

Home hygiene and environmental sanitation: a country situation analysis for India

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Problems of the environment and of domestic hygiene are always related to poverty of population and the sanitation of settlements. Most cities and towns in developing countries, like India, are characterised by over-crowding, congestion, inadequate water supply and inadequate facilities of disposal of human excreta, waste water and solid wastes. Inadequacy of housing for most urban poor invariably leads to poor home hygiene. Personal and domestic hygiene practices cannot be improved without improving basic amenities, such as water supply, waste water disposal, solid waste management and the problems of human settlements. But even under the prevailing conditions, there is significant scope of improving hygiene practices at home to prevent infection and cross-infection. Unfortunately, in developing countries, public health concerns are usually raised on the institutional setting, such as municipal services, hospitals, environmental sanitation, etc. There is a reluctance to acknowledge the home as a setting of equal importance along with the public institutions in the chain of disease transmission in the community. Managers of home hygiene and community hygiene must act in unison to optimise return from efforts to promote public health. Current practices and perceptions of domestic and personal hygiene in Indian communities, the existing levels of environmental and peri-domestic sanitation and the 'health risk' these pose will be outlined, as well as the need for an integrated action for improving hygiene behaviour and access to safe water and sanitation.

Keywords: Environment; domestic hygiene; communicable disease; rural water supply; water quality; waste disposal; sanitation.

Introduction

The public health scenario in India

During the five decades since Indian independence significant progress has been made in the health sector. The death rate per thousand of the population has been brought down from 27.4 in 1947, the year of independence, to nine in 1997. Life expectancy has increased from 32.7 to 63.5 years during the same period, while the rate of infant mortality has been reduced from 162.0 to 62.0. Among the major achievements made in public health are the following (Figs 1 and 2):

- Eradication of smallpox
- Successful implementation of universal immunisation programme and near elimination of polio
- Creation of an extensive healthcare infrastructure in urban and rural areas.

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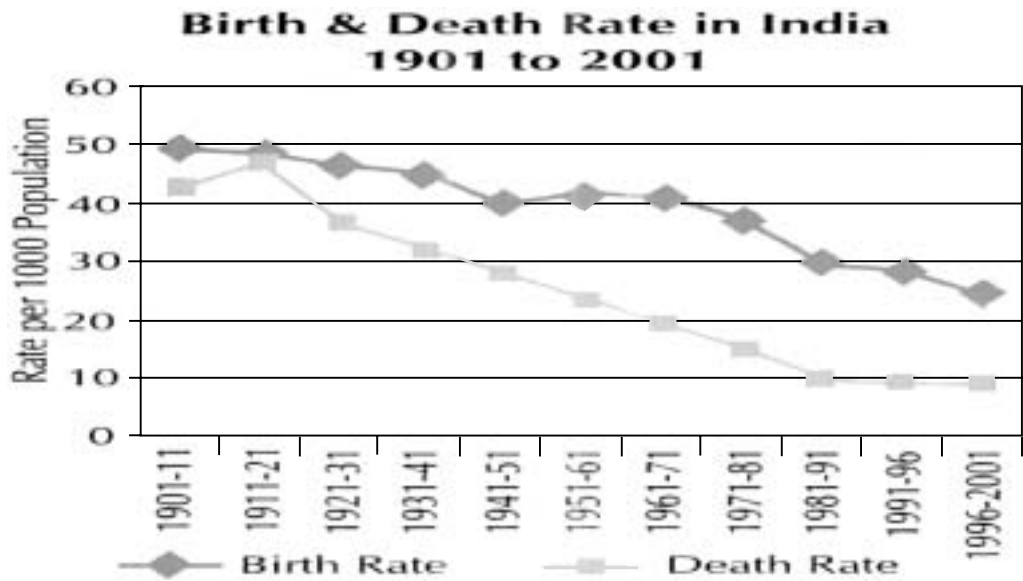
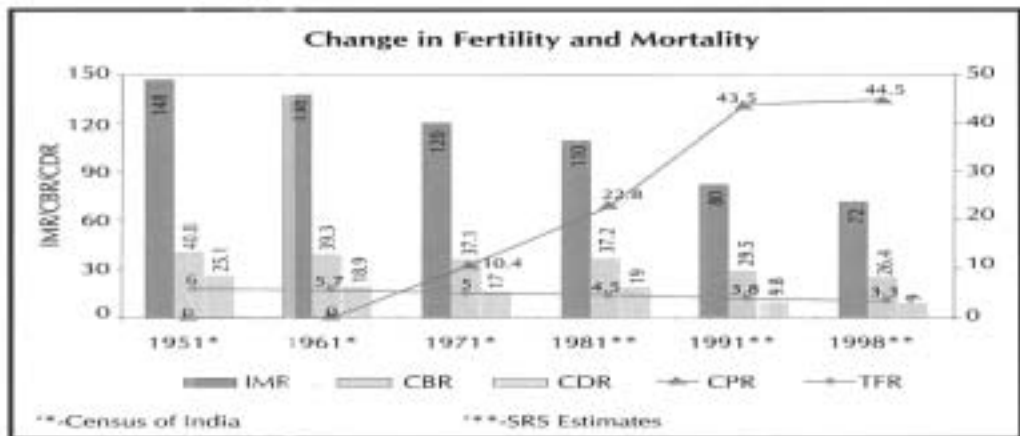


Fig. 1. Birth and death rate in India between 1901 and 2001.



Infant Mortality Rate (IMR) Crude Birth Rate (CBR) Crude Death Rate (CDR)
 Couple Protection Rate (CPR) Total Fertility Rate (TFR)

Fig. 2. Change in fertility and mortality.

But despite these impressive achievements, the demographic and epidemiological situations in most parts of the country are causing serious concern. Unabated growth of the population coupled with the burden of poverty and illiteracy, and a lack of access to safe water and sanitation are resulting in a huge burden of communicable diseases. There is a neglect of preventive and environmental health and the health authorities are biased in favour of curative services. This has created a vicious cycle in which the over-burdened hospital services and healthcare infrastructures are unable to cope with the burden of diseases.

Communicable diseases

Communicable diseases continue to be a heavy burden on the health sector. Though mortality has been reduced, morbidity due to water, sanitation and hygiene-related issues, and vector-borne diseases continue unabated. Between 60% and 80% of illnesses are related to faecal contamination of drinking water and food and because of poor personal and home hygiene, as well as environmental sanitation.

During the past 10 years, reported cases of diarrhoea, cholera, viral hepatitis and enteric fever have continued unchecked (Fig. 3). In fact, these reported cases provide a gross underestimate of the real figures. Community studies have shown that every child under 5 years of age has two or three episodes of diarrhoea each year. The actual burden of water, sanitation and hygiene-related infections in the community is, therefore, much higher than the number of cases reported.

Community water supply and environmental sanitation: present status

Coverage of urban and rural water supply

In 1996 at the beginning of the 9th plan, 90% of the urban population had access to a community water supply, though the quality, safety and reliability of the supply was often questionable. The poorer section of the population in under-served urban areas had very poor access to public water supply systems. Out of 1,422,646 rural habitations, 1,183,212 are fully covered and 213,331 partially covered. There are still 26,121 uncovered problem villages that do not have an adequate provision of drinking water.

Norms of coverage

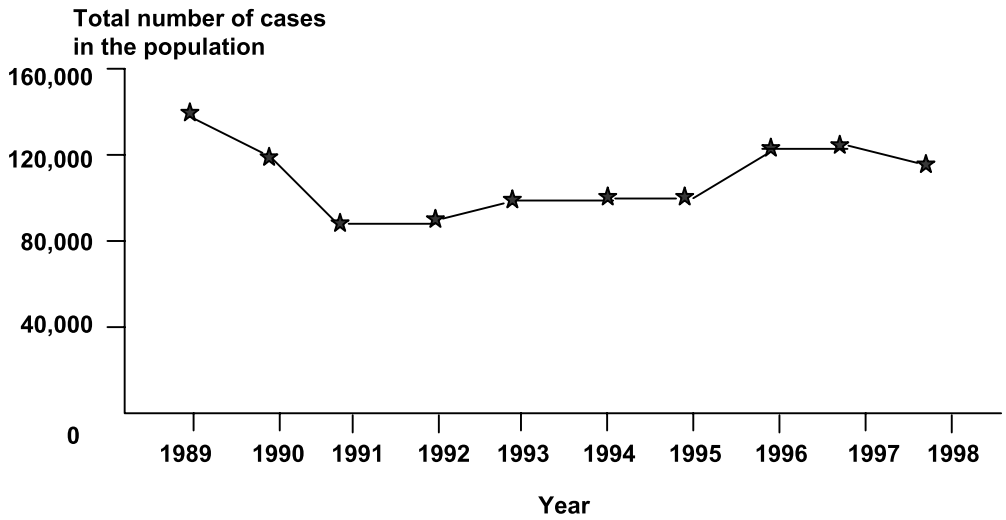
The norm for coverage of rural water supply is 40 litres per capita daily (lpcd), or one hand pump for 250 people within a walking distance of 1.6 km, or an elevation difference of 100 mm in hilly areas. An additional 30 lpcd of water is required for cattle (rural water supply). Variations in water requirements include 40 lpcd where only spot-sources are available; 70 lpcd where there is a piped water supply but no sewerage system; 125 lpcd where there is a piped water supply and a sewerage system, and 150 lpcd for large cities. Additional demands on water are called upon for in urban situations, including industrial, commercial, institutional, fire fighting and for gardens (urban water supply).

Environmental sanitation

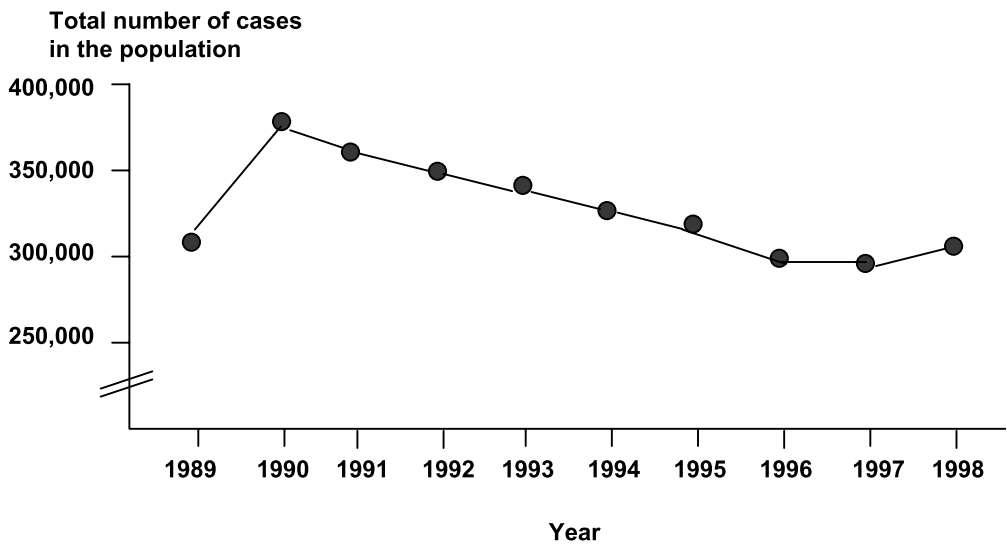
Only 200 of more than 4,000 towns have a partially complete sewerage system. There are still 400,000 scavengers and 7,210,000 dry latrines, of which 5,400,000 are in urban areas. Less than 50% of the urban population have access to sanitation, that is, safe disposal of human excreta, while in the rural population less than 20% have facilities for sanitary disposal of human excreta. Open defecation is still the most popular means of toileting in rural India, while in urban areas less than 60% of waste is collected and disposed of on a regular basis.

The drainage infrastructure for storm water and sullage is extremely poor in urban, peri-urban and rural areas. There are other problems too. Rivers and other bodies of surface water are grossly polluted, where, for example, faecal coliform count can vary between 5,000 and 20,000 mpn 100 ml⁻¹. The holy river of the Ganges is one such river where in many parts it is unfit for bathing.

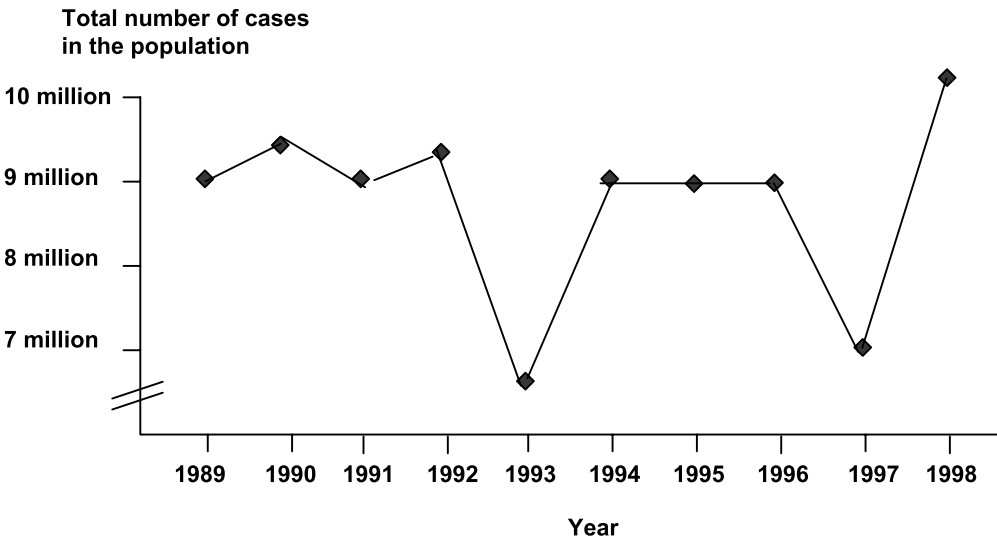
(i) Reported data on viral hepatitis (1989–1998)



(ii) Reported data on enteric fever (1989–1998)



(iii) Reported data on diarrhoea (1989–1998)



(iv) Reported data on cholera (1989–1998)

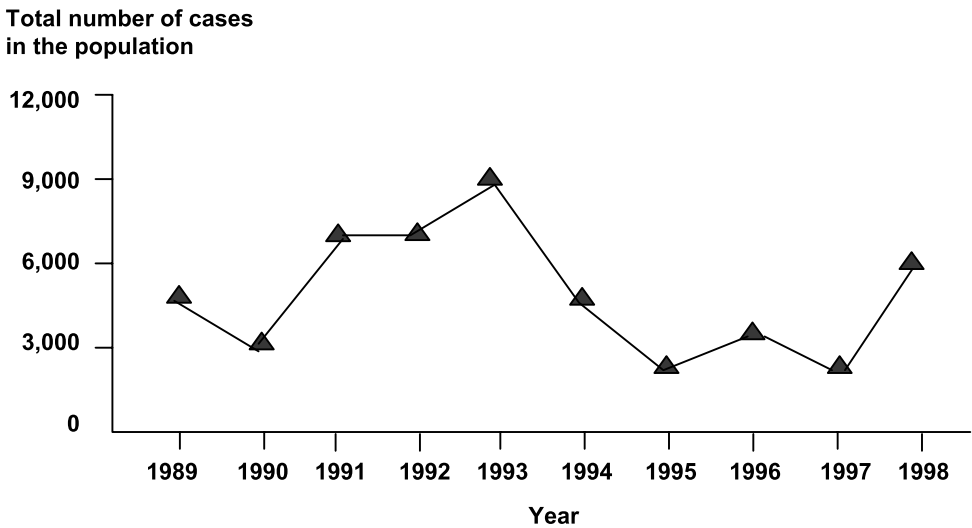


Fig. 3. Burden of water and sanitation related diseases.

Quality of water in public distribution systems

Almost all urban water supply systems in the country are prone to disruption. As a result, faecal contamination of the distribution systems is universal in most cities and towns. Ground water drawn from tube wells and dug-wells is often contaminated by chemicals, minerals, pesticides or bacteria. For example, fluoride and arsenic contamination of ground water has become a serious health risk for almost 80 million people in the country.

Hazardous and toxic waste management

Monitoring and management of toxic waste from industry and biomedical waste from hospitals and other healthcare institutions is extremely poor. As a result, these have become potential sources of contamination and infection.

Water goes only part of the way

Between 1970 and 2000, water supply coverage in rural areas increased from less than 20% to almost 90%. During the same period, reported cases of diarrhoea remained unabated at around 10 million cases per year. Viral hepatitis and enteric fever have also proven difficult to overcome.

To achieve the primary objective of improving the health status of the community, there is a need to implement hygiene at home and encourage changes in attitudes with respect to personal and environmental hygiene in conjunction with community water supply and sanitation. Unfortunately, community water supply projects in India are often initiated in isolation, and as a result health benefits made have not been commensurate with investments.

Domestic and personal hygiene: practice and perception

The level of personal and household hygiene in rural and unserved urban areas is extremely poor. Inadequate housing and a lack of access to adequate quantities of potable water and facilities for waste disposal make it difficult to obtain an adequate standard of domestic and personal cleanliness. However, the level of personal and domestic hygiene is relatively better among those people of greater socio-economic standing.

How personal hygiene is carried out in practice varies widely between urban, peri-urban and rural communities, depending on the socio-economic status of the people. In the urban high-income sector, use of soap and water to wash hands after defecation is almost universal. However, only 25% of people from this same group use soap and water for handwashing before and after a meal, while others use only water. In the rural and peri-urban areas, 61% of the surveyed population used water and ash/mud for handwashing.

Quality of water for domestic use

Water quality for domestic use is an important determinant of personal and domestic hygiene. In a sample survey conducted in Calcutta, it was observed that most of the population in urban and rural areas use piped water or ground water (tube well) for drinking (Figs 4 and 5). The quality of water from these sources is variable as depicted in Table 1.

In rural areas, washing of utensils and clothing is often carried out in pond water, which is highly polluted (faecal coliforms > 1000 mpn 100 ml^{-1}). Cloths used for wiping floors or drying utensils are mostly dirty and provide a possible source of infection and cross-infection. Utensils are cleaned with potable water and detergents in the majority of cases among the urban middle class and higher income groups of the population. On the whole, the present level

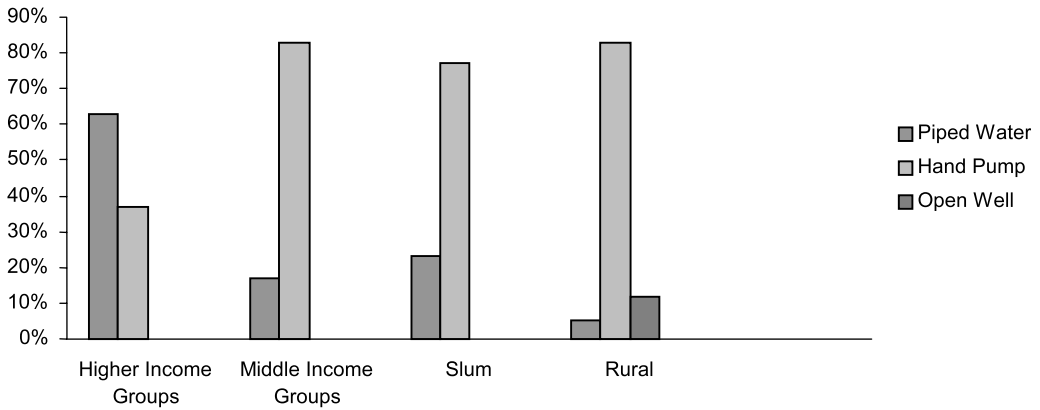


Fig. 4. Sources of drinking water according to different sectors of the population in Calcutta.

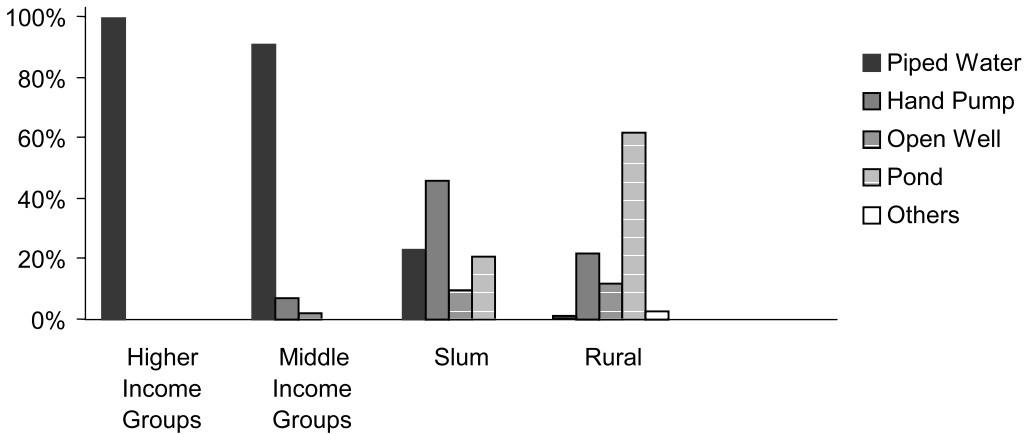


Fig. 5. Sources of water for washing according to different sectors of the population of Calcutta.

of personal and domestic hygiene in the rural areas is extremely poor and may be the cause of infection for all diseases spread through the faecal and oral route or by skin contact, and the situation is not much different in unserved areas of the city.

Collection, storage and handling of drinking water is one of the major risk areas in respect to domestic hygiene. In a sample survey, it was found that in 68% of rural households in India, water was taken out of the storage pot using a container without handles. This often leads to hands being dipped in the water and contaminating it. Observations show that there is repeated hand contact with drinking water during collection, storage and serving among all groups of people in both rural areas and the urban community.

People’s perception regarding linkage of community health with personal, household and environmental hygiene are also not scientifically conditioned. In a sample survey among the rural population it was found that 75% were unaware of the link between exposed excreta and

Table 1. Quality of water sources tested in Calcutta

<i>Water source</i>	<i>Proportion of samples faecally contaminated</i>
Municipal/community piped water supply (72 samples)	> 20%
Hand pump tube wells (81 samples)	> 20%
Open wells (20 samples)	85%
Village ponds (20 samples)	100%
Household water reservoirs, household taps, in-house water containers, etc. (80 samples)	> 60%

Source: IFH study, Calcutta, 2000.

Table 2. Means of disposal of children's stools (% of families)

	<i>High-income group</i>	<i>Middle-income group</i>	<i>Slum inhabitants</i>	<i>Rural inhabitants</i>
Within the yard	–	–	–	20
Outside the yard or on the roadside	15	3.30	30	70
In drains or on garbage dumps	–	6.70	70	8
In latrines	85	90	–	–
Buried in the ground	–	–	–	2

Source: IFH Study, Calcutta, 2000.

its deleterious affect to health. This is also borne out by the ways people dispose of children's stools (Table 2). A graded relationship was found among most people attempting to practise a rudimentary amount of personal hygiene and a lesser amount of household hygiene, but almost no effort was directed towards environmental hygiene, for which nobody wishes to take responsibility. Most people are aware of a link between hygiene practice and health, but their lack of conviction has resulted from years of tolerance to unhygienic surroundings.

Low priority for community water supply and sanitation sector

In planning for national development in India, programmes for improving water supply and sanitation have received low priority. In the first five 5-year plans allocation for the water supply and sanitation sector was less than 1.5%. In the sixth 5-year plan (1980–1985), during the international decade for water supply and sanitation, the allocation was increased to more than 4% (Table 3). Even now, the priority for this sector is low, particularly when one considers the impact of unsafe water and lack of sanitation and hygiene on community health and economic productivity.

In a study by the World Bank, the health impact due to contamination of water sources and the lack of sanitation and hygiene in terms of disease burden and premature deaths brought about by diarrhoea and other water, sanitation and hygiene-related infections, was reported to be between US\$3 and 8 billion per year. This is equivalent to 1.5 to 3% of the gross domestic

Table 3. Total plan outlay for the water supply and sanitation sector in urban areas of India since the first 5-year plan

Period of 5-year plan	Total republic plan outlays (tens of millions of INR)		Total plan outlay for the water supply and sanitation sector (tens of millions of INR)		Plan outlays under urban water supply and sanitation sector (tens of millions of INR)	
	2	3	4 = (column 3 × 100)/(column 2)	5	6 = (column 5 × 100)/(column 2)	
1st Plan (1951–56)	3,360	49	1.46	43	1.28	
2nd Plan (1956–61)	6,750	72	1.07	44	0.65	
3rd Plan (1961–66)	8,573	105.70	1.23	89.37	1.04	
4th Plan (1969–74)	15,902	437	2.75	282	1.77	
5th Plan (1974–79)	39,303.49	1,030.68	2.62	549.44	1.40	
6th Plan (1980–85)	97,500.00	4,047	4.15	1,766.68	1.82	
7th Plan (1985–90)	180,000	6,522.47	3.62	2,965.85	1.65	
8th Plan (1992–97)	434,100.00	16,711.00	3.85	5,881.00	1.38	

Note: Sanitation receives less than 2% of the total outlay for the Water Supply and Sanitation Sector Plan.
INR, Indian Rupees.

product of the country. When considering that the economic and developmental planners in the country are struggling to achieve an economic growth rate of 5–6%, the futility of their economic logic becomes apparent. Clearly, investments in hygiene promotion along with community water and environmental sanitation would be cost-effective and beneficial in the long term.

Conclusion

In order to achieve the primary objective of improving the health status of the community there is a need to improve attitudes, both with respect to hygiene in home and general health education, and implement these in conjunction with community water supply and environmental sanitation programmes. Most waterborne diseases spread through exposure of food and drinking water to human faeces. Hence, the rate of infection may be reduced by improving practice for disposal of human waste, as well as improving hygiene in the home and water quality and food hygiene. After all, a supply of safe water would be of little benefit if it became contaminated because of unhygienic practices in the home. Correct storage and handling of food and drinking water should be an important component of any programme for promoting domestic hygiene. On the other hand, improvement in the hygiene behaviour of a community cannot be sustained without a concurrent improvement in the quality of environmental sanitation and the supply of safe drinking water.

References

- Impact of Ganga Action Plan on Community Health. Study undertaken by AIIH and PH, Calcutta (1996–1999).
- Reports of the Planning Commission, Government of India (1998).
- Report of the National Institute of Communicable Diseases (2001).
- Report on the Pilot Survey. Conducted by Professor K. J. Nath, West Bengal, India, and sponsored by IFH (1999–2000).