Basic Sanitation in Rural India- Road Map for Swachh Bharat

Dr. Bindeshwar Pathak

Sanitation includes clean water supply, safe disposal of human waste, waste water and solid waste management, control of water borne diseases, and domestic and personal hygiene.

The US National Sanitation Foundation defines sanitation as: 'The quality of living expressed in clean homes, clean farms, clean neighbourhoods and clean community. Being a way of life, it must come from people, nourished as it is by knowledge and it grows as obligation and ideal in human relations'.

Accordingly, environmental sanitation is viewed as 'the control of all those factors which exercise a deleterious effect on his physical development, health, and survival' (WHO, 1992). Environment sanitation is vital to protecting the environment, improving health, alleviating poverty, enhancing quality of life and raising productivity-all of which are essential for sustainable development.

Sanitation is not only keeping clean but protecting those sources of the environment which support and sustainable development. The development programmes, howsoever innovative they maybe, are not likely to yield desired results unless environmental sanitation is improved and protected. (Sulabh website)

The Problem

Globally 2.5 billion do not have access to basic sanitation, of which 1.1 billion still practice open defaecation. The countries where open defecation is most widely practiced are the same countries with the highest numbers of under-five child deaths, high levels of under-nutrition and poverty, and large wealth disparities.

This has adverse effects on personal health as well as environment. Poor sanitation contributes to about 700,000 child deaths from diarrhoea alone each year. Chronic diarrhoea can hinder child development by impending the absorption of essential nutrients and reducing the effectiveness of life-saving vaccines. (UN)

In 2008, 88% of the population in India had access to an improved water source, but only 31% had access to improved sanitation. In rural areas, where 72% of India's population lives, the respective shares are 84% for water and only 21% for sanitation.

In 2010, the UN estimated based on Indian statistics that 626 million people practice open defecation. That is, more than half of India's population does not have access to basic structured sanitation facilities. According to the 2011 Indian census, 53 per cent of households do not use any kind of toilet or latrine. In June 2012, Minister of Rural Development, Jairam Ramesh stated India is the world's largest "open air toilet". He also remarked that Pakistan, Bangladesh and Afghanistan have better sanitation records.
(https://en.wikipedia.org/wiki/Water_supply and_ sanitation_in_India)

———— *Text of the* ***13th Rajiv Gandhi Memorial Lecture,*** delivered by **Dr. Bindeshwar Pathak,** Founder, Sulabh International Social Service Organisation, New Delhi, under the aegis of the ***Academy of Grassroots Studies and Research of India (AGRASRI)*** at Tirupati, Andhra Pradesh, on 20 August, 2015.

However, the effect of lack of sanitation facilities can be seen much beyond open defaecation. Over 28% of Indian children (23 million) under the age of six suffer from malnourishment and are underweight, a direct result attributed to poor sanitation.

Every minute 1.1 million litres of human excrement enters the river Ganga. Teenage girls leave schools when they start menstruating because they have no privacy. Every day women face the threat of sexual violence as they take their daily trek to relieve themselves in the open fields. *(opendefecation.org)*

Brief history of Indian Government's initiatives

The Central Rural Sanitation Programme, which was started in 1986, was one of the first efforts by the Indian Government to provide safe sanitation in rural areas. This programme focussed mainly on providing subsidies to people to construct sanitation facilities. However, a study done by the government in 1996-97 showed that it was more important to raise awareness about sanitation as a whole rather than to just provide subsidies for construction. This understanding marked the first shift in the programme. In 1999, a restructured Total Sanitation Campaign (TSC) was initiated to create supply-led sanitation by promoting local sanitary marts and a range of technological options.

The last modification of the scheme happened in 2012. It was restructured and renamed as the Nirmal Bharat Abhiyan. With intent to transform India to '*Nirmal Bharat*', the scheme's revised target for reaching total sanitation was changed from 2012 to 2022. *(http://www.indiawaterportal.org/topics/rural-sanitation)*

Swachh Bharat Abhiyan

On 2 October 2014, Prime Minister Narendra Modi launched the Swachh Bharat Mission, which aims to eradicate open defecation by 2019, thus restructuring the Nirmal Bharat Abhiyan. The campaign was officially launched at Rajghat, New Delhi, where Prime Minister Narendra Modi himself cleaned the road. It was launched to honour India's independence leader, Mahatma Gandhi on the anniversary of his birth. It is India's biggest ever cleanliness drive and 3 million government employees and school and college students of India participated in this event.

The aim of the nationwide cleanliness drive: to clean up the country by 2019, the year that marks the 150th anniversary of the birth of Mahatma Gandhi, who wanted to make sanitation a priority for India more than a century ago. The current drive aims to end the wide-spread practice of open defecation, build more toilets and improve waste management, among other goals.

The program plans to construct 12 crore toilets in rural India by October 2019, at a projected cost of Rs.3.66 lakh crore. Prime Minister Narendra Modi spoke of the need for toilets in his 2014 Independence Day speech stating, 'Has it ever pained us that our mothers and sisters have to defecate in open? Poor womenfolk of the village wait for the night; until darkness descends, they can't go out to defecate. What bodily torture they must be feeling, how many diseases that act might engender. Can't we just make arrangements for toilets for the dignity of our mothers and sisters?' *(https://en.wikipedia.org/wiki/Swachh_Bharat_Abhiyan)*

Problems of Sanitation in Rural India

Open defecation in rural India remains a problem that perplexes policy makers and civil society alike. India has the largest number of people who practice open defecation (626 million) and the most number of child deaths due to poor water, sanitation and hygiene conditions compared to the rest of the world. *(http://www.indiawaterportal.org/topics/rural-sanitation)*

In the developed countries, the standard practice for the sanitary disposal of human waste is sewerage. Due to financial constraints and exorbitant maintenance and operational costs, sewerage is not the answer at present to solve the problem of human waste management in India. Sewerage was first introduced in London in 1850, followed by New York in 1860. Calcutta in India was the next city in the world to have this privilege in 1870, yet out of over 4,800 towns/cities in India only 232 have the sewerage system and that too partially.

In developing countries neither the government nor the local authorities, or the beneficiaries can bear the total capital expenditure, and operation and maintenance costs of a sewerage system. Moreover, it requires skilled persons and good management for the long term operation and maintenance. It requires over 8L of water to clear human excreta. Do we build huge dams and irrigation systems to bring in water only to flush it down in to an expensive sewage system, all ending up polluting our rivers and ponds? Most of the rivers are heavily polluted due to untreated domestic sewage load from the cities. This has led to deterioration of groundwater aquifers and community health.

Similarly, the septic tank system is also expensive and requires large volumes of water for flushing. They also have other problems like periodic cleaning and disposal of sludge. Inadequate effluent disposal is a source of foul smell, mosquito breeding, and health hazards. *(http://www.sulabhinternational.org/introduction-to-sulabh-technology/)*

One of the17 Sustainable Development Goals (SDGs) launched by UN this year is to 'Ensure access to water and sanitation for all'. Clean, accessible water for all is an essential part of the world we want to live in. There is sufficient fresh water on the planet to achieve this. But due to bad economics or poor infrastructure, every year millions of people, most of them children, die from diseases associated with inadequate water supply, sanitation and hygiene.

Water scarcity, poor water quality and inadequate sanitation negatively impact food security, livelihood choices and educational opportunities for poor families across the world. Drought afflicts some of the world's poorest countries, worsening hunger and malnutrition.

By 2050, at least one in four people is likely to live in a country affected by chronic or recurring shortages of fresh water. *(http://www.un.org/sustainabledevelopment/water-and-sanitation/)*

The shortage of water is acutely felt in developing countries around the world, but this shortage takes an even extreme form in rural areas, especially in India. Hence standard sanitation practiced cannot be employed as a solution to poor sanitation, water, and hygiene in India.

Technological Intervention

Dr Bindeshwar Pathak, Founder of Sulabh Sanitation Movement believes a technological intervention is the answer to India's sanitation problem in rural areas. To this effect, in 1968, he innovated a revolutionary cost-effective, affordable technology: the two-pit pour flush.

Sulabh Flush Compost

Sulabh flush compost toilet is eco-friendly, technically appropriate, socio-culturally acceptable, and economically affordable. It is an indigenous technology and the toilet can easily be constructed by local labour and materials. It provides health benefits by safe disposal of human excreta on –site. It consists of a pan with a steep slope of 25 -28 degrees and a specially designed trap with 20mm water seal requiring only 1 Litre of water for flushing, thus helping conserve water.

It does not need scavengers to clean the pits. There are two pits of varying size and capacity depending on the number of users. The capacity of each pit is normally designed for 3 years' usage. Both pits are used alternately. When one pit is full, the incoming excreta is diverted in to the second pit. In about two years, the sludge gets digested and is almost dry and pathogen free, thus safe for handling as manure. Digested sludge is odourless and is a good manure and soil-conditioner. It can be dug out easily and used for agricultural purposes. The cost of emptying the pit can be met partially from the cost of the manure made available. The cost of emptying the pit can be met partially from the cost of manure made available. Sulabh toilet can also be constructed on the upper floors of buildings. It has a high potential for upgradation, and can later be easily connected to sewers when introduced in the area. Sulabh has so far constructed over 1.3 million individual household toilets in different parts of the country.

Sulabh flush compost toilet does not cause water pollution. When constructed in homogeneous soil, horizontally, bacteria do not travel more than 3 metres, and vertically the seepage is not more than 1 metre. To this is to be added the precaution that the toilet is built at a safe distance from the source of water, keeping the above points in mind. If there is a tube-well or hand pump sunk, the first joint should be lower than the limit of the vertical seepage. No vent pipe is needed since the gas gets absorbed in the soil facing the chamber, as the brick lining inside is in lattice formation. The parameters change depending upon the coarseness of the soil and the type of terrain where the toilet is being constructed. Depending on the availability of space, the shape of pits may be designed. It may be rectangular, circular or linear in shape. It fulfils all the seven conditions of a sanitary latrine laid down by the WHO. *(Excreta Disposal for Rural Areas and Small Communities by E.G. Wagner & J.N. Lanoix, WHO, 1958, pp. 39).*

- The surface soil should not be contaminated.
- There should be no contamination of ground water that may enter springs or wells.
- There should be no contamination of surface water.
- Excreta should not be accessible to flies or animals.
- There should be no handling of fresh excreta; or when this is indispensable, it should be kept to a strict minimum.
- There should be freedom from odours or unsightly conditions.
- The method used should be simple, inexpensive in construction and operation.

Advantages of Sulabh Toilets

- Hygienically and technically appropriate, and socio-culturally acceptable.
- Affordable and easy to construct with locally available materials.
- Design and specifications can be modified to suit householder'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 during construction.
- Can be located within the premises as it is free from foul smell and fly/mosquito nuisance etc.
- Can be constructed on upper floors of houses.
- Pits are generally designed for 3-year desludging interval, but if desired, it can be designed for longer periods or it can be reduced even to two years.
- Maintenance is easy, simple and costs very little.
- Needs only 1 to 1.5 litres of water for flushing, while conventional flush toilet needs 12 to 14 litres of water.
- Needs less space than a septic tank toilet system.
- Does not need scavengers for cleaning the pits or disposal of sludge. This can be done by the householder.
- 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. *(http://www.sulabhinternational.org/two-pit-system/)*

Environmental and Economic Benefits *(http://www.sulabhinternational.org/environmental-economic-benefits/)*

Water Saved (per year) if Sulabh Two-pit System is Implemented or 700 Million People

Using Sulabh toilet an amount of 9 litres of water per flush is saved per person in comparison to septic tank that requires 10 litres of water to flush toilet (Sulabh requires only 1 litre of water to flush).

If 700 million people use such a toilet, a calculated amount of 6,300 million litres of water will be saved per flush. Taking into account use of flush twice a day, the figure will be 12,600 million litres per day, or 45, 99,000 million litres per annum.

Total Numbers of users per day	700 million
Water used in Sulabh two pit toilets	1 litres
If used Sulabh two pit toilet in used then water used	700 million X 1 litres
	700 million litres

Had it been Septic Tank

Water used in septic tank	10 litres
Hence, water used per day	700 million X 10 Litres
Water saved in one day by 700 million people	7,000 million litres
	(7,000–700) million litres
	6,300 million litres

If toilet is used twice a day	6,300X2 million litres
	12,600 million litres

Water saved in a day = 12,600 million litres.

Water saved in one year

By Sulabh two- pit system	(12,600 X 365)million litres
	45, 99,000 million litres

Water saved through existing Sulabh Two-pit Toilet in one year

Sulabh has implemented over 1.3 million two-pit toilet, where per flush only 1 litres of water is required. Assuming 7 persons of a family per toilet it save 63 litres of water per flush in comparison to septic tank system. Assuming two times flush per day one unit will save 126 litres of water per day i.e. (1.3 X 126) million litres = 163.8 million litres per day i.e. 59,787 million litres per annum.

Two-pit Toilets constructed by Sulabh	1.3 million
Number of people using one toilet (average)	7
Number of times one person uses a toilet (average)	2
Total number of users per day: 1.3 million x 7	9.1 million
Water used in Sulabh two-pit toilet	1 Litre
	1 litre x 9.1 million
Water used by 9.1 million people	**9.1 million litres**

Had it been Septic tank

Water used in Septic tank	10 litres
Water used by 9.1 million people	9.1 million x 10 litres = 91 million litres
Hence, water saved by existing Sulabh two-pit toilets	(91-9.1) million litres
	81.9 million litres
If toilet is used twice a day	(81.9x 2) million litres
	163.8 million litres

Water saved in a day = 163.8 million litres.

Hence, water saved in one year by Sulabh two-pit system = (163.8 x 365) million litres = 5**9,787 million litres**

Cost of Manure from existing Sulabh Two-pit Toilet in one year

Number of toilets constructed by Sulabh (Twin-Pit)	1.3 millions
Average family members	7
Manure obtained from one person in a year	40 kg
Cost of manure	Rs. 10 per kg
Hence, the cost of manure by Sulabh twin-pit toilet is	1,30,000 x 7 x 40 x 10
	Rs. 3,640 million
	Rs. 3,640 million per year

Cost of manure from toilets to be constructed on the Sulabh twin-pit toilet model for 700 million people per year:

1 Person Produces 40 kg Manure in 1 year

700 million people produce	40 x 700 million kg manure
	28000 million kg manure
	28 million tons manure
Cost of Manure (in 1 year)	
Cost of 1 kg of manure is Rs. 10.00	
Cost of 28000 million kg manure (Rs. 10 x 28000 million)	**Rs. 2,80,000 million**

Cost recovered from a Biogas Plant (1000 user capacity), in the form of energy per year

One person produces	1 cubic feet (cft) of biogas
From a public toilet of 1,000 users (per day) we get	1000 Cft of biogas = 30 cubic meters (cum)
30 cum of biogas	4.6 gallons of diesel
4.6 gallons of diesel	4.6 x 4.55 litres of diesel
	21 litres

In a day we get 21 litres of diesel

Hence, total diesel obtained in a year	21 x 365 litters
	7,665 litres/year
Cost of diesel @ Rs. 50/-	7,665 x 50

	Rs.3,83,250
	$7097

Contribution of Sulabh to reduce Global Warming per year (based on a biogas plant of 1000 users)

Number of two-pit toilets constructed by Sulabh	1.3 million
Average users of toilet per day	7
Total users per day from all Sulabh toilets	(1.3 x 7) million
	9.1 million
1 person produced 1 cft gas per day	
9.1 million people produced: (1 x 9.1) million gas per day	9.1 million cft gas
	260000 cum
Total gas absorbed in soil	0.26 million cum gas per day
Total gas absorbed in soil in one year	(0.26 x 365) million cum
	94.9 million cum

If 700 Million People used Sulabh Two-pit System

Total gas produce in 1 day	700 million x 1 cft
	700 million cft
	20 million cum
Total gas absorbed in soil in one year (by Sulabh Two-pit system)	20 million cum x 365
	7300 million cum

200 Biogas Plants constructed by Sulabh

Average Biogas production per plant per day	45 cum
Total biogas production per day	(200 x 45) cum =9000 cum
Biogas produced in a year	9000 cum x 365 = 3285000 cum
	3.9 million cum
Total gas saved by Sulabh technology	**(94.9+3.9) = 98.8 million cum**

Since, methane damages the Ozone Layer of the atmosphere, from environmental point of view; it became harmless when it is used for different purposes like cooking, heating, or electricity generation.

Sulabh's Road Map for Rural Sanitation

The aim of Swachh Bharat Abhiyan is to build 12 crore toilets over a period five years. That is almost one toilet every second. It seems like a mammoth task but with strategic planning and community mobilisation, it is not an impossible one.

With integrated central and state schemes, India has the ability to achieve this target.

India has 690 districts, 5924 blocks, 250,000 clusters of villages, and over 640,000 villages. In order to provide toilets for over 600 million people, every village must have a motivator, whose job will to be educated, motivate and train people on healthy sanitation practices and help implement projects. They will also carry out the necessary maintenance and follow up and will help the beneficiary.

1 mason with 2 labourers can construct 10 toilets per month. If 500,000 masons are employed along with 1 million construction workers, under the supervision of 250,000 motivators, Indian can make 130 million toilets easily well within Prime Minister Modi's target and deadline of 2019.

Sulabh has taken up the programme of rural sanitation in 350 districts of the country, where volunteers have been trained in the technology, methodology, implementation, and follow-up. Masons have been trained and raw material has been made available at various centres to encourage people to take the initiative of constructing their toilets as per their needs and economic status. *(All the above information is from Dr Pathak's speeches and from the Sulabh Sanitation Movement book. I typed it out.)*

Beyond the physical structure

From the very beginning of civilization, human beings must have been going out for defecation in the open. There was no concept of houses or toilets at the time. When they started settling, in the cold climate, they built houses and had some arrangement to defecate inside the house and to throw it outside. Because there was no technology for disposal of human waste hygienically, they had to throw it outside. But in the countries with tropical climate, they must have been going outside for defecation.

In India, this practice got a religious sanction because it was mentioned in Devi Puran, a religious scripture, to not defecate near the human habitation. It was said, one should take a bow and an arrow, shoot the arrow, and where the arrow falls one should go for defecation there, or at least at that distance. Another suggestion was that one should dig the soil and put leaves and grass in it. And then defecate there. After defecation, one should cover it with the leaves and grass, as well as soil. This was a very healthy practice. Besides sanction given in the Devi Puran, because of the tropical climate this practice continued for centuries. Had the climate been cold, there would have been some sort of toilets, but may be unhygienic ones.

Moreover, earlier there used to be trees, bushes, mounds etc, behind which one could hide and defecate. But now trees have been cut and bushes have become sparse. Consequently, the villagers have to face a lot of problems for their toilet necessities.

The problem of sanitation in India is far beyond the lack of facilities. There are several cultural, religious, and social reasons that have compounded this problem over the centuries. There is also insufficient motivation and awareness among the people.

People (mostly from lower economic strata) are generally not aware of environment benefits of sanitation and it is still not a "felt need" for them, resulting in absence of people's participation in sanitation programmes. Non-availability of a choice of toilet designs, area specific technologies, inadequate supporting delivery systems and absence of trained masons, skilled workers and technical manpower are also reasons for low coverage. By tradition, the Indian society and culture values personal hygiene, but gives little importance to clean and healthy community environment. Human excreta is regarded as the most hated object and anything connected with the latrine is considered so defiling that one is supposed to take a bath immediately after coming out of the toilet and before going into the kitchen– due to psychological and religious taboos. Sanitation is, therefore, regarded as a matter of individual initiative and not a collective obligation of the community. In this socio-cultural background, the environmental sanitation has sadly been given the lowest priority.

Sanitation is a taboo in our country. Nobody likes to discuss topics like sanitation, open defecation, toilets etc. Many countries which have very less economy as compared to India like Bangladesh, Afghanistan and other Sub- Saharan countries have done much better in the sanitation drive. If we take the case of India itself, Haryana which is economically very developed has very high rate of open defecation. This leads to the conclusion that open defecation is also because of the lack of awareness, cultural practices, behavioural attitudes etc.

Many great leaders have actually realized the importance of the subject matter. While leading a non-violent movement for India's independence from the British in 1947, Mahatma Gandhi spoke about the need to improve hygiene and cleanliness in the country. 'Sanitation is more important than political independence', he said.

Jawaharlal Nehru said, 'The day every citizen of India will get a toilet to use, I shall know that the country has reached the pinnacle of the successes'.

While emphasising the urgent need to work on sanitation in India, Prime Minister Modi said, 'Toilets first, Temples later'.

One of the direct result of open defaecation or use of unsanitary and poor facilities in India is the rise of the practice of manual scavenging: the practice of manual cleaning of human excreta from service/dry latrines. The scavengers crawl into the dry latrines and collect the human excreta with their bare hands, carry it as head-load in a container to dispose it off.

A caste based and hereditary profession, which is handed down, as a legacy from one generation to the next; "manual scavenging" has been an age-old routine for this community, which is untouched by technological advancement in sanitary practices. Not only does the prevalence of this culture seem antediluvian, but what is worse is the fact that those born in this community are considered agents of pollution due to their background of social hierarchy, based on birth. They are the most oppressed and suppressed class of Indian society – hated, ostracized, vilified and avoided by all other castes and classes. The appalling hardship, humiliation and exploitation they face, have no parallel in human history. The practice started in the Puranic period continued in the Buddhist, Mauryan, Mughal and British periods.
(*http:// www. sulabhinternational.org/what-is-manual-scavenging/*)

Mahatma Gandhi strongly and repeatedly condemned the Indian practice of hiring people from the lowest rungs of the Hindu caste system, who were once called 'untouchables', to manually clean out primitive dry latrines or collect waste from fields where villagers relieved themselves, urging his countrymen to clean up after themselves.

In 1937, Mahatma Gandhi received a letter from a villager living in Birbhum, a district in India's eastern state of West Bengal. The letter writer asked Gandhi how he perceived an 'ideal village' and what problems he thought plagued Indian villages.

Here's his response, as it appeared in a 1937 edition of 'Harijan', another weekly publication, which Gandhi began editing in the early 1930s. 'An ideal village will be so constructed as to lend itself to perfect sanitation…The very first problem the village worker will solve is its sanitation', he wrote.

'If the worker became a voluntary scavenger, he would begin by collecting night soil and turning it into manure and sweeping village streets. He will tell people how and where they should perform daily functions and speak to them on the value of sanitation and great injury caused by its neglect. The worker will continue to do the work whether the villagers listen to him or not'. *(http://blogs.wsj.com/briefly/2015/10/01/5-things-mahatma-gandhi-said-about-sanitation/)*

The problems arising from casteism and untouchability are complicated, old and deep rooted. Even the scavengers, considered unclean and untouchable by society, accept their lowly position in society.

The problem of Balmikis is as much economic as it is socio-cultural. In fact, it is woven into the fabric of India's culture. Traditions take time to change and require the will and support from all sections of society. *(http://www.sulabhinternational.org/liberation-of-scavengers/)*

Hence, building 12 crore toilets alone will not solve the sanitation crises in India as it is a multi-faceted issue. It, thus, needs a multi-pronged solution.

One of the key philosophies of Sulabh's sanitation programme is to combine hardware knowledge (physical and technological aspects) with the software knowledge (awareness, education, community engagement).

For the speedy implementation of sanitation programmes in rural areas, Sulabh has made the following proposals:

- A nation-wide campaign is necessary to make people aware of the adverse effects of open air defaecation, which is responsible for number f infections and diseases. People should be motivated to not go barefoot for open defaecation. This type of education will be necessary until adequate toilet facilities are available in the villages.
- People in rural areas going for open defaecation should be educated to put soil on human excreta after relieving themselves, so that flies do not sit on the night-soil and become carriers of diseases like diarrhoea, dysentery, dehydration, and cholera, which are responsible for the death of half a million children every year in India.
- Experience shows that it is not practical to impose uniform design of a toilet on users. There should be several designs of pour flush toilets based on a family's economic situation. Choice can be made by the beneficiary based on resources they have access to.

- Help in the form of subsidy or loan or both should be extended to the beneficiary who wants to have toilets in their homes irrespective of their economic status.
- The programme of construction of toilets in rural areas is linked to making people aware of sanitation standards and the adverse effects of insanitary conditions. This requires house-to-house visits and follow ups. This can be done effectively by NGOs, volunteers, civic bodies. Thus the role of civil society is very crucial in the implementation of sanitation programmes in the country.
- These groups and NGOs can be identified either by the State Government or the District Administration. The selection of the groups should be based on their experience, expertise, and the ability to provide infrastructure.
- The NGOs identified for the implementation of the programmes should be given proper training in different aspects of the programmes. A comprehensive manual can be prepared for imparting this training at various levels.
- The entire training starting from information, education, communication, implementation, and follow up should be given to the same group, as the experience shows that division of work results in division of responsibilities, which can impact the result of the programme.
- The selected NGOs should be allowed 15% of the estimated cost of the IEC activities, including implementation, and follow up services. In addition, 10% of the project cost should be allowed for training and support services, like publicity, which could include printing of books, literature, posters, organising community events like dramas and nukkad plays. For setting up sanitary marts and production centres, subsidy as admissible under the government's sanitation programmes should also be paid to the NGOs.
- Interest free bank loans should be provided to all beneficiaries who want to build toilets in their houses.
- A nation-wide campaign should be launched through media to generate demand and educate about the need of safe hygienic toilets. Apart from a door-to-door campaign, it will be the responsibility of NGOs to publish the education material and literature in local language and distribute them to the people.
- The implementation of an effective sanitation programme will require social mobilisation on a large scale, which will include collaboration between people belonging to different groups. Politicians and policy makers will have to be involved extensively to encourage them to take policy decisions in favour of sanitation programmes. This social mobilisation will also include village elders, doctors, lawyers, and teachers. A comprehensive media coverage across all avenues of print, radio, TV, and online will be needed.
- School sanitation will form an important component of the programme as school teachers are an effective medium to reach students with the message of sanitary toilets and hygienic practices. This message can then be transferred to families in the villages through the students. The NGOs working in a particular village should also be responsible for construction and maintenance of the facilities in school as well as for training the teachers and students in the daily maintenance tasks.
- Public toilets in rural areas are generally not favoured. However, there should be public toilets constructed near Panchayat Bhawans, village markets, health centres, bus-stands, and other public spaces where people congregate in large numbers. These public toilets can also be constructed by NGOs and maintained on pay-per-use basis.

Impact: Ludhiana Case Study

Over 600 million people in India defecate out in the open posing serious health, security and environment threat. This, however, is about to change as sanitation experts and businesses join hands in their efforts to provide toilets in every house.

Ludhiana district, in northern Indian state of Punjab, is one such example. Paramjit Kaur, 27, a mother of three children, just had a toilet in her house and describes it as the most "precious" gift.

With a monthly income of 6000 rupees ($ 90), the family had no means to build a modern toilet. Her family dwells in a tiny cluster with four other families also with no toilets: the semi –concrete houses adjoin a dusty motorway with fast moving lorries and cars.

Paramjit narrates how her life changed drastically when a toilet was "gifted" to her. "I had to walk almost 2 kilometres taking three little children with bottles of water with just before the day- break crossing the highway far into the fields for relieving ourselves so that no one could notice us during the dawn."

She says it was nightmarish and humiliating exercise as the owners of the nearby paddy farmlands would shoo and abuse if they were caught defecating in their fields. There was a constant threat of snake and rodent bites, and also the fear of the unknown elements lurking in the dark.

This took a toll on the family's health. 'My children would fall sick with diarrhoea, cholera, fever, and stomach infection or cold. We had high medical expenses almost every month. We never had a luxury to sleep more even during the winters, we had to brave the chilly winds and the fog', she says.

Answering the call of nature was further difficult if any of the family members felt ill. That meant relieving near the house and disposing the poo at a safer distance. There were other problems like children often getting late for school, which invited the ire of the teachers.

A few months back, Bharti Foundation, the CSR arm of the Indian multi-national business conglomerate Bharti enterprise offered to construct toilets for her and her neighbours free of cost. The project is part of 100 crore initiative with an aim to provide 12000 toilets covering 900 villages in Ludhiana district. The toilets are being and built and maintained by Sulabh international, a globally renowned sanitation NGO with over four decades of experience in proving affordable two-fit plush toilets.

Parmajit says the toilet in houses brought remarkable comfort and a greater sense of hygiene and good health in their lives. Her medical bills have totally reduced and she is able to organize her household work in a better way, and her children are no longer late of school.

Parmajit echoes 300 million women across India who doesn't have access to proper sanitation and are often vulnerable to sexual harassment, assault, rape and voyeurism. In 2014, two young Dalit girls were raped, murdered and hanged to a tree in a village in north India, which attracted world–wide condemnation.

Taking stalk of the situation, the Indian prime minister, Narendra Modi, in his first address to the nation on India's independence day in 2014 called for a holistic action to end open-defecation and vowed to make sanitation one of his priorities of his government.

Dr. Bindeshwar Pathak, Sociologist and Social Reformer, the founder of Sulabh international,

says ‘to meet India’s goal, it needs to built around 12 million toilets for which it needs around 3,60,0000 million Indian rupees’.

Pathak says it is not clear how the government proposes to raise such amount. The state governments want the amount for the construction of toilets should come from the other sources but not from their own budget. The Indian government through the ministry of corporate affairs issued direction to all the companies with a profit of over 5 crores to spend 2% of the profit on welfare measures including sanitation.

In Ludhiana, most households without toilets were seen owning television and refrigerators. The villagers say such articles can be bought through instalments but constructing a toilet is expensive and there are no financial arrangements to pay for it.

Pathak says ‘bank loan to a beneficiary is the best way to finance the construction of toilets. It ensures transparency and efficiency’. The government offers a subsidy 12,000 rupees for every household which is not enough to construct a quality toilet. Further, it takes a lot of time for the money to trickle down through government’s complex machinery.

Monica Jain, a grassroots behaviour change campaigner says ‘if benefices take loan they will have ownership of the toilets leading to behaviour change’. Such experiments have been successful in Hirmathla village in the state of Haryana-60 KMs from Delhi-where the beneficiaries contributed 3000 rupees (10% of the amount), the rest were paid through the CSR initiative of a state owned corporation, Railtel.

The public and private sector undertakings have already started taking up the projects and it is expected that 20,000 crores may come from their contribution but more needs to be done.

Conclusion

Sulabh’s approach is based on partnerships with local governments, backed by community participation, and this has substantially improved environmental quality in rural and urban slums inhabited by poor people. Sulabh’s solution is a low-cost, pour-flush water-seal toilet with leach pits for on-site disposal of human waste. The technology is affordable for poor people because designs suit different income levels. Flushing requires only 2 Liters of water, compared with the 10:1 used by other toilets. Moreover, the system is never out of commission because there are two pits; so one can always be used while the other is being cleaned. The latrine can be built with locally available materials and is easy to maintain. It also has high potential for upgrading because it can easily be connected to a sewer system when one is introduced in the area. Since 1970, more than 1 million of the units have been constructed in houses. In addition, 5,500 have been installed in pay-and-use public toilets, staffed by an attendant around the clock who supplies soap for Pathak 029 washing hands. The public toilets include facilities for bathing and doing laundry and offer free services to children, disabled and poor people. As a result more than 10 million people have received improved, low-cost sanitation, and 50,000 jobs have been created. Sulabh’s door-to-door campaigns also provide free health education to millions of people. The organisation trains local people to construct more latrines themselves, and has helped set up and maintain fee-based community toilets in slums and other areas. The extent and magnitude of the sanitation problem is tremendous and as an organisation, Sulabh with its family of more than 60,000 dedicated volunteers must rededicate their services to be equal to the challenging tasks. ‘*We have miles to go before we sleep’* (Pathak 2010)

References

http://www.academicjournals.org/app/webroot/article/article1381913441_Pathak%20PDF.pdf

http://modelgovernance.com/open-defecation-in-india/

http://www.indiasanitationportal.org/index.php

http://writepass.com/journal/2012/11/an-essay-on-the-benefits-of-sanitation-in-developing-countries/

http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3299104/

http://www.indiacelebrating.com/essay/social-issues/swachh-bharat-abhiyan/

http://www.indiacelebrating.com/essay/social-issues/swachh-bharat-abhiyan/

http://www.indiacelebrating.com/government/swachh-bharat-abhiyan/

https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&cad=rja&uact=8&ved=0ahUKEwjbnqbflKPLAhXHGo4KHd_lBjcQFgg2MAE&url=http%3A%2F%2Fwww.wateraid.org%2F~%2Fmedia%2FPublications%2Fdrinking-water-quality-rural-india.pdf&usg=AFQjCNH8Ny97geq8NcdYNcekfdip6Y4j_Q&sig2=mbRvfMfTG2YeYx4koYeXQg&bvm=bv.115339255,d.c2E

http://www.un.org/waterforlifedecade/sanitation.shtml

http://www.unwater.org/downloads/sanitation.pdf

http://www.gandhi-manibhavan.org/gandhiphilosophy/philosophy_environment_sanitation.htm

http://www.ircwash.org/sites/default/files/Nath-2003-Home.pdf

http://www.sciencedirect.com/science/article/pii/S1353829214000768

http://unicef.in/Whatwedo/11/Eliminate-Open-Defecation