

Seeing (but not smelling) is believing — Kerala's compost toilet

by Paul Calvert

Pit latrines are cheap and effective — unless you have a high water-table. What's the alternative? And is it culturally acceptable?

THE MARINE-FISHING communities of Kerala, in south-west India, are important contributors both to local food supplies and to the country's export earnings — 75 per cent of the region's animal protein, while fish from Kerala accounts for 25 to 35 per cent of India's marine-product export earnings. But despite this apparent economic success story, living conditions for most of Kerala's fisherfolk are overcrowded, unhygienic, and impoverished.

Men defecate on the shoreline, while women and girls use a number of designated pieces of land around the vil-

lage. These plots are very congested and over-used. It is almost impossible to walk in these plots without coming into contact with the raw faeces — and most of the users are barefoot. In the home, much of the food preparation and eating is done on the floor. Typically, over 80 per cent of rural Kerala households have no latrine facilities, and at least 50 per cent are obliged to fetch their water from communal wells. The proximity of these wells to private soakaways or pit latrines has resulted in water heavily contaminated with coliform bacteria. It is hardly surprising that intestinal worms and diarrhoea

are endemic, or that outbreaks of cholera and dysentery occur year after year.

Raising awareness

A lot of good work on sanitation has already been done in many of the fishing villages in Kerala, through effective awareness-raising and the construction of pit latrines. But, although relatively low-cost, this technology does not suit these crowded fishing villages with a high water-table. Consequently, many of these villages are completely neglected with regard to sanitation and related education.

Intermediate Technology (IT) has been working with two well-respected, local organizations: the Programme for Community Organization (PCO), and the Pulluvila Mahila Samajam (women's group) to tackle some of

Hygiene survey

Two fishing villages in Kerala were surveyed: the project village and a control village. There were 49 respondents in the project village and 18 in the control village.

● *Attitude to children's faeces*
There were two points for observation and one question. The question was, 'Is children's faeces harmful to our health?' The observations were: 'Are the adults' hands washed after handling the child's faeces or cleaning the child's bottom?', and 'How are children's faeces disposed of?'

At least two out of three

people think that children's faeces are not harmful to health. In the project village, 67 per cent do wash after handling children's faeces, a figure that rises to 89 per cent in the control village.

With regard to the disposal of children's faeces, people displayed a considerable lack of understanding of the health implications (see Table 1 below) with almost 90 per cent of respondents in both the project village and the control village leaving it on open ground, the beach, or in open gutters. Only 10 per cent of the project villager surveyed threw the

excrement into a latrine or buried it. In the control village, the figure is 5.5 per cent.

● *Source of drinking-water*

In the project village, only 41 per cent of respondents usually take their drinking-water from a standpipe. Thirty-one per cent usually obtain it from public bathing wells. In the control village, the corresponding figures are 17 and 56 per cent, respectively.

More than half (53 per cent) of the respondents in the project village have to take their drinking-water from a public bathing well or from another family's well (78 per cent in

the case of the control village respondents). All the wells are open. Also, the number of private family wells is

quite limited; the preliminary data indicates that there are only 136 wells in the village, of which 10 are large public bathing wells. In response to the question, 'Do you ever take your drinking-water from the public well?' 55 per cent of the project village respondents said 'yes', and 39 per cent said 'no'. Among the control village respondents, the figures are 61 per cent and 33 per cent. If one looks at the difference between the percentage of respondents in the project village who usually take drinking-water from the public well (31 per cent), and the percentage who sometimes do (55 per cent) it gives some indication of the pressure on drinking-water supplies.

Children's handwashing habits were also observed. In the project village, observers found that approximately half the children washed their hands before meals and after defecation. But the majority of these wash only one hand, and do not use soap. After defecation, those that do wash tend to wash both hands with soap. In the control village, about 60 per cent of the survey sample do not wash their hands, either before meals or after defecation.

Table 1. Villagers' attitudes to children's faeces

	Harmful to health?		Do you wash after handling?		Where do you dispose of them?			
	Yes	No	Yes	No	Pit	Open ground	Open beach	Open drain
Project village	11	37	33	14	5	30	11	3
Control village	6	12	16	1	1	12	1	3

Table 2. Village drinking-water sources

	Source of drinking-water				Do you ever take your drinking-water from a public well?	
	Own well	Other family's well	Public well	Standpipe	Yes	No
Project	2	11	15	20	27	19
Control	1	4	10	3	11	6

The compost toilet

It was decided to explore the use of compost toilets; an option which would reduce water usage (currently between 20 000 and 50 000 litres per family per year) significantly. An even greater advantage is that water cannot be polluted with faeces and, therefore, the community does not have to go to great lengths to clean it again or dispose of it (and create a nuisance elsewhere for someone else). The compost toilet could be built to keep the faeces and urine out of the water-table and off the ground; away from feet, flies, dogs, and crows. There would even be a useful end-product, compost, which could be added to the flower beds at the community latrine, where jasmine is grown and sold as hair decorations.

The first compost toilet, illustrated in Figures 1 and 2 simply comprises a raised slab over two vaults; plaster keeps the vaults waterproof. Villagers deposit faeces into a hole over either of the two vaults and a funnel receives their urine. At the centre of the slab, between the two vaults, there is a trough above which people carry out anal cleansing. This trough is connected to the urine funnels, and flows to an evaporative reed-bed outside the latrine. Before the start of each six-month use cycle the vault is primed with a bed of straw, and the user sprinkles a spoon of ashes onto the faeces after each use.

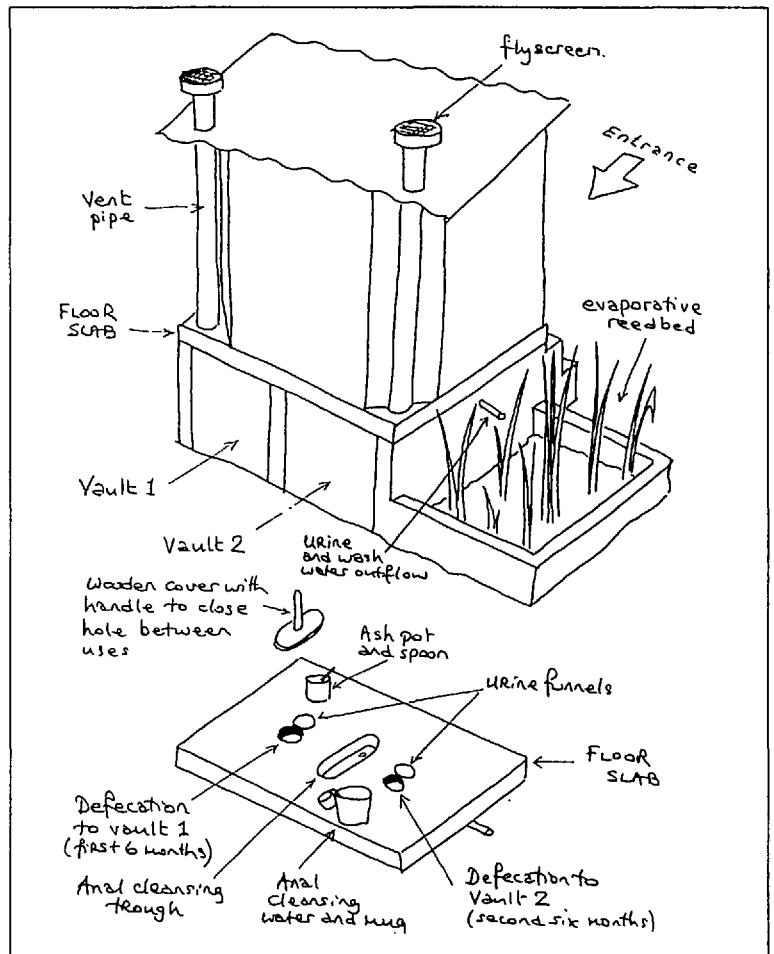
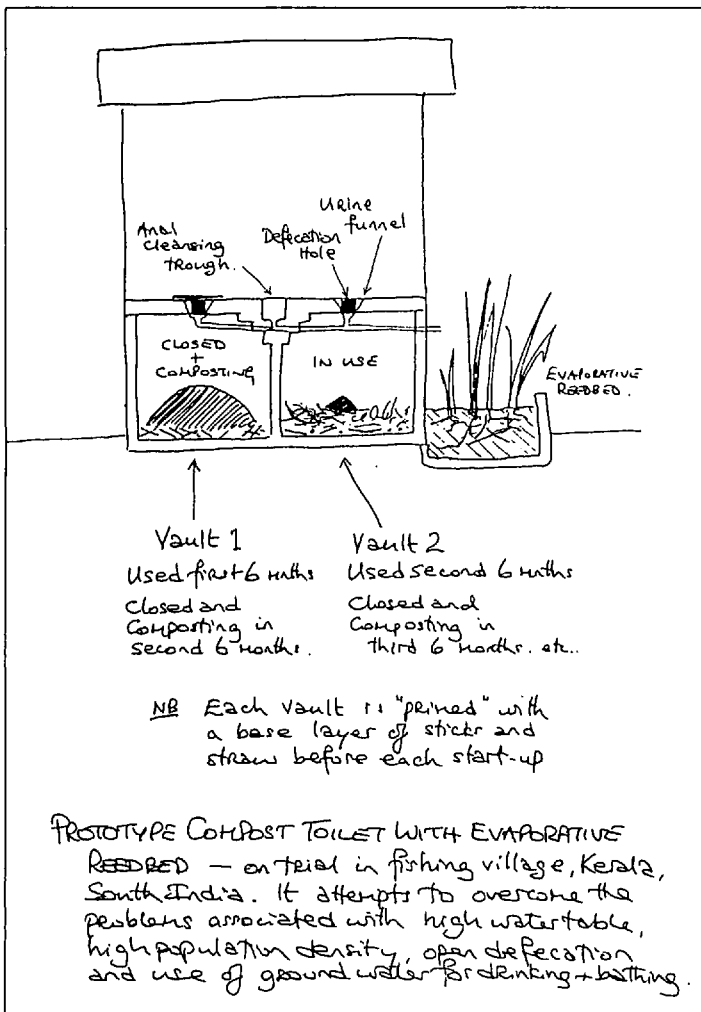


Figure 1 (above) and Figure 2 (below). The prototype compost toilet with evaporative reed-bed developed in Kerala, south-west India.



these problems.

When the collaboration began, the villagers demonstrated very little awareness of the links between health, hygiene, sanitation, and water. People did not know that virtually all their wells were contaminated with faecal coliforms, or how this had happened; or that this was a major cause of sickness. Most people believed that bad smells make you sick; hence the clearing of throats and spitting on encountering one. The women considered open defecation to be distasteful, as it afforded them no privacy. Handwashing before eating or preparing food, or after defecation was neither routine nor properly understood. Before deciding on the right course of action, therefore, IT, PCO and the Mahila Samajam carried out a hygiene survey to establish exactly what people knew, did, and wanted (see box on page 30).

The right latrine?

In 1994, a community latrine was built in response to the women's expressed desire for greater privacy, and a little dignity. Still operating, the latrine utilizes a series of lagoons which incorporate aquatic plants to treat the effluent. The latrine is managed by women from the Mahila Samajam who collect a user fee of Rs0.25 at the gate to cover cleaning, maintenance, and staff costs.

But, although the users feel that the community latrine is a great improvement, and fulfils their original wishes, what many of the women would really like is a latrine at home. In addition, a home latrine would be a starting point for attempts to

reduce the men's open defecation. As indicated above, pit latrines are inappropriate because the village wells are so close to people's homes, which are built on sand, and the water-table is so high (0-1m below ground).

The women are the prime movers for change; they are much more aware of these problems, which they have thought about and discussed at workshops and meetings over the last three years. Now they want a latrine that will not only give them privacy but which is smell-free; does not encourage flies; and will not contaminate the groundwater.

Non-options

Faced with these requirements, the collaborative team did not appear to have a great range of technologies to choose from. If a reliable and adequate piped-water supply for everyone in the village could be assured, putting the sewage into the ground — using soak-aways, pit latrines and septic tanks — could be considered. The women's group considered this option, but no one felt confident that this type of water supply would become a reality, given the increasing burden on water supplies from the city and tourism; fishing communities always seemed to be the losers. And anyway, the villagers would still have to use their wells for bathing and washing: 'No, we have to look after our own water supplies and that means taking care of our wells.'

tem serving the community latrine would take up too much space; it would be difficult to use the final effluent during the monsoon rains when the land is waterlogged; and, in any case, would not work well under a thick cover of coconut palms.

Open sesame!

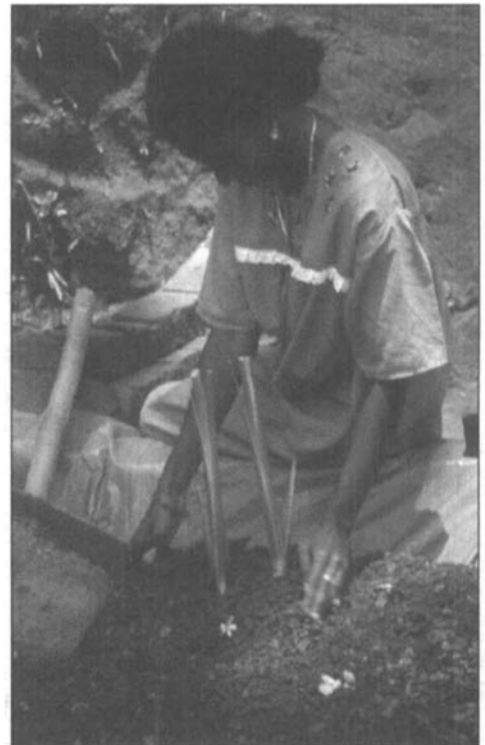
The first vault of the prototype compost toilet was opened a year after it went into operation. Six women used vault I every day for six months; then they switched to vault II, leaving the faecal matter in vault I to compost for the next six months. There have been no problems with flies or odours, and the toilet has remained clean and pleasant to use. The reed-bed needed additional watering, indicating that a smaller area would be sufficient.

The compost results were very encouraging; inside the vault was an almost dry, crumbly, black product with only a light, pleasant, 'earthy' odour. This 'unveiling ceremony' was the acid test; the merest hint of a smell or something unsightly would have meant instant death for the experiment. PCO's managing-committee secretary and civil engineer were looking on as we opened the back wall of the vault. As each brick was removed, they retreated another pace, quite convinced they were witnessing the opening of the gates of hell; they are now enthusiastic promoters!

Mahila Samajam members, all the PCO staff, various villagers, old and young, and *panchayat* (local government) members came, with considerable trepidation, to see the product at what was probably the greatest awareness-raising event for this technology to date; seeing (and not smelling) is believing.

Eleven more compost toilets are being built in the village. Six of these are going up in Mahila Samajam members' houses. The credit goes to Leenama, the local team animator, and the team members Sameema, Stalin, and Benny. The PCO agreed to subsidize the first six village toilets, so the women paid the first Rs1000 of the Rs5000 cost. This compares with about Rs3500 for a single pit latrine. (\$1 = Rs37, £1 = Rs59.) The experience gained, and the positive reactions in the

community have resulted in the ongoing development of a smaller unit at a more competitive cost.



Above and below: Sameema and Stalin prepare the evaporative reed-bed.

As we go to press, we can report that, for the past five months, families in the village have been operating six compost toilets, in addition to the six on the community latrine site. All of them are functioning well, with no flies, no smells, and no problems!

One of the objectives of this pilot project is to leave the Mahila Samajam with a socially, economically, technically, and environmentally sustainable community latrine. The Mahila Samajam President is keen for the community latrines to consist entirely of compost toilets, which she considers to be manageable, which save a huge amount of water (both in initial use, and by avoiding polluted groundwater treatment). She is also enthusiastic about how easily the women are adapting to its use. At the end of 1996 it was possible to construct a compost toilet for around Rs3500 (just under £60).

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Clearly such luxuries as waterborne piped sewerage were out of the question. Even a basic system is expensive, but in Kerala, the pipework would be in the groundwater, and the low-lying land would also necessitate pumping stations. Night-soil collection was a non-starter as people are highly offended by their own faeces, let alone their neighbours'! The lagooning sys-