



United Nations Development Programme

# Water Governance for Poverty Reduction

*Key Issues and the UNDP Response  
to Millenium Development Goals*

## Foreword

### From Water Development Challenges to Opportunities

The water crisis is a largely silent crisis. Every year, some 3.4 million people, mostly children, die from diseases associated with inadequate water supply, sanitation and hygiene. Over half of hospital beds in the world are filled with people suffering from water-borne diseases.

The water crisis is a problem that in many parts of the world is getting worse even as we strive towards meeting the Millennium Development Goals, which include the targets of halving, by 2015, the proportion of people without access to safe drinking water and proper sanitation, and fulfilling the Johannesburg Plan of Implementation agreed at the World Summit on Sustainable Development.

It is crisis with many dimensions, but one of the most important – and neglected – is the governance aspect: meeting the MDGs will depend in large part on whether we can all value and manage scarce water resources better at both the individual and collective level. We need to support national policy and regulatory frameworks for integrated water resources management and the development of improved water service delivery mechanisms, through a participatory approach, at all levels of society.

This booklet not only examines the governance aspect of the crisis but also the various social, economic, environmental and capacity challenges as they relate to the MDGs, proposing solutions at every level. The booklet draws on the experience and work of UNDP, as the UN's global development network, highlighting our holistic approach to create an enabling environment for water resource management to enhance the lives of the poor. In doing so many opportunities are created to foster the exchange of knowledge and expertise and capacities developed to meet the various challenges through unique interventions that are outlined in this book.

I am sure that the issues raised in this booklet will stimulate further thinking and debate about this critical issue.



**Shoji Nishimoto**

Assistant Administrator and Director  
Bureau for Development Policy

## Prologue

This booklet aims to highlight the key water-related challenges developing countries face, give examples of approaches that have worked based on the experience of UNDP and its partners, and make recommendations concerning policy. It is organized in chapters that correspond to the areas targeted by the Millennium Development Goals.

Chapter 1 provides an overview of key water issues, how they relate to the MDGs, and how UNDP addresses them through improved water governance, integrated water resources management, and capacity building. Chapter 2 looks at the role of water in eradicating poverty and hunger; Chapter 3 addresses gender equality, women's empowerment and girls' education; Chapter 4 explores the role of water in safeguarding human health, particularly in reducing child mortality and major diseases for which water is a vector; Chapter 5 examines the relationship between water and environmental sustainability; Chapter 6 explores the special challenges faced by slum dwellers with regard to water and sanitation; and Chapter 7 presents conclusions, recommendations and the key elements of UNDP's water strategy.

The views expressed in this publication do not necessarily represent those of UNDP. The designations and terminology employed and the presentation of material do not imply any expression of opinion whatsoever on the part of UNDP.

© 2004

United Nations Development Programme  
One United Nations Plaza  
New York, NY 10017

**Editor:** Kristen Lewis

**Managing Editor:** Lara Yacob

**The book was conceptualized and guided by Ingvar Andersson**

The editorial team would like to thank the following colleagues for their invaluable and extremely useful comments, suggestions and inputs: Undala Alam, Walid Badawi, Neera Burra, Arnaud Comolet, Maleye Diop, Asa Forsman, Maryam Niamir-Fuller, Linda Ghanime, Pascal Girot, Peter Hazlewood, Michael Hooper, Andrew Hudson, Arun Kashyap, Charles McNeill, Prahtibha Mehta, Leda Mercado, Nehemiah Murusuri, Joseph Opio Odongo, Jonas Rabinovitch, Shashi Sudhir, Susanne Schmidt, Minoru Takada, Carmen Tavera, Paul Taylor, Sarah Timpson, Hakan Tropp, Juha Uitto, Jake Werksman and Gregory Woodsworth. We would like to acknowledge Kristen Helmore's contribution of the case studies in this book.

## Acknowledgements

**Design:** Rizco Design

**Photo Credits:** Karsti Steige (cover image), Pernacca Sudhakaran (interior images)

**For more information please contact:**

Water Governance Programme

Bureau for Development Policy

UNDP

304 East 45th Street New York, NY 10017

**Email:** [bdp-water@undp.org](mailto:bdp-water@undp.org)

[www.undp.org/water](http://www.undp.org/water)

January 2004

## Contents

1 Water – A Key to Meeting the  
Millennium Development Goals

---

2 Combating Poverty and Hunger

---

3 Promoting Gender Equality  
and Girls' Education

---

4 Safeguarding Human Health

---

5 Sustaining the Viability and  
Biodiversity of Ecosystems

---

6 Bettering the Lives of Slum Dwellers

---

7 Conclusion: Meeting Water-related  
Challenges to the Achievement of  
the Millennium Development Goals



## Chapter 1

# Water – A Key to Meeting the Millennium Development Goals



It is difficult to convey the centrality of water to all life on Earth without resorting to clichés. Yet there it is: water is life, for people and for the planet. It is essential to the well-being of humankind and a basic requirement for the healthy functioning of all the world's ecosystems. As such, water is

a catalytic entry point for UNDP's efforts to help developing countries fight poverty and hunger, safeguard human health, reduce child mortality, and both

**Water is life, for people and for the planet. It is essential to the well-being of humankind and a basic requirement for the healthily functioning of all the world's ecosystems.**

manage and protect their natural resources. Over the past decade, the organization has managed a portfolio of over US\$1 billion in support of sustainable water development in more than 100 countries worldwide.

Clean water is essential for human health and survival; indeed, the combination of safe drinking water, adequate sanitation and hygienic practices like hand washing is recognized as a precondition for human health and for overall reductions in morbidity and mortality rates, especially among children. As the subsequent chapters will illustrate, access to clean water and sanitation services is also critical to other facets of sustainable development, from environmental protection and food security to increased tourism and investment, from the empowerment of women and the education of girls to reductions in productivity losses due to morbidity and malnutrition. In addition, sufficient water for washing and safe, private sanitation facilities are central to the basic right of every human being for personal dignity and self-respect (*see box 1*).

Yet for almost all of the world's poorest citizens, the right to safe water and adequate sanitation remains a promise unfulfilled. Some 1.1 billion people lack access to safe water, and 2.4 billion lack access to basic sanitation, a humanitarian crisis that each day takes thousands of lives, robs the poor of their health, impedes progress toward gender equality, and hinders economic development, particularly in Africa and Asia. Access to clean water is lowest in Africa, while Asia has the largest number of people with no access to basic sanitation, more than half the population. Important differences exist between rural and urban areas, with rural services still lagging far behind urban services.

The water crisis that humankind is facing today is largely of our own making. It has resulted chiefly not from the natural limitations of the water supply or the lack of financing and appropriate technologies (though these are serious constraints), but rather from profound failures in water governance, i.e., the ways in which individuals and societies have assigned value to, made decisions about, and managed the water resources available to them.

At the United Nations Millennium Summit in September 2000, 189 heads-of-state adopted the Millennium Development Goals (MDGs), which set clear, numerical, time-bound targets for making real progress, by 2015, in tackling the most pressing issues developing countries face (*see box 2*). Cutting in half the proportion of the world's population without access to clean drinking water and adequate sanitation is not only one of the eighteen targets embedded in the MDGs, but also a critical factor for meeting all the goals, including eradicating extreme poverty and hunger; achieving universal primary education; promoting gender equality and women's empowerment; reducing child mortality; improving maternal health; combating major diseases; and improving environmental sustainability.

At the Johannesburg World Summit for Sustainable Development (WSSD) in August 2002, the overall MDGs were reaffirmed and additional targets related specifically to water and sanitation were added under the Johannesburg

### Box 1: The Right to Water

The United Nations affirmed the Right to Water on 26 November 2002, noting that such a right is “indispensable for leading a life in human dignity” and “a prerequisite for the realization of other human rights.” Through its General Comment 15, the Committee on Economic, Social and Cultural Rights of the United Nations Economic and Social Council stated that “the human right to water entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses.” While the right to water has been implicit in the rights to health, housing, food, life, and dignity already enshrined in other international conventions, such as the International Bill of Human Rights and the Convention on the Rights of the Child, General Comment 15 is the first to focus explicitly on the right to water and the responsibilities that governments have in delivering clean water and adequate sanitation services to all. The full text of this General Comment is available at [www.unhcr.ch/html/menu2/6/cescr.html](http://www.unhcr.ch/html/menu2/6/cescr.html).

Plan of Implementation. It was recognized that water and sanitation are fundamental to poverty eradication and sustainable development overall. Although the MDG for water originally referred only to the proportion of the population with sustainable access to an improved water source, at WSSD it was affirmed that sanitation is as important for health and poverty reduction as safe water, and thus the sanitation target was added.

Water challenges will increase significantly in the coming years. Continuing population growth and rising incomes will lead to greater water consumption as well as more waste. The urban population in developing countries will grow dramatically, generating demand well beyond the capacity of already inadequate water and sanitation infrastructure and services. Globally, the withdrawal of water supplies is projected to increase by at

least 50 percent by 2025. This may seriously constrain the availability of water for all purposes – particularly for agriculture, which currently accounts for 80 percent of water consumed in developing countries. Unsustainable agricultural as well as growing industrial production is likely to increase water pollution as well as water use. Experts predict that climate change and variability, particularly the foreseen increases in the frequency and severity of extreme events, will worsen water scarcity to crisis levels in many parts of the world, and by 2025, nearly two-thirds of the world’s population will live in water-stressed regions. Water scarcity is likely to become a more frequent cause for conflict.

This list begs the question “Is achieving the MDG goal on water and sanitation possible?” The answer is a qualified yes. Despite the many challenges, with high-level political will and

### Box 2: The Millennium Development Goals

#### **Goal 1: Halve extreme poverty and hunger**

- Halve, between 1990 and 2015, the proportion of people whose income is less than one dollar a day.
- Halve, between 1990 and 2015, the proportion of people who suffer from hunger.

#### **Goal 2: Achieve universal primary education**

- Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling.

#### **Goal 3: Promote gender equality and empower women**

- Eliminate gender disparity in primary and secondary education, preferably by 2005, and to all levels of education no later than 2015.

#### **Goal 4: Reduce child mortality**

- Reduce by two-thirds, between 1990 and 2015, the under-five mortality rate.

#### **Goal 5: Improve maternal health**

- Reduce by three-quarters, between 1990 and 2015, the maternal mortality ratio.

#### **Goal 6: Combat HIV/AIDS, malaria and other diseases**

- Have halted by 2015 and begun to reverse the spread of HIV/AIDS.
- Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases.

#### **Goal 7: Ensure environmental sustainability**

- Integrate the principles of sustainable development into country policies and

programmes and reverse the loss of environmental resources.

- Halve, by 2015, the proportion of people without sustainable access to safe drinking water and adequate sanitation.
- By 2020, to have achieved a significant improvement in the lives of at least 100 million slum dwellers.

#### **Goal 8: Develop a Global Partnership for Development**

- Develop further an open, rule-based, predictable, non-discriminatory trading and financial system.
- Address the special needs of the Least Developed Countries.
- Address the special needs of landlocked countries and small island developing states.
- Deal comprehensively with the debt problems of developing countries through national and international measures in order to make debt sustainable in the long term.
- In cooperation with developing countries, develop and implement strategies for decent and productive work for youth.
- In cooperation with pharmaceutical companies, provide access to affordable, essential drugs in developing countries.
- In cooperation with the private sector, make available the benefits of new technologies, especial information and communications technologies.

commitment, a clear policy focus, increased allocation or re-allocation of financial resources, and the active involvement of all stakeholders, including poor people themselves, halving the proportion of people without access to improved water and sanitation is achievable, feasible and affordable, and meeting this goal is necessary for real progress against poverty and environmental decline.

Examples exist in all regions of the world that show how accelerated progress is possible and affordable within the budgetary resources of the country and communities concerned. For instance, in 1994, 15.2 million of South Africa's population of 40 million lacked access to basic water supply.<sup>1</sup> Following a series of policy reforms, increased expenditure, and the introduction of a policy to provide a minimum basic water supply free, by mid 2002 more than 7 million previously unserved people had gained access to clean water; at this rate of progress, by 2010 access to the basic supply of water necessary for daily life in South Africa will be universal.

### Key Challenges

Throughout the developing world, there are significant social, economic, ecological, and capacity obstacles to meeting the MDG for water and sanitation. Overcoming them will require more effective water governance, improved water management, enhanced capacity at all levels, and greater empowerment of the poor.

### Social Challenges

Dramatically increasing the proportion of people with access to water and sanitation will require similarly dramatic increases in the degree of empowerment, participation, and social mobilization of the world's poorest. Water flows upstream to the rich and powerful the world over. The challenge to attaining equity in access is finding ways to channel the stream to those who have less social and financial power, thereby reducing the vulnerability of poor people (especially women and children) to livelihood insecurities and water-related diseases and disasters.

Governments often promise free water supply to communities and municipalities during political campaigns, frequently giving rise to unrealistic and ultimately unfulfilled expectations. In addition, communities and governments alike often regard the provision of water as a service that should be provided by the government. This "government supplier" approach has tended to distance communities from planning and decision-making processes pertaining to the development of water infrastructure and the maintenance of water facilities. Furthermore, it has impeded cost-recovery by absolving communities of their responsibilities in sharing the costs of providing drinking or irrigation water, ultimately threatening the sustainability of water services. Fundamentally, this approach has served to undermine community control over water.

Increasing access to sanitation is both an infrastructure issue and a question of education, social marketing, and social mobilization aimed at improving understanding of the links between sanitation and health, changing entrenched habits and mindsets, and, most importantly, creating demand for sanitation services. The most successful tools in this process are not toilets placed in villages by the government or a donor, but community-based, culturally appropriate communication vehicles like home visits by community organizers, motivational kits and materials, songs, skits, slogans and school-based programs.

Another significant challenge, the subject of Chapter 3 on Gender Equality and Girls' Education, is ensuring that the attitudes, priorities, roles and responsibilities of women as well as men are taken into account in planning and implementing water and sanitation projects. Considering the needs, access rights, entitlements, capacities, benefits and burdens of all community members, men and women, rich and poor, young and old, is still the exception rather than norm, making water and sanitation initiatives less effective and sustainable than they could be.

### **Economic Challenges**

Several economic factors hinder expanded access to water and sanitation services. Among them are chronic under-financing of water infrastructures; lack of appropriate economic instruments for sound water management and

efficient and equitable water allocation; and a significant gap between the financial resources needed to meet the Millennium Development Goals (MDGs) and what is currently provided by the public sector, the private sector, and development assistance.

Providing water and sanitation infrastructure systems, especially in urban areas, requires significant capital investments, and it is unrealistic to expect complete cost recovery for initial investments, though operating costs can often be covered through user fees. For many developing countries, the flow of financial assistance has been much lower than warranted by the magnitude of the water crisis. The debt burden many countries face is a serious obstacle to investment. There is also a lack of political will in many developing countries as well as donor countries to invest in improving water and sanitation services and extending those services to poor communities. Furthermore, domestic resource mobilization efforts have not been sufficiently promoted.

In most cases, water markets function poorly because water is greatly undervalued, leading to water profligacy, perverse subsidies, wasteful investments, and resistance to the idea that water is something that one should have to pay for. The Dublin Conference on Water and the Environment in 1992 established the principle that water is an economic good, with economic value in all its competing uses, to which realistic prices should be attached, and whose costs must be met to ensure sustainability of

services. Nonetheless, the widespread lack of appropriate economic incentive structures to use water more efficiently inhibits the adoption of innovative and efficient solutions.

By providing water users with a clear economic incentive to use water efficiently, water pricing and economic incentives for efficient water use are critical for guiding water use and allocation decisions. Pricing instruments can have positive environmental implications since more efficient water use and attention to production costs generally reduces water wastage. Charging for water services (water supply, irrigation, wastewater disposal, etc.) is essential to generating funds for operating, maintaining, and expanding or modernizing the system; ensuring that scarce supplies are allocated to essential purposes; and signaling to users the real value of water.

Experience has shown that even very poor communities are willing to pay for water and sanitation services and invest in the construction and up-keep of systems provided that the communities themselves are involved in the planning and decision-making related to the design of the system, feel that it meets a perceived need, and experience the services as effective and affordable. In such a situation, cost-recovery of operating and maintenance costs is often possible.

On the other hand, the cost-recovery principle should not override the social imperative of

providing a basic supply of safe water and adequate sanitation to every human being, as called for by the MDGs and enshrined in various international human rights instruments. Where there is a concern about providing water to the poor at low cost, a certain minimum volume necessary for basic needs can be provided free or at an affordable price, with higher-level volumes subject to higher tariffs for everyone.

Estimates for the global cost of meeting the MDG for water supply range from US\$50-102 billion for water supply, and from US\$23-42 billion for sanitation (for the period 2001-2015). This is an average of US\$68 billion for water and US\$33 billion for sanitation, for a total of US\$101 billion or US\$6.7 per year. Various studies show the current level of resources available for drinking water, sanitation and municipal waste treatment for all developing countries to be in the neighborhood of US\$27-30 billion.<sup>2</sup> Due to lack of reliable data on water and sanitation coverage in many countries, these cost estimates are only that: estimates. Nonetheless, it is fair to say that financing of at least two-to-three times the current level overall will be required to meet the water and sanitation goals.

While providing water may be expensive, the lack of clean water is far more costly in human terms. As Secretary-General Kofi Annan said in Millennium Declaration, "No single measure would do more to reduce disease and save lives in the developing world than bringing safe water and adequate sanitation."

### Box 3: UNDP's Dialogue on Effective Water Governance

UNDP is working to promote effective governance for a broad range of local, national and international water resources issues. UNDP plays an operational role in helping countries build cross-sectoral capacities and put in place effective and sound policies and institutions to manage and develop water resources in a sustainable way.

A prime example is UNDP's support to the Dialogue on Effective Water Governance, an initiative spearheaded by the Global Water Partnership with the collaboration of the International Council for Local Environment Initiatives (ICLEI). It was Launched in 2000.

Some 40 Dialogues have been held so far in more than 30 countries in six regions, at the local, national and regional levels. On average, nearly 130 people from across the water sectors and from a diversity of backgrounds – national and local government, civil society the private sector and academia – have attended each Dialogue.

The Dialogues make it possible to share current experiences on effective water governance. The outcomes and the issues discussed vary from country to country. In general, many Dialogues focus on building capacity for better water governance, decentralization, basin management and shared waters, participation, establishing an enabling environment, economic instruments and financing.

Dialogues are a means to increase information exchange and cooperation among stakeholders whereby negotiation, improved capacity building and collective planning and decision-making can take place in an atmosphere of confidence and trust. Dialogues discuss issues such as:

- How can governance systems promote efficient and equitable water resources management?
- What kind of legal instruments, policies and institutions are required to encourage stakeholder participation in decision-making?
- Who should participate in a governance system, how should they be involved, and at what stages in the water allocation process?
- Mobilizing political support for the analysis of governance systems with a view to providing alternative solutions for more effective water governance.
- Encouraging politicians, decision-makers and other stakeholders to facilitate the required changes in water governance with solutions that respond to the priority needs of water users.
- Examining governance regimes from various locations around the world to determine what works and what does not, and why.
- Demonstrating IWRM as a practical and ongoing process for water resources management.

The Dialogues have made a start at putting a complex issue on the agenda of decision-

makers and moving this issue from global to more practical regional, national and local levels of implementation. The Dialogue on Effective Water Governance is designed to be an ongoing process. In future the emphasis on practical outcomes needs to continue and to be

strengthened. Experience shows that the best dialogues are those that are specific in theme and place. This helps participants identify practical improvements and find support for them.

### **Ecological Challenges: The Quality and Quantity of Water**

Water scarcity is a tremendous problem in many developing countries. Only 2.5 percent of water on earth is freshwater, and about two-thirds of that is locked up in glaciers and snow. The supplies of freshwater are then diminished further by the 2 million tons of waste (human excreta, agricultural wastes like pesticides, and chemical and industrial wastes) dumped into lakes and rivers each and every day. Salinity as well as contamination from arsenic, fluoride, and other chemical toxins threaten drinking water supply in some areas. In the coming years, the combined impact of the increases in per capita water use that commonly accompany development, population growth overall, increased concentration of the population in urban areas, and the effects of climate change will make water more scarce in much of the world. The balance of supply to population is already uneven; Asia, with 60 percent of the world's population, has only 36 percent of the world's freshwater resources. The disparities will continue to grow. Today, 20 countries face water scarcity. By 2050, water scarcity will affect at least 2 billion people in 48 countries; in the

worst-case scenario, water scarcity will affect 7 billion people in 60 countries.<sup>3</sup>

The quality and quantity of water has clear impacts on poor people's livelihoods, health and vulnerability to crises of all sorts. It also greatly affects overall environmental health, particularly biodiversity, the ability of ecosystems to provide environmental services, and the likelihood of environmental disasters.

### **Capacity Challenges**

Weak capacity is a major impediment to the provision of water and sanitation services and the sound management of water resources. In the water sector, reforms and the decentralization of service provision have created huge capacity building demands. In addition to the long-term requirements for graduates and skilled personnel, much greater attention must be paid to the immediate capacity needs of government and civil society to support policy, legal and institutional reforms. This is a serious issue at all levels.

Decentralized, community-based institutions are effective vehicles for helping poor

### What is Water Governance?

The term water governance encompasses the political, economic and social processes and institutions by which governments, civil society, and the private sector make decisions about how best to use, develop and manage water resources.

communities access water and sanitation, but these emerging groups need tremendous support to advocate effectively for their needs and manage resources fairly and sustainably. Addressing water issues in a holistic way, ensuring that actions taken in one area, such as sanitation, don't worsen conditions in another, such as the environment, requires capacity for cross-sectoral planning and policy making, an ability lacking in many developing countries – and many donor agencies, as well.

There is also a need to develop capacity to construct and manage small, locally operated water and sanitation systems in cities<sup>4</sup>, which are much less expensive and technologically complex than large, centralized systems, as well as to devise and implement a range of lower-cost technological options for both rural and urban areas. Capacity for alternative modes of service provision needs to be built not just in the public sector, but in the private sector as well.

### **Key Approaches: Water Governance, Integrated Water Resources Management, and Capacity**

### **Building**

Water governance is more than national-level water legislation, regulations and institutions, though these are important components. It also refers to the processes that exist to promote popular participation in designing water and sanitation systems and where decisions about those systems are made (in the capital city or in the community itself) as well as how and by whom. It refers to social mobilization and other actions designed to promote ownership, co-investment, capacity building, incentives for participation, and willingness to pay for services at the community level. Effective water governance builds institutional capacity from the local level upwards and empowers stakeholders with knowledge and the ability to make decisions about matters that directly affect their lives. It promotes the equal participation of women and men in decision-making.

Water governance is critical for resource planning and allocation among riparian states (those sharing a water basin) and vital for conflict resolution to defuse upstream-downstream tensions and balance the needs of different groups sharing water resources. Good water governance determines the appropriate role

### **Integrated Water Resources Management (IWRM)**

The grave risks associated with the growing water crisis – illness, hunger, environmental degradation, conflict, stymied economic development – require urgent action in all parts of the world and by all people, from local communities to international bodies. The starting point for action is Integrated Water Resources Management (IWRM). The IWRM is an ecosystem-based approach that considers the relationships among natural resource systems, biophysical processes, and socio-economic systems and objectives, with a view to integrating them in the management of water resources.

for the government in service delivery (i.e., as a facilitator or as a service provider) and ensures that water and sanitation services provided by both public and private actors meet the needs of the people they serve and do not fall prey to corruption. Good water governance corrects market distortions, perverse incentives, and pricing that shuts out the poor.

UNDP focuses on water governance for three main reasons. First, UNDP's overarching goal is poverty eradication, and good water governance is a prime vehicle for ensuring that local and national governments as well as the international system as a whole prioritize the needs of the poor in setting water policy and in designing water and sanitation services. Second, good water governance is a precondition for implementing holistic, integrated water management strategies that balance sometimes competing needs for environmental sustainability, economic growth, and equity in access. Third, UNDP has a comparative advantage in this area. The organization as a

whole makes good governance for poverty reduction a priority across its programme areas, has a long history of grant-based, unconditional partnerships with developing countries, and is viewed as a trusted, honest broker by governments and civil society actors alike.

### **Integrated Water Resources Management (IWRM)**

Addressing the inter-related social, economic, ecological, and capacity challenges developing countries face in managing their water resources to maximize environmental sustainability, growth, and equity requires an integrated, cross-sectoral approach. Effective water governance creates an environment in which this type of management, commonly called Integrated Water Resources Management (IWRM), can occur.

IWRM is a cross-sectoral policy approach to responding to the growing demands for water in the context of finite supplies. Designed to replace the traditional, fragmented

sectoral approach to water resources and management that has led to poor services and unsustainable resource use, IWRM is based on the understanding that water resources are an integral component of the ecosystem, a natural resource, and a social and economic good.<sup>5</sup>

IWRM means recognizing water as a precious, scarce resource with multiple and inter-connected uses: drinking, washing, agriculture, industry, transport, recreation, and the maintenance of human and ecosystem health. It requires coordinating policy and action in the development of water, land and related resources to optimize economic and social welfare without threatening the long-term sustainability of environmental systems. UNDP addresses water issues in order to further a variety of development objectives, including environmental health and sustainability, human well-being, and women's empowerment, and champions IWRM because it addresses the interlinkages between these important areas and makes possible the realistic assessment of trade-offs.

The Key Principles of IWRM Are:

- Water should be treated as an economic, social and environmental good;
- Water policies should focus on both the management of water (demand) and the provision of water (supply);
- Government regulatory frameworks are critical in fostering the sustainable development of water resources;
- Water resources should be managed at the

lowest appropriate level (i.e., in communities and villages as opposed to in capitals); and

- Women should be recognized for and supported in the central role they play in the provision, management and safeguarding of water.

IWRM is essentially about the practical or instrumental integration within and among human socioeconomic systems, natural resource systems, and physical processes (such as the naturally occurring interplay between the hydrological cycle, land, flora and fauna). Practicing IWRM means seeing watersheds, rivers, lakes, wetlands, coastal zones, and oceans as part of an interdependent system; recognizing the ways in which the hydrological cycle affects and is affected by land use; and aiming to create governance systems, policies, institutions and instruments that take these physical processes into account in planning, decision-making and implementation. IWRM provides a framework for balancing these natural processes with social, economic and environmental needs and objectives. Some examples of practical water management instruments are water resources assessments and information dissemination; awareness raising; allocation and conflict resolution; regulatory instruments; technology; and financing.

IWRM is a challenge. It depends upon effective, transparent governing institutions with the capacity to bring about significant changes in the way in which politics, laws, regulations,

institutions, civil society, consumers, and voters interact. Indeed, the rigid functional divisions within governments as well as international development agencies work against the types of cross-cutting, holistic approaches to development planning and resource management that IWRM requires. Building national capacity has emerged as a particularly elusive goal in development cooperation, and initiatives in all sectors have constantly faced both a lack of necessary skill

and weak institutions.<sup>6</sup> Building capacity for integrated programming, when ministries are organized along sectoral lines and poverty reduction and environmental protection/management plans are drawn up separately, continues to be difficult. Nonetheless, IWRM offers a way to approach these issues in a new and potentially more effective way.

### Box 4: Addressing the IWRM Capacity Challenge Through Cap-Net

Since April 2002, UNDP, together with the Global Water Partnership and UNESCO-IHE (the Institute for Water Education), has been implementing Cap-Net, the Capacity Building Network for Integrated Water Resources Management, as a global programme of capacity building for the sustainable development of water resources. Building on widespread water sector reforms towards better water governance and sustainable management and development, Cap-Net is helping to bridge the capacity gap by promoting access to global, regional and national networks, global and regional resource centers, training and resource materials.

Cap-Net's approach is to ensure that capacity building is anchored, owned and managed at the country and community levels. Water sector capacity building supports a process of transformation for the implementation of

Integrated Water Resources Management, affecting water policies and legislation, institutional development and human resources development. Cap-Net is building on past experience that reveals three major areas where strategic changes can significantly improve the successful development of capacity in the water sector: ownership, partnerships and response to demand.

#### Ownership

UNDP recognizes the central role of local capacity, which should be used as a starting point, and Cap-Net advocates local ownership of the capacity building process, supporting and strengthening national and regional networks that are rooted in local capacity building institutions. At the same time, the complexity of IWRM requires that capacity building must address holistically a wide range of issues, problems and opportunities across sectors.

There is no one correct approach to implementing generally accepted IWRM principles; hence the importance of local control and local solutions backed by local adaptation of internationally accepted knowledge and principles.

### **Partnership**

Cap-Net supports 12 regional and national networks of IWRM capacity building institutions around the globe, each with hundreds of member institutions. These networks provide the vehicle for the effective sharing of information and experience and for the delivery of capacity building services using the maximum of available local expertise and skills founded on the best of international and local knowledge. Moreover, networks are more likely to generate a critical mass and economies of scale, drawing on the limited resources of the individual partners. One example of this is WaterNet in Southern Africa, which is using its members to develop the curriculum for a regional master's programme in IWRM, thus taking advantage of the skills and experience of members across the region.

Cap-Net has many international partners, such as the World Wildlife Fund (WWF), the International Water Management Institute, IW Learn, UNESCO-IHE, the International Water and Sanitation Centre, the Economic and Social Commission for Western Asia, the Global Water Programme, the World Bank and the United Nations Environment Programme. Activities with these partners vary from materials development and dissemination to information exchange and the development of network management tools.

### **Response to demand**

Cap-Net supports a growing "demand and supply" market for training in IWRM. When the Southern Africa Water Partnership sought IWRM training, for example, they contracted a fellow Cap-Net member, the Institute of Water and Sanitation Development in Harare, Zimbabwe, to carry out the training. With a less demand-driven approach, the funding is given by a donor directly to the training institution to carry out specified (or unspecified) training. This is less effective. When those receiving training are not required to pay for it there is no real evidence that the training is a priority for them, or that the right people have been selected to undergo the training. Cap-Net is also promoting demand assessment tools and techniques with capacity building institutions and networks. Linkages between implementing agencies and capacity building service providers are vital to ensure the relevance, and therefore the impact, of capacity building. Country and regional water partnerships are one vehicle being used to assess demand and provide inputs for planning capacity building activities. Cap-Net supports the training of trainers and improved access to the information materials and tools required to identify and respond effectively to demand.

For more information on Cap-Net, go to [www.cap-net.org](http://www.cap-net.org)



## Chapter 2

# Combating Poverty and Hunger



One in five people on the planet, two-thirds of them women, live in extreme poverty. Of the world's 6 billion people, 2.8 billion live on less than US\$2 a day, and 1.2 billion on less than US\$1 a day.<sup>7</sup>

### **The MDG on Poverty and Hunger**

Chronic hunger, among the starkest and most absolute manifestations of poverty, affects 800 million people.

### **Goal 1: Halve extreme poverty and hunger**

- Halve, between 1990 and 2015, the proportion of people whose income is less than one dollar a day.
- Halve, between 1990 and 2015, the proportion of people who suffer from hunger.

In this era of progress and plenty, 17 percent of the world's people are on the brink of starvation, and eleven children under five die from malnutrition every minute.<sup>8</sup>

A sufficient supply of clean water for drinking and adequate water for other household uses as well as for agriculture, energy and industry is essential to fighting poverty and hunger. Water is an important factor of production in a variety of industries crucial to economic development and poverty reduction; it is also central to the

livelihood systems of the rural poor. Meeting the MDG in this area will be impossible without better water management and a dramatic expansion of access to water for the world's poorest. Ensuring an adequate food supply, achieving aggregate progress against poverty at the national level, and relieving poverty at

### Box 5: The Poverty-Environment Initiative

For many years, development practitioners and laypersons alike have characterized the relationship between poor people and the environments in which they live as an inescapable vicious circle. While there are, to be sure, instances in which poor people and their environment have become locked in a downward spiral of resource degradation and further impoverishment, this situation is not inevitable but rather the direct result of governance failures. In fact, most environmental degradation and depletion of resources like water are caused by the production and consumption patterns of the non-poor. The poor, whose lives and livelihood choices are profoundly shaped by their physical surroundings and available natural resources, including water, have a strong vested interest in protecting rather than destroying the environment – provided they have some say in its management and use.

The reality is that the relationship between poverty and environment is complex and context-dependent, and simplistic models and unexamined assumptions – such as poverty invariably causing environmental degradation or poor people being uninterested in or unwilling to invest in environmental – lead to poor policy choices. The danger of a simplistic view is that it tends to support policies that reduce poverty at the expense of the environment or protect the environment at the expense of the poor.

Over the last few years, under the auspices of the Poverty-Environment Initiative, UNDP and several of its partners (DfID, the European Commission and the World Bank, among others) have deconstructed these pervasive assumptions through research, case studies, networking, and expert group meetings. They have identified the need for operational shifts toward more integrated development policy making as well as conceptual shifts in the way governments and development practitioners see poor people – namely as part of the solution rather than as part of the problem. Central to both environmental protection and poverty reduction is empowering the poor with the assets, rights, and entitlements they need to manage their natural resources like water sustainably and reduce their vulnerability to environmental shocks, hazards and conflicts.

The main finding of a PEI study on water in the context of the poverty-environment nexus ([www.undp.org/seed/pei/publication/water.pdf](http://www.undp.org/seed/pei/publication/water.pdf)) was that activities to manage local hydrological resources must be preceded by measures to mobilize local communities and create institutions that enable community members to act together in an egalitarian and cooperative manner so that the benefits of any new natural resources created are equitably shared. The role of governments, NGOs and donors is to empower the community with the financial resources needed for capital investment in eco-restoration and to ensure that laws governing land, water and forest resources do not obstruct the community effort.

the community and household level simply cannot occur in many parts of the world given the current water crisis.

Insufficient water stymies overall economic growth. Research<sup>9</sup> has found that the loss of productivity, through the time spent collecting water and waterborne diseases, costs countries in the developing world millions of working days a year. For instance, water-related diseases cost the Indian economy some 73 million working days a year, and in 2002 alone Madagascar lost five million working days due to poor sanitation that contaminated the water supply. (Productivity losses due to the burdens of water-carrying and ill-health are discussed at greater length in Chapter 3 on Gender Equality and Chapter 4 on Health.)

### **Water and Poverty**

Poverty at its most extreme threatens human survival. But for people living in poverty, it is a multi-dimensional experience that encompasses a range of factors including, but not limited to, survival. UNDP's Human

Poverty Index is a composite of indicators of basic dimensions of deprivation: a short life (measured by the percentage of people expected to die before 40), lack of basic education (measured by literacy rates), and lack of access to public and private resources (measured by access to health services and clean water and percentage of malnourished children under five). Other definitions of poverty encompass the many things that people living in poverty generally lack: income, household and productive assets, entitlements, social connections and support networks, personal security (including increased exposure to violence), and empowerment to participate in the political process and in decisions that influence one's life. Some definitions include the humiliation and stigma that tragically accompany poverty's material deprivations in all corners of the world.

For the poor much more than for the non-poor, the fulfillment of humankind's most basic aspirations, such as living a long and healthy life, having sufficient resources to earn a living,

and seeing one's children reach adulthood, is predicated on the state of the environment, including water resources. Environment is central to poor people's sense of well-being, empowerment and control over their own lives. It affects the ability to choose jobs and livelihoods, to assert cultural and religious values, to find adequate time for education and leisure, to cope with crisis, and to enjoy freedom from violence, exploitation and fear.

When looking the relationship between people living in poverty and water, three dimensions of poverty stand out: health, livelihoods and vulnerability.

- **Health** – Health is discussed in Chapter 4, the key point being that the health of poor people is disproportionately affected by contaminated water and poor sanitation services, setting up a cycle of ill-health and further impoverishment that has severe financial and personal costs.
- **Livelihoods** – In rural areas, poor people's livelihood systems are rooted in the natural world and depend upon ecosystem health. Lack of a safe, adequate water supply and contamination of common property resources like lakes, rivers and coastal areas directly translate into less food, income and time for the poor. Common property resources provide a significant share of food and household income for the poorest families (see box 6).
- **Vulnerability** – Vulnerability is a critical dimension of poverty. Poor people are particularly at risk from environmental

shocks and crises. The increasingly frequent and severe natural disasters brought on climate change (cyclones, hurricanes, floods, landslides, droughts) as well as changes in rainfall patterns, shifting agricultural zones, and rising sea levels impact developing countries and the poor who live there disproportionately. The poor are the most affected by environment-based conflicts, which are becoming more frequent. They are also more vulnerable to market failures with regard to water pricing. Not only do they more often go without, but they also pay more for the little water they use. As most buy their water in small containers, the urban poor commonly pay four to ten times more per liter than the metered rates of their wealthier neighbors. In most African countries, the poor rarely share the benefits of large-scale water supply, sanitation, irrigation or hydropower projects which dominate investments in the water sector.

### **Drylands – Where Water Counts Most**

The bulk of the world's poorest people, 800 million to one billion rural people, live in arid areas and depend directly on natural resources, including water, for their livelihoods. Many drylands people are subsistence farmers who also keep some livestock, while others are pastoralists, a nomadic way of life that is increasingly under threat. In dry, rural countries like Mali and Eritrea, most of the population lives in this way, whereas in countries with both humid and dry regions, the dry areas are home to the poorest of the poor. For instance, in the driest

### Box 6: Addressing the Loss of Common Property Resources in Uganda

The Nalukonge community is located within Uganda's Cattle Corridor, a semi-arid belt used by semi-pastoral communities to graze and water their livestock. The introduction of commercial ranching has reduced the portion of communal land available to pastoral communities and limited their access to water. Their main coping strategy has usually involved long-distance herding of cattle southwards into neighboring districts and sometimes as far a field as Tanzania. But even with this strategy, communities have suffered declines in livestock productivity, as well as encountering increasing conflicts with the communities they pass through in search of water and pasture. Moreover, women and children left behind also lack enough water for domestic use.

In 1998, the Nalukonge received a US\$5,000 grant from UNDP to establish more water sources for livestock and reduce overcrowding and pressure on existing water sources. The community accepted a 70:30 formula for sharing the cost of constructing valley tanks to harvest rain water for both human and livestock consumption. Besides meeting 30 percent of the costs of the tanks, the community established mechanisms to ensure equitable access to and cleanliness of the valley tanks premises. Responsibilities were equitably shared between women and men. Strong partnerships developed with both the local government and a local NGO that helped with training and capacity building.

Following the positive impact of the three initial valley tanks constructed, the Nalukonge decided to mobilize their own resources and construct additional tanks by themselves.

regions of Kenya, 84 percent of the population is impoverished; the life expectancy in Nairobi is 66 years, whereas it is 53 in Wajir, which lies in Kenya's arid northeast.

Retaining as much water as possible is a question of survival, but in arid areas a substantial amount of rainwater is lost through surface run-off, evaporation and percolation. When the rains come and the water runs off, topsoil is carried away, gullies are formed and the water is lost. People in drylands are uniquely vulnerable not only to drought and other

natural disasters, but also to economic and social changes. Achieving sustainable development in the drylands has significant implications for reducing poverty and hunger globally.

UNDP's Drylands Development Centre (DDC) in Nairobi helps people in the world's drylands fight poverty by linking them with those who have expertise in key areas, such as water management.

### Box 7: Rainwater Harvesting Doubles Yield in Gaza

Ask farmer Abraham Abu Imhadi how valuable the new rainwater harvesting pond is to his greenhouses in Wadi Gaza, and he points to the rows of lush tomato-laden plants and replies, “It doubled my yield.”

Gazan groundwater resources are becoming more scarce and more polluted by high nitrate and saline content, and fresh groundwater is decreasing at an alarming three to four percent each year due to overuse and extraction. As a result, farmers here are always looking for more effective ways of gathering rainwater. “Before the new water harvesting pond was in place, I used an inefficient system of collecting rainwater on plastic sheeting,” explains Abu Imhadi. “Now with the new pond, I am getting twice as much fruit from each dunam (about a quarter acre) of my land.”

Poor water resource management practices of the past have allowed potentially good agricultural land in Wadi Gaza to go to waste. But since the introduction of new water collection and irrigation techniques by the United Nations Development Group (UNDP) in a project funded by the US Agency for International Development (USAID) and the Global Environmental Facility (GEF), Abu Imhadi is benefiting from one of 50 artificial rainwater collection ponds created in the area. The 200 square metre capacity ponds collect the rainwater that falls on his greenhouse rooftops—water which would otherwise be lost. Through the efficient use of water resources, farmers can irrigate up to 10 dunams, and dramatically increase productivity. The project is part of a larger effort, the restoration and preservation of the wetlands of Wadi Gaza, and is one of the largest UNDP projects in the region. (Excerpted from UNDP Choice magazine, March 2003).

It emphasizes the need to improve local governance for natural resource management and champions the value of indigenous knowledge and technologies. DDC carries out research and analysis of policies that affect drylands, helps countries design development programmes for drylands, and helps ensure that national policies address the concerns of dryland populations. UNDP’s support to drylands development includes advisory services, capacity building, and institutional strengthening, with a focus

on empowering the poor to participate in decisions that affect their lives.

Drylands issues are complex, but solutions can be developed if affected populations lead the process. This requires political commitment to end the marginalization of key stakeholders and to ensure equitable political, economic, social and civil rights, as well as access to basic social services and assets for securing livelihoods.

DDC has regional offices in Beirut, Dakar, Pretoria and San Jose, Costa Rica, with plans to open an office in Asia. DDC has recently developed an Integrated Drylands Development Programme (IDDP) that is being piloted in 16 countries, mainly in Africa.

### **Water, Agriculture and Food Supply**

Agriculture is now and will continue to be a key sector for low-income countries and the poor who live there. In developing countries, 80% of export earnings come from the agricultural sector. It is also the thirstiest sector: irrigated agriculture accounts for almost 70 percent of the global freshwater use. Unfortunately, because of leakage and inefficient irrigation systems, 60 percent of this water is lost. Limited and unreliable access to water is a determining factor in agricultural productivity in many regions, a problem rooted in rainfall variability that is likely to increase with climate change.

Today, huge losses in irrigation systems and poor water management practices worsen the water crises that already exist in many countries. Irrigation and poor drainage lead to salinization and waterlogging. Excessive extraction for irrigation has lowered water tables to critical levels in many places. The use of pesticides and fertilizers in agriculture pollutes groundwater. Invasive species have covered huge water areas throughout the world, clogging irrigation channels, threatening infrastructure, and leading to the collapse of fisheries.

It is expected that the world's population will increase from 6 billion to 10 billion by mid-century, and this will lead to greatly increased demands for food, primarily from developing countries. Currently, the 17 percent of the world's cultivated land that is under irrigation produces 40 percent of the food in the world. Much of the projected increased demand for food will have to come from improved and expanded irrigation, but this will be only a partial solution. Most irrigation systems are financially out of reach for poor smallholders. Most food demand for poor people will come from areas where investment in irrigation makes no sense, with too little return from the significant capital needed. The major part of the crops produced worldwide is still grown in rain-fed agriculture and in order to improve the livelihoods of the farmers in the developing world, more emphasis must be put on employing practices that ensure higher yields per water input.

### **Water as a Factor of Production**

Water is also a factor of production in industry and many other types of economic activity, including both large-scale activities and small, often home-based activities where the poor are themselves entrepreneurs, such as food processing for vending in markets. Access to key factors of production, including water, is critical to the viability of activities that can act as a ladder out of poverty. In some cases, investments in water infrastructure such as dams and irrigation schemes can act as a catalyst for local and regional development.

Water can be critical in supplying energy services to unserved poor people in rural areas, and safe, environmentally friendly, and affordable energy services are critical to poverty reduction. Energy services that allow for heating, cooking and illumination are not

only a boon to the activities of daily life; they are also critical inputs to agriculture and the types of small-scale productive activities that are a significant component of the rural economy in poor areas.

### **Box 8: Ecosan Water-free Toilets: From Pollution to Garden Fertility**

It is estimated that 4.6 kg of nitrogen, 0.6 kg of phosphorus and 1.3 kg of potassium are produced per person per year from feces and urine, enough nutrients to grow sufficient wheat and maize to sustain that person for a year. Ninety-five percent of these natural nutrients, the main components of commercial fertilizer, are found in urine. Failure to return these nutrients to the soil wastes potential soil fertility and agricultural productivity.

In the UNDP-supported Ecological Sanitation (Ecosan) Project, urine is diverted at source and, since it contains up to 90% of the nutrients plants need, it is fed directly to biomass production. Plants that yield fuelwood, bananas, coconuts, vegetables or flowers may be grown. Fecal matter, which is the pathogenic (and smallest) part of our excreta, is contained, without odor, in a pair of small chambers beneath the toilet, where its volume is reduced by dehydration and decomposition and it is sanitized. Once a year or so, this material, which is an excellent soil-improver, can be harvested and applied to gardens. Like a rich soil, it is totally inoffensive in appearance and has no odor. With Ecosan's "closed-loop" approach, nutrients in excreta are returned to the soil instead of dumped in water or deep pits; it is a "zero-discharge" sanitation method that keeps fresh and marine water free of pathogens and nutrients that disrupt natural ecosystems.

To expand the understanding and use of Ecological Sanitation for sustainable, primarily urban agriculture, UNDP has initiated activities to explore linkages between Ecological Sanitation, urban agriculture and community management and to further develop the concept and bring it to the attention of other agencies. UNDP is currently collaborating with UNICEF, the World Bank, the Pan-American Health Organization, Swedish Sida, GTZ and a number of international, national and local NGOs, including CARE, the International Secretariat for Water, WASTE, and WaterAid, UK, in this initiative. Pilot activities are in progress in Africa, Asia, Latin America and Central Asia. To ensure that the technologies developed are safe for human health, ecologically sound and productive for agriculture and horticulture, collaboration has been established with reputable research institutions in Sweden, Germany, the US, Mexico, India, South Africa and China. For more on the Ecosan system, go to Chapter 4 on Health or to [www.undp.org/water/ecol.html](http://www.undp.org/water/ecol.html).

### Box 9: Micro-hydro Energy Fueling Development in Rural Nepal

Nepal's Rural Energy Development Programme (REDP), promoted by the Nepali Government and supported by UNDP, aims to reduce poverty and improve livelihoods by expanding rural energy services. Micro-hydro energy is ideal for this effort because of its suitability to community ownership and because it provides a sustainable means of expanding the national electricity grid in a country with abundant water resources, steep terrains and scattered settlement patterns in the hills.

Improved water use and irrigation practices have been implemented to increase the productivity of water resources and irrigation. Sanitation is being improved with the use of biogas plants, which provide a means to dispose of animal dung and produce energy. Cleaner fuels used to boil water also reduce land degradation. To date, 2,562 biogas plants with toilets attached have been built, as well as 9,803 conventional toilets. Some 1,508 solar home systems are now in operation, as well as 6,507 improved cooking stoves, and nearly three million trees have been planted.

An improved micro-hydropower technology under development has introduced the possibility of adding an electricity generation component to most of the irrigation schemes constructed in the country. During the micro-hydropower plant generation hours, the water is fed into the river through a canal and during non-generating hours, the excess water is fed into an irrigation canal to irrigate arable land.

The programme works by creating gender-balanced community organizations at the village level that implement and manage the micro-hydro projects. To date, 2,706 such organizations have been formed in 16 districts, with a total of 54,642 members, more than half of them women. Village and district level committees must approve each project, which is then recommended to the national-level development bank. Through a special credit line, the bank provides a loan for the purchase of the equipment. Technical assistance is provided directly by the programme and by the private sector. So far, 94 micro-hydro plants have been installed, generating 1,305 kWh of power.

## Chapter 3

# Promoting Gender Equality and Girls' Education



The iconic image of a woman carrying water on her head is emblematic of a lifelong burden that keeps girls from attending school, prevents women from engaging in productive work, and fetters progress toward the MDGs on universal primary education and gender equality.

### **The MDGs on Gender Equality and Girls' Education**

#### **Goal 2: Achieve Universal Primary Education**

- Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling.

#### **Goal 3: Promote Gender Equality and Empower Women**

- Eliminate gender disparity in primary and secondary education, preferably by 2005, and to all levels of education no later than 2015.

Throughout the developing world, in urban as well as rural areas, the gender division of labor typically assigns to women a series of roles and responsibilities that, for the most part, men do not share. They include securing water for household needs like drinking and washing; cooking and ensuring overall household food security; and caring for children, the elderly and the ill.

These traditional roles and tasks mean that poor women are hit hardest by the inadequate services available in informal urban settlements. It is they who must spend much of the day waiting in line for water, thus forestalling their ability to engage in productive activities, adult education, or other domestic responsibilities, not to mention rest and recreation. They are in greatest physical contact with contaminated water and human waste, exposing them to a host of biological pathogens and chemical hazards, and are saddled with the unenviable task of finding a way to dispose of the family's wastewater and feces (no small challenge in areas where diarrheal diseases are endemic and sanitation facilities nonexistent). Having no safe, private sanitation facilities in areas where people are living tooth-to-jowl means going

the whole day without relieving oneself and then risking exposure at night – a humiliating, stressful, and uncomfortable daily routine that can damage health.

In rural areas, the gender division of labor means that the impact of resource degradation is felt most keenly by women and girls, who must walk further distances to fetch water, often of poor quality. In some countries, spending six hours per day collecting water to meet the family's needs is not unusual. In rural Africa, for instance, women commonly walk 10 km. each day to the nearest water source to fetch water for their household needs, often twice that during the dry season.<sup>10</sup> The need to travel further from home to secure the family's water can expose women and girls to sexual harassment and opportunistic rape – this as well as animal attacks can also happen when women who lack safe, nearby sanitation facilities move about at night in search of privacy. Women often combine their water-carrying tasks with other domestic responsibilities like gathering fuel or food, but even when that is the case, the burdens of water portage remain many, serious and disproportionately borne by women.

**Gender refers to the socially constructed rather than biologically determined roles of men and women as well as the relationships between men and women in a given society at a specific time and place. These roles and relationships are not fixed, but highly context-specific; they can and do change in light of evolving needs and opportunities.**

**Gender mainstreaming was defined by the UN Economic and Social Council in 1997 as “a strategy for making women’s as well as men’s concerns and experiences an integral dimension of the design, implementation, monitoring and evaluation of the policies and programmes in all political, economic and societal spheres so that women and men benefit equally and inequality is not perpetuated.” (E. 1997.L.10.Para.4)**

For both rural and urban women, caring for children and other family members who fall sick with water-related illnesses, an all-too frequent occurrence described at length in the health chapter, falls on their shoulders as well. Having healthier children is, of course, a hoped-for end in itself, but higher rates of child survival are also a precursor to the demographic transition toward lower fertility rates. In addition, having fewer children reduces women’s reproductive responsibilities as well as their maternal mortality and morbidity risks.

Even environmental challenges like water crises stemming from climate change and variability impact women more negatively than men. For example, studies in Bangladesh show that women suffered most following the 1991 cyclone and flood. Among women aged 20-44, the death rate was 71 per 1000, compared to 15 per 1000 for men. The reasons: women were left at home by their husbands to care for children and protect property; their saris restricted their mobility; they were malnourished and thus physically weaker than men; and during the cyclone, the lack of purdah in public shelters may also have deterred women from seeking refuge.<sup>11</sup>

### **Impact on Girls**

The impact of poor water and sanitation services on poor women’s physical security, opportunities for adult education, overall productivity, income-generating capacity, nutritional status, time and overall health and well-being is severe. The accumulation of these negative impacts starts in girlhood.

Girls rather than boys generally help their mothers collect water, and in some parts of the world this task becomes a girl’s responsibility when she is nine or ten. Collecting water is physically taxing as well as time-consuming, and when water is scarce or far from home, girls need to spend more time on this task, reducing their time in school. When household security is threatened, girls often must leave school entirely to help their families cope.

The lack of adequate sanitation facilities also prevents girls from attending school, particularly when they are menstruating. Many parents simply will not allow their daughters to attend schools that do not have separate sanitation facilities for boys and girls – and few schools in poor areas do. Studies show that girls’ attendance at school is increased

through improved sanitation. For example, in Bangladesh, a school sanitation programme has increased the enrolment of girls by 11% every year since it began in 1990.<sup>12</sup>

The disparities in girls' and boys' ability to attend school have life-long impacts, for women as well as for their future families and communities. This is why the MDG targets related to women's empowerment track educational attainment from the primary grades upward. Even women who have had just a few years of basic education have smaller, healthier families, are more likely to be literate and have skills for earning a living, and are more likely to view educating their own children as a priority. According to DfID, each additional year of female education reduces childhood mortality by five to ten percent.

### **Gender Mainstreaming in Water and Sanitation**

Recognition that women are more seriously affected by environmental degradation and particularly vulnerable to environmental

hazards like pollution and biological pathogens has led to many water projects that address women's immediate needs as users of services and managers of natural resources. Some of these projects have taken an instrumentalist approach that overburdens women by adding unpaid community development responsibilities to their reproductive and productive tasks. Others have acknowledged that lack of property rights and other legal entitlements to natural resources like water reduces women's capacity to conserve environmental resources, but have not then addressed this important fact.<sup>13</sup>

But the most successful interventions have taken a gender mainstreaming approach. How is "successful" defined here? It means projects that:

- both meet women's immediate needs for water and sanitation services, thereby bettering their lives, and catalyze women's empowerment in ways that are strategic and transformative; and
- are themselves effective in meeting their

### **Box 10: Mainstreaming Gender in Nepal**

In UNDP's country programme in Nepal, gender mainstreaming is a crosscutting theme. The programme addresses both practical and strategic gender needs, and regards women as the primary managers of natural resources, including water resources. Women are encouraged to form their own CBOs so that they can be empowered to take the lead in resource management, including water for drinking, irrigation, electricity and fish farming. The programme has a gender focal point who ensures that gender issues are mainstreamed throughout programme planning and implementation.

own immediate objectives in the short-term and sustainable in the long-term.

In addressing gender issues, UNDP takes a two-pronged approach, both by directly promoting women's empowerment through targeted, strategic interventions aimed at women and by mainstreaming gender into its overall policies and individual programmes and projects. UNDP's Policy Note on Gender Equality states that:

- There are two complementary approaches to achieving gender equality: mainstreaming gender and promoting women's empowerment. Both are critical. Women's empowerment is central to human development. Human development, as a process of enlarging people's choices, cannot occur when the choices of half of humanity are restricted. Targeted actions aimed at empowering women and righting gender inequities in the social and economic sphere, as well as in terms of civil and political rights,

must be taken alongside efforts to "engender" the development pro; and

- Gender mainstreaming means being deliberate in giving visibility and support to women's contributions rather than making the assumption that women will benefit equally from gender-neutral development interventions. Policies and programmes that ignore differential impact on gender groups are often gender-blind; potentially harmful for human development. Gender mainstreaming requires a focus on results to improve the well-being of poor women.

### UNDP's Resource Guide for Gender Mainstreaming in IWRM

At UNDP, gender mainstreaming and women's empowerment are important organizational commitments, and the advancement of women and the protection of the environment play crucial overlapping and reinforcing roles in UNDP's overall strategy.

#### Box 11: Gender and Integrated Water Resources Management: Key Steps

- In every initiative, programmers and analysts take steps to carry out a gender and water analysis to understand the differences and relations among and between women and men in each specific context under consideration. Ideally, this is done in a participatory fashion and both women and men are involved.
- Based on this analysis, all initiatives incorporate both women's and men's perspectives, needs and interests and, where possible, promote the advancement of women (in other words, reduce gender inequalities).
- Participatory approaches that facilitate the equitable participation of women (especially at decision-making levels) are used.

### **Box 12: Women Place a Higher Value on Household Toilets, Cambodia, Indonesia, and Vietnam**

Women in Cambodia, Indonesia, and Vietnam put a greater value on their household toilets than men do. This is one of the outcomes of an interesting multi-country study of sanitation experience by the Water and Sanitation Program for East Asia and the Pacific. The findings suggest that those promoting sanitation schemes should treat women as ‘valued customers’ and give them a greater voice in how toilets are planned and installed. However, there is also evidence that the extra work involved in keeping toilets clean and ready for use is falling on the women in the family.

Women in all three countries consistently gave higher ‘value for cost’ scores to their toilets than men did. Women in Indonesia and Vietnam also mentioned more benefits than men did, including convenience, privacy and a clean home environment. Women’s greater interest in sanitation was also evident from the fact that they initiated the process for acquiring family latrines in 18 out of 24 communities in Indonesia and Cambodia. Men rarely initiated a discussion about acquiring a family latrine.

In general, users of pour-flush latrines in all three countries were close to being fully satisfied with their toilets (75-100 percent satisfaction), provided water was available close by for flushing. Again, women were more satisfied than men in each country. It is worth highlighting that in the survey men did not generally carry water to the toilets, and would not use them if there was no water available. It therefore fell on the women to keep the latrine’s water tank or bucket filled, adding to their long list of chores; nonetheless, they still valued the toilets.

In view of women’s greater interest and influence on family decisions regarding sanitation improvements, projects should evidently treat women as decision-makers and seek to strengthen their voice. This can take the form of ensuring that women are fully informed of options and costs. It can also mean more actively promoting women’s access to credit for sanitation and offering women training in income-generating skills such as mason training for sanitation.

Mukherjee, N., “Achieving sustained sanitation for the poor: policy lessons from participatory assessments in Cambodia, Indonesia and Vietnam”. Jakarta, Indonesia, Water and Sanitation Program for East Asia and the Pacific, 2001.

To ensure that UNDP’s 166 country offices have the tools they need to effectively mainstream gender into its water-related activities, UNDP has developed a resource handbook, *A Practical Journey to Sustainability*. Focusing on case studies and practical methodologies for

gender mainstreaming in Integrated Water Resources Management (IWRM), the handbook targets development practitioners involved in planning, negotiating and monitoring water resources management initiatives, and includes topics like policy development, institutional

strengthening and capacity building, domestic water supply and sanitation, and irrigation.

UNDP is working to include a gender perspective in IWRM initiatives for a number of reasons:

- Women and girls are most seriously affected by inadequate water and sanitation services, as described above.
- Community action and social mobilization around the provision of basic social services like water have been shown to be a valuable entry point for promoting women's empowerment. Having a leadership role in community management of water supplies, for instance, can increase women's social capital as well as their bargaining power within the household (see box 13 on experiences in India).
- Because of differences in production, labor, responsibilities and resources, women and men have different interests in, and derive different benefits from, the availability, use and management of water. Women, for instance, generally prioritize water for domestic uses like drinking and washing, whereas men may focus on irrigation (see box 12 on how men and women perceive the need for toilets). As a result, they often have different criteria to evaluate the adequacy, equity, timeliness, convenience and quality of various interventions. Also, women and men often have different perceptions about the costs and benefits related to participation in the various types of water users' groups through which water use and management are organized. In addition, they differ in their ability to participate in such schemes. Young women may simply not be able to participate in community management efforts if they have small children to care for; if meetings are held at night, safety concerns or cultural norms may keep them home. All these factors can be discovered and addressed by taking a gender-sensitive approach.
- The social and economic analysis, including documenting natural resource uses, is incomplete without an understanding of gender differences and inequalities. With a gender analysis, planners gain a more accurate picture of communities, natural resource uses, households, and water users. Understanding the differences between women and men (who does what work, who makes which decisions, who uses water for what, who controls which resources, who is responsible for the different family obligations) is part of a good analysis and can contribute to more effective initiatives.
- Without specific attention to gender issues, initiatives and projects can reinforce and even worsen inequalities between women and men. Although many initiatives are thought to be "gender neutral," this is rarely the case. Projects and programmes often bring new resources, such as training, tools and technology. Whether someone is male or female can influence whether or not they can take advantage of these opportunities, and even projects aimed at women can be "captured" by men when significant new resources are at stake.

- The involvement of both women and men in integrated water resources initiatives can increase project effectiveness. Experience shows that ensuring both women's and men's participation can improve project performance. It enhances project results and improves the likelihood of sustainability. In other words, a project is more likely to achieve what planners hope it will achieve if women are active participants and decision-makers.
- Women's and men's expressed needs for water and sanitation and their willingness and ability to pay for services.
- The decision-making structure within families (intra-household dynamics).
- Women's and men's participation in decision-making structures (such as water users' associations, local government and national government).
- The relative visibility of women's and men's work and informal organizations.
- The importance of understanding the social dynamics of water use, as well as its technical elements.

### **An Approach to Gender and Water Management**

The core assumption of a mainstreaming strategy is that gender differences and inequalities are relevant in all water discussions. Furthermore, in many cases the analysis of gender perspectives in relation to water resources must be context-specific. It is important to ask in each specific situation how and why gender issues are relevant.

A starting point is the consideration of the differences and inequalities between and among women and men. Concern for gender differences and inequalities draws attention to issues such as:

- The interrelationship (and visibility) of productive and domestic uses of water.
- Women's and men's access to and control over water and other key resources linked to water such as land, credit, and extension services.

- Gender biases within public institutions working on water resources management. (Institutions may not always represent all members of society equally or provide services in an equitable fashion – a prime example is women's exclusion from extension services based on the faulty assumption that they are not farmers.) And the flip side: the institutional capacity of institutions working with water resource management to integrate gender perspectives into their work.
- Women's and men's access to and participation in careers in water-related professions.

The analysis of gender and water should be incorporated into policy recommendations and programme design as part of promoting gender equality. Thus this analysis must inform discussions and help to ground both policy prescriptions and the design of initiatives

in all areas of water resources management, from river basin management to domestic water supplies.

### **Conclusion**

The MDGs on women's empowerment and parity in girls' education cannot be achieved when women and girls spend the better part of each day collecting water and lack of sanitation services at schools coupled with frequent bouts of ill-health effectively make school attendance all but impossible. Significant expansion in access to water and sanitation is fundamental to both these aims. And a gender mainstreaming approach to water management and the provision of services is critical to success.

### **Box 13: Women's Activism for Water Spurs a "Virtuous" Circle of Empowerment and Better Living Conditions in India**

The relationship between poor women and environmental resources is often discussed in terms of a "vicious circle" of resource degradation and further impoverishment. But social mobilization in pursuit of basic social services like water and sanitation can become a launch pad for women's empowerment, spurring action for additional services that, in turn, further increase women's social capital. This dynamic can be seen in the two examples below, in which UNDP's support to communities in India had catalytic effects.

#### **Rajourgarh**

Women of Rajourgarh village in the north Indian state of Rajasthan will always cherish the events of 2000, when they successfully took on the might of the local government. Initially mocked by men for forming self-help groups and holding meetings rather than involving themselves in practical work, the women decided to find solutions to village problems. In the dry and arid Rajasthan, water had always been an issue.

The villagers found out that the government had decided to dig a well in their village, but due to manipulation by local officials, the well was being dug elsewhere. Led by Kajouri Mai, a middle-aged grandmother, the women blocked the road and sought an explanation from the officials for shifting the construction of the well from their village. Dissatisfied with the explanation, the women sat on the road, gheraoed (surrounded) the

officials and prevented them from leaving the village. The siege continued for nearly three days. Finally, the administration gave in and decided to dig the well in the parched village of Rajourgarh as originally planned.

Having tasted victory, the women groups decided to tackle other issues, one of which was male drunkenness. Kajouri Mai says: "We called a meeting of women from other villages to act upon liquor shops in the areas. Women from nearly 10 - 12 villages met and decided to serve notice to all the three liquor shops. The owner of the shops knew that we meant business. He therefore decided to close the shops."

Encouraged by the success of these two initiatives, the women decided that they should try and alleviate their sufferings further. They decided upon harvesting rain water in a nearby drain. They collected money for tractors and diesel and, along with men, they also provided shram daan (voluntary labor) in digging and transporting the earth for a medium-sized mud dam.

The success story of Rajourgarh village has been replicated in numerous neighboring villages with the help of a local, non-governmental organization, Tarun Bharat Sangh (TBS), which UNDP supports. It has succeeded in bringing about positive change in areas like the education of girls, ridding the area of water shortages, starting women's banks, protecting nearby forests and reviving

traditional methods of water harvesting. TBS leader Rajinder Singh says: “Though most of our work has been in the area of water harvesting, we have also tried to empower people so that they can sustain themselves and fight for their rights without our intervention.”

Singh says water management should not be looked at in isolation. He says that wherever harvesting has been done and forests have been regenerated, women have been the first beneficiaries. “It saves them time in collecting fuel, fodder and water. The result has been that they have the time to look after their children and send the daughters to school. Earlier, not a single girl used to be educated as mothers would spend the entire day collecting the three necessities and the girls would take care of their siblings and help in household chores.”

Forming women’s groups wasn’t easy. According to TBS volunteer, Narendra Singh, the organization faced an uphill battle. He says, “Establishing a women’s group meant that the men had to be persuaded to let women participate. Once this was overcome and women started meeting, they realized that they had to play a bigger role in managing natural resources than merely collecting water, fodder and fuel.”

For thousands of women in Rajourgarh and nearby villages, the fruits of empowerment have become visible in the form of education for girls, having a say in the selection of water harvesting sites, and having a measure of control over the family’s finances. And if Kajouri Mai’s daughter-in-law Lali can give her three-month-

old baby girl an urban name, Ritu, it means that empowerment for women has definitely arrived in the rural areas of Rajasthan.

### **Dabhi**

Life in Dabhi, as in other villages in the arid Patan district in north Gujarat, revolves around water – or the lack of it. This is one of the most resource-poor and underdeveloped pockets of a prosperous state; the male literacy rate in the district is below 40%; less than 25% of women in this region can read or write. Patan has an average annual rainfall of 20 inches, droughts and sand storms are frequent, and the soil and water are saline. Ruthless exploitation of ground water has made things worse. The water table is sinking at the rate of 3 meters per year. Village after village empty out as families move in search of water and work.

However, efforts by the community, especially women, are changing life and attitudes in this harsh, desert land.

The village pond is the pride of Dabhi. It glistens with water unlike so many others that have gone dry. Women dressed in bright red, gold and yellow crowd around the village well waiting their turn to scoop up the little water inside in clay pots. Four years ago, there was no water in the pond nor in the well in Dabhi. Women and children had to walk miles in the scorching sun to fetch water for their families. A community-led project to desilt and clean up the pond changed things dramatically.

"I got blisters in my hands digging out the thorny shrubs surrounding the pond. But we all worked. We cleaned up the pond, dug deeper and then built a bund around it. I got paid in cash and food for the work I put in: Rs 500 a week and vegetables to feed my family," says Ramila Behn, a Dabhi resident and a member of the village 'water committee' (pani samiti).

The village water committee, one among several in the area, makes decisions about all critical issues relating to water. The committees were formed following efforts by the Banaskantha DWCRMA Mahila SEWA Association (BDMSA), a federation of district level women's self-help groups and producers collectives, to mobilize the village women. Many women who now actively participate in the village water committees had never stepped out of their homes earlier.

In partnership with the district government, UNDP has actively supported BDMSA's efforts, thus helping vulnerable villagers cope with the threat of a continual water crisis – and also contributing to a transformation in the way in which men and women relate to each other in this traditional society.

The turnaround in Dabhi as elsewhere in Patan has been a gradual process. The women's self-help groups – the agents of change – were activated by SEWA, a well-known trade union with over 3,000,000 self-employed, mostly female, informal-sector workers across the country. SEWA got involved with the issue of drinking water in the area in the late '80s following a three-year severe drought in the

state. In 1988, SEWA launched a regional development programme which now covers more than 80 villages. Water was the entry point. But then a lot of other things happened. SEWA identified other priorities of local women – livelihood, social security, health care, child care, insurance, housing, savings and credit – and helped women address them.

"Many of the tribes like Ahirs were skilled in embroidery, but they had not thought of exploiting their talent commercially," said Mumtaz Khan, who coordinates BDMSA's field work. "We decided to develop markets for these people and that is how the idea of Banascraft [a traditional crafts cooperative that sells its wares worldwide through the Internet] was born. We also opened up other income-generating opportunities. For instance, we revived milk cooperatives by procuring fodder from other districts when fodder was not locally available."

Khan says one of the most heartening outcomes of the community-led watershed projects has been the growing confidence among village women. Today, Dabhi resident Champa Behn and other members of the village water committee knowledgeably talk about the technical aspects of roof rainwater harvesting structures in their village.

"You have to carefully look at all the material. Otherwise the suppliers can cheat you. I have caught them trying to give us a half-cracked pipe," says Champa, who does not appear to feel handicapped by her lack of formal education. "People from other villages and districts

have come to see Dabhi's efforts at creating structures to harvest rain water. I am not afraid talking to engineers."

Key to the success of UNDP-supported initiatives on water in this region has been its choice of trusted local partners and a demand-driven rather than donor-driven approach.

For more information on these projects, contact [shashi.sudhir@undp.org](mailto:shashi.sudhir@undp.org) in the UNDP India office. The story on Dhabhi was drawn from a piece written by Patralekha Chatterjee.

## Chapter 4

# Safeguarding Human Health



The importance of clean water and adequate sanitation to the preservation of human health, particularly among children, cannot be overstated.

Water-related diseases are the most common cause of illness and death among the poor of developing countries. According to the World Health Organization, more than five million deaths worldwide are caused each year by waterborne diseases and water-related illnesses, with an additional one million caused by malaria.

#### **The Health MDGs**

##### **Goal 4: Reduce Child Mortality**

- Reduce by two-thirds, between 1990 and 2015, the under-five mortality rate.

##### **Goal 5: Improve Maternal Health**

- Reduce by three-quarters, between 1990 and 2015, the maternal mortality ratio.

##### **Goal 6: Combat HIV/AIDS, Malaria and Other Diseases**

- Have halted by 2015 and begun to reverse the spread of HIV/AIDS.
- Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases.

Realizing the health-related MDGs goals, particularly those targeting child mortality and major diseases, will require a dramatic increase in the number of poor people in developing countries with access to clean water and adequate sanitation services as well as attitudinal and behavioral shifts with regard to water and sanitation as well as hygiene, a critical but often overlooked element in discussions usually dominated by questions of access and service provision.

The health impact of poor quality water and sanitation services and water-related diseases on developing countries is devastating<sup>14</sup>:

- At any given time, close to half the people in the developing world are suffering from one or more of the main diseases associated with inadequate provision of water and sanitation services: diarrhea, ascariasis, dracunculiasis (guinea worm), hookworm, schistosomiasis (bilharzias, or snail fever) and trachoma.
- More than half the hospital beds in the world are filled with people suffering from water-related diseases. In China, India, and Indonesia – three of the world's most populous nations – twice as many people die from diarrheal diseases than from HIV/AIDS each year.
- Approximately 4 billion cases of diarrhea each year cause 2.2 million deaths, mostly among children under five; this is equivalent to approximately 6,000 children dying every day, or one child dying every 15 seconds. Water, sanitation and hygiene interventions reduce diarrheal diseases by between one-quarter and one-third.
- Though not well documented, watching a much loved young child die, as do one in four or five in the poorest pockets of the world, no doubt has serious and lasting impacts on the psychological and emotional health of surviving parents and siblings.
- Intestinal worms infect about ten percent of the population of developing countries; intestinal parasitic infections can lead to malnutrition, anemia and retarded growth; they can be controlled through better sanitation, hygiene and water supply.
- Some six million people are blind from trachoma, with 500 million people at risk from this water-borne disease; it is the leading cause of blindness in the developing world.
- Worldwide, over 2 billion people are infected with schistosomiasis and soil-transmitted helminthes, of whom 300 million suffer serious illness; there is a 77 percent reduction in schistosomiasis from well-designed water and sanitation interventions.
- Malaria kills one million people each year, 90 percent of them in Africa. It causes at least 300 million cases of acute illness each year, and is the leading cause of deaths in young children. Along with HIV/AIDS, it is one of the major public health scourges eroding development in the poorest countries in the world, and costs Africa more than US\$ 12 billion annually. It has slowed economic growth in African countries by 1.3% per year, the compounded effects of which are a gross domestic product level now up to 32% lower

than it would have been had malaria been eradicated from Africa in 1960.<sup>15</sup>

- Arsenic in drinking water is a major public health threat. In Asia, more than 50 million people per year drink arsenic-contaminated water from deep wells that draw on tainted aquifers.
- Cholera epidemics are a major risk where there are large concentrations of people and hygiene is poor (as in refugee camps and urban slums); an epidemic that began in Peru in 1990 spread to 16 other countries in Latin America, and ten years later cholera remains endemic following its absence from the continent for nearly a century.
- Water containers typically hold 20 liters of water and weigh 20 kgs. Carrying such heavy loads, commonly on the head or back, for long distances each day, can result in headaches, fatigue, and pain or even serious injury to the head, neck, spine and pelvis. Women are responsible for carrying water, and spinal and pelvic injuries can cause problems during pregnancy and childbirth; reducing water portage burdens can reduce maternal mortality risks. (Children who carry water can also suffer serious and lasting injury.)
- Improved health overall from clean water, sanitation and better nutrition reduces susceptibility to anemia and other conditions that affect maternal mortality.

Overall, the inadequate water and sanitation services upon which the poor are forced to rely damage their health, causing relatively high health costs relative to income, an increase

in morbidity, and a decreased ability to work. The vicious circle of poverty and ill-health is endemic among the poorest: poverty renders women and men ill-equipped to protect themselves and their children from biological pathogens and chemical hazards or seek treatment for illness; and their poor health, impaired ability to work and high health costs further mire them in poverty.

### **Breaking the Fecal-oral Cycle: The Key to Disease Reduction**

Adequate water supply and sanitation, coupled with hygienic behaviors (especially hand washing, safe water handling and storage, and the safe disposal of feces) are fundamental to health, because the main culprit in the transmission of water-related disease is the “fecal-oral” cycle. Water and sanitation practitioners have a handy mnemonic device to describe the factors that fuel this destructive cycle – they refer to the “Five F’s”:

- **Fluid (drinking contaminated water and having too little water to wash)** – Drinking contaminated water transmits waterborne fecal-oral diseases like cholera, typhoid, diarrhea, viral hepatitis A, dysentery and dracunculiasis (guinea worm disease). Insufficient quantities of water for washing and personal hygiene leads to water-washed disease; when people cannot keep their hands, bodies and domestic environments clean, bacteria and parasites thrive, causing skin and eye infections, including trachoma, and fecal-oral diseases are more easily spread.

### Box 14: Raw Sewage No Longer a Threat to the Water Supply in Gaza Neighborhood

Water pollution in Gaza is not only caused by seawater and agricultural run-off seeping into the underground aquifer, but also by raw sewage. The Gaza Aquifer, which provides about 96 percent of water to the Gaza Strip, is becoming increasingly endangered by poor sewage disposal infrastructure. Many of the refugee camps and residential areas on the edges of the main towns are not connected to the central pumping system, leaving sewage to flow in the streets. In addition to the obvious immediate health risks, raw sewage will eventually reach the underground aquifer, polluting the water for the whole population.

As part of a US\$3 million UNDP project, financed by the Government of Japan to rehabilitate Gazan municipal infrastructure, the Al Hatabia neighbourhood in Beit Lahia has been transformed by the building of a sewage pumping station. “I just cannot compare the streets before and after,” says Beit Lahia Mayor Muhammad al-Masri. Previously, Al-Hatabia had not been connected to the central sewage system, and waste gathered in percolating pits. The regularity with which such pits need to be emptied meant that sewage frequently overflowed into the streets, a problem that became particularly acute for Beit Lahia, a town with a population of 40,000, where approximately 50 percent of neighbourhoods are connected to the central sewage system. (Excerpted from UNDP Choices Magazine, March 2003)

- **Feces (the contamination of water, soil and food with human fecal matter)** – Sanitation facilities interrupt the transmission of much fecal-oral disease by preventing human fecal contamination of water and soil. It is particularly important in controlling worm infections. Because children are the main victims of diarrheal diseases (which can be either waterborne or water-washed), they are also the mostly likely source of infection; the safe disposal of children’s feces is thus critical. To optimize human as well as environmental health, fecal matter should be treated as close to the point of defecation as possible.
- **Fingers (unwashed hands preparing food or going into the mouth)** – Recent research shows that hand washing does more for reducing child mortality and the incidence of infectious intestinal diseases than the provision of safe water or even latrines. Yet hygiene gets surprisingly little focus.
- **Food (eating contaminated food)** – Eating contaminated food presents the same health risks as drinking contaminated water, and careful food handling is key to combating gastro-intestinal illnesses.

Ecological sanitation is different from conventional approaches in the way people think about and act upon human excreta. First, those promoting and using ecological sanitation take an ecosystem approach to the problem of human excreta. Urine and faeces are considered valuable resources, with distinct qualities, that are needed to restore soil fertility and increase food production. Thus, sanitation systems should be designed to mimic ecosystems in that the “waste” of humans is a resource for microorganisms that help produce plants and food. Second, ecological sanitation is an approach that destroys pathogens near where people excrete them. This makes reuse of excreta safer and easier than treatment of wastewater that often fails to capture the nutrients it transports to downstream communities. Third, ecological sanitation does not use water, or very little water, and is therefore a viable alternative in water scarce areas. Fourth, ecological sanitation can provide hygienic and convenient services at a much lower cost than conventional sanitation, and therefore, should be considered both in developing and developed countries.

- **Flies (spreading disease from feces to food and water or directly to people)** – Flies are particularly problematic where open-air defecation is the norm.

Breaking the oral-fecal cycle depends upon the adoption of healthful practices (like hand washing) and use of technologies that contain and sanitize fecal matter. Conventional sanitation systems and practices have been primarily based on western systems (flush toilets) and pit latrines.

The water-based sewage system of flush toilets was designed based on the premise that human excreta is a waste fit only for disposal and that the environment is capable of assimilating this waste. Yet this water-dependent system has not met sanitation needs of developing countries, and it is clearly inappropriate in

countries facing severe water shortages. Even when flush toilets are installed, more than 90 percent of the sewage they collect is released untreated into rivers, lakes and coastal areas, thereby spreading waterborne diseases and often devastating the natural environment upon which the poor depend. Thus while fecal matter is removed from the homes and villages where it was created, “solving” the immediate sanitation problem there, it winds up in someone else’s water source or fishery downstream, creating serious environmental and health risks to neighboring communities.

The other conventional sanitation solution in developing countries is the pit latrine. The pit latrine, while more appropriate than flush toilets, also has its shortcomings, particularly in densely populated areas where space is limited (once the pit fills up, a new one must

### Box 15: Draining Away Malaria's Breeding Ground in Senegal

Near Dakar, Senegal, in a sprawling peri-urban hinterland called Yeumbeul (pop. 120,000), stagnant pools of discarded household wastewater provide choice breeding-grounds for mosquitoes. Malaria sufferers, most of them children, account for more than 80 percent of all medical consultations.

UNDP's LIFE programme has been working in one neighborhood, Houdalaye, which today is the cleanest in all Yeumbeul. The lanes are dry, there are fewer mosquitoes and incidents of malaria are declining. Forty percent of the families in Houdalaye now have drainage tanks underneath their homes for the disposal of wastewater. Those without tanks who continue to throw water out of their houses have learnt to sweep it away with a broom to keep the ground dry.

A quarter of LIFE's project budget was spent on training, especially focused on disease prevention. LIFE's partner NGO, ANBEP (the National Association for the Wellbeing of the Population) worked through its 18 neighborhood sub-groups, each with between 50 and 80 members. ANBEP organized 36 community meetings in which Health Department officials provided instruction in household waste management, water, health and sanitation and nutrition to some 8,000 people. Three hundred unemployed young people were trained as informal public health workers, 102 of them women.

"You have to raise people's awareness that all the houses and the streets must be kept clean," says Alpha Ndiaye, President of ANBEP. "You explain how to maintain the wastewater tanks, how to keep children and adults healthy. As a result of all these discussions, people's behavior has changed. When you walk around Yeumbeul today you see a big difference between the neighborhoods where we have worked and other areas. Today, people in Houdalaye are constantly receiving visitors from other places who come to learn from their experience."

be dug). In both flush toilet and pit latrine systems, the groundwater invariably becomes polluted in areas where flooding is a problem or where the water table is high and the ground is permeable. The contamination of soil and ground water poses serious risks to food security and human health.

Moreover, both conventional approaches to waste management leave the excreta untreated – and therefore a health hazard – and do not take advantage of the valuable natural nutrients found in human urine and feces for the benefit of agricultural production.

The solution to such waste and water management challenges resides both in

### Box 16: Tackling Pesticide Poisoning in Thailand

UNEP has designated Thailand's Nan River a "pollution hotspot" due to the 31,000 tons of pesticides and 3.5 million tons of chemical fertilizers that washed into it in 2001 alone. With funding from the UNDP-GEF Small Grants Programme, the Indo-China Development Institute (ICDI) is working with Buddhist monasteries and villages along the Nan to reduce pollution at the source by decreasing farmers' use of agrochemicals. The monks have organized the Network for Conservation of the Nan River and adopted organic practices on monastery farms. These serve as demonstration sites to train farmers in 29 communities in organic agriculture as a means of reducing dependence on agrochemicals. Since the project began, there has been a 50 percent decrease in cases of pesticide poisoning treated at a local hospital.

innovations in safe, non-polluting technologies at the local level and in policies that promote an ecosystem-based approach to human waste and water management.

#### **Ecological Sanitation: Water-free Toilets**

UNDP is currently supporting a number of programmes that promote such solutions. One on-going project in collaboration with the Swedish government is Ecosystem-based Sanitation, or Ecosan. Ecosan is a "closed loop" system based on the concept of recovering the nutrients in urine and feces and recycling them into productive systems like farms and small household garden plots. This is done through the use of ecological (usually "urine-diverting") toilets that produce two products, urine that is sterile when separated from feces and a dry matter comprised of feces and other compost materials. These can both be used as nutrients in the soil, thereby increasing food security.

Ecological sanitation is especially suitable for use in waterlogged and water-scarce areas and in situations where sewers are overloaded or where impermeable strata such as rock are near the surface. Ecological sanitation is becoming popular in parts of Europe, the US and Australia, where anti-pollution laws are strict and water bills are high.

In addition to sanitizing human excreta, Ecosan has the advantage of preventing the pollution of rivers, seas, groundwater and other water bodies. It minimizes water use, conserving water for more useful purposes such as drinking, cooking and bathing, and it safely recycles the valuable plant nutrients contained in excreta, thereby helping to improve soil structure and fertility and reducing dependence on chemical fertilizers.

The UNDP initiative has so far supported the construction of hundreds of urine-diverting Ecosan toilets in India, Sri Lanka, and Mexico. It has held workshops and training courses with water authorities and local NGOs in a large number of countries in Latin America, South and Central Asia, and the Pacific to further promote the system.

UNDP has also supported similar activities through pilot projects in Latin America, where local NGOs such as Sarar Transformacion have been promoting this alternative to conventional waste and water management through a wide network. In addition, UNDP works in partnership with groups such as the Hesperian Foundation to promote environmental education manuals and documents on the subject. In South Asia and the Pacific, UNDP supports the efforts of EcoSolutions to promote an ecological approach to sanitation.

### **Vector-borne illnesses**

Another category of water-related diseases are vector-borne illness, which include malaria, dengue and schistosomiasis; they are passed to humans by insects and snails that breed in aquatic ecosystems.<sup>16</sup> Vector-borne diseases are becoming more difficult to treat due to the growing resistance of bacteria to antibiotics, parasites to other drugs, and insects to insecticides. Thus improved water management practices are becoming an increasingly important tool in combating this category of disease. For instance, improving irrigation techniques to avoid standing or

slow water can have a big impact on malaria. As illustrated in box 15, improved disposal of household wastewater can eliminate a choice breeding ground for mosquitoes.

### **Persistent Organic Pollutants**

Persistent Organic Pollutants, or POPs, are another dangerous source of water contamination. POPs are produced and released into the soil, air and water by human activity such as irrigated agricultural, industry and improper waste disposal. Derived from pesticides, other agrochemicals, industrial chemicals and the byproducts of industrial processes, they can accumulate in living organisms to levels harmful to both human and environmental health. They include such substances as dioxin, PCBs and DDT.

Research suggests that the rural and urban poor, who are most exposed to environmental hazards, and especially women, children and infants, are generally the groups most affected by POPs. Evidence points to links between human exposure to specific POPs and cancers and tumors; learning disorders and changes in temperament; immune system changes; reproductive disorders; birth defects; a shortened period of lactation in nursing mothers; and diseases such as endometriosis and increased incidence of diabetes, among others. These substances appear to become highly concentrated in human tissue and breast milk, and can be passed to the developing fetus through the placenta. Even in small amount (parts per

trillion) these substances can have serious impacts on the development of the brain and reproductive system of children.<sup>17</sup> These substances become integrated into the food chain, prolonging their damaging effects on ecosystem and human health.

UNDP, as an implementing agency for the Global Environment Facility (GEF), has supported remedial and preventive approaches to reducing the burden of persistent toxic substances, including POPs, on transboundary waters, thereby protecting drinking water supply as well as ecosystem health, through the UNDP-GEF International Waters Programme (efforts to address the environmental impacts of POPs on biodiversity and aquatic habitats are discussed in Chapter 5 on Environmental Sustainability).

### Conclusion

Addressing water and sanitation problems in developing countries is critical to reducing morbidity and mortality. Water-borne diseases are the biggest killer of young children and improved quantities and quality of domestic water and sanitation will directly reduce child deaths. Improved nutrition and food security, for which access to water is critical, will reduce susceptibility to a wide range of diseases and will lower both child and maternal mortality rates. Malaria will only be successfully addressed through water management that removes their breeding habitat. Similarly, water management will reduce vulnerability to a range of other diseases for which water

is a vector. Meeting the three health-related MDGs thus depends greatly on the ability of countries to expand access to clean water and sanitation services and better manage their water resources.

## Chapter 5

# Sustaining the Viability and Biodiversity of Ecosystems



The MDG target on water and sanitation, so important for the realization of all the MDGs, officially resides in the overall goal of ensuring environmental sustainability.

#### **Goal 7: Ensure Environmental Sustainability**

Water is essential not just to human health and poverty reduction, but also to the viability and long-term sustainability of all the world's ecosystems. Ecosystem health, in turn, is critical to the quantity and quality

- Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources (forest, biodiversity, energy, climate change).
- Halve, by 2015, the proportion of people without sustainable access to safe drinking water and adequate sanitation.

of water supply. Human activities, such as infrastructure development, modification of river flows, land conversion (like deforestation), increased agricultural production, over-fishing, the introduction of exotic species, and the release of pollutants, upset the delicate balance between water resources and environmental sustainability.

Several threats to overall ecosystem health, and consequently to the ability of ecosystems to provide the services upon which human life depends, are particularly relevant to water.<sup>18</sup>

- Climate change and resulting alterations in weather patterns, water distribution, and fisheries will impact seriously on marine ecosystems and small island developing states and stress poor populations unable to protect themselves from flooding, erosion, water shortages, and coral bleaching.
- Loss of species diversity and genetic diversity within species impacts the health of marine and coastal environments as well as wetlands.
- Global fisheries, marine ecosystems and coastal habitats are fast degrading due to over-fishing and contamination from land-based activities.
- Freshwater ecosystems are losing ground to runoff, silting, fertilizers, pollution, and invasive species.
- Drylands are further degrading due to desertification, dropping water tables and over-irrigation.
- Small islands have been hit hard by invasive species and the destruction of coral reefs.

Integrated water resources management offers a way to tackle these interdependent challenges and is the backbone of UNDP's approach. IWRM means coordinating policy and action in the development of water, land and related resources to optimize economic and social welfare without threatening the long-term sustainability of environmental

systems. Three areas are particularly critical:<sup>19</sup>

- the creation of an enabling environment through national, provincial and local policies and legislation, i.e., the “rules of the game”;
- the clear identification of appropriate institutional roles and responsibilities of key actors (for instance, government's role should be that of facilitator rather than top-down manager; there should be a separation of regulation from service provision functions; civil society should be empowered to take part in decision-making); and
- the development of practical management instruments like water resource assessments, communication and information vehicles, tools for water allocation and conflict resolution, regulatory instruments, and new technologies.

The IWRM approach informs UNDP's water-related work in the areas of biodiversity, transboundary waters and marine-coastal management, global water issues, energy, and adaptation to climate change.

### **Biodiversity**

Wetlands play a crucial role in ensuring the quality and quantity not only of the world's biodiversity, but of its water resources as well. Capturing and holding rainfall and snowmelt, retaining sediments, and purifying water, wetlands are a vital component of the water cycle. Yet in the 20th century, humans destroyed 50 percent of the world's remaining wetlands and physically modified others with dams and canals, fragmenting and altering water

flow in 60 percent of the world's largest rivers and compromising many valuable ecosystem functions.

In addition, the impressive increase in food production in the past 50 years has often come at considerable cost to the health of wetlands

and the availability of fresh water. Humankind has not only destroyed wetlands to make way for agriculture and placed increasing demands on freshwater, with agriculture now claiming 70 percent of global freshwater withdrawals. It has also put further pressure on the remaining wetlands through the high levels of nitrogen,

### Box 17: Equator Prize Nominee Restores Wetlands

Many of the efforts nominated for the Equator Prize dealt explicitly with interlinkages between water, biodiversity, and poverty. A good example is work supported by an organization called CACID (Support for Conservation and Sustainable Development Initiatives) in Cameroon, a regional NGO that works with local communities in the Waza-Lagone floodplain. Home to a 170,000 hectare UNESCO Biosphere Reserve and rich in plant and animal species, the biological systems of the Waza-Lagone floodplain were devastated by the construction in 1979 of a large hydroelectric dam. Since the highly biodiverse flood plain was also intensively used for fisheries and agriculture by local people, this destruction was disastrous for local livelihoods. To tackle the problem, CACID rallied a range of stakeholders and in 1992 established a management committee linking the park and riverside communities and led efforts to restore the hydrological balance of the plain, encourage vegetation regrowth and spur re-emergence of the wetlands.

Since then, biodiversity has been successfully conserved by the restoration of wetland and other floodplain ecosystems. Working committees now exist at both the local and regional levels to address the environmental, social and economic needs of the entire floodplain system. Thus, CACID and has not only succeeded in restoring the ecological fabric of the floodplain, it has also successfully promoted opportunities for sustainable income generation.

Ecotourism and environmental education form the cornerstones of CACID's approach. With 40 percent of tourism revenues going to local communities, opportunities for sustainable income generation by residents of the plain have increased. Poverty reduction efforts have focused on promoting rainfed rice culture, improving food security, launching a community-run ecotourism village (including a restaurant run by women and a lodge run by men), selling farm produce, and controlling disease by ensuring a potable water supply and sanitary latrines. Through these efforts and a dedication to participatory planning for the future of Waza National Park and its inhabitants, CACID has helped to ensure that both the biodiverse flood plain and its communities will enjoy the benefits of enduring sustainability for generations to come.

phosphorous, pesticides and sediment accumulating in surface and groundwater from agricultural activities. While agriculture is the key source of water pollutants in the developed world, human waste takes center stage in many developing countries, where 90 percent of sewage is dumped, untreated, into water systems. The net result is a serious reduction in both freshwater quantity and quality.

A number of UNDP programmes support efforts to conserve biodiversity, including the Global Environment Facility's work on Biodiversity and International Waters, the Africa 2000 Network, Capacity 21 and the Equator Initiative, which recognizes local success stories that combine biodiversity conservation with poverty reduction.

The Equator Initiative was designed to identify, recognize and share local success stories that combine biodiversity conservation with poverty reduction. Its flagship program is the Equator Prize, which rewards innovative, community-based solutions that address biodiversity and poverty reduction. In 2002, the Initiative received 420 nominations from 77 Equator-Belt nations.

The Equator Initiative also seeks to highlight the important link between water, biodiversity and food security. Fish provide 28 percent of animal protein consumed in Asia and 21 percent in Africa. Globally, requirements for fish for direct human consumption will double in the next ten years, yet marine stocks are already

over-fished, and future yields are unlikely to increase significantly. Inland fisheries are supplying an increasing amount of this fish – today they provide 12 percent of fish directly consumed by humans, and this proportion is rising – but there are clear signs of widespread unsustainable exploitation here, too.

More than 90 percent of the marine fish catch is dependent on coastal waters for breeding and nursery areas. Thus the health of these coastal ecosystems is directly dependent upon the health of inland wetlands: too little water and too many pollutants in freshwater wetlands eventually degrade coastal wetlands, as well. Indeed, 80 percent of marine pollution originates from land-based sources. Although aquaculture in coastal and inland wetlands is increasing and replacing some of the losses from natural sources, without dramatic improvements in current practices, aquaculture may bring further degradation of wetland habitats through the addition of pollutants and excess nutrients.

### **Transboundary Waters and Marine-coastal Management**

Water is a resource that transcends geopolitical and other human-defined boundaries. The 261 transboundary river basins in the world represent 45 percent of the earth's land area. Similarly, the 64 large marine ecosystems analyzed to date provide 95 percent of the annual global marine fishery yields, and the large majority of these are shared by two or

### Box 18: Bringing Burundi, Congo, Tanzania and Zambia Together to Manage Lake Tanganyika

Lake Tanganyika is the largest body of water in Africa, holding almost one sixth of the world's lake freshwater resources. Ten million people share the lake's watershed, and depend on it for freshwater, food, transportation and livelihoods. It has the highest biodiversity of any lake in the world, with more than 1,500 species of fish, invertebrates and plants, 500 of them endemic. The lake faces growing threats from erosion, urban and industrial pollution, and over-fishing. UNDP-GEF is assisting the governments of Burundi, Congo, Tanzania and Zambia in the development and implementation of an strategic action plan and a Convention for the Sustainable Management of Lake Tanganyika.

more countries.

Because of the transboundary nature of much of the world's aquatic resources, sustainable management of the marine and freshwater systems often requires cooperation and coordination among groups of countries that share these resources. UNDP, as an implementing agency of the Global Environment Facility (GEF), is supporting efforts to manage these resources in three principal areas: large marine ecosystems, freshwater systems, and global water issues.

Large marine ecosystems (LME) are vast ocean areas with linked food chains and distinct submarine topography, hydrography and productivity. Globally, LMEs are under stress from over-fishing, introduced species, pollution and habitat loss. UNDP-GEF helps countries address these threats through the preparation and implementation of strategic action pro-

grammes (SAPs) that apply comprehensive protection and remedial measures to shared water bodies. Experience to date has shown that SAPs can provide political, institutional and economic frameworks for multi-country efforts to sustainably manage LMEs. UNDP-GEF is supporting the development and implementation of SAPs in ten LMEs covering nearly 90 countries around the world.

For example, the Benguela Current LME (BCLME) along the coast of south-west Africa is a highly productive "upwelling" system that supports a unique biodiversity reservoir of fish, invertebrates, sea birds and marine mammals. (Upwelling is the process by which warm, less-dense surface water is drawn away from the shore by offshore currents and replaced by cold, denser water brought up from the subsurface.) However, the BCLME faces threats from over-fishing, seabed mining, toxic algae blooms, coastal development, and environmental variability. UNDP-GEF and several bilateral

### **Box 19: UNDP's Transboundary River Basin Initiative (TRIB) – Facilitating Dialogue Between Co-riparian Countries**

The Transboundary River Basin Initiative (TRIB) aims to foster inter-riparian dialogue to strengthen emerging basin institutions and to support riparian countries as they seek sustainable and equitable development of their shared waters resources.

TRIB is financed through a global UNDP trust fund established in January 2000 with seed money from the US government. The project builds upon existing international work looking at improving the management of transboundary basins, such as the Petersburg Process supported by the German government and the Second World Water Forum hosted by the Dutch government. Lessons are also drawn from UNDP's ongoing experience, in partnership with others, in basins around the world.

Through TRIB, UNDP supports efforts to facilitate inter-riparian dialogue in a number of regions, most recently in the Mekong Basin, the Niger Basin, the Nile Basin, the Rio Frio Sub-basin and the Senegal Basin. In the Mekong Basin, TRIB is helping to enhance communications between the Mekong River Commission and its member countries. In the Niger Basin, the Initiative is examining a data-sharing mechanism between the Niger Basin Authority and its member countries and among the member countries themselves. In the Rio Frio Sub-basin, it is facilitating cross-border dialogue between Costa Rica and Nicaragua through watershed management. In the Senegal Basin, TRIB is lending support to the four riparian countries to build an inclusive institution for basin management.

donors are partnering with the governments of South Africa, Namibia and Angola in the preparation and implementation of an SAP that includes the establishment of a Permanent Commission for the BCLME, harmonized policies for offshore diamond mining, and sustainable management of shared fish stocks.

Other LMEs with active UNDP-GEF programmes include the Red Sea, Black Sea, Yellow Sea, South Pacific Warm Pool, Guinea

Current, and East Asian Seas.

Freshwater-based ecosystems include lakes, river basins, estuaries, wetlands, floodplains and aquifers. They provide a wide variety of ecosystem services, including critical habitats for aquatic species of plants and animals, removal of toxins and nutrients from surface waters, and local and global climate regulation. They also provide important benefits to humans, including potable water, food resources, reduction of flood risk, prevention of erosion, and a broad array of

livelihoods, from tourism to agriculture. In many parts of the world, freshwater resources are under severe stress from pollution, excessive withdrawals and inefficient use, invasive species, over-harvesting of bio-resources, and habitat loss. As noted earlier, a large proportion of the world's freshwater resources are transboundary, necessitating cooperation among riparian countries on integrated, ecosystem-based approaches to sustainable management of increasingly scarce freshwater resources.

UNDP-GEF also uses SAPs as frameworks for multi-country cooperation in the integrated management of freshwater systems. By assisting in the development and strengthening of multi-country institutions, fostering policy and legislative reforms, and promoting broad stakeholder involvement in addressing key threats and priorities, UNDP-GEF seeks to ensure that adequate and clean freshwater resources are available to meet the needs of both growing populations and critical ecosystems. UNDP-GEF supports programmes in lakes Chad, Peipsi, and Tanganyika; the Tumen, Danube, Dnipro, Nile, Senegal and Niger river basins; and the Rio de la Plata and Caspian seas.

Through its initiatives on transboundary waters, UNDP aims to foster dialogue among riparian states (countries sharing water resources) with a view to strengthening emerging river basin institutions. There are more than 260 international river basins around the world,

some of which face increasing water scarcity. Water scarcity can intensify the competition for water between riparian countries that share water resources – and can also promote the search for joint development solutions. Developing a framework among riparian countries to jointly manage their shared water resources is an intense, primarily political process of building relationships and trust through ongoing dialogue.

Although there is no blueprint for transboundary river basin management, certain principles can be summarized:

- Riparian ownership of, and a political commitment to, the process;
- Sharing the benefits from water use and not only the water itself;
- Focusing on moving from challenges to opportunities;
- Building broad partnerships between riparian countries and international donors to ensure coordinated programme implementation;
- Building on the comparative advantages of various donor institutions;
- Developing trust and personal relations among riparian delegations;
- 'Leveling the playing field' in terms of information and skills among riparian partners;
- Developing a shared vision among riparians that defines common goals for co-operation and objectives; and
- Committed donor involvement in building dialogue and trust.

### Box 20: UNDP-GEF Combating POPs in Zimbabwe and Jordan

In eastern Zimbabwe, a UNDP-GEF Small Grants Programme project has successfully mobilized nearly 200 members of the Nyanyadzi community to protect the Save River Valley – an international watercourse – from silting and POPs through sustainable agriculture and alternative livelihoods. Exchanges and visits to other projects have built the community's capacities and strengthened their knowledge of sustainable irrigation practices and ecologically friendly methods of food production, thus reducing chemical deposits in the Save River.

In Jordan, the UNDP-GEF Small Grants Programme helped establish the Jordan Royal Ecological Diving Society (JRED), the first NGO dedicated to protecting the unique Red Sea ecosystem from POPs. JRED has initiated continuous monitoring of the coral reefs in the Gulf of Aqaba along with an intense public information campaign. The NGO partnered with an international research vessel, which used data collected by the project as part of a global survey on coral reefs. It also established a youth training center on marine ecology and conservation. JRED is now assisting marine conservation efforts by other local groups in Aqaba and is implementing an eco-tourism project to help change unsustainable tourism in the Red Sea.

Promoting equitable use as well as equitable sharing of benefits from transboundary waters is an approach that is being promoted by UNDP and its partners, including the World Bank. Focusing on sharing the benefits from water leads to economies of scale, efficient, practical solutions, and collaboration and compromise among countries. For example, a mountainous country with hydropower but little arable land might trade the electricity and water for irrigation from its mountain streams for agricultural produce from the flat, irrigated country next door.

UNDP's role is one of concerned neutrality in support of riparian dialogue. It works as a partner, often in co-ordination with other key

agencies, to the riparian countries in devising strategic actions and projects for co-operative development, environmental protection, stakeholder involvement, and continued capacity building across the basin.

### Global Water Issues

Certain international waters problems are so ubiquitous that they require a global approach. Such global issues include aquatic invasive species, persistent toxic metals, and persistent organic pollutants (POP). UNDP-GEF is partnering with other UN agencies, such as the International Maritime Organization and the United Nations Industrial Development Organization, and others in a number of initiatives aimed at addressing these emerging

### Box 21: Heating Water for Public Baths in Morocco

In Morocco, water for hammams, or public baths, is a leading consumer of energy for heating. UNDP's Capacity 21 programme has a number of pilot projects there, focusing on more efficient use of fuel wood and solar water heaters for hammams. In one project, Capacity 21 is supporting the construction of solar-powered, fuel-efficient hammams in three provinces, with plans to build an additional 50 improved hammams in other rural areas. UNDP also plans to install 100,000 square meters of solar water-heater panels in Morocco over a four-year period, in partnership with the Global Environment Facility (GEF).

issues. A key element of these programmes is the demonstration and replication of successful approaches at the local, national and regional levels.

#### **Invasive Species**

Each year, thousands of ships, which transport more than 80 percent of the world's commodities, also transport nearly 5 billion metric tons of ballast water between the world's major shipping ports. This ballast water contains thousands of species from the ports of origin, some of which can survive the journey and establish a foothold in the port of entry. These introduced species can wreak havoc on local aquatic ecosystems, both marine and freshwater. For example, the European zebra mussel, which infested US waterways, has required more than US\$5 billion in control measures since 1989. The comb jelly, introduced from North America into the Black Sea, contributed to the collapse of Black Sea fisheries and has most recently been discovered in the Caspian Sea.

Negotiation of a global convention on ballast water management is near completion. As part of this multi-national effort, UNDP-GEF is collaborating with the International Maritime Organization in the Global Ballast Water Management Programme (GloBallast) to help developing countries reduce the transfer of harmful organisms in ship ballast water. Pilot demonstration sites in major ports in India, Iran, China, Ukraine, South Africa and Brazil are testing and replicating strategies and approaches to minimize the threat from ballast water invasive in these regions.

#### **Persistent Toxic Metals**

Millions of artisanal and small-scale gold miners in developing countries produce about one third of the world's annual gold supply. Unfortunately, the vast majority of these miners use highly toxic mercury in their mineral processing, with devastating impacts on the miners' health and the aquatic environment as the mercury moves downstream and through the food chain. Although there are simple and

### Box 22: Wind-Powered Irrigation Improves Livelihoods in Tanzania

On the shores of Lake Victoria in Tanzania, poor farmers were unable to irrigate their crops because of high capital investment, operation and maintenance costs. UNDP's GEF Small Grants Programme (GEF/SGP) helped 40 families build a wind-powered irrigation system with a 100,000-litre reservoir tank.

The system now provides water for 40 acres of rice and high-value vegetable crops, thus improving food security and incomes. It also provides a water supply line to the centre of the village for domestic use, lessening the drudgery of women who used to fetch water from far away. Formerly, young men in the area used illegal and environmentally harmful fishing methods such as poison or dynamite in Lake Victoria. But the establishment of the irrigation project has pulled the youths away from illegal fishing activities to irrigated farming which they have found to be equally profitable. The project was so successful that eight neighboring communities with a total population of about 3,000 have replicated it.

affordable alternatives to reduce or eliminate mercury use in gold mining, governments are often unable or unwilling to finance the costs of introducing alternative technologies and raising community awareness. In response, UNDP-GEF is partnering with the UN Industrial Development Organization to demonstrate such alternatives in six pilot countries with extensive artisanal mining operations: Brazil, Indonesia, Laos, Sudan, Tanzania and Zimbabwe.<sup>20</sup>

#### **Persistent Organic Pollutants**

Persistent organic pollutants, or POPs, are another dangerous source of water contamination. POPs are produced and released into the soil, air and water by human activity such as irrigation, industry and improper waste disposal and can accumulate in living organisms to levels harmful to human

health and the environment. The Stockholm Convention on POPs, adopted by more than 90 nations in 2001, links effective implementation of Convention commitments by developing-country parties to the performance of donor governments in meeting their Convention commitments to provide financial resources, technical assistance and technology transfer. The Convention will enter into force after 50 countries have ratified it. As of July 2002, 11 countries had done so. Once ratified, Convention parties will be required to take action to reduce or eliminate releases of POPs, often with their ultimate elimination as the goal.

Implementation of the Stockholm Convention is a key element of any strategy to reduce the pollution of marine and freshwater ecosystems and protect and

### Box 23: Hydroelectric and Wind Power Made Affordable to Local People in Costa Rica

In Costa Rica, Capacity 21 helped support the creation of the Office of Joint Implementation (OCIC). OCIC has emerged as a world leader in implementing the mechanisms of the Kyoto protocol by providing affordable, sustainable hydroelectric energy to Costa Rican consumers. In a process considered a model for developing countries, sustainable energy in the form of hydroelectric and wind power is being made affordable to local people – and therefore more economically viable – through transactions outlined by the Kyoto protocol's Clean Development Mechanism (CDM) brokered by OCIC.

US US\$10 million has been granted to OCIC by the prototype Carbon Trust Fund of the World Bank for investments in three hydroelectric and two wind power projects in Costa Rica, all totaling nearly 100 megawatts. According to the CDM, future sustainable energy projects will be brokered by organizations like OCIC throughout the developing world, with funding coming in the form of “carbon tradable offsets” from producers of carbon dioxide emissions who pay these brokers for the privilege of burning fossil fuels. These payments, like the World Bank funding in Costa Rica, will help developing countries provide their populations with affordable, sustainable, clean energy such as hydropower. By thus contributing to the promotion of renewable, non-polluting energy in developing countries, polluters will help reduce greenhouse gas emissions on a global scale.

safeguard drinking-water supplies. The UNDP-GEF International Waters Programme includes remedial and preventive approaches to reducing the burden of persistent toxic substances, including POPs, on transboundary waters. UNDP POPs activities are also linked to water-resource issues under the UNDP Thematic Trust Fund for Environment (TTF).

UNDP's POPs Enabling Activities Programme aims to create sustainable capacity and ownership in programme countries to enable them to meet their obligations under the Stockholm Convention, including the

preparation of a POPs National Implementation Plan (NIP). These plans describe how the country will meet its obligations to phase out sources of POPs and clean up contaminated sites. By facilitating dialogue, the exchange of information and cooperation among relevant stakeholders – including the governmental, non-governmental, academic and private sectors – the program helps raise awareness and knowledge of POPs issues in the country. As a result, greater account will be taken of these issues in planning and strategy formulation for different economic and technical sectors. The activities will also strengthen the country's role in international scientific forums and

### Box 24: Adapting to Climate Change from the Local Level Upwards in Burkina Faso

Since 1996, nearly 47,000 people in Burkina Faso have been working to galvanize the country to adapt to the effects of climate change – notably desertification. Supported by UNDP's Capacity 21 programme, this large group of teachers and trainers are also learners. While communicating information and raising awareness down to the community level, they have also been listening to the villagers and conveying their priorities to planners and policy-makers in the capital. As a result, virtually everyone in the country, including those in Burkina Faso's 8,535 villages, has been exposed to the principals of adaptation to climate change.

Support from Capacity 21 enabled Burkina Faso's National Council of Environmental Management (CONAGESE) to create a decentralized framework for discussions and top-down/bottom-up information sharing. It consists of a nation-wide network of Steering Committees at the national, regional, provincial, department and village levels. It functions as a "cascade" of capacity-building, information-sharing, awareness-raising and empowerment of all stakeholders, focusing especially on strengthening capacities for planning and management at the village level.

The National Committee trains the Regional Committees, who train the Provincial Committees, who train the Departmental Committees, who train the Village Committees. Village Steering Committees consist of between five and ten people, one of whom must be literate in order to act as secretary. These Committees constitute the nucleus of the system of local governance and local action plans on which the country's climate change adaptation strategy is based.

Advocating an integrated, multi-sectoral approach to sustainable development is a key UNDP theme, and is central to this program's strategy. It includes such activities as "theatre-forums," in which small groups of actors travel the country putting on plays that highlight issues such as water conservation and the importance of vegetation in maintaining groundwater levels. "The activities portrayed are not only tree-planting or reforestation," says project coordinator Delphine Ouedraogo. "We tell people that fighting desertification isn't just one isolated activity. Our message is, 'We have to integrate our activities, plant trees, build little stone walls, fertilize, conserve water and soil, work together cohesively and farm intensively.'"

Ms. Ouedraogo has already observed a change in people's mentality and behavior, evidence that they are learning new techniques to make the most of the country's meager rainfall. "People aren't cutting down trees to make a new field the way they used to," she says, "and they don't burn brush any more. In almost every village there's a compost heap. People dig holes and put fertilizer in, and as soon as the first rains come they plant seeds and the seeds grow. They know that they have to preserve their resources, and they are coming up with their own integrated development plans."

negotiation processes relating to POPs. UNDP has received requests from 18 Stockholm Convention signatory countries for assistance in this area.

### Energy and Water

There are nearly two billion people in the world without access to electricity, mostly in rural areas of developing countries. Focusing less on how to supply more fuel and electricity and focusing more on how to supply the services that energy can provide is a more effective way of approaching the issues of access, affordability, and equity. This shift involves ensuring that diverse and affordable energy services – lighting, cooking, heating and cooling, water pumping, water sterilization, refrigeration, transportation, communication, and mechanical power for productive purposes – will meet basic needs. To meet the needs of the rural poor, decentralized energy options that rely on cleaner fuels and renewable energy systems are now being more widely introduced throughout the world.

Energy is a key driver for most water infrastructure projects. The six broad areas of intersection between water and energy are safe drinking water, sanitation, agriculture, gender, hydropower, and pollution/environmental degradation.

- **Drinking Water** – Energy systems that fuel water pumping, boiling, disinfection, purification, distribution and storage are vital for providing a reliable supply of safe

drinking water.

- **Sanitation** – Energy is often needed to lift ‘clean’ sub-soil water or to boil water to reduce the health risk from fecal contamination. Renewable energy technologies are well suited to providing power for water treatment and pumping. Hybrid systems that combine the benefits of conventional and renewable energy services are also being deployed, as are biogas plants that use human excreta and animal manure.
- **Agriculture** – Water pumping can improve agricultural output significantly; access to energy services, therefore, can mean the difference between subsistence and commercial agriculture. There is a wide range of energy technologies that are affordable and feasible for small-scale agriculture operations. It should be noted, however, that irrigated agriculture is frequently chemically invasive when combined with the use of fertilizers and pesticides, and can make the water unsuitable for consumption and continued irrigation. Therefore, protection of water sources and reducing contamination from runoff should be considered in the planning and implementation of projects.
- **Gender** – In addition to reducing the drudgery and time women and girls spend on water collection, the provision of pumped water and energy services helps keep girls in school. The provision of cleaner water and

energyservicesisalsolinkedtoimprovements in the health, micro-enterprise activity, and agricultural productivity of women.

- **Hydropower** – Large-scale production of electricity through hydropower is widely used throughout the world. However, large-scale hydropower can have high costs, including large capital requirements, serious environmental drawbacks, and harmful social consequences (like mass population displacement) that the poor tend to shoulder disproportionately. In addition, there are water rights issues to be negotiated when waterways cross borders, which is the case for many rivers. Small-scale hydropower is a more decentralized power option that can be highly cost-effective where the appropriate resources and organizational skills are available to support it. Small hydropower systems for villages can be designed and developed according to local requirements based on the size of the community, the available technological knowledge and the resource base. The local private sector can have an important role to play in the development of small-scale hydropower.

- **Pollution and Environmental Degradation**  
The acidification of water – “acid rain” – resulting from the combustion of fossil fuels is a major problem in many parts of the world; the resulting changes in the chemical composition of water affect agricultural productivity and disrupt ecosystems.

Sedimentation of waterways through the loss of topsoil caused by fuelwood harvesting affects many hilly regions and degrades ecosystems. The effects of climate change caused by burning fossil fuels disrupt existing water resources and supplies, displace people and undermine their livelihoods.

Through integrated management of water and energy resources, made possible through the use of IWRM, the multiple goals of sustainable development are beginning to be addressed in a more coherent way. UNDP supports a number of activities that foster the linkages between energy and water in project planning and implementation. This involves more decentralized and environmentally sensitive approaches to the provision of energy and water services in developing countries. Such efforts are being applied to providing policy advice, building capacity, initiating pilot projects, and knowledge networking to move things forward. Because the private sector plays a pivotal role in leveraging funds and expanding the delivery of both energy and water services, its involvement is essential in project development and implementation, along with that of partners from national governments and multilateral institutions.

### **Adaptation to Climate Change and Water Governance**

Projected climate changes during the 21st century will likely exacerbate the north-south divide by worsening poverty in developing countries. The adverse impacts of climate

change will be most striking in developing nations because of their geographical and climatic conditions, high dependence on natural resources, and lack of capacities to adapt to a changing climate. The Intergovernmental Panel on Climate Change (IPCC) Third Assessment Report projects that Southeast Asia and most countries of Africa will be highly vulnerable to climate change because of limited capacity and widespread poverty. Developing adaptive capacity to minimize damage to livelihoods from climate change is also the expressed need of the developing countries themselves.

At the UNDP Roundtable on Adaptation to Climate Change in 2002, there was broad agreement that in order to achieve the key Millennium Development Goals of halving poverty, hunger and the proportion of populations without access to safe drinking water and sanitation by 2015, adaptation to the effects of climate change were imperative. Building on the outcome of the UNDP Adaptation Roundtable, UNDP is uniquely positioned to focus on adaptive capacity development in the water sector. Among its strengths is the ability to convene a wide spectrum of stakeholders, to promote participation and dialogue and to translate community level activities to the national level (see box 23 on Burkina Faso). UNDP is already doing this within the framework of national priorities for sustainable development and poverty reduction, especially in LDCs, which will have the greatest difficulty in adapting to climate change.

The Conference of Parties (COP) to the Framework Convention on Climate Change (UNFCCC) also recognizes that LDCs require prioritized assistance in building adaptive capacity to combat climate change while eradicating poverty. Accordingly, the Least Developed Countries Expert Group has established a work plan for LDCs that aims to strengthen existing, and establish new, national climate change secretariats, provide training in negotiating skills and language and support the preparation of National Adaptation Plans of Action (NAPAs).

In partnership with regional and global centers of excellence and agencies such as the Dialogue on Water and Climate and the International Research Institute for Climate Prediction, UNDP will support this process by helping countries implement “learning by doing” and human, institutional and systemic capacity development in the water and climate change sector. Such efforts will support the formulation of adaptation and coping strategies and integrate water issues and impacts into local and national development instruments.

UNDP Country Offices, by virtue of their strong relationships with the diverse stakeholders in each country, will play a key role in promoting multi-stakeholder dialogue, assessing the impact of climate variability and change on Integrated Water Resource Management (IWRM) and water governance, and strengthening national adaptive capacities.

UNDP aims to strengthen the knowledge base to incorporate climate change adaptation into national development planning through demand driven policy demonstration projects in the water sector, undertaken in close cooperation with partner institutions and diverse stakeholders. It is envisaged that the results will in turn feed back into new research.



## Chapter 6

### Bettering the Lives of Slum Dwellers



For poor people living in slums, the water-related problems discussed in other chapters – inadequate access to clean water and sanitation services, poorly managed water resources, and the resulting drain on human health, education, women's empowerment, and environmental sustainability – are magnified.

**Goal 7: Ensure environmental sustainability**

- By 2020, to have achieved a significant improvement in the lives of at least 100 million slum dwellers.

The geographical concentration of people, production and pollution amplifies the biological pathogens and chemical hazards to which urban people are exposed. Poor slum dwellers, unlike their wealthier urban counterparts, have little way to insulate themselves from these threats. They are exposed to a host of environmental risk factors because they live in shoddy housing often built in hazardous locations (such as near industrial sites or in areas vulnerable to floods and landslides); and they are outside more often given the types of work they are likely to do, because they generally face long commutes, and because their houses are overcrowded. As a result, morbidity and infant mortality rates are higher among slum dwellers than among either urban people who do not live in slums or the rural population.<sup>21</sup>

As the Brundtland Commission report noted over 15 years ago, “the future will be predominantly urban and the most important environmental concerns of most people will be urban ones.”<sup>22</sup> Two-fifths of people in Africa, Asia, the Pacific, Latin America, and the Caribbean now live in urban areas, and every passing day further swells the ranks of city and town dwellers. UN-Habitat estimates that 870 million people in the developing world live in slums. In least developed countries and sub-Saharan Africa, more than 70 percent of the urban population lives in slums, a figure expected to increase.<sup>23</sup>

Tackling urban environmental problems is

critical to meeting the MDG target of improving the lives of 100 million slum dwellers. The main challenge is addressing threats to health, livelihoods and security stemming from hazardous living conditions and poor services; these threats include sub-standard housing, polluted water, lack of sanitation and solid waste systems, outdoor air pollution from industry and traffic, indoor air pollution from low-quality cooking fuels, and extreme vulnerability to environmental disasters (which are likely to increase with climate change). Many steps taken to reduce environmental hazards, such as building with better materials and ensuring adequate drainage systems, also contribute to disaster preparedness, as does improving urban planning and zoning so that the poor are not relegated to flood-prone or otherwise unsafe living sites.

### **What is a Slum?**

The term “slum” has long been understood as catchall term to describe overcrowded, informal settlements characterized by inadequate housing, insecure tenure, and lack of basic services, and inhabited primarily by very poor people. In November 2002 it was, for the first time, defined officially for the purposes of UN monitoring of the MDGs<sup>24</sup> as follows:

A slum is defined as a contiguous settlement where the inhabitants are characterized as having inadequate housing and basic services. A slum is often not recognized and addressed by the public authorities as an integral or equal

part of the city. Five components define a slum:

- Insecure residential status
- Inadequate access to safe water
- Inadequate access to sanitation and other infrastructure
- Poor structural quality of housing
- Overcrowding

Inadequate access to water and sanitation infrastructure are two of the five areas that characterize a slum. But the other three components have significant water-related dimensions, as well. Poor structural quality of housing puts people at risk during water-related natural disasters, particularly where drainage is poor. Overcrowding in the absence of sanitation increases the incidence of infectious diseases that flourish when raw sewage contaminates water supply. Insecure residential status creates a situation in which incentives for investment in infrastructure are few, even when populations live in the same settlement for generations.

Insecure residential status, or insecure tenure, means that people can be evicted at any time. Slum dwellers are often unable to invest in improving their water and sanitation access since they do not hold the legal title to their land or dwellings; they may also be unwilling to do so, given that their investment would be for naught should they be forced out. There are cases where people themselves have improved infrastructure or managed to obtain government services, only to be pushed out by increased rents as their neighborhood

becomes more desirable.

Most critically, lack of tenure means that public utilities do not recognize slums as legitimate settlements entitled to municipal services. Within the city limits of Nairobi, for instance, over 700,000 people live in a slum called Kibera, which occupies 250 hectares (2.5 square kilometers) just minutes from the city center. It is a collection of nine contiguous “villages,” some of which were settled as early as 1928, that have now merged into a vast, dense beehive of narrow lanes and tiny, closely packed dwellings. The second-largest informal settlement in Africa, the main gateway for rural-urban migration, and home to hundreds of thousands working in Nairobi’s city center and industrial area, it is not served by any water and sanitation services other than private water vendors and a handful of latrines set up and maintained by community groups. People in Kibera and settlements like it pay up to 200 times the tap price for water<sup>25</sup> and usually have no choice save open-air defecation, with its high costs to health, dignity and environmental sustainability.

### **Finding Solutions Through Community Action and Public-private Partnerships**

To address the significant challenges associated with providing water and sanitation services to the urban poor, UNDP has relied on two key mechanisms for more effective and accountable water governance: community action and public-private partnerships.

### Box 25: Improved Services Spur a Willingness to Pay in Egypt and Tanzania

The town of Mwanza on the southern shore of Lake Victoria is the second largest urban area in Tanzania. Its main market, Mwaloni, serves 6,000 people every day. Until recently, Mwaloni had only one standpipe for drinking water and six water-operated latrines. Moreover, Tanzanians generally believed that water services should be provided by the government free of charge.

UNDP's LIFE programme (Local Initiative Facility for the Urban Environment) has since supported the installation of four new water standpipes with improved drainage areas and 18 new water-operated latrines in Mwaloni. But perhaps most important, with the improved infrastructure has come a change in attitudes among local people. At first, people who had no public toilets in the past refused to pay for a need they had fulfilled in the open. But once the new toilets were installed in the market, people decided they could pay a small fee to use them. In fact, the new services became so popular that public showers have also been built in Mwaloni, and people willingly pay to use them as well.

In Egypt, in a community north of Cairo, residents had long resented paying for the inadequate water disposal services the municipality provided. LIFE helped build a partnership between the community and city officials and strengthened the capacity of a local Community Based Organization to carry out reliable wastewater removal. As a result, the people themselves decided to pay the CBO a higher fee for the new service than they had previously paid to the city for a service that barely functioned, and to pay in advance. Participating in the decision making process had given them a sense of ownership, a stake in the improvements that were taking place.

For each of these projects, LIFE's financial contribution, which included other services besides water infrastructure, was less than US\$50,000.

### Community Action

In the slums of Dhaka, where clean water is scarce, UNDP's LIFE programme (Local Initiatives for the Urban Environment) has enabled poor communities to join in partnership with local authorities to gain access to tube wells, install latrines and erect standpipes that provide hundreds of families with safe water. In Cartagena, Colombia, LIFE supported projects for the provision of drinking

water, sewage and wastewater services where they were unavailable before. It has financed an entire sewage system in a provincial city in Pakistan, and has launched a National Sanitation Task Force in Jamaica.

These are just a few examples of LIFE's activities since its establishment as a UNDP global pilot programme at the Earth Summit in 1992. Since then, LIFE has worked with the poorest

### Box 26: LIFE Project Improving Environmental Services in Senegal

In the Senegalese city of Yeumbeul, a LIFE project focusing on household wastewater disposal affected local politics in a number of ways. Newly elected council members are promising to expand the wastewater project to other communities, and municipal officials have become much more involved in addressing community problems since their participation in LIFE's consciousness-raising workshops. At the national level, LIFE has entered into partnership with the Senegalese government's poverty eradication programme and discussions are under way with the National Mayor's Association to plan how to mainstream the LIFE approach in all Senegalese cities in the future.

of the urban poor in 12 countries, and in 37 additional countries through its regional and global programmes. It is estimated that nearly 1.3 million people have benefited directly from LIFE projects, while 5.3 million have benefited indirectly. And in every city, water and sanitation have been major priorities of LIFE projects. LIFE has supported 26 projects that provide drinking water, 24 drainage projects and 17 projects that installed latrines.

By targeting basic water and sanitation services, LIFE has helped to improve the quality of life for people living in slums. Equally important, LIFE's approach to providing urban infrastructure and services is designed to build the capacity of local people to meet these needs for themselves through participatory local governance. LIFE uses the environmental entry point as a means to strengthen community-based organizations, NGOs, and local authorities so that they can meet the needs of poor communities for water supply, sanitation and other necessities.

LIFE takes an "Upstream, Downstream, Upstream" approach to eradicating poverty through urban environmental improvements. It works first at the "upstream," or national level, to involve key stakeholders among government, NGOs, academia and the donor community in a National Steering Committee (NSC) that formulates a national strategy for prioritizing urban environmental objectives. It then works "downstream" at the local level of urban communities, providing small grants (of less than US \$50,000 each) to local organizations to implement participatory environmental projects in poor neighborhoods. These small-scale, pilot projects provide basic services and bring various partners – local authorities, CBOs, the private sector and the poor themselves – together in dialogue and collaborative efforts. Then the results and lessons of the small-scale projects are brought to the attention of "upstream" policy makers by the NSC to initiate policy-level dialogue, to influence policies and to further support the scaling up, transfer and generation of new community-based initiatives.

Another mechanism for enhancing community involvement in water and sanitation provision is the Urban Governance Initiative (TUGI), a network for capacity building, advocacy and information sharing for urban governance in Asia and the [www.tugi.org/Pacificabout.php](http://www.tugi.org/Pacificabout.php).

Based in Kuala Lumpur and with pilot projects in Penang (Malaysia), Kathmandu (Nepal), Shenyang (China), and Suva (Fiji), TUGI acts as a regional hub to promote participatory, transparent, accountable and equitable urban governance through institutional capacity building and policy advisory services. TUGI promotes the sharing of innovations in tools and methodologies for urban governance, as well as wide information dissemination and

collaborative networking within and between the cities of Asia and the Pacific.

Recognizing that water is an important urban issue in the region, TUGI has created an enabling environment for citizens' participation on water issues through tools and by disseminating information about water. For example, the TUGI Report Card on Water and Sanitation is an effective participatory tool that provides a means for all stakeholders to come together and rate the current water service delivery in their city. The process of implementing the Report Card is the vital first step that a city authority takes in involving stakeholders in decision-making processes regarding water. The Report Card also acts as a platform for creating viable, localized

### Box 27: PPPUE Brings Water and Sanitation to Urban Settlement in Buenos Aires

Moreno is a large informal settlement outside Buenos Aires, with a population of some 371,000 people, 65 percent of whom live below the poverty line. Two-thirds of the houses in this area have no piped water, while three-quarters have no sewage facilities. One reason – a problem throughout the developing world – is that it is difficult for the private sector to operate in such marginal neighborhoods, where lack of coherent laws and regulations governing squatter settlements often produces contractual problems and disputes over land rights.

PPPUE is working in Moreno in collaboration with the International Institute for Environment

and Development-Latin America (IIED-AL) to build the capacities of community organizations, the local municipality, the Water Regulatory Board of Buenos Aires, and a private water company to implement a model of partnership-based management for the delivery of water and sanitation services. Partnerships with community organizations will mean that people living in Moreno will, for the first time ever, have the chance to play an active role in improving their living standards.

Scheduled to be completed by June 2004, the project will coordinate the actions needed to provide Moreno with reliable, clean water,

including technical systems and appropriate financial mechanisms. Key activities include capacity building workshops on partnership-based management, the implementation of pilot case studies and evaluation workshops. Work manuals and guides will be produced for transferring the experiences and lessons learnt from the project as a “poor-poor” model for other municipalities. The project will also develop norms, bylaws, rules and regulations to provide a legal framework for the provision of services in informal settlements, including technical systems and organizational set-ups appropriate for settlements like this one.

“We believe that tri-sectoral partnerships such as this are a viable alternative for ensuring that huge groups of people without resources can have access to water and sanitation services,” says Gaston Urquiza, project coordinator for IIED-AL. “Without the collaboration of the members of this partnership, there would be no possibility that the urban poor could have reliable water given the present socioeconomic situation in Argentina. We also believe that this project will bring about a sustainable solution, because it is putting in place a dynamic working model that links the various stakeholders together and facilitates the adaptation of norms to the needs of each stakeholder group.”

Special strategies are being put in place to ensure that the poorest residents of Moreno will be able to afford the new water and sanitation services. On the technical side, such innovations include the use of relatively shallow drains that require fewer pipe sections and double septic

tanks that include a small tank with a grille to ensure that solids do not flow into the sewage network. In addition to being more economical, this shallow system would also avoid contact with the water table. The system is hermetically sealed like conventional systems.

In addition, regulations are being made more flexible. For example, suppliers will be allowed to use piping of lower quality where this will adequately meet the needs, as long as it is installed under pavements where it will be protected, and not under unpaved streets. As a temporary measure until upgrading is possible, water pressure will be lowered while water quality will be guaranteed. With lower pressure water would not have to be piped from contaminated water tables, and domestic effluents would not contaminate the groundwater.

In some cases, a “mixed system” administrative solution will be applied. This would involve the water company bringing water to a point in Moreno, and then the community itself distributing and paying for the water service at the local level.

PPPUE will bear the costs of capacity building, training and workshops for project partners, as well as publications and translations of materials. Local government and the private sector will finance construction and the cost of materials. Users will be expected to pay an affordable rate for water service.

action plans to combat the root causes of urban water problems.

### **Public-Private Partnerships**

The creation of partnerships between public and private sector institutions is one of the most promising emerging strategies for providing urban environmental services to city dwellers in developing countries. Working together, all potential stakeholders – local governments, businesses and communities – can pool their resources, expertise and unique approaches to problem-solving to improve the delivery of basic services.

The core goal of UNDP's Public-Private Partnerships for the Urban Environment (PPPUE), launched in 1994, is to increase the access of the urban poor to basic services such as water supply and sanitation by promoting collaboration among the public and private sectors (which includes local, national, and international businesses as well as informal enterprises) and engaging non-governmental organizations and communities as active partners. PPPUE runs three National Programmes (in Nepal, Namibia and Uganda) and 12 Innovative Partnership Grant projects (in Mauritania, Mozambique, South Africa, Russia, Ukraine, Argentina, Haiti, Peru, Indonesia, Laos, Malaysia and the Philippines). PPPUE also provides policy advice on PPP-related activities to UNDP country offices throughout the developing world.

Helping address national and local limitations and create an enabling environment for tripartite partnership development and service delivery through PPPs is key to UNDP's approach. Elements of enabling environment include the following:

- Appropriate legal frameworks (for instance, legal frameworks adapted to informal settlements where residents may not have land rights and laws that allow the public sector to work with the private sector for service delivery;
- Financial mechanisms (subsidies, tax breaks and other incentives for service operators; pricing structures that allow for cost recovery but do not price out the poor);
- Decentralization of responsibilities and resources within government;
- Urban planning frameworks that allow or facilitate innovative solutions to urban service delivery problems.

PPPUE also supports information exchange and the sharing of best practices through its Global Learning Network (GLN), made up of individuals, institutions and programs working on public-private partnerships at the local level. The Network provides partners with services such as newsletters, a virtual library, and project databases that close the gap between practical experience and theoretical analysis. Its activities include the development of toolkits on public-private partnerships, the development of professional capacity in PPP through a world-wide collaborative learning initiative, and face-to-face as well as virtual

meetings where PPP experiences are collected, analyzed and disseminated. Extensive databases covering publications, events and projects across the globe and in a wide range

of sectors are also freely available in support of the ongoing enhancement of PPP initiatives.

### **Box 28: PPPUE Pilots Urban Water Supply Management Model in Mozambique**

In Mozambique, PPPUE and CARE International have launched a project to provide water and sanitation services to some 20,000 households in the cities of Maputo and Matola through the establishment of area-based offices and consultative water committees. The idea is to institutionalize dialogue among consumers, private companies and municipal councils to protect vulnerable communities from the repercussions of privatization. Other partners include the Municipal Directorate of Water and Sanitation, the Water Regulatory Council, CBOs in the cities of Maputo and Matola and Aguas de Mozambique, a private firm currently running water supply and sanitation in both cities.

The project will produce a management model of water and sanitation service delivery, which will be used to guide other basic service delivery mechanisms. It will also clarify the roles and responsibilities of key stakeholders – government, business and civil society – within a privatized water delivery system. And it will establish area-based offices (AOBs) for consultation on water affairs, as well as consultative water committees.

Facilitated by the project team, communities will actively participate in the water sector, a critical leverage point for issues of poverty alleviation in cities, and in the development of beneficial relationships with private service providers. Community representatives will receive training to enable them to understand the key issues involved in water supply and sanitation and to discuss these issues with the Water Regulatory Board and the private supplier. Community representatives will also be trained to understand the water tariff structure as well as how to handle water leakage and other problems in order to reduce losses and their impacts on the tariff. These processes will help create public awareness of the rationale for private sector participation in public service delivery, help avoid the confusion and resistance often seen in the reform of public services in developing countries, and ensure that the poor will be able to afford the water and sanitation services provided.

Funding provided by PPPUE will be used to establish the AOBs, provide the necessary training and raise communities' awareness on water and sanitation issues. The costs of the water and sanitation services provided to the communities will be decided by the Water Regulatory Board in consultation with the communities and the private partner.

## Chapter 7

# Conclusion: Meeting Water-related Challenges to the Achievement of the Millennium Development Goals



The water crisis is largely a silent one. Every year, millions of people, most of them children, die from diseases associated with inadequate water supply, sanitation and hygiene. Water scarcity and **Goal 8: Develop a global partnership for development** poor water quality negatively impact food security, livelihood choices, and educational opportunities for poor families across the developing world. Developed nations use an average of 400-500 liters a day per person, whereas in developing countries the volume is just 20 liters. Although far more people suffer the ill effects of poor water and sanitation services than are affected by headline-grabbing topics like war, terrorism, and weapons of mass destruction, those issues seem to capture the public imagination, as well as public resources, in a way that the arguably more critical water issues do not. In order to alleviate the detrimental effects of poor water management and a lack of adequate financial resources, partnerships at all levels with multiple stakeholders must be fostered.

The gulf in water use between rich and poor countries is stark: developed nations use an average of 400-500 liters a day per person, whereas in developing countries the volume is just 20 liters. It is a problem that in many parts of the world is getting worse. Simply meeting the MDG for water requires us to connect around 275,000 people a day to clean water over the next 12 years, while at the same time meeting the broader challenge of reversing depletion of fresh water and alleviating growing competition over scarce resources in many parts of the world.

This is a crisis with many dimensions, but one of the most important - and neglected - is the governance aspect: meeting our goals will depend in large part on whether we can all value and manage scarce water resources better at both the individual and collective level. This includes everything from supporting national policy and regulatory frameworks for integrated water resources management to the development of improved water service delivery mechanisms, through a participatory approach, at all levels of society.

While the exact approach chosen will vary from country to country, there is an important central principle that stretches across all of them: the need to involve the poor themselves in crafting and implementing solutions. One of the few lessons that we have learned in development over the years is that it is only by giving local people, particularly women, a real say in how resources are used and managed in their own

communities that we can properly tackle these problems.

To achieve the MDGs, particularly the target on water and sanitation, the international community as well as regional, national and local governance institutions must meet several key water-related challenges.

- **The social challenge** – attaining equity in access to safe water; enhancing the livelihoods of the poor; reducing the poor's vulnerability to water-related diseases, disasters like floods and droughts, and water-based conflict; promoting equality for women and girls in access, rights, entitlements and decision-making; and encouraging social mobilization to promote change.
- **The economic challenge** – maximizing the social and economic benefits from available water resources, while ensuring that basic human needs are met and the environment is protected. Meeting this challenge requires the application of IWRM principles, instituting mechanisms for fairer and more efficient allocation and use of water resources, improving the performance and sustainability of existing supply systems, introducing and enforcing a self-governing system of incentives that promote more efficient water use within and outside agriculture, financing a significant expansion of services, and getting pricing right.

- **The ecological challenge** – ensuring the sustainable use of water and protecting the resource base both in terms of quantity and quality to ensure that present and future generations are able to sustain their lives on the planet.
- **The capacity challenge** – building the capacity of the decentralized, community-based structures needed to improve the effectiveness of service delivery as well as the capacity of governments at all levels for IWRM.

These challenges can be addressed in a number of mutually reinforcing ways: prioritizing the needs of the poor; expanding the resource base for water and sanitation; promoting integrated water resources management; and building capacity at all levels.

### **Prioritizing the Needs of the Poor**

Putting the poor at the top of the water and sanitation agenda by promoting policy and institutional reforms that prioritize their needs, enhance their ability to exercise their rights to safe water and adequate sanitation, and enable them to influence water supply and water management decisions is critical. The decentralization policies currently in force in developing countries are a useful vehicle for strengthening local water-management structures.

Developing the capacity of poor communities for advocacy and management is an important

step. Skills in advocacy can enable the poor to influence the policy, budget and investment decisions of governments, especially at lower levels. Capacities in management can help them ensure the sustainability of community-based water and sanitation programmes and demand accountability on the part of those responsible for service delivery.

Poor people can contribute to operating costs for water and sanitation systems, and evidence shows that they are willing to do so when services meet their expressed needs and are effectively implemented. Nevertheless, the impact of various cost-recovery mechanisms for water and sanitation services on the poor requires careful monitoring to ensure that pricing does not shut out the poorest. The need for cost-recovery should not come before the need for universal access.

UNDP supports pro-poor policy development as well as community-level action in these areas through its GEF Small Grants Programme, the Local Initiative Facility for the Urban Environment (LIFE), Capacity 2015 (formerly called Capacity 21), the Drylands Development Centre, the Africa 2000 Network, the Community Water Initiative, and the Poverty-Environment Initiative (web links to these programs can be found at [www.undp.org/energy/index.html](http://www.undp.org/energy/index.html) and [www.undp.org/water/index.html](http://www.undp.org/water/index.html)).

### **Expanding the Resource Base for Water and Sanitation Services**

While sustainable water governance that encourages capacity development, sound policy frameworks, and a strong focus on community-based activities is essential, it is far from sufficient; there is also a need to significantly increase the resources dedicated to expanding water and sanitation services. For this, both additional ODA and new, innovative ways of financing local and community level initiatives are required.

That is one of the key recommendations of the new Report of the World Panel on Financing Water Infrastructure, carried out under the chairmanship of Michel Camdessus, which estimates that spending on water infrastructure in developing countries will have to increase from current levels of around US\$80 billion a year to around \$180 billion over the next 20-25 years to meet growing needs. Despite the need for increased resources, however, both domestic and international funding for water and sanitation has fallen in recent years: governments have cut investments in water, sanitation, and garbage collection; international lending to water and sanitation infrastructure has plummeted; and international private flows have dropped off in line with broader falls in foreign direct investment to developing countries. Through the various partnership programmes at UNDP, sound economic instruments are promoted in order to ensure that the obligation of donor countries are met to achieve the MDG's.

There is still a lot of skepticism surrounding the issue of private sector involvement in the provision of basic services as well as much debate over issues like user fees. But the response should not be to reject private sector; the scale of the challenge we face means we literally cannot afford to. Rather, we need to do a better job at ensuring that private public partnerships meet the needs of the poor in a transparent and effective manner. The starting point must be making sure that the entity that provides the end-user water or sanitation service, whether public, private or some combination of the two, is one that local communities have initiated, trust and are able to hold accountable. There are a number of possible models, ranging from privatized central suppliers that then sell services to elected local municipalities, to direct subsidies for poor users linked to differential pricing schemes to guard against price gouging, to explicit targets linked to private contracts that ensure the poor get priority and are not priced out of services.

Experimenting to find effective models that allow sustainable cost-recovery is only one part of the answer. There is still the need to pay for the capital costs. That can mean leveraging in new types of financing, whether through new forms of credit or raising public resources at local level through sub-sovereign borrowing by municipalities and other bodies within the context of nationally set minimum standards of provision.

Nevertheless, it is important to recognize that the financial requirements for meeting water- and sanitation-related goals will be beyond what some developing countries can afford. For them, additional ODA will be necessary. Thus it was recognized at the World Summit for Sustainable Development that, in addition to national resource mobilization, substantial increases in international assistance and other resources will be required if developing countries are to achieve the MDGs.

UNDP directly supports innovative financing mechanisms through the Public-Private Partnerships for the Urban Environment (PPPUE), the GEF Small Grants Programme, LIFE, and the Africa 2000 Network. More information on these programs can be found at [www.undp.org/energy/index.html](http://www.undp.org/energy/index.html).

### **Promoting Integrated Water Resources Management**

Building capacity in IWRM and promoting IWRM policies and strategies that drive development programmes within the water, agricultural and industrial sectors is critical. Such policies would focus on increased water-use efficiency and more sustainable water management; effective management of the competition for water among various stakeholders within a country and among riparian states, while safeguarding the special interests of the poor; the development and enforcement of regulations; and the use of incentives like the “polluter pays principal” for the containment of water contamination.

There is a need a particular need to:

- Ensure that national policy frameworks, action plans and investments include the management of water resources and the delivery of water and sanitation services. Otherwise, water deficiency as well as mortality and morbidity associated with water-related diseases and contaminants will continue to lead to low land and labor productivity, undermining poverty reduction efforts.
- Help policy makers take into account the increasing evidence that global climate change and climate variability will affect the variability and availability of water supplies and water quality as they design new instruments, tools, and institutions.
- Promote the application of agricultural technologies that enable the most efficient and sustainable use of water, especially in arid and semi-arid areas, to increase food and income security and reduce vulnerability of the poor to shocks and crises is also a priority.
- Ensure the full participation of women in the design, management and operation of water and sanitation schemes.

IWRM is the backbone of UNDP’s work in water. The organization supports this approach in all its water-related initiatives, particularly through the following programs: Cap-Net (the Capacity Building Network for Integrated Water Resources Management); Ecosan; the Global Ballast Water Management Programme (GloBallast); the Trans-boundary River Basin Initiative (TRIB); the Equator Initiative; the POPs

### Box 29: Community Water Initiative – Building Capacity to Promote Local Solutions

UNDP recently launched the Community Water Initiative. It builds on the success of UNDP-administered small grants programmes such as LIFE, Africa 2000, and the Global Environment Facility (GEF) Small Grants Programme, and is being implemented in close collaboration with WaterAid, an NGO based in the UK and active in thirteen developing countries.

The initiative will provide grants to communities undertaking innovative work in water supply, sanitation, rainwater harvesting and integrated watershed management. It will support local innovations in technology and develop community capacities through programmes that demonstrate innovative approaches, focus on the community level, provide reliable management systems and affordable services, lead to reductions in poverty, test low cost, appropriate technologies, and show evidence of a strong gender mainstreaming approach. Capacity development, the exchange of good practice between communities (study visits, national/regional meetings and workshops), documentation of successful approaches, and pro-poor policy development in the areas of water management, water supply and sanitation will be central to the Initiative.

In its first stages, the Initiative will support activities in the areas of water supply for communities and households, household sanitation, local watershed management, and innovative financing and management structures. Grants up to US\$20,000 are available for each community.

There will be close collaboration with the existing GEF Small Grants Programme, with the networks of UNDP's LIFE programme and with Africa 2000 as well. This initiative will not only help finance innovative local solutions but will strengthen human and local institutional capacity to manage water resources.

For more information, visit [www.undp.org/water/initiative.html](http://www.undp.org/water/initiative.html).

Enabling Activities Programme; and UNDP/GEF programs in the areas of biodiversity, climate change, ozone depletion, and international waters. More information on all these programs can be found at [www.undp.org/water/index.html](http://www.undp.org/water/index.html).

### Building Capacity at All Levels

Water sector reform can lead to greater responsiveness and effectiveness of service provision in the water and sanitation sector. Yet reforms, such as decentralization, have created huge capacity challenges at all levels. Reforms have also created a need to help institutions manage change. Achieving sustainable

management of water usually requires new types of policy, legal and institutional structures and new ways of working. Support must be provided to institutions and individuals who are taking on new roles, improving awareness and knowledge, and working toward a more equitable sharing and use of this limited and precious resource across user groups, communities and international borders.

Capacity building is central to UNDP's overall organizational mission. In the water arena, UNDP is building capacity at all levels through a variety of programmes, among them Cap-Net, Capacity 2015, the Community Water Initiative, LIFE, PPPUE, the Africa 2000 Network, the Dialogue on Effective Water Governance (see box 29), the Programme of Assistance to the Palestinian People (PAPP, [www.papp.undp.org](http://www.papp.undp.org)), and the Urban Governance Initiative (TUGI, [www.tugi.org](http://www.tugi.org))

### **UNDP's Role**

Given the complexity of water uses within society, UNDP's role is to help developing countries create an enabling policy environment, strengthen institutional and human capacity, and ensure that water resources are allocated and managed equitably, efficiently and in an environmentally sustainable way. UNDP helps countries put in place regulatory regimes and water management systems that allow clear transactions between stakeholders in a climate of trust and shared responsibility for safeguarding water resources, and that conform to basic water governance principles. Actions

to support demand-driven water management and water economics instruments depend on institutional, regulatory and legal development, capacity building, awareness building and monitoring, and UNDP provides assistance in each of these areas.

The organization takes a holistic approach to water issues, addressing social, economic, ecological, and capacity challenges through a wide variety of programmes at all levels. Four core principles govern UNDP's role in supporting water programmes: achievement of sustainable human development goals; meeting the challenges of food security, human health, and the deterioration of the aquatic environment; building upon UNDP's proven strengths and capabilities; and supporting water-related international conventions and agreements.

UNDP is well placed to help developing countries with specific mechanisms for good water governance and IWRM. The organization is increasingly focusing on policy support services, advocacy and strategic partnerships, primarily in the following areas:<sup>26</sup>

- Strengthening local management of water resources and service delivery, with an emphasis on implementation of community-based watershed management projects and community and household-based water supply and sanitation projects;
- Integrating water resources management into national development frameworks;
- Addressing issues related to global and

- regional transboundary waters;
- Addressing adaptation to climate variability and change in the context of water governance;
- Gender mainstreaming in the management of water resources and service delivery; and
- Capacity building for the management of water resources and service delivery.

### Box 30: UNDP Water Governance Programme At-A-Glance

**Service Line 1** – Support efficient and equitable water resources management as well as water supply and sanitation service delivery in the context of national development frameworks.

Focus of Intervention	Areas of support
1.1 Develop policy options and strategies that integrate local, national, regional and global water resources objectives and instruments into national development frameworks and poverty reduction strategies	<p>Promote holistic approaches to water resources management</p> <p>Facilitate multi-stakeholder dialogues on integrated water resources management, IWRM, and broad participation, particularly of poor and marginalized groups, in the formulation of policies and strategies</p> <p>Strengthen inter-ministerial coordination, and capacity to integrate national water resources objectives and international water targets into poverty reduction strategies, macro- economic and sectoral policies, regulatory frameworks, planning and budgetary processes</p> <p>Support capacity development to analyze issues, identify policy options, and provide an enabling environment for effective decentralized water resources management</p> <p>Strengthen country capacity to participate in negotiations of multilateral water resources agreements, trade, and other international economic policy instruments</p> <p>Promote shift towards demand management approaches to meeting water supply and sanitation needs</p> <p>Support adoption of cost-effective and environmentally sound methods for water conservation, wastewater reuse, and ecosystem-based sanitation</p>
1.2 Strengthen government and civil society capacity to plan and implement integrated water resources programmes to improve livelihoods	<p>Support application of strategic water resources management methods and tools, such as water resources assessments; communication and information sharing; conflict resolution mechanisms; regulatory and financing instruments; vulnerability assessments, poverty profiles and other diagnostic instruments, including provision of gender disaggregated data and gender specific analysis</p>
1.3 Support UN Country Teams in integrating water resources issues into development cooperation frameworks and programmes	<p>Provide policy advice, technical support and training to UN Country Teams on integrating water resources management and service delivery into the CCA, UNDAF, PRS and PRSP processes, and into the formulation and implementation of joint programmes</p>

### Box 30: UNDP Water Governance Programme At-a-glance

**Service Line 2** – Increase access to adequate and safe water supply and basic sanitation and improve local management of water resources.

Focus of Intervention	Areas of support
2.1 Strengthen national and sub-national policy, legal, regulatory and budget frameworks to improve local water resource management and provision of water and sanitation services	<p>Support policy, legal, and regulatory reforms that improve poor people's access to and control over water resources</p> <p>Support decentralized water management based on IWRM principles, that is responsive to local conditions and the livelihood needs of poor and marginalized groups</p> <p>Strengthen institutional mechanisms between government, civil society and private sector for effective and equitable management and allocation of water resources and service delivery</p> <p>Support civil society capacity for negotiation and dialogue with government</p> <p>Enhance capacity of government and civil society for enforcement and monitoring</p>
2.2 Support participatory water governance decision-making processes that empower marginalized and vulnerable groups and enhance accountability and transparency	<p>Promote effectiveness and pro-poor impact of decentralization</p> <p>Support IWRM and monitoring at the level of local governments and civil society</p> <p>Strengthen participatory procedures and conflict resolution mechanisms to enable poor people to fully participate in decision making</p> <p>Support access to information and knowledge networks, lessons learning and knowledge exchange among civil society and government, including South-South exchange</p>
2.3 Support community-based projects to implement and test participatory approaches for integrated water resources management	<p>Apply watershed approach to community-based IWRM projects that support sustainable development of and equitable access to water resources and sanitation</p> <p>Support community and household-based projects for supply of water and sanitation services</p> <p>Raise awareness on and apply local water resource management</p>

### Box 30: UNDP Water Governance Programme At-a-glance

**Service Line 2** – Increase access to adequate and safe water supply and basic sanitation and improve local management of water resources.

Focus of Intervention	Areas of support
	<p>practices and technologies</p> <p>Utilize existing UNDP small grants programmes and NGOs to provide technical and financial assistance to community and household-based projects Support exchange of experiences between communities to scale up implementation and impact</p>
2.4 Support development of water and sanitation systems that are safe for human health and environmental sustainability	<p>Provide advisory services and support projects that demonstrate new ecosystem-based technologies and systems, such as ecological sanitation and rain water harvesting</p> <p>Provide feedback for “upstream” policy development and support replication of ES-based technologies</p> <p>Support production of “How To” guides for application of ES-based technologies</p>
2.5 Develop effective financing instruments for IWRM at local level	<p>Examine applicability of local innovative financing mechanisms for wider application to IWRM</p> <p>Tests alternative public-private partnership modalities for provision of water and sanitation services</p>

### Box 30: UNDP Water Governance Programme At-a-glance

**Service Line 3** – Promote cooperation on regional and global water challenges

Focus of Intervention	Areas of support
3.1 Facilitate coordination and harmonization of national policies, and development of common frameworks for action, for cooperative management of transboundary water resources	<p>Support assessments of key transboundary water management issues, constraints and common priorities</p> <p>Support information exchange and sharing of experience</p> <p>Facilitate country participation in regional and sub-regional policy dialogues aimed at managing shared water resources cooperatively and for mutual benefit</p>
3.2 Strengthen country capacity to formulate and implement regional and sub-regional strategic initiatives for managing shared water resources	<p>Support capacity building for conflict resolution based on concepts of benefit sharing</p> <p>Strengthen capacities to apply an IWRM approach to transboundary water resource management and address related problems such as regional impacts of land degradation</p> <p>Strengthen institutional capacities for cooperation in the management of shared water resources</p> <p>Support exchange of information, experience and good practices</p>
3.3 Increase advocacy of pro-poor and ecosystem-based water governance approaches and global dissemination of water governance experiences	<p>Participate in key international fora, publications, and follow-up activities to advocate for pro-poor and ecosystem-based water governance, e.g. CSD, WSSD and MDG follow-up, World Water Development Report, UN-WATER, and Global Water Partnership</p> <p>Contribute governance perspective to key advocacy documents such as the World Water Development Report</p>

### Box 30: UNDP Water Governance Programme At-a-glance

**Service Line 4** – Integrate adaptation to climate variability and change into national water governance strategies

Focus of Intervention	Areas of support
4.1 Develop strategies to integrate adaptation to climate variability and change (CV&C) into national policies and development planning processes, Press, and IWRM plans	<p>Undertake assessments of vulnerability of countries to CV&amp;C from the perspective of IWRM strategies in the context of sustainable development frameworks</p> <p>Identify options for translating vulnerability assessments into concrete actions to respond to the impact of CV&amp;C</p> <p>Facilitate inter-disciplinary multi-stakeholder dialogues to formulate IWRM strategies to adapt to and cope with the impacts of CV&amp;C and reduce vulnerability of poor people</p>
4.2 Enhance adaptive capacity to cope with CV&C in integrated water resources management	<p>Assist development of tools for water managers to pro-actively respond to CV&amp;C, such as risk assessments and improved inter-sectoral cooperation</p> <p>Support development of capacity of national and sub-national (operational) water management institutions and civil society organizations to implement strategies to adapt to CV&amp;C</p> <p>Test cost-effective, learning-by-doing adaptive capacity mechanisms to reduce loss of life and livelihoods and feed results back into policy formulation</p> <p>Support knowledge networking on integrating water governance and relevant CV&amp;C issues to facilitate south-south and north-south exchange of experience and lessons learned</p>

### Box 30: UNDP Water Governance Programme At-a-glance

#### Service Line 5 – Mainstream gender in water governance

Focus of Intervention	Areas of support
5.1 Integrate a gender perspective throughout water resources governance and IWRM initiatives	Maintain, update, and disseminate resource guides for mainstreaming gender in water management
5.2 Expand development of tools to mainstream gender in IWRM	<p>Adapt resource guides for country and community-specific needs and use by community-based practitioners</p> <p>Design additional tools for mainstreaming gender in water management and disseminate information through “How To” publications and other means</p>

### Box 30: UNDP Water Governance Programme At-a-glance

**Service Line 6** – Develop capacity for integrated water resources management

Focus of Intervention	Areas of support
6.1 Strengthen capacity building networks at national, regional, and global levels to deliver education, training, and information support for improved management of water resources	<p>Strengthen and empower alliances of capacity building institutions to share skills and expertise and meet capacity building needs for integrated water resources management at local, regional and global levels</p> <p>Support capacity building networks to identify and prioritize capacity building demand</p>
6.2 Support knowledge development and awareness raising among decision makers and stakeholders	<p>Improve knowledge sharing on capacity building for IWRM</p> <p>Raise international and local commitment to new capacity building strategies in IWRM</p> <p>Include capacity building components addressing management issues, gender, and sustainability in UNDP support to water resources management activities</p> <p>Develop information systems at the global and regional level to support local access to knowledge and information sharing on IWRM</p>
6.3 Improve access to materials and tools for integrated water resources management	<p>Match appropriate materials and tools to identified and prioritized demand for knowledge and information</p> <p>Disseminate materials through knowledge networks, including UNDP country offices.</p>

## End Notes

- <sup>1</sup> Defined in South Africa as 25 liters per person per day of acceptable quality water available 200 meters or less from home.
- <sup>2</sup> This information is drawn from the Background Paper of the UN Millennium Project Task Force on Water and Sanitation, available at [www.unmillenniumproject.org](http://www.unmillenniumproject.org). It uses as its basis "Vision 21: A Shared Vision for Hygiene, Sanitation and Water Supply and a Framework for Action" and "JMP: Global Water Supply and Sanitation Assessment 2000 Report".
- <sup>3</sup> The United Nations World Water Development Report 2003, UNESCO-WWAP.
- <sup>4</sup> This is called "unbundling" of service provision; rather than implementing a technologically complex and capital-intensive centralized system for a large urban area, the city is divided into smaller zones, each with its own independent collection and treatment system. These smaller systems are simpler to operate and cheaper to install and maintain, thus both reducing the "lumpiness" of investment and removing technological constraints to improved access.
- <sup>5</sup> From "Governing Water Wisely for Sustainable Development," Chapter 15 of the UN World Water Development Report, page 377.
- <sup>6</sup> From Capacity for Development: New Solutions to Old Problems, UNDP 2002, page 3, by Sakiko Fukuda-Parr, Carlos Lopes, Khalid Malik.
- <sup>7</sup> "Linking Poverty Reduction and Environmental Management: Policy Challenges and Opportunities", DfID, EC, UNDP and World Bank, July 2002.
- <sup>8</sup> Background paper of the Millennium Project Task Force on Hunger, available at [www.unmillenniumproject.org/documents/tf02apr18.pdf](http://www.unmillenniumproject.org/documents/tf02apr18.pdf).
- <sup>9</sup> This research was done by WaterAid, an international NGO focused on the sustainable provision of safe domestic water, sanitation and hygiene education to the world's poorest people; its website address is [www.wateraid.org.uk](http://www.wateraid.org.uk).
- <sup>10</sup> From WaterAid's website at <http://www.wateraid.org.uk/>.
- <sup>11</sup> From "In Brief" article, "Bangladesh cyclone response fails to meet women's needs", drawn from BRIDGE Report no. 26: Background Paper on Gender Issues in Bangladesh, by S. Baden, A.M. Goetz, C. Green and M. Guhathakurta, commissioned by ODA, August 1994.
- <sup>12</sup> From WaterAid's website at <http://www.wateraid.org.uk/>.
- <sup>13</sup> From "Do environmental projects promote gender equity?", an article by Susan Jokes, IDS Fellow, in IDS Bridge "In Brief".
- <sup>14</sup> Stats drawn from the United Nations World Water Development Report, UNESCO-WWAP 2003 and the WHO Global Water Supply and Sanitation Assessment 2000 Report ([http://www.who.int/water\\_sanitation\\_health/Globassessment/Global1.htm#1.1](http://www.who.int/water_sanitation_health/Globassessment/Global1.htm#1.1)).
- <sup>15</sup> From the Roll Back Malaria website, [http://mosquito.who.int/cgi-bin/rbm/dhome\\_rbm.jsp?ts=3233614026&service=rbm&com=gen&lang=en](http://mosquito.who.int/cgi-bin/rbm/dhome_rbm.jsp?ts=3233614026&service=rbm&com=gen&lang=en).
- <sup>16</sup> UN World Water Report 2003.
- <sup>17</sup> From the website of the Center for International Environmental Law (CIEL) at <http://www.ciel.org/POPs/popsimpacts.html>.
- <sup>18</sup> The information in this paragraph is drawn from the Background Paper of the Millennium Project Task Force on Environmental Sustainability, available at <http://www.unmillenniumproject.org>.
- <sup>19</sup> The United Nations World Water Development Report, Chapter 15, page 377.
- <sup>20</sup> Additional information on UNDP-GEF's International Waters programmes that address transboundary waters issues can be found at [http://www.undp.org/gef/undp-gef\\_focal\\_areas\\_of\\_action/sub\\_international\\_water.html](http://www.undp.org/gef/undp-gef_focal_areas_of_action/sub_international_water.html).
- <sup>21</sup> "Guide to Monitoring Target 11: Improving the lives of 100 million slum dwellers," UN-Habitat 2003.
- <sup>22</sup> The report of the World Commission on Environment and Development (the Brundtland Commission), Our Common Future, 1987.
- <sup>23</sup> "Guide to Monitoring Target 11: Improving the lives of 100 million slum dwellers," UN-Habitat 2003.
- <sup>24</sup> This definition was arrived at by a UN-sponsored Expert Group Meeting held in Nairobi in November 2002.
- <sup>25</sup> "Guide to Monitoring Target 11: Improving the lives of 100 million slum dwellers," UN-Habitat 2003.
- <sup>26</sup> For details, see box 30, UNDP Water Governance Programme At-A-Glance.



**United Nations**

**Development Programme**

Bureau for Development Policy

304 East 45th Street

New York, NY 10017

[www.undp.org/water](http://www.undp.org/water)