
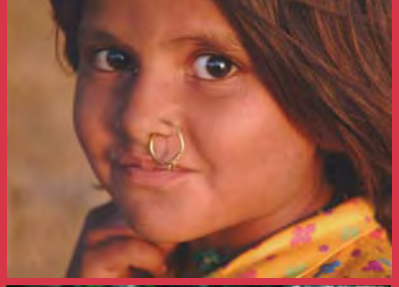




ASIA WATER WATCH 2015

Are Countries in Asia on Track to Meet Target 10 of the Millennium Development Goals?

ADB

UNDP

United Nations ESCAP

World Health Organization

Published jointly by the Asian Development Bank (ADB), United Nations Development Programme (UNDP), United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), and World Health Organization (WHO).

This publication was prepared by staff and consultants of ADB, in collaboration with UNDP, UNESCAP, and WHO.

Printed in the Philippines.

Publication Stock No. 020206

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December 2005

Abbreviations

ADB	Asian Development Bank
BRAC	Bangladesh Rural Advancement Committee
JMP	WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation
MDGs	Millennium Development Goals
NGO	nongovernment organization
PEP	Poverty Environment Partnership
PPWSA	Phnom Penh Water Supply Authority
PRSPs	Poverty Reduction Strategy Papers
SEWA	Self-Employed Women's Association
UN	United Nations
UNDP	United Nations Development Programme
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNICEF	United Nations Children's Fund
WHO	World Health Organization
WSS	water supply and sanitation
WSSD	World Summit on Sustainable Development

Foreword

Five years ago, the Millennium Development Goals (MDGs) unveiled a special horizon—one that the entire developing world has been tasked to arrive at by 2015. At this horizon is a world half as afflicted with poverty as the one we experience now. To arrive at this moment of achievement, though, we must first cross the water barrier. We must strive to meet MDG Target 10: To halve, by 2015, the proportion of people without sustainable access to safe drinking water and sanitation. The strong correlation between water and poverty proves that when water is inaccessible and unfit, it is a barrier. But when it is available and clean, water is a bridge to even greater security and prosperity for the poor.

For Asia and the Pacific, home to the majority of the world's poor, MDG Target 10 is an especially ambitious but critical goal. The number of people without improved water supplies in the People's Republic of China alone is nearly as large as the number of underserved in the entire African continent.

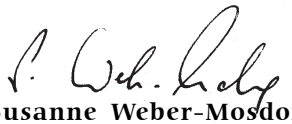
Into the countdown to 2015, what progress does the Asia and Pacific region register in meeting MDG Target 10? What more is required? How will meeting MDG Target 10 advance countries toward achieving all eight MDGs?

This report offers answers to these questions. Prepared by the Asian Development Bank (ADB), the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), the United Nations Development Programme (UNDP), and World Health Organization (WHO), it uses the latest data available to measure each country's progress toward MDG Target 10 and analyzes whether it will be achieved. The results show a mixed picture. Some countries have already met the target; others are on track; others are likely to miss it in 2015. Some countries even show a decrease in coverage.

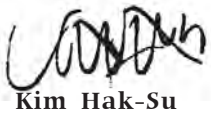
The analysis in this report figures the economics of change—how much it will cost to ensure each country in the region meets MDG Target 10. Considering the economic returns of improved access to water on productivity and growth at both macro and micro levels, the paper argues that "it is the height of economic irrationality to not invest in these vital services." The correlation between water and each of the eight MDGs is explicitly drawn in the report, showing water as a bridge to meeting all other MDGs. The report also defines the challenges threatening the region's chance of meeting MDG Target 10 and assigns roles and responsibilities to be taken up by key stakeholders.

The regional picture this report presents should serve as a resource and representation of the progress and needs of the region's 3.9 billion people. In this context, this report reminds us that 2015 appears as a horizon today, but is actually, once arrived at, only a halfway marker toward a poverty-free world.

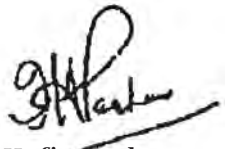
Geert van der Linden
Vice President
Asian Development Bank
Manila



Susanne Weber-Mosdorf
Assistant Director General
Sustainable Development and Health Environments Cluster
World Health Organization



Kim Hak-Su
United Nations Under-Secretary-General &
Executive Secretary,
United Nations Economic and Social Commission for Asia and the Pacific,
Bangkok



Hafiz Pasha
United Nations Assistant Secretary General &
UNDP Assistant Administrator & Regional Director, Regional Bureau for Asia and the Pacific,
New York

Acknowledgement

This report was prepared under a partnership among four agencies: the Asian Development Bank (ADB), the United Nations Development Programme (UNDP), the United Nations Economic and Social Commission for Asia and the Pacific(UNESCAP), and the World Health Organization (WHO). It is designed to provide accurate and authoritative information on the progress, prospects, and price tag of meeting Target 10 of the Millennium Development Goals (MDGs): to halve, by 2015, the number of people without sustainable access to safe water supply and improved sanitation.

Kallidaikurichi Easwaran Seetharam, ADB; James Bartram, WHO; Anuradha Rajivan, UNDP; and Nanda Kraikiksh, UNESCAP, coordinated this publication on behalf of the respective agencies. John Soussan and Matthew Chadwick, of the Stockholm Environment Institute, led the research and development of this publication.

Inputs and comments were provided by: (ADB) Melissa Alipalo, Wouter Lincklaen Arriens, Stephen Blaik, Mario Cabrera, Ma. Virginita Capulong, Shiladitya Chatterjee, Ma. Christina Dueñas, In-Ho Keum, Ellen Pascua, Bhanoji Rao, Fransisco Roble Jr., and Grendel Saldevar; (UNESCAP) Rae Kwon Chung, Anatoly Kadushkin, LeHuu Ti, and Yuri Steklov; and (WHO) Houssain Abouzaid, Roger Aertgeerts, Laurence Haller, Han Heijnen, Jose Hueb, and Terrence Thompson.

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CHAPTER 1

Setting the Scene: Water,[1] Poverty, and the MDGs

THE MILLENNIUM DEVELOPMENT GOALS (MDGs) reflect the commitment of the world community to work together and reduce global poverty. The MDGs do not claim to capture all aspects of poverty reduction. They are, rather, a way of understanding what must be done if poverty is to be reduced. And momentum is building, along with the hopes and concerns for those countries that seem on target and those that lag behind.

MDG Target 10 calls for the world to halve, by 2015, the proportion of people without sustainable access to safe drinking water and sanitation.

The Asia and Pacific region plays a pivotal role in the MDG commitment. The region is home to the majority of the world's poor. In the People's Republic of China (PRC) alone, the number of people without access to clean water supply is nearly as large as all of the underserved in Africa. The progress this region makes will define the entire global community's success in achieving the ambitious targets the MDGs have set for 2015.

In the five years since the MDGs were identified in the 2000 UN Millennium Declaration, Asia and the Pacific have shown remarkable progress. The region has been reducing poverty by attacking it on many fronts—through sound economic policies, development strategies, and targeting specific characteristics of poverty, such as hunger and disease. Water supply and sanitation improvements are proving to be keys that unlock many aspects of poverty.

MDG Target 10 calls for the world to halve, by 2015, the proportion of people without sustainable access to safe drinking water and improved sanitation. The MDGs and associated targets are an opportunity for prioritizing water on the basis of its ability to impact overall poverty and contribute to significant socioeconomic and environmental gains.

Target 10 also presents a particularly formidable challenge for Asia. Around two thirds of the world's population underserved by water live in this region. One third of Asians do not have access to safe, sustainable water supplies. Even worse, one half do not have access to improved sanitation. Yet, it is in many parts of Asia that the greatest gains are being posted. This progress reflects the relatively strong institutional base in the region, vibrant economic growth, a dynamic private sector and civil society and, in many cases, the high priority being given to poverty reduction issues in national development plans. Many parts of Asia are increasing their coverage rates for clean, reliable water supplies. Strides toward improved sanitation are slower, greatly because of the steep climb from extremely low coverage rates to begin with.

This report assesses the region's prospects of reaching Target 10 by 2015. It does not just consider the target's literal call to halve the number of underserved by 2015. True progress must be comprehensive and considerate of all who lack these vital services. For this reason, the report looks at the rate of a country's progress in improving both urban and rural coverage.

Investing in the water sector is investing in all of the MDGs.... Safe water supplies immediately improve people's health and save them time, which they can use to improve their livelihoods.

The report utilizes coverage data from the WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation in assessing the progress and defining the 2015 projections. It also utilized WHO data[2] on cost estimations for meeting Target 10 specifically in Asia and the Pacific. This report estimates that meeting Target 10 will cost as low as $8 billion annually. The higher the investment, though, the higher the technology and assured quality and quantity. Target 10 calls for the most basic technology. Equally important to the progress and prospects of the region is the rationale this report presents for investing in the water sector. It is not investing for water's sake, but for poverty's sake.

Benefits of Water for Poverty Reduction

Investing in the water sector is investing in all of the MDGs, not just Target 10. And the impact of water sector investments directly targeted at poor consumers is anything but subtle. Safe water supplies immediately improve people's health and save them time, which they can use to study, or improve their livelihoods, so they can earn more, eat more nutritiously, and enjoy more healthy lives. Improved sanitation protects the poor from socially and physically degrading surroundings, health risks and exposure to dangerous environmental conditions. Investments in better water resource management further address a host of concerns related to socioeconomic and environmental dimensions, such as conflicts over water rights, contamination of water sources by animal/industrial waste and agricultural chemicals, and sustainability issues related to water quantity in rural and urban areas.

The multiplier effect makes it easier to understand how $1 invested in the water sector turns into $6. All too often, though, the expectation and analysis of benefits from water supply and sanitation projects are limited to the most common intended result—better health. There are many other benefits from water sector investments, such as increased agricultural outputs and income when the rural poor gain access to irrigation. Water sector investments also improve levels of gender equality and educational attainment because the poor have the time and good health to attend school and participate in economic activities, and by doing so, prove their worth by becoming cash-earning members of their households and communities.

By meeting Target 10, countries improve their likelihood of meeting the other MDG targets and goals. ADB's review of six water supply and sanitation schemes[3] identified a range of social and livelihood benefits in addition to the health benefits that were the original rationale for the projects (Box 1). The nongovernment organization (NGO) WaterAid assessed the impacts of water supply projects in a number of countries and found a wide range of impacts on many aspects of life. Similar impacts have been found by other organizations. The benefits and related research prove the economic viability of water and sanitation investments to significantly reduce poverty and increase productivity. For this reason alone, it is important for stakeholders to understand the water and poverty connection. This report makes a strong case for valuing and prioritizing water sector investments and reforms by advancing the analysis beyond the domain of Target 10 to consider water's role in creating the conditions for meeting the other MDGs.

Water Sector Reforms and Poverty Reduction

For water supply and sanitation to dramatically reduce poverty, a greater commitment of resources and political will are needed, and urgently. They are the preconditions to building institutional capacities, improved governance and investment flows, which are all a part of the larger reform work that must happen for water supply and sanitation to play its role in reducing poverty.

Reform as a foundation for social and economic change cannot be underesti-

mated. Recent studies[4] conducted jointly by the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) and the Food and Agriculture Organization (FAO) point out the need to formulate, implement and manage water supply and sanitation programs in strategic approaches of socioeconomic development. This requires complex and multi-dimensional reforms. There is growing realization that the barriers to achieving this are frequently political and institutional, rather than economic or physical.

A number of agencies are collaborating to help key stakeholders, particularly governments in their reform efforts, to understand the water-poverty relationship. ADB and the Poverty Environment Partnership (PEP)[5] (of which ADB and UN agencies are members) have collaborated in the Water and Poverty Initiative and come up with a framework for understanding this relationship. The report of the UN Millennium Project Task Force on water and sanitation and the WHO/ UNICEF JMP *Meeting the MDG Water and Sanitation Target: A Mid-Term Assessment of Progress* report[6] also provide key insights into how water and sanitation relate to poverty. The analyses in these different sources are consolidated here.

Four key dimensions of poverty are used in the PEP conceptual framework:

- **Enhanced livelihoods security**. The ability of poor people to use their assets and capabilities to make a living in conditions of greater security and sustainability. This analysis should address all aspects of their livelihoods, including the use of domestic water supplies for productive activities.

A number of agencies are collaborating to help key stakeholders, particularly governments in their reform efforts, to understand the water-poverty relationship.

BOX 1: The Impact of Improved Water Supplies

Studies by the Asian Development Bank (ADB) and WaterAid on the impact of their projects on the communities in different parts of the Asia region found that multiple benefits were the norm, including many that had not been anticipated or invested in. These benefits, which affected many aspects of life, included:

- **Time saved**, along with reduced fatigue from not having to collect water from, on average, 6 kilometers away: this was often the benefit most valued by the community. The savings were usually directly translated into productive activities, especially by women.
- **Health benefits**, including lower medical expenditure and the reduction of the long-term debilitating effects of diseases such as endemic dysentery and worm infestations.
- Improved **income opportunities** from home-based livelihood activities that used the new water supplies, such as vegetable and livestock production, brick and pot making, and operating food stalls.
- **Multiplier effects** throughout the local economy from increased incomes and new enterprises based on improved water supplies.
- **Local organizations** set up to build and run water supplies were often the basis for wider social mobilization, and led to the empowerment of women and greater social cohesion.
- **Savings and credit** groups led to the development of wider access to credit among the communities and improved financial management skills. In urban areas, poor households also saved on the cost of water, as before they had to pay informal providers high prices.
- The new skills, organizations and social cohesion, along with increased economic momentum, had impacts on the wider **political and social system**, including at times influencing government policies and bringing about more balanced representation.

Sources: ADB. 2003. The Impact of Water on the Poor. ADB Operations Department, Manila; and WaterAid. 2001. Looking back: The long-term impacts of water and sanitation projects. WaterAid, London.

- **Reduced health risks.** The mitigation of factors that put the poor and most vulnerable (especially women, children and the immunocompromised) at risk from different diseases, disabilities, poor nutrition, and mortality. Many health risks are linked to water supply and sanitation, including killers such as diarrhea, malaria and dysentery.
- **Reduced vulnerability**. The reduction of threats from environmental, economic and political hazards (e.g., resettlement, conflicts over water rights, water quantity and quality, etc), including floods, droughts, storms, pollution, and other forms of water-related hazards that threaten the livelihoods of the poor. Water quality is a direct concern for providing safe water supplies; improved sanitation is essential for maintaining environmental integrity; and providing access to water and sanitation is a key priority in response to serious disasters.
- **Pro-poor economic growth**. Enhanced economic growth is essential for poverty reduction, but the quality of growth, particularly the extent of new opportunities created for the poor, greatly matter. Investments in the water sector (for both supply and sanitation) must utilize strategies that directly, and even disproportionately, benefit the poor. To effectively target the poor, though, their needs and abilities to contribute must be understood, which requires their direct involvement as stakeholders in consultation and implementation processes. Beyond being just recipients of investments, the poor must be seriously and genuinely valued for their multiple abilities as shareholders of knowledge, participants in implementation, and caretakers of investment outputs—the very systems they will use and depend on into the far future. Their needs vary within communities and locations, requiring a more complete understanding of the full range of costs and benefits associated with different options for improving water supplies and sanitation.

Water Management and Poverty Reduction

It is important for Asia and the Pacific to understand the links between water resource management, water supply and sanitation, and these wider development processes if the region is to meet its MDG aspirations and obligations. Many parts of Asia and several Pacific Islands face critical and worsening problems in the availability, reliability and quality of water and in environmental degradation and health risks from poor sanitation option that is available to them. These problems are likely to worsen in the coming decade, despite (and, in some cases, partly because of) their otherwise positive development trajectory.

The Millennium Declaration and the policies and strategies of many organizations like ADB, UNDP, UNESCAP, and WHO address the challenge of water resource management and water supply. The Millennium Declaration calls for "sustainable water management strategies at the regional, national, and local levels that promote both equitable access and adequate supplies." ADB's water policy[7] sees water as a socially vital economic good that needs careful management to sustain equitable economic growth and reduce poverty. Similarly, the Human Poverty Index[8] developed by UNDP identifies access to safe water as a key indicator of poverty.

Underlying the issues and relationship of water resources management and water supply is the view that water management must have two attributes. First, it must be integrative: looking at all aspects of water resources and their uses at different institutional levels. Secondly, it must be targeted: focused on specific actions that provide for the needs of the poor in an equitable and effective manner. In this context, it may be noted that several

countries and organizations in the region have been developing strategic approaches to integrated water resources management as recommended by the UN General Assembly at its Nineteenth Special Session. In this connection, UNESCAP has developed a set of guidelines on strategic planning and management of water resources[9] in 2003 and applied it in pilot studies on integrated water resources management in 17 countries in the region. ADB has also helped advance integrated water resource management (IWRM) in the region in two ways: through its Water for All Policy that gives high priority to fostering IWRM and through its initiation of the Network of Asian River Basin Organizations.

The MDG Water Supply and Sanitation Target

Target 10: To halve, by 2015, the proportion of people without sustainable access to safe drinking water and sanitation, is actually defined by two indicators—one for safe drinking water and the other for improved sanitation. Ultimately, a country must meet both indicators to qualify for achieving the entire Target 10. This report looks at the region's progress and prospects toward each indicator and applies the indicator for measuring rural and urban coverage. Analyzing a country's progress of Target 10 can render a number of scenarios. A country may be on course to meeting one of the indicators in rural areas but not urban areas. A country may be on course toward meeting one indicator and not the other. **This report does not credit a country with being on track toward achieving Target 10 or its indicators unless adequate progress is being made in both urban and rural areas.**

The drinking water indicator was included as a high priority issue in the Millennium Declaration, while the sanitation indicator was added after much debate in the World Summit on Sustainable Development (WSSD) in Johannesburg in 2002. The WSSD Plan of Implementation recognized that attaining improved sanitation to such a level as what Target 10 demands entailed more than just constructing new facilities for a given number of people. It would involve a number of social and financing activities for those facilities to be sustainable and deliver the desired impact. The Plan of Implementation[10] cited the following examples of activities that investments must support:

- development and implementation of efficient household sanitation systems;
- improvement of sanitation in public institutions, especially 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; and
- development of innovative financing and partnership mechanisms.

Target 10 presents formidable challenges to Asia and the Pacific. This report provides a detailed analysis of progress since 1990, the reasons for good or poor progress in the subregions, and the implications of the progress. The challenges are not confined to one aspect of life, cannot be addressed by one sectoral agency, and are found in all levels of society. The UN Task Force Report captures the multiple and multi-level character of these challenges well, emphasizing in particular the institutional and political issues that are a focus of this report:

> "In order to put forward effective recommendations for action to meet the MDGs, it is first necessary to analyze what is holding us back. Understanding why two in every ten people in the developing world lack access to water supply, and five in ten lack access to sanitation services, is fundamental to identifying effective strategies for meeting Target 10. Clearly, the explanations vary across communi-

What is clear is that actions to achieve both the water supply and the sanitation indicators of Target 10 must be implemented without delay. This presents a milieu of challenges for countries and governments to manage.

ties, countries, and regions, but a common set of political, financial, institutional, and technical challenges confronts most developing countries in their quest to expand water supply and sanitation services."[11]

Effective and affordable strategies to address these different areas where action is needed present major challenges in the poorest countries of Asia, where institutions are at their weakest and progress toward Target 10 most distressing. Of the two, challenges around meeting the sanitation target are the greatest—coverage levels are only half those of drinking water and the rate of progress in working toward the MDG target is noticeably slower. Indeed, the WHO/ UNICEF report[12] suggests that for most Asian countries, their prospects are good for reaching the water supply indicator, but bleak for the sanitation indicator unless major changes are introduced with urgency.

What is clear is that actions to achieve both the water supply and the sanitation indicators of Target 10 must be implemented without delay. This presents a milieu of challenges for countries and governments to manage. Ideally, water supply and sanitation projects should be implemented in as far advance of the 2015 deadline as possible for their impacts to register on the other MDG targets. Yet, the impact of these projects that deliver water supply and sanitation services are not likely to be sustainable if they are not accompanied by reforms that build the capacity of institutions and enhance investment flows. These reform tasks take time to work through and cannot be implemented too quickly, although they are urgently needed. Governments, therefore, should immediately prioritize water sector reforms to maximize their ongoing implementation of water supply and sanitation projects.

Table 1: CONTRIBUTION OF WATER SUPPLY AND SANITATION TO THE MILLENNIUM DEVELOPMENT GOALS

Goals and Targets	Impacts on MDGs
Goal 1: Eradicate extreme poverty and hunger **Target 1**: Halve, between 1990 and 2015, the proportion of persons whose income is less than $1 a day **Target 2**: Halve, between 1990 and 2015, the proportion of people who suffer from hunger	• Water as a factor of production in home-based production ● ■ • Investments in water infrastructure and services as catalyst for local development ● ♦ • Reduced water-related hazards and ecosystems degradation ❍ ■ • Improved health increases productive capacities ● ♦ • Reliable water and fertilizers from wastewater and human excreta for subsistence agriculture, home gardens, livestock, tree crops ❍ ♦
Goal 2: Achieve universal education **Target 3**: Ensure that by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary education	• Improved school attendance from improved health and reduced water carrying burdens, especially for girls ● ■
Goal 3: Promote gender equality and empower women **Target 4**: Eliminate gender disparity in primary and secondary education preferably by 2005 and at all levels of education not later than 2015	• Community-based organizations for water management including women improve social capital ❍ ♦ • Reduced time and health burdens from improved water services increase earning and saving activities and more balanced gender roles ❍ ♦
Goal 4: Reduce child mortality **Target 5**: Reduce by 2/3 the under-five mortality rate	• Improved quantities and quality of water and sanitation reduce main morbidity and mortality factor for young children ● ■ • Improved nutrition and food security reduces susceptibility to diseases ● ■
Goal 5: Improve maternal health **Target 6:** Reduce by 3/4, between 1990 and 2015, the maternal mortality ratio	• Improved cleanliness, 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 ❍ ♦
Goal 6: Combat HIV/AIDS, malaria and other diseases **Target 7**: Have halted by 2015 and reversed the spread of HIV/AIDS	• Improved health and nutrition and increased incomes reduce susceptibility to HIV infection and the onset of AIDS ❍ ♦ • Better water management reduces mosquito habitats, malaria incidence, and other diseases ● ♦
Goal 7: Ensure environmental sustainability **Target 9**: Integrate the principles of sustainable development into country policies and programs and reverse the loss of environmental resources **Target 10**: Halve, by 2015, the proportion of people without sustainable access to safe drinking water and improved sanitation **Target 11**: Achieve, by 2020, a significant improvement in the lives of at least 100 million slum dwellers	• Pollution control and sustainable levels of abstraction and eco-sanitation methods reduce water consumption and recycle nutrients and organics ● ■ • Actions to ensure access to adequate and safe water for poor and poorly-serviced communities ● ■ • Actions to ensure access to improved and if possible of productive eco-sanitation for poor households ● ■ • Health and hygiene promotion activities to ensure greater service coverage generate improved health benefits ● ■ • Develop operation and maintenance and cost recovery systems to ensure sustainability of service delivery ● ■ • Actions to improve water supply and sanitation services for urban poor communities ● ■ • Reduced waterborne pollution and wastewater discharge and improved environmental health in slum areas ● ■ • Communities organized around water supply provision better placed to negotiate for other needs ❍ ■
Goal 8: Develop a global partnership for development **Target 13:** Address the special needs of the least developed countries **Target 14**: Address the special needs of land-locked countries and small island states	• Actions to reform water sector and invest in needs of the poor demonstrate poverty reduction commitments ● ♦ • Water problems (e.g., water scarcity, salinity, pollution) major constraint on development in these countries ● ♦

● Direct Contribution ❍ Indirect Contribution ♦ Significant Impact ■ Major Impact

Source: Poverty Environment Partnership: Linking Poverty Reduction and Water Management

CHAPTER

2

Water Supply Coverage: Progress and Prospects

THE WATER SUPPLY INDICATOR of Target 10 calls for halving by 2015 the proportion of people without sustainable access to safe water supply. In 2002, 82% of the region's population had gained access to improved water supplies, an increase of approximately 758 million people since 1990 (Table 2).[13] The most dramatic improvement was in urban water supply coverage, where 368 million people, an overall increase of 35%, gained access to improved drinking water supplies.

Of course, *improved* water supply does not guarantee *safe* water supply, but it assumes a greater likelihood a source is clean because of the level of technology used.

Despite progress made between 1990 and 2002, approximately 669 million people in the region were without access to safe drinking water, with nearly half of them in East and Northeast Asia. This is still a large number of people, representing the majority of the estimated 1.1 billion people globally without adequate water supplies. These aggregate figures also mask dramatic disparities between the subregions, between nations within subregions, and between urban and rural areas within countries.

It is important to clarify what qualifies as safe water, which Target 10 specifically calls for. It is, unfortunately, extremely difficult to confidently and statistically assure *safe* water. Countries may at the national level, and certainly at the local level, test to ensure that a water supply is in fact safe. Large scale and wide-

Table 2. DRINKING WATER COVERAGE ESTIMATES FOR SUBREGIONS IN ASIA AND THE PACIFIC, 1990 and 2002 (in million)

Subregion	1990								
	Population[a]			Served Population[b]			Unserved Population		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
East and Northeast Asia	1,351	446	905	994	445	549	357	1	356
North and Central Asia	215	140	75	196	135	61	19	5	14
Pacific	27	19	8	24	19	5	3	-	3
South and Southwest Asia	1,232	345	887	875	310	568	357	35	319
Southeast Asia	440	141	299	321	128	194	119	13	105
Totals	**3,265**	**1,091**	**2,174**	**2,410**	**1,037**	**1,377**	**855**	**54**	**797**

Subregion	2002								
	Population[a]			Served Population[b]			Unserved Population		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
East and Northeast Asia	1,502	631	871	1,202	591	604	300	40	260
North and Central Asia	216	135	81	197	133	68	19	2	17
Pacific	32	23	9	28	23	5	4	-	4
South and Southwest Asia	1,551	481	1,070	1,318	457	871	233	24	209
Southeast Asia	536	220	316	423	201	226	113	19	94
Totals	**3,837**	**1,490**	**2,347**	**3,168**	**1,405**	**1,774**	**669**	**85**	**584**
Increase from 1990 to 2002	**572**	**399**	**173**	**758**	**368**	**397**	**(186)**	**31**	**(213)**

a Breakdown of population was based on data provided by the WHO/UNICEF JMP for Water Supply and Sanitation.
b Refer to Annex B for regional percentages of access to water supply; access rates were computed from figures given in the WHO/UNICEF JMP for Water Supply and Sanitation.
Note: Totals may not tally due to rounding.

spread analysis, such as what this report attempts to gather, relies on specific types of technology as the best means of measuring whether newly covered areas are most likely delivering clean water. Box 2 on page 13 discusses these types of technology that greatly increase the likelihood that the water delivered from them is safe. For these reasons, this report prefers the language of "improved" water supply and uses the WHO's definition[14] of improved water supply as being characterized by (i) a significant increased probability that the water is safe, (ii) that it is more accessible, and (iii) some measures against contamination are being taken to protect the water source (e.g., stand post, borehole, protected spring or well, or collected rainwater).

Of course, *improved* water supply does not guarantee *safe* water supply, but it assumes a greater likelihood that a source is clean because of the level of technology used. Improved water supply is simply the *best measurable standard*. Therefore, the coverage and cost projections in this report are based on standards of improved access for both water supply and sanitation. There are many places where water quality is a concern, with the water available not meeting international guidelines for bacterial or chemical pollutants.[15] Similarly, in urban areas in particular, supplies are often rarely 24 hours a day. For example, in Delhi, only 1% of those people with water supply connections enjoy 24-hour service availability. In Karachi, Dhaka, and Kathmandu, the figure is less than 1%.[16] It is typically low-income areas that have the most unreliable access, with the only alternative being to buy water from informal vendors at prices much higher than those charged by utilities.

The WHO defines improved sanitation[17] as generally involving better, private access and safer disposal of excreta through

BOX 2: Definition of "Improved" Water Supply and Sanitation

The WHO report on the "Evaluation of the Costs and Benefits of Water and Sanitation Improvements at the Global Level" (by Hutton and Haller) categorizes which types of services are "improved" and which are considered "unimproved."

In terms of basic technology improvements to the WSS services:

- "Improved" water supply does not automatically mean that the water is safe. Rather, it denotes that water is more accessible, and some measures have been taken to protect the water source from contamination.
- "Improved" sanitation generally involves better access and safer disposal of excreta.

Intervention	Improved	Unimproved
Water Supply	house connection standpost/pipe borehole protected spring or well collected rainwater water disinfected at the point-of-use	unprotected well unprotected spring vendor-provided water bottled water water provided by tanker or truck
Sanitation	sewer connection septic tank pour-flush simple pit latrine ventilated improved pit latrine	service or bucket latrines public latrines latrines with an open pit

Source: Hutton, G. and Haller, L. *Evaluation of the Costs and Benefits of Water and Sanitation Improvement at the Global Level*. Geneva: World Health Organization, 2004. (WHO/SDE/WSH/04.04)

a septic tank, pour-flush, simple pit latrine, small bore sewer, or ventilated improved pit latrine. The facilities used for both improved water supply and sanitation are basic and low technology, but must be properly constructed and properly maintained.

The analysis done for this report is based on the coverage rates for 1990 and 2002, the most recent data for most countries, and projected coverage rates for 2015.[18] Analysis is provided for total, urban, and rural rates of change. Not all countries had baseline data in 1990, so most of the analysis is limited to the 34 countries with baseline data. Countries that either lack baseline data or have already achieved 100% coverage in 2002 are most often excluded from the analysis.

The mixed picture of progress and prospects begins to appear as one takes a closer look at the trends in coverage rates between Asia and the Pacific's five subregions, the countries within those subregions and between urban and rural areas (See Tables 3A and B). Of the 34 countries that provided baseline data in 1990 for the water supply indicator and did not have 100% coverage in 2002, only 10 countries will likely achieve or exceed the water supply indicator of Target 10 for both rural and urban coverage: Azerbaijan, India, Micronesia, Myanmar, Nepal, PRC, Russian Federation, Sri Lanka, Turkey, and Tuvalu. Of those 10 countries, four countries are projected to achieve 100% improved water supply coverage in both urban and rural areas before 2015: India, Micronesia, Myanmar, and Tuvalu. Based on data trends from 1990 to 2002, more countries are likely to meet the water supply indicator in urban areas than in their rural areas.

Several countries are actually showing a decline in coverage rates (Annex C). Of the 34 baseline countries, five countries are regressing in urban coverage (Bangladesh, Cook Islands, Indonesia, Nepal, and PRC) and two countries are regressing in rural coverage (Northern Mariana Islands and Palau). Four countries are regressing in both urban and rural coverage—Maldives, Marshall Islands, the Philippines, and Samoa. A regression in coverage should not be mistaken as a case of a country not making any progress in expanding coverage. Most likely, coverage rates are increasing but not at a rate that keeps pace with population growth. In areas where populations are rapidly swelling, particularly urban areas, coverage rates must expand at an even faster rate to maintain course for Target 10. Worth noting, though, is that coverage rates in the small Pacific island countries may be slightly skewed because certain areas cannot be as definitively categorized as either rural or urban.

Population wise, the PRC and India dominate their subregions and the whole of the Asia and the Pacific region. Collectively, in 2002, they accounted for 60% of the region's population and 38% of the global population. Both countries have made remarkable progress in water supply coverage during the 12-year period. Yet, the question remains whether this rate of progress is enough for these two countries to meet Target 10 of the MDGs.

East and Northeast Asia

With baseline data: CHINA, PEOPLE'S REP. OF • MONGOLIA
Without baseline data: CHINA, HONG KONG (SAR) • CHINA, MACAO (SAR) • JAPAN • KOREA, DEM. PEOPLE'S REP. OF • KOREA, REP. OF

This region is home to some of the more prosperous Asian countries and territories, yet is also home to around 15% of the world's population who lack water. In 2002, 300 million people in the subregion still did not have access to improved water supplies. When excluding those countries with 100% coverage or no baseline data, the regional analysis zeroes in on only two countries, the PRC and Mongolia.

The PRC dominates this subregion in geographic and population size, accounting for 86% of the subregional population. Yet, a subregional analysis of the growth in water supply coverage is solely a reflection of the PRC; Mongolia has not improved upon its 1990 numbers. At best, any expansion in coverage is only going

Table 3-A: COVERAGE AND PROJECTIONS for 2015 – URBAN WATER SUPPLY (in thousand)

Subregion/Country	Urban Population		Served Urban Population				Projections for 2015			Target 10 Achievement Prospects
	1990	2002	1990 Served Pop.	1990 Coverage (%)	2002 Served Pop.	2002 Coverage (%)	Urban Pop.	Served Urban Pop.	Coverage (%)	
East and Northeast Asia										
China, People's Republic of	311,932	492,049	311,932	100	452,686	92	694,139	680,256	98	♦
Korea, Dem. People's Rep. of	11,574	13,750	11,574	100	13,750	100	15,571	15,571	100	♦
Korea, Republic of[a]	31,723	37,944	30,771	97	36,806	97	41,251	41,251	100	♦
Mongolia	1,263	1,459	1,099	87	1,269	87	1,845	1,476	80	○
Japan[a]	77,916	100,295	77,916	100	100,295	100	86,114	86,114	100	♦
North and Central Asia										
Armenia[a]	2,375	1,997	2,351	99	1,977	99	1,926	1,907	99	♦
Azerbaijan	3,884	4,149	3,107	80	3,941	95	4,874	4,874	100	♦
Kazakhstan	9,581	8,663	9,198	96	8,316	96	8,905	8,548	96	♦
Kyrgyz Republic[a]	1,670	1,723	1,637	98	1,688	98	2,089	2,047	98	♦
Russian Federation	108,253	105,180	105,006	97	104,128	99	99,116	99,116	100	♦
Uzbekistan	8,206	9,511	7,960	97	9,226	97	11,359	10,791	95	○
Pacific										
Australia[a]	14,357	17,929	14,357	100	17,929	100	20,593	20,593	100	♦
Cook Islands	10	12	10	99	12	98	14	14	100	♦
French Polynesia	109	125	109	100	125	100	155	146	94	♦
Guam	122	152	122	100	152	100	185	185	100	♦
Kiribati	25	40	19	76	31	77	62	52	83	○
Marshall Islands	29	34	27	95	27	80	70	28	40	○
Micronesia, Fed. States of	25	31	23	93	30	95	35	35	100	♦
New Zealand[a]	2,890	3,376	2,890	100	3,376.0	100	3,654	3,654.0	100	♦
Niue	1	1	1	100	1	100	1	1	100	♦
Northern Mariana Is.	39	71	38	98	70	98	94	94	100	♦
Palau	11	14	7	71	11	79	14	14	100	♦
Papua New Guinea	535	726	471	88	639	88	1,044	890	85	○
Samoa	34	39	33	99	35	91	49	38	76	○
Tonga	31	34	31	100	34	100	38	38	100	♦
Tuvalu	4	5	3	92	5	94	7	7	100	♦
Vanuatu	28	46	26	93	39	85	86	59	69	○
South and Southwest Asia										
Bangladesh	21,880	34,514	18,161	83	28,302	82	53,694	45,766	85	○
India	220,069	293,874	193,660	88	282,119	96	401,341	401,341	100	♦
Iran, Islamic Republic of	31,754	44,926	31,119	98	44,028	98	60,155	60,155	100	♦
Maldives	56	87	56	100	86	99	141	138	98	♦
Nepal	1,676	3,691	1,576	94	3,433	93	6,560	6,232	95	♦
Pakistan	34,379	50,970	32,660	95	48,421	95	80,778	74,183	92	○
Sri Lanka	3,534	3,971	3,216	91	3,931	99	4,635	4,635	100	♦
Turkey	33,980	46,410	31,261	92	44,553	96	59,030	59,030	100	♦
Southeast Asia										
Indonesia	56,456	95,538	51,940	92	85,028	89	144,731	124,469	86	○
Malaysia	8,923	15,098	8,566	96	14,494	96	21,016	21,016	100	♦
Myanmar	10,127	14,167	7,392	73	13,459	95	20,981	20,981	100	♦
Philippines	29,941	47,148	27,845	93	42,433	90	66,640	57,976	87	○
Singapore[a]	3,016	4,170	3,016	100	4,170	100	4,815	4,815	100	♦
Thailand	15,773	19,902	13,722	87	18,907	95	25,543	25,543	100	♦
Viet Nam	13,215	20,070	12,290	93	18,665	93	30,683	29,351	96	♦

Legend: ♦ = on track ○ = off track

a Does not have complete baseline data

Notes: 1. Blanks indicate unavailability of data. 2. "On track" means that the country has either a) reached the target, b) exceeded the target, or c) is within 3–5% of the target.

Table 3-B: COVERAGE AND PROJECTIONS for 2015 – RURAL WATER SUPPLY (in thousand)

Subregion/Country	Rural Population		Served Rural Population				Projections for 2015			Target 10 Achievement Prospects
	1990	2002	1990 Served Pop.	1990 Coverage (%)	2002 Served Pop.	2002 Coverage (%)	Rural Pop.	Served Rural Pop.	Coverage (%)	
East and Northeast Asia										
China, People's Republic of	843,373	802,818	497,590	59	545,916	68	708,162	601,937	85	♦
Korea, Dem. People's Rep. of	8,382	8,791	8,382	100	8,791	100	8,129	8,129	100	♦
Korea, Republic of[a]	11,146	9,486			6,735	71	8,449		-	
Mongolia	953	1,100	286	30	330	30	1,256	389	31	○
Japan[a]	45,621	27,145	45,621	100	27,145	100	41,086	41,086	100	
North and Central Asia										
Azerbaijan	3,308	4,149	1,621	49	2,448	59	4,627	3,239	70	♦
Kazakhstan	7,228	6,806	5,204	72	4,901	72	6,395	4,591	72	○
Russian Federation	40,039	38,902	34,433	86	34,234	88	34,284	30,855	90	♦
Uzbekistan	12,309	16,194	10,340	84	13,603	84	19,341	16,246	84	○
Pacific										
Australia[a]	2,516	1,730	2,516	100	1,730	100	1,107	1,107	100	♦
Cook Islands	8	6	7	87	5	88	3	2.7	89	○
French Polynesia	86	116	86	100	116	100	136	136	100	♦
Guam	22	16	22	100	16	100	9	9	100	♦
Kiribati	47	47	15	33	25	53	38	38	100	♦
Marshall Islands	15	18	15	97	17	95	31	19	62	○
Micronesia, Fed. States of	71	77	60	85	72	94	65	65	100	♦
New Zealand[a]	520	563	520	100	563	100	546	546	100	♦
Niue	1	1	1	100	1	100	1	1	100	♦
Northern Mariana Is.	5	5	5	100	4	97	4	3.8	94	○
Palau	5	6	4	99	6	94	7	6	89	○
Papua New Guinea	3,579	4,860	1,145	32	1,555	32	6,156	2,166	35	○
Samoa	126	137	112	89	121	88	151	130	86	○
Tonga	68	69	68	100	69	100	62	62	100	♦
Tuvalu	5	5	5	89	4	92	4	4	100	♦
Vanuatu	121	161	64	53	84	52	214	113	53	○
South and Southwest Asia										
Bangladesh	87,522	109,295	59,515	68	78,692	72	127,706	97,056	76	○
India	626,349	755,675	382,073	61	619,654	82	845,059	845,059	100	♦
Iran, Islamic Rep. of	24,949	23,144	20,708	83	19,209	83	21,245	17,708	83	○
Maldives	160	222	158	99	174	78	259	192	74	○
Nepal	16,949	20,918	11,356	67	17,152	82	25,440	21,624	85	♦
Pakistan	76,522	98,941	59,687	78	86,079	87	123,723	111,350	90	♦
Sri Lanka	13,296	14,939	8,243	62	10,756	72	15,965	14,349	90	♦
Turkey	23,613	23,908	15,349	65	20,800	87	23,070	19,609	85	♦
Southeast Asia										
Indonesia	125,661	121,593	77,910	62	83,899	69	105,669	80,308	76	○
Myanmar	30,380	34,685	12,152	40	25,667	74	34,819	24,373	70	♦
Philippines	31,163	31,432	25,554	82	24,203	77	29,660	22,819	77	○
Thailand	38,616	42,291	30,121	78	33,833	80	44,057	36,127	82	○
Viet Nam	52,859	60,209	35,416	67	40,340	67	64,017	46,450	73	○

Legend: ♦ = on track ○ = off track

a Does not have complete baseline data

Notes: 1. Blanks indicate unavailability of data. 2. "On track" means that the country has either a) reached the target, b) exceeded the target, or c) is within 3–5% of the target.

Overall, the region's picture of stymied progress is a reflection of compounding factors—pollution, overexploitation of ground water, dilapidated systems, and insufficient levels of investment.

as far as the population growth rate. Mongolia's lack of progress, however, is likely related to its sparse population that is largely spread out in rural areas.

The PRC extended access to total improved water supplies on an annual compounded rate of less than a percent—just 0.8%, which still amounts to a 10% total increase in total supply coverage between 1990 and 2002. The PRC's urban coverage has declined at an annual compounded rate of 0.7% for a total regression of 8% over the 12-year period. Despite the declining coverage rate, the actual number of served populace has actually increased at an annual rate of over 3% between 1990 and 2002. This translates to an additional 141 million people gaining access to improved water supply in the 12-year period. Assuming this rate is maintained in the next 12 years, urban coverage in the PRC will reach approximately 98% in 2015, a remarkable feat given the rapid urbanization predicted for the country over the next decade or so.

Progress in the PRC's rural areas is the result of over 1% compounded annual increase, which has meant a 9% total increase in the past 12 years. Projections put the PRC's rural coverage at 85% by 2015 if past coverage rates continue.

Beyond the incredible percentage growth in the rural areas, the greatest gains in real numbers were made in the cities. Specifically, over 141 million people in urban areas received improved water supply services between 1990 and 2002, compared to the 48 million people in the rural areas.

North and Central Asia

With baseline data: AZERBAIJAN • KAZAKHSTAN • RUSSIAN FEDERATION • UZBEKISTAN
Without baseline data: ARMENIA • GEORGIA • KYRGYZ REPUBLIC • KYRGYZSTAN • TAJIKISTAN • TURKMENISTAN

Historically, improved water supply coverage in North and Central Asia has always been high and remains the highest in Asia and the Pacific. The region also has some of the lowest disparities between urban and rural coverage, and their respective average annual rates of increase.

No other country in the subregion comes close to Azerbaijan's performance over the 12-year period in both urban and rural coverage expansion. Since 1990, Azerbaijan has increased its total coverage by 16% at a compounded annual increase of over 1%. Urban water supply coverage has increased annually at under 2% for a total increase of 17%, making it an early achiever of Target 10's water supply indicator. Its rate of increased coverage in rural areas registered an impressive 19% change since 1990.

Kazakhstan and Uzbekistan show no change. The declining coverage in the other countries within this subregion is characteristic of the overall economic decline and disruption of many service institutions in the former Soviet Union countries during the early years of independence.

The Pacific

With baseline data: COOK ISLANDS • FRENCH POLYNESIA • GUAM • KIRIBATI • MARSHALL ISLANDS • MICRONESIA, FED. STATES OF • NIUE • NORTHERN MARIANA ISLANDS • PALAU • PAPUA NEW GUINEA • SAMOA • SOLOMON ISLANDS • TOKELAU • TONGA • TUVALU • VANUATU
Without baseline data: AMERICAN SAMOA • AUSTRALIA • FIJI ISLANDS • NAURU • NEW CALEDONIA • NEW ZEALAND

The Pacific subregion represents by far the smallest population of the subregions, accounting for only 1% of the total regional population. It also hosts great disparities in coverage between countries and between urban and rural areas.

There has been a lack of any change in coverages of Papua New Guinea, the most populous country in the subregion after Australia and New Zealand. Papua New Guinea's total coverage in 2002 was only 39%, with 88% coverage in urban areas, but only 32% coverage in rural areas, one of the lowest figures globally. Projections for 2015 see little change in coverage of Papua New Guinea.

The Marshall Islands has been experiencing an unusually substantial reversal. From already high coverage rates in 1990, coverage rates are dramatically regressing. From 94% total water supply coverage in 1990, Marshall Islands lost

coverage at an average 1% annually, totaling a 12% decline. The country's urban coverage rates fell at an even faster rate at 1.4% to imply a 17% decrease in urban rates, resting at just 80% coverage. Fortunately, its rural rates show only—yet still unacceptably—an annual regression of 0.2% for a total 2% drop from 1990 figures, resting at 95% coverage. Several countries that once trailed this former leader in the subregion for water supply coverage now surpass it. Samoa also experienced regression in all categories, but did not suffer as much of a setback as the Marshall Islands.

Despite many disappointing cases of performance in this subregion, there are instances of progress. Kiribati's average annual growth rates put it on track to meet the Target 10 indicator in rural areas, but is slow in cities. Kiribati is making inroads in rural coverage, reaching 53% in 2002, which is still low but a noteworthy increase from 33% coverage in 1990. Kiribati's progress in urban coverage, however, is not experiencing the same growth, up only 1% in 2002 to 77%. Micronesia is excelling in both urban and rural coverage at rates that make it an early achiever of the Target 10 water supply indicator. Tuvalu is on track to meet the water supply indicator in both urban and rural areas, but could easily achieve 100% total coverage given its high rate of coverage in 1990 and moderate rate of increased coverage over the 12 years.

Overall, the region's picture of stymied progress is a reflection of compounding factors—pollution, overexploitation of ground water, dilapidated systems, and insufficient levels of investment. The failure to even come remotely close to achieving Target 10 weakens the Pacific's defense against overall poverty.

South and Southwest Asia

With baseline data: BANGLADESH • INDIA • IRAN, ISLAMIC REPUBLIC OF • MALDIVES • NEPAL • PAKISTAN • SRI LANKA
Without baseline data: AFGHANISTAN • BHUTAN • TURKEY

South and Southwest Asia is the most populous subregion. Similar to China's, India's geographic and population size dominates in this subregion, accounting for almost 70% of the region's total population. India has made advances in both its urban and rural water supply coverage since 1990, when it posted one of the lowest coverage figures. By 2002, however, India had made some of the greatest improvements in the Asia and Pacific region.

India's total compounded annual rate of change is impressive at 2% annually and 24% total over the 12-year period. India's urban coverage increased from 88% to 96%, while over the same period, its rural coverage leapt from 61% to 82%—the result of under 3% average annual rate of increase, the most rapid rural coverage growth rate in Asia and the Pacific. India's progress in this 12-year period brought access to 88.5 million people in urban areas and a staggering 237 million people in rural areas. It is on track to provide 100% coverage countrywide by 2015.

Bangladesh is the only country in the subregion projected to miss the Target 10 water supply indicator for both urban and rural water supply. Bangladesh would have also shown dramatic improvements, from around 70% to over 90%, if groundwater sources in some areas had not been identified for arsenic contamination, leading to the reclassification of many hand pumps as being unsafe. Maldives has also experienced an unfortunate severe downturn in its nearly 100% coverage levels in 1990. Its once respectable rural coverage level of 99% in 1990 is just 78% in 2002. Rural coverage in Maldives decreased on an average 2% annually to a total decrease of 24% in rural supply. To a far lesser degree, its urban water supply decreased by only 1%, yet the total effect of the country's regression meant that total water supply coverage decreased by 16% over the 12 years.

All countries, except for Bangladesh, Iran, and Maldives, had increased rural water supply coverage in excess of 10% and ranging through to 34% (Annex C). Recent data for Nepal, however, shows re-

Countries in Southeast Asia are by far more likely to achieve the water supply indicator in their urban areas than rural areas.

versing trends that threaten its chance of meeting the Target 10 water supply indicator. Between 2000 and 2002, Nepal's rate of increase for total coverage fell from 4% to less than 1%. Further threatening Nepal's progress is a civil conflict that began in the mid 1990s, which led to restricted access to many parts of the country, particularly in the western region.

Southeast Asia

With baseline data: INDONESIA • MALAYSIA • MYANMAR • PHILIPPINES • THAILAND • VIET NAM
Without baseline data: BRUNEI DARUSSALAM • CAMBODIA • LAO PEOPLE'S DEM. REPUBLIC • SINGAPORE • TIMOR-LESTE

Countries in Southeast Asia are by far more likely to achieve the water supply indicator in their urban areas than rural areas. Projections based on past coverage growth rates indicate that Malaysia and Thailand are likely to either approach or reach 100% coverage in urban areas by 2015, but their rural areas will elude Target 10 achievement. No country in this subregion is likely to meet the indicator in rural areas. A further area of concern is that while Indonesia and the Philippines both had relatively high urban coverage in 1990, both regressed (although their actual numbers of people with access may have increased). Both countries are also regressing in rural coverage levels. Viet Nam shows no change.

CHAPTER 3

Sanitation Coverage: Progress and Prospects

AT FIRST GLANCE, the picture of progress for improved sanitation coverage in Asia and the Pacific might appear to have changed little—stuck at irredeemably low levels that require difficult amounts of financing to launch momentous change by 2015. For many, this impression would seem logical and the result of a historical oversight to improve sanitation coverage despite linking them to water supplies programs and projects. The focus of policy and investments has tended to be on improving water supplies while sanitation coverage has fallen far behind. As of 2002, one third of Asia and the Pacific lacked access to clean water, but one half of the region had no access to the most basic sanitation facilities. A huge proportion of the population is living in conditions that pose high risks to their personal and environmental health.

Many countries are expanding access to improved sanitation at rates that far exceed their efforts in water supply coverage. Compounded annual increases in access have been as impressive as 27%.

Taking a closer look, though, substantial changes have been made in securing sanitation coverage between 1990 and 2002. Coverage levels remain low in 2002, yet in many cases, they are respectable improvements upon the 1990 figures (Table 4). In fact, many countries are expanding access to improved sanitation at rates that far exceed their efforts in water supply coverage. Compounded annual increases in access have been as impressive as 27%. Assuming that trends continue and that no major barriers to progress take place in the coming years up to 2015, majority of the countries with complete baseline data will likely meet their respective levels to achieve the Target 10 indicator for improved sanitation in at least their urban or rural areas (Tables 5A and B).

Twelve countries show promise of achieving their sanitation indicator level in both urban and rural areas—Fiji, French Polynesia, Guam, India, Malaysia, Myanmar, Northern Mariana Islands, Pakistan, Sri Lanka, Thailand, Tonga, and Tuvalu. On the other hand, 10 countries are at serious risk of missing their sanitation indicator levels in both urban and rural areas—Indonesia, Iran, Kazakhstan, Marshall Islands, Micronesia, Nepal, Papua New Guinea, Russian Federation, Turkey, and Uzbekistan.

Meeting the sanitation indicator is only a milestone en route to truly respectable and widespread humanitarian change. MDG target levels by no means represent acceptable levels of coverage. They do, however, represent achievable levels if countries commit the resources and power to accomplish them. As of 2002, less than half of the region's population had access to improved sanitation facilities—nearly 2 billion of the 2.6 billion people unserved worldwide. This total sanitation figure masks dramatic regional disparities between rural and urban populations. In 2002, urban sanitation coverage had reached 76%, while in rural areas the figure was a pitiful 32%. The rates of increase range from 0.1% to 27% (Annex C). It is worth noting that the disproportionate attention urban areas receive for improved sanitation is not without some justification. Urban dwellers face greater health

Table 4. SANITATION COVERAGE ESTIMATES FOR SUBREGIONS IN ASIA AND THE PACIFIC, 1990 and 2002 (in million)

Subregion	1990								
	Population[a]			Served Population[b]			Unserved Population		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
East and Northeast Asia	1,351	446	905	432	318	106	919	128	799
North and Central Asia	215	140	75	176	128	48	39	12	27
Pacific	27	19	8	24	19	4	3	-	4
South and Southwest Asia	1,232	345	887	283	201	76	949	144	811
Southeast Asia	440	141	299	211	97	117	229	44	182
Totals	**3,265**	**1,091**	**2,174**	**1,126**	**763**	**351**	**2,139**	**328**	**1,823**

Subregion	2002								
	Population[a]			Served Population[b]			Unserved Population		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
East and Northeast Asia	1,502	631	871	751	468	273	751	163	588
North and Central Asia	216	135	81	172	123	50	44	12	32
Pacific	32	23	9	28	23	4	4	-	4
South and Southwest Asia	1,551	481	1,070	605	334	266	946	147	799
Southeast Asia	536	220	316	327	181	163	209	39	170
Totals	**3,837**	**1,490**	**2,347**	**1,883**	**1,129**	**756**	**1,954**	**361**	**1,593**
Increase from 1990 to 2002	**572**	**399**	**173**	**757**	**366**	**405**	**(185)**	**33**	**(230)**

a Breakdown of population was based on data provided by the WHO/UNICEF JMP for Water Supply and Sanitation
b Refer to Annex B for regional percentages of access to water supply; access rates were computed from figures given in the WHO/UNICEF JMP for Water Supply and Sanitation
Note: Totals may not tally due to rounding.

risks from the combination of widespread pollution from human waste and the extreme densities of many low-income areas in major cities.

The analysis in this chapter follows the same methods used for measuring progress and prospects for the water supply indicator (Endnote 18). In this case, improved sanitation involves better access and safer disposal of excreta through facilities such as septic tanks, simple pit latrines or ventilated improved pit latrines (Box 2).

East and Northeast Asia

With baseline data: CHINA, PEOPLE'S REP. OF
Without baseline data: CHINA, HONG KONG (SAR) • CHINA, MACAO (SAR) • JAPAN • KOREA, DEM. PEOPLE'S REP. OF • KOREA, REP. OF • MONGOLIA

The PRC is the only country in this subregion (without 100% coverage) to have 1990 baseline data. Mongolia only had baseline data for its water supply coverage, but only sanitation coverage in 2002.

By 2002, the PRC increased its total sanitation access by 67%—the result of a 6% compounded annual rate of expansion. In its urban areas, total coverage grew by 8% (from 23% to 44%) over the 12-year period. the PRC increased rural sanitation coverage by a remarkable 150% from the lowly level of just 7% in 1990 to 29% in 2002. The percentages of increase represent incredible amounts of people. Overall, about 300 million people in the PRC gained access to improved sanitation facilities during this period. Although a markedly lower percentage than rural gains, the 8% growth in urban sanitation coverage is remarkable given the rapid rate of urbanization in the PRC. The 13% annual increase in rural sanitation translates into nearly 174 million rural Chinese gaining access, yet sanitation coverage in rural areas still only reached 29% in 2002. Despite the progress, over 725 million people in the PRC alone remain without access to improved sanitation facilities—over a quarter of all the people without adequate sanitation globally.

North and Central Asia

With baseline data: KAZAKHSTAN • RUSSIAN FEDERATION • UZBEKISTAN
Without baseline data: ARMENIA • AZERBAIJAN • GEORGIA • KYRGYZ REPUBLIC • TAJIKISTAN • TURKMENISTAN

As with drinking water supplies, North and Central Asia has a long history of providing access to improved sanitation facilities. Unfortunately, this legacy appears to have not continued during the period between 1990 and 2002, with the subre-

Table 5-A: COVERAGE AND PROJECTIONS for 2015 – URBAN SANITATION (in thousand)

Subregion/Country	Urban Population		Served Urban Population				Projections for 2015			Target 10 Achievement Prospects
	1990	2002	1990 Served Pop.	Coverage (%)	2002 Served Pop.	Coverage (%)	Total Urban Pop.	Served Urban Pop.	Coverage (%)	
East and Northeast Asia										
China, People's Republic of	311,932	492,049	199,637	64	339,514	69	694,139	513,662	74	○
Japan[a]	77,916	100,295	77,916	100	100,295	100	86,114	86,114	100	♦
North and Central Asia										
Armenia[a]	2,375	1,997	2,280	96	1,917	96	1,926	1,588	82	○
Georgia	3,003	2,692	2,883	96	2,584	96	2,425	2,296	95	♦
Kazakhstan	9,581	8,663	8,336	87	7,536	87	8,905	6,757	76	○
Russian Federation	108,253	105,180	100,675	93	97,817	93	99,116	92,178	93	○
Uzbekistan	8,206	9,511	5,990	73	6,943	73	11,359	8,146	72	○
Pacific										
Australia[a]	14,357	17,929	14,357	100	17,929	100	20,593	20,593	100	♦
Cook Islands	10	12	10	100	12	100	14	14	100	♦
Fiji	304	424	301	99	420	99	541	541	100	♦
French Polynesia	109	125	108	99	124	99	155	144	93	♦
Guam	122	158	121	99	156	99	185	185	100	♦
Kiribati	25	40	8	33	24	59	62	58	94	♦
Marshall Islands	29	34	25	88	32	93	70	41	59	○
Micronesia, Fed. States of	25	31	13	53	19	61	35	25	70	○
New Zealand[a]	2,890	3,376	2,890	100	3,376	100	3,654	3,654	100	♦
Niue	0.6	0.7	0.6	100	0.7	100	1	0.8	80	○
Northern Mariana Is.	39	71	33	85	67	94	94	94	100	♦
Palau	11	14	8	72	13	96	14	14	100	♦
Papua New Guinea	535	726	358	67	487	67	1,044	678	65	○
Samoa	34	39	34	100	39	100	49	45	91	○
Solomon Islands	45	74	44	98	73	98	125	125	100	♦
Tonga	31	34	30	98	33	98	38	37	97	♦
Tuvalu	4	5	3	83	5	92	7	7	100	♦
South and Southwest Asia										
Bangladesh	21,880	34,514	15,535	71	25,886	75	53,694	45,007	84	○
India	220,069	293,874	94,630	43	170,447	58	401,341	322,439	80	♦
Iran, Islamic Rep. of	31,754	44,926	27,308	86	38,637	86	60,155	51,733	86	○
Maldives	56	87	56	100	87	100	141	138	98	♦
Nepal	1,676	3,691	1,039	62	2,510	68	6,560	4,920	75	○
Pakistan	34,379	50,970	27,847	81	46,892	92	80,778	80,778	100	♦
Sri Lanka	3,534	3,971	3,146	89	3,892	98	4,635	4,635	100	♦
Turkey	33,980	46,410	32,621	96	43,625	94	59,030	54,308	92	○
Southeast Asia										
Indonesia	56,456	95,538	37,261	66	67,832	71	144,731	109,996	76	○
Malaysia[b]	8,923	15,098	8,387	94	14,796	98	21,016	21,016	100	♦
Myanmar	10,127	14,167	3,949	39	13,600	96	20,981	20,981	100	♦
Philippines	29,941	47,148	18,863	63	38,190	81	66,640	66,640	100	♦
Thailand	15,773	19,902	14,984	95	19,305	97	25,543	25,402	99	♦
Viet Nam	13,215	20,070	6,079	46	16,858	84	30,683	30,683	100	♦

Legend: ♦ = on track ○ = off track

a Does not have complete baseline data

b In the case of Malaysia, JMP data has no coverage rate for 2002. The 98% rural coverage rate for that year was used for urban areas also and a 100% rate was used for 2015.

Note: "On track" means that the country has either a) reached the target, b) exceeded the target, or c) is within 3–5% of the target.

Table 5-B: COVERAGE AND PROJECTIONS for 2015 – RURAL SANITATION (in thousand)

Subregion/Country	Rural Population		Served Rural Population				Projections for 2015			Target 10 Achievement Prospects
	1990	2002	1990 Served Pop.	1990 Coverage (%)	2002 Served Pop.	2002 Coverage (%)	Rural Pop.	Served Rural Pop.	Coverage (%)	
East and Northeast Asia										
China, People's Republic of	843,373	802,818	59,036	7	232,817	29	708,162	361,162	51	♦
Japan[a]	45,621	27,145	45,621	100	27,145	100	41,086	41,086	100	♦
North and Central Asia										
Kazakhstan	7,228	6,806	3,758	52	3,539	52	6,395	3,316	52	○
Russian Federation	40,039	38,902	28,027	70	27,231	70	34,284	26,395	77	○
Uzbekistan	12,309	16,194	5,908	48	7,773	48	19,341	10,463	54	○
Pacific										
Cook Islands	8	6	7	88	6	100	3	3	100	♦
Fiji	420	407	412	98	399	98	359	359	100	♦
French Polynesia	86	116	83	97	112	97	136	136	100	♦
Guam	12	11	12	98	11	98	9	9	100	♦
Kiribati	47	47	10	21	10	22	38	11	29	○
Marshall Islands	15	18	8	51	10	59	31	14	46	○
Micronesia, Fed. States of	71	77	15	21	11	14	65	8	12	○
Niue	1	1	1	100	1	100	1	1	100	♦
Northern Mariana Is.	5	5	4	78	4	96	4	4	100	♦
Palau	5	6	2	54	3	52	7	4	57	○
Papua New Guinea	3,579	4,860	1,467	41	1,993	41	6,156	2,775	45	○
Samoa	126	137	124	98	137	100	151	151	100	♦
Tonga	68	69	66	96	66	96	62	62	100	♦
Tuvalu	5	5	4	74	4	83	4	4	100	♦
South and Southwest Asia										
Afghanistan	11,315	17,656	566	5	883	5	24,673	1,430	6	○
Bangladesh	87,522	109,295	9,627	11	42,625	39	127,706	67,684	53	♦
India[b]	626,349	755,675	6,263	1	136,022	18	845,059	405,628	48	♦
Iran, Islamic Rep. of	24,949	23,144	19,460	78	18,052	78	21,245	16,641	78	○
Nepal	16,949	20,918	1,186	7	4,184	20	25,440	10,685	42	○
Pakistan	76,522	98,941	14,539	19	34,629	35	123,723	88,667	72	♦
Sri Lanka	13,296	14,939	8,509	64	13,296	89	15,965	15,965	100	♦
Turkey	23,613	23,908	15,821	67	14,823	62	23,070	13,813	60	○
Southeast Asia										
Indonesia	125,661	121,593	47,751	38	46,205	38	105,669	44,587	42	○
Malaysia	8,923	8,867	8,744	98	8,690	98	8,584	8,584	100	♦
Myanmar	30,380	34,685	4,557	15	21,851	63	34,819	34,819	100	♦
Philippines	31,163	31,432	14,335	46	19,174	61	29,660	23,432	79	♦
Thailand	38,616	42,291	28,576	74	42,291	100	44,057	44,057	100	♦
Viet Nam	52,859	60,209	8,457	16	15,654	26	64,017	30,500	48	○

Legend: ♦ = on track ○ = off track

a Does not have complete baseline data

b In the case of India, the 1990 coverage rate was 1% and the 2002 rate was 18%, together giving an astounding compound growth rate of coverage of 29% per annum. Instead of this, the rural water supply coverage growth rate of 4% per annum was used here. If the 29% were used the coverage would be over 100 percent several years before 2015.

Note: "On track" means that the country has either a) reached the target, b) exceeded the target, or c) is within 3–5% of the target.

gion declining in access to total, urban, and rural improved sanitation facilities.

All countries in the subregion provided information on total, urban, and rural sanitation coverage for 2002. In contrast, there are only three countries with complete baseline data—Kazakhstan, Russia, and Uzbekistan. Armenia and Georgia had baseline data but only for urban sanitation. Not one country with baseline data is projected to meet the sanitation target. In fact, since 1990, no rate of change registers for any of the baseline countries.

The Pacific

With baseline data: COOK ISLANDS • FIJI ISLANDS • FRENCH POLYNESIA • GUAM • KIRIBATI • MARSHALL ISLANDS • MICRONESIA, FED. STATES OF • NORTHERN MARIANA ISLANDS • PALAU • PAPUA NEW GUINEA • SAMOA • TONGA • TUVALU
Without baseline data: AMERICAN SAMOA • AUSTRALIA • NAURU • NEW CALEDONIA • NEW ZEALAND • NIUE • SOLOMON ISLANDS • TOKELAU • VANUATU

Despite some regression, the majority of countries in the subregion are increasing coverage levels in both urban and rural areas, with many on track to meet the Target 10 sanitation indicator in at least their urban or rural areas.

One of the more worrisome states in the entire Asia and Pacific region, if not globally, is Papua New Guinea, where total sanitation coverage remains at only 45%, with only 41% of the rural population having access to improved sanitation facilities. By 2015, roughly half of Papua New Guinea will still be without improved sanitation, according to data trends.

Northern Mariana and Tuvalu will meet the indicator for total coverage if they continue at their past rates of expansion; Kiribati, Solomon Islands, and Palau have been expanding at a feasible rate in urban areas to meet the indicator there, but a greater rate of increase is needed to meet the sanitation indicator in rural areas.

Kiribati is a prime example of the Pacific experience with increasing access to improved sanitation—low coverage levels to build on, uneven progress between urban and rural areas, incredible gains and rates of expansion, yet not at a rate to completely achieve the Target 10 sanitation indicator by 2015. Kiribati had some of the lowest baseline figures in 1990 in its subregion, as well as the whole of Asia. Total sanitation coverage was just 25% in 1990, with urban coverage at 33% and rural coverage at 21%. Kiribati made far greater progress in its urban areas than rural areas. Urban coverage rose almost 60% at a compounded rate of 5% annually, while rural coverage rose just 5% at 0.4% annually.

South and Southwest Asia

With baseline data: BANGLADESH • INDIA • IRAN, ISLAMIC REPUBLIC OF • NEPAL • PAKISTAN • SRI LANKA • TURKEY
Without baseline data: AFGHANISTAN • BHUTAN • MALDIVES

South and Southwest Asia has the lowest coverage levels for improved sanitation than any other subregion within Asia and Pacific region. Its sanitation coverage level is the same as Sub-Saharan Africa.

Of the countries with baseline data in South and Southwest Asia, five will achieve the Target 10 sanitation indicator in at least urban or rural areas if they continue at their current rate of growth. India, Pakistan, and Sri Lanka will likely achieve the improved sanitation indicator in both urban and rural areas if they continue expanding access at their 1990–2002 rates.

In Pakistan, total coverage has risen from its 1990 level of 38% to 54% in 2002. In urban areas, it is projected to achieve 100% access to improved sanitation. Sri Lanka is the only country in the subregion on course toward 100% total improved sanitation coverage by 2015. Bangladesh will likely achieve the sanitation indicator only in rural areas, yet this is a remarkable feat given that its 6% average annual increase—if continued—will more than double its coverage level by 2015. This means access will be provided to more than 110 million people by the end of the MDG period.

Despite their high coverage rates, Iran and Turkey are not projected to halve the remaining proportion of their people without improved sanitation. Nepal, with lower coverage rates than others in its

Despite some regression, the majority of countries in the (Pacific) subregion are increasing coverage levels in both urban and rural areas....

subregion, will also not improve at rates needed to meet Target 10. Iran figures show no progress in coverage levels and Turkey has been regressing in all coverage levels, which will leave approximately 15 million people without improved sanitation in 2015. Although projections are reserved for countries with baseline data, Afghanistan's total sanitation coverage of only 8% deserves attention. In rural areas of Afghanistan, only 5% of the population had access to improved sanitation in 2002. Few places in the world face such scarce and alarming coverage levels.

Southeast Asia

With baseline data: INDONESIA • PHILIPPINES • THAILAND • VIET NAM
Without baseline data: BRUNEI DARUSSALAM • CAMBODIA • LAO PEOPLE'S DEM. REPUBLIC • MALAYSIA • MYANMAR • SINGAPORE • TIMOR-LESTE

Southeast Asia has significantly expanded access to improved sanitation facilities in both rural and urban areas since 1990. Most baseline countries in this subregion will meet the sanitation indicator of Target 10 in at least urban or rural areas, if they continue to meet their past annual rates of increase. Thailand is progressing at a rate that could provide 100% improved sanitation coverage by 2015, as long as it maintains the expansion rates achieved during the 12-year reporting period. If the Philippines and Viet Nam continue at their 1990–2002 expansion rates, they could provide 100% access to improved sanitation in urban areas.

Making the highest coverage increases of any Southeast Asian country, Viet Nam is quickly overcoming a total coverage level of just 22% in 1990 by posting over 5% average annual rates of increase. In rural areas, however, only 48% is expected to have access to improved sanitation facilities, despite the country's likely increasing rural coverage at a rate of more than 4% annually. Unlike its poor status for water supply access, the Philippines has made considerable improvements and is on track to meet the Target 10 sanitation indicator in both urban and rural areas, so long as it maintains its past average rates of annual increase.

Indonesia is the only country with baseline data not likely to achieve the Target 10 sanitation indicator in either rural or urban areas. There was some increase in urban coverage levels, but there was no change for rural coverage levels. If Indonesia continues at the rate it has been going since 1990, it will have one of the lowest rural coverage rates in all of Asia and the Pacific, with just 42% of its rural population having access to improved sanitation. Urban coverage rates are headed toward the same conclusion, with only 76% of Indonesia's urban dwellers having access to improved sanitation in 2015, which is also one of the lowest projected sanitation coverage levels in all of Asia and the Pacific.

Projections are not possible for Cambodia, Lao PDR, or Timor-Leste because they lack sufficient data. These low-income countries did have data in 2002, which are the lowest coverage levels in all of Asia and the Pacific. Cambodia had a 16% total coverage level, with urban coverage much higher than rural coverage—53% and 8% respectively. Lao PDR had 24% total improved sanitation coverage, with 61% of its urban populations covered and 14% of its rural populations covered. Timor-Leste had total, urban, and rural coverage rates at 33%, 65% and 30% respectively.

CHAPTER

4

Meeting Target 10: How Much Will It Cost?

JUST WHAT IS THE COST OF MEETING TARGET 10 in Asia and the Pacific? The price tag is surprisingly affordable. A regional, recurrent investment of just $8 billion a year would ensure that Asia and the Pacific meets Target 10 and continues to expand coverage beyond 2015 (Table 6). The greatest proportion of the bill belongs to the South and Southwest Asia subregion, followed by East and Northeast Asia, where the greatest numbers of unserved people are found in India and the PRC. And because Asia bears the majority of the world's poor, this region achieving Target 10 represents a significant achievement toward attaining the global target. The achievability and affordability of meeting Target 10 in Asia and the Pacific raises an interesting possibility: Political leaders can afford to confidently set more ambitious targets than the MDGs and advance their countries toward greater levels of social and economic development. It is not a matter of possibility, but a matter of willingness.

The achievability and affordability of meeting Target 10 in Asia and the Pacific... is not a matter of possibility, but a matter of willingness.

The costs of providing access to safe water and adequate sanitation vary from high, when high standards are applied and sophisticated technology is used, to substantially lower costs, when simple technology that demands low maintenance is used. In this analysis, improved water supply and sanitation refers to low technology improvements, such as those discussed in previous chapters, which would satisfy Target 10. A WHO study[19] on the costs and benefits of water and sanitation improvements at the global level presented cost estimations on the following four interventions:

1. Intervention 1—Reaching Target 10: Halving the proportion of people without sustainable access to both safe water supply and improved sanitation (water and sanitation MDG targets);

2. Intervention 2—Improved Water Supply and Sanitation for All: Sustainable access to safe water and improved sanitation for everyone;

3. Intervention 3—Improved Water Supply and Sanitation for All Plus Disinfection: Providing disinfection at point-of-use over and above increasing access to improved water supply and sanitation[20]; and

4. Intervention 4—Piped WSS for All Plus Primary Treatment: Providing regulated piped water supply in house and sewage connection with partial sewerage for everyone.[21]

According to the WHO report, the funding or investment requirements for these four interventions cover:

- **Investment costs:** Planning and supervision, hardware, construction and house alteration, protection of water sources and education that accompanies an investment in hardware.
- **Recurrent costs:** Operating materials to provide a service, maintenance of hardware and replacement of parts, emptying of septic tanks and latrines, regulation and control of water supply, ongoing protection and monitoring of water sources, water treatment and distribution, and continuous education activities.

For Asia and the Pacific as a whole, the levels of investment needed to achieve the MDGs are affordable.

The investment costs were annualized and added to the recurrent costs to obtain final total costs per intervention per year, based on the life of the technology and a discount rate of 3%.

Each intervention and its related costs and impact are discussed below. Table 6 presents the cost estimations for each of the four interventions by subregion.

Intervention 1—$8 billion annually. The intervention that would satisfy Target 10 requires the least amount of annual recurring investment at $8 billion. These cost figures reflect the definitions of improved and safe water supply and sanitation given in the previous chapters, with adequate but not high cost technologies that involve, for example chemical water supply treatment or primary wastewater treatment. There are many examples where lower cost technologies can be used, with this particularly true for rural areas, where family labor is often used and where local entrepreneurs make materials and construct services themselves. The cost estimates used in this analysis and elsewhere can be found in Hutton and Haller (2004).[22] The WHO report presents the annual costs of each type of improved technology per person reached. Table 7 presents the figures for Asia. From Table 7, one can see that a range of options are available, but that sanitation interventions are clearly more costly, with the cheapest option of a small pit latrine starting at almost $4. Most of the options for improved water supply are well under $4, starting as low as $0.25. The investment levels for sanitation, however, are still affordable. Yet, the comparative figures provide a good insight as to why the rates of change for sanitation

Table 6: ANNUAL COSTS FOR WATER SUPPLY AND SANITATION DEVELOPMENT IN ASIA AND PACIFIC REGION, year 2000
(in $ billion)

Subregion	MDG Target	Access for All	Access for All plus Disinfection at Point of Use	Regulated, In-House Piped WSS Connection
	Intervention 1	Intervention 2	Intervention 3	Intervention 4
East and Northeast Asia	2.99	5.99	6.38	24.55
North and Central Asia	0.20	0.39	0.49	4.12
Pacific	0.02	0.04	0.05	0.24
South and Southwest Asia	3.95	7.90	8.40	40.83
Southeast Asia	0.96	1.91	2.08	15.55
Total	**8.11**	**16.24**	**17.40**	**85.28**

Source: Data derived from Hutton, G. and Haller, L. Evaluation of the Costs and Benefits of Water and Sanitation Improvement at the Global Level. Geneva: World Health Organization, 2004. (WHO/SDE/WSH/04.04)

Table 7: ANNUAL COSTS FOR IMPROVEMENTS ON A PER-PERSON-REACHED BASIS

Target 10 Indicator	Type of Improved Technology Implemented	Cost in $ (2000) per Person Reached
Improved water supply	Standpost	4.95
	Borehole	1.26
	Dug well	1.63
	Rain water	2.51
	Disinfected	0.26
	Regulated piped water in-house (hardware and software)	9.95
	Regulated piped water in-house (software only)	5.97
Improved sanitation	Septic tank	9.10
	VIP	5.70
	Small pit latrine	3.92
	Household sewer connection plus partial treatment of sewage (hardware and software)	11.95
	Household sewer connection plus partial treatment of sewage (software only)	5.28

Source: Hutton, G. Haller, L. Evaluation of the Costs and Benefits of Water and Sanitation Improvement at the Global Level. Geneva: World Health Organization, 2004. (WHO/SDE/WSH/04.04)

coverage continue to lag behind water supply coverage rates.

Intervention 2—$16 billion annually. To provide access to improved water and sanitation services for all the unserved people of Asia and the Pacific would cost around twice as much: $16 billion per year until 2015. This is again a large but not impossible figure that is achievable given the nature of economic development and social change in Asia and the Pacific.

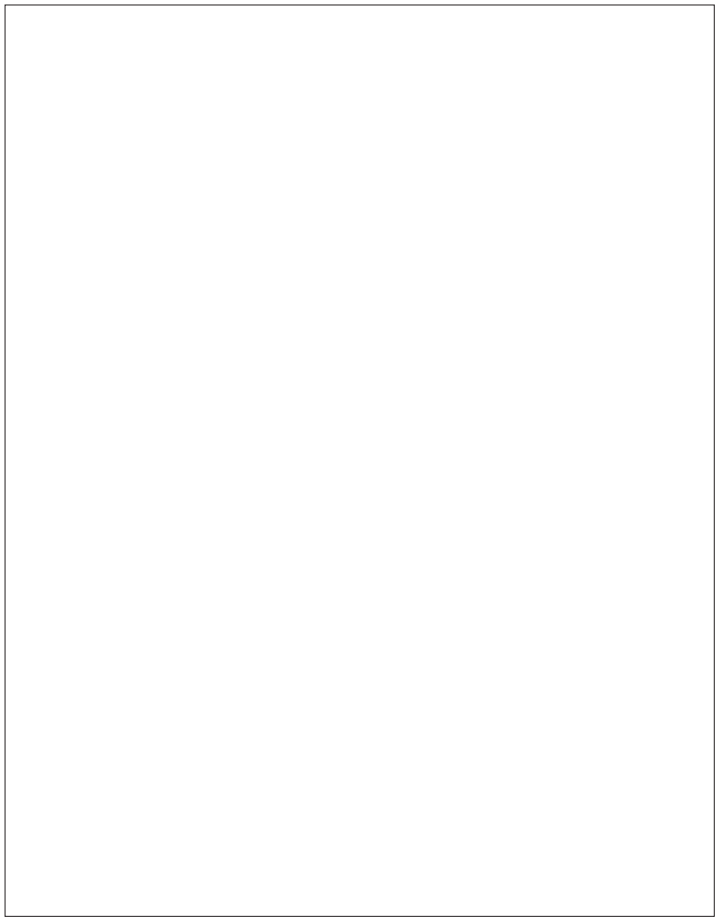
Intervention 3—$17 billion annually. The third scenario, which involves providing household water treatment using chlorine and safe storage in addition to improved water and sanitation services for all, would cost an additional $1 billion on top of improved water and sanitation costs, taking the regional cost to $17 billion. This again is affordable for most parts of the region.

Intervention 4—$85 billion annually. Finally, providing access to regulated piped water supply in house with quality monitoring and sewerage connection with partial treatment of sewage for all households would require a total investment of $85 billion per year. This higher level of investment reflects the much higher levels of service provided and, in consequence, the necessity of investing for much greater numbers of people, as many who presently have access to less sophisticated technologies would need to be provided with the more expensive connections.

The key message from this is clear—for Asia and the Pacific as a whole, the levels of investment needed to achieve the MDGs are affordable. The key is how to stimulate these investments from as wide a range of sources as possible, including consumers themselves and the private sector, as well as from governments and the international community. Indeed, it is likely that the actual levels of investment made in water supplies and sanitation in the region will be far greater than this as many people will reflect their new prosperity in decisions to invest in far higher levels of technology and service than those represented by the basic cost calculations made here. Of course, that more is spent does not mean that more people are reached and it is the poor, those who are not in a position to choose expensive solutions, whose needs are the greatest cause for concern. The majority of Asians can and will look after themselves. Governments and the international community must focus their attention on those sections of society who cannot provide for their own needs under existing service delivery systems.

The achievability of these investments raises the possibility of political leaders across the region setting targets that are more ambitious than those found in the MDG targets: remove forever the misery and adverse economic consequences of inadequate water and sanitation in the region that contains the majority of the world's poor. Indeed, some governments have already set targets that are more ambitious than the MDGs: for example, Viet Nam's development goals aim to exceed the MDG targets by 2010 and provide safe water and improved sanitation for the whole country by 2020.

In the international community, the central importance of improving access to safe and adequate water supplies and improved sanitation for poverty reduction is recognized, and, indeed, is one of the most frequently cited issues in the wider debate on poverty reduction. There are concerns, though, that this recognition of water's importance is not being matched by increased commitments of funds for the sector. Indeed, there is evidence of reversing trend, with declining levels of funding support from the international community.[23] There are still other concerns that the sector is neglected in the preparation of poverty reduction strategy papers, which set key priorities in national poverty reduction strategies and provide a framework for donor support[24]. The following chapters build a case for investing in water by looking at the sheer economic benefits water brings to all major characteristics of poverty. The analysis shows strongly that reducing poverty increases economic productivity, and at levels that far surpass the initial investments.



CHAPTER 5

Maximizing Target 10: Reaping the Full Social and Economic Benefits

INVESTING IN WATER is investing in poverty reduction. In fact, $1 spent on improving water supplies and sanitation buys the poor at least $6 in time and health savings. The first chapter of this report discussed the purpose of prioritizing improved water supply and sanitation facilities—they are gateways to widespread poverty reduction. We have measured the progress of Asia and the Pacific and made projections of who is on course to meet Target 10 and who is not. We know what it will cost to ensure every country arrives at the target—$8 billion annually. Now why? Why invest so much in the water sector when there are other sectors demanding equal or more resources? This chapter explains what investments in water will buy for the people of the regional economies. The hundreds of billions of dollars and millions of productive days that water offers are waiting to be realized. By building a rationale of water's benefits on each MDG and providing a cost benefit analysis, this chapter presents a strong case for investing in water. To not do so, the data argues, is the height of economic irrationality. And, to not do so urgently is a waste of opportunity to reap the social and economic benefits of water. Improving water immediately brings the poor better health, more productive hours in a day, higher wages, more time in school, and better educational attainment.

To not (invest in water) is the height of economic irrationality. And, to not do so urgently is a waste of opportunity to reap the social and economic benefits.

The first MDG target, to halve by 2015 the proportion of the world's people living on less than $1 a day, requires sustained economic growth in countries across Asia and the Pacific. The existing record on this is patchy, with some countries facing considerable challenges in achieving such sustained progress. Others, however, most notably the PRC, India, other South Asian countries, and much of Southeast Asia, are showing high and sustained levels of growth in recent years, becoming the envy of many other parts of the world.

Even in these rapidly growing economies, though, growth alone is not automatically reducing poverty. Strategies for growth and its benefits must be engineered to benefit the poor. We cannot expect a country's economic growth to trickle down to the poor. Left to this strategy, the poor receive disproportionately and insufficiently less—their poverty being sustained rather than alleviated. Growth should provide opportunities, specifically for the poor, to improve their livelihoods, increase their incomes, reduce their vulnerability to illness, and rid their worries about food and the misery of hunger. If growth is not equitable, genuine sustainable development and poverty reduction is not possible. It is largely up to governments to ensure the poor are not left behind as more prosperous classes, sectors, and geographic areas benefit from the wealth that growth creates.

For growth to reach the poor, growth must be directed to them—the sectors and places where the poor live and work. Investments in water are a vehicle for de-

The annual value of time savings (from improved access to water and sanitation) for the Asia and Pacific region would amount to $54 billion for achieving Target 10 and $109 billion to improve water supply and sanitation *for all*.

livering the benefits of growth to the poor, and when done effectively, to their very doorstep. Investments in two key areas will greatly advance countries toward reducing poverty: Agricultural water supply and domestic water supply. Investments in these two areas will foremost improve their health through food security and increase their opportunities for greater income-generating livelihoods. Through these investments, the poor can become more productive workers and become engines for overall economic growth.

Agricultural water supply and rural poverty. Technically, the scope of Target 10 is limited to increasing access to drinking water. Yet, traditionally, the water supply subsector includes water for irrigation and agricultural uses, as well as domestic use, as the context for monitoring access to drinking water. Improved access to agricultural water is also highly effective intervention for improving the poor's income, nutrition, and health. In most parts of Asia and the Pacific, the poor are heavily concentrated in rural areas, and not where the capital intensive, high productivity agriculture is found. Yet, agriculture will continue to be a key sector where the rural poor work. Limited access to rural water supply, particularly irrigated fields, reduces the viability of agricultural activities for the rural poor. A wide variety of water management strategies could be adopted to address these problems, such as improving and expanding irrigation systems across more farming land where possible, improving rainwater harvesting and on-farm water management in rain-fed agriculture, crop diversification, and improvements to crop strains.

By improving rural water supply, a major determining characteristic of poverty is alleviated—hunger and food security for the poor. The second MDG target calls for *reducing by half, by 2015, the proportion of the world's people who suffer from hunger*. Food security, in part, depends on national production and distribution capabilities, including government famine relief systems. This is critically important for affordable food for both the rapidly growing numbers of urban poor and rural populations in times of hardship, such as droughts and other disasters. Reliable water for subsistence agriculture, home gardens, livestock, fisheries, tree crops, and the sustainable production of other foods gathered in common property resources are potential options that can contribute to improving the food security of those most vulnerable to hunger. In rural areas, food insecurity should primarily be tackled at the local level, so that specific sections of the poor, such as landless families, female-headed households, rainfed farmers, livestock herders, and other vulnerable people, are targeted by interventions.

Domestic water. Both the rural and urban poor depend on small, home-based enterprises where they, themselves, are the entrepreneurs. The poor have been industrious in using domestic water for a range of enterprises—vegetable gardens, plant and tree crops, livestock, aquaculture, handicrafts, pottery, brick making, and leather goods, and providing such services as hair salons, laundries, and eateries. Similarly, ecologically sustainable sanitation experiences show many productive uses for waste, whether from the recycling of nutrients or the use of biogas as an energy source.

The scale, value, and importance of domestic water, sanitation, and micro-irrigation around homesteads to support livelihoods and thus reduce poverty are key policy issues for managing water in the developing world. To maximize the promise of domestic water to build livelihoods for entire poor communities, the following policy and program approaches should be pursued:

- Water supply systems designed to ensure adequate water supply with the supply points being in the right place;
- Management and tariff structures that account for the economic gains made by productive uses of water, increasing their ability to pay and demand for reliable water supplies;

■ Transparent, agreed upon regulation of water uses across seasons;

■ Training of rural and urban water users in product diversification and market development of the products and services they offer, which allow the poor to take full advantage of the new livelihood opportunities.

Home-based productive activities are complex and diverse, as well as informally—and at times illegally—carried out, making it difficult to collect data and estimate—even broadly—their economic contribution. Initiatives to quantify these water-dependent home-based livelihood activities and include them in the calculation of benefits of water supply and sanitation investments are needed and should be a focus of cooperation between governments and national and international development partners.

Domestic water has traditionally been written off as a nonproductive cost— something used only for consumption purposes. So, analysis of the benefits attached to domestic water has typically been limited to improvements in health and increases in time available and capacities for productive activities. Not including the income-generating effect of domestic water supply limits the analysis. Yet, the time and health savings on their own generally justify investments in water and sanitation.

There is one main variable typically used to estimate the cost benefits of better access to clean, reliable water supply and improved sanitation— time savings. These time savings are traditionally split into two main types: gains related to lower morbidity and fewer deaths, and gains related to less distance and energy spent fetching water.

Time savings represents an additional resource, which can be valued based on minimum wages. From this, it is estimated that the annual value of adult days gained from meeting Target 10 would be $323 million, rising to almost $647 million when improved water supply and sanitation are provided for all (Annex D). Due to the considerable health impact from disinfecting water at point-of-use (households), the value of productive days gained would be over $1.8 billion, and would reach $2.8 billion when regulated piped water supply in house and sewage connection with partial treatment for everyone is provided. East and Northeast Asia would benefit the most in terms of the value of productive days gained per year.

The second major benefit of improving access to water and sanitation derives from the time savings associated with closer location of the facilities. Time savings occur from the relocation of a well or borehole to a site closer to user communities, the installation of piped water supply in houses, and closer access to latrines. They translate into increased production, higher school attendance, and more leisure time.

The annual value of these time savings, spread over the entire population of the Asia and Pacific region, would amount to $54 billion for achieving Target 10 and $109 billion to improve water supply and sanitation *for all*. When regulated piped water supply in house and sewage connection with partial treatment is provided for everyone, $241 billion are generated from time savings.

The economic and political significance of these potential benefits are tremendous. Essentially, every dollar invested in meeting Target 10 generates $6 in economic returns—and that is just in terms of time savings. As stated earlier, Target 10 requires an annual investment of $8 billion. Once Target 10 is met, an economic benefit of over $54 billion is returned annually. Providing total coverage generates even greater levels of benefits.

It is the height of economic irrationality to not invest in these vital services—as there are few other areas of investment that will generate as high a rate of return and that are as effective at targeting the specific needs and capabilities of the poor. The benefits of meeting Target 10 will disproportionately go to the poor since it is the poor who usually do not have adequate coverage now and whose time would be saved, and it is the poor who would ben-

Initiatives to quantify water-dependent home-based livelihood activities and include them in the calculation of benefits of water supply and sanitation investments are needed and should be a focus of cooperation between governments and national and international development partners.

efit from the new opportunities. As such, investments in water supply and sanitation are self-selecting to the poor and are of significance in terms of targeting investments directly to poverty reduction. The poor themselves, who lack decent water supplies and sanitation options, almost always prioritize water when asked what are their needs.

Improving Health and Hygiene

Of all the social sectors, the water supply and sanitation target—Target 10—obviously affects the three health-related MDGs and their associated targets. By 2015, the three health-related MDGs hope to:

- Reduce by two thirds the death rate for children under the age of 5 years
- Reduce by three fourths the maternal mortality ratio
- Have halted and begun to reverse the spread of HIV/AIDS, malaria, and other major diseases.

Assisting the poor in their fight against diseases and high mortality rates, water is crucial to improving nutrition and food security. By making them healthier, the poor reduce their chances of falling ill—and too often fatally—to a wide range of conditions and diseases. The greatest threat posed by waterborne and water-washed diseases is infectious diarrhea—the biggest killer of young children. Improved quantities and quality of domestic water and sanitation will directly reduce child deaths. As the WHO Director-General puts it:[27]

> "Water and sanitation is one of the primary drivers of public health. I often refer to it as 'Health 101,' which means that once we can secure access to clean water and to adequate sanitation facilities for all people, irrespective of the difference in their living conditions, a huge battle against all kinds of diseases will be won."

His views are echoed by Secretary-General of the United Nations Kofi Annan:

> "We shall not finally defeat AIDS, tuberculosis, malaria, or any of the other infectious diseases that plague the developing world until we have also won the battle for safe drinking water, sanitation, and basic health care."

Role of Awareness. Providing access alone will not deliver on water's promise to dramatically improve the poor's health. Behavior must change. Health and hygiene awareness campaigns must be waged in local communities to educate them on the different health and hygienic practices that should go along with the new and improved water services and facilities they receive. Government officials and services providers should not be excluded from this process of awareness raising. They too must understand, plan, and commit resources to the important role that awareness building plays in maximizing new services introduced in communities. There are many examples of successful awareness-raising approaches in this area.

Role of local water, environmental management. As communities become more informed about personal health and hygiene, they also need to be educated on new ways of managing their surroundings. Local water quality must be protected from potentially hazardous environmental elements, such as waste from livestock, pollution from farming and local industries, and potential habitats for parasites and disease vectors, such as mosquitoes and worms. Protecting local water resources and surrounding environments at the local levels protects human health. Malaria is a scourge that will only be successfully addressed through water management that removes their breeding habitat. Similarly, water management will reduce vulnerability to a range of other diseases such as trachoma and schistosomiasis for which water is a vector.

Regional Prospects of Water's Impact. The impact of improved water supply and sanitation on the poor's health will vary from one region to another, depend-

ing on the existing levels of water supply and sanitation access and the region-specific levels of morbidity on Health MDGs and mortality due to diarrheal and other diseases. Health impacts will be greatest in regions with high numbers of unserved and significant cases of diarrheal disease. Estimates suggest that South and Southwest Asia and East and Northeast Asia would benefit the most in terms of reducing most cases of diarrhea and the burden of water-related diseases for caregivers (Annex E). If Target 10 is met, almost 137 million cases of diarrhea will be averted per year in South and Southwest Asia and more than 108 million in East and Northeast Asia. Overall, more than 275 million cases in Asia and the Pacific would be averted per year. Providing basic water and sanitation for all—not just the half called for in Target 10—would double these numbers and greatly reduce infant and child mortality.

Cost savings benefit. Avoiding illness naturally saves time and money for both the health sector and to patients themselves. The most significant source of cost savings comes from the reduced number of treatments for diarrheal cases. Patients avoid costs incurred by seeking treatment, which includes expenditures on care, drugs, transport and the costs of opportunity lost to the time spent on seeking care. These cost savings were calculated by multiplying the cost of a health service unit by the number of cases averted. Past studies do not include data on the number of health visits per case, so it was assumed that 30% of the people with a diarrheal case would visit a health facility.

Meeting Target 10 would save Asia and the Pacific $2.5 billion per year. An additional $2.6 billion would be saved every year if improved water supplies and sanitation were provided for all (Annex F). To further note, these health care savings would continue long after the bulk of investments have been made to meet Target 10. That a significant proportion of these savings would go to poor people, who suffer most from the problems and would save most from their removal, has further implications for the poverty reduction benefits of improved water supply and sanitation.

Improving the Lives of Slum Dwellers

The urban poor suffer from poor quality and unreliable water services. In many major South Asian cities, only 1% or less of those fortunate to even have connections receive 24-hour water supplies. In worse conditions, slum dwellers without connections regularly queue for long periods to collect water from private vendors. Most often, they are paying the most—10 times or more than what better off people with connections to central utilities pay. Few of the urban poor have access to sanitation, and many areas where the poor live are vulnerable to floods and contamination from polluted waters.

Providing reliable, affordable and accessible water supplies, improved sanitation, and protection from floods and pollution is a direct contribution to the MDG of improving the lives of slum dwellers. To do this requires substantial investments in infrastructure and reforms in urban governance.

In urban areas of Asia and the Pacific, between 1990 and 2002, nearly 384 million people gained access to water and nearly 369 million gained access to sanitation. Although this is an impressive number of people, the rate of increase has barely kept pace with the growth of urban populations. In 1990, 95% of urban residents had access to improved water supply. Twelve years later, in 2002, 94% had access—although a reduction of only 1%, this is an indication of population growth outpacing services.

Sanitation coverage increased from 70% in 1990 to 75% in 2002. Meeting the urban sanitation challenge is particularly daunting, as the disposal of contaminated wastewater in densely populated areas is both expensive and technically challenging and the scope for sustainable revenue to pay for these services is limited. There are examples of successful actions to ad-

BOX 3: Reforming Phnom Penh's Water Supplies

In 1993, the people of Phnom Penh lacked reliable water supply. Open a tap in 1993 and out would come little more than a trickle—if you were lucky. Only 20% of the people in Phnom Penh had access to water supplied by the Phnom Penh Water Supply Authority (PPWSA). The organization's staff of 500 was underqualified, underpaid, inefficient, and lacked motivation: according to Ek Sonn Chan, the then newly installed PPWSA Director, it was "in a sad state of chaos and disarray." At the time, PPWSA had 26,881 connections, only 13% of which were metered. PPWSA earned riel (KR)0.7 billion ($175,400), against an operating cost of KR1.4 billion ($350,900). What was needed, Mr. Chan says, was a complete restructuring of the organization to increase revenue and rehabilitate PPWSA's distribution network and treatment plants. In cleaning up PPWSA, Mr. Chan also sought to supply clean and safe water directly to poor families. Now, more than 10 years on, each of the 82,000 PPWSA connections in Phnom Penh is metered, and 70% of the city is connected to the water distribution network.

"Probably the most difficult of all," says Mr. Chan, "was to increase the water tariff to cover its cost." By 2001, after phased increases, PPWSA's revenue covered the cost of supply. PPWSA's distribution network was rehabilitated and an effective maintenance system was installed. By 1996, with a $20 million Asian Development Bank loan and funding from the World Bank, France, and Japan, PPWSA embarked on renewing and rehabilitating its distribution network, a task completed by 2002. New treatment plants were built and old ones rehabilitated. In restructuring PPWSA, Mr. Chan gave higher management more responsibility. Salaries were increased, by up to 10 times, and performance-based bonuses were introduced. Those who performed badly were penalized. PPWSA started to install water meters and set up an inspection team to stop illegal connections. It revised and improved its consumer files and began to educate the public of the importance of paying their water bills. The bill collection improved from 50% in 1993 to 99% in 2004. The success of reforms in the PPWSA shows that an efficient and sustainable urban water utility can be created even in challenging circumstances, so long as leadership and political will exist and the needs of consumers are put first.

Source: ADB Water for All website: http://adb.org/water/actions/CAM/PPWSA.asp

dress these issues (Box 3) but as Bhatia[26] says: "Despite all the ideas and 'pilot' projects, approaches have not proved to be replicable, sanitation policies are absent or not put into practice, investment remains mainly external and limited, and local subsidies have not been sustainable." In the words of UN Secretary General Kofi Annan: "There is a tragic disparity between its human importance and its political priority."

The scope for improving these systems is great. There are examples, however, of where municipal authorities, often with the support of international development partners, have made great strides in both extending coverage and improving services (see Box 4).

Improving Education and Gender Equality

Education is key to any poverty reduction strategy and is increasingly emphasized by national governments and donors as an area where new efforts are needed. The importance of education is reflected in MDGs to ensure that, by 2015, children everywhere will be able to complete a full course of primary schooling and progress is made towards gender equality and the empowerment of women,

BOX 4: Urban Sanitation: Islands of Success

- Sulabh community toilet complexes in India have succeeded in providing clean toilets and bathing facilities to urban poor at nominal charges. There are around 6,000 community toilets providing toilet-cum-bath services to around 3 million people in 625 towns on a pay-and-use basis.
- The Orangi project in Karachi, Pakistan is a low-cost sanitation program which enables low-income households to construct and maintain modern sanitation (pour-flush latrines in their own homes and underground sewerage pipelines in the lanes) with their own funds and under their own management.
- The WaterAid-Bangladesh/DSK Urban Programme has been implemented since 1998 in approximately 168 slums in the Dhaka metropolitan area and in Chittagong City Corporation. Around 25,000 households have gained access to one or more of the services offered: connections to metropolitan water authority lines; tubewells; sanitation blocks combining water points and hygienic latrines; community/cluster latrines with septic tanks; household water-seal, pit latrines; footpaths; drainage improvements; solid waste management; and hygiene education. All physical improvements are wholly or partly paid for by local users.

Source: Bhatia, R. Community-managed sanitation services for the urban poor in Asia, Africa and Latin America: Constraints to scaling-up of 'islands of success'. 2004

BOX 5: WaterAid Australia Support to School Latrines in Papua New Guinea

WaterAid Australia has completed its first project in Papua New Guinea (PNG) in conjunction with Oxfam CAA, Oxfam NZ, and ATprojects. The project has directly benefited over 5000 schoolchildren and indirectly over 13,000 local community members by helping them to build latrines. Funds from WaterAid Australia have supported the building of 84 latrines in 14 primary schools in the Eastern Highlands province of the country. The project worked with children as they are most affected by, and most vulnerable to, hygiene-related illnesses. Establishing sound personal hygiene habits at a young age is vital so that children take these habits into adulthood and pass them on to the next generation. WaterAid's partner organization, ATprojects, has developed low cost 'ATloo' that are easy to build and maintain, easy to clean, free of smell, and nice to look at. Communities are taught to operate and maintain them and learn about good hygiene. Training in HIV/AIDS awareness and prevention education is also being included as part of the project as HIV/AIDS is becoming a growing issue in PNG. The project reported a strong appreciation of the latrines by the schools and WaterAid intends to continue to help other schools in PNG to build improved sanitation facilities.

Source: WaterAid Water for Life website: http://www.wateraid.org.uk/

which is demonstrated by ensuring that girls and boys have equal access to primary and secondary education.

Although water does not play a direct role in achieving this, improved health resulting from clean water and improved sanitation is key to improving attendance and performance at school (see Box 5). Better health resulting from improved water supply and sanitation will mean millions

BOX 6: Scaling Up Access to Safe Water Supply and Sanitation in Rural Nepal

The Asian Development Bank-assisted Community-Based Water Supply and Sanitation Project is to support the Government in expanding the coverage of improved water supply and sanitation facilities to underserved populations, especially in poor and remote areas, and in improving health and hygiene practices related to waterborne and sanitation diseases. The project was designed in close consultation with a wide range of stakeholders. Socially excluded castes and disadvantaged ethnic groups are specifically targeted to benefit from these investments, which will help rectify historically inequitable access to many social services, including water supply and sanitation.

The project builds on lessons learned and best practices to incorporate features such as (i) ensuring diversity in all decision making; (ii) demand-driven and participatory delivery and management using nongovernment organizations (NGOs) and community-based organization; (iii) NGO supported community-based planning, implementation, and management; (iv) support to decentralization built into design; and (v) a program orientation. Under this project, NGOs are helping the beneficiaries form water user groups, which will be responsible for construction, as well as operation and maintenance of water supply systems. Community water user and sanitation committees must have, at least, a proportional representation of poor, deprived castes, and of ethnic minority groups. Moreover, at least 50% of the executive and general members of these committees must be women. The committees will decide on the type of technology used and will be responsible for implementing the schemes. Low-income families will receive payments for 50% of the time they spend working on the project, and receive concessionary loans and subsidies to support latrine construction. The longer-term benefits of the project will arise principally from the productive uses of time saved, fewer days lost to sickness, and reduced expenditures on medical treatment.

Sources: ADB.Website: http://adb.org/Documents/Profiles/LOAN/32249013.ASP

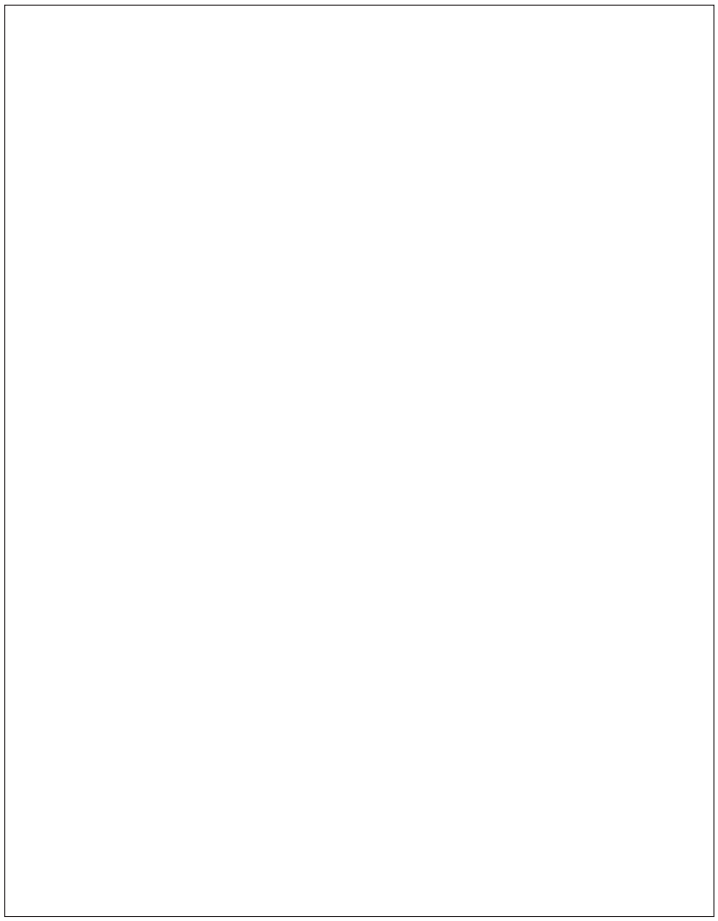
of girls do not have to spend study time collecting water. Better water supplies and sanitation in schools, poorer rural areas in particular, are also important in ensuring school attendance. Without these improved facilities, cultural barriers in a number of Asian countries prevent girls from attending school.

The benefits of improved water supplies and sanitation in both the homes of children and in school can be measured by calculating the numbers of school days that would otherwise be lost to illness (see Annex G). The data show that tens, or even hundreds of millions, of school days could be gained every year from water supply and sanitation investments, having a tremendous impact on the education of children. These days gained can be valued in terms of the future productivity of better-educated children. The value of these school days gained ranges from $232 million to $2 billion annually depending on the level of intervention.

Gender Balance. Community organizations for water management are often important mediums for improving the social capital of women, leading to more balanced gender roles. The experiences of NGOs, such as the Bangladesh Rural Advancement Committee and the Self-Employed Women's Association in Gujarat, India, provide models that initially organize women around water, acting as a catalyst to wider processes of empowerment and development. The widespread replication of these examples and other NGO experiences in South Asia show that scaling up is not necessarily a problem, even in areas that are more socially conservative. The time and drudgery women save

from collecting water frees up time for productive activities, giving them more economic power and independence, or greater time for leisure, study, and social interactions—all of which build their social capital.

These gains can be measured in terms of time saved and productivity increased, as discussed above. Because of women's central role in collecting and using water, they are central actors in improving water supplies and sanitation. They are the main stakeholders and it is essential that they be placed at the center of decision making when planning and implementing system improvements. It is understandable why women place such a high priority on improving water supplies and sanitation facilities. They carry tremendous burdens to provide water and care for the health of their families. It should also be understandable then why improving water supplies and sanitation facilities is central to addressing gender issues.



CHAPTER 6

Defining the Challenges: Where Change is Needed

WE HAVE SEEN THAT in many parts of the Asia and Pacific region, and for the region as a whole, the prospects for reaching at least the MDG target for water supply are good. The situation for sanitation is less positive, though even here there are a number of countries where it can be expected that the target will be achieved. Many of the countries likely to reach all of Target 10 are ones where the situation is already relatively good and where the prospects for continued development and growth suggest that the needed resources and institutions will ensure continuing progress. Several of these countries are large, including the big two—the PRC and India, implying that their achievement will also push for the accomplishment of Target 10 at the global level. Attaining the MDG targets will be an important milestone in the process of socioeconomic and environmental development in these countries, but continuing commitment will be necessary to maintain the momentum of the achievement of the MDGs.

Target 10... only aims to halve the number of people without access to water and sanitation (and) the challenges of providing improved water supply and sanitation for all of the people of Asia and the Pacific will still be significant.

Achieving the MDG targets is still not the end of the story, including the end of the need for significant investments in water supply and sanitation. Even in countries where Target 10 and the MDGs are met, there will often be communities and areas that will still face problems. Target 10, like most other targets, only aims to halve the number of people without access to water and sanitation. In most countries, many millions of people will not have their needs met despite the MDG targets being achieved. Given that it is likely to be the poorest people, often living in the most challenging locations and whose needs are unmet, the challenges of providing improved water supply and sanitation for *all* of the people of Asia and the Pacific will still be significant. Other countries in the region face a variety of challenges in reaching the MDGs. As we have seen, for some countries in Asia and the Pacific, the prospects of attaining Target 10 are remote unless major changes are made in the ways water supply and sanitation services are delivered. This is particularly true for sanitation, where current trends suggest that there is little or no prospect of the 2015 target being reached without these changes.

What changes need to take place to address these challenges? Clearly and now widely accepted is the understanding that the principal challenges will not be technological— the hardware of water supplies and sanitation—but rather the soft issues: How can water supply and sanitation programs be organized and financed? How can people be trained, organized, and motivated to install, use, and maintain the facilities? How can institutions develop more and better incentives and make improvements more sustainable? These questions are not new, and indeed have been recognized as pivotal since the Water Supply and Sanitation Decade in the 1980s. That they are familiar does not negate their relevance or importance, for the challenges the questions present are still to be met in many parts of the Asia and Pacific region.

Priority Action Areas

Box 7 sets out the 10 priority action areas identified by the UN Water and Sanitation Task Force in their final report for the Millennium Project. These 10 recommendations provide a framework for adapting to the specific situations of different countries and to identify their priorities for action. For Asia and the Pacific, the analysis of trends demonstrates that the first valid action for most countries is to put sanitation on the top of the agenda. This includes the need to identify different modalities for extending access to sanitation services. The existing tendency to link sanitation provision to water supply, while attractive on a number of levels, has meant that insufficient attention has been paid to sanitation. In particular, the needs of the many millions who do have adequate water but lack sanitation tend to be neglected. Different approaches are needed to address the problems.

The remaining recommendations emphasize institutional reforms and strengthening at all levels, but with a particular focus on decentralized government institutions, community organizations, and the private sector. The implications of these recommendations, along with experiences from other sources, are clear: the key is to provide people, including the poor, with increased choices over what investments to make, how they are organized and paid for, and how services are run once access to facilities is improved.

BOX 7: UN Water Supply and Sanitation Task Force Recommendations

Action 1: Governments and other stakeholders need to move the sanitation crisis to the top of the agenda.

Action 2: Countries must ensure that policies and institutions for water supply and sanitation service delivery, as well as for water resources management and development, respond equally to the different roles, needs, and priorities of women and men.

Action 3: Governments and donor agencies must simultaneously pursue investment and reforms for improved water supply, sanitation, and water management.

Action 4: A focus on sustainable service delivery, rather than construction of facilities alone, must be at the center of efforts to reach Target 10.

Action 5: Governments and donor agencies must empower local authorities and communities with the authority, resources, and professional capacity required to manage water supply and sanitation service delivery.

Action 6: Governments and utilities must ensure that users who can pay do pay in order to fund the maintenance and expansion of services – but they must also ensure that the needs of poor households are met.

Action 7: Within the context of national MDG-based poverty reduction strategies, countries should elaborate coherent water resources development and management plans that will support the achievement of the MDGs.

Action 8: Governments and their civil society and private sector partners must support a wide range of water and sanitation technologies and service levels that are technically, socially, environmentally, and financially appropriate.

Action 9: Institutional, financial and technological innovation must be promoted in strategic areas.

Action 10: The United Nations system organizations and their Member States must ensure that the UN system and its international partners provide strong and effective support for the achievement of the water supply and sanitation target and for water resources management and development.

Source: United Nations. 2004. *What will it take? Water, Sanitation, and the Millennium Development Goals*. UN, New York.

The focus on increasing choices for people as consumers of services implies a different role for governments. Instead of seeing their main task as building more facilities, government agencies should concentrate on creating an effective policy, legal and regulatory environment in which *all* sections of the community, including local communities and the private sector, can play an active role in improving access to safe water and improved sanitation.

In defining the trajectory of and priorities for change, decision makers need to address a range of issues in the following four core areas that reflect the key constraints identified in the UN MDG Task Force report:

1. **Policy, legal, and regulatory reform** is an essential pre-condition for sustainable and effective change in Asia and the Pacific. Governments are the central actors because they are responsible for defining the framework within which water supply and sanitation provision takes place. This framework houses the set of laws and regulations that determine the responsibilities and rights of different sections of society to access these services, as well as determine the quality of standards these services must maintain to protect users and environments. These laws and regulations are further prioritized by the policy framework for the sector and for related sectors such as health, education, ecosystems conservation, and household-based livelihood activities that use domestic water. Special attention to defining policies that target the specific needs and opportunities of the poor for improved access to water supply and sanitation is needed. This is particularly true for targeting government and donor resources for investments, awareness raising and community mobilization.

2. **Planning and technology** choices must ensure that the national legal and policy framework is put into practice. Governments need to ensure that the planning systems surrounding their programs, including programs supported by donors, reflect the policy priorities. They do this by having explicit poverty targets and providing options that reflect the needs and capabilities of the poor. Above all, the goal should be to make the full range of technology and management choices available to poor people and to planners. This should include developing innovative and, where possible, low cost technical choices that can be afforded and implemented by poor communities. For water supply, this should include approaches such as small piped networks for, in particular, areas of urban fringes and densely settled rural areas, as well as innovative technologies to ensure adequate water quality. For sanitation, ideas for approaches that accomplish both safe use of wastewater and excreta and ecologically sustainable sanitation need to be scaled up to a level where they make a real impact at a national level.

3. **Financing mechanisms**[26], including supportive investment environments (especially ones that encourage small private sector investments) and effective cost recovery mechanisms are approaches that will address major challenges in many places. Two aspects of this issue are particularly important:

a) The establishment of more effective and diverse credit and financial management systems that are accessible to and affordable by the poor. This is essential to generate as high a level of cost recovery as possible. In many cases, the poor are willing to pay for better water and sanitation. The appropriate financial mechanisms are needed to deliver the improved access to them.

b) The development of a regulatory regime in which investments by the private sector, and especially by local small-scale entrepreneurs, are encouraged. A key aspect of this is the reform of government regulations in order to enable private sector's engagement in the water sector. This should be accompanied by the development of targeted programs to encourage entrepreneurial development.

4. **Institutional reform**

makers, central ministries, local government agencies, and the support given by international development partners; (iii) the private sector; and (iv) relevant international stakeholders.

People, communities, and civil society

This fundamental group of stakeholders comprises the very families we are trying to extend access to safe and sufficient water and improved sanitation, the organizations that represent and involve them and organizations from the rest of society that support the poor. These communities and organizations are central to any development of water supply and sanitation. In particular, working with local people provides

- Knowledge of their real needs and priorities, the condition and sustainability of local water resources, the many types of long-standing and effective solutions to their problems and the local traditions and customs that need to be understood if awareness programs are to be effective.
- Skills of many sorts, including the practical skills of masonry and plumbing needed to build and maintain water supply and sanitation facilities, the skills needed to make home-based livelihood activities viable, and organizational skills needed to plan, construct and operate water supply and sanitation facilities.
- Resources from the people themselves, which experience in many parts of the region show that people are both willing and able to pay for water supplies and sanitation where the technology choices and materials are appropriate and available.
- Augmentation of knowledge, skills, and resources of local people through their willingness to work with civil society, which are in turn effective at introducing innovations that ensure these local assets can be used more effectively. They are also often important in assisting to develop community-based organizations that are fair and representative, and can play a key role in assisting local communities to relate to government agencies and other external organizations.

The discussion about local communities, and even the poor, does not mean to generalize them as a homogeneous group. They are differentiated along gender, economic, and social lines. These different groups often have extremely different, even conflicting, needs and interests. It is consequently essential to ensure that organizations that purport to represent the poor are indeed representative of all sections of the poor and not just some dominant interests. Where this is the case, the contribution of local communities to the sustainable and effective development of water supply and sanitation facilities will go far in determining whether and when the MDG targets will be met.

Governments

Key government figures in advancing water supply and sanitation coverage should include policy makers, central ministries, and local government agencies. Collectively, they represent a variety of perspectives. The four points discussed under defining the challenges above give many pointers to the key role that different branches of government should play in ensuring that the investments needed to meet the MDG targets are made. International development partners can and do support governments in many ways for each of the points listed below. The role of government agencies, together with donors, are consolidated as:

- Establishing the policy, legal, and regulatory environment, as discussed above. It is of utmost importance to clarify the roles and responsibilities of different stakeholders and remove restrictions and perverse incentives that prohibit private sector investments and inhibit community initiatives to develop water supply and sanitation solutions. Particular attention needs to be paid to the regulatory and institutional context for ensuring that appropriate financial mechanisms exist.

- Directly investing in water supply and sanitation in key areas. This includes (i) urgently investing in water supply and sanitation facilities in schools, health care facilities, and other public places; (ii) targeted programs of investments that aim to reach places where private initiatives and the market are not likely to provide solutions, including serving and subsidizing the poorest of the poor and investing in areas such as large rural settlements, cities, and peri-urban areas where the only viable options are multi-household facilities. A key issue is the nature and effectiveness of cost recovery mechanisms if the investments are to last.
- Providing financing and credit for investments made by others, whether communities, the private sector or other organizations. This can take many forms, including the existing banking systems, direct credits to NGOs or other organizations, and dedicated credit systems established under projects and others. There is a need to make such systems flexible, appropriate to the needs of the poor (with issues such as collateral a particular concern) and, above all, permanent. Far too many credit systems have been set up under projects only to wither away once the project support is over.
- Advocacy, education, and awareness connected with issues of health and hygiene promotion, ensuring environmental sustainability, informing people of their rights and responsibilities, and assisting communities to access government programs and other resources. Ministries and agencies with responsibilities in the health and education fields have a particularly important role in this area.
- Monitoring and enforcement of regulations concerning key issues, such as water quality and wastewater disposal, technical standards for facilities, any regulations to ensure fair financial conditions for investments and service provision, and the registration and regulation of organizations that represent local communities (Endnote 15 on WHO Guidelines).
- Supporting innovations through both research and development that generate new options and, perhaps more importantly in the short term, establish conditions where good practices can be scaled up to a level where they make a real and sustainable impact on the ground. Local universities and other research institutions are of pivotal importance here.

Because the water sector and all its varied subsectors (supply, sanitation, irrigation, drainage, resource management, etc.) are often divided between many different government departments and agencies, reforms and the regular overseeing of these subsectors can be extremely fragmented. Governments need to establish apex bodies that bring inter-government coordination. In the area of investments, different tiers of government consequently have a complex and pivotal role in ensuring that investments are made and other aspects of water supply and sanitation development are implemented in ways that are fair, sustainable, and efficient in economic, environmental, and social terms. Although governments do have an important role in the direct implementation of some types of investment, this is not their primary role, but one of many roles.

Private Sector

The private sector has increasingly been recognized as having a key role in water supply and sanitation development. The private sector takes different forms and can perform a variety of roles. The one that has attracted the most attention (and criticism, whether justified or not) is where large private corporations, including multinationals, have taken over the management of water utilities in major cities. The experience in these ventures has been mixed, but lessons are being learned and there is scope for improving approaches for the engagement of appropriate private sector corporations in many rapidly growing urban areas.

This high-profile role of the private sector is not, by a long way, the most im-

portant one in water supply and sanitation provision in Asia and the Pacific. Of far greater importance, whether judged economically or by numbers of people served, is the role of local, generally small, entrepreneurs in providing a wide range of services to support and make investments in and the operation of water supply and sanitation facilities. Small, local private sector entrepreneurs provide the following range of services in water supply and sanitation:

- Manufacturing and distribution of materials and equipment, including pipes, latrine pans, pumps, bricks, water tanks, and many others. The availability of these materials through local retail outlets is essential if people are to invest directly in addressing their needs.
- Constructing and maintaining facilities, including drilling wells, laying pipes, building latrines, and all other aspects of the work needed to turn investments into facilities. These can be communal or individual, but the existence of the skills and equipment among local small businesses to build and look after water supply and sanitation facilities is essential for the sustainability of investments.
- Service providers in the form of water sellers, whether they are the operators of small piped schemes or vendors who bring water to people's homes. These are often small and informal, and are often the only reliable source of water in low-income urban areas. They can be efficient, but are often extremely expensive. Despite this, they provide a service when no others are available.
- Providing inputs and markets for the goods and services produced in home-based livelihood activities that depend on domestic water supplies. The viability of these livelihood activities depends on the availability of the inputs and good access to markets, which are most often local.

The scale of such small-scale private sector involvement is extremely difficult to estimate, but in many countries appears to be large, often larger than the services provided by government agencies if measured by number of people connected or served. These local investments also tend to be economically efficient to provide facilities at a lower unit cost than those provided by government or through donor projects and to be sustainable and responsive to consumer needs and demands. Such investments can also be important in generating local economic development through the multiplier effects they generate. The private sector, and especially local entrepreneurs, has long been neglected in many government and donor activities in the sector. It is essential that this is reversed, and the private sector be recognized as a key stakeholder in the sector if the MDG targets and the needs of the poor are to be met efficiently and sustainably.

Relevant International Stakeholders

The international community has been playing a major role in creating an environment conducive to partnerships, commitment, investment, and accountability in development. The important challenges discussed in the previous section also require involvement of the relevant international stakeholders to monitor, promote, and support the process of developing the region's water sector and advancing it toward the MDGs and sustainable socioeconomic growth in the region.

The title of this chapter asked, "Who should do what?" The discussion above gives some answers to this question. In many ways, we need integrated approaches where different stakeholders work together and are driven from below. Indeed, this could apply to almost any sector and are conventional wisdoms of international development approaches. This familiarity does not invalidate them, however—the need for these approaches has been recognized in principle but all too often not followed through into practice in a comprehensive manner. There are ele-

ments of these approaches in almost all countries. What is needed is for these elements to be drawn together into a coherent national strategy. This will create the conditions where the levels of investments needed to achieve and surpass Target 10 can be realized throughout Asia and the Pacific. As it is, great progress is being made in the region. But more can be done where governments, supported by international development partners, act to ensure that the capabilities and resources of all sections of society are utilized to their full potential for a sector that is one of the keys to the reducing the poverty of hundreds of millions of people in the countries of Asia and the Pacific.

Next Steps

The immediate next steps of all four key stakeholder groups should be in the direction of aggressive sanitation interventions to meet Target 10, or at least come closer than what the dismal projections warn. It has long been argued that sanitation should be promoted as part of integrated rural development plans and programs, urban upgrading, or primary health care, or at least together with water supply and hygiene education (Cairncross, 1992). The belief was that by combining sanitation with water supply, it would prevent it from being neglected. There is increasing concern, however, that this is not always the case. There have been cases where the implementing agency has appropriate staff or structures for one component but not the sanitation element. Also, just because several interventions are planned together does not mean they progress at the same speed. As Cairncross points out, the pace of sanitation implementation is set not by administrative ability to provide facilities but by consumer demand so that it rarely matches the progress of other measures.

Clearly, each case must be weighed on its own merits and an analysis of the local situation. There may also be practical reasons for water supply and sanitation to be dealt with separately.

Endnotes

1. The term "water" is also used to refer collectively to water supply and sanitation.

2. Hutton, G., and L. Haller. *Evaluation of the Costs and Benefits of Water and Sanitation Improvement at the Global Level*. Geneva: World Health Organization, 2004. (WHO/SDE/WSH/04.04)

3. ADB. 2004. *The Impact of Water on the Poor.*ADB Operations Evaluation Department, Manila.

4. UNESCAP and FAO. 2004. *From Vision to Action in Least-Developed Countries: A Synthesis of Experiences in South-East Asia*. UNESCAP, Bangkok.

5. Soussan, J. et al. 2005. *Poverty Reduction and Water Management: Joint Agency Paper of the Poverty Environment Partnership*. ADB, Manila (forthcoming).

6. WHO and UNICEF. 2004. *Meeting the MDG drinking water and sanitation target: A mid-term assessment of progress.* United Nations, New York.

7. ADB. 2001. Water for All: The Water Policy of the Asian Development Bank. ADB, Manila.

8. UNDP. 1997. *Human Development Report*. UNDP, New York.

9. UNESCAP. 2004. Guidelines on Strategic Planning and Management of Water Resources, ST/ESCAP/2346. United Nations, New York.

10. UN. 2002. WSSD Plan of Implementation, page 3.

11. UN Millennium Project Task Force on Water and Sanitation, Final Report, Abridged Edition. New York, UN Millennium Project and Stockholm International Water Institute, 2005.

12. WHO and UNICEF. 2004. *Meeting the MDG drinking water and sanitation target: A mid-term assessment of progress.* United Nations, New York, page 2.

13. Several countries did not report figures for 1990, only for 2002.

14. Hutton and Haller. p. 9.

15. For more information on drinking water guidelines, see: WHO, 2004. Guidelines for Drinking Water Quality 3rd Edition Volume 1: Recommendation.

16. McIntosh, A. 2003. *Asian Water Supplies: Reaching the Urban Poor*. ADB and International Water Association, Manila.

17. Hutton and Haller. 2004.

18. The percentage of a country's population with access to improved drinking water supplies and improved sanitation facilities by 2015 is based on the indicators used by WHO and UNICEF in their report "Meeting the MDG Drinking Water and Sanitation Target: A Mid-Term assessment of Progress (2004)." Projections have been made only for those surveyed countries that have estimates of population, improved drinking water coverage percentages, and improved sanitation coverage percentages for urban and rural populations for both the baseline year of 1990 and 2002. Applying the coverage rates to the respective countries, the percent of the population covered has been figured for 1990 and 2002, along with the estimated average annual compounded population growth rate. The same average annual compounded population growth rate is assumed for the future and used to project the percent of population covered in 2015. The 2015 coverage rate is estimated by dividing the projected served population for 2015 by the projected population, which were derived from the UN World Population Prospects 1950-2050: The 2002 Revision (Database, Department of Economics and Social Affairs, Population Division, New York, 2003). The 2015 coverage estimates have been figured separately for urban and rural areas. In the course of working on the estimates and projections, a number of inconsistencies in the data have been noticed. It is probable that data definitions and methods of data collection may have changed in the two years of data gathering (1990 and 2002) or differed by country. In such cases, additional analysis was done to arrive at conservative estimates.

19. Hutton and Haller. 2004.

20. See International Network to Promote Household Water Treatment and Safe Storage website at http://www.who.int/household_water/en/index.html

21. Howard, G., and J. Bartram. Domestic Water Quantity, Service Level and Health. Geneva, WHO, 2003 (WHO/SDE/WSH/03.02); http://www.who.int/ water_ sanitation_health/diseases/wsh0302/en

22. Hutton and Haller. 2004.

23. OECD DAC Secretariat. 2004. *Aid for Water Supply and Sanitation*.

24. Slaymaker & Newborne. 2004. *Implementation of water supply and sanitation programs under PRSPs;* and ODI, London and Bojo & Reddy. 2002. *Poverty Reduction Strategies and the Environment*. World Bank Environmental Economics Series Paper no. 86.

25. Dr Lee Jong-Wook, Director-General, WHO, WHO Fact Sheets, www.who.org.

26. Bhatia, R. 2004. Community-managed sanitation services for the urban poor in Asia, Africa and Latin America: constraints to scaling-up of 'islands of success'. Annex to Hansen, S. and R. Bhatia, 2004. *Water and poverty in a macro-economic context*. Paper commissioned by the Royal Norwegian Ministry of Environment.

27. ADB's new financing mechanisms were prepared in August 2005.

Annexes

ANNEX A: IMPROVED WATER SUPPLY AND SANITATION COVERAGE FOR COUNTRIES IN ASIA AND THE PACIFIC

Country	Year	Population			Drinking Water Coverage (%)						Sanitation Coverage (%)					
		Total	Urban	Rural	Total		Urban		Rural		Total		Urban		Rural	
		('000)	(%)	(%)	Total Access	House Connections	Total Access	House Connections	Total Access	House Connections	Total Access	Sewer Connections	Total Access	Sewer Connections	Total Access	Sewer Connections
Afghanistan	1990	13,799	18	82						0		1		4	5	0
	2002	22,930	23	77	13	2	19	8	11	0	8	0	16	0	5	0
American Samoa	1990	47	81	19												
	2002	60	90	10												
Armenia	1990	3,545	67	33			99	97					96			
	2002	3,072	65	35	92	85	99	97	80	64	84	69	96	93	61	24
Australia	1990	16,888	85	15	100		100		100		100		100		100	
	2002	19,544	92	8	100		100		100		100		100		100	
Azerbaijan	1990	7,192	54	46	66	41	80	63	49	16						
	2002	8,297	50	50	77	47	95	76	59	19	55		73		36	
Bangladesh	1990	109,402	20	80	71	6	83	28	68	0	23	1	71	4	11	0
	2002	143,809	24	76	75	6	82	26	72	0	48	2	75	6	39	0
Bhutan	1990	1,696	5	95										0		
	2002	2,190	8	92	62		86	81	60		70		65	40	70	
Brunei Darussalam	1990	257	66	34												
	2002	350	75	25												
Cambodia	1990	9,744	13	87						1						0
	2002	13,810	18	82	34	6	58	31	29	1	16	4	53	23	8	0
China, People's Rep. of	1990	1,155,305	27	73	70	49	100	80	59	37	23	9	64	28	7	1
	2002	1,294,867	38	62	77	59	92	91	68	40	44	17	69	42	29	2
Hong Kong, China	1990	5,704	100	0												
	2002	6,981	100	0												
Macao SAR, China	1990	372	99	1												
	2002	460	99	1												
Cook Islands	1990	18	58	42	94		99		87		95	0	100	0	88	0
	2002	18	69	31	95		98		88		100	0	100	0	100	0
Korea, Dem. People's Rep. of	1990	19,956	58	42	100		100		100							
	2002	22,541	61	39	100	77	100	81	100	71	59	11	58	12	60	9
Fiji Islands	1990	724	42	58							98		99		98	
	2002	831	51	49							98		99		98	
French Polynesia	1990	195	56	44	100	98	100	99	100	96	98	2	99	0	97	4
	2002	241	52	48	100	98	100	99	100	96	98	2	99	0	97	4
Georgia	1990	5,460	55	45									96			
	2002	5,177	52	48	76	58	90	83	61	30	83		96		69	
Guam	1990	134	91	9	100		100		100		99	98	99	99	98	96
	2002	160	94	6	100		100		100		99	98	99	99	98	96
India	1990	846,418	26	74	68	17	88	51	61	5	12	7	43	25	1	1
	2002	1,049,549	28	72	86	24	96	51	82	13	30	7	58	18	18	2
Indonesia	1990	182,117	31	69	71	10	92	26	62	3	46	1	66	2	38	0
	2002	217,131	44	56	78	17	89	31	69	5	52	1	71	2	38	0
Iran, Islamic Republic of	1990	56,703	56	44	91	84	98	96	83	69	83	4	86	7	78	0
	2002	68,070	66	34	93	87	98	96	83	69	84	13	86	20	78	0
Japan	1990	123,537	63	37	100	95	100	98	100	91	100		100		100	
	2002	127,478	65	35	100	96	100	98	100	91	100		100		100	
Kazakhstan	1990	16,809	57	43	86	62	96	88	72	27	72	43	87	72	52	4
	2002	15,469	56	44	86	61	96	88	72	27	72	42	87	72	52	4
Kiribati	1990	72	35	65	48	24	76	46	33	13	25		33		21	0
	2002	87	46	54	64	34	77	49	53	22	39	17	59	36	22	0
Kyrgyz Rep.	1990	4,395	38	62			98									
	2002	5,067	34	66	76	48	98	87	66	28	60		75		51	
Lao People's Dem. Republic	1990	4,132	15	85						4		0		0		0
	2002	5,529	20	80	43	8	66	25	38	4	24	0	61	0	14	0
Malaysia	1990	17,845	50	50			96				96		94		98	0
	2002	23,965	63	37	95		96		94	64					98	0
Maldives	1990	216	26	74	99	20	100	78	99	0			100	99		
	2002	309	28	72	84	22	99	76	78	0	58	41	100	99	42	18
Marshall Islands	1990	44	65	35	96		95		97		75		88		51	
	2002	52	66	34	85		80		95		82		93		59	
Micronesia, Fed. States of	1990	96	26	74	87		93		85		30		53		21	
	2002	108	29	71	94		95		94		28		61		14	
Mongolia	1990	2,216	57	43	62	28	87	49	30	1						0
	2002	2,559	57	43	62	28	87	49	30	1	59	34	75	61	37	0
Myanmar	1990	40,506	25	75	48	3	73	11	40	1	21	1	39	3	15	0
	2002	48,852	29	71	80	8	95	23	74	2	73	1	96	3	63	0

Source: *Meeting the MDG drinking water and sanitation target: A mid-term assessment of progress.* WHO and UNICEF. 2004. United Nations, New York.
Note: Blank spaces indicate unavailability of data.

Annex A: IMPROVED WATER SUPPLY AND SANITATION COVERAGE FOR COUNTRIES IN ASIA AND THE PACIFIC continued

Country	Year	Population			Drinking Water Coverage (%)						Sanitation Coverage (%)					
		Total	Urban	Rural	Total		Urban		Rural		Total		Urban		Rural	
		('000)	(%)	(%)	Total Access	House Connections	Total Access	House Connections	Total Access	House Connections	Total Access	Sewer Connections	Total Access	Sewer Connections	Total Access	Sewer Connections
Nauru	1990	9	100	0												
	2002	13	100	0												
Nepal	1990	18,625	9	91	69	6	94	42	67	3	12		62		7	0
	2002	24,609	15	85	84	14	93	48	82	8	27	2	68	12	20	0
New Caledonia	1990	171	60	40												
	2002	224	61	39												
New Zealand	1990	3,360	85	15	97		100	100	82					95	88	
	2002	3,846	86	14			100	100						95		
Niue	1990	2	31	69	100		100	100	100		100	0	100	0	100	0
	2002	2	35	65	100	87	100	100	100	80	100	0	100	0	100	0
Northern Mariana Islands	1990	44	89	11	98		98	93	100		84		85	75	78	
	2002	76	94	6	98		98		97	35	94		94		96	35
Pakistan	1990	110,901	31	69	83	28	95	61	78	13	38	15	81	41	19	3
	2002	149,911	34	66	90	23	95	50	87	9	54	24	92	52	35	10
Palau	1990	15	70	30	80		71		99		66	39	72	56	54	0
	2002	20	69	31	84		79		94	10	83	45	96	65	52	0
Papua New Guinea	1990	4,114	13	87	39	11	88	61	32	4	45	2	67	15	41	0
	2002	5,586	13	87	39	11	88	61	32	4	45	2	67	15	41	0
Philippines	1990	61,104	49	51	87	21	93	37	82	6	54	6	63	9	46	2
	2002	78,580	60	40	85	44	90	60	77	22	73	7	81	10	61	2
Korea, Rep. of	1990	42,869	74	26			97	96								2
	2002	47,430	80	20	92	84	97	96	71	39		52		65		2
Russian Federation	1990	148,292	73	27	94	77	97	87	86	49	87	70	93	84	70	30
	2002	144,082	73	27	96	81	99	92	88	52	87	70	93	85	70	30
Samoa	1990	160	21	79	91		99		89		98	0	100	0	98	0
	2002	176	22	78	88	57	91	74	88	52	100	0	100	0	100	0
Singapore	1990	3,016	100	0			100	100					100	96		
	2002	4,183	100	0			100	100					100	100		
Solomon Islands	1990	319	14	86		11		76		1		3	98	22		0
	2002	463	16	84	70	13	94	76	65	1	31	4	98	25	18	0
Sri Lanka	1990	16,830	21	79	68	11	91	37	62	4	70	1	89	4	64	0
	2002	18,910	21	79	78	10	99	35	72	4	91	1	98	4	89	0
Tajikistan	1990	5,303	32	68												
	2002	6,195	25	75	58	40	93	82	47	26	53		71		47	
Thailand	1990	54,389	29	71	81	28	87	69	78	11	80	0	95	0	74	0
	2002	62,193	32	68	85	34	95	80	80	12	99	0	97	0	100	0
Timor-Leste	1990	740	8	92												
	2002	739	8	92	52	9	73	26	51	8	33		65		30	
Tonga	1990	99	31	69	100		100		100		97		98	0	96	
	2002	103	33	67	100	75	100	72	100	76	97		98	0	96	
Turkey	1990	57,593	59	41	81	50	92	64	65	30	84	50	96	79	67	7
	2002	70,318	66	34	93	52	96	64	87	30	83	60	94	84	62	14
Turkmenistan	1990	3,668	45	55												
	2002	4,794	45	55	71	52	93	81	54	29	62		77		50	
Tuvalu	1990	9	41	59	91		92		89		78	0	83	0	74	0
	2002	10	54	46	93		94		92		88	0	92	0	83	0
Uzbekistan	1990	20,515	40	60	89	54	97	85	84	33	58		73		48	
	2002	25,705	37	63	89	53	97	85	84	33	57		73		48	
Vanuatu	1990	149	19	81	60	38	93	80	53	28				0		
	2002	207	22	78	60	38	85	73	52	28	50		78	0	42	
Viet Nam	1990	66,074	20	80	72	11	93	51	67	1	22	1	46	6	16	0
	2002	80,278	25	75	73	14	93	51	67	1	41	2	84	8	26	0

Source: *Meeting the MDG drinking water and sanitation target: A mid-term assessment of progress.* WHO and UNICEF. 2004. United Nations, New York.
Note: Blank spaces indicate unavailability of data.

Annex B: DRINKING WATER AND SANITATION COVERAGE ESTIMATES FOR SUBREGIONS IN ASIA AND THE PACIFIC, 1990 and 2002

	Year	Population			Water Supply Coverage (%)						Sanitation Coverage (%)					
		Total	Urban	Rural	Total		Urban		Rural		Total		Urban		Rural	
		('000)	(%)	(%)	Total Access	Household Connections	Total Access	Household Connections	Total Access	House Connections	Total Access	Sewer Connections	Total Access	Sewer Connections	Total Access	Sewer Connections
Asia and the Pacific	1990	3,263,921	33	67	74	38	95	70	64	22	34	13	70	33	16	2
	2002	3,838,218	39	61	82	43	94	73	75	24	49	16	75	37	33	3
East and Northeast Asia	1990	1,349,962	33	67	74	55	99	85	62	40	32	10	71	28	12	1
	2002	1,502,315	42	58	80	64	94	92	70	43	50	20	73	43	33	3
North and Central Asia	1990	215,178	65	35	91	71	96	86	82	42	82	64	92	83	63	26
	2002	217,858	63	37	91	72	98	90	79	40	79	63	90	84	59	26
Pacific	1990	26,672	70	30	89	67	100	93	63	6	90	54	99	77	69	0
	2002	31,828	73	27	87	69	99	92	53	8	87	55	98	75	57	0
South and Southwest Asia	1990	1,232,183	28	72	71	21	90	56	64	7	23	9	58	29	9	1
	2002	1,550,605	31	69	85	26	94	54	80	13	39	10	69	27	25	3
Southeast Asia	1990	439,926	32	68	73	14	91	37	65	3	48	2	67	6	39	0
	2002	535,612	41	59	79	23	91	45	70	8	61	3	79	7	49	0

Source: Figures dervived from data in *Meeting the MDG drinking water and sanitation target: A mid-term assessment of progress*. WHO and UNICEF. 2004. United Nations, New York.

Annex C. 1990 AND 2002 COVERAGE AND ANNUAL GROWTH RATES

	Water Supply									Sanitation								
	1990			2002			Annual Growth Rate (%)			1990			2002			Annual Compounded Growth Rate (%)		
Subregion/ Country	Total water supply coverage (%)	Urban water supply coverage (%)	Rural water supply coverage (%)	Total water supply coverage (%)	Urban water supply coverage (%)	Rural water supply coverage (%)	Total	Urban	Rural	Total sanitation coverage (%)	Urban sanitation coverage (%)	Rural sanitation coverage (%)	Total sanitation coverage (%)	Urban sanitation coverage (%)	Rural sanitation coverage (%)	Total	Urban	Rural
East and Northeast Asia																		
China	70	100	59	77	92	68	0.80	(0.69)	1.19	23	64	7	44	69	29	5.60	0.60	12.60
Korea, Dem. Peoples Rep. of	100	100	100	100	100	100	0.00	0.00	0.00				59	58	60			
Korea, Rep. of		97		92	97	71		0.00										
Mongolia	62	87	30	62	87	30	0.00	0.00	0.00				59	75	37			
Japan				100	100	100							100	100	100			
North and Central Asia																		
Armenia		99		92	99	80		0.00			96		84	96	61		0.00	
Azerbaijan	66	80	49	77	95	59	1.29	1.44	1.56				55	73	36			
Georgia				76	90	61					96		83	96	69		0.00	
Kazakhstan	86	96	72	86	96	72	0.00	0.00	0.00	72	87	52	72	87	52	0.00	0.00	0.00
Kyrgyz Republic		98		76	98	66		0.00					60	75	51			
Russian Fed.	94	97	86	96	99	88	0.18	0.17	0.19	87	93	70	87	93	70	0.00	0.00	0.00
Tajikistan				58	93	47							53	71	47			
Turkmenistan				71	93	54							62	77	50			
Uzbekistan	89	97	84	89	97	84	0.00	0.00	0.00	58	73	48	57	73	48	(0.10)	0.00	0.00
Pacific																		
Australia				100	100	100							100	100	100			
Cook Islands	94	99	87	95	98	88	0.09	(0.08)	0.10	95	100	88	100	100	100	0.40	0.00	1.10
Fiji Islands										98	99	98	98	99	98	0.00	0.00	0.00
French Polynesia	100	100	100	100	100	100	0.00	0.00	0.00	98	99	97	98	99	97	0.00	0.00	0.00
Guam	100	100	100	100	100	100	0.00	0.00	0.00	99	99	98	99	99	98	0.00	0.00	0.00
Kiribati	48	76	33	64	77	53	2.43	0.11	4.03	25	33	21	39	59	22	3.80	5.00	0.40
Marshall Islands	96	95	97	85	80	95	(1.01)	(1.42)	(0.17)	75	88	51	82	93	59	0.70	0.50	1.20
Micronesia, Fed. States of	87	93	85	94	95	94	0.65	0.18	0.84	30	53	21	28	61	14	(0.60)	1.20	(3.30)
New Zealand				100	100	100												
Niue	100	100	100	100	100	100	0.00	0.00	0.00	100	100	100	100	100	100	0.00	0.00	0.00
Northern Mariana Is.	98	98	100	98	98	97	0.00	0.00	(0.25)	84	85	78	94	94	96	0.90	0.80	1.70
Palau	80	71	99	84	79	94	0.41	0.89	(0.43)	66	72	54	83	96	52	1.90	2.40	(0.30)
Papua New Guinea	39	88	32	39	88	32	0.00	0.00	0.00	45	67	41	45	67	41	0.00	0.00	0.00
Samoa	91	99	89	88	91	88	(0.28)	(0.70)	(0.09)	98	100	98	100	100	100	0.20	0.00	0.20

Notes: 1. Countries in bolded text have full baseline data. 2. Blanks indicate unavailability of data.
Source: Figures dervived from data in *Meeting the MDG drinking water and sanitation target: A mid-term assessment of progress*. WHO and UNICEF. 2004. United Nations, New York.

Annex C. 1990 AND 2002 COVERAGE AND ANNUAL GROWTH RATES continued

Subregion/ Country	Water Supply									Sanitation								
	1990			2002			Annual Growth Rate (%)			1990			2002			Annual Compounded Growth Rate (%)		
	Total water supply coverage (%)	Urban water supply coverage (%)	Rural water supply coverage (%)	Total water supply coverage (%)	Urban water supply coverage (%)	Rural water supply coverage (%)	Total	Urban	Rural	Total sanitation coverage (%)	Urban sanitation coverage (%)	Rural sanitation coverage (%)	Total sanitation coverage (%)	Urban sanitation coverage (%)	Rural sanitation coverage (%)	Total	Urban	Rural
Solomon Is.				70	94	65					98		31	98	18		0.00	
Tokelau			96			89			(0.63)			30			74			7.80
Tonga	100	100	100	100	100	100	0.00	0.00	0.00	97	98	96	97	98	96	0.00	0.00	0.00
Tuvalu	91	92	89	93	94	92	0.18	0.18	0.28	78	83	74	88	92	83	1.00	0.90	1.00
Vanuatu	60	93	53	60	85	52	0.00	(0.75)	(0.16)				50	78	42			
South and Southwest Asia																		
Afghanistan				13	19	11						5	8	16	5			0.00
Bangladesh	71	83	68	75	82	72	0.46	(0.10)	0.48	23	71	11	48	75	39	6.30	0.50	11.10
Bhutan				62	86	60							70	65	70			
India	68	88	61	86	96	82	1.98	0.73	2.50	12	43	1	30	58	18	7.90	2.50	27.20
Iran, Islamic Republic of	91	98	83	93	98	83	0.18	0.00	0.00	83	86	78	84	86	78	0.10	0.00	0.00
Maldives	99	100	99	84	99	78	(1.36)	(0.08)	(1.97)		100		58	100	42		0.00	
Nepal	69	94	67	84	93	82	1.65	(0.09)	1.70	12	62	7	27	68	20	7.00	0.80	9.10
Pakistan	83	95	78	90	95	87	0.68	0.00	0.91	38	81	19	54	92	35	3.00	1.10	5.20
Sri Lanka	68	91	62	78	99	72	1.15	0.70	1.25	70	89	64	91	98	89	2.20	0.80	2.80
Turkey	81	92	65	93	96	87	1.16	0.36	2.46	84	96	67	83	94	62	(0.10)	(0.20)	(0.60)
Southeast Asia																		
Cambodia				34	58	29							16	53	8			
Indonesia	71	92	62	78	89	69	0.79	(0.28)	0.90	46	66	38	52	71	38	1.00	0.60	0.00
Lao People's Dem. Republic				43	66	38							24	61	14			
Malaysia		96		95	96	94		0.00		96	94	98			98			0.00
Myanmar	48	73	40	80	95	74	4.35	2.22	5.26	21	39	15	73	96	63	10.90	7.80	12.70
Philippines	87	93	82	85	90	77	(0.19)	(0.27)	(0.52)	54	63	46	73	81	61	2.50	2.10	2.40
Singapore				100	100	0												
Thailand	81	87	78	85	95	80	0.40	0.74	0.21	80	95	74	99	97	100	1.80	0.20	2.50
Timor-Leste				52	73	51							33	65	30			
Viet Nam	72	93	67	73	93	67	0.12	0.00	0.00	22	46	16	41	84	26	5.30	5.10	4.10

Notes: 1. Countries in bolded text have full baseline data. 2. Blanks indicate unavailability of data.
Source: Figures dervived from data in *Meeting the MDG drinking water and sanitation target: A mid-term assessment of progress*. WHO and UNICEF. 2004. United Nations, New York.

Annex D. ECONOMIC VALUE OF TIME SAVINGS FROM IMPROVED WATER SUPPLY AND SANITATION, 2000 (amounts in $ million)

Value of Productive Days Gained due to Less Illness at Minimum Wage (15–60 age group)

	Intervention 1	Intervention 2	Intervention 3	Intervention 4
East and Northeast Asia	205.9	412.0	1,113.9	1,688.3
North and Central Asia	4.5	9.0	32.8	52.3
Pacific	1.3	2.6	5.9	8.6
South and Southwest Asia	91.8	183.6	521.0	797.0
Southeast Asia	20.0	39.9	147.3	235.2
Total	**323.5**	**646.9**	**1,820.9**	**2,781.5**

Value of Time Gain per Year due to Closer Access to WSS Facilities

	Intervention 1	Intervention 2	Intervention 3	Intervention 4
East and Northeast Asia	17,916.2	35,832.3	35,832.3	61,356.7
North and Central Asia	1,582.2	3,164.5	3,164.5	6,857.7
Pacific	345.9	691.9	691.9	1,716.3
South and Southwest Asia	27,525.4	55,050.8	55,050.8	119,244.0
Southeast Asia	6,884.8	13,769.6	13,769.6	52,254.8
Total	**54,254.6**	**108,509.1**	**108,509.1**	**241,429.5**

Source: Hutton, G. and L. Haller. Evaluation of the Costs and Benefits of Water and Sanitation Improvement at the Global Level. Geneva: World Health Organization, 2004. (WHO/SDE/WSH/4.04)
Note: Figures may not add up due to rounding.

Annex E. NUMBER OF DIARRHEA CASES AVERTED PER YEAR, 2000 (in million)

	Intervention 1	Intervention 2	Intervention 3	Intervention 4
East and Northeast Asia	108.4	216.8	557.5	836.2
North and Central Asia	3.9	7.9	30.7	49.4
Pacific	0.8	1.6	3.8	5.5
South and Southwest Asia	137.6	275.2	718.5	1,081.0
Southeast Asia	24.6	49.2	150.7	233.8
Total	**275.4**	**550.7**	**1,461.1**	**2,205.9**

Source: Hutton, G. and L. Haller. Evaluation of the Costs and Benefits of Water and Sanitation Improvement at the Global Level. Geneva: World Health Organization, 2004. (WHO/SDE/WSH/4.04)
Note: Figures may not add up due to rounding.

Annex F. COST SAVINGS DUE TO IMPROVED HEALTH FROM INCREASED ACCESS TO WATER SUPPLY AND SANITATION, 2000 (in $ million)

Health Sector Costs Averted due to Less Illness Per Year

	Intervention 1	Intervention 2	Intervention 3	Intervention 4
East and Northeast Asia	1,273.7	2,547.4	6,548.7	9,822.8
North and Central Asia	55.7	111.4	442.7	713.8
Pacific	9.6	19.3	44.5	65.2
South and Southwest Asia	983.1	1,966.1	5,306.0	8,038.2
Southeast Asia	265.7	531.4	1,612.8	2,497.8
Total	**2,587.8**	**5,175.6**	**13,954.7**	**21,137.7**

Patient Costs Averted due to Less Illness Per Year

	Intervention 1	Intervention 2	Intervention 3	Intervention 4
East and Northeast Asia	32.7	65.4	168.2	252.3
North and Central Asia	1.2	2.4	9.3	14.9
Pacific	0.2	0.5	1.1	1.7
South and Southwest Asia	41.5	83.0	216.8	326.2
Southeast Asia	7.4	14.8	45.5	70.5
Total	**83.1**	**166.2**	**440.8**	**665.5**

Source: Hutton, G. and L. Haller. Evaluation of the Costs and Benefits of Water and Sanitation Improvement at the Global Level. Geneva: World Health Organization, 2004. (WHO/SDE/WSH/4.04)
Note: Figures may not add up due to rounding.

Annex G. SCHOOL DAYS SAVED FROM IMPROVED WATER SUPPLY AND SANITATION AND THEIR ECONOMIC VALUE

Number of School Days Gained due to Less Illness Per Year (in million)

	Intervention 1	Intervention 2	Intervention 3	Intervention 4
East and Northeast Asia	41.6	83.3	214.0	321.0
North and Central Asia	1.8	3.7	12.5	19.8
Pacific	0.3	0.6	1.4	2.1
South and Southwest Asia	66.4	132.9	345.8	519.9
Southeast Asia	9.8	19.7	59.8	92.6
Total	**120.0**	**240.1**	**633.5**	**955.3**

Value of School Days Gained per Year due to Less Illness (in $ million)

	Intervention 1	Intervention 2	Intervention 3	Intervention 4
East and Northeast Asia	69.7	139.4	377.0	571.4
North and Central Asia	5.9	11.9	37.7	58.9
Pacific	1.7	3.4	7.9	11.6
South and Southwest Asia	132.1	264.2	749.8	1,147.1
Southeast Asia	23.4	46.7	161.7	255.8
Total	**232.8**	**465.6**	**1,334.2**	**2,044.8**

Source: Hutton, G. and L. Haller. Evaluation of the Costs and Benefits of Water and Sanitation Improvement at the Global Level. Geneva: World Health Organization, 2004. (WHO/SDE/WSH/4.04)
Note: Figures may not add up due to rounding.