yet many lower-income countries are losing a staggering 4 to 8 percent of their GDP through environmental degradation. Industrial income lost to water pollution in China in 1992 alone amounted to US \$1.7 billion. On the other hand, an investment in watershed protection can save anywhere from 7.5 to 200 times the original investment in costs of waster treatment saved. The annual benefits of protecting a wetland in Cambodia, for example, have been estimated at US \$3,200 per household.

With respect to climate variability, for example, it has been estimated that improved resilience to floods and drought could help Kenya's GDP to grow at an annual rate of 5 to 6 percent – the amount needed to start effectively reducing poverty – rather than its current 2.4 percent.

3c. Integrated Water Resources Management

Change is virtually the only constant of modern times, as emphasized by **Chapter 1**, with globalization, urbanization, climate variability, hydrological variability, cooperation and conflict all vying for attention within the water management setting. All of which emphasizes the necessity for societies and their socio-economic systems to be adaptive and resilient.

The political systems of the world vary greatly, driven by different underlying cultures, attitudes, relationships and natural environments. Relationships between different levels of government also vary, within their institutions, legislative, regulatory and socio-economic settings. Watershed and basin boundaries often do not coincide with administrative boundaries, causing many overlaps to occur. Strategic basin and watershed issues cannot always be dealt with at the local level. Growing demands for water, availability reduced by pollution, competition from the various sectors and the many and growing number of users, is another constant. Globally, regionally, nationally and locally, ecosystems are under growing threats.

All of this emphasizes that the various water issues are not independent of each other and focuses on the need for greater foresight in the allocation and management of water resources. At both strategic and local levels, a flexible approach is essential. The answer to all of this, including meeting the MDGs, lies in a holistic, ecosystem-based approach, known as Integrated Water Resources Management (IWRM).

1. This section has been adapted from SIWI/WHO, 2005.

The different chapters of the Report, which address the challenge areas associated with meeting the MDGs, set out what needs to be done in the different water-using sectors. Each stresses how the IWRM approach is essential to an optimum and efficient response to the challenges. But there is no panacea for implementing IWRM; it must be tailored to prevailing conditions and flexible enough to permit this. Local circumstances can put obstacles in its way:

- lack of appropriate governance
- lack of proper coordination of management activities
- lack of appropriate management tools
- institutional fragmentation
- insufficiently trained or qualified manpower
- shortfalls in funding
- inadequate public awareness
- limited involvement by communities, NGOs and the private sector.

Probably because of these and other difficulties, very few countries have met the Johannesburg Plan of Implementation (JPOI) target that IWRM should be incorporated into national water resources plans by the end of 2005. Thus, it is clear that more analysis of the practical means of moving from a fragmented, sector-by-sector approach to IWRM needs to be carried out for lower-income countries, and these experiences need to be shared widely (see **Chapter 14**).

3d. The need for international and national cooperation

The necessary overhauls of water governance and the challenge of meeting the MDGs are closely linked. In order to succeed in both, action at all levels of society is required. Individuals must take greater responsibility, both for their families and their communities. Provincial and national governments, with full transparency and accountability, must take steps towards making resources available and creating enabling environments for beneficial change, while ensuring that water policies and plans are set firmly within the context of regional and national development plans and budgets. Action to increase progress on the MDGs must be initiated within countries themselves, involving the whole country and maximizing the capacity for community self-organization.

At the international level, industrialized countries must play their part. **Chapter 1** makes clear that the MDGs are a joint project. The first seven goals are directed at alleviating poverty; while the eighth goal is to create the partnerships of rich and poor countries to meet the first seven. Lower-income countries are tasked with delivering promised policy changes and improvements to governance, and the industrialized countries must follow through with their long-standing commitments to increase Overseas Development Assistance (ODA) and technical assistance.

*Globally,
regionally,
nationally and
locally,
ecosystems are
under growing
threats*

Women's group for micro-finance, Andra Pradesh, India





'In economic terms, the human race has never been richer, or better armed with the medical knowledge, technical prowess and intellectual firepower to make poverty history'

Part 4. Cautious Optimism

4a. Economic progress is being made

As previous chapters indicate, there should be cause for cautious optimism. We know that economic development can and does work in many parts of the world. Despite the sometimes daunting data and statistics on the extent of poverty, at least five-sixths of the world's population is at least one step above extreme poverty. Nearly 5 billion people are living in countries where average incomes rose in the 20 years between 1980 and 2000. Over a similar timeframe, life expectancy increased in a range of countries in which some 5.7 billion people live. Out of the total world population of 6.3 billion people, nearly 5 billion have managed to advance into at least the first stages of social and economic development. The truth is that, thankfully, the scale of extreme poverty is lessening, both in terms of the total numbers affected and as a proportion of the total world population (Sachs, 2005).

In addition, the growth of microfinance is proceeding and has great potential for speeding up poverty alleviation.² Microfinance is a system of providing small loans to the very poor, which can then be used by local communities to build a well, for example. Microfinance is presently receiving a lot of attention from policy-makers, with its proponents asserting that it has enormous potential in the fight against poverty – sweet music indeed for those who fight for the rights of the poor and the abolition of poverty (*Economist*, 2005). It is showing signs that it may be about to expand substantially by providing financial services that can be made available to the very poor, or low-cost insurance to protect them against the risks and setbacks to which they are particularly vulnerable – water-related hazards, crop and livestock losses, death of the family breadwinner and others.

Among the barriers to providing financial services to the very poor are inflation, incompetent governments (which allow corruption and fail to provide an enabling environment for financial services) and property laws that make it impossible for homes (for those who own their own) to be used as security for loans. Funding for microfinance organizations must go beyond governments, aid agencies and charities, and the cost of operations must be brought down, because as it is presently organized, microfinance is very labour-intensive.

4b. Reform is underway in the water sector

Although evidence of its effectiveness is hard to come by, a tremendous worldwide revolution is ongoing in the reform of the water sector's many institutions. Progress is patchy, sometimes slow and not as synchronized with national development planning and budgeting as it should be. Many local initiatives, often by poor communities, are underway but usually under-reported. Rapidly growing lower-income countries, such as Brazil, China and India, are coming up with a wide range of novel initiatives to deal with their water governance and water service delivery challenges, which are robust and could be adapted by other countries. The UN Millennium Project (see **Chapter 1**) has produced a range of plans and ideas to meet the MDG targets on time, much of which involves activities within and directly related to the water sector. Universities training water managers have shown that they understand the issues and challenges of contemporary water management and are responding positively to them.

This report covers a lot of ground, reflecting the breadth and scope of what needs to be done in the water sector worldwide and indeed what is being done. It has made plain just how central water is to poverty alleviation and development and how little this fact has been recognized and acknowledged. There are other important sectors that would wish to claim priority for scarce resources and investments, yet water is *primus inter pares* – the first among equals. No matter how many mobile phones are in circulation, how many new drugs and new seed varieties are produced, without access to secure water supplies, development will stall and the MDG targets will fall short. The same can be said about the environment, which is also dependent upon good quality water to sustain it.

It is not that the world does not have the resources to do what is needed, both for water and the MDGs. The Millennium Project has made clear that the world does have the wealth and the tools to do what is needed, an idea that *The Economist* (2004) has succinctly summarized: 'Optimism is certainly justified. In economic terms, the human race has never been richer, or better armed with the medical knowledge and technical prowess and intellectual firepower ... to make poverty history'.

Given the nature of the challenges, the thoughts of the 2005 Stockholm Water Prize winner, Ms Sunita Narain,

2. It is not certain how many microfinance organizations there are worldwide, but the number is thought to be large and growing. Indonesia alone claims 600,000 and other countries in Asia and in Africa claim many thousands more. Today, some of the world's biggest banks (Deutsche Bank, Citigroup, HSBC and ABN Amro) are showing an interest. Credit rating agencies are beginning to provide affordable services to microfinance organizations, and big banks are finding their way into the sector through the remittances that overseas workers send to their families back home.

seem particularly appropriate. She noted that water is about more than just water; it is about building people's institutions and their power to take control over decisions. However, water cannot be made everyone's business without fundamental changes in the way we do business with water: 'Humanity must realise, policy makers and public alike, that water management which involves communities and households needs to become the greatest cooperative enterprise in the world.'

Given the state of water around the world, and the challenges facing contemporary water managers, there has probably never been a more exhilarating time to be in the profession. Certainly, managing water today is a tough proposition, but the rewards are immense: world poverty alleviation and environmental sustainability.

In some of the concluding remarks to WWDR1, it was said that, given the evidence available at that time, the prospects for hundreds of millions of poor people in lower-income countries, as well as the natural environment, did not look good. Has the situation improved since then, in the intervening years? Yes, it has. Certainly the major water-related challenges have not changed very much, but a worldwide process of reform of water is underway. We have convincing evidence of the very positive cost-effectiveness of investments in water. The growth in microfinance has the potential to provide essential capital for the extension of water service provision, through a much enhanced availability of funds to the very poor, while also contributing to lessening their insecurity in many other ways. The MDG review has been carried out; we know what has to be done to meet the targets, and a plan to do this has been produced. We know that there has been and continues to be progress in poverty alleviation and socio-economic development. We know, in fact, how to bring to an end the exclusion of the poor from their fair share of the Earth's resources. With determination and political will, the levels of international cooperation agreed on in the Millennium Declaration, and

reconfirmed at the 2005 UN World Summit, the MDGs can be achieved, and the water sector can be reformed.

There is a danger of complacency however. The fast changing context of today's world, especially the accelerated pace of climate change, can only heighten the urgency with which we must address our water-related challenges. We all share the responsibility to ensure that water – critical to every aspect of our life – remains at the forefront of the political agenda.

*Jiuzhaigou valley,
Sichuan, China*



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