

# Improvement in the Quality of Life and Human Health Through Low Cost Sanitation

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## Introduction

THE MOST important issue of the world today is to save environment, the destruction of which has threatened the survival of this planet. The survival and well being of a nation depend on sustainable development. It is a process of social and economic betterment that satisfies the needs and values of all interest groups without fore-closing future needs. To this end, it has to be ensured that the demand on the environment from which we derive our sustenance, does not exceed its carrying capacity for the present as well as future generations.

Environment came on the World's agenda after it was discovered that the growth and a very reckless one at that, has taken place at the cost of nature whose capacity to meet man's needs is limited. Since growth is resource-based, the higher the growth, in terms of human consumption, the thinner the supportline to sustain it. Population, mostly in the Third World countries, doubled during the last thirty years and the frightful technologies to exploit nature's resources diminished the possibility of human civilisation lasting forever.

Population is an important resource for development, yet it is a major source of en-

vironmental and health degradation affecting the quality of life, when it exceeds the threshold limits of the support systems. Unless the relationship between the multiplying population and life support systems can be stabilised, development programmes, however innovative, are not likely to yield desired results. It is possible to expand the carrying capacity through technological advances and spatial distribution. But neither of these can support unlimited population growth. Although technological progress will add to the capabilities for sustaining a large population, the need for a vigorous drive for population control can hardly be over emphasised in view of the linkage between poverty, population growth, environment and health.

Sanitation and environment are the two sides of the same problem; one cannot be solved without solving the other. Sanitation has many linkages, most important among them being water supply, personal cleanliness and safe and hygienic systems of human waste disposal. Sanitation ensures health and better environment, the lack of which creates poverty which greatly affects the quality of life. Putting it simply, sanitation is not only keeping clean but protecting those sources of environment which support sustainable development. And, to that extent, reducing dependence on the global commons, which are already under pressure.

The fast deterioration of environmental

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and ecological balance specially in developing countries has become a matter of deep concern. Population explosion, urbanisation, industrialisation, felling of trees, erosion of soil and an ever-increasing number of vehicles and factories are the main causes of this imbalance. But over and above all these, another major cause of imbalance which is particular to India as well as many other developing countries is the centuries old sub-human and unhealthy traditional practice of open defecation and the use of bucket or dry privies cleansed manually.

**Environmental and health hazards of bucket and open defecation :** The bucket latrines are a potential hazard to health, hygiene and environment. It is a common sight in India to see human excreta flowing in open drains due to defecation by children and adults. The latrine seat, squatting hole and collection chamber expose excreta to flies and encourage fly breeding in the locality. The excreta from the bucket is often spilled in the vicinity all along the road during its transport to the disposal site. The bucket is sometimes left in the open without cleaning, and exposing it to the flies. The chamber in the bucket is cleaned by pouring water from the squatting hole and raw night soil flows in the drains in front of the houses exposing the entire locality to health hazards and foul environment.

Since the excreta is not properly segregated, collected and disposed off, it might get access to water supply, contaminate food through flies and spread hook worms and other worms by polluting the soil. Consumption of polluted water and con-

taminated food and exposure of population to polluted soil transmit pathogenic micro-organisms from the sick persons to the healthy persons in the community.

The enormity of the problem can be gauged from the fact that out of the world's total population of 5.5 billion, three billion people either defecate in the open or use unsafe and unhygienic latrines. In India the situation is not different, 700 million people out of 900 million population either defecate in the open or use insanitary bucket/dry privies cleaned manually.

**The worst of it is human excreta :** Human excreta is the cause of many enteric diseases such as cholera, dysentery, typhoid, paratyphoid, infectious hepatitis, hookworm, diarrhoea *etc.* Over 50 infections<sup>1</sup> can be transferred from a diseased person to a healthy one by various direct or indirect routes from excreta. Therefore, safe disposal of human excreta should be the primary objective of improved sanitation to build a healthier nation and provide a cleaner environment.

The Bulletin of Regional Health Information (1986-87) of WHO states that the highest number of deaths from all causes in India were from diarrhoea. Majority of illness in the country is due to water borne and excreta related diseases affecting the health and thus the productivity of the nation.

The impact of improved sanitation on health and quality of life has been particularly significant in reducing morbidity and mortality from gastro-enteric diseases and helminthic infection. Studies apart from various parts of the world were also conducted by Dr. Feachem of London School of Tropical Medicine. The study<sup>2</sup> indicated relative importance of alternative preventive strategies concerning water supply, sanitation and health education. It gave a rough guide to the overall relative importance of the preventive measures considered; excreta dis-

1. *Manual on the Design, Construction and Maintenance of Low Cost Pour Flush-Waterseal Latrines in India: TAG Technical Note No. 10 - United Nations Development Programme, Interregional Project INT/81/047; Executing Agency : The World Bank.*

2. *Dr. Feachem of London School of Tropical Medicine's Report on Water and Sanitation - Related Infections and Their Control.*

posals 25, excreta treatment 15, personal and domestic cleanliness 18, water quality 11, water availability 18, drainage and sullage disposal 6 and food hygiene 17. It can therefore be concluded that health impact of supplying clean water alone is limited. However, carefully designed programmes which combine water quality with improvements in water availability, sanitation and hygiene education have the potential to be successful.

A similar study conducted by the All India Institute of Hygiene and Public Health, Calcutta (1944-1953) earlier in its Rural Health Centre at Singur revealed that the number of morbidity and mortality cases due to gastro enteric diseases and helminthic infection was lowest in the villages where both had pump tube wells for safe water and pour flush toilets were provided, the next in order were those villages where only such toilet facilities had been made available but no safe water and next were those with only hand pump tube wells and no toilet facilities and lastly those villages with neither of the two facilities.

A report by the Ministry of Health, Government of India 1964 clearly indicated that the installation of water supply without waste water disposal merely results in a shift from one dominant set of diseases to another. It would be counter productive from the point of view of the community health to go for substantial increase in community water supply level without simultaneously improving the environmental sanitation facilities particularly human excreta disposal. If full benefits are to be derived, sanitation must be

implemented in conjunction with water supply.

History reveals that household privies were not suited to the culture and tradition of this country in the past, and therefore were not an essential feature of a house. Defecation direct on to the soil was a matter of habit and convenience. Intensity of the problem was not so acute as long as India was largely rural with only a few towns scattered and their population reasonably within bounds. With rapid urbanisation and population explosion, the problem was taken a catastrophic dimension.

**Sanitation status :** From the interpolation of the data of the UNDP/World Bank survey<sup>3</sup> of 1979-82, it has been assessed that in urban areas only 9% of the households are directly connected to sewerage, 20% have on-site septic tank or leach pit system, 25% have bucket privies and nearly 46% of households have no toilet facilities; the people from such households defecate either in the open or use public facilities if available, and are in usable condition. In the rural areas less than 3% of the village population might be having latrine facilities at the end of the Seventh Five Year Plan.

The Task Force<sup>4</sup> constituted by the Planning Commission, Govt. of India has assessed that the number of bucket/dry privies in India is about 76.4 lakhs of which 54 lakhs exist in urban areas. With the present, rate of conversion of bucket/dry privies into sanitary toilets, a period of over 50 years will be needed to eliminate service privies. The programme needs to be stepped up considerably to achieve the target fixed by Govt. of India for eradication of scavenging from the country.

The first step for the betterment of sanitation, environment and health of the nation is to convert nearly 7.6 million bucket privies into water flush toilets and to provide individual or community latrines to those

3. House-to-house survey carried out by the UNDP/World Bank Project during 1979-82 in 211 small and medium towns in 21 states and union territories in India covering 15 lakhs households for the preparation of feasibility reports on low cost sanitation.

4. *Report of the Task Force for Tackling the Problems of Scavengers and Suggesting Measures to Abolish Scavenging with Particular Emphasis on Their Rehabilitation* : Government of India, Planning Commission, 1990-91.

households which do not have any latrine in their houses.

In India considerable progress has been made in the field of safe water supply but sanitation sector has remained neglected. The people are not aware of the health and environmental benefits of sanitation and it is still not a felt need for most of them. This is evident from the fact that even after several projects undertaken during the International Drinking Water Supply and Sanitation Decade (1981-1991) in India, the targets achieved<sup>5</sup> in water supply by the end of Seventh Plan were 84 percent of population coverage in urban sector and 75% in rural sector whereas in sanitation these figures were only 46% for urban and less than 3% for rural.

What a painful paradox persists. On one hand a gigantic leap in the field of science and technology is ready to take us into the 21st century, while on the other the centuries old practice of manually cleaning and carrying night-soil to disposal site by scavengers and open air defecation remains a blot on our civilisation. The foul smell, enteric diseases, pollution of water and environment and diminished work-capacity are sources of poverty. An unhealthy, sick and unclean nation can never grow.

**The poor scavengers :** Apart from diseases and degradation of ecology, pollution of water sources and stink in inhabited areas, there is a social stigma attached to the profession of scavenging. Nearly four lakh people<sup>6</sup> are engaged in the demeaning task of manual handling of human excreta in India, which is the greatest unreported tragedy of our times.

Environmental and sanitation improvement of both rural and urban settlements with

5. See , *CPHEEO*, Ministry of Urban Development, Government of India.

6. *Report of the Task Force for Tackling the Problems of Scavengers* : Government of India, Planning Commission, 1990-91.

particular attention to economically weaker sections is an essential prerequisite for sustainable development and to improve the quality of life and social justice. Development action must be addressed to the roots of the problem, and a wide range of strategies must be developed to deal with the variety and complexity of the issues involved. Greater emphasis must be directed to improve the quality of life by providing the basic needs of water supply, sanitation and housing, thereby increasing the productivity of the nation.

**Legal provisions :** People often say that legal provisions will solve the problem. Survey conducted in many towns indicated that even with the prevailing and binding laws, in most of the towns having sewerage even 50% of the houses are not connected to sewers. The Government of Bihar framed bye-laws over twenty years ago to ban the construction of dry and bucket privies and requiring the existing conservancy type of latrines to be closed and replaced by approved type of water-flush toilets connected to septic tanks or leaching pits. The bye-laws in Gujarat require such privies to be converted within three months of the notice served, yet existence of dry privies is still common in majority of the towns in these states.

The Government of India have since enacted legislation banning manual handling of human waste and discontinuation of bucket/dry privies with effect from the date of notification to be issued by the states.

Mere legal provisions are not enough. The municipal administration has many laws, rules and bye-laws to enforce any change, it desires, in any sanitation programme. The local authorities have ample powers under municipal Acts to compel the house owners to take sewer connections where under-ground sewerage is provided. But it has not been possible to get a large number of water-borne latrines connected to sewers in areas where such systems exist.

Prosecution involves long delays and nominal fines are no deterrent. Therefore, it is for the municipalities to modify these bye-laws to suit their requirements to enable their executives, health officers and municipal engineers to enforce them. This calls for both administrative and political will.

The failure in enforcement is partly due to the absence of a positive approach to solve the problem. One can be prosecuted for committing nuisance, but it is equally important to tell the individual where to go for necessary facilities and to have a programme of public amenities to back up. Enforcement programme must be backed by a systematic campaign of civic education by local bodies. While coercive powers are necessary to ensure provision of sanitary facilities to all to improve health and quality of life; yet socio-cultural programmes of this nature require support by vigorous positive action to provide technical and financial support and organisational infrastructure. Education and motivation are other important ingredients for the success of the programme.

***Sulabh shauchalaya is the answer :*** No doubt conventional sewerage is an ideal solution. It satisfies most of the public health criteria and also provides convenience. But it requires copious supply of water for its proper functioning. The capital cost of its construction is very high, much beyond the economic capability in the present stage of development. Besides this, operation and maintenance cost is also beyond the capacity of the poor countries. Although sewerage was introduced in India in 1870 and the entire five year plan allocations for sanitation have been spent on sewerage, yet there are hardly 232 towns and cities (out of 4,689) having sewerage. None of them, however, covers the entire municipal city area, leave alone the adjoining suburbs included in the municipal limits. In most towns, even on the streets where sewers have been laid, all houses have

not been connected in spite of municipal laws making such connections compulsory. Thus insanitation continues.

Septic tanks, an alternative on-site sanitation system, cost almost two and a half to three times more than that of low-cost pourflush system popularly known as *sulabh shauchalaya*. It has many drawbacks in comparison to *sulabh shauchalaya*. Safe disposal of its effluent poses a problem. Septic tank has to be cleaned after every one or two years. The wet sludge taken out contains fresh night soil and has obnoxious smell. It is health hazardous, if not handled properly. The sludge has to be discharged at a safe place. Emptying the septic tank is a burden on the municipality or the householder. The traditional quantity of 14 litres of water is needed for flushing.

For cleaning the septic tanks and disposal of sludge, scavengers are needed. The Government of India has enacted an Act to ban scavenging after 1995. In such a situation, de-sludging of septic tanks will pose a serious problem. Though the design of septic tank was developed nearly 400 years ago and introduced in India about 150 years back, yet nearly 20% of the houses even in urban areas have septic tank latrines. Both sewerage and septic tanks are, therefore, not suitable in the present economic condition of the country to solve the problem of insanitation.

The concept that sewerage and septic tank are the only suitable technologies for safe disposal of human waste has led to the continuance of large number of bucket or dry privies and practice of open air defecation all over the country.

Considering the vastness of the country with its divergent culture, social customs and attitudes together with variations in climate, geological and hydrogeological conditions and low income of people, design of latrine which could suit the needs of rural and urban population raises several complex problems.

The author pondered over this situation, studied the various designs developed in the country in the nineteen sixties and introduced for the first time *sulabh shauchalaya* (pourflush waterseal latrine with twin pits for on-site disposal of human excreta) with necessary modifications in the congested cities and towns in India. These *shauchalayas* can be afforded even by the poor and could be constructed and maintained easily to replace the bucket latrines and stop open air defecation. *Sulabh shauchalaya* is hygienically and technically appropriate, does not need scavengers to clean and has a high potential for upgradation - can be connected to sewer easily when introduced in the area. Digested sludge in the leach pits is a good manure and soil conditioner.

**Pollution problem :** Although low-cost pour-flush latrines are being advocated but the dangers of water pollution from the leach pits are often being raised by several authorities desirous of adopting this system. The apprehension of ground water pollution is a deterrent factor in adoption of *Sulabh shauchalaya system*. The pollution problem has been studied in great detail both in India and abroad, although further studies are underway to evolve a more economical design to prevent pollution under different hydrogeological conditions. However, it has been conclusively proved that with due precautions, *sulabh shauchalayas* can be safely constructed in almost all the hydrogeological conditions prevailing in India.

In 1970, the author founded a non-profit social voluntary organisation, *Sulabh International* (earlier known as *sulabh shauchalaya sansthan*) to solve the challenging problem of insanitation.

Hundreds of thousands *sulabh shauchalayas* have since been constructed all over India in rural and urban areas. *Sulabh* alone has constructed more than 6.5 lakh *shauchalayas* in 614 towns in 18 states. The

people have accepted them and are fully satisfied with their performance. The Government of India, state governments, various national and international agencies like UNICEF, World Bank, UNDP, WHO, United Nations Centre for Human Settlement (UNCHS) etc. have accepted the design and are advocating and providing financial assistance for the construction of *sulabh shauchalayas* in India and other developing countries in South-East Asia, Latin America, Africa etc. The national and international press, All India Radio, Doordarshan, B.B.C. have also acknowledged *sulabh shauchalaya* as the most appropriate technological option for the disposal of human excreta in non-sewered areas and appreciated the methodology adopted by *Sulabh International* for marketing and delivery.

**Pay and use system :** The year 1974 may be recalled as a landmark in the history of sanitation, when *Sulabh International* introduced the system of operating and maintaining "pay and use" community toilets with bathing, washing and urinal facilities popularly known as *sulabh shauchalaya* complexes with round the clock attendant's service ensuring people's participation without any burden on public exchequer or the local authorities.

The *sulabh* complexes with pay-and-use system have now found acceptance throughout the country and earned international appreciation also. The scheme has been welcomed and accepted by the people and the governments. It has resulted in the improvement of health and quality of life of the urban poor. Nearly 2100 complexes have so far been constructed and are being operated and maintained by *sulabh* in 458 towns in almost all states in India. *Sulabh* is also operating and maintaining a *Sulabh shauchalaya* complex at Thimphu in Bhutan. *Sulabh shauchalayas* and *sulabh* complexes are used by about 6 million of economically weaker and middle class sections of the

population every day.

**Environment influences mind :** Environment influences the thoughts and habits of human beings. Their social and cultural development respond with better community health and personal hygiene amidst environmental betterment. Sulabh International's goal is to remove such environmental deterrents by replacing the obnoxious smelling bucket privies in individual homes with low cost sanitation and provide community toilets with bathing, washing and urinal facilities wherever needed to prevent indiscriminate open air defecation and improve health, hygiene and quality of life of the economically weaker sections of the population.

While the provision of *sulabh shauchalayas* in individual houses has made the residents to live in a healthier environment, the toilet complexes, in addition to the improvement of environment have restored human dignity by providing facilities for defecation and bathing in privacy to those who were deprived of these. These measures have resulted in better health and environment, hence higher productivity.

**Awareness and education :** Most of the people, specially economically weaker sections and low income groups are not aware of the benefits of improved sanitation. Their priorities are different. Latrine is not a felt need for them. They are also not aware of the technological options which they can afford and government's efforts and programmes. General awareness, sanitation and health education and community's involvement in the social infrastructural programmes like water supply and sanitation will develop self-reliance and confidence in the community. However, the awareness and education programmes need to take into consideration the socio-cultural customs, attitudes and beliefs and are required to be tuned to the requirements of each situation, level of knowledge and understanding not only of

people in a town or a village but also of different target groups. Dissemination of information on the programme and the technology as well as removal of people's doubts and concerns is essential. These activities should form an integral part of the project plan so that the proposed sanitation technology and activities are appropriate to men, women and children in the project area and result in desired sustainable benefits to the community. For the success of social programmes, community participation especially involvement of women is essential.

Sulabh International has laid special emphasis on health education, creating awareness in the community about sanitation, personal hygiene and environment and community participation with stress on women's involvement. For this purpose, a large number of health educators and social scientists have been working with the Mass Communication Wing of the Organisation. They make house to house contacts in the project area, visit schools, slum areas, places of mass gatherings *etc.* and convey the message to the people through audio-visuals, songs, meetings, picture display, pamphlets, speeches *etc.*

**Restoration of human rights and human dignity to scavengers :** The scavengers who clean the bucket or dry privies and carry the human excreta for disposal are most backward socially and economically and looked down even by those who derive the benefit of their services. The stigma attached to this profession passes down from generation to generation and they continue to carry out this work unwillingly. Thus the conservancy system is handled by the unhappy, grudging and sullen labour. Most of the scavengers lose their sensitivity to the dignity and human and social values of life having been obliged to take up scavenging profession since their childhood. This appears to have affected their mental attitude

at work and at home. They lead a segregated life from the rest of the community and live in colonies which are most unhygienic and insanitary which exposes them to health hazards and foul environment. With the eradication of scavenging and training of liberated scavengers and their wards in other dignified professions, their life style and mental attitude will change, human rights and dignity will be restored and the environment in which they live at present will also change.

With this in view, Sulabh International has established training institutes in Delhi and Maharashtra to train the liberated scavengers and their dependents exclusively, in different vocations. After training they are able to take up gainful employment in professions other than scavenging to earn their livelihood. *Sulabh* is the only organisation which carry out the twin operations - provision of sanitary latrines and training and rehabilitation of scavengers. It has also established an English medium school at Delhi oriented towards fulfilment of the aspirations of the most deprived socio-economic group - the scavengers. The school provides the much needed prop to the children of scavengers for overcoming the impediments of their upward mobility. The intention is to enable them to catch up with the rest of the society. To avoid perpetuation of segregation that characterises other schools for the scheduled castes, the *sulabh* school is open to the children of upper caste families too.

The schooling is vocation based so that employment may not become a problem later. The children of scavengers get free education; they are provided free text books, uniform and bus-service.

*Sulabh* movement is an action programme which attempts to integrate different strands of philosophies of social movements, takes sufficient care of the structural support to the philosophy which is born out of concern for scavengers and other deprived sections of the society. The *sulabh* movement carries out campaigns, holds seminars and *melas* and take up other social activities to influence the public opinion for social change. The social upgradation of scavengers is essential to get them assimilated in the mainstream of social life. With this in view a programme has been launched to persuade people to socially adopt at least one scavenger family to restore human rights and dignity to them. The programme has received a tremendous response. A large number of people including ministers, members of the planning commission, journalists, doctors, judges, members of Parliament and other distinguished persons have adopted scavenger families.

An unclean and unhealthy society cannot be productive. Therefore it is necessary to launch programmes for improving the sanitation and environment right away. Tomorrow may be too late.

