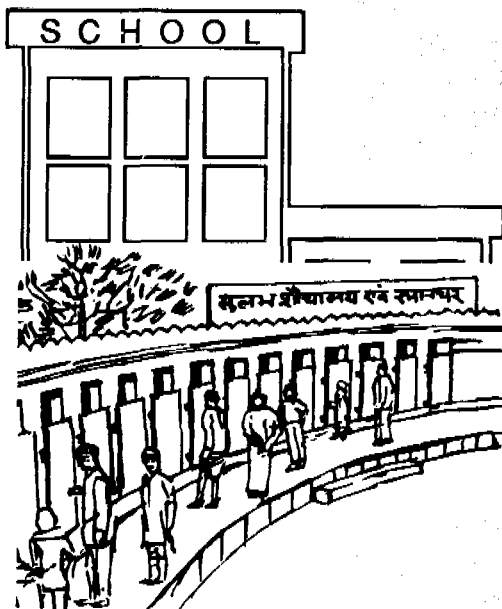


**Teachers' Training in
Environmental Sanitation and Community Health
under ODA-British Council
Andhra Pradesh Primary Education Project**

Unit 3



SCHOOL TOILET COMPLEXES



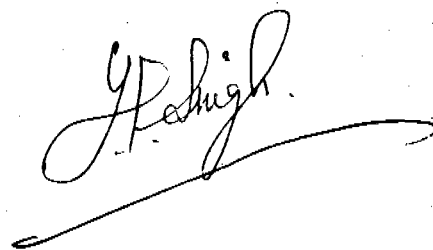
**Sulabh International Institute of Rural Development,
Research and Training, New Delhi**

PREFACE

Studies world-over have revealed that the impact of safe disposal of human excreta is extremely vital in terms of reducing the morbidity and mortality due to gastro-enteric diseases and helminthic infections. It is a shocking revelation that the unsafe human excreta disposal is responsible for transferring over 50 infections from a sick person to a healthy one-directly or indirectly, causing enteric diseases like cholera, dysentery, typhoid and infectious hepatitis.

Safe excreta-disposal through the sewerage has yet to go a long way, though it may be the ideal solution. Economy and other factors have limited the spread of sewerage only to 232 towns and cities out of the total of 4689. Septic tank, the second option, introduced in India 150 years back is a redundant technology which is neither appropriate pragmatically nor viable economically. Due to its high cost and several other limitations, only 20% of the houses even in urban areas have septic tank toilets. The basic reason of the septic-tank failure is its non-accessibility to the common man of India.

The last but the best technological option is that of the Sulabh Shauchalaya which is basically a pour-flush waterseal latrine (with twin leach-pits), designed by the world-famous low-cost sanitation expert and action-sociologist Padma Bhushan Dr. Bindeshwar Pathak - Founder, Sulabh Movement. This design saves water; saves labour, and is economical as well. For example, it uses only 1.5 to 2 litres of water to flush the excreta and not 13-14 litres like in the conventional system. Hence, the need for imparting the technical know-how of this low-cost-sanitation technology to achieve the goal of "Sanitation for all by 2000".



(Y.P. SINGH)
Director General;
S.I.R.D.

LIBRARY IRC
PO Box 93190, 2509 AD THE HAGUE
Tel.: +31 70 30 689 80
Fax: +31 70 35 899 64
BARCODE: 14803
LO:

203.2 955C

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Chapter 1

PROMOTING PERSONAL HYGIENE HABITS IN STUDENTS

Personal hygiene or hygiene observed at the individual level is the backbone of Community Health, since all such healthy individuals build a healthy community.

In the same view, our students have the two-fold on us of being an integral part of the school-community as well as a vital component of the family-unit. So, a student who adheres to the personal-hygiene norms is a great asset not only to his own family but the entire community as the school is also a subset of the larger community.

To cite a small example, if a student is having lice in his or her hair then the students of the entire class will end up scratching their heads, sooner or later. Same is the case with any infection stemming from not keeping the body clean and healthy. Hence, it becomes the duty of the teachers to make their pupils aware of the importance of personal hygiene and its impact on others.

Dwelling further into the subject, the students must be imparted the basic awareness regarding cleanliness and protection against injury and infection to the various parts of the body. Special emphasis should be given on the individual care of the eyes, teeth, ears, nose and throat, apart from the general cleanliness of the skin, nails and hair.

The students should also be made aware of the appropriate diet-intake to have disease a free body. In fact, the teachers must guide the students in observing a daily routine with the accent on health and hygiene.

Personal hygiene mainly relates to the care of (a) ear, (b) eye, (c) nose and throat (d) teeth, (e) skin, nails and hair alongwith (f) life-routine. A brief account of necessary precautionary steps and recommended measures are as follows:

EYE-CARE

Our eyes give us the vision to see the whole wide world around us.

Causes of damage

- a. Deficiency of vitamin A; it causes night-blindness and white spot in sclera.
- b. Trauma to eyes is caused by:
 1. dust and smoke
 2. pieces of stone or glass flying into the eye, or children throwing dust or stones at each other or playing with bows and arrows or other sharp objects.
 3. bright light, ultraviolet rays or sparking light from welding.
- c. Infection
Eye-infection spreads by:
 - using towel and handkerchief of infected person..
 - using same stick for applying kajal or surma.
 - letting flies sit on the face and eyelids.

d. Behavioural Odds

There are various behavioural odds which damage the eyes, like:

1. Reading in poor light
2. Reading in bad posture
3. Reading books with very small print.

Precautions

- Ensure regular washing of face and eyes
- Use of handkerchief or stick of Kajal used by others is prohibited

Ear Care

Our ears give us the hearing capacity.

Cause of damage

- a. Poking hairpins or match stick in ears to remove wax may cause injury to ear membranes and infection in ears.
- b. Insects or foreign body stuck up in ears cause damage and infection.
- c. Bathing in dirty water or swimming in dirty ponds leads to infection of ears.
- d. Sudden or loud voice, sound explosion or constant loud noise may result in the impairment of hearing.

Precautions

- Do not swim in dirty ponds
- Do not poke a stick or a hair-pin in your ears
- Take precautions against insects entering your ear.
- Avoid places having loud noise of fire crackers. Do not shout close to anybody's ear
- Get your wax removed by an ENT specialist.
- Get throat-infection immediately treated.
- Children should be instructed not to throw dust or stone chips on the face and not to use arrows or other sharp objects during play.
- Use proper light and posture during reading and writing.
- Prevent the sitting of flies on face and eyes.
- Take plenty of green leafy vegetables and fruits containing vitamin A, like papaya, carrot, cod-liver oil, etc.
- Report to doctor immediately in case of injury or infection in the eye.
- Use coloured glasses (tinted) in welding work and bright light.

Nose and Throat

Nose is the organ of smell and filters the air inspired in lungs. The throat contains a pair of glands called tonsils.

By breathing, sneezing and coughing, germs confined in an infected person will infect others.

Air-borne diseases are cold, bronchitis, tuberculosis, measles, diphtheria, whooping cough, small pox, pneumonia, etc.

Care

- Do not blow your nose or cough without putting a handkerchief on your nose and mouth
- Do not spit anywhere. It spreads diseases.
- Do not pick your nose
- Get throat infection immediately treated.
- Putting oil in the nose will impair ciliary function.

Teeth

Two rows of teeth are used to cut food in small pills and also for mastication. If they are not taken care of properly, it leads to infections with formation of cavity and loss of teeth.

Care

- Regular tooth-wash with massage of gums.
- Brush and clean teeth before going to bed to remove the remaining food particles between the teeth which may decay and cause damage to the enamel.
- Do not use teeth for opening bottle caps or cracking nuts or hard substances.
- Take plenty of calcium and vitamin C for keeping teeth healthy.

Skin, Nail and Hair

Proper cleaning of skin and hair by regular washing and periodical cutting of nails will prevent development of diseases. Dirty nails are a potent source of infection.

Dirty clothes may contain bugs, lice, flies or, germs and can easily infect the skin.

Walking barefoot; specially in villages, leads to various worm-infections due to open air defecation in the fields by village. Shoes prevent injury from thorns, snake or scorpion bite and also prevent worm infections like hookworm, round worm etc.

Care

- Regular bathing and proper cleaning of skins, hair
- Regular trimming of nails
- Use shoe for walking in fields
- Use clean and properly washed clothes
- Use of shampoo and antiseptic lotions for hair infection, dandruff etc.
- Keeping shoes outside home as it will check germs entering your house through footwear.
- Properly clean and wash hand before taking food.

General Care of daily routine

(For work, rest, exercise and sleep)

- House, especially, bedroom should be perfectly clean. Rooms should be well ventilated and fly-proof.
- Ensure sufficient rest and sleep.
- Exercise should be adjusted as per physical requirement and tolerance.
- Sleeping in crowded room with unhealthy surroundings should be avoided.



Chapter 2

SULABH SHAUCHALAYA : USE AND MAINTENANCE

Sewerage is the ideal solution for the disposal of human and other wastes, but its cost is prohibitive. Septic tank with proper effluent disposal is another alternative, but this is also beyond the reach of most of the the people; moreover it has other problems like periodic cleaning and disposal of sludge. Effluent disposal is a potential source of mosquito-breeding and hazardous for health if not properly disposed off. Pourflush latrine with twin pits popularly known as Sulabh Shauchalaya (developed by Padma Bhushan Dr. Bindeshwar Pathak, an action sociologist, social reformer and internationally known expert on low cost sanitation) is an answer to the problem of safe disposal of human excreta. Dr. Pathak founded a voluntary social organisation - Sulabh Shauchalaya Sansthan - in 1970 (later named as Sulabh International) to assist the governments, local authorities and people, by carrying out work on turn-key basis from the beginning to end, including follow-up to the entire satisfaction of the beneficiaries.

Sulabh Shauchalaya

Sulabh Shauchalaya consists of a pan with a steep slope of 25 to 28 degree gradient and a trap with 20mm waterseal needing 1.5 to 2 litres of water for flushing the toilets.

The excreta is carried into leach pits through pipes or covered drains; one pit is to be used at a time. The liquid infiltrates and gases disperse into the soil through the holes in the pit lining. When one pit is full, excreta is diverted to the second pit. In about 18 months' rest period, the contents of the filled-up pit get digested and become safe for handling. The pit can then be conveniently emptied and is ready to be put back into use after the second pit is full. Thus, the two pits can be used alternatively and continuously. The sludge of the pit is a good manure for use in horticulture/agriculture. The cost of emptying the pit can be met partially from the cost of manure made available.

Advantages

Main advantages of Sulabh Shauchalaya are:

- Hygienically and technically appropriate, and socio-culturally acceptable.
- Low cost and easy to construct with locally available materials.
- Design and specifications can be modified to suit beneficiary's needs and affordability.
- Eliminates mosquito, insect and fly-breeding.
- Can be constructed in different physical, geological and hydrogeological conditions.
- Free from health hazards and does not pollute surface or ground water, if proper precautions and safeguards are taken in construction.
- Can be located within the premises as it is free from foul smell and fly/mosquito nuisance.
- Can be constructed even on upper floors of houses.

- Pits are generally designed for a 3 year dislodging interval;but if desired, they can be designed for longer periods or the time-period can be reduced even to two years.
- Maintenance is easy and simple and costs very little.
- Needs only 1.5 to 2 litres of water for flushing, while conventional flush toilet needs 13 to 14 litres of water.
- Needs less space than a septic tank latrine.
- Does not need scavengers for cleaning pits or disposal of sludge. This can be done by the householder himself or by a labourer.
- Makes available rich fertilizer and soil conditioner.
- Can be easily connected to sewers, when introduced in the area.
- A low volume flushing cistern could be attached to avoid pour flushing.

No Need For Vent Pipe

In Sulabh Shauchalaya, vent pipe is not necessary as gases are dispersed into the soil.

Why Two Pits ?

Single leach pits are appropriate only if they can be dislodged mechanically by a vacuum tanker, since their contents are not pathogen-free. In a two-pit system, since one pit is used at a time, the filled-up pit can be cleaned manually even by the householder himself because of the long period of digestion which makes it free of foul smell and safe for handling.

In a single pit system, dislodging has to be done almost immediately after the pit has been filled to enable its refuse; this involves handling of fresh and undigested excreta which is health-hazardous.

If a deeper and larger single pit is provided, dislodging operation will be difficult and there would be more chances of pollution, especially where the ground-water table is high.

Fixing of Pan and Trap

Squatting pan of the design specified for pourflush and trap (with 20mm waterseal) should be used in Sulabh Shauchalaya. The pan can be of ceramic, fibre glass, PVC, mosaic or cement concrete. With the fibre glass pan, traps of HDPE are used. With ceramic and PVC pans, traps of the same material are used. For mosaic and cement concrete pans, traps are of cement-concrete.

To ensure a 20 mm waterseal, the trap should be fixed by keeping the top of inlet and top curvature of the trap horizontal and then fixing the pan over it, keeping its rim horizontal and flush with the floor.

Shape of Pits

As far as possible, separate circular pits should be constructed as these are structurally more stable and the sludge is dry and safe to handle. Where separate circular pits of standard sizes can not be constructed due to space constraint, pits of smaller diameter (not less than 750mm) be provided, but depth should be increased suitably to provide required storage-volume and

infiltration surface area. If it is not possible to construct small diameter pits, combined oval, square or rectangular pits divided into two equal compartments by a partition wall be provided. The partition wall should be taken 300 mm below the bottom of pit and be plastered on both sides with cement mortar in the ratio of 1:6. The partition wall and pit lining in 300mm width adjoining the partition wall should not have holes. However, the possibility of water from one pit finding its way to the other pits is very much there. Therefore, the dislodging of the filled-up pit has to be done with care to avoid health hazards.

Spacing Between Two Pits

The minimum space between the two pits should be one metre or equal to the depth of pits below the level of the incoming pipe or drain, whichever is more. Where it is not possible to maintain this space, provide an impervious barrier like cut-off screen or puddled wall between the two pits.

Lining of Pits

The pits should be lined to avoid collapsing. Lining could be in brick work, stones, latrine bricks, burnt clay or cement concrete rings. Lining could be done with treated bamboos, wooden logs, tar drums also but the life of such lining is limited.

Holes which are 50mm wide, should be provided in alternate brick courses by laying bricks 50mm apart. Above the invert of incoming pipes or drains, no holes should be provided. Where the soil is sandy or sand envelope is provided or there are chances of damage by field rats, the width of holes should be reduced to 12-15mm.

Interconnection Between Trap And Pits

The trap should be connected to the leach pit either through 'U' shape covered brick-drains or 75mm diameter AC or PVC non pressure pipes. In case pipes are used, a junction chamber (250mm x 250mm internal size) should be constructed at the place from where the pipe is bifurcated to connect the two pits. The pipes or drains should have a minimum gradient of 1:15.

Size of Pits

The sizes of pits where ground-water table is always below the bottom of the pit, and infiltration rate of soil is 30 l/m/day and for 3 years, sludge storage volume works out as follows:

No. of Users	Circular Pits		Combined Rectangular Pit divided by partition wall in two equal compartments. (Size of each compartment)		
	Diameter (mm)	Depth (mm)	Length (mm)	Breadth (mm)	Depth (mm)
5	900	1000	850	850	900
10	1250	1000	1100	1100	1050
15	1400	1200	1400	1400	1200

The above depths are from the invert of incoming pipes or drains to the bottom of the pit. These depths are to be increased by 225mm to provide a free space above the invert of pipes/drains

Pits In High Subsoil, Water Logged And Flood Prone Areas

In water logged, flood prone and high subsoil water areas, the pits should be raised so that invert of pipe or drain is just above the likely water level. The rising of pits will necessitate raising of latrine floor also. Earth should be filled and well compacted all around the pit.

Prevention Of Pollution

To check pollution of drinking water sources, the pits in fine soils (effective size 0.2mm or less) should be located at a minimum distance of 3 metres from open wells and shallow hand pumps, provided ground water table throughout the year is 2 metre or more below the bottom of pit; if water table is higher, the distance should be increased to 10 metres. In coarser soils (effective size more than 0.2mm), the same safe distances can be maintained by providing 500mm thick sand envelope of 0.2mm thick sand all around the pit and sealing the pit bottom by some impervious material like puddled clay, polythene sheet, lean cement concrete or cement stabilised soil.

Operation And Maintenance

Operation and maintenance of Sulabh Shauchalaya is very easy and simple:

- **Before use, wet the pan by pouring little quantity of water in it.**
- **After defecation, pour 1.5 to 2 litres of water in the pan for flushing.**
- **Pour about half litre of water in the pan after urination.**
- **Wash hands after defecation with ash or soap.**
- **The pan should be cleaned once a day with a brush or a broom and with soap powder periodically.**
- **One of the pits is to be used at a time by plugging the mouth of one of the drains or pipes.**
- **Kitchen/bathroom waste-water or rain water should not be allowed to enter the pits.**
- **Other solid wastes like kitchen-waste, rags, cotton, sweepings, etc. should not be thrown in the pan; this will block the latrine.**
- **To remove choking in the trap, do rodding from the pan and rear side by means of a split bamboo stick.**
- **When the pit in use is full, the flow should be diverted to second pit and the filled-up pit should be dislodged after a 1.5 to 2 year rest period. The first pit can then be put to reuse, when the second pit fills up.**

Wide Acceptance

Hundreds of thousands Sulabh Shauchalayas have been constructed all over India in rural and urban areas, Sulabh alone has constructed nearly 6 lakh Shauchalayas in 585 towns in 18 states and one union territory. The people have accepted them and are fully satisfied with their performance.

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 construction of these Shauchalayas in India and other developing countries in South-East Asia, Latin America, Africa etc. The national and international press, All India Radio, Doordarshan, BBC have also acknowledged Sulabh Shauchalaya as the most appropriate technological low cost option for the disposal of human excreta and appreciated the methodology adopted by Sulabh International for its marketing and delivery.

Assistance To People For Sulabh Shauchalaya

Government of India and State Governments are providing financial assistance to people to get Sulabh Shauchalaya constructed in their houses. The persons interested in having Shauchalaya should contact the concerned municipality, gram panchayat or the block development office to know whether the programme is going on in their areas, how much financial assistance would be available to them and how they can get the Sulabh Shauchalaya constructed in their houses. Sulabh International also assists the people in getting Shauchalayas constructed through the concerned zonal office.



Chapter 3

ROLE OF SCHOOLS IN HEALTH PROGRAMMES

The School Health Programme is an integrated approach to health. It is a branch of community health in which health education, health services, a healthy environmental sanitation and involvement of the community are realised.

It is comprehensive in the sense that it emphasises the curative, preventive and educative aspects of health. With School as the entry point, this approach gradually leads to increased levels of community involvement.

It is a phased programme in which simple messages to keep good health reach children through their teachers and from them to the society.

The primary motive of this programme is to improve the health of school children. But it works also towards the development of more effective parents, family and community members.

The school health programme can contribute to a high level of personal, physical, mental, emotional and social well-being. It can also free from the clutches of the modern health care system.

It also exploits the unfathomable curiosity of the child and the investigative and exploring tendency of the young minds to give creative expression to health messages in writing, public speaking, acting, painting, drawing, organising, etc.

Children

"Target the school children" is the modern day cry of community health enthusiasts.

School children here are the main actors. The programme primarily aims at them. And this too not merely as objects or as passive recipients of the programme and the health messages it conveys, but as subjects and agents.

Actually, the programme is one of making the school children **health agents and activists**.

The programme draws on insights from psychology and participatory management to creatively involve them as agents and initiators.

Children are more receptive than adults. They practice what they learn. The young minds offer themselves in this programme as a reliable and fertile ground to plant the seeds of a healthy society.

Teachers

Teachers are where the schools are and they are a rich local resource. They are available in large numbers, present even in the remotest areas. The vast majority of children have much closer contact with teachers than with health workers. They provide the manpower to reach out to 14 million children enrolled in our educational system which, according to a 1986 assessment, formed 42 percent of our Indian people. Teachers, thus are the best channel to activate and empower children for a dynamic health education and action for health.

They have the where-withal to promote students' health, skills and behaviour continuously and efficiently. A teacher can understand students' physical, social and emotional needs more than an outside health worker. A teacher can know the customary behaviour of the children as he can observe their eating, study, health and play habits much more than the outside health worker.

More of the teachers again are natives of the region and are aware of the beliefs and customs in the community that need to be changed. And they can change them too, more easily than others.

The changing role of teachers in the school health programme can be explained in the table below:

Old Role	New Role
1. Teaching facts and techniques	Transmitting a capacity to handle facts, to know where and how to find them and what to do with them.
2. Preparing children to pass examination	Preparing children for life-long learning.
3. Isolating children from environment	Stimulating the children to identify himself/herself for awakening in him/her a loving concern for environment to take care of it.
4. Teaching a curriculum irrelevant and divorced from life-needs and aspirations of the community	Implementation of a curriculum relevant and related to life, needs and aspirations of the community.
5. Being indifferent to the place of school in the community	Taking loving care to make the school an integral part of the community and a centre of love, learning, beauty and harmony.

Health Professionals

Health professionals, doctors, nurses and health workers, have a vital role as health educators in the school health programme. They can fulfill this role by helping to demystify medical care, and sharing information with teachers and children about the nature of main diseases, their prevention, etc. These social health delivery personnel have health expertise and access to the national health system. Their participation ensures coordination of school health programmes with other existing health programmes in the locality.

Family and Community

Parents have intimate knowledge of their children's health and nutrition. They have also realistic perspectives on sorts of behavioural changes that, given local conditions, can be expected. Their participation is valuable to ensure home-reinforcement of new behaviours their children learn at school.

Children take health education home to siblings and parents. Thus, the school-going section of community shares its gains with the community as a whole. Children not attending school due

to poverty or ignorance, can also be reached indirectly. Something specific can be done through School health programme. School dropouts too are a part of the community and not to be forgotten and a good school health programme thus becomes the entire community's health programme which (though based in school) spreads out to the entire community.

The school health education tends to be effective to the extent that the health messages the children learn in the school are reinforced in their own environments, and to the extent the children have access (in their homes) to the means to maintain health. But, for the vast majority of Indian children, access to these means is poor and their environment is negating. Hence the insistence that health efforts in schools must involve and be backed by parents and communities, which otherwise could end up posing barriers to health and thus nullifying the health education.

The School and its role in Community Health

School should be the model house and sign-post for the community.

It is an avenue of approach to the community. It reaches a large percent of individuals of the community face to face.

As the children are gathered in one place, the school provides an easy accessibility for delivering different components of health care.

The three dimensional role of school as regards health is that :-

- 1. The school becomes a centre for organising and providing health-care for the young.**
- 2. It educates them in healthy-living.**
- 3. It becomes a focal point for community-health.**

The integration of school health with community health efforts strengthens health messages, and expands their coverage and meaning. It ensures a healthier environment for children outside school homes.

In our villages, schools children are often more educated than their parents. Here school care and health education can become the means of introducing behavioural changes and basic health concepts to village homes. Children, teachers, parents and health personnel can enlarge health programmes. Thus, school health programme becomes a relationship between powerful agents of motivation of parental involvement. Finally, by acting through an established institutional base, the school health programme can generate effective community participation and well-being. This is facilitated by the fact that the community often sees the school as a great asset for the future well-being of its children.

Health Action Groups

The promotion of health action in schools, aimed by the school health programme needs to be actualized by encouraging formation of Health Action Groups in schools. These groups will become agents to make community health a movement.

This process of getting Health Action Groups in schools widen out their impact as a movement for community health, requires the participation of all relevant groups. This will help ensure sharing and coordination of resources and expertise.

An agenda for such impactful action groups would include:

- Contact with community leaders, officials and organizations to obtain their support and develop vital linkages; obtaining parental support and participation;
- Identifying and training volunteers among students;
- Obtaining curriculum and instructional strategies;
- Integration of health into school curriculum.
- Training and motivating teachers;
- Devising an on-going evaluation plan;
- Provision of health services;
- Use of indigenous medicines, etc.

The orientation and training programmes motivate the students and teachers and volunteers to initiate a number of activities in the school and community. Some of these initiatives can be spelled out - like awareness campaign, village cleansing, provision of dust bins and compost pits, organisation of exhibitions, assistance to the disabled, demonstrations, setting up of herbal gardens, preparation of health-related teaching aids, organising of health check-ups, health fund, health clubs, immunisation, etc.

Governmental Sectors

The School Health Programme, built upon a wide range of educational, medical, sociological, political or cultural perspectives must be backed by a political will.

The School health must become the priority of government departments of both education and health.

The "preventive" and "outreach" nature of school healthcare is yet to get the higher priority of these sectors. Mutual 'buck-passing' here is to be overcome by mutual co-operation and coordination between them.

Based on need-based programmes, the school and community (with the cooperation of its teachers, children, volunteers, health personnel and parents) can open up a new path for our sick society to recover its health.

The boys and girls involved in the programmes must be treated as a part of a national health movement. The school health programmes call upon the professionals to leave their offices and go down to the streets to talk to the children about building up a healthy society.

Abraham Lincoln said "***A child is a person who is going to carry on what you have started. He will assure control of your Cities, States and Nations. The fate of humanity is in his hands***".

Will the School Health architects consider every child no matter how poor, how dirty or how indisciplined, still potentially a health activist, if we do the right thing, the right way at the right time?

Teacher & Students

An ancient teacher asked his students how they could tell when night had ended and day was on its way.

"Could it be when you see an animal in the distance and can tell whether it is a sheep or a dog?", said one.

"No," answered the teacher.

"Could it be when you see an animal in the distance and can tell whether it is a fig tree or a peach tree?"

"No," answered the teacher.

"Well, then," the students demanded, "when is it?"

"It is when you look at the face of any man or woman and see that she or he is your brother or sister. Because if you cannot do that, no matter what time it is, it is still night."

- Jeevan

What School Health is not....

- **School health is not regular medical check-ups of students**
- **School health is not mid-day meals.**
- **School health is not physical education.**
- **School health is not giving vaccinations in the school campus.**
- **Schools health is not an intellectual exercise in health planning at the central and state levels, and wishful thinking and a seemingly unrealistic dream by those involved with rural schools.**

What is School Health ?

It is a part of the community health programmes through which comprehensive care of the health and well-being of children throughout the school years is taken care of. The school health service is an economical and powerful means of raising the health of the communities. It is a personal health service. It has grown from the narrow concept of medical examination of children to the more comprehensive care of health and well-being of school-going children. Today, school health programmes stress the role of the child as a "change-agent" for the community.

Process of School Health Programme

1. Gather Health Data in schools.
2. Define Programme Objectives.
3. Design the activities to meet these objectives.
4. Implement the activities one by one.
5. Operate the Programme.
6. Evaluation of the results by gathering the health data again.
7. Tabulate and analyse.
8. Redefine the objectives required.

Requirements for School Health Programme Teachers

According to a WHO/UNESCO Expert Committee, we must train teachers to develop in them:

- a standard of personal health practices which will help maintain the health of the individual and serve as an example to the pupils;
- understanding and developing skills in maintaining an optional emotional environment through desirable interpersonal relations;
- an appreciation of the value, importance and place of education in health, as a part of the total education programme;
- a willingness to play an appropriate part in the promotion of health in school and in the community;
- an adequate background of professional knowledge about child-growth, development, personal and community health, and programmes as well as procedures in school health;
- understanding and appreciation of working co-operatively with others in this sphere.
- a knowledge of community health and social agencies and the ways in which the teacher may work effectively with them.

Objectives of School Health Programme

- **Promotion of positive health;**
- **Prevention of disease;**
- **Health conscientisation among school children;**
- **Providing healthful learnings in a healthy environment;**
- **Recognising the child as a "change-agent" in the family and community.**



Chapter 4

SANITATION: A LOW-COST SOLUTION*

Sanitation has a wide connotation. Human excreta, waste water, solid waste and even personal hygiene and housing are all directly connected with sanitation. The scope of sanitation may vary with the need and communities; but in a developing country like India, safe disposal of human excreta is the most challenging problem in the field of sanitation, both in rural and urban areas.

Researchers and scientists, both in India and abroad, have concluded that safe disposal of human excreta can bring about maximum improvement in sanitation and environment. The All-India Institute of Hygiene and Public Health, Calcutta, came to the same conclusion and observed in their investigation carried out at the Singur Research Centre that the mortality and morbidity rates were higher in villages with only tubewell water supply facilities than where only low cost pour flush toilets had been provided. The best results were observed where both the facilities were available and the worst where none was present. Health statistics of the country also reveal that excreta-related diseases cause the highest number of deaths.

Let us deal presently with the problem only of excreta disposal, as its safe disposal is the prime need especially when there is a resource constraint.

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 directly into the soil was a matter of habit and convenience. Even now, though in urban areas, toilets are regarded as a part of the house, yet only 44 per cent of the houses have latrines and nearly half of these are bucket or dry privies.

The primary objective of public health engineers in converting traditional service latrines into water-flush toilets has been environmental hygiene and protection of the community against health hazards. They have been advocating underground sewerage as the only safe and most effective means of achieving these ends.

Sewerage is the best system for disposal of human waste as it takes care of both human excreta as well as waste water from bathrooms and kitchens. Sewerage is, however, costly and neither the government nor the local authorities or beneficiaries can bear the capital of operation and maintenance cost. Excreta disposal through sewerage costs almost five to six times more than a Pour-Flush system with twin pits (PF) which is an on-site system. Moreover it requires almost six times more water for flushing than that in the PF system and water is a scarce commodity.

Although almost the entire Five Year Plan allocation for urban sanitation has been spent on sewerage systems, either on-going or new, yet there are hardly 232 towns and cities with sewerage at present. None of these sewerage schemes, however, cover the entire municipal city area, leave alone the adjoining suburbs included in the municipal limits.

Another difficulty is the operation and maintenance of sewerage. After the introduction of sewerage in the town, the local authorities levy sewerage tax to which there is opposition because everybody has to pay it, whether one has a sewer connection or not. The maintenance cost of

* Padma Bhushan, Dr. Bindeshwar Pathak, Ph.D., D.Litt.
Founder, Sulabh International

sewerage cannot be met from the tax even though it is high. The rate, however, cannot be increased as it is beyond the capacity of the common person to pay higher taxes. Due to the general budgetary constraint, local authorities are unable to maintain the sewerage system even with Govt. subsidy and the sewers are getting choked for lack of proper cleaning and maintenance. Moreover, since all the houses on a street are not sewered, the household waste water along with waste from the streets is let into the sewerage. Discharge of such waste and soil and insufficient water for lack of house connections is resulting in the chockage of sewers, making many of them defunct. The large sums of money spent on sewerage have thus become infructuous.

A sewerage project has to be completed substantially before even a portion of the completed work can be made use of, while with individual on-site systems for each house, this difficulty is not encountered. One of the advantages of a pour-flush system is that maintenance is not a burden on the local authority. The daily maintenance is done by the house owner. While the dry sludge which is to be taken out every three years, is safe for handling and can be taken out by any labourer as it is dry and odourless like earth, the returns from the sale of the sludge are more than the cost of the labourer. Low-Cost Sanitation (LCS) has the advantage that when there is any budgetary constraint and the work has to be stopped or slowed down, all the work completed can be used and people derive the full benefit, which is not so in a sewerage system.

Septic tank, an alternative to on-site sanitation, costs almost two-and-a-half to three times more than the low-cost pour-flush system. Septic tanks have many drawbacks in comparison to PF latrines. They have to be cleaned after one or two years. The wet sludge to be taken out is a health hazard and at times gets mixed up with fresh night-soil and has an obnoxious smell. The sludge has, therefore, to be discharged at a distant place. Emptying the septic tank is, thus, not easy and a burden on the municipality. The traditional quantity of 14 litres of water is needed for flushing. The space required for a septic tank is more than the PF latrine.

On-site sanitation with a pour-flush two-pit latrine popularly known as Sulabh Shauchalaya is acceptable and affordable and is easily available. Nearly 6 lakh dry (bucket) latrines have been converted by adopting the PF system all over the country. Now a two litre flushing cistern has been developed which can be fixed to the pour-flush system and changed to cistern flush whenever desired. Thus, it has been possible to overcome one of the factors that led to the non-acceptance of the low-cost PF system by the middle income group and high income group population.

On-site sanitation was tried in rural areas in the 1950s and 1960s but did not succeed. The toilets were built with one pit and the second pit was to be constructed by the household when the first pit was filled. The pits were also not lined. The result was that many pits collapsed and the second pit was not constructed and people again started going out for defecation in the open. The people lost faith in the technology, proving a great setback to the programme.

It was Sulabh International, a voluntary social organisation, which showed that the PF latrine with two leach pits can be successfully constructed even in the most congested towns. This achievement of Sulabh led to adoption of low-cost sanitation all over India. This system meets the technical, socio-economic and cultural needs of the people.

Financing

Financing has undoubtedly been the major problem area in promoting the conversion programme of dry (bucket) privies. Although low-cost sanitation costs 1/5 to 1/6 of sewerage and 1/2 to 1/3 of septic tank, yet it has not made the desired progress because the authorities always gave priority to sewerage. Till 1981, low-cost sanitation had a very low priority. Even now, states either do not make provision for LCS or it is so meagre that it is not sufficient even to match the

available central assistance; with the result, most states are unable to avail of the financial assistance offered by the Government of India.

Human resource

Engineers have been educated and trained in high-tech and any engineering work which is grand and can earn applause attracts them. Thus, piped water supply system or sewerage is their natural choice. Less technical men are attracted to the construction aspects of sewerage system. Most of them are, therefore, indifferent to low-cost sanitation.

Big contractors are not interested in taking up the construction of LCS. They prefer to go in for works where the margin of profit is higher. The NGOs also feel hesitant in taking up this work due to the difficulty in finding a suitable and willing work-force. Experienced and trained persons, including the masons, leave the job of implementing the LCS and shift to other kinds of construction where the payments are higher and prospects are better. This applies to junior engineers and assistant engineers too.

Since pour-flush toilets are to be constructed in individual houses, each toilet becomes a project by itself. As the construction has to be done to the satisfaction of the house-owner and the work is scattered, the labour and material-costs increase. Due to low turnout, chances of wastage of materials and labour and a close supervision by the house-owner, the margin of profit is reduced considerably.

Financial assistance to beneficiaries

The financial assistance made available to beneficiaries should be such that they can afford to have a toilet in each of their houses. It has been observed that in many states, the rate of interest and the retiring period of the loans advanced to beneficiaries make the loan repayment installments too high to be affordable by most people. It results in non-repayment of loans too.

Till now all the households, irrespective of their income, were getting 50 percent subsidy and 50 per cent loan to cover the full cost of the toilet, up to the sub-structure level in most states. The government of India has now curtailed the subsidy and has related it to the income level of the household. The beneficiaries have also to contribute from 5 to 25 per cent of the total cost from their own resources. It has become a problem for most people to spare money in lumpsum which earlier they could have paid in installments.

Felt need

Most people who do not have a toilet or have a bucket privy, belong to the economically weaker sections and low income groups. For them, a sanitary latrine is not a felt need; they give priority to other necessities of life like food, clothing, shelter, etc. The latrine gets very low priority as they are not aware of its importance. It has been observed that most latrines provided in rural areas with 100 percent subsidy from the government are not used. This happened because the programme was not supported by software inputs like sanitation education, motivation, publicity and communication, etc.

Legal support

The Technology Advisory Group of the World Bank had suggested adoption of bye-laws on sanitation in the feasibility reports prepared by it on low-cost sanitation in order to give legal support for expeditious implementation of the programme. The Government of India has also circulated these model bye-laws to be adopted by the local bodies. But, most of them have not so far adopted them. It is also observed that where such laws are available, enforcement is not

possible due to the public resistance. The mere formulation of a law is not an end; it is equally important to enforce it by making available an affordable alternative to bucket privies and open-defecation.

Superstructure

It has been observed that at times when a bucket privy is to be converted, it becomes necessary to construct a new one at a more suitable place which needs a superstructure. Many houses cannot afford to build it from their own resources, resulting in continued use of bucket privies. Similarly, a large number of toilets constructed in houses having no latrines are not used due to non-constuction of a superstructure. Most of these houses belong to economically weaker sections who have no means to build a superstructure.

Methodology for construction

It is very bothersome and time-consuming to get approval of drawings, sanction of grant/loan from the local authority, arranging labour and materials and supervising the construction. Though people may be willing to have a pour-flush toilet, all these problems prevent them from getting the latrine constructed. They will be happy to have an agency take the entire responsibility from the application stage to completion of toilet, including guarantee of the sturcture and its functioning. The households also need education on use and maintenance of PF toilets. The local authorities and the government department do not have the necessary infrastructure to carry out this job. Only NGOs who are experienced in this field are best suited for it.

Community latrines

There is a large section of people in every Indian town whose houses have no space for a private toilet. For them, the only feasible alternative is properly maintained community latrines. Due to lack of resources, the local authorities are unable to construct community latrines in adequate numbers and even the existing ones are not maintained properly; with the result, most people prefer open defecation to using community latrines. Most states do not have provision in their budgets or plan for providing financial assistance to local authorities for constructing, operating and maintaining community latrines. These are the problems and possibilities of the new Sulabh system.

Rural Sanitation

In rural India, people generally defecate in open space, little knowing the consequential health hazards, like cholera, gastroenteritis, ringworm, hookworm, diarrhoea, dehydration, higher morbidity and mortality among the infants, etc.

Bushes and trees have been removed, the lands have been converted into agricultural fields and hardly any place is left to hide for open defecation. People, sepcially women, are the worst sufferers.

Late Prime Minister Mrs. Indira Gandhi stressed the necessity of latrines for rural communities in India, particularly for women. In June 1982 she addressed a letter to the Chief Ministers of states mentioning, "another problem is that of latrines in rural areas. With the consolidation of land-holding and expansion of towns as well as cultivated areas, people in villages have great difficulty in this regard. Women specially feel miserable. They can go out only at night, which is not always safe. I have spoken on this matter to some Chief Ministers. The State Government should take up a programme of building latrines where these are not available or get local organisations to take an interest. This needs urgent attention."

The Solution

Sewerage and septic tank systems are not at all the solutions in rural areas due to the prohibitive cost of construction and maintenance. The only affordable alternative to stop open defecation would be the two-pit pour-flush toilet system, popularly known as Sulabh Shauchalaya.

The cost of construction of Sulabh Shauchalaya ranges from Rs. 1,000 to Rs. 25,000. It will depend on the beneficiary to choose a particular design according to one's economic condition. Only two litres of water is required for flushing, it prevents air pollution; human excreta gets converted into manure and does not need the services of a scavenger to clean. Any person can take out the manure and use it in the field directly. Further treatment after taking out from the pit is not required as all pathogens die during the period of about 18 months.

The shape of the pit will depend on the availability of the space; it may be circular, square or rectangular. If space is available, the circular pits with one metre distance between the two pits will not be required if connected to biogas plants.

The community latrines in rural areas should be discouraged as these are capital-intensive as well as they require costly-maintenance. Hence, it would be worth-while to adopt the strategy to promote individual latrines in rural areas and community latrines in urban. However, two to four seated public toilets may be constructed in schools, anganwadis, health sub-centres, panchayat bhawans and community development centres, etc., so that people could know and be educated about the sanitary latrine and its benefits and they may be motivated to adopt this system in their houses. The community latrines at block development office, market yards and bus depots may be recommended as there is likelihood of collection of adequate amount for proper maintenance.

It is desirable to provide two-pit pour-flush toilets along with the Indira Awas Yojana or other housing complexes in rural areas. It may, however, not be possible for the public exchequer to provide funds for the construction of sanitary toilets in all individual houses. Roughly, the total estimated cost, if it is to be funded by the public exchequer, will be about Rs. 10,000 crores, which the country cannot afford at present.

In rural areas, there are two types of clientele who want to have sanitary latrines in their houses; one who are economically well-off and secondly those who live in the urban areas but visit the villages. They want to have latrines for their convenience. But the infrastructure is not available to assist them for the motivation and construction of the toilets.

It may be proposed that some unemployed youths should be trained as motivators and masons at the district and block levels. They should carry out this programme as social entrepreneurs. In the beginning, some element of subsidy say Rs. 500 per latrine, will be necessary to encourage the beneficiaries to get the sanitary latrines constructed in their houses. However, the amount will not be given to the beneficiaries, rather it will be given to the institutions concerned who will construct latrines for them to minimise the misuse of money. The same methodology has been adopted in urban areas. The nationalized banks may be instructed construction of sanitary latrines also at a low rate of interest, if required by the beneficiaries.

To motivate and persuade the people to have sanitary latrines in their houses, mass media should be utilised in the same way as in the Family Welfare and other programmes. Voluntary organisations should be involved in the motivation, awareness, education, implementation, maintenance and follow-up to make the programme successful.

This may be the beginning to improve the living conditions of the masses of rural India.

Pandit Jawaharlal Nehru had once said, "The day every one of us gets a toilet to use, I shall know that our country has reached the pinnacle of progress."



Chapter 5

PREVENTION OF ENVIRONMENTAL POLLUTION THROUGH LOW COST SANITATION*

The fast deterioration of environmental and ecological balance in India has become a matter of deep concern. Population explosion, urbanisation, industrialisation, felling of trees, soil erosion and an ever-increasing number of vehicles and factories are the main causes of this imbalance.

Another major cause of imbalance, which is particular to this country, is the centuries-old sub-human and unhealthy traditional practice of open defecation and the use of bucket latrines cleaned manually. The excreta from the bucket privies often spill over during its transport to the disposal site. Due to cleaning of the privy chambers by pouring water through the squatting holes, excreta flows into drains, running along the houses and, thus, exposing the entire locality to health hazards and foul environment.

Human excreta is the cause of many enteric diseases such as cholera, dysentery, typhoid, paratyphoid, infectious hepatitis, hookworm, etc. Over 50 types of infection 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 in order to build a healthier nation and provide a cleaner environment.

The major cause of the high rate of incidence of these diseases in India is the tradition of open defecation by millions of people every morning and evening, and the existence of hundreds and thousands of bucket latrines in towns and cities. It is a common sight in our country to see the excreta flowing through open drains due to defecation by children as well as adults and also due to the system of cleaning bucket privies by scavengers who discharge the residual excreta into the drains which flows in front of houses.

A painful paradox persists. On one hand, 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 on the head by scavengers remains a blot on our society.

The employment of human beings of a particular class called "scavengers", who make house-to-house collection of human excreta in buckets or baskets and carry them on the head, shoulders or by hand for disposal, is perhaps today the greatest stigma on the Indian society. The shame of the scavenging system is that a particular class of people are employed for such a demeaning task which is looked down upon even by those who derive the benefit of their services. The stigma attached to this profession has passed down from generation to generation and the scavengers continue to carry out this work unwillingly. Thus, the conservancy system is being

* Padma Bhushan, Dr. Bindeshwar Pathak, Ph.D., D.Litt.
Founder, Sulabh International

human and social values of life which have forced them to take up such profession since their childhood. This appears to have affected the mental attitude of scavengers at work or at home who are segregated from the rest of the community. There are very few countries in the world where scavenging is still prevalent. Scavengers' population in India is disproportionately very high, signifying the preponderance of bucket-latrines in the country.

Since pre-independence period, the nation has been talking about their plight and has from time to time sought for the end to this demeaning practice of manual handling of night-soil, but in a half-hearted manner; with the result, that the achievement in this regard has been insignificant.

It is amazing to note that out of 800 million people, more than 700 million of this country either defecate in the open or use bucket privies.

Since the 1940s, sanitary engineers, experts and scientists in India started searching for an affordable, acceptable and easily available alternative solution to prevent open defecation in rural areas of India. The pour-flush water-seal latrine with on-site disposal of human waste which seems to be feasible in most situations and could satisfy the above criteria was initially developed by the All-India Institute of Hygiene and Public Health, Calcutta. Refinements were brought about subsequently by various research and other organisations, both governmental and non-governmental. The few projects taken up were primarily research-oriented to find out inexpensive solution to the problem.

Low-cost on-site disposal of excreta with pour-flush waterseal latrine (LCS) was introduced in India in the late 1950s as a national programme in rural areas, although it did not succeed due to various constraints. In the late 1960s, a few small towns which were rural in character had been provided with LCS in Tamil Nadu and Gujarat in a very limited way. No thought was given to develop this system as a solution to stop open-defecation and replace bucket privies.

I pondered over this situation and founded an organisation called Sulabh Shauchalaya Sansthan in 1970 (now Sulabh International) and started advocating the adoption of the same two-pit pour-flush-water-seal latrine, popularly known as Sulabh Shauchalaya, with some modification on what was developed in the 1960s to replace bucket latrines and stop open defecation in thickly populated urban areas. In the beginning, the public Health Engineers were opposed to the idea and I had to face a stiff resistance. But, gradually I was able to persuade the Government of Bihar to adopt this technology in urban areas. Sulabh International was able to introduce LCS in several towns including class-I towns (population above 100,000) and even in Patna, the capital city of Bihar State with a population above half a million.

In 1974, Sulabh International introduced the system of operating and maintaining pay-and-use community toilet complexes round the clock with people's participation without any burden on public exchequer. These Sulabh Complexes offer further amenities like bathing and washing facilities and urinals. Now, it is proposed to provide some other facilities like public telephone, primary healthcare unit, ambulance van and creche for children, etc.

Observing the success of the LCS programme of Sulabh International, the Government of India in collaboration with WHO and UNICEF and participation of Sulabh International, organised the first National Conference in Patna in 1978, which was attended by public health engineers, public health scientists, planners, administrators and sociologists of the Central and State Governments. All the participants, after seeing the work done by Sulabh International in Bihar, were convinced that LCS technology adopted there is the only affordable option for improving environment by converting the bucket privy and providing a toilet in every home. Sewerage and

septic tanks are not the answer with the present economic conditions as the cost is prohibitive both for construction, operation and maintenance.

Neither the government nor the community could afford them. The Government of India convinced by the unanimous support for LCS in the country requested the UNDP in 1979 (with the World Bank as the executive agency) to prepare feasibility reports. In three phases, feasibility reports for 211 towns in 21 states and 6,000 villages were prepared. In these reports, it was concluded that pour-flush water-seal latrine with twin leach pits was the most suitable technology for adoption in India. Thus, it was the pioneering and successful achievement of Sulabh International in the urban areas in the field of LCS that paved the way for providing a better environment for improving health and hygienic conditions in the country.

Environment influences thoughts and habits of mankind. His social and cultural development would respond only in good community health and personal setup. Sulabh International's goal is to remove such environmental distortion by replacing the bucket privies in individual homes with Low-Cost Sanitation (LCS) and provide community toilets with bathing facilities wherever needed to prevent indiscriminate open air defecation and, thus, improve the health and hygiene of the poor.



Chapter 6

THE TWO-PITS POUR-FLUSH WATER SEAL TOILET*

We find one important component missing in the scenario of basic education. We talked about public health but we did not give due importance to the means for achieving this- namely, sanitation. Safe potable water and sanitation are extremely important for health, particularly for the burgeoning population in the developing countries.

The proper disposal of human excreta is one of the important aspects of sanitation. Due to the unaffordable cost of construction and maintenance of sewerage and septic tanks and unavailability of low-cost technology for the disposal of human excreta, open air defecation and manually cleaning in different parts of our country continues to be a major challenge for the community health even today.

Sulabh international has developed a design of low cost pour flush waterseal latrine, commonly known as Sulabh Shauchalaya, which is economically and environmentally safe, technically and scientifically appropriate and socially and culturally acceptable. The organisation has constructed over six lakhs of such individual toilets and 2,074 community toilet complexes in different states of the country. It does not require handling of nightsoil by the scavengers, thus liberating them from this inhuman practice. The organisation has liberated 32,500 scavengers and made 110 towns scavenging-free. The design has been adopted by the various national and international governments and agencies, including UNDP/ World Bank, WHO and UNICEF.

The biogas production from public toilets linked to biogas plants is an important method of decentralized energy generation in case of over sixty such biogas plants. From a biogas plant connected with a public toilet used by about 2,000 users per day, 65 units of electricity per day can be produced. Besides, biogas can be effectively utilized for cooking and lighting through mantle lamps. The digested sludge can be used as a rich manure without any health risk. The weeds like water hyacinth and parthenium can be effectively supplemented with night soil for the enhanced biogas production.

Sanitation has a wide connotation which broadly covers human excreta, waste water, solid wastes and even personal hygiene and housing, etc. But in a developing country like India, safe disposal of human excreta alone is the most important aspect of sanitation.

Human excreta contains a full spectrum of different pathogens. According to a World Bank report, more than 50 infections are transmitted from a diseased person to a healthy one by various direct or indirect routes from human excreta, which is the cause of nearly 80% of sickness in developing countries. The health statistics of our country also reveal that excreta-related diseases cause the highest number of deaths. The alarmingly high Infant Mortality Rate (IMR) in India is directly traceable to the insanitary conditions of living. The infections impair the quality of life and make an individual die from superimposed infections.

* Padma Bhushan, Dr. Bindeshwar Pathak, Ph.D., D.Litt.
Founder, Sulabh International

Thus, proper disposal of human excreta is of utmost importance for the improvement of health and quality of life of any community.

Disposal of Waste : Common Practices

Sewerage : Although, sewerage is the best suitable option for disposal of human wastes, but neither the government nor the local authorities can afford the construction and maintenance of this system. It was introduced in India at Calcutta in 1870, yet there are hardly 232 towns and cities out of the 4689 with sewerage at present. None of them, as reported however, covers the entire municipal city area. Excreta disposal through sewerage, including household fixtures and treatment works, costs almost 3 to 4 times more than the pour-flush system with twin pits, which is an on-site system.

Septic Tanks : Septic tanks cost almost two to three times more than that of low cost pour flush system. It has many drawbacks in comparison to the pour-flush system. It has to be cleaned after every one or two years. The sludge settles in a semi-decomposed form at the bottom of the tank with fresh human excreta on top of it, which is hygienically unsafe to clean as it contains viable pathogens. Thus, emptying the septic tank is not so easy and is a burden on the municipality. Further, the space required for a septic tank toilet is much more than that required for a flush toilet.

Both the sewerage and septic tanks are not suitable in the present economic condition.

Low-Cost Sanitation

The low-cost sanitation comprises designing a pour-flush water-seal toilet with twin leaching-pit system. It can most conveniently replace the bucket/dry privies in the unsewered areas of the urban as well as rural communities. It has a special design of squatting a pan and a trap that can be hand-flushed with merely one and a half to two litres of water. The first pit gets filled up in about three years when the other pit can be used; the second pit gets filled up in another three years. The water of excreta leaches into the soil and the gases are dispersed in it. The contents of the first pit are fit for handling as a good quality manure. There is not any taboo attached to handling the dry pit contents as it has neither any foul smell nor any viable pathogen.

No Need For Vent Pipe

In a Sulabh Shauchalaya, vent pipe is not necessary as gases are dispersed into the soil. It also helps, indirectly, in the reduction of different pathogens. Due to the absence of vent pipe or any such connection with the atmospheric air to the pits, anaerobic condition is maintained inside the plastered pit. And, almost all the pathogens are aerobic in nature. Therefore, their viability gets reduced. Most of them get eliminated during emptying the pits. Thus, it helps in reducing the viability of different pathogens.

In a two - pit system one pit is used at a time. Another pit is used when the first pit gets filled up. The contents of the first pit can be taken out easily by the owner as it is in a semi-dried form and without having any foul odour or pathogen and hence, has no health risk.

In a single pit system, dislodging has to be done immediately after the pit has been filled up to enable its refuse. It can be done mechanically by a vaccum-tanker, which is not easily available in our country. Besides, it requires further space and a time-period of two years to get it decomposed for its use as manure. In the absence of a vaccum cleaner, manual handling of fresh

excreta is the only option left, that is health-hazardous and socially unacceptable. If a deeper and larger pit is provided, dislodging operation becomes difficult and there are more chances of pollution, especially where the ground water table is high.

People who do not prefer pour flush, oppose the low-cost system. Now a two litre flushing cistern has been developed, which can be fixed with the pour flush system and changed to cistern - flush whenever desired. Thus, it has been possible to overcome one of the factors that led to the non-acceptance of the low cost pour flush system by some people. These latrines can be connected easily to sewers when sewerage is introduced in the towns.

Sulabh Shauchalaya is low - cost but it is not a low technology. the leach pits are generally constructed on the basis of 2 to 3 years cleaning interval; but if anybody desires, these can be designed and built to any desired period of cleaning interval.

Hundreds of thousands Sulabh Shauchalayas have been constructed all over India in its rural and urban areas. Sulabh International alone has constructed over six lakh Shauchalayas. 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 Center for Human Settlement (UNCHS) etc. have accepted the design and are advocating and providing financial assistance for the construction of these 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 all acknowledged Sulabh Shauchalaya as the most appropriate technological option for the disposal of human excreta and appreciated the methodology adopted by the Sulabh International for marketing and delivery.

Sulabh Shauchalaya has the following advantages :-

- i) It is hygienically and technically appropriate.
- ii) it is low cost and easy to construct.
- iii) it can be constructed in different physical, geological and hydrogeological conditions.
- iv) It does not require scavengers to carry and dispose off human excreta.
- v) It's maintenance is easy and simple.
- vi) It can be constructed within the premises as it is free from foul smell and fly/ mosquito nuisance.
- vii) It eliminates bacterial and helminthic pathogens from the human excreta, thus chances of health hazards are negligible.
- viii) It is well suited to the socio-cultural and economic needs of the people.

Legal provision and constraints

The different State Governments have framed byelaws to ban the construction of dry latrines and to promote the water-flush privies connected to septic tanks or leaching pits. The Government of India has enacted legislation banning the manual handling of human waste and discontinuation of bucket/dry privies. But existence of dry privies and manual cleaning and carrying night soil by the scavengers is still a common sight in majority of the towns in different states.

The failure in enforcement is partly due to the absence of a positive approach to solve the problem. The practice of scavenging and the use of dry privies can be checked only if there is technologically, sociologically and economically affordable design of toilets to the common people. In the absence of such facilities, the mere legal provision would be of no meaning. The Government of India has announced to make the country scavenging-free by the end of this century. But the simple calculation shows that it is beyond the scope of state governments and the central government to achieve this target even in rural areas.

The total rural population of this country, as estimated in the 1991 census, is 627.1 million. The households having sanitary facilities are about 10%. This would mean that 112.9 million rural households are yet to be provided with the basic facilities of sanitation. Even at a modest cost of Rs. 2500 per unit, a gigantic investment of Rs. 28225 crores will be required for this purpose. Such a huge investment is obviously beyond the means of the Centre and State governments in the foreseeable future.

Furthermore, the government has not banned the construction of septic tank that requires scavengers to clean it. The system of scavenging can not be eliminated unless the construction of septic tank is banned.

