

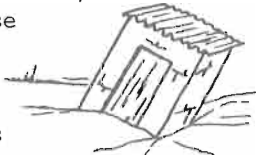
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PEOPLE AND PIT LATRINES IN AFRICA

In the design and location of pit latrines people are far more important than concrete and steel bars. A latrine is built once, but if each user visits the latrine twice a day, a good pit may be used a hundred thousand times during its life!

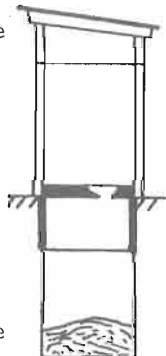
Like people, pit latrines in Africa are found in a great variety of shapes and sizes. They may be good, bad, or indifferent. The simplest, possibly the most common, and certainly the least satisfactory form of pit latrine consists of a hole in the ground about a metre across and two or three metres deep.

A couple of logs or rough planks are placed across the top. The users put their feet on the timbers and defaecate through the gap between them. Such simple latrines are dangerous for children and old people, especially at night. They attract flies, emit odours, and often collapse during the rainy season. The timber becomes fouled with excreta and is difficult to keep clean, so worm infections are passed to bare-foot users. The timber is also subject to attack by termites and fungi, and collapse of the floor is not uncommon.



When the pit becomes full another pit is dug. It may take three or four years for an average family to fill an average pit, but in some areas pits fill or overflow every rainy season.

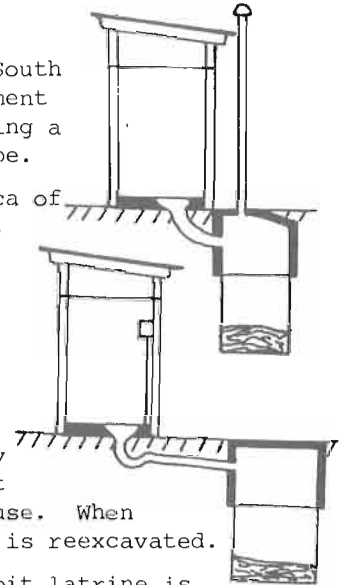
The best simple pit latrines have deep pits in firm but porous soil. A lining near the top prevents collapse of the sides and supports a concrete cover slab with a smooth easily-cleaned surface. The floor is raised above the surrounding ground so that surface water by-passes the latrine. Some pits in East Africa are over ten metres deep. Others are large in plan. The life of such pits may be very long. Owners say they 'never fill up'. In fact there is gradual accumulation of non-biodegradable matter, but pits still in use after twenty years are often found.



Usually the floor slab and the latrine building are immediately over the pit, but various types of *offset* pit are in use. The pit may be completely outside the latrine building, or partly outside and partly inside.

The Reid's Odourless Earth Closet (ROEC) patented in South Africa with an asbestos cement chute, has been adapted using a more-easily cleaned PVC pipe.

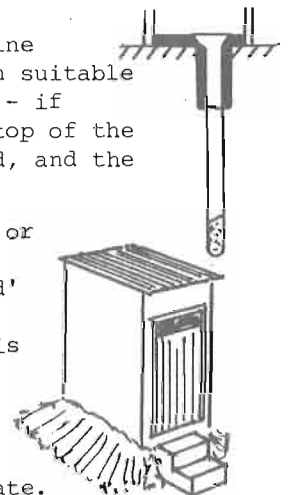
There are examples in Africa of offset pour-flush latrines, although they are more common in Asia. Excreta is flushed down a short length of pipe from a water-seal trap by a small quantity of water. In one type there are two pits connected to the latrine by a Y-junction. When one pit fills the other is put in use. When that is full the first pit is reexcavated.



An essential feature of a pit latrine is infiltration into the surrounding soil of liquid - water used for anal cleaning, rainwater in unroofed latrines, surface run-off into low-level latrines and liquor from the breakdown of faecal solids. The accumulation of solid matter depends on a variety of factors, and is obviously more rapid when solids other than faeces are dropped into the pit.

Modifications of the pit latrine include borehole latrines. In suitable soils they can be dug quickly - if equipment is available. The top of the hole inevitably becomes fouled, and the hole fills up quickly.

Where the water-table is high or rock makes deep excavation difficult an elevated or 'mound' latrine is sometimes built. Part of the storage capacity is above ground and the walls there should be completely watertight. An open bottom and open joints below ground level allow liquid to infiltrate.

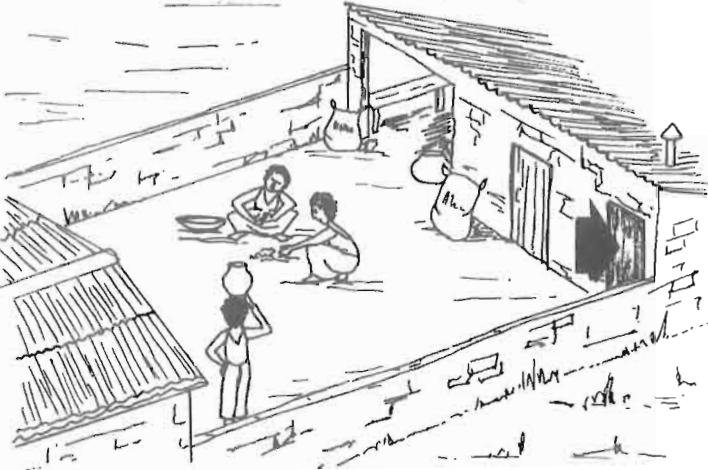


Three aspects of pit latrine technology deserve special attention: the pit lining, removal of accumulated solids, and ventilation.

In many soils a lining is necessary. Soils which appear stable when the pit is dug in dry weather may collapse when the sides are saturated with liquid. In tropical rural areas whole or split bamboos provide a readily-available lining material. Even if they eventually rot, they probably retain the soil until faecal solids

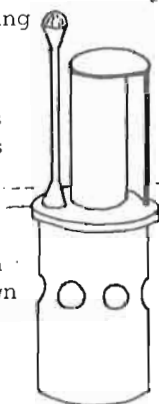
build up in the pit. Some pits are lined with masonry or blocks. In fact, some linings are too good. Built with mortar joints and even rendered they prevent the outward passage of liquid. The pit is effectively a cesspit and quickly fills.

Where there is plenty of space and linings are cheap the usual practice is to dig a new pit when the old one is full. This is impossible or uneconomic in high-density housing with small plots or where expensive linings are used. In some municipal areas a tanker emptying service is available, but even when the tankers are capable of lifting solids the operators are often reluctant to empty the pit completely because of the risk of pipe blockage by old shoes and similar objects. With the usual type of floor slab supernatant liquid is removed by inserting the tanker's pipe through the hole, but the slab has to be taken off if the tank is to be completely emptied. Some local 'manual' methods of emptying pits are very unpleasant(1). Consequently many 'improved' designs have a removable slab or access cover outside the building, usually behind it. The best position for the access depends on considerations which have more to do with people - the users - than with technology. In the compound-type layout common in African urban areas the latrine opens on the yard where much of the household activity takes place. In some moslem communities the yard is the preserve of women. People prepare food, cook it and eat it in the yard. Therefore it can reasonably be argued that pit emptying (with the possibility of spillage, bad smells and so on) should not take place in the yard. Access to the front of the latrine may be actively opposed by women using the yard.



On the other hand placing the access behind the latrine moves it outside the owner's view, and some owners like to keep an eye on emptying work for which they pay. An access cover outside the plot is also liable to damage by passing vehicles or causes obstruction in a public thoroughfare.

The main purpose of pit *ventilation* is obviously removal of unpleasant smells from the latrine, and most 'improved' latrines include a ventilation pipe. Reduction of fly-nuisance may be equally important. The Blair Research Centre, who developed the latrine shown here, tested pits with large-diameter ventilation pipes and found that the



fly-population was greatly reduced (2). A black pipe on the sunny side of the latrine has been advocated. However, as with the access, the users' choice may over-ride technical considerations. It is pointless providing a highly efficient vent pipe behind the latrine (and consequently outside the compound) if the out-of-sight pipe is soon broken by vehicles or playful youths.

Nuisance from smell, flies and mosquitoes is reduced, or even eliminated completely, if a water-seal is placed between the pit and the latrine. Simple traps are suitable for those parts of Africa where anal cleaning with water is the customary practice. Water-seals cause trouble if solid material is used for anal cleaning. Corn-cobs, stones, leaves, rags, old newspaper and office stationary are widely used in Africa. The trap becomes blocked. A stick or iron bar is used to clear it, and the trap is broken!

The question of anal cleaning brings us right into the orbit of user behaviour and preference. Important factors in the use of latrines (and consequently the best design, location and construction) include the following -

- whether users squat or sit -
- the material used for anal cleaning -
- whether users like to bathe immediately after using the latrine, and whether they bathe in the latrine -
- whether there is an inhibition or embarrassment in the use of the latrine, or do people go there quite openly -
- whether there are any taboos against the use of a latrine by different members of the family: man and women, old and young, and so on -
- whether communal latrines (shared by more than one family) are acceptable -
- whether faeces of infants are put in the latrine.

These and similar matters are governed by culture. Culture of this kind varies within short distances, between urban and rural communities, between old and young, between rich and poor, between educated and uneducated. When cultures intermingle, as in a squatter settlement, the pattern may be very confused, and we come to another consideration: how readily do people of various backgrounds change their habits in a new environment?



How receptive are different people to new techniques? How willing are they to respond to change, to alter their habits and to adopt new patterns of sanitary behaviour? These questions are critical to our understanding of the success and failure of individual schemes. Long-established practices of water-use and excreta disposal may bear a unique significance reflecting cultural taboos and social preferences within communities which are not quickly relinquished. In considering the issue of adaptation reference must be made to the forces which stimulate behaviour patterns.

a. Change may be effected within existing rural and urban communities through external influence. Official programmes for sanitation improvement

demand of residents a flexibility and a willingness to adapt. Where customs are firmly established this may be difficult. Under such circumstances knowledge of these habits and preferences is critical at the outset. Indeed it is widely accepted that a degree of community consultation and participation during the course of a project's design, implementation and maintenance are essential prerequisites for success (3).

b. Alternatively change may be precipitated by the individual himself as a result of his decision to move from one environment to another. In the new environment he is faced with alien conditions and circumstances which may force him to change his habits. Indeed free from the customs of the home area he may be more willing to do so. In the Third World and in Africa in particular the most dramatic change of environment is that between rural and urban areas. Today the majority of people who move must cope with this transition.

In broad terms the degree of responsiveness and the speed of adaptation vary with two sets of factors -

- those relating to the individual - his personal background, cultural traditions, economic status and motivation for movement -
- institutional factors including official policies for sanitation improvement and the incentives offered by government to effect change.

As regards the individual migrant, evidence from throughout Africa confirms that rural-urban movement is a selective process, the highest rates of mobility being recorded among the young better-educated (4). For them movement is a conscious decision to seek a better income and more secure employment than is available in rural areas. For this group adaptation to urban life in general may be relatively quick. They are receptive to innovations and adopt new patterns of water use and excreta disposal without difficulty. Indeed for many the rural-urban transition is not great. They are the products of wealthier rural families who may have simple but adequate pit latrines. Formal training at school may have included the basic principles of sanitation and health education. Furthermore the extended family or friends in town fulfil an essential role in their adaptation to urban life by providing accommodation, social and economic security until the young job-seekers are themselves established. Although their urban experience may begin in a low-income housing area with the most basic pit privy, nevertheless the opportunity for social and residential mobility within town is perceived, sought and often secured with relatively little difficulty.

However while rates of movement are highest among the better-educated youth, in absolute terms this group is small by comparison with the large volume of poorly-educated, unemployed rural migrants with no urban contacts and little prospect of upward mobility who move to the squatter settlements on the periphery of African towns. Their spacial segregation presents the most serious set of problems for urban authorities. There is much evidence to

confirm that this low income group reproduces many facets of rural life within the urban environment (5). While inevitably the cultural context influences the types of social organisation preserved, nevertheless certain features are shared in common. The traditional kinship system is maintained and frequently extended to include individuals of similar ethnic or regional origin producing a new category of 'fictive' kin. The code of reciprocal rights, duties and obligations which govern the conduct of individuals to each other persists, particularly when such groups are in close proximity to each other. Through the exchange of services (food, information, cash) between kin members and the mutual security they provide, urban social adjustment is facilitated. Further evidence for the rural attachment is reflected in the remittance system and through the frequent return visits of migrants to attend ritual ceremonies. Even the physical appearance of migrant neighbourhoods reflects the traditional style. Their makeshift homes conform to the widespread rural settlement pattern of individual household plots often with a boundary fence and open courtyard. These squatter areas are devoid of basic services with the result that there is no reason for residents to alter their traditional sanitary practices. With no understanding of toilet facilities the open highway or railway track acts as a useful substitute for the fringes of the home village. Lack of instruction in the health risks involved or in the value of simple alternatives means that they do not perceive their habits as a threat.

Under what circumstances is this behaviour likely to change? The influence of institutional factors is critical. It is apparent that policies to raise standards of sanitation achieve greater success when they form part of an overall strategy for the improvement of social infrastructure as a whole. During the 1970s there has been a profound change in attitude towards squatter settlements and the informal sector activities in which a high proportion of squatters are involved. The traditional bull-dozing approach coupled with elaborate and subsidised programmes of resettlement are giving way to policies which seek improvements in situ at costs which can be recovered from the urban dwellers themselves. Squatter upgrading has become an acceptable urban development policy. There are two fundamental reasons for this change in emphasis -

- economic - the rate of low income house building cannot satisfy the increasing demands of rural migrants -
- socio-cultural - the failure of institutionally-built housing to meet the social needs of rural migrants. Only by a sensitivity to and an awareness of the traditional practices of rural people is their confidence enlisted and new schemes more quickly accepted. Clearly the initial approach is vital to the achievement of success. This basic principle has been harnessed in many upgrading schemes.

The experience of Botswana illustrates the success of such an approach. The Old Naledi squatter settlement on the south-west fringe

of the capital city Gaborone, comprises one-third of the city population (ie 10 000 residents). The community dates back to 1963 when the site of the new capital was designated and a camp was needed for construction workers. A decade later when the community had grown to a squatter area 8 000 people resettlement schemes were initiated elsewhere in the city whereby residents should be provided with low income housing. Then two years later in 1975 pragmatism - the sheer volume of rural migrants and the inability on site and service schemes to absorb the numbers involved - encouraged a major shift in official policy. Naledi was to become a legal residential extension of the capital and to be upgraded to predefined standards.

Three basic criteria guide this new approach -

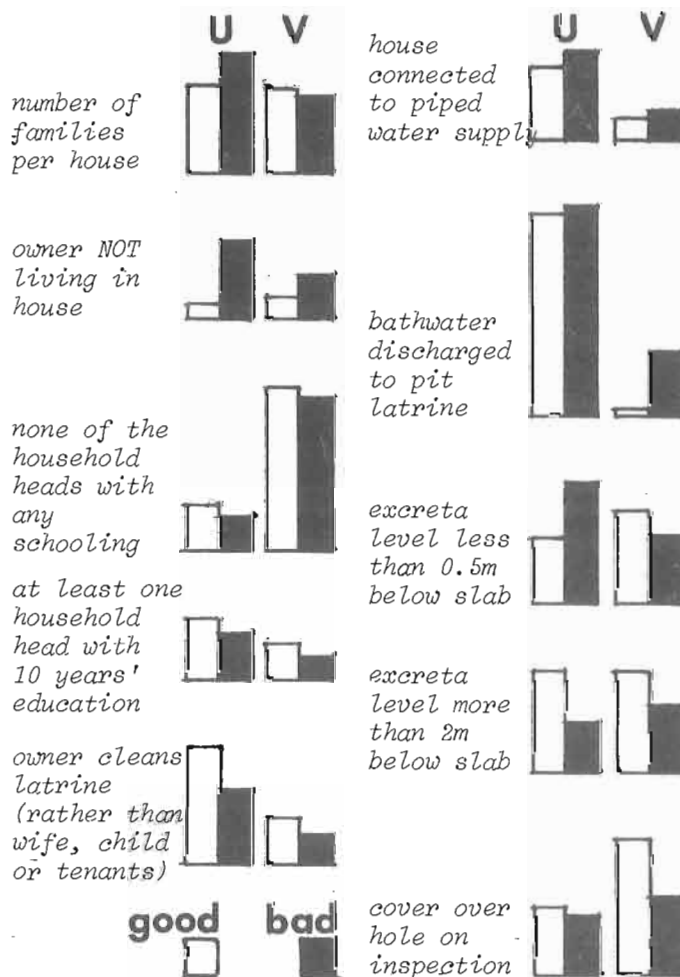
- that the provision of social infrastructure is appropriate only if it can be afforded
- that the costs are recoverable; and
- that the scheme can be replicated elsewhere

Fulfilment of these criteria demands not only a low cost solution to social and environmental problems but also one which is based on the principle of self-help. Indigenous enterprises and initiative are fundamental.

Residents are required to secure a Certificate of Rights over individual plots on a 99 year lease. The procedure by which legal occupancy can be obtained reflects the government's priority attached to improvements in urban sanitation. It is initially required that all plot holders install a latrine. Only when this condition has been met may they construct a "sound" house. Loans for building materials are provided by the Gaborone City Council together with advice and instruction in building methods. In deciding upon the most appropriate toilet facility for the squatter area extensive research was undertaken by the government and specialised agencies. A system was required which used little water, was simple to operate and maintain and was acceptable to the people. The modified ROEC met all these requirements. A major advantage was that it avoided the need for water carrying and periodic emptying which is socially unacceptable in Tswana culture (as indeed it is in much of Africa). While the provision of appropriate facilities does not ensure improvements in sanitation behaviour, proper use and maintenance is a requirement of continued tenancy and is therefore an important motivating force. The toilet facility is constructed in an outhouse within each designated plot and this structure itself is regarded as a status symbol among the squatter community.

Clearly effective and long-standing improvements in sanitary conditions and behaviour within squatter areas require that the migrant's personal commitment is enlisted. The experience of Botswana emphasises that changes are most effectively introduced if they form part of an overall package of infrastructural developments involving the principle of self-help.

A very thorough study of over 350 existing pit latrines was recently carried out in Dar es Salaam, Tanzania, by the Low Cost Sanitation Unit of ARDHI (Ministry of Lands, Housing and Urban Development) in collaboration with the UK consultants Howard Humphreys and Partners. Analyses of data were particularly interesting when the latrines were divided into 'good' and 'bad', based on their nuisance by smells, flies, mosquitoes and cockroaches. The diagrams below show how various sociological and technical matters influenced the state of the latrines. The survey covered both urban areas (U), which included squatter housing, and villages (V) within the Dar es Salaam Master Plan area.



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