



Ecological sanitation in Sri Lanka

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Ecosanitation was practised in the monasteries of Sri Lanka in historical times, and flush toilets are a relatively recent introduction. In many areas, where water tables are high and water is in short supply, ecosanitation is the best solution.

The history of ecological sanitation in Sri Lanka dates back to the 4th century A.D. Museum relics from the Anuradhapura and Polonnaruwa kingdoms indicate that the sanitation systems built during these times were designed to dispose of urine and faecal matter separately. Instead of sending the waste directly into the environment as a pollutant, there is evidence to show that the excreta were used for agricultural purposes, after a systematic process of decomposition.

Historical ecosanitation

The Buddhist monasteries of this period had toilets made out of stone, with three

separate stone apparatuses for defecation, urination and anal cleansing. The stone structure for faecal matter was connected to a tank where decomposition took place. There is evidence of the addition of ash to treat faecal matter.

The urine was directed to a urine filtering system, from the urinal. This filtering system was buried under the soil and consisted of three pots containing sand, lime and coal, through which the urine filtered. Therefore the urine was treated before it reached the soil. It is believed that such care was taken due to the Buddhist religious belief of not causing harm or polluting the habitat of even an earthworm.

The washing apparatus was again a brilliantly carved stone, with a special stand for the water vessel.

In addition there were guard stones to cover and give privacy to the toilet user. These stones were interestingly inscribed with religious messages and verses reflecting the impermanence of life and all material things (including food and drink).

The shift away from sustainable eco-sanitation

While the Buddhist monasteries and palaces used this rather sophisticated stone apparatus for excreta and urine treatment, the general public used the forest for defecation. This, however, was not open defecation. They dug a hole in the ground, and then covered the excreta with soil. This way, the urine was quickly absorbed and the faeces soon became part of the soil. People would carry a water vessel to the spot for anal cleansing. At that time there were many fewer inhabitants and therefore sufficient land available, and no likelihood of polluting the environment or contaminating water sources.

This was the situation before the European invasions. The Europeans introduced the flush toilet system to Sri Lanka, which resulted in 'open loop' nutrient recycling. Although this system was entirely focused on increasing sanitation facilities for the people, with time this system has proved inadequate and unsuitable to our environment and not compatible with the country's weather patterns, social and geographical environment.



The squatting pan with hole at the back for defecation



A historical urinal made out of stone. The channel at the top of the picture would take the urine into the filtering system of three clay pots buried under the earth



A guard stone screens the user

However, the people did not know this at the time and, most importantly, they had not used any kind of toilet before, and therefore accepted the flush-toilet system as the universal solution to better sanitation. The flush system seemed to be the easiest and quickest way to dispose of the excreta and, gradually, less attention was paid to the importance of proper disposal.

Sanitation issues after the 2004 tsunami

In the aftermath of the 2004 tsunami devastation, millions of dollars flowed into the country for rehabilitation and reconstruction of devastated areas. Together with the funding came a wave of foreign consultants to support the reconstruction process, along with the many organizations that entered the country to complete the rebuilding activities within a short period of time.

As a result, rehabilitation and reconstruction took place without proper planning. Large housing settlements were established without consid-

ering environmental conditions and social factors of the area. Inappropriate constructions of toilets, which overflowed in areas of high water table, and inadequate drainage facilities resulting in water stagnation after rain are some of the side effects of poor planning and construction faced by the people two and a half years after the tsunami.

Reintroducing ecosan to Sri Lanka

In the year 2001, a pilot project on eco-friendly sanitation was carried out in the wet-zones of Sri Lanka by the National Water Supply and Drainage Board in collaboration with two local NGOs and consulting with the organization, Eco-solutions, India.

Keeping in mind the successful findings of this pilot project and the need for appropriate sanitation that suited the different topographic, climatic and socio-economic conditions of tsunami-affected areas, Practical Action embarked on the ecological sanitation project in 2005. The new

model of the dry compost toilet, which was developed by the project with the assistance of Paul Calvert (Eco-solutions) and Kannan Pasupathiraj (Action Contre La Faim), was later approved by the Ministry of Health as a suitable alternative sanitation system.

After the tsunami, in addition to Practical Action, other organizations installed ecosan toilets in their reconstruction projects in Sri Lanka, such as UNICEF, Action Contre La Faim, Australian Red Cross, American Red Cross and International Federation of Red Cross (IFRC).

Social, cultural and environmental issues

In Sri Lanka there are different types of excreta disposal systems that are currently used, of which the water-seal pour-flush pit toilet, water-seal pour-flush septic tank and simple pit toilet are the most common. The sewer systems are used in highly populated urban areas. Two main types of apparatus are used for water-seal toilets; the squat-



The fourth-century three-tier urine filtering system. Urine entering the top is filtered through first sand, then lime, then charcoal

ting pan type and pedestal (commode) type. Of the two, the pedestal type reflects high social status, while squatting pans are used by low-income groups and also in public toilets.

When introducing the dry compost toilet, there were several issues regarding people's attitude that needed to be overcome. People regarded the commode-type or a squatting flush toilet as 'proper toilets'; and some feared that neighbours would think they had a 'poor' system, which would lower their social status. Many also confused the dry compost toilet with the bucket-type toilet used in the 1940s. The bucket-type toilet or sludge bucket – into which the faecal matter and urine are both sent – was maintained by low-caste people.

Moreover, government officials in the health sector, especially the Public Health Inspectors (PHI), were not aware of the eco-san system, and therefore opposed their construction in some

places. Another problem faced by the project was that the people affected by the *tsunami* were not willing to try out a new system as they had gone through a number of pilot experiments that had been carried out by various organizations after the *tsunami*.

Issues related to the use of the dry compost toilets include:

- Some do not like to see faecal matter from the hole, even through it is covered with ash.
- People think it will be difficult to direct urine and faeces into separate places.
- Women in particular had serious misgivings. They thought the toilets would be difficult to use, and that during a woman's menstrual cycle the wash water would carry pollution to the soil in the plant bed. In addition, some women used to flush sanitary napkins into the toilet and they therefore needed new options for sanitary napkin disposal.
- Water sometimes goes into the faecal chamber accidentally or due to a lack of awareness (in which case more ash or soil can be added).
- Finding ash is difficult in some areas.
- Due to a lack of general awareness, the system has to be explained to visitors before using it.
- Some people do not like to handle ash, as it not as easy as water

flushing, so there is a need to introduce an ash flush toilet or an ash cistern.

- Health officials have doubts about the hygiene of the wash water as it contains small particles of faecal matter. They think it pollutes the soil in the plant bed.
- Fortunately there are several situations where people are particularly interested in the dry compost toilet:
- In areas where drainage is poor, or where the water-table is high (e.g. near rivers, streams, and lagoons), digging a pit-latrine is a risky and an unpleasant task. Toilets built here cause many problems such as flooding and over-flowing, due to the shallowness of the pit and the high level of ground water.
 - In villages where people struggle to collect clean water for daily consumption, conventional flush-toilets are extremely unpractical, because they use a lot of water.
 - Flush toilets are also not practical in areas where the terrain is rough or hard, as it is more strenuous and costly to dig a deep pit.
 - In congested urban settlements, it is often difficult to maintain the mandatory 50-foot distance between the well and the toilets.
 - Because of the dense population in these areas, the cesspits overflow



The compost toilet (eco solution, India model) showing on one side the water bucket and on the other an ash bucket



A compost toilet built in Hambanthota, 2006

regularly, and it is very costly to get a gully bowser to drain them out. Often, there is insufficient room for the bowser to reach the cesspit through the closely constructed houses.

- Emptying the compost manure every two years from an eco-toilet cell is

much less unpleasant than draining out wet sewage regularly from a septic tank.

- A flush toilet takes much more time, effort and money to build, than a compost toilet. A compost toilet takes three to four working days by two builders, and is 60 per cent of the cost of a conventional flush-type squatting pan toilet.
- The daily water and nutrient supply to the plant bed from the urine was considered as an additional water source for plants in water-scarce areas.
- Rural households with no toilets opted for an eco-san toilet on their premises, as defecation in the open is unsafe for women and hazardous during the rainy season and at night.



Banana plants are fed by urine and wash water (Ampara ecosan toilet, 2007)

Interestingly enough, there were several reasons given by rural people for not using any type of indoor toilet for defecation. Some villagers expressed their preference for using the jungle or the beach, as they could see the sun and imagine the rice growing, hear birds singing, feel the fresh air, touch the sand with their toes and feel they are a part of nature. Some informed us that in order to defecate, they need to smell the wild flowers and the woods around them.

Conclusion

When considering the high water table, lack of water, rocky conditions, and dense population in rural and urban areas of Sri Lanka, the compost toilet may be the most suitable solution to sanitation in many areas of the country.

If we introduce ecosan toilets, however, the following points should be borne in mind:

- The toilet should be free of construction errors.
- The households should be familiar with hygienic practices, because success depends on better use and maintenance.
- A thorough understanding of the system, and how to use and maintain it is necessary prior to use.
- Follow-up is a crucial factor, which affects the success of adoption. This lasts until the user gets the first harvest of compost.
- Follow-up is essential immediately after a change in weather such as heavy rains or floods.

It is important that we do not automatically adopt everything that is handed down to us from various sources. We need to carefully consider the different technologies that we have inherited, and choose what is best for our lives, and the environment in which we live.

About the author

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