

THE ECONOMIC IMPACTS OF INADEQUATE SANITATION IN BANGLADESH



**Inadequate Sanitation Costs
Bangladesh BDT 295.5 Billion
(US\$4.2 Billion)**



An Overview of the Economic Impacts of
Inadequate Sanitation in Bangladesh

Overview

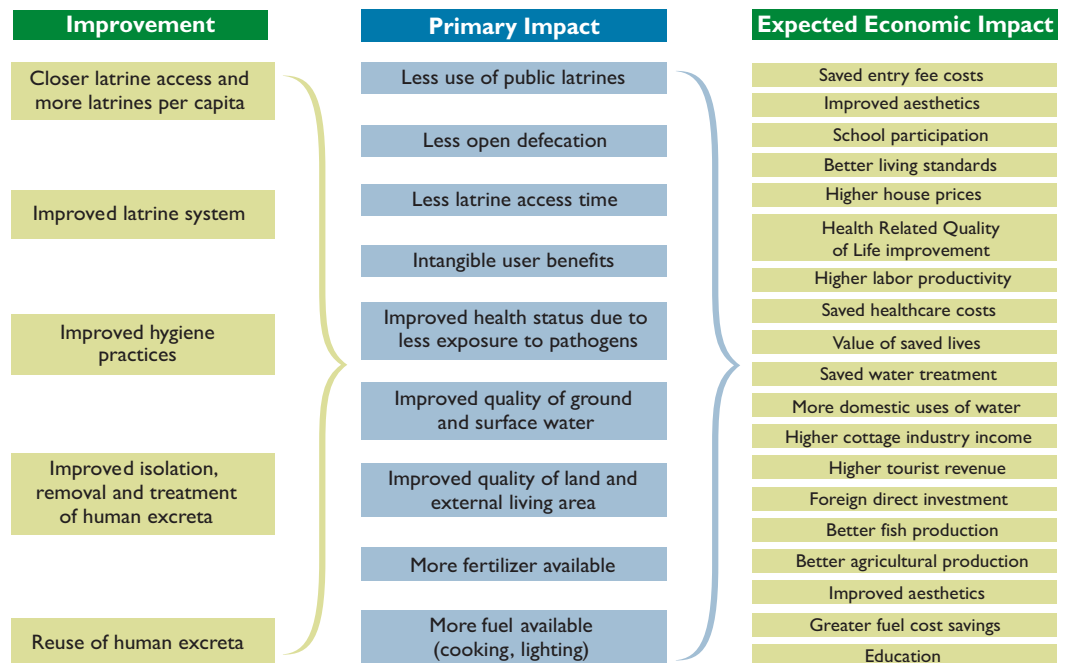
This brochure summarizes key findings from the study, *The Economic Impacts of Inadequate Sanitation in Bangladesh*. The study, carried out by the Water and Sanitation Program (WSP) to address major gaps in evidence and support sanitation advocacy, is the latest in a series of new reports on water and sanitation in developing countries. All the topics and measures highlighted in the following are addressed in much greater detail by the full report.

The Economic Impacts of Inadequate Sanitation in Bangladesh finds that substantial economic losses are incurred every year in Bangladesh as a result of inadequate sanitation. While the Government of Bangladesh has made significant investments to achieve its ‘Sanitation for All by 2013’ goals, much work remains to be done.

The total economic impacts of inadequate sanitation in Bangladesh amount to a loss of BDT 295.5 billion (US\$4.2 billion¹) each year. This is equivalent to 6.3 percent of gross national product (GDP) in 2007.²

Translated into per-person costs, this impact means a loss of BDT 2,072 (US\$29.6) per person each year. The study underlines the fact that substantial investments are needed to mitigate inadequate sanitation. These investments can become effective only when they result in reducing mortality and morbidity, mitigating impacts on access to drinking water, and improving welfare.

Figure 1: Primary and final impacts of improved sanitation options



¹ US\$1 = BDT 70.

² The per person annual impact of BDT 2,072 (US\$ 29.6) was calculated by dividing the 2007 total population of Bangladesh (142.6 million).



Consequences for Children's Health are Severe

In Bangladesh, diarrhea is the second leading cause of morbidity and the fourth leading cause of death among children. Bacteria, viruses, and parasites that cause diarrhea are common environmental hazards linked to poor sanitation. Acute respiratory infection and pneumonia, which are leading causes of death and illness among children, are also indirectly related to poor sanitation via malnutrition.⁵

Sanitation: A Pathway to Health and Human Dignity

Access to safe drinking water and good sanitation is considered a fundamental human right, one that both safeguards health and protects human dignity.³ Bangladesh's progress toward reaching two of the Millennium Development Goals—'Reduce the under-five mortality rate by two-thirds between 1990 and 2015' and 'The proportion of the population without sustainable access to safe drinking water and basic sanitation halve by 2015'—will be accelerated by promoting sanitation and hygiene. The Government of Bangladesh has already shown it is highly committed to these goals through its national 'Sanitation for All by 2013' campaign, under which there has been increasing budgetary allocations for sanitation (hygienic/improved latrines): BDT 4,080 million in financial year 2006–07, BDT 5,510 million in 2007–08, and BDT 6,370 million in 2008–09.

How does Better Sanitation Move Bangladesh Society Forward?

Good sanitation and hygiene practices make major differences in health, education, and socioeconomic development. They increase life expectancy and reduce morbidity, in turn leading to other benefits such as decreased healthcare costs, increased worker productivity, higher school attendance, reduced water treatment costs, and more (Figure 1). Their impact on girls and women is especially large: lack of latrines in households makes women vulnerable to harassment and assault, particularly at night, and many girls and women drop out of schools and miss work due to inadequate sanitation facilities.⁴

What is the Status of Sanitation in Bangladesh Today?

According to the Joint Monitoring Program of the World Health Organization (WHO) and UNICEF, Bangladesh's sanitation coverage rose from 20 percent in 1990 to 39 percent in 2004 and 53 percent in 2008. Although access to improved latrines remains low, the percentage of people defecating in the open has dramatically reduced since 2003. More than 90 percent of the population has access to latrines (mainly low cost pit latrines). While there has been a significant movement from 'open defecation' towards 'fixed point defecation', the quality of coverage is the emerging area of concern. Seventy-five percent of the country's population lives in rural areas, and many communities in hard-to-reach regions do not have adequate access to sanitation. In such a densely populated country, where a large proportion of the land regularly floods, sanitation is a continuing challenge.



Sewage conditions: A large number of people remain at risk from the lack of safe disposal of excreta. In urban areas, ensuring sanitation for all is a huge challenge and an expensive option for the government. Even in Dhaka, the capital of Bangladesh, only 20 percent households are covered by the sewerage network. The rest of the population uses septic tanks, pit latrines, unhygienic latrines or makes do without latrines. The sanitation conditions are even more severe in the slums, where most households do not have private latrines or access to public latrines.

³ Office of the High Commissioner for Human Rights, *Consultation on Human Rights and Access to Safe-Drinking Water and Sanitation: Summary of Discussions* (Geneva: United Nations, 2007).

⁴ Abul Barkat, G. Mahiyuddin, A. Poddar, R. Ara, M. Rahman, M. Badiuzzaman, S. Khan, and A. Osman, *Advancing Sustainable Environmental Health (ASEH): Impact Study* (Dhaka: WaterAid, 2009).

⁵ *Bangladesh Country Paper: Sanitation in Bangladesh* (Third South Asian Conference on Sanitation), November 2008.

Overview

Disease pathways: The study points to important issues regarding hygiene in Bangladesh. On this matter, there is a wide gap between reported figures and observed facts. Handwashing is an important case: The percentage *reported* to be washing their hands with water and soap after defecation is 50 percent for rural areas and about 80 percent for urban areas, but the *observed* scenario indicates that while 55 percent wash their hands, only 1.7 percent wash both hands with soap or ash.⁶ About 42 percent of the rural and 20 percent of the urban population disposes of children's feces in the open.

What Methodology Does the Study Use to Measure Impact?

The study estimates economic impacts by examining three major components: *health impact*, *water-related impact*, and *user preference impact*.

- **Health-related impacts** include premature deaths and morbidity as well as the burden of disease due to inadequate sanitation. To estimate the cost of premature deaths, the *human capital approach* and the *value of statistical life approach* is followed, while the cost estimation of episodes of illness considers the *treatment cost*, and *welfare and productivity losses*.
- **Water-related impacts** include the household cost of treatment of drinking water, the cost of piped drinking and nondrinking domestic water production, and the cost of fetching cleaner water.
- **User preference, time loss, and welfare-related impacts** consider the extra time needed for open defecation and for use of a shared toilet as well as the time lost by girls due to absence from schools and by women from workplaces.

The estimation includes both financial and nonmonetary costs to portray a complete picture of the economic losses caused by poor sanitation.

- *Financial costs* are the direct expenses paid in financial terms by a person or institution, such as changes in household and government spending, real income losses for households, and so on; and
- *Nonmonetary costs* consist of resource use, such as the time spent on taking care of patients, fetching water or using unimproved latrines; they can also be expressed in financial units using 'shadow prices.'

The study also calculates the economic gains that improvements in sanitation and hygiene can bring by reduced relative risk of diarrhea. A sensitivity analysis is made to capture the low and high cases of parameter values to cover the overall variation.

Data sources:⁷ National data on incidence or actual numbers for the indicators under the three broad impact components were compiled from the following data sources: Bangladesh Demographic and Health Survey 2007, Health Bulletin (2008), WHO's Global Burden of Disease (2004), Household Income and Expenditure Survey (2005), Sample Vital Registration System (2007), Multiple Indicator Cluster Survey (MICS) (2006), Population Census (2001), National Accounts and GDP (2007), Labor Force Survey (2005-06), and Statistical Yearbook (2007). Based on the review of relevant scientific literature, attribution factors were used to estimate the populations impacted by inadequate sanitation and, finally, the economic valuation was done using costs/prices based on other secondary sources. Conservative assumptions have been used in economic valuation and the pertinent analysis has been carried out for 2007 for want of comprehensive data for later years.

⁶ ICDDR'B, *Health and Science Bulletin*, Vol. 6, No. 3 (September 2008).

⁷ 2007 was used as the study year for benchmarking reasons. When this study commenced there was no published data after 2007.

Selected Findings

The Magnitude of the Loss in Bangladesh is Enormous

Economic losses due to inadequate sanitation amount to a figure that is 33 percent higher than the National Development Budget in 2007–08. This amount is also five times higher than the national health budget, three times higher than the national education budget, and three times higher than the value of national exports in 2007.

Health Impacts, Including Premature Death, Make Up the Single Largest Economic Loss

The health-related economic loss due to inadequate sanitation, at BDT 249.2 billion (US\$3.56 billion) is the largest component of impacts (84 percent of the total economic impacts or equivalent to 5.3 percent of GDP 2007). More than BDT 195 billion (US\$2.8 billion) was lost due to premature mortality—the single-largest health subcomponent. Health-related productivity losses, estimated at BDT 31.9 billion (US\$456.5 million), are the second-largest impact. (Figures 2 and 3.)

Time Lost at Home, Work, and School is Significant As Well

The other two main areas of impact—on welfare and access time and on drinking water—account for losses of BDT 31.8 billion (US\$456.3 million) and BDT 14.5 billion (US\$207.3 million), respectively. Within those categories, loss of access time cost households BDT 30.1 billion (US\$430.2 million) and healthcare costs add up to BDT 22.1 billion (US\$316.3 million).



Figure 2: Composition of the economic impacts of inadequate sanitation by broad components, 2007

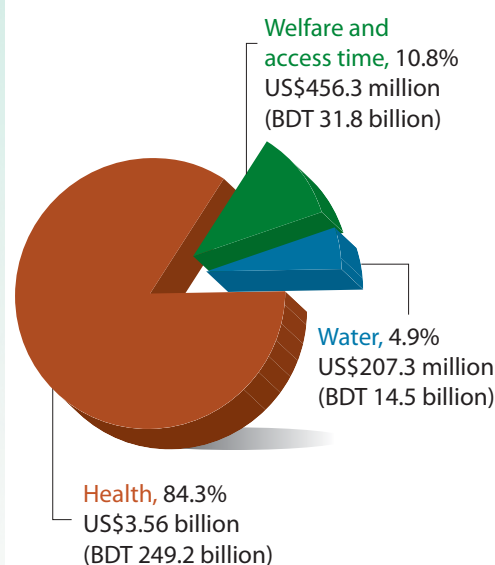
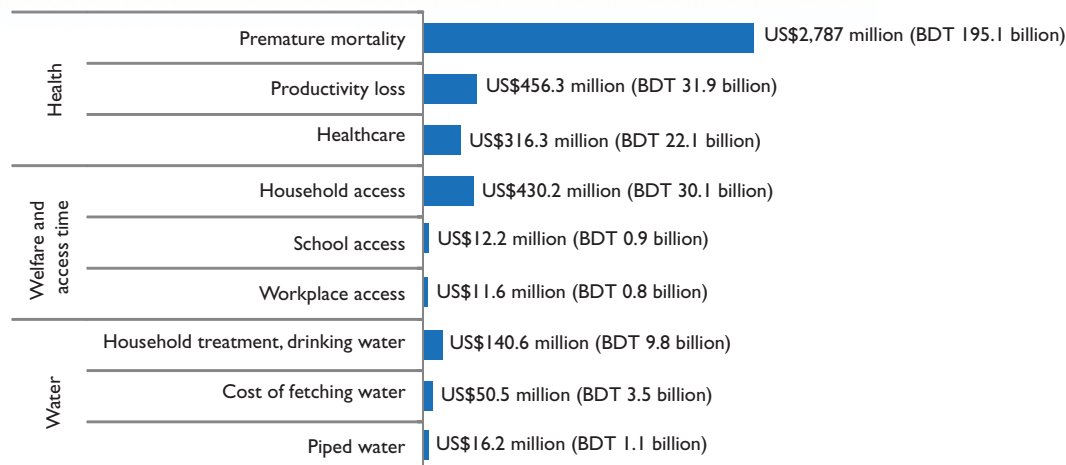


Figure 3: Economic impacts of inadequate sanitation by sub-components, 2007

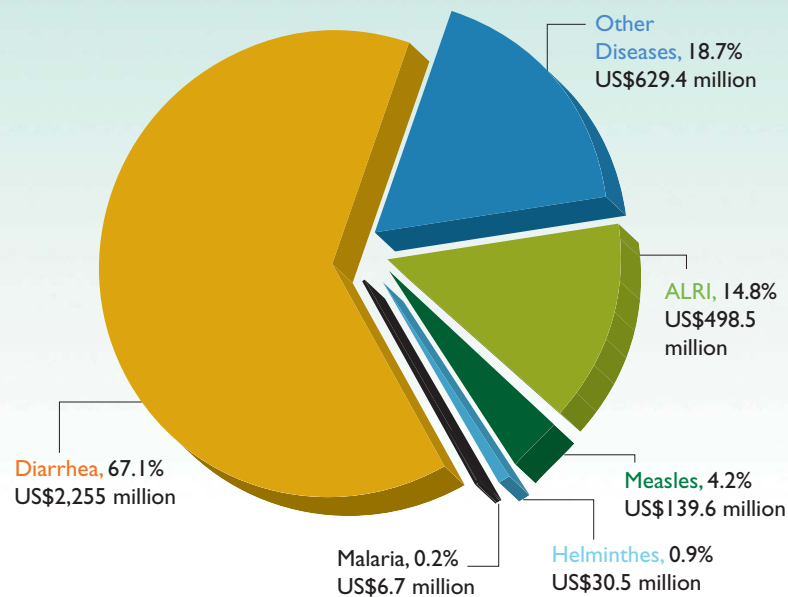


Selected Findings

Diarrhea is the Largest Health Factor Contributing to Economic Loss

Under the health-related impact of BDT 249.2 billion (US\$3.56 billion), diarrhea is the largest contributor, amounting to two-thirds of the total impact. This is followed by Acute Lower Respiratory Infection (ALRI), accounting for about 15 percent of the health-related impact (Figure 4).

Figure 4: Distribution of the health impact of inadequate sanitation by disease, 2007



Children and Poor Households are the Most Heavily Affected Victims

Very young children—below age five—account for 95 percent of the economic losses related to premature deaths under the health impact total (US\$2.66 of US\$2.79 billion, or BDT 186.1 of BDT 195.1 billion). More broadly, diarrhea in the same age group (under five) accounts for 41 percent (BDT 101.9 billion, US\$1.46 billion) of all health-related economic impacts (BDT 249.2 billion, US\$3.56 billion).

Comprehensive data on mortality are not available for all wealth and income classes. However, conservative estimates⁸ show that poor households bear the greatest brunt of inadequate sanitation. The estimated total losses in the 40 percent of poor households affected are equivalent to about 71 percent of the total impact on the nation's population (BDT 210 billion of BDT 295.48 billion).

⁸ The poorest 40 percent of households are those in the lowest two wealth quintiles. In Bangladesh, the poverty ratio based on the direct calorie intake method was 40 percent in 2007. In estimating the poor household's share in the total losses due to inadequate sanitation, the poor/non-poor ratio of diarrheal morbidity (2.73) and that for ALRI (common cold, URI, acute cough, bronchitis; 2.04) were considered in weighted form. Source: Barkat Abul. 'Political Economy of Health Care in Bangladesh', in *Social Science Review*, Vol. 27, Number 1, June 2010, Dhaka University.



Key Lessons and Recommended Action

The study's estimation of economic losses shows that inadequate sanitation has serious implications for Bangladesh's overall socioeconomic and cultural development. Its findings are also highly encouraging in the measurable gains that sanitation and hygiene interventions could achieve by reducing premature deaths and related morbidity, eliminating domestic water-related costs, reducing absentee time at schools and workplaces, and improving welfare and productivity. Therefore, to derive maximum benefits from sanitation, the study recommends the following:

- Increase investment in sanitation.
- Increase investment in hygiene interventions.
- Launch vigorous communication campaign.
- Devise an appropriate monitoring framework.

What can Bangladesh Gain by Improving Sanitation?

This study estimates that a package of comprehensive sanitation and hygiene interventions can result in preventing 61 percent of the economic loss due to health impacts linked with sanitation and *all* the adverse impacts of inadequate sanitation related to water and welfare losses. Such a comprehensive package would need to address increased use of sanitary toilets, hygiene promotion (including hand washing and safe water management), safe disposal of human excreta, and improved access to safe water.

As a result of comprehensive interventions, the study estimates a potential gain of about BDT 158.4 billion (US\$2.26 billion, the equivalent to 3.4 percent of GDP in 2007). This implies a potential gain of BDT 1,111 (US\$15.9) per capita.



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Water and Sanitation Program Funding Partners

WSP is a multi-donor partnership created in 1978 and administered by the World Bank to support poor people in obtaining affordable, safe, and sustainable access to water and sanitation services. WSP provides technical assistance, facilitates knowledge exchange, and promotes evidence-based advancements in sector dialog. WSP has offices in 25 countries across Africa, East Asia and the Pacific, Latin America and the Caribbean, South Asia, and in Washington, DC. WSP's donors include Australia, Austria, Canada, Denmark, Finland, France, the Bill and Melinda Gates Foundation, Ireland, Luxembourg, Netherlands, Norway, Sweden, Switzerland, the United Kingdom, the United States, and the World Bank.

Economics of Sanitation

The Economics of Sanitation Initiative (ESI) is a multi-country initiative of the Water and Sanitation Program (WSP). ESI was launched in 2007 as a response by the Water and Sanitation Program (www.wsp.org) to address major gaps in evidence among developing countries on the economic aspects of sanitation. The study aims to provide evidence that supports sanitation advocacy, elevates the profile of sanitation, and acts as an effective tool to convince governments to take action. The first study completed in Southeast Asia found that the economic costs of poor sanitation and hygiene amounted to over US\$9.2 billion a year (2005 prices) in Cambodia, Indonesia, Lao PDR, the Philippines, and Vietnam. Its second phase analyzes the cost-benefit of alternative sanitation interventions and will enable stakeholders to make decisions on how to spend funds allocated to sanitation more efficiently. Due to that study's successful traction, WSP has now carried out ESI studies in India and Pakistan as well as the Bangladesh study summarized here. ESI studies are also planned for countries in Africa, Latin America, and the Caribbean.

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