



Interim Report of Task Force 7 on Water and Sanitation

February 1, 2004

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Note to the reader

This Interim Report is a preliminary output of the Millennium Project Task Force 7 on Water and Sanitation. The recommendations presented herein are preliminary and circulated for public discussion. Comments are welcome and should be sent to the e-mail address indicated above. The Task Force will be revising the contents of this document in preparation of its Final Task Force report, due December 2004. The Final Task Force report will feed into the Millennium Project's Final Synthesis Report, due to the Secretary-General by June 30, 2005

Disclaimer

This publication does not necessarily reflect the views of the United Nations Development Programme (UNDP), its Executive Board or its Member States.

The Millennium Project is the independent advisory body to United Nations Secretary-General Kofi Annan that is commissioned with recommending, by June 2005, operational strategies for meeting the Millennium Development Goals (MDGs). This includes reviewing current innovative practices, prioritizing policy reforms, identifying frameworks for policy implementation, and evaluating financing options. The Project's ultimate objective is to help ensure that all developing countries meet the MDGs.

As a United Nations-sponsored initiative, the Millennium Project proceeds under the overall guidance of the Secretary-General and United Nations Development Programme (UNDP) Administrator Mark Malloch Brown in his capacity as chair of the United Nations Development Group (UNDG). Professor Jeffrey Sachs directs the Project, which brings together the expertise of world-class scholars in both developed and developing countries, United Nations agencies, and public, non-governmental, and private-sector institutions. Ten Task Forces carry out the bulk of the Millennium Project's analytical work with support from a small secretariat based at UNDP headquarters in New York. The Task Forces and their Coordinators are listed below.

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Additional information on the Millennium Project is available on its website at www.unmillenniumproject.org

**ACHIEVING THE MILLENNIUM DEVELOPMENT GOALS
FOR WATER AND SANITATION:
WHAT WILL IT TAKE?**

INTERIM FULL REPORT

**Task Force on Water and Sanitation
Millennium Project**

February 2004

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PREFACE

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. Among those targets is Millennium Development Target 10 (as expanded by the 2002 World Summit on Sustainable Development): to cut in half, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation.

To help the international community as a whole reach the Millennium Development Goals, the United Nations established the Millennium Project, which focuses on the question “what will it take to achieve the MDGs?” Commissioned by the UN Secretary-General and the UNDP Administrator (in his capacity as Chair of the UN Development Group), the Millennium Project is a three-year effort (June 2002- June 2005) to identify the best strategies for meeting the MDGs. Ten thematically-orientated Task Forces made up of independent experts perform the bulk of the Millennium Project’s work, each Task Force being responsible for recommendations for achieving one or more of the MDG targets.

The Task Force on Water and Sanitation focuses primarily on how the world can join together to meet MDG Target 10, and that is the main subject of this paper. But improving water resources management is also a critical factor for meeting most of the goals, which include 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. Thus, while the bulk of the report deals with improving access to domestic water supply and sanitation services, the role of sound water management in meeting the MDGs as a whole is also touched on very briefly in this report to prepare the way for a more thorough analysis of the subject that will be carried out in collaboration with the task forces on hunger, poverty and environment in early 2004; this analysis will be included in our Final Report.

This paper is the Interim Report of the Task Force, the members of which are listed in Annex 1. It will address the following questions: why water and sanitation require urgent action; where the needs are greatest; what is holding us back; what are the essential components of action; and who needs to act. It also sketches out those actions needed to manage water as a resource to meet the MDGs as a whole. It will explore both the national and international dimensions of these questions. The paper is intended for several audiences –government decision-makers, policy-makers, experts in the water sector, development professionals, advocacy and other civil society groups, and interested members of the general public (such as students and journalists). We have sought to strike a balance between providing sufficient background information for the non-expert while focusing principally on strategies and recommendations for the future.

The report has nine chapters and three parts.

- Part I provides the context for, and an overview of, the Task Force’s work. It includes an analysis of why it is important to focus on domestic water and sanitation services, as well as on the broader issue of water resources management. It also includes an

analysis of the Millennium Declaration and the Millennium Goals and Targets related to Water and Sanitation, as well as a brief summary of international discussions on water and sanitation, both prior to and after the Millennium Declaration.

- Part II analyses the key issues that relate to the specific MDG target on increasing access to water and sanitation, including current systems for monitoring and evaluation. It provides an overview of progress towards achieving the MDG Target on access to water and sanitation, including a brief review of existing information on costs.
- Part III outlines the task force’s analysis of the constraints to achieving the goals, and its principal propositions regarding the actions needed to move forward. It also translates these overall propositions into specific actions that need to be undertaken by key actors.

It is important to note that, at this stage of its work, the Task Force is not making definitive recommendations, but rather setting forth a series of propositions. During 2004, these propositions will be discussed at the national level with key actors, and will be further informed by research efforts not yet complete at the time of this drafting. By the end of 2004, a report that includes final versions of these propositions, along with concrete recommendations, will be produced by the Task Force.

Definitions

Since the term “water” in the name of the Task Force embraces both domestic water supply (as in MDG Target 10) as well as water resources management, we will attempt throughout the report to use terminology that clearly differentiates the use of the term in each case. Thus, we will employ the terms “domestic water supply and sanitation services” or simply “water supply and sanitation” when we refer to water and sanitation in the context of Target 10. We will use the terms “water resources management”, “water as a resource” or simply “water resources” when we refer to the management of water as a resource for meeting the MDGs as a whole, including the infrastructure needed to manage the resource. We will only use the overall terms “water” or “water and sanitation” when we explicitly wish to embrace both domestic water supply and water resources management.

For the purposes of our work, we define access to domestic water supply as “access to sufficient drinking water of acceptable quality and sufficient quantity of water for hygienic purposes.” Our working definition of access to basic sanitation is “access to, and use of, excreta and sullage¹ disposal facilities and services that provide privacy and dignity while at the same time ensuring a clean and healthful living environment both at home and in the immediate neighborhood of users.”

¹ Defined as domestic sewage or wastewater resulting from bathing and washing of dishes and clothes in-house.

Acknowledgements

The ideas contained in this Interim Full Report represent the culmination of 18 months of analysis and consultation among Task Force members and others, as well as the results of substantial debate and interchange among the members of the Task Force. A first draft of this report was prepared based on the inputs of Task Force members at a Task Force meeting in May 2003 in Nairobi, a subsequent meeting of a sub-set of members in August 2003 in Stockholm, a further meeting of the task force in October 2003, and through electronic discussions. The paper frequently draws directly on various reports, memoranda and studies, the details of which are indicated in the relevant footnotes.

This Interim Report complements a companion short document prepared directly by the Task Force -- the Summary Interim Report of the Task Force, which serves both as a free-standing statement of the main propositions of the Task Force and the Executive Summary of this Report. The Full Interim Report contains substantial additional material substantiating the principal arguments in the Summary Interim Report, but no change in the argument itself.

This full Interim Report has been prepared by a writing and editing group consisting of Kristen Lewis, Task Force Manager; Jennifer Davis, Task Force Member (who took the lead in the preparation of Chapter 6); and Albert Wright and Roberto Lenton, Task Force Coordinators. The editors wish to acknowledge, with thanks, the extensive contributions of several people and organizations to the development of this paper. In particular, we would like to thank UNDESA, UNICEF, UNDP, UNEP and the World Bank, whose documents we drew on extensively in several parts of this report; Guido Schmidt-Traub, for the section on financing requirements and costing methodologies; Malin Falkenmark, member of Task Force 6, for permission to include a recent memorandum on water and the MDGs in section 7.B of this report; and Christie Walkuski, for her generous assistance in the preparation and finalization of the report as a whole, including the annexes and figures, under significant time pressure. The co-coordinators take full responsibility for any errors or omissions in the contents of this report.

Comments and suggestions on this report should be sent to Kristen Lewis, Task Force Manager, at kristen.lewis3@verizon.net.

PART I: BACKGROUND

CHAPTER ONE: INTRODUCTION

1-A. Overview

Water is life, for people and for the planet. It is essential to the well being of humankind, a vital input to economic development, and a basic requirement for the healthy functioning of all the world's ecosystems. Clean water for domestic purposes 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.

Water 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. Thus, increasing access to domestic water and sanitation services and improving water resources management are catalytic entry points for efforts to help developing countries fight poverty and hunger, safeguard human health, reduce child mortality, promote gender equality, and manage and protect natural resources. 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.

But for the world's poorest citizens, the right to safe water and adequate sanitation remains a promise unfulfilled. At least 1.1 billion people lack access to safe water, and 2.4 billion lack access to basic sanitation, a silent humanitarian crisis that each day takes thousands of lives, robs the poor of their health, thwarts progress toward gender equality, and hamstring economic development, particularly in Africa and Asia.

Every year, millions of people, most of them children, die from diseases associated with inadequate water supply, sanitation and hygiene. Each and every day, some 6,000 children in developing and emerging countries die for want of clean water and sanitation. Water scarcity, poor water quality, and inadequate sanitation negatively impact food security, livelihood choices, and educational opportunities for poor families across the developing world. Yet 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 capture the public imagination – as well as public resources – in a way that water and sanitation issues do not.

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 for all purposes, whereas in developing countries the volume is just 20 liters. It is a problem that is getting worse in many parts of the world; indeed, 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.

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. Cutting in half the proportion of the world’s population without access to clean drinking water and basic 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. The Johannesburg Plan of Implementation explicitly recognized that water and sanitation are fundamental to poverty eradication and sustainable development overall. Importantly, WSSD reiterated the Millennium Development Goal to halve, by 2015, the proportion of people who are unable to reach or to afford safe drinking water. A new target on halving the proportion of people who do not have access to basic sanitation by 2015—not part of the Millennium Development Goals—was also set. In addition, the Plan made a strong call for more integrated approaches to Water Resources Management by setting a new time-bound target to “develop integrated water resources management and efficiency plans by 2005, with support to developing countries, through actions at all levels.”

The historical context: international deliberations on water and sanitation

The goals and targets relating to water and sanitation outlined in the United Nations Millennium Declaration and in the Millennium Development Goals and Targets were not developed in a vacuum. Indeed, they were the culmination of several decades of international deliberations on the subject. In turn, the water and sanitation issues and agreements outlined in the MDGs were further developed at the World Summit on Sustainable Development in Johannesburg.

International conferences and agreements on water and sanitation²

Over the last 30 years, numerous major conferences and international agreements have provided the broad background for today’s water resources policies and decision-making. In the last decade, many international conferences have discussed and agreed on steps required to speed up the implementation of *Agenda 21*. Water for sustainable development was discussed at the intergovernmental level in the sixth session of the Commission for Sustainable Development (CSD-6) in 1998, and broad consensus was reached on key water issues. Recent international water meetings (the Second World Water Forum in the Hague in 2000, the International Conference on Freshwater in Bonn in 2001, the Third World Water Forum in Kyoto in 2003, and the International Conference on Water for the Poorest in Stavanger in 2003) served as important fora for multi-stakeholder dialogues and generated new recommendations on how to address increasing water challenges. The United Nations Millennium Declaration and the preparatory

² Drawn directly—with a few updates—from the Annex to the 2002 publication of the WEHAB Working Group, “A Framework for Action on Water and Sanitation”, which also includes a complete list of all relevant major conferences and agreements.

process leading up to the World Summit on Sustainable Development (WSSD) further affirmed the role of water as a key to sustainable development and the urgency of immediate action.

These international meetings have identified several key water issues and challenges, with increasing focus on provision of water supply and sanitation as well as the need for improved governance and integrated water resources management. They proposed many actions to meet the challenges, stressing the importance of using water as an entry point to achieve the goal of sustainable development. As noted earlier, water is a critical factor influencing the global community's responses and actions to realize the Millennium Development Goals, including those aimed at reducing poverty, integrating the principles of sustainable development into national policies and programs, improving access to water, improving the lives of poor people, and reducing child mortality by 2015.

The Millennium Declaration and the MDGs and Targets relating to water and sanitation

Water and sanitation are dealt with in several ways in the United Nations Millennium Declaration and in the final list of Millennium Development Goals and Targets.

In Chapter 4 ("Sustaining our Future") of the Secretary General's Report to the Millennium Summit, the Secretary General urged the Summit:

"To adopt the target of reducing by half, between now and 2015, the proportion of people who lack sustainable access to adequate sources of affordable and safe water"

In the Millennium Declaration, the heads of State and Government gathered at United Nations Headquarters in New York from 6 to 8 September 2000 resolved, under the heading "protecting our common environment":

"To stop the unsustainable exploitation of water resources by developing water management strategies at the regional, national and local levels, which promote both equitable access and adequate supplies"

This resolution is explicitly highlighted as a goal on page 34 of the Report of the Secretary General entitled "Road map towards the implementation of the United Nations Millennium Declaration" to the Fifty-sixth session in September 2001 on the follow up to the outcome of the Millennium Summit.

However, in the statement of the United Nations Millennium Development Goals, Targets and Indicators (see background documentation), which lists eight goals and 18 targets, the overall goal relevant to this area (labeled goal #7) is stated more generally as "ensuring environmental sustainability," with three specific targets:

- *Integrate the principles of sustainable development into country policies and programmes; reverse loss of environmental resources*
- *Reduce by half the proportion of people without sustainable access to safe drinking water*
- *Achieve significant improvement in the lives of at least 100 million slum dwellers, by 2020*

Two main conclusions can be drawn from the above. First, the goal of “stopping the unsustainable exploitation of water resources by developing water management strategies at the regional, national and local levels, which promote both equitable access and adequate supplies” appears to have been incorporated in that part of the first target that refers to reversing the “loss of environmental resources.” Second, the target urged by the Secretary General in his report to the Millennium Summit was incorporated (with some modifications) in the second target to reduce by half the proportion of people without sustainable access to safe drinking water. Importantly, the Millennium Target itself was modified during the World Summit on Sustainable Development (see below) with the addition of a specific reference to basic sanitation.

The World Summit on Sustainable Development (WSSD)³

One of the main outcomes of the WSSD was that water and sanitation were recognized as being inextricably linked to the eradication of poverty and to the achievement of sustainable development. Water and sanitation were identified by the Secretary General as one of the five specific “WEHAB⁴” areas in which concrete results are both essential and achievable. To provide focus and impetus to action in the water area, a document entitled “A Framework for Action on Water and Sanitation” was prepared for WSSD that outlined the larger context in which the MDG Targets were established, and provided a holistic view of the multiple impacts of increasing access to water and sanitation by the poor.

WSSD reiterated the Millennium Development Goal to halve, by 2015, the proportion of people who are unable to reach or to afford safe drinking water. A new target on halving the proportion of people who do not have access to basic sanitation by 2015—not part of the original Millennium goals—was also set. Several elements for a program of action on sanitation were clearly established in the Plan of Implementation, which particularly highlighted the need to integrate sanitation within Integrated Water Resources Management (IWRM) strategies. Both the water and sanitation targets are set out under the Plan of Implementation chapters on poverty eradication and protecting the natural resource base. Water resource management and protection were also recognized as fundamental to sustainable management of the natural resource base for economic and social development. It was also recommended that the participation of women be facilitated at all levels in support of policies and decision-making related to water resources management and project implementation. Water-related policies were included in virtually all of the natural resource objectives of the Plan of Implementation.

Notably, the Plan of Implementation took a broad view of the actions required to achieve the MDG on water and sanitation, emphasizing the need, for example, to intensify water pollution prevention to reduce health hazards and protect ecosystems, and to adopt measures to promote sustainable water uses and address water shortages. The Plan also made a strong call for Integrated Water Resources Management by setting a new time-bound target to “develop integrated water resources management and efficiency plans by 2005, with support to developing countries, through actions at all levels.”

³ Much of this section was drawn directly from “Preliminary Analysis of WSSD Outcomes on Water, Natural Resources, Natural Disasters and SIDS”, Water, Natural Resources and SIDS Branch, Division for Sustainable Development, DESA, September 13, 2002.

⁴ WEHAB stands for “Water, Energy, Health, Agriculture and Biodiversity.”

Specific activities agreed by the WSSD to achieve water and sanitation targets and objectives include:

1. The establishment of a World Solidarity Fund to eradicate poverty and promote social and human development. Because water and sanitation are linked so inextricably to poverty eradication, projects on water and sanitation could, in principle, be eligible for funding projects at the community level.
2. Elements for a program of action on sanitation.
3. A mandate to launch a program of action, with financial and technical assistance to achieve the Millennium Development Goal on safe drinking water and the additional target on sanitation was established.
4. Development of integrated water resource management and water efficiency plans with support to developing countries, as called for in the time-bound target noted above.
5. Support to proposals and activities for the International Year of Freshwater 2003 and beyond.
6. Call for effective coordination among the various international and intergovernmental bodies and processes working on water-related issues, both within the UN and between the UN and international financial institutions.

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.⁵

The institutional context for water and sanitation⁶

⁵ “The human right to water is indispensable for leading a life in human dignity. It is a prerequisite for the realization of other human rights... States parties have to adopt effective measures to realize, without discrimination, the right to water, as set out in this General Comment.” ECOSOC General Comment No. 15, E/C.12/2002/11, 26 November 2002.

⁶ Drawn directly from the Annex to the publication of the WEHAB Working Group, “A Framework for Action on Water and Sanitation.” (Full citation so as to be consistent?)

Although there is no global, comprehensive intergovernmental structure for water, there is a very dynamic process of advancing international understanding and co-operation on water for sustainable development. These efforts are led by different governments; by the private sector and members of the civil society; by the work of various UN system entities and by other important regional and intergovernmental bodies; by NGOs such as Water Aid; and by several organized networks or partnerships, such as the Water Supply and Sanitation Collaborative Council (WSSCC) and its WASH (Water Sanitation and Hygiene for all) partnership, the Global Water Partnership (GWP), the Gender and Water Alliance, and the World Water Council. Progress on water for sustainable development requires by its very nature a multistakeholder approach, including the private sector.

Within the UN system, a number of different entities are involved in water and sanitation-related issues. Perspectives and approaches vary according to the mission and mandates that the governing bodies provide to the different UN entities.

The Intersecretariat Group for Water Resources was established in 1977 following the UN Water Conference at Mar del Plata in Argentina, defining areas where interagency collaboration would be important, such as in the implementation of the International Drinking Water Supply and Sanitation Decade (1981-1990). After the Rio Summit, the Group was integrated into the structure of the former Administrative Committee on Coordination as the ACC Subcommittee on Water Resources. In 2000, the Subcommittee started a long-term project called the World Water Assessment Program whose main product is the *World Water Development Report*, the first of which was issued in March 2003. Following the recent restructuring of the ACC, the members of the UN system entities dealing with water have formed “UN-Water,” the United Nations Inter-Agency Committee on Water Resources. In late 2003, the United Nations System Chief Executive Board for Coordination (CEB) formally established UN-Water as the inter-agency mechanism for follow-up of the WSSD water related decisions and the MDGs concerning freshwater.

Global strategies, frameworks and plans of action

The development of global plans or frameworks for action have been an inherent part of this process, including in particular the International Drinking Water Supply and Sanitation Decade, the GWP Framework for Action to achieve the Vision for Water in the 21st Century, the WSSCC Vision 21, the Bonn Plan of Action, and the WEHAB Framework for Action on Water and Sanitation, which identified potential means and activities to fulfill mandates emerging from WSSD. These initiatives are summarized in Box 1.1 below.

Box 1.1 Important recent frameworks for action on water and/or sanitation

- “Framework for Action on Water and Sanitation” prepared by the WEHAB Working Group for the World Summit on Sustainable Development (2002)
- Bonn Plan of Action (2002)
- Framework for Action outlined in the WSSCC’s document “Vision 21: A Shared Vision for Hygiene, Sanitation and Water Supply and A Framework for Action” (2000)
- Numerous national and community level plans that are being prepared under Vision 21’s umbrella
- “Towards Water Security: A Framework for Action” prepared by the Global Water Partnership to achieve the Vision for Water in the 21st Century (2000)
- The International Drinking Water Supply and Sanitation Decade (1981-1990) and end of the Decade Declaration (New Delhi 1990)
- The Dublin Statement and Report of the Conference on Water and Environment (ICWE) (Dublin 1992).

Most of these plans and frameworks for action, however, have fallen short of a full strategy and plan along the lines of what the Millennium Project has been requested to develop, in that they do not lay out the organizational means required for implementation, nor provide the degree of clarity needed on the amount, nature and sources of financing required.

The local institutional context⁷

It is widely recognized that water services are often most effectively delivered through decentralized organizations, and that voluntary community participation is critical to their success. Historically, water management can be found to lie at the origins of many institutions of local governance that now have a broader role. Aside from the ancient riverine civilizations of Asia and Africa, local governments in European countries such as the Netherlands and Great Britain were rooted in the need to cooperate to manage water on a collective basis in the public interest. This perspective is important not just for the design of water strategies, but also to provide an institutional framework for the achievement of other MDGs.

It is also necessary to recognize the plurality of institutions of local government and administration and voluntary community participation and to clarify their roles, inter-relationships and sequence of development. It is also necessary to recognize the different roles and responsibilities of men and women in water and sanitation provision, and that other factors, such as socio-economic status, ethnicity, and age may place additional burdens on women in water resources management.

1-B. The Millennium Project and the Task Force on Water and Sanitation

The Millennium Project Task Force on Water and Sanitation is one of ten Task Forces that comprise the Millennium Project, which is itself one of four major components of the United Nations’ strategy for helping the international community as a whole reach the Millennium Development Goals. These four components are:

⁷ Contributed by Task Force Member Mike Muller

1. The MDG reporting process, which focuses on the question “where do we stand?” This effort, which essentially monitors progress towards achieving the Millennium Development Goals, is spearheaded by UNDP under the leadership of Mark Malloch Brown.
2. The Millennium Campaign, which mobilizes political support for the Millennium Declaration among developed and developing countries. This is led by Evelyn Herfkens, the Secretary-General's Executive Coordinator for the MDG Campaign.
3. Operational support, the component that aims to define what the United Nations system itself can do by identifying operational, national-level activities, coordinated across agencies through the UN Development Group, which can help individual countries implement policies necessary for achieving the Millennium Development Goals.
4. The Millennium Project, which addresses the question “what will it take?”

The Millennium Project, commissioned by UN Secretary-General Kofi Annan and the Administrator of the UN Development Programme (UNDP), Mark Malloch Brown, is a three-year effort to identify the best strategies for meeting the MDGs, including the identification of operational priorities, strategies, organizational means of implementation, and financing structures. It aims to analyze policy options and develop a plan of implementation, and will be completed by June 30, 2005.

As an advisory body to the UN, the Millennium Project will report its findings directly to the UN Secretary-General and the Administrator of UNDP. Though commissioned by the UN, it is an independent body. The Millennium Project is directed by Professor Jeffrey Sachs of Columbia University, who serves as Special Advisor to the Secretary-General on the Millennium Development Goals. Through his involvement, some of the Project's research is conducted at the Earth Institute of Columbia University, which Prof. Sachs directs.

The Millennium Project itself has two key advisory groups. One is the UN Experts Group that oversees UN participation in the Project. This Group consists of senior representatives from UN agencies whose role is to ensure that the Millennium Project has access to and makes full use of the knowledge, experience and capacities of the UN system. The second is an International Advisory Panel that brings together globally recognized experts in the relevant fields to provide independent advice to the Millennium Project.

Ten thematically-orientated Task Forces perform the bulk of the Millennium Project's research and analysis. The Task Forces are comprised of representatives from academia, the public and private sectors, civil society organizations, and UN agencies – with the majority of participants coming from outside the UN system. The 20-25 members of each Task Force are all global leaders in their area, selected on the basis of their technical expertise and practical experience. Task Force members act in their personal capacity as experts, rather than as representatives of specific organizations or organizational points-of-view, with a view to providing the highest quality advice to the international community.

The Millennium Project Task Force on Water and Sanitation focuses on Millennium Development Target 10, as expanded by the 2002 World Summit on Sustainable Development: *to cut in half, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation*. Its principal objective is thus to identify and communicate the strategies

and actions needed to meet the Target. It is responsible for identifying priority areas for action, developing strategies and proposing effective institutional arrangements for addressing these areas, and exploring both financial requirements and possible new sources of funding.

In addition, the Task Force aims to identify and communicate the actions and strategies in the area of water resources management required to help achieve the other Millennium Development goals and targets. This set of tasks is undertaken in close coordination with other Task Forces of the Millennium Project, especially those concerned with poverty, hunger, and environmental sustainability, and includes examining the implications of the new time-bound target established by WSSD to “develop integrated water resource management and efficiency plans by 2005, with support to developing countries, through action at all levels.”

The Millennium Project Task Force on Water and Sanitation, together with the larger Millennium Project of which it is an integral part, thus represents a unique opportunity to undertake, in an integrated way, three tasks that have heretofore not been undertaken and have normally been considered separately: developing a strategy to meet the MDG targets on water and sanitation, identifying the actions needed in the water resources sector to meet the MDGs as a whole, and pinpointing the actions needed in other sectors if the MDG targets on water and sanitation are to be achieved.

Given the wealth of work completed or underway in areas directly related to its work, the Task Force is fortunate in being able to build on past efforts and ongoing processes and apply their results to the Task Force’s goals. In building on these efforts, however, the Task Force will not simply produce one more water study. The Task Force’s value added is derived from:

- Its clear focus on the Millennium Development Goals, and the authority and visibility that derives from its association with the Millennium Project
- Its dual responsibility to identify the best strategies to achieve MDG target #10 and the best strategies in the area of water resources management to help achieve the other MDG targets.
- Its ability to dovetail an action plan for water in the larger context of action plans to achieve the Millennium Development Goals.
- The intellectual independence that has been granted to the Millennium Project to put forward what it considers to be the best strategies for achieving the MDGs.
- The analytical strength that derives from the project’s overall framework and methodology.

CHAPTER TWO: WHY FOCUS ON WATER AND SANITATION?

As indicated in the Preface, this report has a dual purpose: to outline a roadmap for meeting Target 10 on domestic water supply and sanitation; and to explore the broader water resources management actions needed to help achieve the Millennium Development Goals as a whole. This Chapter provides the overall arguments as to why these two issues are fundamentally important. Section 2-A outlines the argument for prioritizing access to water supply and sanitation services and gives an overview of the ways in which meeting Target 10 (access to domestic water supply and sanitation services) will further the pursuit of the MDGs on poverty, gender equality, and health. Section 2-B explores the contribution of sound water resources management to the achievement of the MDGs on poverty, hunger, and environmental sustainability.

2-A. Why does Target 10 matter?

Given the myriad development challenges facing the world's poorest countries and communities – from the HIV/AIDS pandemic to pervasive gender inequality to grinding poverty – why has halving the proportion of people without access to water and sanitation services been singled out as critical? The imperative of dramatically expanding coverage of water supply and sanitation services and improving water management overall deserves the vigorous response of the international community for several reasons: because of the relationship between water supply and sanitation and questions of human health, overall economic development, and equity; and because of humankind's shared understanding of our responsibilities to one another, a common understanding enshrined in many international human rights instruments. Not everyone will find the various rationales for investment in water supply and sanitation listed below equally persuasive; what matters is that water supply and sanitation advocates, policy makers and practitioners are able to articulate to a range of key constituencies a compelling case for action and that governments and other important actors respond with the necessary measures.

Human values and human rights

Expanding access to water and sanitation is a moral and ethical imperative rooted in the cultural and religious traditions of societies around the world and enshrined in international human rights instruments.

Success in bringing water and sanitation to poor communities in the most difficult circumstances is due as much to the qualities and personal motivations of the people concerned as it is to the technical ingenuity and the financial resources available, important as those may be. Many services run on a shoe-string of hope by volunteers, religious groups or dedicated, poorly paid officials succeed because they mobilize the enthusiasm and engagement of their communities, while other projects backed by extravagant budgets and massive expertise turn to dust in a bureaucratic desert that stifles individual and community spirit. Many of the most effective interventions at the community level meld economic and social development with spiritual growth and bonds of communal solidarity. They also clearly balance rights on the one hand with responsibilities on the other; indeed, experience has shown that the most sustainable community-level interventions are characterized by significant community investment of labor, other in-kind resources, and user fees in the design, construction, maintenance and operation of facilities. The

Millennium Development Goals themselves are built around a shared understanding of what we as human beings owe to one another and are informed by principles of fairness, justice and the obligation of the individual to pursue the mutual good that characterize religious and ethical systems the world over.

These shared principles are echoed in the recent affirmation by the United Nations of the Right to Water (26 November 2002) – a right that 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, 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.⁸

The contribution of domestic water supply and sanitation to the Millennium Development Goals as a whole⁹

Expanding access to domestic water supply and sanitation services, as called for in Target 10, will bring the international community closer to meeting a number of other Millennium Development targets; in fact, for many of the targets, it is difficult to imagine how significant progress can be made without first ensuring that poor households have a safe, reliable water supply and adequate sanitation facilities. Meeting Target 10 is particularly vital in terms of the poverty, gender and health MDGs, and also has a significant impact on other goals. For instance, as illustrated in Table 1.1, in terms of the hunger goal, healthy people are better able to absorb the nutrients in food than those suffering from excreta-related diseases, particularly intestinal worms; in terms of the education goal, reducing the incidence of water and excreta-borne disease among children improves school attendance.

⁸ The full text of this General Comment is available at <http://www.unhchr.ch/html/menu2/6/cescr.htm>

⁹ The remainder of this section, as well as the following section, draws extensively on a UNDP publication (in press) entitled “Water and the MDGs: Key Issues and the UNDP Response”, which has been made available by Task Force Member Ingvar Andersson

Table 1.1 Contribution of Improved Water Resources Management and Access to Water Supply and Sanitation

Millennium Goal by 2015	Contribution of Improved Water Resources Management and Access to Water Supply and Sanitation
<p>Poverty To halve the proportion of the world's people whose income is less than \$1/day</p>	<ul style="list-style-type: none"> • Water is a factor of production in agriculture, industry and other economic activities • Investments in water infrastructure/services as a catalyst for local/regional development • Reduced vulnerability to water-related hazards reduces risks in investments and production • Reduced ecosystems degradation makes livelihood systems of the poor more secure • Improved health increases productive capacities, reduces burden on those who care for the sick
<p>Hunger To halve the proportion of the world's people who suffer from hunger</p>	<ul style="list-style-type: none"> • Water is a direct input to irrigation for expanded grain production • Reliable water for subsistence agriculture, home gardens, livestock, tree crops • Sustainable production of fish, tree crops and other foods gathered in common property resources (also affects poverty when such goods are sold for income) • Reduced urban hunger due to cheaper food prices • Healthy people are better able to absorb the nutrients in food than those suffering from water-related diseases, particularly worms
<p>Primary Education To ensure that children everywhere complete a full course of primary schooling</p>	<ul style="list-style-type: none"> • Improved school attendance from improved health and reduced water-carrying burdens, especially for girls • Having separate sanitation facilities for girls and boys in schools increases girls' school attendance
<p>Gender Equality To ensure girls and boys have equal access to primary and secondary education</p>	<ul style="list-style-type: none"> • Community-based organizations for water management improve social capital of women • Reduced time, health, and care-giving burdens from improved water services give women more time for productive endeavors, adult education, empowerment activities, leisure • Water sources and sanitation facilities closer to home put women and girls at less risk for sexual harassment and assault while gathering water and searching for privacy • Higher rates of child survival are a precursor to the demographic transition toward lower fertility rates; having fewer children reduces women's reproductive responsibilities
<p>Child Mortality To reduce by two-thirds the death rate for children under five</p>	<ul style="list-style-type: none"> • Improved quantities and quality of domestic water and sanitation reduce main morbidity and mortality factor for young children • Improved nutrition and food security reduces susceptibility to diseases
<p>Maternal Mortality To reduce by three-fourths the rate of maternal mortality</p>	<ul style="list-style-type: none"> • Improved health and reduced labor burdens from water portage reduce mortality risks • Improved health and nutrition reduce susceptibility to anemia and other conditions that affect maternal mortality • Sufficient quantities of clean water for washing pre-and-post birth cut down on life-threatening infections • Higher rates of child survival are a precursor to the demographic transition toward lower fertility rates, and fewer pregnancies per woman reduce maternal mortality
<p>Major Disease To halve, halt and begun to reverse the spread of HIV, malaria, other major diseases</p>	<ul style="list-style-type: none"> • Better water management reduces mosquito habitats • Better water management reduces incidence of a range of other water-borne diseases • Improved health and nutrition reduce susceptibility to/severity of HIV/AIDS and other major diseases
<p>Environmental sustainability To stop the unsustainable exploitation of natural resources and to halve the proportion of people who are unable to reach or afford safe drinking water</p>	<ul style="list-style-type: none"> • Improved water management, including pollution control and water conservation, key factor in maintaining ecosystems integrity • Development of integrated management within river basin creates situation where sustainable ecosystems management possible and upstream-downstream effects are mitigated • Biodiversity conservation, combating desertification furthered by sound water management

Poverty: At both the national and international levels, it is difficult to find a definition of poverty that is not based at least in part on access to basic water and sanitation services. For instance, the United Nations Development Programme'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, clean water and sanitation, and percentage of malnourished children under five). Vulnerability is a critical dimension of poverty, and households with access to safe, reliable W&S services are less vulnerable than those who must figure out on a daily basis how to meet their needs.

Improved access to domestic water supply and sanitation brings with it considerable economic benefits at the household level. There is a strong link between health and household livelihood security; 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. In addition, sufficient water supply is critical to the success of many household-based microenterprises.

- Poor people spend a significantly greater proportion of their income on water than do the rich, and the absolute price they pay to water vendors is often ten times or more the tap price.
- Reducing the ill health and disease of children through improved water and sanitation frees the time of the adults who care for them (particularly women) for more productive activities; it also keeps the children themselves from missing school, which has long-term economic consequences. Less illness (among both children and adults) means that adults miss fewer days of work, be it as employees, entrepreneurs or farmers, with positive impacts on overall income and livelihood security. 73m working days are lost each year in India to water-borne diseases at a cost of \$600m in terms of medical treatment and lost production¹⁰. Lower health costs mean more disposable income.
- Access to water near the home can save significant amounts of time for women and girls – time that can be spent on productive activities and education, which lay the groundwork for economic growth. Forty billion working hours are lost each year in Africa to the need to carry water¹¹.
- 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, which in turn improves quality of life and spurs development.

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 water borne diseases and water related illnesses. Realizing the health-related MDGs goals, particularly those targeting child mortality and major diseases, will require a dramatic increase in

¹⁰ UNDP "International Drinking Water Supply And Sanitation Decade 1981-1990: Decade Dossier"

¹¹ Cosgrove WJ & FR Rijsberman "Creating A Vision For Water, Life And The Environment" in "Water Policy" Vol.1 1998 p115-122

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 devastating¹²:

- 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, ascariis, 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 control through better sanitation, hygiene and water supply. Overall, healthy people – as opposed to those sickened by water-related diseases – are better able to derive the maximum nutritional benefits from food; for instance, much of the caloric intake of people suffering from worms is captured by the parasites.
- 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.

¹² 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);

- 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.

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.
- 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.
- 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.

Addressing water and sanitation problems in developing countries is critical to reducing morbidity and mortality. Health is often viewed from a curative perspective; it is easy to forget how effective and affordable preventative approaches can be. Improving the quantity and quality of water that households receive and improving the management of human excreta are arguably the most effective health interventions that can be made in the world's poorest countries. For children in particular, improving access to water supply and sanitation is one of the most effective ways of improving health and quality of life.

Gender: 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.

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.¹³ 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 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.

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, 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.

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 1990.¹⁴

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.

¹³ From WaterAid's website at <http://www.wateraid.org.uk/>

¹⁴ From WaterAid's website at <http://www.wateraid.org.uk/>

Thus the water and gender goals interact in several ways:

- 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.
- 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. 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.

2-B. Why does water resources management matter? Water resources and the Millennium Development Goals

Water as a resource is an essential ingredient to virtually all the MDGs. Although these goals and targets focus principally on ends rather than means and therefore do not explicitly recognize water's role in areas like food security or environmental sustainability, good water management and development will be essential to meeting the MDGs as a whole. It is also clear that steps taken to meet the MDGs potentially have both positive and negative impacts on water and the environment. Moreover, efforts to make the MDGs a reality on the ground are going to demand possibly conflicting uses of the same water resources.

Table 1.1 also summarizes the contributions that water resources management can make to the realization of each of the MDGs. Its role in combating poverty and hunger, ensuring environmental sustainability, improving health and reducing gender inequalities is analysed in more detail below.

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 \$2 a day, and 1.2 billion on less than \$1 a

day.¹⁵ Chronic hunger, among the starkest and most absolute manifestations of poverty, affects 800 million people. 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.¹⁶

In addition to the role that improving access to domestic water and sanitation plays in reducing poverty, water's role as a resource 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 the community and household level simply cannot occur in many parts of the world given current water shortages. Clearly, therefore, insufficient water stymies overall economic growth.

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 – as discussed, 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. 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.
- Vulnerability – Vulnerability is a critical dimension of poverty. Poor people are particularly at risk from environmental shocks and crises. Increasingly frequent and severe natural disasters (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 also becoming more frequent. Extreme events can have a strong impact on the ability of many developing countries, especially in the tropics, to achieve the MDGs. Damage caused by floods and droughts and other extreme climate events can undo in a short period many years

¹⁵ "Linking Poverty Reduction and Environmental Management: Policy Challenges and Opportunities", DfiD, EC, UNDP and World Bank, July 2002

¹⁶ Background paper of the Millennium Project Task Force on Hunger, available at <http://www.unmillenniumproject.org/documents/tf02apr18.pdf>

of steady development and growth. Though the impacts of such extreme events start with direct damage related to the loss of infrastructure and crops, they are often amplified throughout many areas of economic activity leading to widespread macroeconomic, financial and political consequences. In Kenya, for example, flooding during the El Nino event of 1997/98 is estimated to have cost some US\$880 million (10% of GDP) through the loss of infrastructure such as roads, pipelines and water treatment plants.

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 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 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.

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. 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, under-performing irrigation systems and poor water management practices worsen the water shortages 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.

The return to water in food production, including the efficiency of agricultural water use, can be improved substantially through better water resources management – and provide “more crop per drop”.

Projected increases in the world's population 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 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.

In sum, in terms of the poverty and hunger goals, water is critical because:

- Agriculture is and will continue to be a key sector for low-income countries and the poor who live there.
- Water is a factor of production in industry and many other types of economic activity.
- Common environmental resources provide a significant share of food and household income for the poorest families and the livelihood systems of poor women and men depend upon a healthy environment.
- Pollution of common resources like lakes, rivers and coastal areas directly translate into less food, income and time for the poor.
- Sound water management may reduce the incidence of a range of other diseases for which water is a vector (see below).

Ensuring environmental sustainability

As discussed in Chapter One, the overall goal (labeled goal #7) of ensuring environmental sustainability” has three specific targets:

- *Target # 9: Integrate the principles of sustainable development into country policies and programmes; reverse loss of environmental resources*
- *Target # 10: Reduce by half the proportion of people without sustainable access to safe drinking water (and basic sanitation)*
- *Target # 11: Achieve significant improvement in the lives of at least 100 million slum dwellers, by 2020*

Clearly, water is a key dimension of each of these three targets. Let us take each one in turn.

Target # 9: Integrate the principles of sustainable development into country policies and programmes; reverse loss of environmental resources.

Water is perhaps the most fundamental of all environmental resources and key to the viability and long-term sustainability of all the world's ecosystems. Ecosystem health, in turn, is critical to the quantity and quality 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 resources.¹⁷

- Climate change and resulting alterations in weather patterns, water distribution, and fisheries will impact seriously on marine ecosystems and small island developing states, and will also threaten 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 of 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.

It is important to note that, as discussed in Chapter One, target #9 is intended to address the goal of “stopping the unsustainable exploitation of water resources by developing water management strategies at the regional, national and local levels, which promote both equitable access and adequate supplies,” which was clearly enunciated in the Millennium Declaration but is not referred to explicitly or implicitly in any other of the eighteen MDG targets.

Target # 10: Reduce by half the proportion of people without sustainable access to safe drinking water (and basic sanitation).

This is, of course, the MDG target on water and sanitation that was discussed at length in the previous section. Although clearly this target is much more than an “environment” target, given

¹⁷ 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>

its implications for human health and poverty reduction, officially it “resides” in the MDG structure under the overall goal of ensuring environmental sustainability.

Target # 11: Achieve significant improvement in the lives of at least 100 million slum dwellers, by 2020.

For poor people living in slums, the water-related problems discussed above in relation to the other Millennium Development goals—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. 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 poor quality housing often built in hazardous locations (*e.g.*, near industrial sites, in flood-prone areas). Poor urban dwellers are also frequently outside, 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 urban people who do not live in slums, or among the rural population.¹⁸

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.”¹⁹ 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 over 900 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.²⁰

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.

Improving health

Over and above the impact of domestic water supplies and sanitation on human health, as described in the previous section, the management of water resources more generally has significant health impacts in terms of vector-borne diseases and water contamination.

¹⁸ “Guide to Monitoring Target 11: Improving the lives of 100 million slum dwellers,” UN-Habitat 2003

¹⁹ The report of the World Commission on Environment and Development (the Brundtland Commission), *Our Common Future*, 1987

²⁰ “Guide to Monitoring Target 11: Improving the lives of 100 million slum dwellers,” UN-Habitat 2003

Worldwide, over 2 billion people are infected with schistosomiasis²¹ 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, malaria 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 1960.²²

Vector-borne illness, which include malaria, dengue and schistosomiasis are passed to humans by insects and snails that breed in aquatic ecosystems.²³ 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, or POPs, are another danger as a 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.²⁴

²¹ Schistosomiasis, also known as bilharzia, is a disease caused by water-borne flatworms or blood flukes that spend part of their development in human intestines or in their urinary tracts; the second part of their development takes place in small water snails (that act as intermediate hosts of the flatworms) when they are discharged into surface waters through feces or urine. The disease is endemic in 74 developing countries and infects over 200 million people in agricultural and peri-urban areas. It is a disease of great public health and socio-economic significance. Those with the urinary types discharge blood in their urine and sometimes develop bladder cancer.

²² From the Roll Back Malaria website, http://mosquito.who.int/cgi-bin/rbm/dhome_rbm.jsp?ts=3233614026&service=rbm&com=gen&lang=en

²³ UN World Water Report 2003

²⁴ From the website of the Center for International Environmental Law (CIEL) at <http://www.ciel.org/POPs/popsimpacts.html>

These substances become integrated into the food chain, prolonging their damaging effects on ecosystem and human health.

Reducing Gender Inequalities

Over and above the gender implications of improving access to domestic water supplies and sanitation as described in the previous section, the management of water resources more generally has significant gender dimensions. For example:

- Social and economic analyses, including documenting natural resource uses, is incomplete without an understanding of gender differences and inequalities. With 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.

In addition, even water-related environmental challenges 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 (partitions used to separate women from men or strangers) in public shelters may also have deterred women from seeking refuge.²⁵

²⁵ 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

PART II: ANALYSIS OF TARGET 10

CHAPTER THREE: BACKGROUND INFORMATION ON WATER SUPPLY AND SANITATION

This Chapter analyzes Target 10 and outlines the current global-level monitoring system in the sector.

3-A. Analysis of MDG Target 10 on access to drinking water and household sanitation

This section of the report contains a brief analysis of the specific MDG target #10 on increasing access to water and sanitation.

The four components of MDG Target #10 on water and sanitation

At the start, it is important to highlight four issues inherent in the MDG Target #10 (“to halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation”).

First, the baseline date for these targets, which was not made explicit in the original wording, needs to be clarified. Several other MDG Targets (#1, 2, 5, 6, and 11) call for specific improvements with respect to some baseline year, but with the exception of the Slum Dwellers Target (#11), they all specify this baseline year as 1990. Moreover, in the case of Target #11 this ambiguity matters slightly less, since an absolute number of Slum Dwellers whose lives are to be improved is arguably an inappropriate way to measure progress at the country level. This Task Force must therefore make its own determination of the baseline date. Taking into account that the UN Statistics Division and UNICEF use 1990 as their baseline year, and that as a result the Secretary-General’s report on progress towards achieving the MDGs will use the same year, it is proposed that the same baseline date be adopted, in order to ensure maximum consistency with other UN publications and the work of the Secretary-General.

Second, “sustainable access” must be viewed from a social and economic perspective as well as an environmental one. It includes a physical/infrastructure dimension – for example, access to drinking water means the existence of infrastructure in good working order – but also embraces a concept of use.²⁶ For example, access to sanitation cannot simply be measured in terms of whether a toilet is installed, but whether that toilet is working and used for safe disposal of excreta with improved hygienic practices, as otherwise the contribution to human health will be negligible or even negative.

Third, the targets can and should be set (and monitored) at both global and national levels – and even sub-national levels for large nations like China, India, Brazil, Nigeria. National targets must be owned by each country – some countries, for example, are well on track to achieving one or more of the above targets and can aspire to something much more ambitious than the Millennium Development targets that are being recommended as voluntary minimum targets for all countries. Likewise, intermediate milestones (e.g., for 2005 and 2010) should be set at both

²⁶ For example, the Public Affairs Center (PAC) in India has conducted a survey of 36,500 households regarding basic services. Their data indicate there is a gap, sometimes wide, between availability of a service and its satisfactory functioning, e.g., water pumps installed in villages, but not functioning.

national and global levels (as well as sub-national levels where appropriate). Progress at both levels should be monitored and evaluated in terms of these intermediate milestones.

Fourth, the target itself has four components, since “people without sustainable access to safe drinking water and basic sanitation” encompasses four fairly distinct groups. This is depicted in greater detail in Figure 1, below. An overall strategy for achieving the Target will therefore need to have distinct sub-strategies to address problems of urban water supply, rural water supply, urban sanitation and rural sanitation.

Figure 3.1 Components of MDG Target #10

<p>Urban Water Supply</p> <p>Reduce by half, by 2015, the proportion of urban people without sustainable access to safe drinking water</p>	<p>Urban Sanitation</p> <p>Reduce by half, by 2015, the proportion of urban people without sustainable access to basic sanitation</p>
<p>Rural Water Supply</p> <p>Reduce by half, by 2015, the proportion of rural people without sustainable access to safe drinking water</p>	<p>Rural Sanitation</p> <p>Reduce by half, by 2015, the proportion of rural people without sustainable access to basic sanitation</p>

Two points relating to these four targets need to be highlighted here:

- The urban sanitation target is similar to one of the key indicators of the target addressed by the “Slum Dwellers” Task Force, which is to have achieved, by 2020, a significant reduction in the proportion of urban population with access to improved sanitation. This component of the Task Force’s work will therefore need to be developed in close cooperation with this water and sanitation Task Force.²⁷
- Decomposing the overall challenge into four groups will need to take into account the many interconnections among the four, as well as the fact that there are a range of situations from sparsely populated rural areas to densely populated urban systems, characterized by increasing levels of population density.

One additional point for consideration by the Task Force is that the 2004 *World Development Report* is intending to investigate how countries can accelerate progress towards the MDGs by making services work for poor people. The *Report* is intended to serve as a guide to policymakers, donors, and citizens on approaches that can be followed to improve the delivery of basic services. Since the services selected for in-depth treatment in the *Report* are water,

²⁷ Task Force member Gouri Ghosh has noted, “There is a distinct difference between urban slums and peri-urban or poor urban areas (which sometimes may not be a slum but may have a serious problem). It is better to subdivide the urban groups into three main components: urban slums, peri-urban and neo-urban conglomerates like those areas in transition from large rural pockets to regular urban areas like the Nagar Panchyats or towns in India and China respectively.”

sanitation, health and education, the Task Force could greatly benefit by close collaboration with the World Bank team working on the 2004 *World Development Report*.

Definitional issues

For the MDG targets for water and sanitation, there is a need for a common agreement on three things: (a) the terminology for access to both water and sanitation; (b) the operational meaning of the agreed terminologies; and (c) survey instruments and indicators for assessing progress towards the targets.

The targets for this Task Force are:

1. To halve, by 2015, the proportion of people without sustainable access to safe drinking water²⁸
2. To halve, by the year 2015, the proportion of people who do not have access to basic sanitation

The target for drinking water was defined at the Millennium Summit as part of the MDGs. The baseline global data available on the current status of this target are what is contained in the “Global water supply and sanitation assessment 2000” (GWSSA2000) prepared under the WHO/UNICEF Joint Monitoring Program (JMP). Whereas the MDG target on water uses the terminology of “safe drinking water,” the JMP Report uses the terminology of access to “improved” water technology types. It has been argued that this “change in terminology reflects both the past misrepresentation, and the future uncertainty, in judging and defining services as “safe” in terms of human health.²⁹

It is very difficult to measure global coverage of safe water or sanitary excreta disposal routinely, because monitoring aspects of service such as the quality of water at point of consumption or the correct usage of sanitary facilities is not currently within the scope of national surveys or other data sources. Surveys typically register the presence of water and sanitation facilities of different technology types. The GWSSA2000 assumed that those technologies that can be categorized as “improved” are inherently safer or more sanitary than others which are considered “not improved.” Therefore, the coverage estimates from JMP are expressed as the percentage of population with access to improved drinking water sources and improved sanitation as defined in Box 3.1.

²⁸ Neither “safe” nor “sustainable access” were defined at the Summit; exploring further this important question of definitions will be part of the Task Force work (in collaboration with the JMP) in 2004, and will be addressed more thoroughly in the Task Force Final Report.

²⁹ Hunt, C. (2001). *How Safe is Safe? A Concise Review of the Health Impacts of Water Supply, Sanitation and Hygiene*. London, WELLS (LSHTM/WEDC):22

Box 3.1 Improved and Unimproved Water and Sanitation Facilities as defined by the JMP

Improved water supply Household connection Public standpipe Bore hole Protected dug well Protected spring Rainwater collection	Improved sanitation Connection to a public sewer Connection to septic tank Pour-flush latrine Simple pit latrine Vented improved pit latrine
Unimproved water supply Unprotected well Unprotected spring Vendor provided water Bottled water ¹ Tanker truck-provided water	Unimproved sanitation Service or bucket latrine (where excreta are manually removed) Public or shared latrines Latrines with open pit

¹ Not considered "improved" because of limitations concerning the potential quantity of supplied water, not the quality

It appears, however, that the meaning of "improved" is still an issue. One interpretation has been proposed by a task force on monitoring established by the Water Supply and Sanitation Collaborative Council, WSSCC. According to the WSSCC task force, *a person is said to have access to "improved" water supply if the person has access to sufficient drinking water of acceptable quality as well as sufficient quantity of water for hygienic purposes*³⁰.

As mentioned earlier, the target for sanitation was established at the 2002 World Summit on Sustainable Development, WSSD. The terminology chosen for this target is "basic sanitation." In contrast, the terminology used in the JMP report is "improved sanitation." The term is defined in the JMP report as a sanitation system in which excreta are disposed of in such a way that they reduce the risk of fecal-oral transmission to its users and the environment. It would appear, however, that in choosing "basic sanitation" as the preferred terminology, the Summit had something more in mind. It linked access to sanitation to improved human health and reduced infant and childhood mortality. Basic sanitation was defined more explicitly to include actions on the following:

- Development and implementation of efficient household sanitation systems;
- Improvement of sanitation in public institutions, especially in schools;
- Promotion of safe hygiene practices;
- Promotion of education and outreach focused on children, as agents of behavioral change;
- Promotion of affordable and socially and culturally acceptable technologies and practices;
- Development of innovative financing and partnership mechanisms;

³⁰ A survey instrument being prepared by the WSSCC task force gives further elaboration of the meanings of these two aspects of improved water supply.

- Integration of sanitation into water resources management strategies in a manner which does not negatively impact on the environment (includes protection of water resources from biological or fecal contamination).

It is apparent that the WSSD definition is broader than what is envisaged in the JMP report and is more impact-oriented, particularly in communities that currently have very low levels of sanitation service. The WSSD is also not focused on the construction of a particular number of toilets as the target goal, but rather on the creation of an overarching process for improved health and hygiene through basic sanitation. The JMP may also be concerned with this broader goal, but has developed a definition and indicators of ‘improved sanitation’ that are simpler to operationalize. On the other hand, an emphasis on the presence or absence of particular household technologies ignores health risks associated with poor disposal of sullage or wastewater from domestic sources (*e.g.*, filariasis and schistosomiasis). Moreover, issues of privacy and dignity are also important components of monitoring in sanitation, as they influence willingness to use sanitation facilities regularly.

With these considerations in mind, the Task Force defines and is using the term “basic sanitation” as follows:

Access to, and use of, excreta and wastewater facilities and services that provide privacy and dignity while at the same time ensuring a clean and healthful living environment both at home and in the immediate neighborhood of users.

With basic sanitation, access at the household level should be sufficient. Yet, one of the goals of such access is public health and environmental pollution prevention. Hence, at the very minimum, the definition of access should reflect a healthful environment at the neighborhood level. While this may be sufficient in a rural environment or in a dispersed settlement, it would be woefully inadequate in an urban area, especially in urban slum areas or in congested urban areas and mega-cities. For such situations, we would need to go beyond access at the household level to provide proper collection systems like an appropriate form of sewerage, together with facilities for proper treatment and disposal of the collected sewage. This brings us to the sanitation ladder (see Chapter 7 and Annex 3).

In defining indicators that will be used as the basis for monitoring, it is necessary to strike a balance between “ideal” consistency with conceptual definitions and measurable indicators which provide approximations to the ideal definitions. It is such measurable indicators that should form the basis for developing the main monitoring instruments at the national and international levels. For instance, from a gender perspective, ideally the definition of “improved” water supply would include some measure of the distance between a household and its water source, as the distance women must travel for water has many impacts on their lives, from the amount of time they must spend on water gathering to questions of physical safety. Similarly, having separate sanitation facilities for men and women and, at schools, for girls and boys, as well as the physical location of such facilities, also affects a regularity of use, women’s physical safety, and girls’ school attendance. Disaggregating service access data by sex would also yield important information, allowing for assessment of the degree to which both men and women are benefiting from interventions in this area.

However, if the information collected from, for instance, household surveys – among the most reliable methods – does not track access by sex, distance to water sources, or the presence of separate sanitation facilities for men and women, then creating monitoring indicators based on these considerations presents a host of operational difficulties. There is a need to strike a workable balance between what is desirable to measure and what is possible to measure, and cost is an important variable in this exercise.

3-B. The current system for monitoring and evaluation at the global level: The Joint Monitoring Programme (JMP)

In 1990, at the end of the water decade, the World Health Organization (WHO) and the United Nations Children’s Fund (UNICEF) joined their efforts in monitoring the water supply and sanitation sector through the *Joint Monitoring Programme for Water Supply and Sanitation* (JMP). The purpose of the JMP was to:

- Monitor sector progress towards internationally established goals on access to water supply and sanitation;
- Monitor sector trends and programmes;
- Build national sector monitoring capacity;
- Inform national and global policy-makers on the status of the sector.

Over the past decade, the JMP focused on monitoring access coverage at the global and regional levels. To that end, the JMP compiled coverage rates on water supply and sanitation using information provided primarily by water utilities and government sources. JMP sector assessment reports based on this methodology were issued in 1991, 1993 and 1996.

The latest JMP report, the *Global Water Supply and Sanitation Assessment 2000 Report* (GWSSA2000) provides a comprehensive review of the water supply and sanitation sector at the end of the millennium. It presents country-by-country coverage data, global and regional data, trends over the period 1990-2000, and an analysis of sector challenges and future needs.

The coverage estimates³¹ provided in the GWSSA2000 are primarily based on user-based data derived from nationally representative household surveys³² and census. This was an important

³¹ If possible, coverage estimates are based on all available national household surveys and censuses. All available surveys and censuses are plotted on a time scale. A linear trend line, based on the least-squares method, is drawn through these data points and determines the estimates for 1990 and 2000. In case household surveys and censuses are not available, coverage data given through the GWSSA 2000 questionnaire is used. In the future the linear trend line might be replaced by a curvilinear trend line. For a more detailed description of the methodology, please refer to the GWSSA2000 report or the JMP web site (www.wssinfo.org) when it is established.

³² To be used in the calculation of coverage data for a country, surveys must meet certain criteria. First of all, the survey needs to be representative of the entire country. Further, it needs to be well-documented and details about the data should be available. In the JMP approach, coverage data are based on the type of services used, so if a survey only gives one total figure for people with “access”, this survey can not be used to calculate the coverage estimates because it is not clear whether this access meets the JMP standard of “improved”. However, details of surveys, even those not used, have been included in the country files and are visible in the graphs for purposes of comparison. Examples of valid surveys are the Demographic and Health Survey of Macro International (funded by USAID), UNICEF’s Multiple Indicator Cluster Survey and some of the World Bank’s Living Standard Survey. Many censuses have also been used, but sometimes their data are given with insufficient detail.

shift in methodology away from using provider-based data in favor of evidence-based data. This shift was made possible after the introduction of the Multiple Cluster Indicator Surveys (MICS) by UNICEF in 64 countries in 1995 and the MICS2 around 2000 in 67 countries. These 120+ MICS results, in addition to the now over 150 Demographic and Health Surveys (funded by USAID and conducted by ORC-Macro) and data from National Census, provide a large enough database to calculate coverage estimates based on evidence-based data.

Why is the data derived from household surveys better than that supplied by governments and water utilities? In many cases, provider-supplied estimates are based on facilities constructed under their programmes multiplied by an estimated number of users per facility. This means that facilities constructed by households themselves, NGOs, or the private sector might not have been included. It also means that systems that have broken down or for other reasons are not being used might be counted. Urban and peri-urban slums, even those that are home to hundreds of thousands of people, are often not counted in official government reports because of questions of tenure; access in such areas tends to be very poor, and when the people living there are not counted, a significant over-reporting of coverage can result. In addition, political, institutional, career, and other pressures can sometimes create incentives for suppliers to inflate the numbers of people reported to have access. Therefore, household-level information gathered through household surveys gives a better reflection of the real situation on the ground.

In response to monitoring the World Summit for Children goals, UNICEF greatly expanded its monitoring capacity. Through its country offices, UNICEF currently has a reporting system in place that tracks all surveys with relevance for child protection, survival and development that are conducted at the national level (in addition to DHS and MICS, surveys like health and nutrition surveys, reproductive health surveys, living standard measurement surveys, Gulf Family Health Survey etc.). When survey results are officially produced, the results including a hard-copy of the report are sent to UNICEF-headquarters. The survey methodology and design are assessed and relevant data extracted.

UNICEF and ORC-MACRO, responsible for the DHS surveys, have been coordinating their surveys for some years now. Yearly household surveys are likely to show change within the margin of error of the previous survey results. To avoid this, DHS and MICS aim to have at least three years between surveys. Thus, if a MICS survey has been conducted in 2001, a DHS survey will not be done in the same country until 2004 or later. This strategy maximizes the scarce resources and limits survey fatigue amongst households, which is a possible confounding factor. There is also cooperation around harmonization of survey questions and indicators.

The current JMP-database contains water supply and sanitation coverage data of over 350 national household surveys and census conducted throughout the developing world during the past 15 years. The widely used figures of 1.1 billion people without access to drinking water and 2.4 billion without access to sanitation by the end of 2000, are derived from this JMP database.

Limitations of household surveys

The current major survey instruments only ask a question about the time taken to collect water. No questions are asked about the reliability of the supply, the water quality or affordability, the distance between the household and the facility, or the availability of separate facilities for women and men. Nor do the surveys assess how hygienic a sanitary facility really is.

Both the DHS and MICS surveys strive to strike a balance between obtaining information and the time needed to conduct a survey interview. Costs are an issue. A regular MICS or DHS survey interview takes between 45 minutes to one hour. MICS surveys are usually conducted in 4000 – 6000 households, DHS surveys in 6000 – 9000 households. Limiting the number of survey questions to those that have relevance for global level monitoring is therefore of utmost importance.

Although the current five-to-seven questions on water and sanitation in the MICS and DHS may be expanded with a few additional indicators with global relevance, it is likely that the demands of the sector require additional information. Current demands include information on hygiene and hygiene behavior (hand washing) and disaggregation of data for peri-urban areas or sub-national level. GIS mapping of the current survey instruments is not enough as the current DHS and MICS survey designs stratify their sampling for an entire country and not for separate regions. Regional stratification as is done in a very large country like India could easily increase the sample size five-to-ten fold to 60,000 households. Such surveys therefore are better done at the individual country level targeting specific regions of interest – the benefits of global monitoring of sub-regional coverage most likely do not outweigh the costs. Rapid appraisal techniques are likely a good and cost-effective alternative to household surveys to assess particular water, sanitation and hygiene problems in a specific sub-regions. The unofficial rule-of-thumb applied to the MICS for inclusion of a survey question is whether or not that question or indicator has relevance for measuring progress toward an internationally established global goal.

Recent developments – The JMP Advisory Group

JMP broadened its participation base beyond WHO and UNICEF with the establishment of a JMP Advisory Group in 2003. This advisory group is made up of leading field and academic experts in water supply, sanitation and hygiene, sector monitoring, and data collection. Its main role is to advise the JMP Secretariat to enhance the quality of its work and expand its scope beyond monitoring of access. Members of the Advisory Group include representatives from the following institutions:

- London School of Hygiene and Tropical Medicine
- Water and Environment Development Centre (WEDC), Loughborough University, UK
- Water Supply and Sanitation Collaborative Council (WSSCC)
- Environmental Health Project (EHP)
- The Water Supply and Sanitation Programme of the World Bank
- The African Water Association
- ORC MACRO – responsible for carrying out DHS surveys worldwide

Recommendations from the first advisory group include enhancing the quality and quantity of data through:

- the promotion of harmonized survey questions and indicators among the main survey instruments and at individual country level;

- the inclusion of additional indicators, specifically on hygiene and hygiene behavior with relevance for global monitoring;
- Promotion of the JMP-methodology and recognition and use of JMP figures at country level.

The advisory group also expressed the need for a higher reporting frequency by the JMP of its updated coverage estimates. From the trend lines based on household survey data, the JMP can now produce yearly coverage estimates through extrapolation of the trend. The first report with end-2002 estimates will be published in March 2004. In addition, the Advisory Group argued the JMP should better address the need for building national monitoring capacity as well investigate options for becoming involved in national sector monitoring beyond monitoring of access.

For the GWSSA2000, the JMP collected data on sector performance, covering sector investments, strategies, and issues of quality and effectiveness. After the Millennium Summit, the WHO Regional offices in Latin America and in South Asia promoted the elaboration of individual country sector assessments reports based on the information provided at the request of the JMP for the GWSSA2000. Sector authorities from a number of countries, with assistance from external consultants and participation of partners in the sector, prepared national sector assessments. These sector assessments could form the basis for strengthening and accelerating sector performance, pinpointing the main barriers to progress for reaching the MDGs. A next step in this process could be the preparation of country plans-of-action for reaching the MDG targets.

In low-income countries, the JMP-partners, WHO and UNICEF, through their country representations and regional offices, can play a pro-active and supportive role in the preparation of such country assessment reports and plans. Close cooperation with other ESAs and primarily the World Bank, with its double role of technical advisor and lender/financer will surely benefit such process. The added value of the JMP will be its experience in monitoring and reporting on global and regional trends within the context of measuring progress towards the MGD targets.

The national sector assessment reports and plans of action could serve as advocacy tools for fundraising as well as a roadmap for reaching the MDG targets on water supply and sanitation.

JMP funding

Since its inception, the JMP has largely been funded from the regular resources of the two lead agencies, UNICEF and WHO. The role of managing the JMP, updating the country files with new survey data, producing regular reports on coverage, and maintaining JMP's presence in the sector at global forums has on average received an input of 1½ person-years divided over a total of six people within the two executing agencies. In other words, the JMP has been operated on a shoestring. Costs for conducting the household surveys and tracking and collection of all data have not been borne by the JMP, but somehow should be taken into account to get an overall picture of the costs of monitoring progress towards the MDGs.

Whereas in the nineties the JMP set out to fill an information gap, the current demands made on the JMP, with its mandate from the UN-SG to monitor progress towards the MDG targets on water and sanitation, has changed considerably.

To ensure proper representation at global level forums and discussion platforms, and to ensure a yearly update of coverage estimates and promotion of the JMP methodology and use of JMP figures at national level, it is estimated that at least three full time professional staff are needed. If the mandate of the JMP is further expanded into capacity building at national level, including support to national sector assessments, much more programme funding would be required. An estimated operating budget of little over US\$ 1 million per year would allow the JMP to carry out its expanded role and implement the recommendations of its Advisory Group. This would include capacity building efforts in 25 priority countries, making use of the existing UNICEF and WHO infrastructure at country level. It also includes a pilot project to test a rapid water quality assessment protocol developed by WHO, to be introduced for regular water quality surveillance, with the potential to be run alongside a national level household survey.

CHAPTER FOUR: EXPANDING ACCESS TO WATER AND SANITATION SERVICES: WHERE ARE THE NEEDS GREATEST?

Three caveats are important when assessing the current situation with regard to water and sanitation access; progress toward the Millennium Development Goal on water and sanitation; the likelihood that the target of halving the proportion of people without access will be met by 2015; and the specific constraints that impede the expansion of access. First, one must draw a distinction between the goals for water supply *versus* sanitation. While they are mutually reinforcing and equally important, meeting the sanitation target is the far more daunting challenge for a variety of reasons, including lack of political will and commitment at the highest level, low effective demand for sanitation among the unserved, inadequate financing, the lack of institutions at the national level charged with sanitation, the relatively low pay and status associated with work in the sanitation field as opposed to work in other sectors, and near-universal cultural taboos surrounding discussion (much less the handling) of human excreta. In addition, the scale of the problem is far greater for sanitation than for domestic water supply: twice as many people (2.4 billion) lack access to sanitation as compared to water supply (1.2 billion).

Second, it is important to examine specific circumstances at the regional, national, and sub-national levels (and within the last category, the distinction between the rural and urban contexts is particularly important). To be effective, interventions, approaches, costing and financing mechanisms must be highly context-specific: one size does not fit all, and strategies and action plans rooted in generalities tend to be less effective than those which take advantage of local opportunities and which address local constraints.

Third, whereas data sources used in this report do have some shortcomings—for instance, they tend to understate the gaps in coverage—they are nevertheless the best, most reliable data sources available. Measuring access to domestic water supply and sanitation services is a tremendously challenging task that requires striking a balance between what is conceptually desirable to measure and what is practically possible to measure (particularly in terms of costs).

Given these caveats, how should policy-makers, advocates, donors, and others identify where the needs for intervention are greatest? Three different possible approaches to identifying regional, national and sub-national “hotspots” for urgent action are discussed below. One approach is to identify areas where access to domestic water supply and sanitation services is lowest. Another approach combines information on access to services with information on progress toward the goal: is access growing quickly, has progress stalled, or is coverage actually declining? A third approach involves identifying areas where both access to services is poor and the incidence of water-related disease is high.

4-A. Access to domestic water supply and sanitation services

The Unicef/World Health Organization Joint Monitoring Programme (JMP) report for 2000 describes regional coverage for both improved drinking water and improved sanitation at the turn of the century. The JMP report, which is the most reliable source of global information on access, shows Asia and Africa are the two regions where coverage is lowest for both water supply and sanitation (Table 4.1). In the year 2000, a total of about 1.1 billion people lacked

access to improved water supply.³³ Asia and Africa accounted for 86 percent of the unserved (61 percent lived in Asia and 25 percent in Africa). The report also shows that about 2.4 billion people in the world lacked access to improved sanitation, of which 79 percent lived in Asia alone. Some 12 percent lived in Africa, while 5 percent lived in Latin America and the Caribbean.

Table 4.1 Regional distribution of persons without access to improved water supply and sanitation, 2000³⁴

Region	Percent of global total without access to improved water that live in indicated region	Percent of global total without access to improved sanitation that live in indicated region
Sub-Saharan Africa	25	12
Middle East/North Africa	4	2
South Asia	19	37
East Asia/Pacific	42	42
Latin America & Caribbean	6	5
CEE/CIS & Baltic States	4	2

Table 4.2 provides information on access to improved water and sanitation in 2000 by region. Across all regions, coverage was lower for sanitation than for water, and access overall in rural areas was far worse as compared to urban areas. Finally, the data indicate that for drinking water, the lowest coverage rates were in sub-Saharan Africa, where 43 percent lacked access to improved drinking water supply, followed by East Asia (24 percent without access), South Asia (15 percent without access), and Latin America (14 percent without access).

Table 4.2 Percentage without access to improved water supply and sanitation within regions, 2000³⁵

Region	Percent within region without access to improved water			Percent within region without access to improved sanitation		
	Urban	Rural	Total	Urban	Rural	Total
Sub-Saharan Africa	17	56	43	27	57	47
Middle East/North Africa	5	23	13	7	30	17
South Asia	6	20	15	33	78	66
East Asia/Pacific	7	33	24	27	65	52
Latin America & Caribbean	6	34	14	14	48	23
CEE/CIS & Baltic States	5	18	9	3	19	9
Industrialized Countries	0	0	0	0	0	0
Developing Countries	8	31	22	23	65	48
Least Developed Countries	18	45	38	29	65	56
World	5	29	18	15	60	39

In the case of sanitation, coverage rates were lowest in South Asia, where 66 percent of people were without access to improved services. Roughly half of those living both in East Asia (52 percent) and Sub-Saharan Africa (47 percent) did not have access to improved sanitation

³³ An "improved" water supply is defined by types of technology that provide access. These do not necessarily ensure that the supply will be continuous or that the water will be safe to drink. Thus those lacking access to a continuous safe supply of drinking water will be much greater. JDHERE

³⁴ Source: WHO/UNICEF Joint Monitoring Program, 2001

³⁵ Source: WHO/UNICEF Joint Monitoring Program, 2001

services. In the Latin America and Caribbean region, 23 percent were without access. In all cases, access to both water and sanitation services is higher—sometimes by as much as a factor of 6—in urban areas as compared to rural areas.

Based on these year 2000 coverage levels, along with projected population figures from the United Nation Population Division, UNICEF has estimated that the number of people that must be reached with water and sanitation facilities by 2015 in order to meet the Millennium Development targets (Table 4-3). For water supply, meeting the target requires that services be extended to 359 million more persons in sub-Saharan Africa, 444 million in South Asia, and 465 million in East Asia and the Pacific. With regard to sanitation, the challenge in sub-Saharan Africa is of roughly the same scale as that for water supply; another 363 million persons must obtain access to sanitation by 2015 in order to meet the MDG target. The sanitation challenge is much more daunting in both South Asia and East Asia, where services must reach more than 700 million in each region.³⁶

Table 4.3 Number of people (millions) to whom access must be extended by 2015 in order to meet MDG targets

Regions/Country categories	Number of people to gain access to improved water supply by 2015			Number of people to gain access to improved sanitation by 2015		
	Urban	Rural	Total	Urban	Rural	Total
Sub-Saharan Africa	175	184	359	178	185	363
Middle-East and North Africa	104	30	134	105	34	140
South Asia	243	201	444	263	451	714
East Asia and Pacific	290	174	465	330	376	705
Latin America and Caribbean	121	20	141	132	29	161
CEE/CIS and Baltic States	27	0	27	24	0	24
Total	961	609	1570	1032	1076	2108

4-B. Current levels of access and the rate of progress toward the goal

The Human Development Reports (HDR) for 2002 and 2003 provide information on progress towards the MDG target for safe drinking water, using JMP data and 1990 as the baseline year. The 2002 assessment was undertaken for all the United Nations member countries (except high-income OECD countries), and included Hong Kong and China. For 75 countries, representing 10.3 percent of the world’s population, no assessment could be carried out because of data unavailability.

The results of the HDR analyses indicate that 25 countries have already achieved the Millennium Development target for water. Of these, four (Singapore, Sri Lanka, Bangladesh³⁷, and the Maldives) are from Asia; only one, Mauritius, is from sub-Saharan Africa. Another 43 are considered to be “on track” toward achieving the goal, of which eight and nine are from Asia and Africa, respectively. Finally, 25 countries are either lagging somewhat behind, considerably behind, or are even slipping in their progress toward the MDG targets. Among these, 13 are

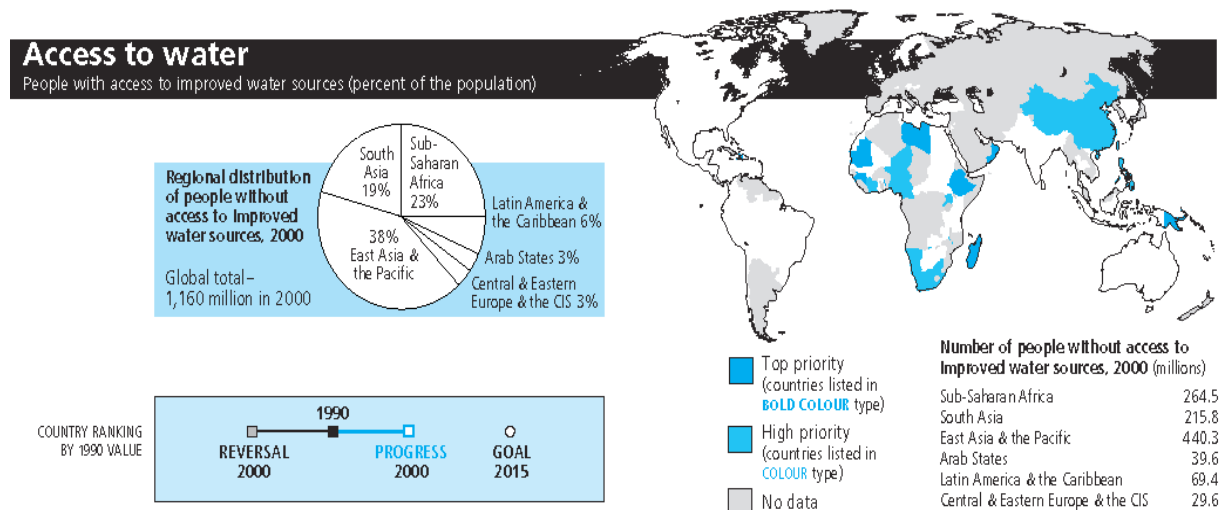
³⁶ UNICEF, “Financing the International Goals for Water and Sanitation.”

³⁷ It is important to remember that progress in Bangladesh must be evaluated in the context of the significant problem the country is currently facing of arsenic in groundwater supplies.

from Sub-Saharan Africa; only four (The Philippines, Vietnam, Myanmar, and China) are from Asia. Around the world, the HDR results indicate that 43.4 percent of the population have either achieved the goal or are on track towards it, while 32.1 percent are lagging behind the target.

The 2003 HDR assessment identifies two groups of countries that appear to need urgent changes of course in order to meet the goals. In the first group of countries, access to services is low and progress toward the goal is stalled or reversing. The Report argues that these countries should receive the lion’s share of the world’s focus, resources, and assistance. In the second group of countries, the situation is somewhat less desperate but the needs remain great. These countries either have medium coverage rates but exhibit stalled or reversing progress, or have very low levels of coverage and are progressing only very slowly. In addition, sufficient data are not available to classify another 32 countries; if the data were better, no doubt at least some of these would be included in these “urgent needs” categories.

Figure 4.1 Access to domestic water supply: percentage with access to improved water sources³⁸



Source: Human Development Report 2003

In terms of **access to water** (Figure 4.1), the countries where access is poor and progress toward the goal is stalled or reversing include five in Africa (Ethiopia, Mauritania, Madagascar, Guinea, and Togo); one in East Asia and the Pacific (Papua New Guinea); two in the Arab States (Oman and Libyan Arab Jamahiriya); and one in Latin America and the Caribbean (Haiti).³⁹ Countries with better prospects for meeting the goal but where challenges are still formidable include eight in Africa (Uganda, Malawi, Cameroon, Niger, Nigeria, Namibia, Cote d’Ivoire, and South Africa); two in East Asia and the Pacific (China and the Philippines); and one in Latin America and the Caribbean (Trinidad and Tobago). It is important to underscore that, for several of the poorest countries such as Sierra Leone and Burkina Faso, insufficient data are available. It is likely that many such states would be included in this list.

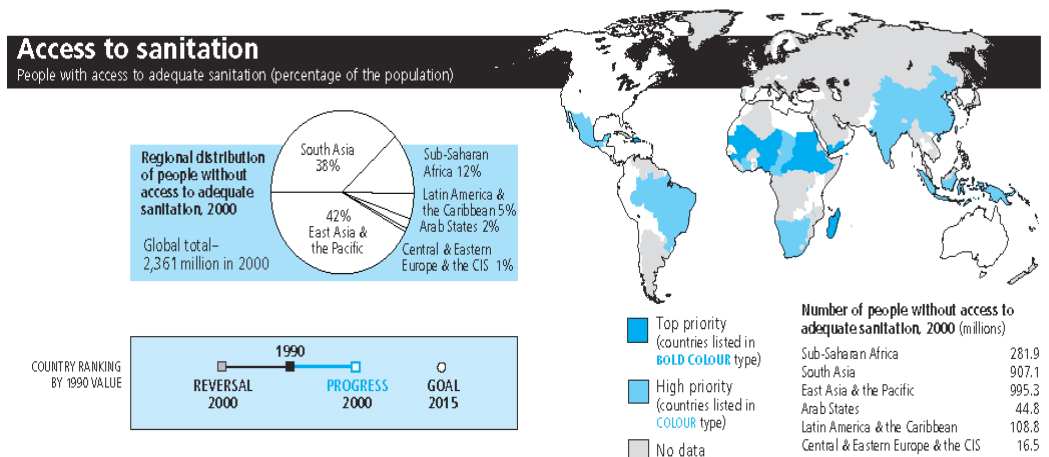
In terms of **access to sanitation** (Figure 4.2), the countries where access to services is poor and progress toward the goal is stalled or reversing include ten in Africa (Ethiopia, Niger, Benin,

³⁸ Human Development Report 2003

³⁹ Human Development Report 2003, page 58

Central African Republic, Mauritania, Madagascar, Guinea, Togo, Nigeria, and Mali); two in the Arab States (Yemen and Sudan); and two in Latin America and the Caribbean (Haiti and the Dominican Republic).⁴⁰ Countries with better odds of meeting the goal but where challenges are still substantial include nine in Africa (Chad, Namibia, Cote d'Ivoire, Zimbabwe, Botswana, Malawi, Cameroon, South Africa and Burundi); three in South Asia (India, Nepal, and Pakistan); three in East Asia and the Pacific (China, Indonesia and Papua New Guinea); and two in Latin America and the Caribbean (Mexico and Brazil).

Figure 4.2 Access to sanitation: people with access to improved water sources



Source: Human Development Report 2003

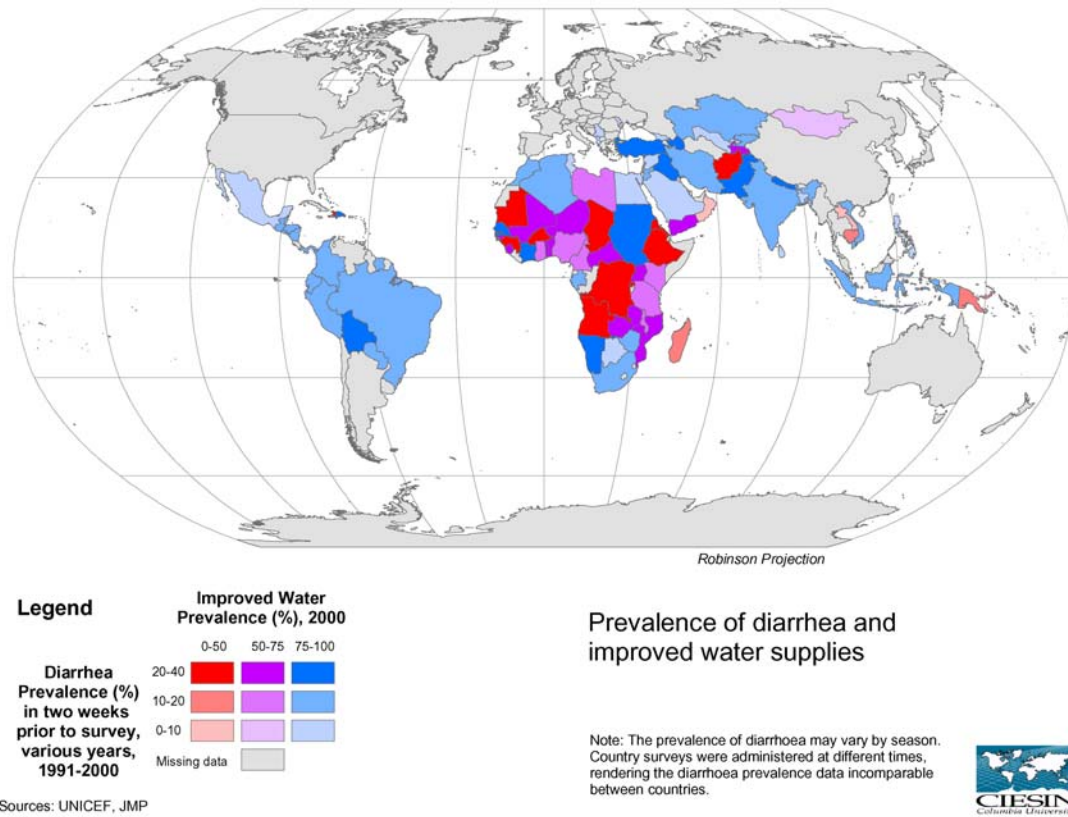
4-C. Low access to services and high incidence of water-related disease

Another perspective on identifying areas where the needs for accelerated action in domestic water supply and sanitation are greatest is to consider both the existing level of access to services and the prevalence of water-related diseases. Such an analysis could, for instance, help policy makers concerned with public health know if a problem like diarrheal diseases in a given area were associated with low WSS service coverage, or if it were related to another factor, such as poor healthcare delivery systems.

The two maps below (Figures 4.3 and 4.4) indicate both the extent of access to domestic water supply and sanitation services and the prevalence of diarrhea in a number of countries. Countries where, by these criteria, the needs are particularly great—for example, where coverage is less than 50 percent and diarrhea prevalence is highest (20-40 percent)—appear in red. For domestic water supply, these countries include, Angola, Burkina Faso, Chad, Congo, Ethiopia, Eritrea, Guinea, and Mauritania (in Africa); and Afghanistan in the Arab States.

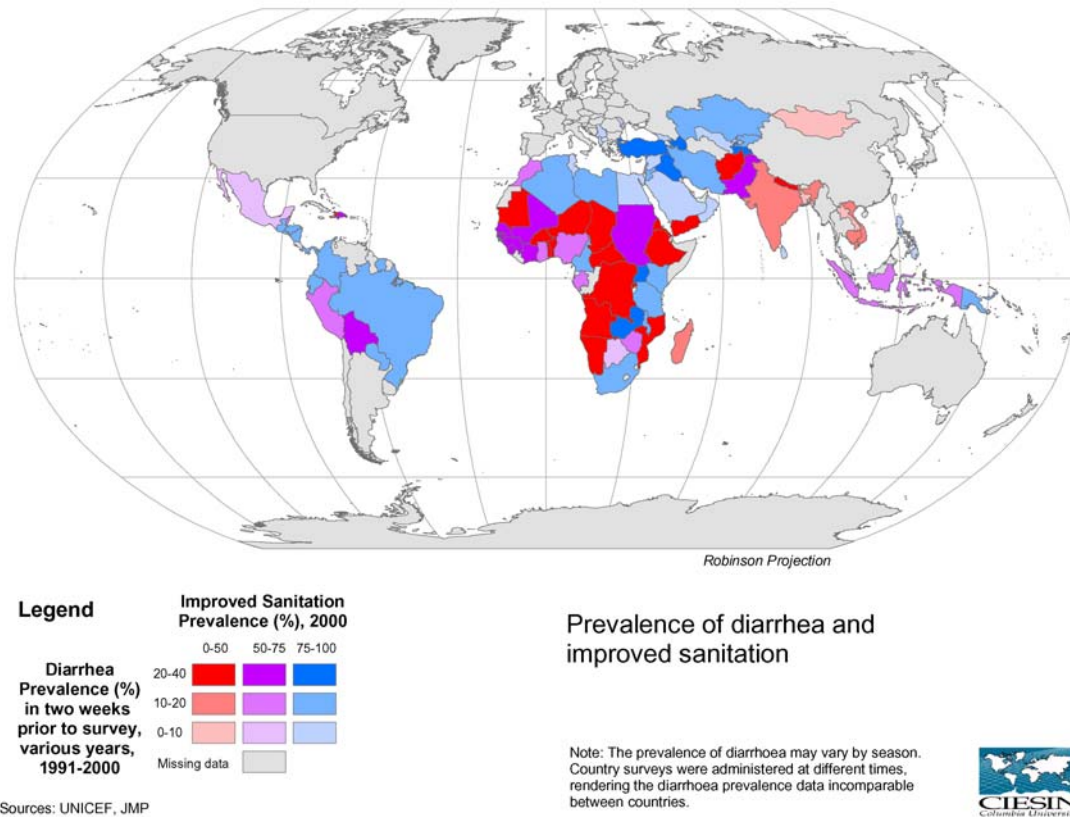
⁴⁰ Human Development Report 2003, page 59

Figure 4.3 Prevalence of diarrhea and improved water supplies



For sanitation, countries requiring urgent action would include, in Africa, Angola, Benin, Burkina Faso, Central African Republic, Chad, Congo, Ethiopia, Eritrea, Mauritania, Mozambique, Namibia, Niger, and Togo; and in Asia, Afghanistan and Bangladesh.

Figure 4.4 Prevalence of diarrhea and improved sanitation



At the sub-national level, within the countries that appear on these lists as well as within countries where progress overall gives cause for hope but pockets of entrenched poverty and deprivation persist, there are large swaths of the population without access to either water or sanitation. These populations at the sub-national level can also be targets for intervention by national governments based on their distance from reaching the goal, their rate of progress, and the incidence of water-borne diseases, as has been described for these country-level analyses.

4-D. Summary and discussion

Clearly the international community would like to allocate the limited resources available for expanding access to water supply and sanitation where (1) needs are greatest and (2) expenditures will have the greatest impact on human health and well-being. The data presented in Sections 4-B and 4-C are generally consistent in suggesting that the majority of countries with low coverage rates, slow progress toward the MDG targets, and high incidence of diarrheal disease are located in Africa (Table 4-4). Nevertheless, incorporating explicit consideration of diarrhea incidence does result in shifts among the countries in the ‘high priority’ category.

Table 4.4 Comparison of prioritization criteria for water supply and sanitation targets

WATER SUPPLY			SANITATION		
Low rates of access, slow progress (HDR)	Moderate rates of access & progress (HDR)	Low access, high diarrhea incidence (CIESIN)	Low rates of access, slow progress (HDR)	Moderate rates of access & progress (HDR)	Low access, high diarrhea incidence (CIESIN)
AFRICA					
<i>Ethiopia</i>		<i>Ethiopia</i>			
<i>Guinea</i>		<i>Guinea</i>	<i>Guinea</i>		
<i>Madagascar</i>			<i>Madagascar</i>		
<i>Mauritania</i>		<i>Mauritania</i>	<i>Mauritania</i>		<i>Mauritania</i>
<i>Togo</i>			<i>Togo</i>		<i>Togo</i>
	<i>Cameroon</i>			<i>Cameroon</i>	
	<i>Cote d'Ivoire</i>			<i>Cote d'Ivoire</i>	
	<i>Malawi</i>			<i>Malawi</i>	
	<i>Namibia</i>			<i>Namibia</i>	<i>Namibia</i>
	<i>Niger</i>		<i>Niger</i>		<i>Niger</i>
	<i>Nigeria</i>		<i>Nigeria</i>		
	<i>South Africa</i>			<i>South Africa</i>	
	<i>Uganda</i>				
		<i>Angola</i>			<i>Angola</i>
		<i>Burkina Faso</i>			<i>Burkina Faso</i>
		<i>Chad</i>		<i>Chad</i>	<i>Chad</i>
		<i>Congo</i>			<i>Congo</i>
		<i>Eritrea</i>			<i>Eritrea</i>
			<i>Benin</i>		<i>Benin</i>
			<i>Cen. African Republic</i>		<i>Cen. African Republic</i>
			<i>Ethiopia</i>		<i>Ethiopia</i>
				<i>Botswana</i>	
				<i>Burundi</i>	
				<i>Zimbabwe</i>	
			<i>Mali</i>		<i>Mozambique</i>
ASIA					
<i>Papua New Guinea</i>				<i>Papua New Guinea</i>	
	<i>China</i>			<i>China</i>	
	<i>Philippines</i>				
				<i>India</i>	
				<i>Nepal</i>	
				<i>Pakistan</i>	
				<i>Indonesia</i>	
					<i>Bangladesh</i>
ARAB STATES					
<i>Oman</i>					
<i>Libya</i>		<i>Afghanistan</i>			<i>Afghanistan</i>
			<i>Yemen</i>		
			<i>Sudan</i>		
LATIN AMERICA & CARIBBEAN					
<i>Haiti</i>			<i>Haiti</i>		
	<i>Trinidad & Tobago</i>				
			<i>Dominican Republic</i>		
				<i>Mexico</i>	
				<i>Brazil</i>	

CHAPTER FIVE MEETING THE GOALS: WHAT WOULD IT COST

A financing strategy for the increases in investments required to meet the MDGs will need to identify the required levels of capital investments and operating expenses. Some preliminary information on the subject, based on a specially commissioned paper prepared by the central office of the Millennium Project⁴¹ plus material provided by Task Force member Vanessa Tobin⁴² and comments by Task Force member Richard Jolly, follows. Additional discussion on the subject can be found in the note prepared by Task Force member Bill Cosgrove entitled, “Comments on Monterrey Estimates.”

Available estimates of costs for water supply and sanitation

At the start, it is important to distinguish very carefully the different types of costs involved in water resource development:

- the specific cost of reducing by half, by 2015, the proportion of people without sustainable access to drinking water and basic sanitation
- the cost of ensuring water and sanitation and waste disposal in urban areas especially reticulated water, waste disposal and major sewage schemes
- the cost of providing water for other purposes

This distinction is important, because although Target # 10 involves only the first set of costs, developing and managing water resources to meet other MDGs involves the second and third sets. It is also important to distinguish between costs that are clearly additional, and those that are affordable through restructuring of existing expenditures.

UNICEF has prepared preliminary estimates for the first type of cost, based on the numbers of people to gain access indicated in Table 5.1 and unit cost derived from four different sources⁴³. The results are indicated in Table 5.2 below. Key assumptions used in arriving at these cost estimates are summarized in Box 5.1. As can be seen, global financing costs range from \$50-102 billion for water supply, and from \$23-42 billion for sanitation for the period 2001-2015. Taking an average would yield \$68 billion for water and \$33 billion for sanitation, for a total of \$101 billion or \$6.7 billion per year.

⁴¹ “Financing Water Supply and Sanitation”, by Guido Schmidt-Traub, Millennium Project, October 2002.

⁴² UNICEF, “Financing the International Goals for Water and Sanitation”, n.d.

⁴³ “Vision 21: A shared vision for Hygiene, Sanitation and Water Supply and a framework for action (also forming the “Water for people” component for the World Water Vision)”, WSSCC, 2000; “JMP: Global Water Supply and Sanitation Assessment 2000 Report”, UNICEF/WHO, 2000; “Costs and Resources for WES in the 1990s” by Ashok Nigam and Gourisankar Ghosh, WaterFront, Special Issue, 1994; “Financing Agenda 21: Freshwater”, John Briscoe and Mike Garn, The World Bank, February 1994.

Table 5.1 Summary of costs for reaching water and sanitation goals (USD x million)

Sources of cost data	Targets		
	Water	Sanitation	
	Vision 21/ MDG for 2015	Vision 21 goal for 2015	MDG for 2015
Vision 21	57,185	41,936	2,500
Global WSS Assessment/JMP	62,753	28,835	2,246
Nigam & Ghosh	50,653	23,644	2,228
Briscoe & Garn	102,192	36,557	2,500

Box 5.1 Key Assumptions used in arriving at the estimates in Table 5.1

- The idea of a “minimum package” was used in which low service levels (technologies and costs) were applied for rural populations and intermediate service levels were applied for urban populations (vast majority of need assumed to be in peri-urban/slums).
- To reach these low and intermediate service levels, costs of specific technologies were averaged.
- The sources of cost data used provide estimated costs related only to direct *construction costs*. Other program delivery costs necessary for ensuring sustainability (hygiene education, training, institutional development and operation and maintenance costs) are not included. Nigam/Ghosh proposed an additional cost of 10% as being appropriate.
- While population growth over the 15 year period was accounted for, constant figures for unit costs were used.
- Where sanitation costs were given as cost per facility, an assumption of 5 people per household sanitary facility was made. Water costs were given on per capita basis.
- The 100 million slum dwellers (MDG sanitation target) were distributed over the regions by applying the proportion of urban populations unserved by region in 2000.

The most comprehensive estimate of financing requirements for the water resource sector as a whole (i.e., all three types of costs indicated above) to date is contained in the publication “*Towards Water Security: A Framework for Action*”, which was prepared by GWP in 2000. As the authors themselves acknowledge, their findings, as summarized in Table 5.2 below, are preliminary and should not be seen as accurate estimates of the actual financing required. In particular the estimates lack the necessary differentiation by region and income levels, and were not prepared in the context of the MDGs.

Table 5.2 Funding of water and sanitation sector in developing countries (GWP 2000)

(In \$ billions)	Current annual investments in 2000	Estimated investments p.a. for achieving the Vision	Estimated funding gap
Access to drinking water	13.0	13.0	0.0
Sanitation and hygiene	1.0	17.0	16.0
Municipal waste water treatment	14.0	70.0	56.0
Industrial effluent	7.0	30.0	23.0
Agriculture	32.5	40.0	7.5
Environmental protection	7.5	10.0	2.5
Total	75.0	180.0	105.0

Future investment needs summarized in Table 5.2 are calculated on the basis of the Vision exercise. The cost of providing access to urban water supply is estimated to be \$87.5 per capita and calculated using the assumption that 75% of the new connections will be made using a common water standpipe and only 25% will be obtained through a separate household connection. For urban sanitation facilities, the authors assume four different technologies costing between \$25-\$300 per person. These are equally weighted in the projections, yielding an average cost per person of \$137.5. The cost of providing access to water and sanitation for the rural population is budgeted at \$15 and \$10 per capita, respectively.

The report also includes estimates for wastewater treatment costs. In the absence of reliable global data, the proportion of human wastewater treated today is assumed to be 10% and projected to rise to 20% by 2025. This will be achieved using low-cost water treatment facilities costing \$63 per capita with O&M costs budgeted at 15% of annual investment levels.

Cost estimates for agriculture and environmental protection are based on global figures for area under irrigation without taking into account variations in geohydrological, soil, and climate conditions.

Clearly, all the above cost estimates are “back of the envelope” calculations and should therefore be treated with extreme caution. Actual financing needs for halving the number of people without access to improved water supply and sanitation by 2015 need to be calculated on the basis of disaggregated data and may deviate significantly from current estimates.

Importantly, the cost of access will depend upon the level of service. Annex 3, for instance, shows one estimate of the likely costs of providing access to different levels of sanitation. The same could be done for access to safe water supply.

Determining costs more precisely

To better determine the costs related to expanding services in pursuit of Target 10, there is a need to carry out detailed assessments, at both national and sub-national levels and for both rural and urban settings, of:

1. Required capital investments to provide water and sanitation services to previously unserved people as well as the cost of scaling up existing infrastructure to meet growing demand.
2. Operating costs for water and sanitation networks, including O&M as well as repairs and replacement of existing infrastructure.
3. Costs of institutional and sector reform work, such as decentralization to local governments, which will often need to precede investments in water supply and sanitation

A robust modeling of the capital investments required for extending coverage of water and sanitation services will need to include the following:

- Comprehensive cataloguing and costing of best practice technologies for different environments and the required O&M practices, including an assessment of the scope for future cost savings due to technological improvements.
- Identification of additional investments, which domestic (and possibly industrial) users will need to make for their own water and sanitation facilities.⁴⁴
- Detailed costing of the scaling up and upgrading of existing water and sanitation facilities to satisfy growing demand – particularly in fast-growing urban environments.
- Specification and costing of water treatment facilities for domestic and industrial effluents.
- Costing of required investments in “software” for each type of environment. In particular this includes improved hygiene education and training for O&M.
- Costs of sector reform and of national institutional reform to serve as a basis for sector reform.
- Costs of community mobilization and organization.
- The additional investments that will be required to stimulate the tertiary sectors, and also the related strengthening of the market to develop a healthy competitive environment to reduce costs⁴⁵.

A first cut at these questions can be obtained by systematically cataloguing all major water and sanitation projects carried out by the World Bank, UNDP, as well as other organizations. This will yield an extensive database of deployment costs for the commonly used water and sanitation technologies.

For an improved understanding of the operating costs of water and sanitation services it is necessary to develop robust estimates of costs relating to:

- Drinking water treatment

⁴⁴ In the case of urban sanitation for domestic users, this may represent a significant investment. A World Bank study in El Alto (Bolivia) found that the cost for a rudimentary “bathroom” may exceed the per capita investment in the water and sanitation infrastructure. These investments are typically not included in financing estimates for the water and sanitation sector.

⁴⁵ Task Force member Gouri Ghosh has noted that the hand pump development program in India, for example, resulted in reduction of costs, development of the private sector, and increased exports.

- Drinking water provision – including long-term changes in available freshwater supplies caused by climate change and the impact on water costs
- Wastewater treatment and recycling and reuse
- O&M at all levels
- Repair and replacement of existing infrastructure
- Hygiene education and training for O&M
- Social mobilization and marketing
- Regulatory work, especially for protection of quality and quantity of groundwater
- Promotion and cost of simple models of rain water harvesting and water treatment

Investment needs relating to O&M, repair and maintenance depend heavily on the quality of the existing infrastructure as well as the adequacy and quality of preventive maintenance. While it will be particularly challenging to arrive at robust estimates for these figures it is imperative to include them in estimates of financing needs for the water and sanitation sector since they may significantly alter the overall level of investments required.

Both capital investments and operating costs need to be estimated at national or ideally sub-national levels to account for variations in water availability, climate, population density, and cultural preferences.

An initial methodology⁴⁶ for estimating costs in the comprehensive manner outlined above has been developed by the Millennium Project and will be tested and further refined in 2004. It entails the following sets of interventions in rural and urban areas for both water supply and sanitation:

- Provision of new water supply infrastructure
- Provision of new sanitation facilities
- Provision of new waste water treatment facilities
- Rehabilitation of existing defective water and sanitation infrastructure
- Provision for ongoing maintenance and operation costs for new and existing infrastructure
- Supply of sufficient clean water
- Education and awareness raising for water use and sanitation, *and*
- Integrated Water Resources Management (IWRM)

Results from the application of this methodology to Uganda and Tanzania under specified assumptions have been developed. In the coming year, it will be instructive to test the methodology under actual country conditions.

⁴⁶ Available on request.

**CHAPTER SIX:
WHO LACKS SERVICE? A TYPOLOGY OF COMMUNITIES
LACKING ACCESS TO WATER SUPPLY AND SANITATION**

That billions of people around the world do not have access to a minimum quantity of water and/or adequate sanitation is common knowledge among W&S professionals, and considerable empirical research has been undertaken to explain the reasons for low coverage rates in particular communities. Governments, however, often know much less about those who lack water supply and sanitation services as compared to those who do have access. In turn, a ‘one-size-fits-all’ policy and planning for the water and sanitation sector may not reflect the supports and strategies needed to reach the unserved.

This chapter presents a simple typology of six kinds of communities in which a substantial proportion of households do not have access to improved water supply and sanitation services. With respect first to water supply (Section 6-A) and then sanitation (6-B), a brief description of each community type is provided, along with a summary of the principal explanations for low existing coverage levels, possible strategies for improving coverage, and illustrative examples. (A summary table is also provided at the end of each of the two sections.)

A schematic of the typologies is presented in Figure 6.1. Acknowledging that access to water supply and sanitation is a function of many technical, financial, and institutional factors, a multi-faceted analytical challenge has been distilled into one with a smaller number of dimensions. The horizontal access represents the consideration of density, which carries with it a host of technical and cost implications for improving access to services. On the vertical access is the consideration of existing infrastructure. This variable serves as a more indirect proxy for a number of institutional considerations, *e.g.*, the scope for collective action, based on the assumption that communities with existing but inadequately functioning water-supply infrastructure have a greater institutional foundation upon which to build as compared to a community where collective water systems have never been installed. This is clearly a simplifying assumption that will not hold in all cases; however, it is a generalization that is consistent with experience in many of the case studies described in the following sections.

Figure 6.1 A typology of communities with low water supply and sanitation service coverage

		<i>Density</i>		
		Dispersed (rural)	Medium (village, small town)	Dense (urban/peri-urban)
<i>Existing infrastructure</i>	Little/no improved infrastructure	Type I: dispersed, little/no improved infrastructure	Type III: medium density, little/no improved infrastructure	Type V: high density, little/no improved infrastructure
	Low-functioning improved infrastructure	Type II: dispersed, dysfunctional improved infrastructure	Type IV: medium density, dysfunctional improved infrastructure	Type VI: high density, dysfunctional improved infrastructure

Efforts have been made to keep the number of categories small; many nuances in both the community characteristics and in service delivery considerations have thus been omitted. In addition, important ‘macro’ level considerations such as the status of governance and rule of law have also been omitted from the typology exercise. These issues are, however, discussed briefly in a separate section (6.C).

Across all six community types, unserved households tend to share two characteristics: they are poor, and they have limited ‘voice’ in priority-setting and resource allocation decisions. While neither of these features is unique to the water and sanitation sector, each has important implications for the kinds of strategies needed to improve W&S coverage and to meet Target 10.

6-A. Access to domestic water supply services

Water-supply coverage is a function of both demand and supply considerations in each typology category.⁴⁷ For each community type, a summary of the principal demand considerations is presented, followed by a synopsis of the principal supply issues.

Type I: Dispersed settlement, little or no improved infrastructure

Type I communities tend to be found in rural areas with agrarian economies. Household members—typically women and children—obtain water for domestic uses from surface water sources, and occasionally from water vendors. The time devoted to water fetching is often substantial, and both quantity and quality of water supply is lacking.

The reasons for lack of access to adequate supplies of water in Type I communities are found both in the economics of water supply, as well as in development policy frameworks at the national level. Such settlements are generally unable to exploit economies of scale for community-level water supply solutions, so *per-capita* costs of improvements are high, while the potential for cash contributions from households tends to be low. At the provincial and national level, an ‘urban bias’ in infrastructure investment policy often pushes Type I communities to the end of the queue for government-financed water supply improvements.

Facilitating water supply improvements in Type I communities often requires substantial investment in institutional capacity building before sustainable improved water supply infrastructure can be installed. Frequently the type of institutions needed to facilitate collective action for improving water supply are weak or completely absent. Partnerships with national or even international NGOs may be necessary to develop community capacity for organization and planning of improved services.

If cost-sharing policies exist, flexible strategies that allow in-kind and labor contributions may be important in Type I communities, where cash tends to be scarce. Another strategy for addressing the cost issues of water improvements in such communities is to consider the possibility of combined irrigation/domestic water supply initiatives. Millions of people throughout the developing world obtain their household water from irrigation facilities, yet planning and policy

⁴⁷ It should be noted that fresh water scarcity is one supply issue that receives limited attention in the typology. IWMI estimates that 30% of the world’s population lives under conditions of physical water scarcity (*e.g.*, without enough water to (a) meet minimum industrial and domestic needs and (b) provide present levels of food production. Scarcity is also an important explanation for lack of access to water supply in many local-level analyses. On the other hand, overall the association between physical water availability and coverage is not as strong as, for example, the (inverse) association between poverty and access.

for irrigation is carried out largely without consideration of domestic users. Exploring the possibilities for incorporating both irrigation and domestic needs into water planning has the potential in many cases to lower costs and to replace environmentally damaging practices (e.g., tubewell irrigation, which can deplete water tables) with more sustainable ones (e.g., drawing seepage from irrigation canals through handpumps).⁴⁸

Type II: Dispersed settlement, existing infrastructure providing inadequate supply

Type II communities have some type improved water supply infrastructure installed—typically shared facilities such as borewells with handpumps—but are considered to be lacking access to services because the volume of water supplied *per capita* is insufficient or because the facilities have fallen into disrepair. Households either manage with these small quantities of water, or supplement them with water from surface sources or vendors.

The water supply infrastructure in Type II communities has often failed because of inadequate maintenance. (Population growth in the community may also contribute to declining *per-capita* supplies.) The public investment neglect and affordability issues that Type I communities suffer has been overcome, at least initially, but sustainability of the installed infrastructure is lacking as a result of inadequate financial resources for operation and maintenance; unavailability of spare parts or technical skills; and/or a weak institutional arrangement for upkeep of the facilities.

Understanding the reasons for the poor performance of a Type II community's water infrastructure is a critical first step in improving coverage. If the level of service installed is too expensive to be maintained by users, simply rehabilitating the existing infrastructure will result in another failure in the future. If the economic capacity for operation and maintenance does exist within the community, a different sort of mismatch between supply and demand may exist. In the village of Vellukara, India, for example, a piped water system with shared public taps fell into disuse because half of the village's households preferred to use private or shared wells.⁴⁹ These households were also unwilling to pay monthly fees toward the upkeep of the system, which rendered it financially unviable and left the other half of the village reliant on distant surface water sources.

Explanations for poor system performance may instead have more to do with inadequate capacity to maintain (appropriate levels of) service. In the case of Ghana, for example, rural communities had historically not been a part of the planning process for water supply, and thus did not have a stake in the longevity of the installed handpumps and piped systems. By one estimate, 60 percent of these facilities were non-functional at any given time before Ghana initiated major sector reforms in the 1990s.⁵⁰ Accounts of this sort are very common, particularly in countries with weak local administrations. By extension, sustainable coverage expansion in Type II communities often requires considerable focus on capacity of local institutions.

⁴⁸ Water quality is, of course, a concern when households use water primarily intended for irrigation. Installing handpumps alongside irrigation canals as described above is just one strategy for improving the quality of water to levels needed for domestic purposes; the water is drawn through a natural sand filter before being pumped and captured. Point-of-use treatment technologies may be another option for households wanting to treat irrigation water for domestic use.

⁴⁹ J. Davis *et al.* (2001). *Good Governance in Water and Sanitation: Case Studies from South Asia*. New Delhi: Water and Sanitation Program, South Asia regional office.

⁵⁰ Drawn from the "Blue Gold" series on African experience in water and sanitation, World Bank Water and Sanitation Program, 2002

In Ghana, for example, capacity building was undertaken gradually, with core planning functions transferred from central government to local government and communities. Ownership of water supply was transferred to the local governments and the communities. A number of public and private organizations brought their strengths to the new project, including four drilling companies, 32 local NGOs and community-based organizations (CBOs), and several national and international NGOs. In Togo, a re-design of one of the country's largest rural water supply programs included strengthening of social intermediation programs and training of community technicians. In one village, Ayole—where a previous government-installed community handpump had broken down—a rehabilitation project was accompanied by technician training, the formation of a committee responsible for raising funds for O&M, and earmarked public funds at the district level for the provision of spare parts and extension services. The result was a well functioning handpump and a community who, one year after its rehabilitation, successfully overcame a major failure of the pump.⁵¹

It is important to note, however, that building capacity at the local level does not mean that central government has no role to play in sustainable service delivery. Indeed, the balance between the center and local service providers is critical to maintaining effective and reliable services. Whereas the prevailing wisdom in the development community advocates decentralization of W&S services to the “lowest possible level,” empirical evidence increasingly indicates that particular tasks within service planning, delivery, and monitoring may be best executed by centralized institutions.⁵² For example, in one rural supply project in Azad & Jammu Kashmir, Pakistan, it was a set of centralized oversight mechanisms that ensured sustainable scheme designs and prevented disadvantaged groups from being excluded from project benefits.⁵³

Centralized agencies may also need to provide ongoing support to local administrations and service providers who are undertaking responsibility for water supply for the first time. A growing literature also suggests that Type II communities need considerably more post-construction support than previously believed. Resources and capacity to provide training, technical assistance, and supply-chain support to communities must be available in the long term, whether through local government, NGOs, or external agencies. Because such “software” components of water supply planning receive much less emphasis (and funding) than do more visible construction projects, these elements so critical to sustaining installed infrastructure are often the most difficult to establish.

Type III: Medium density, little or no improved infrastructure

Type III communities often represent the interface between rural and urban settlements—villages that have grown into small towns but whose infrastructure systems have not yet evolved to a level comparable with larger cities. Some wealthier households may have installed private wells, while a substantial proportion of families obtain water from vendors and/or surface water sources.

Type III communities are generally large enough to enjoy some economies of scale in water supply—which means that piped networks will be feasible in at least part of the settlement—but

⁵¹ UNDP (1988), *Water of Ayole*. New York: UNDP.

⁵² See, for example, Judith Tandler's (1997) discussion of the importance that centralized functions had in development projects across several sectors in Ceará, Brazil.

⁵³ J. Davis *et al.* (2003) “Corruption in public service delivery: Experience from South Asia's water and sanitation sector.” *World Development* 32(1).

too small and/or dispersed for traditional urban utility management models to operate effectively. There often exists in Type III communities the economic capacity to make considerable improvements in water supply, but the absence of a supportive institutional framework often results in a variety of household-level solutions as opposed to a coordinated community-level effort. Type III communities are generally excluded both from national water supply programs targeting rural areas, as well as from those focused on cities. Local government institutions are often weak and under-resourced. Few households have access to credit.

Extending coverage in Type III communities can happen quickly and sustainably, but planning mistakes are easy to make in this type of settlement. In particular, the question of whether such communities should be viewed more like large rural villages or like small cities has considerable implication for the technologies and management structures that will be adopted. In the town of Lugazi, Uganda, for example, a piped network was installed which provided private connections to a substantial proportion of households, as well as a limited number of public kiosks in the central business district. Households that once used spring water now obtain water supply from their own or their neighbors' private connections, from public kiosks, or from vendors who also patronize the kiosks. In all cases, users pay the full cost of the level of service they receive. In the neighboring town of Wobulenzi, the water planning paradigm was more like that of a rural village. Water user groups were established and were given responsibility for managing neighborhood kiosks throughout the town, and most established prices that were lower than the cost of supply. Private connections were also made available to households and businesses who wished to pay the full cost of this improved level of service. These two very different models stemmed from fundamentally different views of the character and the future of the communities, and gave rise to two unique sets of financial and institutional challenges.⁵⁴

Much less is known about effective strategies for extending sustained coverage in small towns as compared to both rural and dense urban settlements. It appears that allowing for a variety of service options, and expecting the composition of technologies to change rapidly, are important planning principles in these dynamic communities. Considerable empirical research has also demonstrated that provision of financing—even at market rates—can unleash latent demand for improved services and allow households in small towns to move more quickly up the 'water ladder' toward community-level piped networks. In towns where such economic capacity does not exist, policies that promote small-scale independent providers (SSIPs) can also increase the range of options available to households and lower service costs through competition and innovation.⁵⁵ Growing recognition of the policy vacuum regarding water and sanitation services for Type III (and IV) communities has spurred several important research and policy-experiment activities. In Peru, for example, the Water and Sanitation Program is currently undertaking comparative analysis of several different management models in a number of small towns.⁵⁶

Type IV: Medium density, existing infrastructure providing inadequate supply

Small towns in the Type IV category have installed water supply facilities that provide an insufficient volume of water *per capita* per day. Households typically supplement their water

⁵⁴ See, for example, B. Wandera (undated), 'The post-construction management challenge.' Paper presented at the UNDP/World Bank RWSG ESA Financing Community Water and Sanitation workshop; and D. Whittington *et al.* (1999), 'Implementing a demand-driven approach to community water supply planning: A case study of Lugazi, Uganda,' *Water International* **23**(3): 134.

⁵⁵ B. Collignon and M. Vezina (2000), *Independent Water & Sanitation Providers in African Cities*. Nairobi: Water & Sanitation Program.

⁵⁶ See http://www.wsp.org/07_Latin.asp.

supply with water purchased from vendors, or perhaps drawn from surface sources. If the level of community-level service continues to slide, wealthier households will tend to exit the public system in favor of self provision (*e.g.*, through private wells). Over time, the situation deteriorates as revenues decline and households with the greatest ability to withstand tariff increases (and provide cross-subsidies to poorer households) invest in private solutions instead.

As with Type II communities in rural areas, it is important to understand the reasons that existing infrastructure in Type IV towns is not providing adequate supply. Simply rehabilitating a poorly designed system will not provide sustained access to improved services in the long run. In many cases, small town systems are over-built as a result of designs based on perceived demand and peak estimates, rather than on dialogue with users themselves. Although technically sound, such systems cannot be supported given the economic base of the community. In Mali, for example, the “overscaled” design of facilities was identified as one of the key explanations for the high rates of failure in small-town water systems.

The unsustainability of over-built systems can be further exacerbated by the institutional arrangements for water supply services that are typically found in small towns. Services managed by local government may suffer from under-financing, particularly for O&M, when funds for water are intermingled with the community’s general accounts. Water user associations or other civic groups dedicated to water supply service delivery may perform better with respect to financial and accountability matters, but they often lack technical capacity, and also have limited access to state or national sources of support in the event of major problems.

A variety of institutional models are being employed to improve water services in Type IV communities, from regional utilities in South Asia to local *juntas* in Latin America. There is also increasing private-sector involvement in the management of small-town water systems. In Uganda, the national government financed the rehabilitation of several dozen Type IV towns as a prelude to establishing management contracts with six private operators.⁵⁷ The World Bank is also supporting pilot projects in franchising for small town water systems.⁵⁸

Type V: High density, little or no improved infrastructure

Urban areas lacking water supply infrastructure typically fall into two categories: (a) newly constructed neighborhoods to which trunk lines have not yet been extended; and (b) unregularized areas where the installation of trunk infrastructure is costly and/or prohibited by law. Households in Type V communities typically obtain water from vendors (ranging from pole vendors to tankers); from privately or communally managed stationary tanks; or from friends, family, or employers located in networked areas.

In areas of new construction, urban development policy and regulation is typically the cause of lack of access. Development permits, for example, may be granted without the requirement of providing basic services. Indeed, at times urban development authorities actually work at cross purposes with water and sanitation agencies. In Lima, Peru, for example, a decision of the Vice Ministry for Construction and Sanitation that inadequate water supply was available to develop an outlying area of the city was overturned by the Ministry of Housing, which was under strong political pressure to develop new areas for a national low-cost housing program.

⁵⁷ S. Kayaga (2003), “Public-private community partnerships for the poor: The case of small towns water supply in Uganda.” Paper presented to the Third World Water Forum, Osaka, Japan.

⁵⁸ B. Roche *et al.* (2001), ‘Franchising in Small Town Water Supply.’ Unpublished report to the World Bank.

In urban slums—defined as unplanned areas in which the majority of residents have title neither to their land or their homes—both the high cost of water supply improvements and an unsupportive policy environment constrain access to service. Such settlements are often located on marginal lands at considerable distance from trunk infrastructure, with steep slopes, rocky or hilly terrain, and irregular layouts. The *per-capita* cost of networked water supply improvements is high, as is the risk of damage to installed systems (through landslides or floods, for example). Even if households were able to bear most of the costs of an improved system, service providers are often prohibited from extending networks into unregularized areas. Municipal and state governments use proscriptions such as urban growth management tools, hoping to discourage the expansion of squatter settlements in already overburdened cities. In other cases, service providers have the authority to extend services to such neighborhoods, but are reluctant given the high costs and perceived risks to investments, as well as the perception of low revenue potential among poor and ‘transient’ households.

In many cases, efforts to improve water supply services in Type V communities are frustrated by policy constraints at various levels. Where network services cannot be installed, promoting alternative service options is often the most feasible way of improving households’ water supply situation. Mobile delivery systems, such as the *aguaterros* in Latin America and tankers in South Asia, are two such examples.⁵⁹ In some cases, collaboration between the municipal W&S agency and local entrepreneurs is another strategy for improving services. In Abidjan, vendors install water lines at the limit of the municipal water company’s service area and operate standposts in the city’s outlying, unregularized areas.⁶⁰ Such solutions are often less efficient than piped service, and can result in households’ receiving poor quality service and yet paying very high unit prices.⁶¹ However, where the service-delivery environment is competitive, and/or is effectively regulated (*e.g.*, through involvement of credible civic organizations), these “appropriate tech” approaches can represent a workable strategy for providing reliable water services to Type V households.

Type VI: High density, existing infrastructure providing inadequate supply

Type VI settlements are often considered by municipal governments and W&S agencies to be ‘covered’ with improved service (typically through shared public sources), whereas independent assessments of coverage document a high proportion of households receiving very small volumes of water. In Hyderabad, India, for example, households in many colonies served by public taps were found to receive only 20 liters *per capita* per day (lpcd) on average, as compared to 135 lpcd provided to households with private connections.⁶² The city’s water and sanitation agency, however, does not classify the former communities as ‘lacking access to services.’ Households in Type VI communities may supplement their water supply with purchases from vendors, or from other households with private connections.

The factors underlying inadequate water supply in Type VI communities are somewhat more varied than with other categories in the typology. In some cases, technical explanations are

⁵⁹ T. Solo. 1999. Small-scale entrepreneurs in the urban water and sanitation market. *Environment and Urbanization* 11(1).

⁶⁰ A. Mitter (1999). *Water for the Urban Poor: Cote d'Ivoire's Experiment with Private and Informal Sector Cooperation*. Master’s thesis: Massachusetts Institute of Technology, Department of Urban Studies & Planning.

⁶¹ See, for example, Lovei, L., *et al.* (1993). Rent-extracting behavior by multiple agents in the provision of municipal water supply: A study of Jakarta, Indonesia. *Water Resources Research* 29(7): 1965-1974.

⁶² J. Davis *et al.* (2001). *Good Governance in Water and Sanitation: Case Studies from South Asia*. New Delhi: Water & Sanitation Program, South Asia regional office.

important, as when a distribution network has deteriorated to the point that it can supply only a minimal quantity of water each day. In other cases, improved services are available, but households cannot or do not take advantage of them. A large proportion of households may live in rented homes, for example, and are reluctant (and/or prohibited by landlords) from investing in private household connections. Households may be willing and able to afford the monthly fees associated with improved services, but do not have the credit necessary to pay for up-front installation and plumbing costs.⁶³ In addition, service providers often afford Type VI communities low priority in their planning and budgeting processes, both because such neighborhoods are perceived as having little revenue potential and difficult working conditions, and because they have limited political clout as compared to more affluent parts of the city.

Strategies for improving water supply services in Type VI communities must be tailored to the particular constraints encountered on the ground. Where trunk infrastructure exists but households are unable to afford connections and/or monthly fees, targeted subsidies and credit programs can have large impacts. If large-scale rehabilitation or installation of trunk infrastructure is a necessary precursor for expanding coverage, access to financing at the municipal level is essential. In either case, there may be scope for improving access to services in the shorter term through the promotion of small-scale independent providers (as described for Type V communities above). Because the relationship between households in Type VI communities and their service provider is often characterized by a lack of trust and understanding characterizes, bringing credible third parties into the institutional arrangements for planning, construction, and service delivery can also be an effective strategy. In Ahmedabad, India, three well-known NGOs partnered with the Municipal Corporation to implement an upgrading project in 27 low-income neighborhoods. Not only did the NGOs provide critical financial intermediary services for the project, but their staff helped both households and Municipal Corporation staff to appreciate one another's perspectives and constraints.⁶⁴

⁶³ These costs may be particularly high in urban settings where W&S agencies are subject to technical standards that are often excessively stringent or inappropriate. Many former colonies in Africa, for example, use construction standards that were adopted without modification from Western Europe.

⁶⁴ J. Davis *et al.* (2001), *op cit.*

Table 6.1 Water supply: Typology of un- and under-served communities

	<i>Density</i>	<i>Existing service</i>	<i>Proximate explanations</i>		<i>Possible policy & planning responses</i>
			<i>Supply side</i>	<i>Demand side</i>	
I	Dispersed (rural)	No/little improved infrastructure: supply from vendors, surface water	<ul style="list-style-type: none"> ▪ Limited public investment in rural water supply ▪ Perception of poverty ▪ High per-capita cost 	<ul style="list-style-type: none"> ▪ Poverty ▪ Limited access to credit ▪ Challenges of collective action ▪ Low demand: availability of acceptable alternatives 	<ul style="list-style-type: none"> ▪ Capacity building and development of collective-action institutions ▪ Combined agricultural/domestic water projects ▪ Partnerships with civic organizations ▪ Targeted subsidies
II	Dispersed (rural)	Inadequate supply from shared public facilities, e.g., borewells with handpumps	<ul style="list-style-type: none"> ▪ Limited investment in operations, maintenance, and expansion ▪ Perception of poverty 	<ul style="list-style-type: none"> ▪ Poverty ▪ Limited access to credit ▪ Challenges of collective action for O&M ▪ Low demand: availability of acceptable alternatives 	<ul style="list-style-type: none"> ▪ Capacity building, transfer of planning/budgeting authority to local bodies ▪ Capacity building at national level for long-term community support ▪ Partnerships with civic organizations ▪ Targeted subsidies ▪ Programs to strengthen supply chains
III	Medium density (small town)	Supply from private household facilities, vendors, surface water sources	<ul style="list-style-type: none"> ▪ Limited public and private investment available for small town water supply ▪ Policy vacuum 	<ul style="list-style-type: none"> ▪ Limited access to credit ▪ Demand captured by private (HH) investment 	<ul style="list-style-type: none"> ▪ Policy development ▪ Development of collective-action institutions ▪ Promote small-scale independent providers ▪ Creative solutions (e.g., franchising, regional utilities) ▪ Targeted subsidy and credit programs
IV	Medium density (small town)	Supply from dysfunctional public network	<ul style="list-style-type: none"> ▪ Inadequate resources, capacity for O&M of public system ▪ Policy vacuum 	<ul style="list-style-type: none"> ▪ Limited potential for use of voice ▪ Unwillingness to pay higher tariffs for low-quality service ▪ Higher-income households may exit system 	<ul style="list-style-type: none"> ▪ Capacity building for operations and maintenance ▪ Policy development ▪ Promote small-scale independent providers ▪ Management innovations (e.g., franchising, regional utilities) ▪ Targeted subsidy and credit programs
V	High density (Urban/peri-urban)	No/little improved infrastructure: supply from vendors	<ul style="list-style-type: none"> ▪ Growth (newly incorporated areas) ▪ Investment restrictions in unregularized areas ▪ High per-capita cost ▪ Perceptions of poverty ▪ Constraining standards 	<ul style="list-style-type: none"> ▪ High proportion of rented dwellings ▪ Insecure tenure ▪ Challenges of collective action 	<ul style="list-style-type: none"> ▪ Urban development policy reform ▪ Promote small-scale independent providers ▪ Partnerships with civic organizations ▪ Targeted subsidy and credit programs
VI	High density (Urban/peri-urban)	Supply from shared public facilities	<ul style="list-style-type: none"> ▪ High per-capita cost of supply ▪ Perceptions of poverty ▪ Constraining standards 	<ul style="list-style-type: none"> ▪ High proportion of rented dwellings ▪ Challenges of collective action 	<ul style="list-style-type: none"> ▪ Promote small-scale independent providers ▪ Partnerships with civic organizations to promote dialogue with service provider ▪ Targeted subsidy and credit programs

6-B. Access to domestic sanitation services

When applying the typology presented in Figure 6-A to the case of sanitation services, two inter-related observations quickly emerge. First, despite the fact that sanitation arguably represents a service with greater public-good characteristics than does water supply, in practice sanitation is often a private household matter, organized and financed by users, whereas water supply commands considerable attention in the public policy and planning sphere. This feature of sanitation services leads to a second observation, namely that the key leverage points in expanding sanitation coverage involve generating demand and influencing decisions made at the household level. Together, these insights suggest a rather different set of policy and planning strategies to expanding sanitation *versus* water-supply coverage.

Type I and II communities: dispersed settlements, little or poorly functioning infrastructure

Given the high rates of poverty, limited or complete absence of institutions dealing with sanitation in rural areas, and the availability of many acceptable (from the users' perspective) 'traditional' sanitation practices (*e.g.*, defecation in agricultural croplands), effective demand for improved sanitation in rural communities is often very low. Moreover, efforts to boost demand for improved sanitation must be carefully planned. In some projects, for example, households have been required to install latrines as a prerequisite for receiving improved water supply. Although this 'bundling' strategy has been successful in some communities, in others it has led to the construction of 'white elephants' which households have little interest in using or maintaining.

Education programs intended to increase appreciation of the links between sanitation, hygiene, and health should also be designed carefully. In some cases communities' understanding of these relationships is indeed limited, and education can help generate demand for improved sanitation services. In many other instances, however, households have simply pursued other investments in a rational priority-setting process. "Awareness campaigns" may need to take greater advantage of modern marketing strategies, focusing on basic human emotions such as pride, shame, and competition in order to make real progress in rural sanitation. Such programs could also, where feasible, provide information about the potential for human waste to be used as a resource in agriculture. Some sanitation technologies—such as the twin-pit latrine—are well suited to the collection and safe removal of excreta, which can be applied as fertilizer to crops. Subsidies for improved sanitation services have been declining in recent years. For Type I and II communities, the costs of simple technologies may be low, but so too is effective demand for them. Improving affordability with well-designed subsidies—paired with social marketing efforts—may be more cost-effective than implementing large-scale education and marketing campaigns in an effort to influence household investment decisions.

Type III and IV communities: medium density, little or poorly functioning infrastructure

As is the case with water supply, sanitation planning at the rural-urban interface can be particularly challenging. Households in these communities have often been exposed to sewage systems and would appreciate the convenience and status that toilets with sewers would convey. However, these are costly technologies, and on-site facilities may be a more appropriate choice given the economic base of the community. In some small towns in Peru, for example, fewer than 10% of households have connected to piped sewerage networks, despite the results of

community assessments indicated this level of service was preferred by a majority of residents. Once households were confronted with the substantial connection fees and monthly service bills, however, a majority decided to retain their existing (on-site) service.

It may be possible to respond to the demand for sewerage service in Type III and IV communities by adopting lower-cost technical options. In Brazil, for example, a system of “condominial” sewerage was developed in the 1980s with the aim of extending sanitation services to low-income communities. This technology has now become a standard sanitation solution for entire urban areas in Brazil, irrespective of income levels. Condominial sewers reduce *per-capita* costs of service by replacing the traditional model of individual household connections to a public sewer with a model in which household waste is discharged into branch sewers, and eventually into a public sewer through a group (or ‘block’) connection.⁶⁵

For households that cannot afford a sewer network connection, public facilities may be a good alternative, if they are carefully designed. Countless anecdotes exist in the water and sanitation sector regarding public facilities that, once constructed, quickly fell into disrepair because communities lacked the interest or skills to maintain them. Examples do exist, however, of public facilities that function reliably and are well maintained. In India, the NGO Sulabh International has installed 5,500 pour flush toilets that are operated on a fee basis and are maintained by attendants who live at the facilities. Through gradual technology development, careful attention to sustainability, and strong efforts in marketing and promotion, Sulabh’s facilities are considered to be a model for sustainable public sanitation services.⁶⁶

Communities at the urban-rural boundary are also often good candidates for recycling sewage water in agriculture.⁶⁷ This practice can save enormous costs of treating sewage water while creating substantial benefits in the form of usable water and fertilizer for agriculture. Care must be taken to ensure that the concentration of fertilizer nutrients in the water is not too high, and agricultural workers using recycled sewage water should also be equipped with protective gear such as gloves and boots. In sum, although recycling sewage water in agriculture is not without its’ problems, these problems can be managed, and the savings, in terms of water treatment, and the benefits, in terms of food production make this a highly desirable practice.

Type V and VI communities: high density, little or poorly functioning infrastructure

Improving sanitation in urban areas is perhaps one of the most formidable challenges facing Target 10 and the water and sanitation sector more generally. Given the high densities of these communities, on-site technologies are often unworkable because of limited land availability and the potential for contamination of drinking water supplies. Sewerage systems, on the other hand, are expensive to construct and can generally not be operated and maintained with revenues obtained from low-income households. As with water supply services, challenges related to insecure tenure and landlord/tenant arrangements often undermine efforts to improve sanitation services in these communities.

⁶⁵ G. Watson (1999). *Good Sewers Cheap? Agency-Customer Interactions in Low-Cost Urban sanitation in Brazil*. Washington, DC: World Bank.

⁶⁶ Water Supply and Sanitation Collaborative Council, “Vision 21: *Water for People*, A Shared Vision for Hygiene, Sanitation and Water Supply.” Some information was also supplied by Task Force Co-chair, Albert Wright, based on his personal knowledge of the program.

⁶⁷ See IWMI JD HERE : David sent a paper to the TF Secretariat? Christie, do you happen to have this reference?

In many instances, the high *per-capita* cost of sanitation services is the result of overly stringent technical standards adopted without modification from industrialized countries.⁶⁸ In the past decade many innovative technical solutions have helped resolve this bottleneck to expanding sanitation coverage. Condominial sewerage (discussed above) is one example of a lower-cost technology that has been successful in some areas. Another type of technical innovation involves “unbundling” of sewer networks into several smaller systems serving different zones within a city. In Bangkok, Thailand, for example, the Metropolitan Administration prepared a wastewater master plan for the entire metropolitan area in 1968. Though technically sound, the plan was found to be prohibitively expensive and was shelved for 16 years. In 1984, the master plan was revised under a Japanese (JICA) technical assistance program, and was revised such that the inner part of Bangkok was divided into 10 sewerage zones, each with an independent collection and treatment system. The total sanitation investment among the ten zones is lower than the amount that would be required for a single project that covered the entire city. Moreover, each zone-level project is technically simpler than would be a city-wide project. As a result, the Bangkok Metropolitan Administration has been able to implement various sanitation projects in different zones of the city, using a more affordable phased investment program.

In much of the literature on urban sanitation, institutional constraints are considered to be as important as technical and financial challenges in explaining low rates of coverage. Whereas low-income urban communities tend to have more influence than, say, dispersed rural villages, they still often lack the capacity for organizing, planning, and levying demands on government and service providers. For their part, municipal water and sanitation agencies often find it difficult to initiate a dialogue with low-income communities—and often have little incentive to do so. Partnerships between government, service agencies, communities, and civic organizations can thus be useful in facilitating dialogue and collective action in pursuit of improved sanitation services for the urban poor.

In West Bengal, India, for example, the Medinipur district rural sanitation project was launched in 1990 and involves UNICEF, state and district level governments, a religious NGO (the Ramakrishna Mission), and voluntary grassroots community level organizations.⁶⁹ The project was designed as a “people’s movement” and strives to discourage open-air defecation through education and social marketing. Community mobilization and education is carried out by trained motivators from the communities themselves, using home visits, motivational camps, exhibitions, and the use of visual aids such as flash cards and calendars.

Over the course of just ten years, the project has increased coverage of improved sanitation services from almost zero to 80 percent. Development and production of the latrines was undertaken locally, which improved cultural appropriateness and affordability of the designs while also providing an economic opportunity for local women trained in latrine component manufacturing. To date, approximately 1.2 million latrines have been delivered through the

⁶⁸ For instance, the technical standards for sewers in some African countries include pipe specifications intended to allow networks to withstand snow loadings—clearly an artifact of the European climates in which the standards were developed.

⁶⁹ Chowdry, Kamla, “Ramakrishna Mission: Service and Salvation”, September 26, 2002; Sengupta, Chandan, “Our challenge: Latrine for all.” 27th WEDC Conference. UNICEF. Lusaka, Zambia, 2001, pages 203-206; UNICEF, “Sanitation-The Medinipur Story: Intensive Sanitation Project”, West Bengal, India, Calcutta, India; and UNICEF, “Invest in Children, Advance Sustainable Development: In India, success in improving sanitation”, *press release*.

program throughout West Bengal. The impact of widespread latrine development has been accompanied by a remarkable reduction in cases and deaths associated with diarrheal diseases.

Table 6.2 Sanitation: Typology of un- and under-served communities

	Density	Existing service	Proximate explanations		Possible policy & planning responses
			Supply side	Demand side	
I	Dispersed /Rural	No/little improved infrastructure: open defecation	<ul style="list-style-type: none"> ▪ No institutional home for sanitation ▪ Low priority and limited public investment in rural sanitation 	<ul style="list-style-type: none"> ▪ Poverty ▪ Limited access to credit ▪ Low demand for sanitation improvements 	<ul style="list-style-type: none"> ▪ Social marketing and education ▪ Partnerships with civic organizations ▪ Targeted subsidies and credit programs
II	Dispersed /Rural	Service from dysfunctional private facilities, e.g., latrines	<ul style="list-style-type: none"> ▪ No institutional home for sanitation ▪ Limited post-construction support for sanitation ▪ Limited private-sector skills for O&M ▪ Mismatch between level of service supplied <i>versus</i> demanded 	<ul style="list-style-type: none"> ▪ Poverty ▪ Limited access to credit ▪ Low demand for sanitation improvements 	<ul style="list-style-type: none"> ▪ Social marketing and education ▪ Partnerships with civic organizations ▪ Targeted subsidies and credit programs
III	Medium density (small town)	Service from dysfunctional private and public facilities, open defecation	<ul style="list-style-type: none"> ▪ No institutional home for sanitation ▪ Limited resources available for O&M ▪ Constraining standards for service improvements 	<ul style="list-style-type: none"> ▪ Limited access to credit ▪ Limited demand for sanitation improvements ▪ Demand captured by private (HH) investment 	<ul style="list-style-type: none"> ▪ Social marketing and education ▪ Partnerships with civic organizations ▪ Regulatory reform (standards, new construction) ▪ Innovative technologies
IV	Medium density (small town)	Service from dysfunctional private facilities	<ul style="list-style-type: none"> ▪ No institutional home for sanitation ▪ Limited post-construction support for sanitation ▪ Lack of institutional home for sanitation issues 	<ul style="list-style-type: none"> ▪ Limited access to credit ▪ Limited demand for sanitation improvements ▪ Demand captured by private (HH) investment 	<ul style="list-style-type: none"> ▪ Social marketing and education ▪ Partnerships with civic organizations ▪ Regulatory reform (standards, new construction) ▪ Innovative technologies
V	High density (urban/peri-urban)	No/little improved infrastructure: open defecation, or use of facilities in other neighborhoods	<ul style="list-style-type: none"> ▪ No institutional home for sanitation ▪ Growth (newly incorporated areas) ▪ Investment restrictions in unregularized areas ▪ High per-capita cost of service ▪ Perceptions of poverty ▪ Constraining standards 	<ul style="list-style-type: none"> ▪ High proportion of rented dwellings ▪ Insecure tenure ▪ Limited access to credit ▪ Poverty ▪ Low demand for sanitation improvements 	<ul style="list-style-type: none"> ▪ Land tenure reform ▪ Social marketing and education ▪ Partnerships with civic organizations ▪ Regulatory reform (standards, new construction) ▪ Innovative technologies
VI	High density (urban/peri-urban)	Service from shared public facilities	<ul style="list-style-type: none"> ▪ No institutional home for sanitation ▪ High per-capita cost of household level supply ▪ Perception of poverty ▪ Constraining standards ▪ Limited funding/ incentives for O&M 	<ul style="list-style-type: none"> ▪ High proportion of rented dwellings ▪ Limited access to credit ▪ Poverty ▪ Low demand for sanitation improvements 	<ul style="list-style-type: none"> ▪ Land tenure reform ▪ Social marketing and education ▪ Partnerships with civic organizations ▪ Regulatory reform (standards, new construction) ▪ Innovative technologies

**PART III: ACHIEVING THE GOALS:
CONSTRAINTS AND WAYS FORWARD**

CHAPTER SEVEN: WHAT'S HOLDING US BACK?

In order to put forward effective propositions for action to meet the MDGs , it is first necessary to analyze what is holding us back. The following two sections, therefore , analyze the constraints to expanding access to domestic water supply and sanitation, and to managing water resources to achieve the MDGs as a whole.

7-A. Constraints to expanding access to domestic water supply and sanitation services

Understanding why two in every ten people around the world lack access to water supply, and five in ten lack access to sanitation service, is fundamental to identifying effective strategies for meeting Target 10. Clearly the explanations vary across communities, countries, and regions, but a common set of *political, financial, institutional, and technical* challenges confronts most countries in the developing world in their quest to expand water supply and sanitation services.

Political constraints

One of the major constraints to access to safe water supply and sanitation is a lack of political will, by which we mean a lack of political leadership or government commitment to allocate national resources to the sector or to undertake reforms necessary to attract investment to the sector.

At the national level, many governments in poor countries do not include basic water supply and sanitation among their expenditure priorities.⁷⁰ Several explanations for this low prioritization have been put forward. For decision-makers in finance ministries, for example, investments in water supply and sanitation are perceived as having lower returns as compared to funds spent in other sectors (e.g., roads, energy). Sector professionals might argue that such perceptions indicate an incomplete understanding of the economic benefits of improved W&S services; however, this case has not been made convincingly to those with budgetary authority in the developing world.

It is easier to make the case where political leaders as well as policy and decision makers are themselves aware or convinced of the social, economic, environmental and spiritual benefits from access to water supply and sanitation. Politicians, in particular, tend to respond to public pressures and demands from their constituencies; hence they tend to give higher priority to water supply in response to the higher demand arising the perception of higher private benefits from access to water supply. Experience also shows that where political leadership and commitment have been accompanied by social marketing, significant progress has been made not only in access to water supply, but also to sanitation.

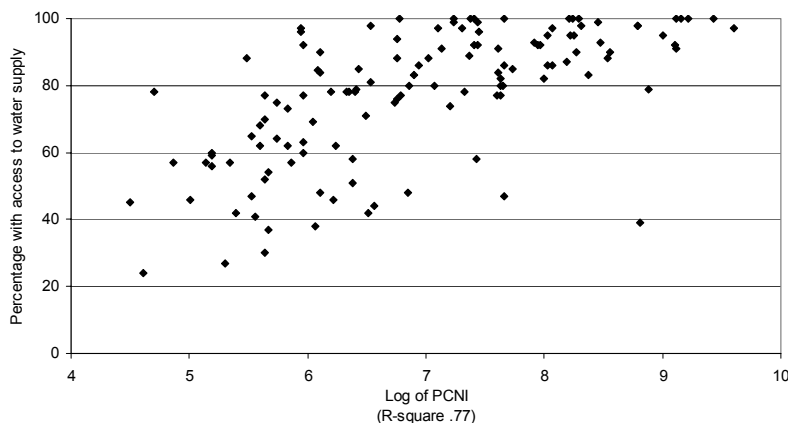
⁷⁰ For example, most of the world's poorest countries did not include MDG Target 10 among their priority objectives in their Poverty Reduction Strategy Papers (PRSPs). See "Water supply and sanitation in PRSP initiatives: A desk review of emerging experience in sub-Saharan Africa" (January 2002), by M. Mehta, Water & Sanitation Program.

Financial constraints

Poverty is a principal impediment to increasing access to services, from the household to the national level. Within communities, some households simply cannot afford the costs of improved services without assistance from other families or from the state. Compared to the rich, many poor households pay a much higher proportion of their incomes towards their daily needs for water supply and sanitation services from informal private providers. Such households do not have access to credit markets; yet without access such access, they cannot finance expansion of service to their communities or the costs of a piped connection; neither can they afford the cost of installation of private wells or latrines.

At the national level too, it is common wisdom that wealth is positively associated with access to water and sanitation services at virtually every level of analysis (Figure 7.1). Middle- and upper-income countries enjoy higher service coverage rates than lower-income countries, just as wealthier households within a given community are more likely to have improved services as compared to their poorer neighbors. Expanding access to water supply and sanitation requires money—whether from national and sub-national government tax revenues; user charges; cross-subsidies from users who can afford to pay; private-sector investment; and official development assistance (ODA).

Figure 7.1 Relationship between per-capita national Income and access to water supply, 2000



Funds must be available not simply to construct new water and sanitation facilities, but also to support their operation and maintenance over the long term. The many defunct piped networks, handpumps, and latrines throughout the developing world are due in part to inadequate resources for proper maintenance. They are powerful reminders that, without this concern for financial sustainability, investments made in pursuit of Target 10 will likely yield only temporary benefits. Indeed, experience suggests that the payoffs to effective preventive maintenance and savings in terms of lower operating costs, reduced adverse external impacts and extended infrastructure life of the infrastructure are very substantial, and are generally underestimated by cuts in budgets intended to meet specific fiscal targets. Realizing these benefits, however, requires the capacity and willingness to plan, manage, and implement effective maintenance. It also obliges a commitment to ensuring the reliable flow of funds for financing maintenance in a timely manner.

In discussing financial constraints, a distinction should be made between the absolute lack of resources for expanding water and sanitation coverage and the need to redistribute potentially sufficient existing resources such that Target 10 can be met. In some countries, sufficient

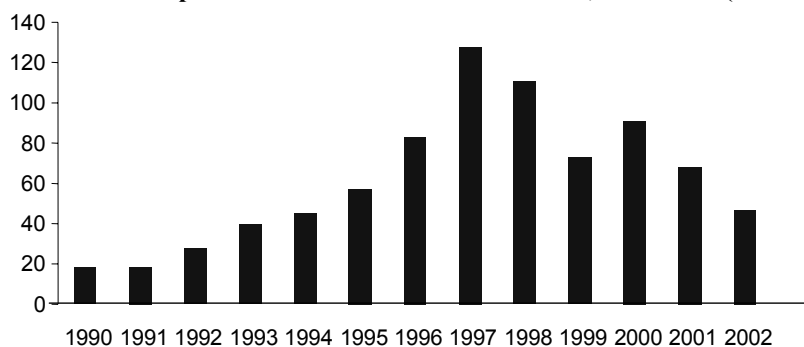
financial resources exist to provide universal coverage, but their concentration among wealthier households leaves a substantial proportion unserved. Sizeable gains in coverage can result from policy and institutional arrangements that encourage the redistribution of resources; they can also result from loan financing facilities that can also help households and communities to express latent demand for services. In other countries, however, pervasive poverty creates binding financial constraints to coverage expansion. Here the challenges are to mobilize the necessary resources from the international community, while also working to ensure that budgetary processes, policies, and institutional arrangements within countries give priority to investment in basic water and sanitation services for the poor. A second challenge is the recognition that the poor cannot be expected to bear the full cost of improved access to water and sanitation. Yet governments as well as donors often direct their resources not to poor communities and countries where the needs for access are the greatest, but rather to areas where there is political capture by politicians or where the criteria for donor success, such as reforms, are in place.

Many towns and municipalities in developing countries are constrained by a lack of access to loan financing facilities. Because of their limited tax revenues, these communities often rely on transfers from central government to finance construction of improved water and sanitation networks. Transfers, however, are subject to fluctuations in the national economic and political climate, thus undermining cities' ability to undertake long-term water and sanitation planning.

Many water and sanitation utilities are characterized by weak managerial and financial capacities. In many cases, political pressures prevent them from charging service prices that would cover recurrent costs, even in communities with the collective financial capacity to cross-subsidize service for the poorest. This, together with poor demand management and high levels of unaccounted-for water often make it impossible for utilities to generate sufficient cash flows for recurrent expenditures. As a result, their credit worthiness is weak, and they are unable to attract investment for expansion. Indeed, many water and sanitation agencies have difficulty funding proper operation and maintenance (O&M) of the systems they currently manage, much less expanding services to keep pace with the rapid growth in their communities. Reliance on recurrent funding from state or national government for O&M is even more tenuous than that for construction. Thus, instead of moving toward financial self-sufficiency and universal coverage, agencies deliver subsidized service largely to their communities' wealthiest households that have more political or social influence. In other cases, financial regulations require that revenues from water supply are sent to national coffers and are prevented from being used for water supply operations and maintenance. Where such revenues have been ring-fenced for the exclusive use of the water supply agencies that collected them, significant improvements have resulted in performance.

Over-optimistic expectation from private sector investments is another constraint. Some developing-country governments are reducing national expenditures for water supply and sanitation with the expectation that the investment gap will be filled by the private sector. Recent evidence suggests that this attitude appears to be overly optimistic (Figure 7.2). The features of investment in water and sanitation facilities—including its 'lumpiness,' payback periods of twenty years or more, and political difficulty of charging cost-recovering tariffs—make it difficult to attract private investment. The frequency with which W&S concessions in both developing and industrialized countries have been postponed or cancelled over the past several years is evidence of how difficult it is to design and implement successful private-sector involvement in W&S services.

Figure 7.2 Annual private investment in infrastructure, 1990-2002 (US\$ billion)



Weak local financial markets constitute another constraint to the financing of improved access to water and sanitation services. As a result there is a tendency to rely on financing that is denominated in foreign currencies. Yet revenues on which utilities and government would depend to repay such loans are denominated in local currencies. Such reliance of external financing is constrained by several risks such as devaluation and liquidity risks associated with the low cash flows from utilities. The Camdessus Panel on the financing of Water Infrastructure provides a number of remedial measures like special forms of international guarantees that can be used to address such financing problems. However, a lot depends upon action by governments and utilities to increase their cash flows and strengthening their financial and managerial capacities.

Finally, trends in ODA suggest that support for water and sanitation infrastructure is small in relation both to support for other infrastructure sectors, as well as to the levels necessary to meet the MDGs. For the water and sanitation sectors, they are estimated to account for only about between 7% and 11 % of total investments, and they focus heavily on the provision of urban infrastructure to middle-income countries. For example, it has been estimated that between 1990-1997 less than 0.2% of all private sector investments in the water and sanitation sector of developing countries went to Sub-Saharan Africa.⁷¹ Moreover, after peaking in 1997 financial flows have decreased steadily during the past several years.⁷² Understanding the reasons for these trends is an important element of mobilizing the resources necessary to meet the MDGs. More generally, there is a need to review the inter-related processes of national budgeting and priority-setting, poverty alleviation initiatives such as PRSPs, and the Millennium Development Goals. Countries prepared to act boldly in pursuit of Target 10 should be encouraged, not stifled, by their partners in the international community.

Moreover, the pre-requisite condition normally prescribed for ODA - that for effective and accountable use of ODA, certain reforms must be in place – has been a constraint to the countries most in need for help in meeting Target 10. While recognizing the importance of such reforms, it increasingly being also recognized that the alternative principle of pursuing reform and capacity strengthening simultaneously with investment, using the “learning by doing” approach is more likely to help the weakest countries to meet Target 10. This is one of the ideas behind the drive to establish regional water facilities. They are intended, in part, to assist weak countries to meet the

⁷¹ Calculated based on Silva et al. (1998) as quoted in Annamraju et al. (2001)

⁷² In nominal terms, ODA for water and sanitation have declined since 1995, fluctuating between \$18Bn in 1996 and a lowest point of \$13.5 Bn in 1999. These commitments were about US\$16 billion in 2002.

conditions for external financial support while, at the same time, undertaking some modest physical development towards Target 10.

Institutional constraints⁷³

Two types of institutional impediments stand in the way of expanding access to water supply and sanitation services: the lack of appropriate institutions at all levels, and chronic dysfunction of existing institutional arrangements. At the community level, potential users of services are often constrained by the absence or underutilization of institutions to facilitate collective and/or individual action. At the national and sub-national level, sanitation often has no institutional ‘home’ at all, creating a policy vacuum and a corresponding lack of prioritization in budgetary decision-making.

Among existing institutions involved in the extension, operation, and maintenance of water supply and sanitation services—including formal organizations such as utilities and local governments, less formal associations such as village committees, and principles or practices such as laws, regulations, and customs—persistent problems related to (1) inadequate capacity, (2) inappropriate incentives, (3) lack of accountability, and (4) absence of a sound regulatory system are at the heart of constraints to expanding access to service.

Capacity building⁷⁴

Institutions responsible for service provision—whether village water and sanitation committees or large urban utilities—need technical, financial, managerial, and social intermediation capacity that is lacking in many parts of the developing world. Technical capacity is particularly critical for extending services to low-income communities, where innovative technologies and service-delivery systems can be tailored to meet the needs of poor households. Similarly, considerable research suggests that reaching the poorest of households with W&S services can be facilitated by the participation of social intermediation professionals.

Capacity building is also essential in the area of gender-sensitive programming and policy-making. 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. As a result, they often have different criteria to evaluate the adequacy, equity, timeliness, convenience and quality of various interventions. Without a thorough gender analysis, planners have a distorted 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

⁷³ The term “institutional constraints” refers to obstacles developing countries face in a wide range of areas required for effective development policy-making and implementation, such as [human resources](#), [managerial skills](#), [monitoring and evaluation systems](#), [work processes](#), [organizational cultures and norms](#), and [legal frameworks](#).

⁷⁴We use the term “capacity building” as defined in Agenda 21 (Chapter 37): “...capacity building encompasses the country’s human, scientific, technological, organizational, institutional and resource capabilities. A fundamental goal of capacity building is to enhance the ability to evaluate and address the crucial questions related to policy choices and modes of implementation among development options, based on an understanding of environment potentials and limits and of needs perceived by the people of the country concerned” (UNCED, 1992)

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.

Capacity is enhanced through adherence to the principle of management at the lowest appropriate level, expressed through mechanisms such as devolution of responsibility to local governments and communities, backed by technical assistance for appropriate capacity building and funding. However, lack of financial and managerial authority and capacity can be particularly problematic when responsibility for water and sanitation service delivery is decentralized to local administrations. From planning and conflict resolution to revenue management and accounting, local governments often need considerable strengthening before they are able to administer W&S services in an effective and sustainable manner. Devolution of responsibility to local levels that are not accompanied by devolution of financial authority often leads to paralysis of sector performance. Decentralization programs also inherently prejudice households living in areas of weakest administration, which are typically the rural poor. Moreover, the financial difficulties of the W&S sector described above often make it difficult to attract and retain good engineers, managers, and social intermediation professionals—particularly in locations outside large urban areas.

With respect to households, capacity building often requires little more than tapping into the skills and endowments that already exist among community members. In some cases, improving access to information can go a long way toward making households aware of their rights and their options for obtaining improved water and sanitation services. Alternatively, forming or supporting civic organizations can be a way of developing community capabilities for organizing, planning, and even implementing local water and sanitation projects.⁷⁵ In other cases, partnership with local and international NGOs would be the feasible option.

Capacity building is often thought to pertain only to emergent institutions, such as local governments receiving authority for water and sanitation planning in a decentralizing country. In such a situation, however, the role of central government is also changing, and national institutions often need strengthening in new and unfamiliar capacities. National and provincial agencies, for example, may need assistance in shifting from design and construction to contracting, procurement, and oversight. It is also important to strengthen capacity for monitoring of access to water and sanitation services at the national level.

Incentives

Capacity building can provide individuals and institutions with the tools and skills to improve water and sanitation services, but not necessarily with the motivation to do so. From the household to the international level, current incentive structures often work against extension of water and sanitation services to the poorest, as well as against the long-term sustainability of installed infrastructure.

In urban areas, for example, service providers may either be prohibited from installing trunk infrastructure, or may be reluctant to do so, in communities with insecure land tenure. Not only are households without a title denied access to network services, but they often cannot obtain

⁷⁵ The Orangi Pilot Project in Pakistan is a well-known example of this type of ‘bottom up’ capacity building that led to a locally planned and implemented sanitation project.

titles without evidence of long-term residency—such as bill payment receipts from the W&S agency. Families without titles are also reluctant to invest in private, individual water and sanitation facilities such as wells and latrines, given that they feel vulnerable to clearance actions by government.

From the perspective of service providers, assignments to projects benefiting low-income communities are viewed with disappointment by many agency staff. Not only do they place employees in less attractive work environments (*e.g.*, urban slums or rural areas), but they also tend to emphasize simple technologies that are viewed as posing few interesting technical challenges. Even where improved services are installed, service providers often view low-income communities as having limited revenue potential, which in turn can engender inadequate maintenance and high rates of failure of systems serving poor households.

The ‘ribbon cutting’ culture of water and sanitation agencies—in which rapid progress toward construction objectives is prioritized over virtually all other activities—has also been well documented. This attitude is the consequence of demands placed on agency staff by elected and unelected leaders, who themselves are under pressure to deliver new construction projects to constituents. As a result, human and financial resources are allocated disproportionately to construction rather than operation and maintenance (O&M), thus placing the sustainability of installed infrastructure at great risk. In addition, professional status becomes increasingly associated with large-scale design and construction activities. Promotions (and elections) may easily be decided on the basis of extending a new water or sewer line; they are rarely influenced by the fact that an existing W&S system continues to function well, or by a reduction in unaccounted-for water.⁷⁶

Accountability

Accountability is a special form of incentives. It is needed to impel individuals and institutions in the right direction. Accountability mechanisms are essential to hold government, service providers, and international institutions responsible for their action (or inaction) in improving access to water and sanitation services. Accountability implies both a measurable standard of performance and a consequence for the failure to meet that standard. In a competitive market, for example, a service provider who does not meet his/her obligations to customers will suffer the consequence of losing business to a competitor.

Given the limited scope for competition in water supply and sanitation service delivery, this market approach to accountability has limited applicability for reaching Target 10. One promising alternative strategy for improving accountability in W&S service delivery is the decentralization of planning and/or budgeting to local institutions. Decentralization offers the potential of increasing the influence of households over decision-making, through elections, social norms, and the use of ‘voice.’ Decentralization can also improve accountability by separating policymaking (*e.g.*, for tariff setting) from service delivery activities. It is important to note, however, that decentralization will have limited (or even negative) effects if implemented in areas with inadequate capacity, and/or if central government does not maintain

⁷⁶ It should be noted that this description of professional incentives favoring new, large construction projects is also relevant to donor agencies and multilateral development banks. In most organizations, incentives are largely structured around the number and/or value of new projects, rather than around the performance or sustainability of existing initiatives.

an active role in oversight by retaining control over certain key functions (*e.g.*, setting standards or redistributing resources to subsidize service for the poor). One method of capturing the gain from decentralization is through benchmarking of performance of service providers.

At the international level, the global institutional structure for supporting water and sanitation issues is still not fully aligned with the Millennium Development Goal initiative. In particular, the accountability of the international community could be substantially enhanced by the development of an effective system to assess and report regularly (a) what actions have been taken to meet the goals, and (b) the extent to which those actions have advanced progress toward achieving the goals.

Regulatory system

Absence of a sound regulatory system and a strong regulator are generally held to be constraints to good performance by public as well as private sector operators. The overall aim of regulation is to ensure that sector goals like Target 10 are reached, confidence is established in the sector to attract private investor participation in financing and service delivery, and that the interests of both users and service providers are protected. A key complement, especially where private sector participation is involved, is establishment of instruments for arbitration.

The regulator should have a clearly defined mandate and authority, with an independent source of funding. The primary responsibility of the regulator should be to supervise operators, both public and private. Two types of regulation are necessary, namely, quality regulation and economic regulation.

Quality regulation is used to track the quality and efficiency of service providers. It entails monitoring service operators to determine whether they are meeting their contractual obligations to provide access to service coverage and quality of service within the authorized tariffs rather than merely providing access to dysfunctional infrastructure. To do so effectively, the regulator should define goals and performance standards so that actual service delivery can be compared with them. In addition, he/she should define the tariff policy, provide information on required investment to meet stated goals, and advise on funding sources to meet investment goals.

The minimum standards to be followed should be defined by central government, leaving regional governments to define local standards provided they are not lower than the national standards. Best practice suggests that both public and private service providers should operate under the specified targets, with rewards for exceeding such targets and sanctions for failure to meet them in terms of costs and timeliness. Quality regulation is also needed to monitor the implementation of reform measures and the flow of resources into the sector.

Economic regulation is required for tariff setting on the basis of agreed objective criteria. It seeks to ensure that the interests of both operators and users are protected. A key principle is to ensure that consumers are not made to pay for the inefficiencies of service providers. Competition between operators and benchmarking are considered to be powerful instruments in economic regulation. Competition helps to improve performance and/or reduce costs and, hence reducing charges and improving affordability. Benchmarking yields information that can be used for performance comparison and tariff setting. Its outputs can give signals which can help to determine whether programs are on track to achieve targets. The information it provides can give

signals that can be used for making mid-course adjustments to technical strategies in order to improve sector performance. In view of the importance of such information, central government should provide incentives to local governments and operators for good reporting.

Technical challenges

One of the important lessons of the past several decades of international collaboration for expanding water supply and sanitation services has been that non-technical issues such as financing and institutions are equally important—and often more important—explanations for the persistent lack of access among developing countries than are technical challenges. At the same time, the pendulum should not swing so far as to neglect entirely the role of technical considerations in expanding services. Indeed, the provision of safe and reliable services is often more technically challenging in poor communities than in rich. Extending services to a dispersed rural settlement or dense urban community on marginal land, for example, is one of the tougher design problems that a water and sanitation engineer can face.

Climatic factors can certainly shape a country's ability to provide and maintain W&S services for its citizens. Many developing countries in the tropics, for example, suffer alternately from floods that damage infrastructure and droughts during which water sources run dry. Whereas inexpensive solutions are available in some cases (*e.g.*, rainwater harvesting), in others costly infrastructure is required in order to control droughts and store water for the dry periods. Such physical constraints may hinder economic development in general and thus impede progress toward all the Millennium Development Goals.

Although the amounts of water required for increasing access to drinking water and sanitation are relatively minor in comparison with the amounts required for agricultural uses, there are often situations in which the physical availability of water resources on a sustainable basis (and access to technologies suited to that environment) limits efforts to increase sustainable access to water and sanitation. It is important to note, however, that in other cases what is termed “water scarcity”—at least as regards water for domestic purposes—is often the result of decisions at various levels to prioritize water allocation to other uses, and to expend limited budgetary resources on activities other than accessing, treating, and transporting water for household use. It is also important to recognize that, although water and sanitation are often seen principally as a challenge of capital investment, the provision of water and sanitation services is an ongoing business that has to be understood and managed as such if it is to achieve its goals. Where a water supply system is poorly planned or “under-managed”, the consequences often include excessive loss of water through leakages and waste as well as loss of the revenue needed to run it effectively through unmanaged consumer connections. Finally, achieving environmentally acceptable sanitation solutions is a major technical challenge, particularly in urban and peri-urban areas—indeed, some approaches may lead to a period of transitional environmental pollution, since increasing access to sanitation under conditions of water stress means that there will be more and more pollutants being disposed into less and less water.

Water supply

In some instances, sustainable access to water may be limited by the physical availability of water itself – where countries or communities have an inadequate water supply at a reasonable distance either in terms of quantity or quality (whether because of low rainfall, topography,

hydrology and/or geography) or might face such constraints in the future, because of such factors as population increases or climate change. Sometimes, one or more particular challenges – such as arsenic contamination, salinity, guinea worm infestation, or groundwater depletion – need to be overcome to ensure a safe drinking water supply.

At a global level, the withdrawal of water supplies for domestic, industrial and livestock use is projected to increase by at least 50 percent by 2025. According to the International Food Policy Research Institute and International Water Management Institute⁷⁷, “current trends show a water crisis could occur, leading to a breakdown in domestic water service for hundreds of millions of people—most significantly in the developing world—as well as devastating loss of wetlands, serious reductions in food production and skyrocketing food prices. If current trends worsen even moderately, farmers will drive down water tables by extracting increasing amounts of water to get sufficient supply for their crops, the institutes predict. The accelerated pumping could cause key aquifers to fail after 2010 in northern China, northern and northwestern India, West Asia and North Africa”. Although the greatest impact of such a worsening of water trends would be in the area of food production and rural livelihoods (the IWMI/IFPRI report estimates a loss of food production equivalent to India’s entire annual cereal crop or the combined annual harvest of sub-Saharan Africa, North Africa and West Asia), the availability of water for drinking and sanitation purposes could also be threatened in the most water stressed areas. Such availability could also be impacted by climate change and increased climate variability, especially since poor countries are the most vulnerable and have the least storage capacity to be able to overcome the effects of climate variability and change and natural disasters⁷⁸. Strategies to prevent this crisis scenario – principally investment in infrastructure to increase the supply of water for irrigation, domestic and industrial purposes; conservation of water and improved efficiency of water use in existing systems through water management and policy reform; and improvement of crop productivity per unit of water and land – extend beyond the narrow water and sanitation sector and relate to the proper management of water resources as a whole, but will be a necessary component of any strategy to increase access to water and sanitation in areas in which the physical availability of water is a limiting factor.

The relative availability of water supplies will of course have a strong impact on the costs of increasing access to water and sanitation. Some estimates of the costs involved in meeting the water and sanitation targets appear to assume that the water resource itself is free, and need to be adjusted to include not only the costs of capture but the opportunity costs of the water itself. Many poor people without access to water supply and sanitation live in places where the shadow value of water is high, and the costs involved in increasing access to water and sanitation will be greater in water-stressed environments, reflecting water’s scarcity value.

Thus any strategy to achieve the water and sanitation MDGs must take into account the costs of meeting the goal as differentiated by ecological setting. To this end, a solid analysis of water resource availability and technological options to address the particular challenges of water-stressed environments is needed. Since conditions are enormously context specific, it would be

⁷⁷ “Global Water Outlook to 2025: Averting an Impending Crisis”; see also IFPRI/IWMI release, Oct. 16 2002.

⁷⁸ See ISDR publication “Living With Risk”, and scoping paper prepared by the International Water and Climate Dialogue.

necessary to segment the overall problem by distinguishing among different ecological conditions—for example, coastal areas, alluvial river basins, drought-prone regions, small island states, etc – and assessing the technological options to increase access to drinking water supplies required in each case.

Strategies to achieve the water and sanitation MDGs must also take into account that additional water supplies can be generated through demand management and reductions of water wastage, primarily in cities, through such mechanisms as tariff structures. But the potential value of demand management approaches should take into account at least two potential caveats. First, since water wasted may be reused, in calculating the benefits of reducing wastage, the additional cost of providing access to people whose water supply currently depends on such leakages must be factored in. Second, higher levels of efficiency can sometimes lead to higher levels of risk. Experience in South Africa, for example, has led to some concern that when you have very high levels of water efficiency you are more vulnerable to drought and climate variability more generally.

Two final considerations. The first is that poorer countries and communities, especially those located in water stressed areas, must learn how to live with perennial water scarcity and design their development around it. Most cities in arid zones do not, for example, have limits on multistoried houses or on high water consuming flushes. The second point is that groundwater protection is a high priority in many water stressed areas. Over-exploitation of groundwater for agricultural purposes increases the cost of water supply for drinking purposes, which is further increased by the need for additional treatment.

The special case of sanitation: service provision chains

Access to sanitation differs from access to water supply in terms of the nature and order of service provision chain that is used. In the case of urban water supply, the service provision chain starts with installation of infrastructure for the public good component of the service, followed by infrastructure for the private good component. The public good component starts with source development and treatment, followed by bulk transmission to a point within or just outside the community to be served. Finally, the last section of the public good component is installed in the form of a local distribution network with connections to individual consumers who install private internal plumbing systems to which the water service is connected for private use. Thus once the consumer receives the private connection and water supply, all the public components would already be in place; and their costs could normally be taken into account in pricing the service.

In traditional supply driven sewerage, the order of the service provision chain is similar to that used in water supply. Installation of infrastructure starts with the trunk sewerage system and sewage treatment facilities. The rest of the infrastructure is then installed, from the downstream end to the upstream end. Finally, households and customers are connected to the installed infrastructure system.

Adherence to this approach has been one of the technical constraints facing access to sanitation in large urban areas in developing countries. This is due, in part, to the lumpy investment required for conventional sewerage. Where an attempt has been made to follow this approach, experience has shown that the resulting sewerage systems have either been highly under-utilized

(Accra, Ghana) or they have not been used at all (Bombay, India). In other cases, what is planned is never implemented due to its prohibitive cost. Hence an alternative service provision chain that follows a demand responsive approach is increasingly being advocated.

In the demand responsive approach, the traditional service provision chain is normally reversed. Ideally, the process should start with the installation of private sanitation infrastructure, followed by successive components of public infrastructure. For sewerage systems, these public good components are (i) feeder sewerage systems that collect sewage from private sources to (ii) trunk sewerage systems, which in turn discharge their wastes to (iii) sewage treatment plants for final treatment and disposal. The same basic approach is followed both for network systems and non-network systems of sanitation. Thus for on-site systems using septic tanks, the public good component may be the fleet of pit or septic tank emptying trucks representing the feeder system, with or without an intermediate transfer station. This is followed by facilities for treatment and disposal of the pit or septic tank materials removed by the fleet of emptying trucks.

Thus, in general, the service provision chain for sanitation starts with the private good component followed by two or three different levels of public good components in the service provision chain, leading to three or four steps in the “sanitation ladder”.

From the private standpoint, the minimum level is access to private sanitation infrastructure that is hygienic and safe to use. In cities like Manila and Jakarta, this level has been reached for millions of people. However, it has not been followed by demand for access to the next level in the “sanitation ladder”, namely, access to feeder systems of sewerage, followed by trunk sewerage and treatment plants. Hence septic tank effluents typically flow into open streams and drainage channels, leading to public nuisance and exposure to diseases of excretal origin, thereby undermining the rationale for public support for access to basic sanitation.

In many cities in Latin America, demand has been extended to the second and third rungs in the sanitation ladder (i.e. to feeder and trunk sewerage systems). However, few cities have sewage treatment plants which represent the fourth rung in the “sanitation ladder”. In general, where one or more of the public components of the service provision chain is/are missing, the result is environmental damage, including pollution of surface and ground water for beneficial uses such as water supply and recreational purposes.

Viewing the sanitation service provision chain as a sliding scale for sequential attainment of access to sanitation, one can argue that cities in Latin America are at a more advanced level on the sliding scale than those in Manila and Jakarta; and those in Jakarta and Manila are also more advanced than those who have reached the first rung in the ladder or the sliding scale. However, there are many countries in Asia and Africa where communities have not reached even the first rung in the ladder.

The Task Force on water and sanitation is still grappling with the issue of the extent to which such a sliding scale of access to sanitation should be accepted or promoted. For how long should the resulting environmental damage be deemed acceptable if countries are only able to climb onto the first few rungs in the ladder? Is there a case for treating progress to the first, second or third rung as an acceptable transitional solution to the creation of access to basic sanitation? This is a policy issue with significant financial and environmental pollution implications that is perhaps best addressed at country levels.

Summary

One of the most striking implications of the previous sections is that many of the constraints to improved access to water and sanitation services lie outside the sector itself. The inadequate financial allocations to water and sanitation services in most developing countries are the result of budget-setting processes in which water and sanitation is pitted against any number of competing claims for limited resources. Lack of responsiveness and accountability in water and sanitation service provision often stems from broader civil-service legislation and the balance of power between central and local government, both of which are established at the national level. Governments that are committed to improving long-term access to water and sanitation services must, by extension, be prepared to make hard choices regarding budget priorities, the devolution of powers to local administrations, and the restructuring of incentives and accountability networks among the public, private, and civic sectors.

Box 7.1 Overcoming Constraints and Increasing Access—The South African Experience

Although not reflected as such in the Human Development Report's figures in 1994, 15.2 million (38%) of South Africa's population of 40 million lacked access to basic water supply (defined in South Africa as 25 liters of water per person per day within 200 meters from home). In addition, just over 50% (20.5 million) lacked access to basic sanitation (defined as a ventilated improved pit latrine or its equivalent).

South Africa has used a combination of policy instruments and investments to expand coverage quickly and dramatically in just eight years. Devolution of responsibility for water supply and sanitation from the national level to the local government level using community-based approaches has been accompanied by policy reforms and an accompanying legislative framework. A capital works program was launched which has provided infrastructure to meet the needs of nearly ten million rural people, and municipal programs have extended services to their growing populations as well. Finally, the 'free basic water supply' program has provided water to some 27 million people as of July 1, 2002. South Africa now expects that, within seven more years, all citizens will have access to basic water supply.¹

Clearly the experience of South Africa should not be viewed as a model that can simply be transferred to other settings; however, it does provide important insights regarding attainment of the Millennium Development Goals. At a recent international conference, Ronnie Kasrils, Minister of Water Affairs of South Africa, identified the three key factors that led to success in South Africa as (1) strong political leadership, (2) a willingness to take action without having planned every last detail, and (3) adequate financial resources.² These three "how-to" principles would seem to be universally applicable.

¹ Drawn from the "Blue Gold" series on African experience in water and sanitation, World Bank Water and Sanitation Program, 2002.

² Keynote address by Ronnie Kasrils, Minister of Water Affairs of South Africa, Conference on Water for the Poorest, Stavanger, Norway, November 2003. In his comments on this address, Conference Chair Jan Pronk emphasized the third point ("money, money, money") and added four additional "how-to" principles: (1) setting clear goals, (2) organizing your tax base, (3) focusing on water and sanitation, and (4) involving local governments.

It is also important, however, to recognize that all of the constraints described here are surmountable. Consider, for example, the case of South Africa (Box 7.1) where access to water supply has increased from 62% to 86% in the period of 1994-2000. A systematic assessment of the impediments to extending water and sanitation service coverage, however, enables the systematic development of strategies to address them—a topic to which we turn in the following Chapter.

7-B. Constraints to managing water resources to achieve the MDGs as a whole

The above section has focused on identifying the political, financial, institutional, and technical challenges that confront most countries in the developing world in their quest to meet MDG Target #10. However, as discussed in Chapter 2, water as a resource is an essential ingredient to virtually all the MDGs, and good water management and development will be essential to meeting most if not all the other MDG targets. Steps taken to meet the MDGs potentially have both positive and negative impacts on water and the environment. And efforts to make the MDGs a reality on the ground are going to demand possibly conflicting uses of the same water resources.

This section thus focuses on identifying some of the constraints and challenges that confront countries in their efforts to manage water in ways that help advance the achievement of the MDGs as a whole, while reducing potential conflicts among goals. We begin with an analysis of water as a component of the natural environment⁷⁹.

Water as component of the natural environment

The fact that water is a fundamental component of both the natural and the social environments involves a huge challenge. On the global scale the *water cycle is the centerpiece of the life support system*. It is the bloodstream of the biosphere where it distributes energy across the earth surface, carries dissolved and suspended matter around landscapes above and below the ground surface, and is deeply involved in plant production in the photosynthesis both as raw material and as carrier of nutrients from the soil to the leaves.

On the regional scale, *water is a natural resource*, the availability of which defines basic preconditions for socioeconomic development. It defines the type of human effort needed to secure water for societal use and food production. The hydroclimate in terms of aridity and humidity defines the dominating type of ecosystem or biome (taiga, deciduous forest, rainforest, grassland, savanna, desert etc.). In arid regions, large populations imply *water stress* with many people both sharing and polluting each flow unit of water passing through the landscape (water crowding). The result is difficulties to mobilize large enough per capita amounts of water to secure *food production* (Target 2) and *income generating production activities* (Target 1). Humid tropics have to fight with a partly different set of water problems related to water surplus: high water table, nutrient leaching, water-related diseases like tse-tse fly, etc.

On the local scale, water flow is seen as a natural *abiotic resource that interacts with local ecosystems to produce ecological services*. Each type of freshwater flow has ecosystem links of its own: streamflow constitutes habitat for aquatic ecosystems, groundwater flow is a determinant of certain wetlands and their biodiversity, soil moisture is a key component of soil fertility, vapor flow is a key output of plant production and at the same time a key component of the climate systems so that land cover change may have climate consequences. Freshwater is intimately involved in provisionary and regulating ecological services: directly in photosynthesis (production of food and wood), and indirectly in different kinds of biological regulations. Local

⁷⁹ The next four sub-sections are drawn directly from a memorandum entitled "Water – dividing line between poverty and prosperity", prepared by Prof. Malin Falkenmark, a member of Millennium Project Task Force #7 on Environmental Sustainability.

freshwater provision to meet societal water supply is regulated by soil infiltrability and plant water uptake, influencing groundwater recharge and dry season streamflow.

Water deficiency challenges in tropical, sub-tropical and arid zones

The fundamental importance of water as a dividing line between poverty and prosperity is demonstrated by the world map of global income distribution: most of the most challenging countries for the Millennium Development Goals identified earlier in this report are largely located in the tropics and subtropics and the majority of them in the arid zone where water scarcity and drought proneness add particular challenges to MDG achievement. Most of these countries have to cope with the particular challenge of water deficiency problems. Since most rain evaporates the local water courses go empty most of the year and low groundwater recharge is reflected in low water tables. This means difficulties in terms of *water access*: long walks and high lifts consuming much human energy to get access to the daily water needed by a family. Target 10 aims at reducing this hardship and release human energy for productive purposes to increase welfare.

Dry climate also involves *food production* difficulties (Target 2) due to several parallel challenges: long dry season, large inter-annual rainfall variations with recurrent drought years, frequent dry spells even during wet years, often also vulnerable crust-prone soils impeding infiltration into the root zone. The result is very low yields (typical yields for the smallholder farmer tend to be 1 ton/ha or even less) unless crops are being drought-proofed either by irrigation or by dry-spell mitigation based on local water harvesting.. Added to this are the dry season difficulties to get access to water for daily household water (drinking water), involving long walks and heavy loads.

Cause-effect chains and inter-goal linkages

By its movement through the landscape from rainfall over the catchment to flow towards the river mouth, water tends to physically link several MDG's. By these linkages different goals are internally related by long cause/effect chains of processes, as exemplified in Figure 7.3. Water linkages therefore tend to generate *inter-goal conflicts*. Activities for certain MDG's involve activities that will be disturbing other goals, so that competing goals have to be internally balanced (food production against aquatic habitats, pollution generating activities against water quality-dependent goals). In the former case food production involves consumptive water use by which huge amounts of water leaves to the atmosphere not available for downstream reuse (of the order of 1000 cubic meters per person and year). In the latter case water acts as a disease transmitter and contaminant carrier, complicating safe water supply and environmental sustainability.

Figure 7.3 Cause-effect chains and inter-goal linkages

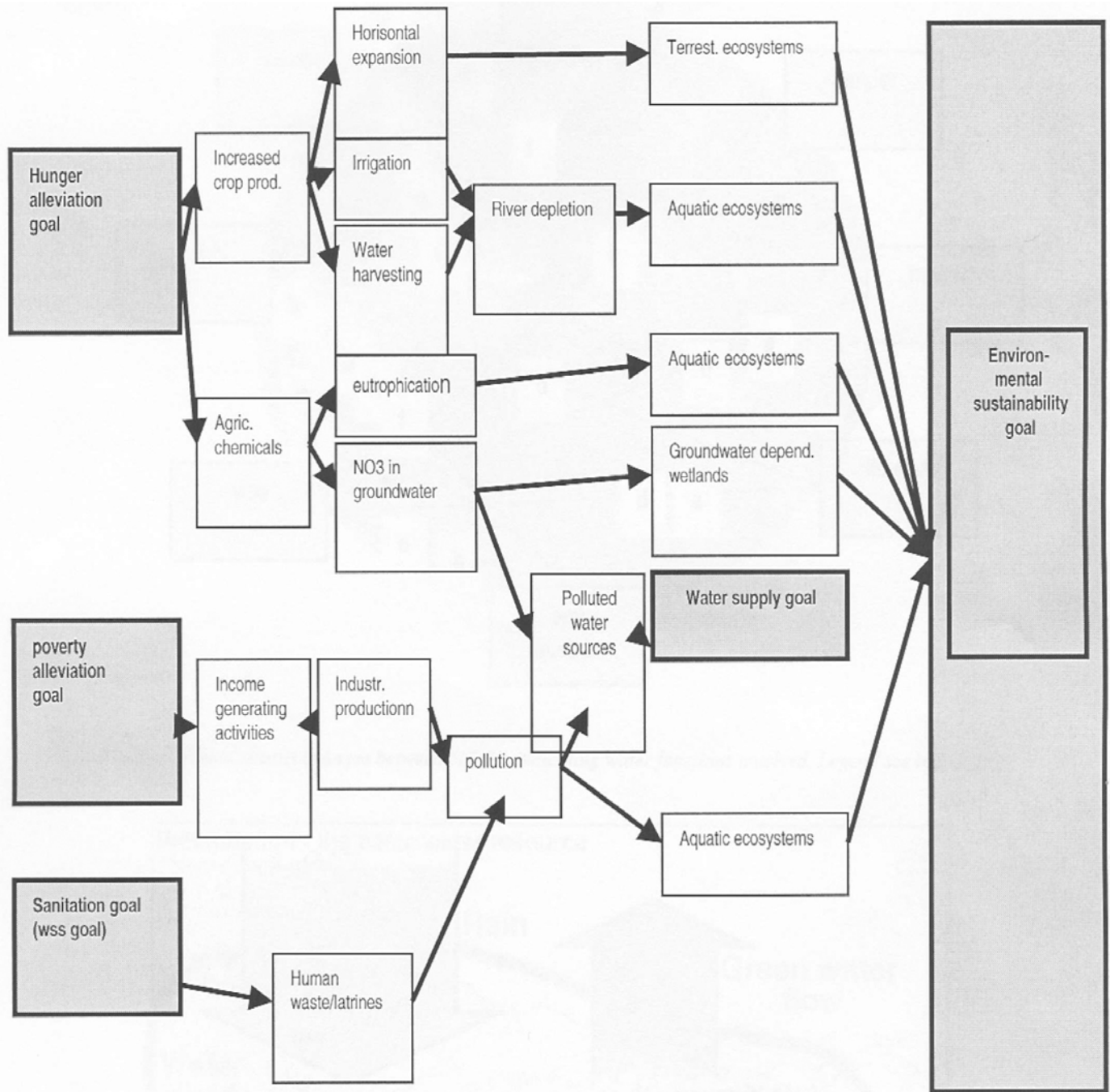
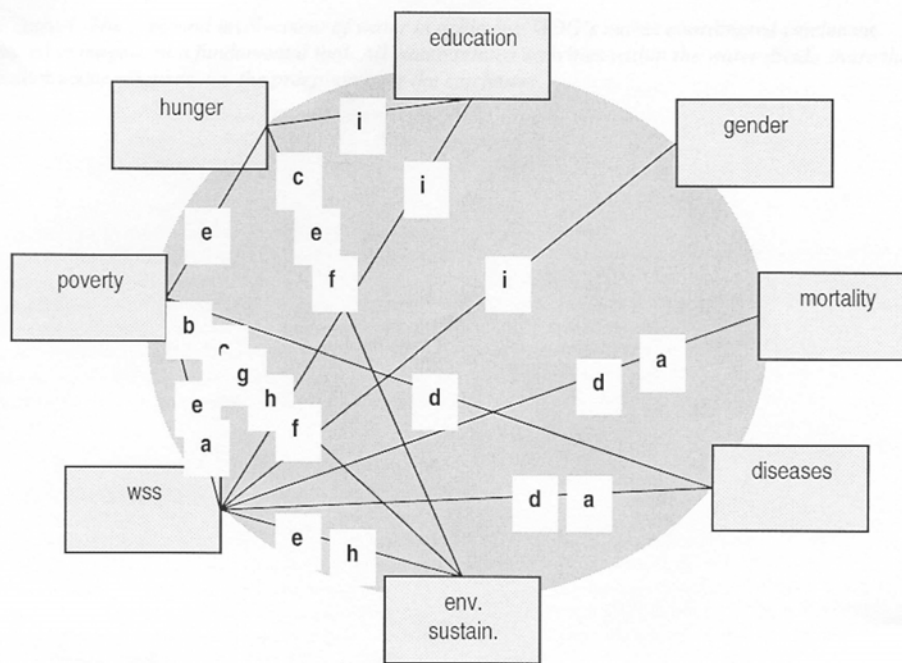


Figure 7.4 Water related linkages between MDGs indicating water functions involved



In Figure 7.4 water-related linkages between all the different MDG's are demonstrated based on a differentiation between the following 8 different water functions.

- a= life-saving drinking water
- b= production factor for income generation
- c= biological production factor for crop production
- d= disease agent transmitting medium
- e= natural resource to be wisely shared
- f= habitat for aquatic ecosystems
- g= degrading landscape agent
- h= contaminant carrier.

In addition a ninth function is indicated for situations where social goals are more or less dependent on water-dependent goals being achieved: safe drinking water, sanitation, and food supply:

i= entry point.

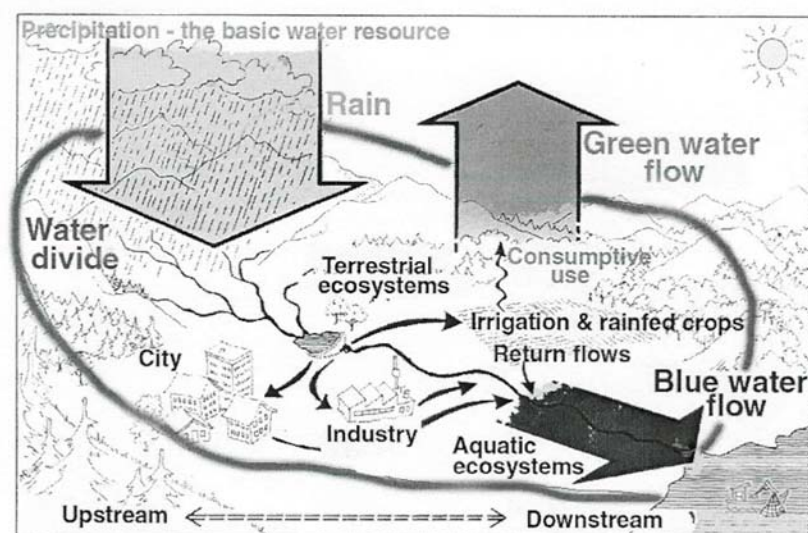
Catchment confinement calls for integrated approach to water

Summarizing, water is profoundly involved in achieving the MDG's, and coordinated water management will have to be a fundamental component.

In all its different functions, water is confined in a gravity-driven flow-based system moving through the landscape after transformation from precipitation over the land and water surfaces

into water flow towards the mouth at the coast or in an inland delta (e.g. Okavango) or lake (e.g. Aral sea). MDG-achievement has therefore to be supported by an integrated catchment-based approach to land, water and ecosystems (Figure 7.5), involving Integrated Water Resources Management in line with the recommendations from the Johannesburg Summit regarding IWRM and Water Efficiency Plans.

Figure 7.5 The profound involvement of water in achieving the MDGs makes coordinated catchment based management a fundamental tool



Trade-offs and win-win outcomes

As is clear from the above analysis, win-win approaches that advance more than one MDG simultaneously are highly desirable but not always possible; there are situations in which trade-offs among the goals are involved, particularly in the short-term. Identifying trade-offs among the poverty, hunger, environment, and water and sanitation goals is currently the topic of an inter-Task Force initiative that should produce results in the first half of 2004.

Some examples of potential trade-offs between water goals and other goals include the following:

- **Water and poverty:** Efforts by poor people themselves to survive as well as government initiatives designed to spur economic development can come into conflict with the need to protect the quantity and quality of water. Certain actions of the poor, such as cutting down trees for firewood, contribute to deforestation, which eventually affects both rainfall and siltation of streams and rivers. In West Africa, for instance, the advancement of the Sahelian zone southwards has been thought to have been influenced in part by such harvesting of trees for firewood. Then, of course, there is the negative impact of development on health and on the availability and quality of water for development. For example, development of dams for various purposes tend to increase suitable breeding places for mosquitoes (responsible for malaria) and snail vectors of bilharzias or schistosomiasis. Spillways of certain dams have also resulted in high velocity flows of water over the spillways. Sometimes, the flow velocities are high enough to become

conducive to the breeding of the black flies (also called *simulium damnosum*) responsible for river blindness. This has huge economic significance because it leads to the abandonment of large tracts of otherwise fertile agricultural lands. On the other hand, at least in one case in Ghana, the construction of a dam led to the flooding of an area where the natural river flow itself was conducive to the breeding of such black flies, and the dam development destroyed the natural breeding place. Pollution from industrial and agricultural activities designed to reduce poverty greatly affects water quality.

- **Water and hunger:** 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.
- **Water and environmental sustainability:** Several threats to overall ecosystem health are particularly relevant to water: a) climate change and resulting alterations in weather patterns, water distribution, and fisheries, which 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; b) loss of species diversity and genetic diversity within species, which impact the health of marine and coastal environments as well as wetlands; c) the degradation of global fisheries, marine ecosystems and coastal habitats due to over-fishing and contamination from land-based activities; and d) the contamination of freshwater ecosystems due to runoff, silting, fertilizers, pollution, and invasive species. Many of the water-related threats to ecosystem health stem from activities that countries deem critical to their overall economic development, such as agricultural and industrial activities and the creation of dams for power generation.
- **Sanitation and wastewater treatment and pollution:** 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. Even sewerage systems that “solve” environmental problems and avert health crises in one area often then create environmental problems elsewhere by dumping the untreated sewage into another community’s water source or common property resource (such as a lake, river or coastal zone). The immediate trade-offs between improvements in human health and the quality of life in an urban area and serious negative environmental impacts on the surrounding area require careful consideration.

CHAPTER EIGHT: THE WAY FORWARD – CRITICAL ACTIONS AT THE NATIONAL AND INTERNATIONAL LEVELS

Based on the analysis of the previous Chapters, what do we as a Task Force think it will take to meet the MDGs related to water and sanitation? More specifically, what are the key propositions that we would like to convey at this stage of our work together?

In essence, the Water and Sanitation Task Force believes that it will take a combination of strong national action—guided by nationally prepared and owned strategies and action plans—complemented and supported by international action.

Our starting point is to recognize the primacy of action at the national and sub-national levels – as close as possible to where the problems and opportunities lie. The key to reaching the targets will be to mobilize people themselves, country by country, particularly in slums and other marginalized communities where access to services is lowest. Clearly, the approach must start on the ground.

Local, sub-national, and national governments have the main responsibilities for expanding access to water supply and sanitation services, and national governments must have the prime responsibility for ensuring that the needs of the poor in their countries are met. Though governments need not engage directly in service delivery, they need to set standards for service providers (including utilities and the private sector), and intervene if needed to force things to happen. The bottom line is that the starting point has to be national action – to recognize the MDGs as priority national development goals, to prepare strategies and action plans for their achievement, to open opportunities for community action, and to mobilize public awareness and support, especially for sanitation and hygiene.

That said, there is clearly a key supporting role for international agencies and actors as well as for developed countries which share the commitment to the MDGs. Multilateral institutions, bilateral donors, and international NGOs have a major, but supporting, role to play to help countries realize *their own nationally determined goals, strategies and action plans*. In particular, they can be advocates, catalysts, mobilizers of international support, and – especially for the poorest countries far from meeting the goals – providers of additional resources. Research workers and analysts also have an important role in clarifying issues and directing attention to points confused, neglected or over-simplified.

Building on the overall framework described above, the work of the Task Force to date has resulted in the following 17 propositions that we believe to be critical for the achievement of the Millennium Development Goals related to water and sanitation. As noted in the preface, these propositions should be considered preliminary; they will be discussed and revised through further discussion, substantiation with targeted data gathering, and outreach to stakeholders planned for 2004.

The first eleven propositions address Target 10, while propositions 12 through 17 are relevant to water resources management to meet the MDGs as a whole (including target 10). In keeping with the overall strategy of emphasizing strong national action, the first 15 propositions are for action at the national level, while propositions 16 and 17 are for action at the global level.

8-A. Propositions to address Target 10

Clearly, at the national level, achieving target 10 will require investments – in both hardware and software. Despite the obviously critical nature of the specific hardware and software ingredients, our Task Force has focused its thinking on some of the less obvious policy decisions that must be taken if the ambitious targets are truly to be achieved. These national policy decisions can be crystallized in the following propositions.

Proposition 1: National governments—including planning and finance ministries and their supporting agencies—must be convinced of the importance of achieving the MDGs in water supply and sanitation. They also need to recognize that water is essential to the success of all development.

Given the myriad development challenges facing the world’s poorest countries and communities—from the HIV/AIDS pandemic to pervasive gender inequality to grinding poverty—why has halving the proportion of people without access to water and sanitation services been singled out as critical? Arguments in support of expanding access to water supply and sanitation services have been expressed in the language of *human values*; have been founded on the notion of a *human right* to basic services; and have also been made in *economic* terms. Although based in different traditions, each argument leads to the same exhortation: We must act to ensure that access to basic water supply and sanitation becomes a reality for poor households around the world. Indeed, water supply advocates, policy makers, and practitioners should draw encouragement from the fact that a compelling, multifaceted case for action can be made to a range of key constituencies who need to respond in order to achieve the target.

With regard to *human values*, expanding access to basic services like water supply and sanitation is a moral and ethical imperative rooted in the cultural and religious traditions of societies around the world. Virtually all of the world’s spiritual and cultural systems embody values and imperatives recognizing the primacy of human dignity, equity, compassion, and solidarity. At least in principle, they exhort us to care about the welfare of others, in particular contributing our various resources toward improving the lot of the poor. Around the world, these principles have formed the basis of action for volunteer, non-profit, and/or religious organizations—often operating on a shoestring budget, hope and commitment—that extend water supply and sanitation services to poor households. Many effective interventions at the community level meld economic and social development with spiritual growth and bonds of communal solidarity, thus mobilizing the enthusiasm and engagement of their communities. The Millennium Development Goals themselves are built around a shared understanding of what we as human beings owe to one another at community, national and international levels. They are informed by principles of fairness, justice, and the obligation of the individual to pursue the mutual good that characterizes religious and ethical systems the world over.

The idea that the global community ought to ensure the provision of basic water supply and sanitation to poor households has been taken one step further, by deeming access to these services to be a *human right*. An extensive body of international agreements has recognized the right to life, health, well-being, and protection from disease. As water supply and sanitation are fundamental to achieving these goals, it has in the past been argued that access to water and sanitation is a ‘derivative right’ emanating from existing covenants. More recently, the United

Nations Economic and Social Council (ECOSOC) explicitly acknowledged that access to water is indeed ‘a prerequisite for the realization of other human rights;’ it also recognized access to water as a basic human right.⁸⁰ Observing the right to water implies responsibilities not only for governments and the international community, but also for households themselves. Indeed, experience has shown that the most sustainable community-level interventions are characterized by significant community investment of labor, other in-kind resources, and user fees in the design, construction, maintenance, and operation of facilities.

Finally, improving access to water supply and sanitation is justified on *economic grounds*, as households with improved services enjoy: reduced morbidity, mortality, and expenditures on water-related disease; greater educational and productive opportunities for women and girls; availability of increased volumes of potable water that can be used to start or expand small enterprises; and increased disposable household income. At the national level, improvements in water supply and sanitation coverage can mean reduced expenditures on health care, increased demand for agricultural products, and greater domestic and international tourism opportunities.

Proposition 2: Countries must focus their efforts and resources where needs and challenges are greatest, such as urban slum areas, peri-urban areas and rural areas.

In many cities, provinces, and countries, surprisingly little is known about the characteristics of households that lack access to water supply and sanitation services. Such basic assessments should be undertaken such that the obstacles to expanding access are understood and relevant financial, policy, and planning instruments are devised to respond. In most countries, the greatest challenge to increasing water and sanitation service coverage will be in dense urban slums, peri-urban zones, and rural areas.

Existing resources must be better used. Making the most of such resources is a prerequisite to reaching the goals. Based on improved information, governments at national, regional and local levels must reallocate their scarce existing resources towards achieving the Millennium Development Goals. Subsidies must promote basic services for all rather than luxury services for some. Ensuring the most cost-effective use of resources and their allocation to highest priority investment needs requires a thorough restructuring of local and national public expenditures.

Proposition 3: A focus on service delivery, rather than only on construction of facilities, must be at the center of efforts to reach Target 10.

The Millennium Development Goals necessarily focus on measurable targets such as the proportion of people without access to water supply and sanitation. It is important to remember, however, that water supply and sanitation are services, not simply facilities. The former is a process—requiring the sustained involvement of government, service providers, and households—while the latter is a product that can be delivered in a one-off project. Adopting a service orientation requires attention to financial flows and institutional arrangements for operations and maintenance, as well as incentives for providing safe, reliable services to all customers (including the poor) on a continuing basis. This approach is being contemplated in

⁸⁰ “The human right to water is indispensable for leading a life in human dignity. It is a prerequisite for the realization of other human rights... States parties have to adopt effective measures to realize, without discrimination, the right to water, as set out in this General Comment.” ECOSOC General Comment No. 15, E/C.12/2002/11, 26 November 2002.

Brazil, where government has proposed subsidizing service for the poor contingent not on the supply of physical infrastructure, but rather on the supply of reliable service.

Proposition 4: Donor agencies and governments must adopt a “learning by doing” approach, combining financing for capacity building and for capital investments.

Over the past decade there has been an undue focus on providing funding for infrastructure and service delivery only after capacity building and institutional reform have been undertaken. This strategy was, at times, the result of donor policies that view capacity building and policy reforms as pre-requisites for investment. However, in a number of cases, the acquired skills atrophied before the investments materialized. In other cases, expectations for private-sector financial involvement in service delivery following institutional reform were never realized. By following a concurrent and “learning by doing” approach, a balance can be achieved between the sequencing of capacity building policy reforms and investments.

Proposition 5: Devolution of authority for water and sanitation service delivery to the local level should always be accompanied by corresponding devolution of financial authority as well as the provision of technical and managerial support to build local capacity.

Decentralization of authority and responsibility to local institutions that lacks the requisite technical, managerial, or financial capacity and authority for planning and service delivery can have the effect of hindering, rather than accelerating, the expansion of sustainable services. Where feasible, partnerships with local businesses and NGOs can be used to help build capacity in local governments and move the service-expansion agenda forward. Civic organizations are also valuable resources for promoting accountability through facilitation of information dissemination and citizens’ exercise of voice and demand for services. Also important is the careful balance of authority between local institutions and the center—for example, with respect to setting standards and subsidy policies—such that the interests of low-income households are served. Central governments should take explicit measures to ensure that decentralization of service provision is not captured by local elites; it should rather create incentives for local governments to serve the poor.

There are strong links between local government reform and reforms in water supply and sanitation sectors. It may well be that the provision of water supply and sanitation services can be pivotal for strengthening local governments. An emphasis on service provision (Proposition 3) implies a greater focus on ongoing management which, in the water supply and sanitation sector, is often more effective when management is decentralized to the lowest appropriate level.

Proposition 6: Governments must recognize that the financial burden of serving the poor cannot be borne by the poor alone.

In most areas without access to service, the financial resources for meeting the MDGs must come from outside the communities concerned. Solidarity is absolutely necessary. Hence part of the additional funding must come from the people already served, using appropriate cross-subsidies; part may come from national solidarity, and a part from international donors. Nevertheless, even in the poorest communities, beneficiaries can contribute through various forms of in-kind

contributions. Such contributions engender a sense of ownership, better commitment to proper care and maintenance of provided facilities, demand of accountability from service providers, and enhanced prospects of sustainability of service.

Where there is low coverage, applying the principles of solidarity to expand revenues from existing consumers will be very difficult; hence the need to turn to other sources of investment to extend water supply and sanitation service delivery. In situations with higher coverage, cross-subsidies can be an important and feasible option for ensuring affordability to all. In general, subsidizing access (connections in network systems, for example) has proven to be a more transparent way of targeting the poor than subsidizing consumption.

Proposition 7: Governments and utilities must increase cash flows as a basis for attracting investments for expanding and maintaining services.

In many situations, consumers are willing to pay where they can hold providers accountable. Households and communities are capable of making responsible decisions about investments in sustainable water supply and sanitation and will pay for them if service providers can be held responsible and accountable for the quality of the service. Willingness to charge by governments and service providers is often the limiting factor for adequate revenue generation and resource mobilization, particularly in those countries where consumers currently pay only a fraction of the cost of services they receive.

Only service providers that generate sufficient cash flow can operate and maintain present systems properly and establish the credit worthiness necessary to attract investments for expanding services. Closing the revenue gap depends both on reducing costs and increasing revenues. Improving revenue collection from all consumers is a matter of survival for most service providers. In many cases, simply charging for what is delivered and collecting bills in a timely manner will substantially increase cash flow and credit worthiness. Governments must set an example by paying their own water bills.

The geographical unit for financial sustainability (municipality, province, country) needs to be defined. Pricing policy needs to be structured to meet social, technical and economic objectives.

Proposition 8: Sanitation must receive at least the same priority as water supply in planning, policy making, and budgeting.

“Water supply and sanitation,” occasionally joined by “hygiene,” are words that often appear together in speeches and pronouncements, and indeed this trio belongs together as a cornerstone of public health as well as social and economic well-being. Sanitation and hygiene, however, somehow disappear during the planning, policymaking, budgeting, and implementation phases, while the lion’s share of effort and resources are allocated to water supply. This reality reflects the often low political commitment to sanitation; low effective demand by users for sanitation; strong cultural and personal taboos against discussing human wastes and their disposal; the lack of an appropriate institutional home for sanitation; and the simple fact that expanding access to sanitation is often more costly and technically difficult than expanding water supply services. Given that many of the health and environmental benefits from improved sanitation accrue to the community at large, rather than to individual households, community institutions have a vested interest in expanding access to sanitation. They should be supported by sound national policies

that help to improve individual and public perception of such vested interests and, thereby, help overcome the constraints and push the sanitation agenda forward.

Financing for sanitation cannot be treated in the same way as financing for water supply. In many cases, basic sanitation deserves and will require government financing. Why? Because, as stated above, the private benefits from investments in basic sanitation services are low in comparison with the much higher public benefits from such investments (e.g. improvements in public health and environmental quality). As a result, perceived private benefits from basic sanitation are low; thus demand for such services and willingness on the part of households to pay for them are correspondingly low. This justifies subsidies for basic sanitation, especially for the poor in priority target areas. This is in contrast to water supply facilities at the household level, which have very high perceived private benefits to the users themselves, thereby triggering a greater willingness to pay and justifying appropriate cost recovery (from those who can afford it).

Proposition 9: The power of social marketing should be exploited, particularly with regard to expanding access to sanitation and promoting hygienic behaviors.

Achieving the MDG target for sanitation is as much a matter of unlocking demand at the household level as it is of increasing supply. Unlike water supply, where service improvements usually start at the public level with community institutions underpinned by national policy frameworks, sanitation coverage often starts at the private level and depends largely on investment and behavioral decisions made at the household level, often entirely outside of government. The challenge for policymakers and planners is learning how best to use public resources to influence these household decisions toward the public good.

The low demand for sanitation documented throughout the developing world is, in some cases, the result of a limited understanding of the links between sanitation, hygiene, and health, not only at the personal level, but also at the public level. In other cases, however, households with limited resources have simply prioritized other expenditures over improved sanitation. Education and social marketing, aimed at both individuals and public authorities, are thus keys to expanding access to sanitation services. Design of sanitation facilities must take into consideration effective marketing principles, including research for technology innovation and development that responds to user preferences, beliefs and practices; demand for different technical options; motivations for change; and capacity to maintain facilities in the long term. As in all sound marketing practice, sanitation promotion should take into account the distinct needs and preferences of different consumer groups, such as women and children.

Rather than continuing to pursue education campaigns focused exclusively on the private health benefits of improved sanitation and personal and environmental hygiene, innovative marketing strategies are needed that capitalize on basic human emotions such as pride, shame, privacy, convenience and competition. In addition, where culturally, technically and financially feasible, marketing campaigns might promote the use of human waste (excreta and urine) as resources to be harnessed for productive purposes (e.g., agriculture).

In virtually all cultures, marketing is most effective among younger populations. Hygiene education campaigns must prioritize schools, where students can be targeted both as beneficiaries and as agents of behavioral and attitudinal change within their families and their communities. Including hygiene education in curricula, along with the provision and

maintenance of improved sanitation facilities at school premises, are essential elements of marketing campaigns in schools.⁸¹

Proposition 10: A wide range of technological options and service levels should be made available in order to facilitate the provision of safe, reliable water supply and sanitation services.

Related to Proposition 3, it is important to maintain a focus on the objective of expanding access to adequate, reliable water supply and sanitation services, rather than insisting that particular technological options be provided to unserved households and communities. Allowing a broad choice set of technologies allows communities with limited capacity to install water and sanitation infrastructure that they want, are willing to pay for, and can maintain in the long term; it can also lower *per-capita* costs, thus permitting limited resources to bring service to more households. Hand pumps, improved wells, rainwater harvesting, installations using volunteer labor, community maintenance, and the promotion of small-scale independent service providers are examples of ‘lower-tech’ approaches that may be particularly relevant and cost-effective for many rural and peri-urban areas. In some urban settlements, small, locally operated water supply and sanitation systems may be less expensive to construct and maintain than large, centralized systems.⁸² Where restrictive technical standards impede these kinds of innovative solutions, they should be re-evaluated and, where feasible, made more flexible to allow for an array of appropriate technical options. A careful balance should be kept between the “maintainability” and reliability of technologies. In congested settlements and in areas where sullage volumes are high, the need for collection, treatment and disposal of wastewater, with or without excreta, becomes increasingly imperative. The use of compact sewage treatment facilities that can be used close to residential areas would make it possible to capture the advantages of decentralized sewerage systems.

Proposition 11: Monitoring and evaluation systems should focus on access to services, not on infrastructure in order to provide decision makers with a basis for their decision making.

Monitoring and assessment systems for access to water supply and sanitation services need to be active and adequately resourced from the sub-national to the international level. Equally important, following on Propositions 3 and 9, these systems need to employ valid and reliable measures of access to water supply and sanitation services. Historically, monitoring has focused on the presence or absence of particular water and sanitation infrastructure; information about the functioning, use, and reliability of systems was typically not collected. At this time,

⁸¹ In many parts of the world, it is imperative that separate facilities be provided for girls and boys, particularly when girls have begun menstruating. Without gender-specific facilities, many parents simply will not allow their girls to attend school.

⁸² In this “unbundling” of service provision, a city is divided into zones, each with its own independent water supply, wastewater collection, and treatment system. These smaller systems are often simpler to operate and cheaper to install and maintain, thus both reducing the “lumpiness” of investment and removing technological constraints to improved access. See Wright, Albert M 1997. “Toward a Strategic Sanitation Approach: Improving the Sustainability of Urban Sanitation in Developing Countries” UNDP-world Bank Water and Sanitation Program; page 21.

however, there exists the opportunity to improve and strengthen monitoring such that a more accurate picture of access to water and sanitation services can be obtained. More specifically:

- Access to services, rather than to infrastructure, should be at the center of monitoring efforts. At a minimum, monitoring should assess whether infrastructure is functioning and provides reliable service. The parameters that matter most to users—including the convenience, reliability, sustainability, and adequacy of water supply and sanitation services—should be measured over time. Equity of access (*e.g.*, by women and the poor) must be undertaken to assess the impacts of investments on different segments of society.
- Monitoring systems should employ a sample survey approach (in lieu of, or in addition to, self-reporting methodologies) such that policy and planning can be based on more objective and accurate information regarding access to water and sanitation services.
- Collected data should not only be analyzed and reported to national and international institutions, but should also be organized and shared in a user-friendly manner with NGOs, civic groups, and the public at large.

8-B. Propositions relating to the development and management of water as a resource to meet the MDGs as a whole⁸³

The Task Force has six additional propositions that aim at meeting Target 10 and promoting sound water development and management in support of the MDGs as a whole. The first four are for action at the national level, while the last two are for action at the global level.

Proposition 12: The vision of Integrated Water Resources Management needs to be translated into tailored solutions to specific countries as a base for achieving the MDGs as a whole.

Integrated Water Resources Management (IWRM) is an approach to 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. Its salient features, as enshrined in the “Dublin Principles”, are applicable not only to the management of water as a resource, but also to its utilization for such purposes as domestic water supply and sanitation, irrigation, power generation and environmental sustainability. Water and its coordinated development, management and use, including investments in water infrastructure, is a crucial pre-requisite for achieving the MDGs as a whole, especially those related to reducing poverty and hunger, improving environmental sustainability and health conditions and making progress toward gender equality.

A target was set in Johannesburg requiring countries to have formulated IWRM plans by 2005. The 2005 target was loosely defined in the World Summit on Sustainable Development (WSSD) Plan of Implementation and needs to be clarified. Noting that IWRM is an ongoing process, the Task Force suggests that a realistic approach is to seek to ensure that an IWRM process is begun

⁸³ A thorough analysis of the actions relating to the development and management of water as a resource to meet the MDGs as a whole is currently being carried out in collaboration with the Task Forces on Hunger, Poverty and Environment through the “Synergy Initiative”. The results of this analysis will be included in the final Task Force Report.

by 2005 in all countries with an appropriate institutional responsibility in place. . Importantly, IWRM processes need to give attention to development as well as management issues, recognizing the key role of investment in infrastructure and the vast deficiencies in infrastructure endowments in the poorest countries most at risk of failing to achieve the MDGs.

The MDGs are intrinsically interlinked. Most water interventions impact on the achievement of more than one MDG, and approaches that fully exploit the potential for synergies need to be promoted. For instance, using wastewater to fertilize and water crops can advance Target 10, the poverty goal, and the hunger goal, as can landless pump programs, such as those introduced by Proshika and the Grameen Bank in Bangladesh. Supplying water to households for drinking and for productive purposes, such as home gardens, can advance the poverty goal as well as help achieve Target 10. And school lunch programs, combined with latrines and hygiene education, can help advance the education, gender, hunger and water supply and sanitation goals simultaneously.

Proposition 13: Countries need to develop national development planning and budgeting processes that focus on achieving the MDGs.

The Task force has noted that current development planning and budgetary processes in many developing countries are not yet aligned with the achievement of the MDGs. There seems in many cases to be a contradiction between the aspirations of the MDGs and the planning and budgeting process. Poverty Reduction Strategy Papers (PRSPs) and Medium Term Expenditure Frameworks (MTEFs) provide a useful framework for prioritization and resource allocation in IDA countries, though a review of the system as a whole would appear to be timely.

There is often an inherent tension in the PRSP process: should countries outline in a serious way what it would *truly take* to meet the MDGs or should they outline what they believe they can achieve *within likely levels of development assistance*? For the poorest countries most off-track for meeting the MDGs, it would appear to be crucial to make transparently clear the gap between what they could achieve with likely levels of development assistance and what they really need in order to achieve their goals.

At the same time, until developing countries see concrete signs that donor countries are taking the Monterrey commitments seriously and are willing to go beyond current levels of assistance, there is reluctance to take a more optimistic approach. Preparing PRSPs⁸⁵ that show both what could be achieved with likely assistance amounts and the “upreach” required to meet the MDGs could offer an effective compromise. The UN Common Country Assessment – a key national-level planning instrument for the entire UN system – should also look realistically at needs in the sector in light of the MDGs.

In terms of national-level budgeting processes, countries need to ensure sustainable financing when making investments in the sector: no system should be built unless it is known how it will

⁸⁴ In contrast, the desire for positive health impacts could influence the design of dam spillways such that conditions favorable to the breeding of the vectors for river blindness are eliminated, as happened in a tail-water power scheme on the Volta River in Ghana.

⁸⁵ A pre-requisite, of course, is that PRSPs should be fully developed and owned by the countries concerned. This requires capacity building.

be financed - not just the initial capital investment, but also the costs of operation and maintenance. While this principle may seem obvious, its application may be one reason why more progress is not made towards the achievement of the MDGs since in many countries, the availability of funds (at household and national level) is not adequate for operations and maintenance and, in the absence of other sources, governments are reluctant to commit the investments required.

A credible arrangement for the sustainable flow of funds to cover operating expenditure is therefore essential: payment for services by those who can afford them is a crucial element of any system to create a stable operating framework and to contribute to subsidizing service to those who cannot pay. Where the needs of the poor are not being met because available public resources are being captured by the rich and powerful, appropriate reforms will be required.

Budgeting processes also need to be transparent. Governments need to prepare budgets with proper discipline, and allocations towards the water sector from national resources. Reduction of corruption at all levels, including in the donor organizations and international agencies, is key.

Priority should be given to ensuring cost-effectiveness and efficiency in the use of scarce public resources. In this regard, it is critical that existing systems are maintained. Community-based and micro-financing may be a starting point, building a domestic financing system in the process. Governments can also develop financial models for support to non-governmental and community-based organizations, which can often deliver services at lower costs. However, in many communities and countries there are simply not sufficient financial resources to meet basic needs for water supply and sanitation services without action that improves local incomes and/or increased external financial assistance.

Proposition 14: Countries need to incorporate analysis of gender and water into policy recommendations and programme design in all areas of water resources management and development.

The involvement of both women and men in water supply and sanitation services provision and integrated water resources initiatives increases project effectiveness. 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. In addition, 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.

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, 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; and gender biases within public institutions working on water resources.

Proposition 15: Innovations in both hardware and software should be promoted in strategic areas.

In the area of water and sanitation, there are many proven technologies that have already been adopted and a great deal of energy and resources has gone into their development. Nevertheless, technological advances as well as innovation in institutional and financial mechanisms are still needed in key areas. Examples include:

- Robust and cost-effective techniques to use saline water for both agriculture and domestic use, which will greatly expand the availability of the resource.
- Technologies aimed at advancing the achievement of multiple MDGs, including in particular efforts to improve “crop per drop”, which help advance progress towards the hunger goal while at the same time reducing demands on scarce water resources.
- Appropriate technologies and technical standards for basic sanitation, sewerage and sewage treatment. Many developing countries have been using technologies, design approaches and technical standards that are inapplicable to their conditions. For example, they have been using technologies like activated sludge treatment processes that are far more complex than trickling filters and waste stabilization ponds. Lower-cost technologies that are technically simple and cheaper to operate and maintain need to be developed. Many developing countries are also using standards for conventional sewerage developed over a century ago. These standards do not reflect advances in hydraulics or in developments in such areas as sewer cleansing technologies and result in unduly high costs for installing water-borne sewerage and more appropriate guidelines for the design of sewerage and sewage treatment plants are needed.
- Effective, affordable and simple to operate sewage treatment plants that can be located close to residential areas to enable the “unbundling” or decentralization of sewerage systems in large cities.
- Innovation in drainage and solid waste disposal in parallel with improvements in access to basic sanitation. There is a great need from the perspectives of municipal and local governments to address the drainage and solid waste disposal problems they face. Feasible approaches to the planning and incremental implementation of programs for the broader range of sanitation services in response to effective demand and financial capacities of governments are greatly needed.
- Urban wastewater management in large urban agglomerations. Beyond the household and neighborhood levels, the largest unsolved financing problem is the expansion of wastewater treatment to serve large urban areas and protect the surrounding environment. Currently, only a small fraction of wastewater in cities in developing countries is treated but urban wastewater treatment, is much more expensive than simple access to safe water and household sanitation. A long-term strategy for urban wastewater management in the large urban agglomerations in the developing world is a high priority⁸⁶.

Since many national, regional and international institutions are engaged in various dimensions of technological innovation in water and sanitation, there would be benefit in creating an

⁸⁶ In fact, many cities in the industrialized world that have neglected maintaining their systems could benefit from such innovative approaches and strategies.

“international strategy forum” to prioritize work on the key technical obstacles to meeting the goals⁸⁷. Several existing institutions would appear to be well placed to act as a vehicle for such a forum.

8-C. Propositions for supportive actions at the international level

The Task Force has two additional propositions addressing the essential components of supportive actions needed at international levels to achieve the MDGs, as outlined below. Both are relevant to the achievement of Target 10 as well as to the management of water as a resource for the achievement of the MDGs as a whole.

Proposition 16: Official development assistance (ODA) for water and sanitation must be fully aligned towards the achievement of the MDGs, and countries doing the right things should not be unduly constrained by the lack of financial resources.

This proposition implies using a program approach, targeting the poor, and employing innovative financing mechanisms. It means ensuring that the poorest countries that cannot meet the MDGs with their own domestic resources get the additional financing that they need to meet the goals. It means increasing not only the quantity but also the quality of development assistance⁸⁸. And it means that no successful program or project should be stopped because of lack of external funding.

Countries with the lowest levels of human development and that have made the least progress over the past ten years are stuck in poverty traps, bypassed by economic development because of structural impediments like geography, climate, the burden of disease, rapid population growth, heavy debt burdens, dependence upon primary commodity exports, and the inequities of the global current trade regime. For these countries, all the governance reforms, enabling policy environments and social mobilization efforts in the world will not address the fact that domestic resources are simply inadequate to support a meaningful expansion of water supply and sanitation services. Without a significant expansion in ODA levels, these countries simply cannot meet the goals. This point is illustrated by the fact that South Africa’s success in significantly increasing access to water supply and sanitation was only possible because of the significant additional resources that were made available as result of cross-subsidies.

A recent OECD/DAC⁸⁹ report showed that only 12% of the total aid to the water sector in 2000-2001 went to countries where less than 60% of population has access to an improved water source (which includes most of the LDCs), and that aid in the water sector is concentrated in certain countries -- with the 10 largest recipients receiving 48% of total for period 1997 –2001. One implication therefore is that donor countries should focus their efforts in regions and countries where the needs are the greatest – i.e., in Africa and Asia. For the 60 or so poorer and least developed countries, more programme aid in the short and medium-term will be essential,

⁸⁷ The need for such innovation was one of the major points made by the World Commission on Water in its report of March 2000. Noting that innovation requires incubation, they recommended the creation of an innovation fund that would help promote environmentally and socially desirable technical and institutional innovations.

⁸⁸ One dimension of the quality of development assistance relates to the need for donors to be committed for the long-term. In particular, donors should not discontinue support for projects without assurance that other sources of sustainable financing are in place.

⁸⁹ Organization for Economic Co-operation and Development/Development Assistance Committee

from the main international and donor agencies, from the regional development banks, and from bilaterals. Here the challenge is not only an increase in the quantity of aid, but also some substantial speeding up of the process for making aid available and some simplifications in the procedures, which too often at present make obtaining aid a nightmare of negotiation, multiple administration and management systems and resultant delays.

A related issue is that official aid for the sector should be used more efficiently and in a more coordinated manner, including harmonization of procedures and joint projects. The evaluation of the Water Supply and Sanitation decade at the end of the 1980s already showed that donors do not often coordinate and in fact frequently compete. A recent OECD/DAC report shows that aid for water sector has declined since the middle of the 1990s, and funding is more and more dispersed (more donors giving lesser sums of money).

One means to address the issues of inadequate financial resources, poor donor coordination and shifting priorities and provide adequate, sustained financial and technical support for the achievement of the water and sanitation MDGs would be through regional-level multilateral donor mechanisms. Regional Water and Sanitation Facilities could provide funds for both sector investment and capacity building in the poorest countries. Just such a facility – the African Water Facility – is at an advanced stage of development, and will be hosted within the African Development Bank. While a “copy-cat” approach in other regions that have very different international dynamics should be avoided, countries in other regions might take the lead in calling for mechanisms for funding investments and capacity building that meet their needs. Some characteristics of the African Water Facility would seem to provide useful pointers for similar facilities elsewhere -- including being housed in a regional bank with UN Regional Office support and liaison, access on a self-selection basis, and use of a “learning by doing” approach -- combining capacity building, reforms, and investments towards the achievement of the MDGs for water and sanitation.

To ensure inclusion of and priority for the poor, the vulnerable and the remote in improved services, ODA should be targeted within countries to programs that benefit the poorest. Subsidies should focus on access rather than consumption and should help to “crowd in” community and private resources through output-based-aid-type mechanisms. Projects that will primarily serve the middle and upper income groups should be excluded from ODA but countries should be assisted to develop mechanisms through which they can pay the cost of their services both through improving the management of public utilities and by supporting the development of local financial markets.

Countries other than those discussed above will themselves need to mobilize the bulk of resources, mostly from public resources, though in a few cases local or international private sector funding may be forthcoming. The ability of countries to mobilize such funding depends enormously on the extent to which their economies achieve dynamic growth – itself requiring a diversity of international support far beyond anything at present available in trade, debt relief and aid.

Since focusing on where the needs are greatest will often imply working in countries with inadequate policy structures relating to water and sanitation, development assistance will need to simultaneously tackle reforms and investment. Actions to enhance institutional capacity and policy reforms and funding for infrastructure should come together as a package rather than the

latter being predicated on the successful completion of the former – ODA must support the “learning-by-doing” approach rather than insisting upon a sequential, conditional approach. Allowing reforms and investments to take place simultaneously will help address the tension between the desire to have reforms in place before investments and meet the MDGs by the deadline of 2015. This parallel approach could be made contingent upon a credible program of investments and a commitment (at the highest level) to reforms simultaneously.

The bottom line in terms of increased international assistance to the poorest countries is that two things are required: a realistic assessment in each country of what is truly required to meet Target 10; and the willingness on the part of donors to then allocate the necessary funds. In the water sector, donors and developing countries alike have become accustomed to identifying what can be done *within the confines of existing aid allocations*. To meet the goals, this process must be turned on its head, with identification of needs and demands coming first and appropriate allocations being made second.

In sum, therefore:

- Donor countries must meet their side of the Monterrey compact to provide official development assistance, thus expanding aid for investments in water and sanitation as well as other critical sectors.
- Donors must increase efficiency of aid through better coordination
- Official Development Assistance must be channeled to places where the potential for impact on the MDGs is highest.
- Countries that need additional resources to meet the MDGs related to water and sanitation need to make sure that demand for investments in these sectors is effectively expressed, so as to overcome the current apparent mismatch between supply and demand.

Proposition 17: There is a need to revamp the global institutional structures for supporting water resources and sanitation issues.

If the MDGs are to be reached, the way in which the international community is supporting work in the area of water services and sanitation must be improved and aligned around the MDGs. This international community includes the UN system, the larger multi-lateral development system including the Development Finance Institutions as well as bilateral donors and broader organizations of civil society.

The critical international need is to strengthen focus on and commitment to the MDGs among all the key international actors – the UN agencies themselves, the major bilateral donors, international NGOs, regional organizations and the private sector. There are a number of steps that should be taken toward this end.

On the **institutional arrangements within the UN system**, the Task Force recognizes that, within this system, a large number of agencies are involved in water resources and sanitation without there being an official “lead agency” (as, say, FAO is for agriculture and WHO is for health). In 2000 the UN agencies took an important step towards system coordination by launching the World Water Assessment Program, whose World Water Development Report (WWDR), the first of which was issued in March of this year, is playing an important role in

presenting a clear picture of the state of the world's water every three years. A more recent but equally significant development has been the establishment, by the United Nations System Chief Executive Board for Coordination (CEB), of UN-Water as the inter-agency mechanism for follow-up of the WSSD water related decisions and the MDGs concerning freshwater, and CEB's request to UN-Water to prepare its terms of reference and modalities of work, including arrangements for progressive and effective participation of non-UN actors.

Given these developments, the Task Force believes that the time is right for the UN system to take steps to adequately gear itself towards a sharp and strong focus on the MDG water goals. While the Task Force does not advocate the creation of a new "water" agency, it proposes that four specific steps be explored:

- The agencies that are a part of UN-Water might develop a game plan for sustainable support for the MDG water goals that replicates the United Nations' overall four-pronged strategy for helping the international community as a whole reach the Millennium Development Goals, and which includes (1) the MDG reporting processes, which focuses on the question "where do we stand?", (2) activities to mobilize political support for the Millennium Declaration, (3) operational support through national-level activities to help individual countries implement policies necessary for achieving the Millennium Development Goals, and (4) substantive analyses, which addresses the question "what will it take?".
- In the same vein, the terms of reference of UN-Water, now being drafted, might include specific reference to the measures that will be taken by UN agencies (with the assistance of non-UN actors) to (1) report on progress towards the goals, (2) mobilize political support, (3) provide operational support, and (4) undertake substantive analyses.
- To address the need to give strategic direction to individual member agencies and to hold them accountable for their performance, an informal group of senior officials able to commit their agencies might be created. One example that comes to mind is the Task Force on Child Survival, which drove the immunization campaign globally and then disbanded when its task was accomplished.
- Under the direction of UN-Water, the World Water Development Report might be considered as a mechanism for periodically reporting on progress made in the area of water resources development and management towards achieving the MDGs as a whole, complementing the role that the Joint Monitoring Programme (JMP) is currently playing as the official monitoring mechanism for the MDG targets on domestic water supply and sanitation services. The publishing of the WDDR in 2006, 2009, 2012 and 2015 would provide an ideal series of time-checks along the road to 2015.

There is also a need to enhance **monitoring and assessment** at the global level. As noted earlier, the Task Force believes that monitoring needs to be improved at national and sub-national levels. But there is a global and regional dimension to monitoring, too, since achievement of the MDGs is a global commitment.

One issue that requires analysis relates to the Joint Monitoring Programme (JMP), which has largely been funded by its two lead agencies, UNICEF and WHO, and whose mandate appears difficult to achieve given its limited resources. There is a clear need to strengthen the JMP as the

key global mechanism for monitoring access to water supply and sanitation, and to provide it with the substantial resources necessary to enable it to do its job effectively and truly monitor progress toward the MDGs on Water Supply and Sanitation. Some important principles here include:

- The focus must change from measuring infrastructure provision to measuring sustainable access to safe and adequate services, and from collecting provider system data to collecting data on actual service delivery according to agreed norms.
- National strategies and monitoring indicators should be respected; but to promote comparability of data, a few common parameters that can be readily measured at the household level should be identified and tested by the JMP for use in collecting standardized household data on access to safe water supply and basic sanitation.
- Access should be monitored at both national and sub-national levels, using sample survey techniques to complement quantitative national statistics of infrastructure provision.
- The JMP should promote a stakeholder approach, encouraging national governments to cooperate with local as well as international civil society agencies, including representatives of user groups.
- The JMP should play a more active role in promoting capacity building for monitoring purposes at national and sub-national levels.
- The JMP and national governments must adhere to agreed programs for the publication of monitoring data in a consistent format at national and international levels; reports should be publicly available to promote transparency.

A second issue, which is broader and more far-reaching and on which the Task Force has reflected at length, relates to the ways in which the international community might achieve high-level strategic focus that is not trapped by institutional interests. How can the key stakeholders -- the world leaders who pledged to the MDGs -- ensure that their agenda is faithfully taken forward by those working in the implementing institutions, and is not hijacked by institutional interests?

At least three factors suggest that a group that could stand a little back from existing organizations and consider the effectiveness of their programs would be helpful in advancing progress toward the MDGs:

- In the existing international institutions, both within the UN system and beyond, there is weak oversight and accountability, and the institutions themselves tend to set, implement and evaluate their own agendas.
- Virtually all existing recurring reports on water concentrate on “what the world should be doing” or “what my institution is accomplishing in this area”. There is little or no sustained high-level attention to questions such as “What has to happen for there to be real change?” “Is it happening or not?”, and “If not, why not?” A periodic, focused, high-profile report that would eschew advocacy in favor of pointed and focused recommendations would, at a minimum, be useful to the world leaders who pledged to the MDGs, to the senior officials trying to sway other senior officials, and to those who try to shape government policy at all levels.
- Although bodies such as the JMP and the World Development Report are concerned with monitoring progress towards the outputs for the water targets, there is no

mechanism for monitoring inputs – not only support from external donors and international financial institutions as is done by OECD, but also commitments for investments and financial, institutional and policy reforms at national and sub-national levels. A way of interpreting output results in the light of such inputs would fill an important need, as well as help sustain international commitment to the MDGs and to the water targets in particular.

At the same time, there are a number of factors that point in the direction of caution and suggest that the establishment of an independent group should be examined with great care. These include, for example:

- Given the inherently political nature of the water resources and sanitation sector, is it indeed possible to achieve the needed independence of such a group in practice?
- Since the time and effort involved in the establishment of any such group might be considerable, would it not be preferable to direct such resources to in-country action rather than to global oversight, especially since water is not a global commodity but a very local one?⁹⁰
- Could the establishment of such a group point to the need for other MDGs to have their own monitoring mechanisms, and thus lead to an inappropriate proliferation of such institutions?
- Would the establishment of a new group be a disservice to existing output monitoring mechanisms such as the JMP, and would it therefore not be preferable to focus on strengthening existing mechanisms instead?

Against this background, the Task Force welcomes the recent bold decision of the United Nations Secretary General to establish a “Panel of Eminent Persons” on Water and Sanitation. Given that this decision has been taken, the task at hand now is to ensure that the Panel is designed in such a way as to address the needs and concerns identified above. Two issues are clearly crucial – what the Panel should do, and how it should do it.

On the functions of the Panel, the Task Force is of the view that the Panel should focus on assessing progress in the attainment of the water and sanitation target and giving strategic direction. It should identify where there are blockages to progress and make recommendations for overcoming them as well as give credit to those who are progressing well. Areas of attention might include:

- Assessing policies and actions in the water and sanitation sectors and advising the international community and individual governments, especially those having difficulty in reaching the MDGs;
- Assessing not only level of access but also inputs being made in terms of financing by governments, the donor community and IFIs and the appropriateness of policy implementation in individual countries;

⁹⁰ Note, however, that regional or global monitoring promotes peer pressure on performance by Governments.

- Assessing the quality of data and statistics and the capacity to monitor policies and actions in the water and sanitation sectors, as well as the adequacy of monitoring systems, and make recommendations for their improvement;
- Identifying gaps in current national and international actions for the sustainable use of the world's water resources to meet the MDGs as a whole. A Panel that focused on the broader issue of water development and management to meet the MDGs as a whole would be more useful than one focused only on Target #10, and help address any possible implication that every MDG target should have its corresponding Panel.

Given the high-level nature of the Panel and the desired seniority of its members, the Terms of Reference for the Panel should not be tendentiously specific. Rather, the group should be able to concentrate on a few issues and recommendations that could really help move things forward.

On how to structure the work of the Panel, the Task Force believes it important for the Panel to draw upon the monitoring reports, assessments and major findings of key existing bodies, including in particular the reports by UN-Water and the Joint Monitoring Programme (JMP). The Panel should have some independent means to undertake analytical work necessary for the proper discharge of its functions and to obtain independent technical support. Importantly, the Panel will need to have sufficient understanding of the underlying issues to enable it to assess what is presented by the various agencies concerned but with sufficient distance from the key actors to ensure independence of thought and action.

Clearly, maximizing the ability of the group to think and act independently lies at the heart of many of the above structural recommendations and will need considerable attention. Additional measures might include limiting the terms of office of the members of the panel. Funding for the operations of the Panel, the Secretariat and technical support should preferably be obtained from outside the UN system. Given the need for accountability and avoidance of conflict of interest, the Panel should not be advised by bodies that may be involved in defending their performance (though it should receive information from such bodies). Importantly, though the Panel should report to the Secretary General, it should not be viewed as a United Nations body and should not in any way be impaired in its ability to comment freely on UN functions.

Finally, attention will also need to be devoted to ensuring that the group does not fall into any of the “traps” that might limit its effectiveness or that of other key components of the international system. In particular, it will be important to ensure that the establishment of the group does not lead in any way to a reduction of attention and resources to in-country action, but rather to do precisely the reverse. It should not lead to any weakening of existing monitoring mechanisms such as the JMP, but rather to their strengthening. It should not be viewed as a permanent body, but rather be created for a fixed term and cease to exist when its purpose has been accomplished. And it should not encourage a top-down view of the world, but rather provide a forum where in-country forces and external support groups, governmental decision makers and civil society can come together to recognize the reality of the problems on the ground and help achieve workable solutions.

CHAPTER 9: THE WAY FORWARD -- WHO NEEDS TO DO WHAT?

It is clear from the preceding Chapter that achieving the MDG targets by 2015, especially in the poorest countries, will take a combination of strong national action complemented and supported by international action. Given that there are just 11 years to the year 2015, efforts will have to proceed simultaneously on several fronts by a variety of actors -- communities, governments, water and aid professionals and other stakeholders -- many of which may need to make radical changes in the way in which they are currently working. A first cut at a list of key actors and corresponding responsibilities, based on the actions inherent in the 17 propositions of Chapter 8, is outlined below. This first cut at a list should be considered very preliminary and will be substantially revised through further analysis and discussion during 2004. As appropriate, suggested timelines will also be provided.

National governments (including sector agencies) in developing countries should:

- For countries particularly at risk of not meeting the MDGs for water and sanitation, prepare PRSPs that document both what can be achieved with likely assistance amounts, as well as the additional resources that would be required to meet the MDGs.
- Ensure that an IWRM process is begun by 2005.
- Promote interventions that aim at the achievement of more than one MDG at once.
- Ensure sustainable financing when making investments in the sector.
- When allocating resources to national-level initiatives or decentralizing water supply and sanitation services delivery to local authorities, ensure that funds for both infrastructure and capacity building (*e.g.*, for planning, operation, and maintenance) are provided in one package.
- Take measures to increase accountability of service providers to consumers, such as the reform of civil-service legislation and limiting political interference in planning, construction, and O&M.
- Establish and provide resources for credible regulatory institutions.
- Establish minimum national standards for water and sanitation services that focus on end goals (*e.g.*, safe removal of excreta) rather than on specific technologies.
- Undertake policy reforms that improve the financial standing of utilities, such as “ring fencing” revenues for operations and maintenance, and the establishment of cost-recovering tariff structures.
- Ensure that cost-recovery efforts do not limit access to water and sanitation services by the poor, acknowledging at the outset that subsidies will be required for the poorest households.
- End the practice of subsidizing water supply and sanitation services to the non-poor.
- Where feasible (*e.g.*, in medium income countries), develop systems for cross-subsidies in water and sanitation services whereby wealthy households cover both their own costs and the costs of service provision to the poor.
- Create a national-level “institutional home” for the issue of sanitation, be it a ministry of its own or a department within another ministry (*e.g.*, water or health). This

sanitation institution should set national standards, support implementing bodies, and hold local governments accountable for results. It should also create a national-level plan to guide policy-making and goal-setting for sanitation.

- Ensure that sanitation goals and budgetary allocations are a part of major national development exercises, such as the PRSPs and the national strategies for sustainable development.
- Adopt innovative approaches to creating demand for sanitation, *e.g.*, marketing, technology development, and subsidy programs.
- Promote and finance research and development that fosters innovations in both hardware and ‘software’ aspects of water management and water and sanitation service delivery.
- Learn more about the characteristics of households that lack access to water supply and sanitation services such that obstacles to expanding access are understood and relevant financial, policy, and planning instruments are devised to respond.
- Incorporate gender considerations into policy recommendations and program design.
- Address any gender biases within their institutions.
- Take measures to reduce corruption at all levels, whether in donor organizations, international agencies or companies, or public, private, or civic institutions in developing countries.

Sub-national governments in developing countries should:

- Take measures to increase accountability of service providers to consumers, such as supporting the reform of civil-service legislation; limiting political interference in planning, construction, and O&M; and establishing partnerships with civic organizations.
- Identify and implement strategies to address the challenge of extending water supply and sanitation services to unregularized settlements.
- Support policy reforms that improve the financial standing of utilities, such as “ring fencing” revenues for operations and maintenance, and the establishment of cost-recovering tariff structures.
- Establish and provide resources for credible regulatory institutions at the regional and local level.
- Establish minimum regional and/or local standards for water and sanitation services that focus on end goals (*e.g.*, safe removal of excreta) rather than on specific technologies.
- Promote and finance research and development that fosters innovations in both hardware and ‘software’ aspects of water management and water and sanitation service delivery.
- Learn more about the characteristics of households that lack access to water supply and sanitation services so that obstacles to expanding access are understood and relevant financial, policy, and planning instruments are devised to respond.
- Adopt innovative approaches to creating demand for sanitation, *e.g.*, marketing, technology development, and subsidy programs. Provide improved water supply and sanitation services on school premises.

- Address any gender biases within their institutions.
- Take measures to reduce corruption at all levels, whether in donor organizations, international agencies or companies, or public, private, or civic institutions in developing countries.

Service providers should:

- Develop credible arrangements for the sustainable flow of funds to cover operating and maintenance expenditures, including payment for services by those who can afford them.
- Improve pay scales and incentive structures to attract and retain qualified technical and managerial staff.
- Restructure professional incentives to reward good performance in operations and maintenance, as well as service extensions to low-income communities.
- Establish water supply and sanitation connection fee financing programs for customers.
- Develop customer outreach programs and protocols that target low-income households.
- Involve both women and men in water supply and sanitation services provision and integrated water resources management initiatives.
- Where feasible, pursue collaboration between domestic and agricultural water-use agencies for projects that utilize urban wastewater for agriculture, and combine irrigation with domestic water supply planning.
- Take measures to reduce corruption at all levels, whether in donor organizations, international agencies and companies, or public, private, or civic institutions in developing countries.
- Address any gender biases within their institutions.

Civic organizations such as schools, local NGOs, and community associations should:

- Partner with service providers in projects to provide or improve services to poor communities.
- Collaborate with government and the private sector in developing new appropriate and affordable technologies, particularly for sanitation.
- Participate in public meetings, hearings, and other events related to public-service delivery to advocate for policies and programs that will improve water supply and sanitation services to the poor.
- Conduct “sanitation audits” (similar to the “gender audits” used by women’s rights advocates) to draw attention to expenditure gaps and to hold decision-makers and politicians accountable for their commitments.
- Provide improved water supply and sanitation services on school premises, with separate facilities for girls and boys. Include hygiene education in school curricula.
- Use the issue of water supply and sanitation services as an entry point for promoting women’s empowerment. Promote women’s involvement in community management of water supplies.

National and international research and development organizations and systems should:

- Better document the economic benefits of improved water and sanitation services.
- Increase research and development on technologies aimed at meeting several MDGs simultaneously (*e.g.*, addressing Target 10 and hunger goals through the development of techniques to use saline water for both agriculture and domestic purposes).
- Foster research and development of appropriate, affordable sanitation technologies. Develop appropriate technical standards for sewerage and sewage treatment.
- Conduct research and disseminate findings on effective strategies for providing sustainable water supply and sanitation services in persistently challenging settings (*e.g.*, unregularized urban communities, small towns, poor rural villages).
- Review the possibility of creating a new “international strategy forum” to prioritize work on the key obstacles to meeting the water and sanitation MDGs.

Bi- and multilateral development agencies, regional development banks, and donor agencies and countries should:

- Significantly expand current ODA in the sector to levels commensurate with the costs of attaining the MDG water and sanitation target.
- Reorient the approach to ODA such that needs are identified first, followed by the development of strategies to secure the resources necessary to meet them.
- Promote interventions that aim at the achievement of more than one MDG at once.
- Substantially accelerate the process for making aid available, and simplify the procedures for allocating aid.
- Use ODA to simultaneously tackle reforms and investment, thereby enhancing institutional capacity and policy reforms while also installing infrastructure and expanding services.
- Redirect ODA within countries toward programs that benefit the poorest, that focus on basic access, and that help “crowd in” community and private resources by using output-based-aid-type mechanisms.
- Assist countries to develop mechanisms through which they can pay the cost of services (*e.g.*, improving management of public utilities, supporting development of local financial markets).
- Strengthen the JMP as the key global mechanism for monitoring access to water and sanitation, and provide it with the resources needed for the job.
- Expand monitoring efforts to include information on what actions the international community has taken to help meet the MDGs, as well as on the impacts of those activities.
- Consider the creation of new, regional-level multilateral donor mechanisms along the lines of the African Water Facility.
- Promote and finance research and development that fosters innovations in both hardware and ‘software’ aspects of water management and W&S service delivery.

- Ensure that sanitation goals and budgetary allocations are a part of major national development exercises, such as the PRSPs and the national strategies for sustainable development.
- Review and address any gender biases within their institutions, policies and programs.
- Take measures to reduce corruption at all levels, whether in donor organizations, international agencies, or public, private, or civic institutions in developing countries.

The United Nations system should:

- Review the UN Common Country Assessment to look realistically at needs in the water and sanitation sector in light of the MDGs.
- Move ahead carefully yet expeditiously on the establishment of an independent Panel on Water and Sanitation as a means for the international community to achieve high-level strategic focus.
- Explore a range of mechanisms to align its work in water resources and sanitation around the UN's overall four-fold strategy for reaching the MDGs.

Advocacy organizations should:

- Draw attention to the deficits in coverage and quality of water supply and sanitation services through public statements, articles, and events.
- Conduct “sanitation audits” to draw attention to expenditure gaps and hold decision-makers and politicians accountable for their commitments.
- Reach out to other organizations in order to build action-oriented coalitions.
- Package and disseminate information collection in national and international monitoring efforts such that it is easily accessible by community organizations, the media, and the general public.
- Explore ways to use the new UN ECOSOC affirmation of the Right to Water to influence national policy on water and sanitation.
- Engage popular figures (*e.g.*, from the world of sports and entertainment) to act as champions of water and sanitation issues.

ANNEX 1. MILLENNIUM PROJECT TASK FORCE ON WATER AND SANITATION

Note: Nationalities of task force members (other than international civil servants) are indicated in brackets

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ANNEX 2. INSIGHTS FROM CASE STUDIES

This Annex briefly describes some case studies that have been mentioned in the Report to guide the formulation of strategies for pursuing the targets. These case studies have been selected to demonstrate a variety of approaches that appear to be working. They include community management of rural water and sanitation projects, improving service for the urban poor, and increasing urban coverage for both the poor and the non-poor. We will, however, start with a case that shows what is being done to reach the water target.

Turning the “Right to Water” into a Reality: The South African Experience⁹¹

This case study illustrates the importance of political will in introducing a radical policy and sector reform that led to the adoption of a policy of free access to basic water supply, thereby helping South Africa to make rapid progress towards the MDG Target for water.

In 1994, 15.2 million out of South Africa’s population of 40 million lacked access to basic water supply (i.e. 25 liters per person per day of water of acceptable quality within 200 meters from home). Of these, 12 million lived in rural areas. In addition, 20.5 million lacked access to basic sanitation (defined in South Africa as a ventilated improved pit latrine or its equivalent). South Africa has used a combination of instruments to turn things around. These include introduction of policy reform with an accompanying legislative framework; devolution of responsibility for water supply and sanitation from the national level to the local government level, using community-based approaches; launching of a capital works program which has provided infrastructure to meet the needs of over seven million people; and the introduction of free access to basic water supply through which water has been provided for some 27 million people by July 1, 2002. As a result of all this, South Africa hopes that within seven more years all in South Africa would have access to basic water supply.

This remarkable success in increasing access to basic water supply has been underpinned by a strong political leadership and support from the national government which made it possible to devote so much funds to support the capital works program and the free basic water policy. An important contributory factor has been the existence of a very substantial institutional and technical capacity that was already in place before 1994. The existence of an appropriate institutional framework facilitated the introduction of legislation needed for the program. The policy of free access to basic water was made possible by the level of economic development in South Africa. This is not necessarily applicable to less developed countries unless they benefit from new and creative concessional funding from external sources.

⁹¹ Drawn from the “Blue Gold” series on African experience in water and sanitation, World Bank Water and Sanitation Program, 2002

From Central to Local Government and Community-based Approach to Rural Water Supply: The Experience in Ghana⁹²

This case study involved a shift from a supply-driven central government approach to a demand-driven approach to rural water supply and sanitation. It also involved a shift in the role of central government, from that of an implementer to that of a facilitator, with greater involvement of the private sector, thereby introducing competition with consequent improvement in performance and reduction in the cost of service provision.

It all started in 1990. Up to that time, one national public authority, the Ghana Water and Sewerage Corporation (GWSC), was responsible for water and sewerage services for both urban and rural areas throughout Ghana. During that period, most rural communities were served by boreholes equipped with hand pumps. The boreholes were drilled by the GWSC, donors or NGOs that also maintained them. There was only one private drilling company. The drilling market was characterized by lack of competition. As a result, the average cost of boreholes in Ghana was \$9,000 compared to \$3,000 in the UK or the USA. Mobile crews were responsible for the maintenance. In the circumstances, only about 40 percent of hand-pumps worked at any time. There was no sense of ownership by the communities that were served by hand-pumps. So when hand-pumps broke down, they simply waited for them to be repaired when the mobile repair crew reached their communities. The situation was no better for piped systems that suffered long periods of supply interruptions due to breakdowns and maintenance neglect.

Beginning from the late 1980s, a number of institutional and policy reforms were introduced. New legislation was introduced under which the GWSC was replaced by the Ghana Water Company limited (with responsibility for urban water supply) and the Community Water and Sanitation Agency (with responsibility for rural water and sanitation services). A new national water and sanitation policy was also introduced to shift the approach to service provision from a supply driven one to a demand responsive approach.

Under the new national policy, certain core functions were transferred from central government to the local government and the communities. Ownership of water supply was transferred to the local governments and the communities. The private sector became increasingly involved in various aspects of service provision. In one \$20 million World Bank-financed community water and sanitation project implemented in 26 out of the 110 districts in the country, district assemblies constructed 1,200 water points and 29 piped systems. There was a lot of private sector and NGO involvement in the project. This included four drilling companies, 32 NGOs and community-based organizations (CBOs). Several national and international NGOs were commissioned to train and build the capacities of the district level NGOs and CBOs. The success of this project has led to a follow-up \$80 million nine-year World Bank-supported project. One of the aims of the new project is to shift from individual donor-supported water supply projects to a sector-

⁹² Drawn from the “Blue Gold” series on African experience in water and sanitation, World Bank Water and Sanitation Program, 2002

wide approach under which all external support agencies would be encouraged to pull their resources into a single national water sector program.

Several factors have helped to make this reform process successful. A key factor was the speed of implementing the reform process. It was not rushed. Instead, a gradual approach was followed in the transfer of responsibility from the central level to the local government and community level. The transfer rate was matched to the rate of technical capacity building and support from the central level in the areas where local capacity was deficient. Secondly, the involvement of the private sector was accompanied by an incentive structure under which contractors were paid for their outputs rather than their inputs. Finally, the decentralization of service provision was facilitated by the general process of decentralization taking place within the country at the time.

Unbundling between Different Zones in an Urban Area: Experience from Bangkok, Thailand

This case study shows how unbundling of service facilities can be used as an instrument for reducing the constraints of technologically complex large-scale urban sewerage projects while at the same time reducing the lumpiness of investments in urban sanitation, thereby removing barriers to access to urban sanitation services.

Bangkok is the capital of Thailand. It is a city of 10 million people. In 1968, the Bangkok Metropolitan Administration prepared a wastewater master plan for the entire metropolitan area. Though technically sound, the plan was found to be prohibitively expensive. Hence it was shelved for 16 years. In 1984 the master plan was revised under a Japanese (JICA) technical assistance program. Instead of a single centralized program, the inner city was divided into 10 sewerage zones, each with an independent collection and treatment system. The revised approach is an example of horizontal unbundling between different zones of an urban area. Sanitation investment in each of the ten zones is lower than the investment for a single project in the whole city. Each zone project is also technically simpler than the citywide project. These two impacts of unbundling have made it possible for the Bangkok Metropolitan Administration to implement various sanitation projects in different zones of the city, using a more affordable phased investment program.

Unbundling, coupled with a demand responsive approach, helps to remove major barriers to the expansion of coverage. Yet they still do not address the question about where the boundary between public and private infrastructure should be drawn. Secondly, expression of demand for improved sanitation is almost always based on perceived private benefits. These are much lower than the total benefits from citywide sanitation investments that are known to include externalities or benefits that are realized beyond the boundaries of the direct user of sanitation services. Experiences in Pakistan and Brazil show how these issues have been addressed.

Reaching the Urban Poor with Improved Sanitation: The Orangi Pilot Project Experience, Pakistan

This case study illustrates a tri-partite partnership between community, government, and an NGO in the provision of improved sanitation services to a low-income urban fringe community. It also illustrates a stepwise approach to urban sanitation in which the technology is adapted to the technical capacity and financial means of the beneficiary community. Its salient features include the use of such instruments as unbundling, community management with social intermediation, and internalizing the financing of community level infrastructure for sanitation.

Orangi is a large *katchi abadi* (or low-income informal settlement) in Karachi. It has a population of over one million. The Orangi Pilot Project (OPP) is a non-governmental organization; and sanitation is one of four projects the NGO is undertaking in Orangi.

After years of research and learning by doing, the OPP has developed a model of low-cost sanitation in which government, the community, and the NGO are treated as partners, and sanitation development takes place at two levels, an “**internal component**” level and an “**external component**” level. The internal component has three sequential sanitation sub-components, and the external component has two sub-components. They are:

Internal Component:

- (a) An in-house sanitary latrine or toilet
- (b) A lane sewer that collects sewage from houses along a lane in the community, and
- (c) A neighborhood sewer that collect sewage from the lane sewers in a neighborhood

External Component

- (d) Trunk sewer that collect sewage from neighborhood sewers
- (e) A sewage treatment plant for treatment and final disposal of the sewage from the trunk sewerage system

It is noteworthy that sub-components (b) and (c) are together equivalent to what is known as a feeder sewerage system, and (d) and (e) may be collectively regarded as a trunk sewerage system.

The OPP sanitation project started with the NGO approaching the community and urging them to form lane organizations and to elect a lane manager. Once this was done, technical support was provided to the lane organization to construct a lane sewer to collect waste from their houses. It had been hoped that once this was done, the government would step in and provide a sewer network to collect the sewage from the lane sewers. This did not happen. So the lane managers from each neighborhood came together and pulled their human and financial resources to construct neighborhood-level sewers to collect the wastes from the lane sewers.

Initially, the sewage from the neighborhood sewers was discharged into nearby natural drains. But eventually, the Karachi Municipal Corporation and the District Municipal Corporation agreed to finance the construction of a trunk sewer to collect the waste from the neighborhood sewer. This meant that there was a transitional period during which the untreated sewage from the Orangi community polluted the local environment. However, this was corrected when the public component of the sewerage system was installed. Without the price of the transitional environmental pollution, the community would not have gained access to basic sanitation, and the environmental pollution would have continued all the same through other means.

According to S. Akbaar Zaidi, the OPP model has been replicated in 59 settlements in 11 cities⁹³. It has also been reported that the principles of the model are being applied to projects in Nepal, Central Asia, South Africa and Sri Lanka⁹⁴

It is apparent that in the OPP model, there is vertical unbundling between the internal and the external sewer components. There is also a horizontal unbundling between parallel neighborhoods. A feature of the OPP model is that the normal boundary between private and public sector provision is extended from the household level to embrace the entire neighborhood. **What this means is that the neighborhood level sanitation infrastructure is a public facility that is privately and collectively owned by those in the neighborhood. Thus its ownership is private, but its use is public.** Under this arrangement, investment and operational responsibility within the neighborhood is now treated as internal development and is left to the community. The responsibility for investment, operation and maintenance beyond the neighborhood is treated as an external responsibility and is assigned to the public utility.

This definition of what is private and what is public has a number of attractive features. The entity that expresses demand to the public utility is not the household; it is the community. This reduces the number of respondents for demand assessment, thereby reducing the transactions cost for such assessments. Secondly, this definition makes it possible for the neighborhood to be used as the channel for expressing the “voice” of households, thereby giving the households bargaining powers. Thirdly, it expands the responsibility for financing of private infrastructure beyond the household level. Financing of infrastructure within the neighborhood is thus internalized.

Another feature of the approach is that it defines a clear set of target groups that would serve as partners, along with social intermediaries, in the internal development of sanitation projects. A similar definition of the private/public boundary has also been used in the Brasilia condominium model.

⁹³ Zaidi, S.A. “Transforming Urban Settlements: The Orangi Pilot Project’s Low-Cost Sanitation Model”. City Press, Karachi, 2000

⁹⁴ Hasan, Arif. “Scaling up of the Orangi Pilot Project Programmes: Success, Failures and potential, Orangi Pilot Project-Research & Training Institute. Karachi. May 2000.

Community-based Approach to Urban Sanitation: Experience from Brazil, using the Condominial Model

This case study illustrates a shift from conventional sewerage technology to a technically equivalent lower-cost alternative known as the condominial system. The lower cost arises not from the use of lower technical standards, but rather from the use of sound technical standards based on current scientific and technical research, as well as current experience and innovation rather than a reliance on 100 years old concepts inherent in conventional sewerage. Another technical feature is unbundling. An integral part of it is community participation and joint ownership of community resources such as the sewerage system within a condominial block. This is analogous to ownership of neighborhood level sanitation infrastructure in the OPP model.

Brasilia is the capital of Brazil. It has a population of two million. The model being followed here is the latest version of the condominial sewerage system. Developed in the 1980s in the State of Rio Grande do Norte by Jose Carlos Melo for low-income communities, it has now become a standard solution for entire urban areas in Brazil, irrespective of residential income. The Water and Sewerage Company of Brasilia has been using this version of the condominial system for over ten eight years. Within the first eight years, 121,000 homes were linked to the condominial system, using over 1,300 km of condominial branches and over 660 km of public networks at average costs per person and per meter of sewer network of US27.00 and US16.00, respectively.

The basic planning unit in this model is the condominium. It is defined as the urban block, square, or its equivalent. The residents of a condominium define its boundaries. They do so through an informal community organization. It is this block or condominium that is connected to the public sewer. This is in contrast to conventional sewerage systems where connection to the public sewer is made directly to the individual house, a more costly approach.

The connection in the condominial system is made through the condominial branch sewer. Thus the network within the condominial block is treated as “private” infrastructure, and its investment costs are borne by the residents of the condominial block, just as is the case for the current OPP model in Pakistan. The infrastructure beyond the condominial branch sewer, up to the treatment plant, is treated as the public network or public infrastructure, and its investments are the responsibility of the public service provider. The cost of this system is, however, recovered from the sanitation charge.

The public network is divided into two parts, namely, a number of parallel micro-systems and a citywide system. The micro-systems are defined by sub-dividing or unbundling the urban area into small natural drainage basins, each with its own independent sanitation system, from collection to treatment and disposal. The micro-systems receive wastes from the condominial blocks and either purify them within the corresponding micro-drainage basin, or feed them into a citywide sanitation network. The micro-systems can therefore be operated as independent systems permanently or until such time that local or citywide development imperatives make it necessary that they should be connected to the

citywide system. The citywide system is thus a network that receives flows from parallel independent micro-systems. In much the same way, there can be a regional system that receives wastes from a number of parallel independent citywide systems.

Community participation is an integral part of the condominium model, just as it is in the OPP model. In the condominium model, community participation in decision-making and in community level activities is viewed both as a right and as a duty of citizenship. It is viewed as a way of helping to find solutions for the common interest within the block. Participation is also viewed as a process of negotiation among interested parties; it is a process aimed at reducing costs, mobilizing resources, and stimulating community actions including monitoring of jointly owned resources such as the condominium sewerage.

The Brasilia example illustrates both horizontal and vertical unbundling. The city sanitation system is subdivided horizontally into a number of parallel micro-systems. Each of these micro-systems is, in turn, subdivided horizontally into a number of parallel condominium blocks. In addition, the boundary for the private component of the sewerage system extends to cover the block, square or its equivalent. With this arrangement, sewage flows from households into a sewer network within the condominium area, and from there into a network of micro-systems, and eventually into a citywide system.

The Brasilia condominium model thus gives rise to a decentralized sanitation system with the possibility of interconnection into an integrated citywide network of clearly identifiable sub-systems. The model has a lot of flexibility; it is demand-responsive; and it lends itself to service differentiation within different condominium blocks and within different micro-systems. It has good prospects for overcoming most of the barriers to sustainable expansion of coverage in an urban area. It is being replicated in a number of countries in Latin America. Its use, together with the concepts in the OPP model, holds very good promise for achieving the MDG Target of improving access to basic sanitation in many urban areas in the world, large and small.

Tapping the Strengths of Spiritual Organizations for Community-Based Water and Sanitation Projects: The Example of the Ramakrishna Mission in the Medinipur Intensive Sanitation Project in West Bengal, India⁹⁵

Religious organizations tend to have motivational and organizational skills that make them highly effective in social mobilization and in the changing of entrenched mindsets and habits. However, these strengths and attributes of spiritual organizations are not often appreciated or tapped for community-based water and sanitation programs. This case study illustrates the successful use of these skills in a rural sanitation project in the Medinipur district of West Bengal, India.

⁹⁵ Parts of this case study are drawn directly from Chowdry, Kamla, "Ramakrishna Mission: Service and Salvation", September 26, 2002; Sengupta, Chandan, "Our challenge: Latrine for all." 27th WEDC Conference. UNICEF. Lusaka, Zambia, 2001, pages 203-206; UNICEF, "Sanitation-The Medinipur Story: Intensive Sanitation Project", West Bengal, India, Calcutta, India; and UNICEF, "Invest in Children, Advance Sustainable Development: In India, success in improving sanitation", *press release*.

The Medinipur district rural sanitation project, also known as the Intensive Sanitation Project (ISP) was launched in 1990. It involves a partnership between UNICEF, state and district level governments, a religious NGO (the Ramakrishna Mission), and voluntary grassroots community level organizations. Though sponsored by UNICEF in collaboration with the state and district governments in West Bengal, it is implemented by the Ramakrishna Mission, a development oriented religious organization established in 1897 with its headquarters at the outskirts of Calcutta but heavily involved in social development and rehabilitation works in India and abroad.

The project is treated as a “people’s movement” designed to motivate people to move away from the age-old practice of open-air defecation. Paradoxically, the practice of open-air defecation in the area was based on the belief that defecation is unhygienic, and hence it is best done far away from the home. The only problem was that it was done in the open field from where it exposed people to outbreaks of cholera and other excreta-related diseases that occurred during rainy seasons. The project implementation strategy is thus driven by a need to change mindsets and habits towards not just in-house sanitation, but also a clean and hygienic living environment. Thus hygiene education was an integral part of the project.

A three-tier organizational structure is followed with the Ramakrishna Mission interacting both with state and district level governments at the top and also with cluster organizations, voluntary youth clubs and beneficiaries at the community level.

The organizational unit for the project implementation is the Community Development Block. There are 54 such community development blocks in the project area, each with a population of about 150,000. Within the community development blocks are voluntary youth clubs, over 1,000 in the project area. These are aggregated into a number of groups known as Cluster Organizations. There are eleven such cluster organizations in the project area.

The key instruments used in the project are community mobilization and the involvement of the local community in each stage of the program, especially in the delivery of sanitation messages, and human resources development. Community mobilization is done through trained motivators from the target communities. Its primary goal is to create awareness of the importance of health and hygienic practices. This is done through home visits, motivational camps, exhibitions, and through the use of special communication materials like flash cards, calendars, motivational kits, and audio-visual materials. Sanitation messages are conveyed through writings on walls, video and slide shows, and song squads. Training, especially the training of trainers, is given a high priority in the project. All categories of workers are given appropriate training related to their work.

In 1990, barely anyone in the villages of West Bengal's Medinipur district had household latrines. But just a decade later, roughly 80 percent of the families in Medinipur possess latrines - reducing exposure to communicable diseases of excretal origin and making Medinipur a role model for other parts of India.

Local involvement was also critical in the physical development of the latrines. Each component of the latrine was produced at production centers where local women were trained to manufacture the sanitary wares. A range of cheap and effective sanitation technologies such as single-pit latrines were made available. To help persuade reluctant villagers to switch to latrines, representatives of the production centers were enlisted to motivate and prepare households for such a change. These representatives received an incentive for every household they could motivate.

To date, approximately 1.2 million latrines have been delivered through the program throughout West Bengal and another 1.5 million have been built through other programs. The impact of widespread latrine development has been accompanied by a remarkable reduction in cases and deaths associated with diarrheal diseases.

The Intensive Sanitation Project in Medinipur has proved to be a successful people's movement and has helped develop a sense of pride and belonging among the villagers.

Sulabh Sanitation Movement: Indian Communities Embrace Low-Cost Sanitation System⁹⁶

This case study outlines a successful, low-cost sanitation approach developed and implemented by a non-governmental organization (NGO), Sulabh International. The program, named “Sulabh Shauchalaya” literally translated means “easy access to sanitation.”

Sulabh International's approach to improved sanitation is two-fold: innovative modifications of an existing low cost technology, and equally innovative institutional and social programs, combining sanitation objectives with social reform. Sulabh popularised the use of the pour flush system in India, first as a domestic latrine and second as a public “pay-for-use” facility. Both have been very successful as a result of the institutional arrangements used by the organization.

The pour flush technology has many advantages. It is affordable, even by the economically weaker sections of society, as there are designs to suit different levels of income. Flushing requires only two litres of water, instead of the 10 litres needed by other flush toilets. It is never out of commission since, with the twin-pit option, one pit can always be used while the other one is being rested to allow its contents to be decomposed. The latrine can be built with locally available materials and is easy to maintain. It has a high potential for upgrading because, while it is a stand-alone, on-site unit, it can easily be connected to a sewer system if and when one is introduced in the

⁹⁶ Source: Water Supply and Sanitation Collaborative Council's, “Vision 21: *Water for People*, A Shared Vision for Hygiene, Sanitation and Water Supply”. Some information was also supplied by Task Force Co-chair, Albert Wright, based on his personal knowledge of the program.

area. The toilet is also culturally acceptable inasmuch as it is flushed by the water used for ablution, and its water seal makes it odourless and fly-free.

So far, more than 1,000,000 units have been constructed (or substituted for existing unhygienic latrines) in houses, and 5,500 have been installed in pay-and-use public toilets since the organization's beginnings in 1970. A key aspect of Sulabh's program is its inclusion of facilities for bathing and doing laundry. Their public toilets are staffed by an attendant 24 hours a day and supply powdered soap for hand washing, bathing, and laundry. Free services are offered to children, the disabled and the poor. This is very important for the homeless and the very poor who live under cramped conditions. More than 10 million people use the complexes every day. Some special facilities have also provided telephone services and primary healthcare. Another technological aspect of the program is the modification of the pour flush toilets for the production of biogas from human excreta for electricity generation, cooking and lighting. Sulabh's research and development activities are geared to practical solutions for solid and liquid waste disposal, including recycling and resource recovery.

Despite the virtues of the technology itself, introduction of the Sulabh program might not have been so successful had not public awareness and community participation been considered critical aspects in the goal of improving sanitation. Among isolated populations, unlikely to feel responsible for wider environmental conditions, the Sulabh International Social Service Organization has undertaken educational efforts to help reverse this frame of mind and instil strong community awareness. The approach includes door-to-door campaigns by Sulabh volunteers and workers who persuade people to convert from bucket latrines. Once approval is gained, the organization takes responsibility to relieve the beneficiary of the bother of constructing the twin-pit, pour-flush toilet. Sulabh also educates people on use and maintenance of their new latrine and promises to fix construction defects and solve technical problem at no cost. After construction, service is provided and problems in use and maintenance are resolved by locally posted Sulabh workers.

The program includes technical training to local people to enable them to construct more latrines themselves. In rural areas, latrine-builders are also trained in such fields as hand pump repair, brick-laying, social forestry and biogas production. The organization estimates that 50,000 employment opportunities have been created through the Sulabh Shauchalaya program. Sulabh also helps local communities set up, operate and maintain the community toilet complexes.

Another key institutional aspect of Sulabh's program is that the NGO has, in some municipalities, taken over these complexes from the city officials for a contracted period of 30 years, relieving the municipal authorities from the task of operating and maintaining them. This has vastly improved the quality of facilities available to users. Often these comfort stations are the cleanest ones in town, even in major cities like Delhi, Bombay, Calcutta and Madras. Sulabh's experience shows that, where financial resources are constrained by central administrations, functions can effectively be delegated to grassroots and community level organizations.

Lessons from Case Studies

Several lessons can be distilled from the case studies described above and from several other case studies that have not been included. The key lessons stress the importance of the following:

- Political will and political leadership
- Sector policy reform underpinned by national level reform
- Shift in role of central government from implementation to facilitation
- Devolution of responsibility to local governments and communities accompanied by appropriate capacity building and funding
- Providing local governments and communities with “voice”, choice and control, and ownership
- Tri-partite partnerships between government, community, and NGO/private sector
- Social intermediation through NGOs, especially for the sanitation and hygiene programs
- Capacity building to equip local governments and communities to perform their new responsibilities
- Ensuring that technical complexity, pace of change of responsibilities, and level of financial commitments match the capacity of local governments and communities
- Competition in service provision
- Unbundling of service provision to reduce lumpiness of investments and to reduce technical complexity of large projects
- Adoption of stepwise approach to service provision rather than an all-or-nothing approach
- Adoption of sector-wide approach to water and sanitation programs
- Focusing not household-centered sanitation, but rather on a living environment centered sanitation with the emphasis on a clean and safe living environment (both within houses and within the immediate neighborhood area)
- Internalizing financing of neighborhood/community level infrastructure for sanitation
- Easy access to micro credit or micro finance for the target community as well as for local private entrepreneurs
- Use of output-based approach to remuneration of consultants rather than the use of an input-based approach
- Tapping the strengths of grassroots organizations like spiritual and mission oriented groups

Additional Lessons from World Bank Experience⁹⁷

⁹⁷ Contributed by Task Force Member Jamal Saghir

The World Bank has prepared a note on lessons learned from Water in Rural Communities using a community-driven development (CDD) approach, as well as a case study of the successful example of Rural Water in China, where cost recovery mechanisms are built in the process.

The Bank's experience highlights the following lessons:

- Using the community-driven approach to reach specific sector objectives requires a new approach to development that is different from the exclusive focus on government as provider. Achieving sustainability and scale in the community-driven approach requires new actions from donors and developing countries; otherwise it will not be sustainable.
- Allow the client - national to community level- to take the lead in establishing the reformed system. If there is no sense of ownership at the local level, sustainability is at risk.
- Harmonize approaches to working with communities and local governments, so as not to duplicate efforts or create an administrative burden on the clients. Facilitate the country's leadership in setting fair rules of the game, and be flexible enough to work within reasonable rules.
- Build the capacity and understanding of client countries through training, study tours, and effective communication.
- Adapt program design to local conditions.
- Involve multiple stakeholders in co-managing programs and services. The high cost of scaling up suggests a continued sharing of costs; no one entity can shoulder the cost of providing water services to rural communities.
- Support an enabling policy environment for delivering water to the community. The enabling policy environment should support the institutional arrangements and resource management necessary for good investment, operation, and maintenance of water services. First, the legal environment should allow entities such as community groups, local NGOs, and local governments to be effectively involved in the management of local water sources. This may require popular participation, legal reform, decentralization reform, and the reform of intergovernmental fiscal systems, among other actions. Similarly, the private sector, both local and international, should have the freedom to operate in the country, which could require changes to the legal and regulatory environment affecting investment. Second, the policy and regulations governing water resources should reflect good management practices on user fees, tariffs, water rights, and so forth, and should provide guidance on attainable and maintainable technical standards to ensure quality services to all.

- Link water and its management up the resource chain and the chain of government. Commonly referred to as the rule of subsidiarity, both community-driven development and water professionals advocate managing resources such as water at the lowest appropriate level. Therefore, water user associations may manage and maintain a community water pump or a section of an irrigation system. Local government may maintain or collect fees for a group of communities or farm systems in its jurisdiction. Decentralized subnational government may monitor water usage and arbitrate water conflicts within its jurisdiction.

ANNEX 3. A LADDER OF SANITATION OPTIONS (FROM UNEP)

Financing Wastewater Collection and Treatment

Service level	<i>Extra</i> costs per annum (US\$bn)	Total <i>extra</i> costs of meeting 2015 targets (US\$bn)
Rural sanitation options		
(1). Improved traditional practice & hygiene promotion	0.8	11
(2). Simple pit latrine	4	48
(3). Ventilated improved pit latrine	5	70
(4). Pour flush latrine	6	76
(5). Septic tank system	13	174
Urban/peri-urban sanitation options		
(6). Sanitation & hygiene promotion	2	27
(7). Sewer connection based on low-cost labour	12	150
(8). Connection to conventional sewer (Estimate 1)	15	190
(9). Connection to conventional sewer (Estimate 2)	25	325
(10). Connection to sewer & secondary treatment	37	490
(11). Tertiary wastewater treatment	67	870

Table 1: Annual and Total costs for meeting the sanitation target applying different levels of technology in both rural and urban context

Notes: Technology costs multiplied by half the rural and urban population numbers un-served in 2000
Population growth and rapid urbanisation are not accounted for as yet
Costs for rehabilitation of non-functioning collection and treatment systems are not included
Re-use options have not been considered



Financing Wastewater Collection and Treatment

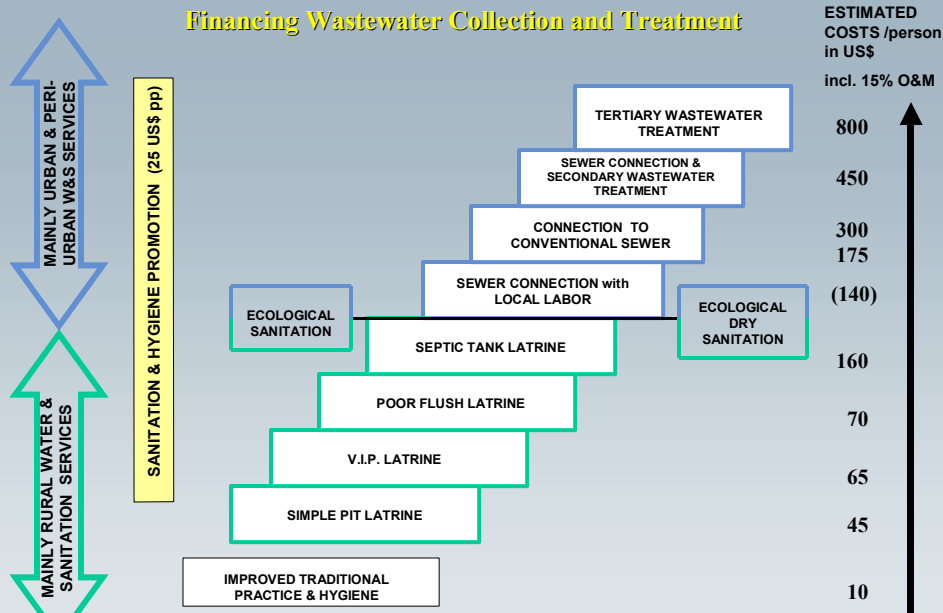


Figure 1: A Ladder of Sanitation Options

