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Single and double pits in Lesotho

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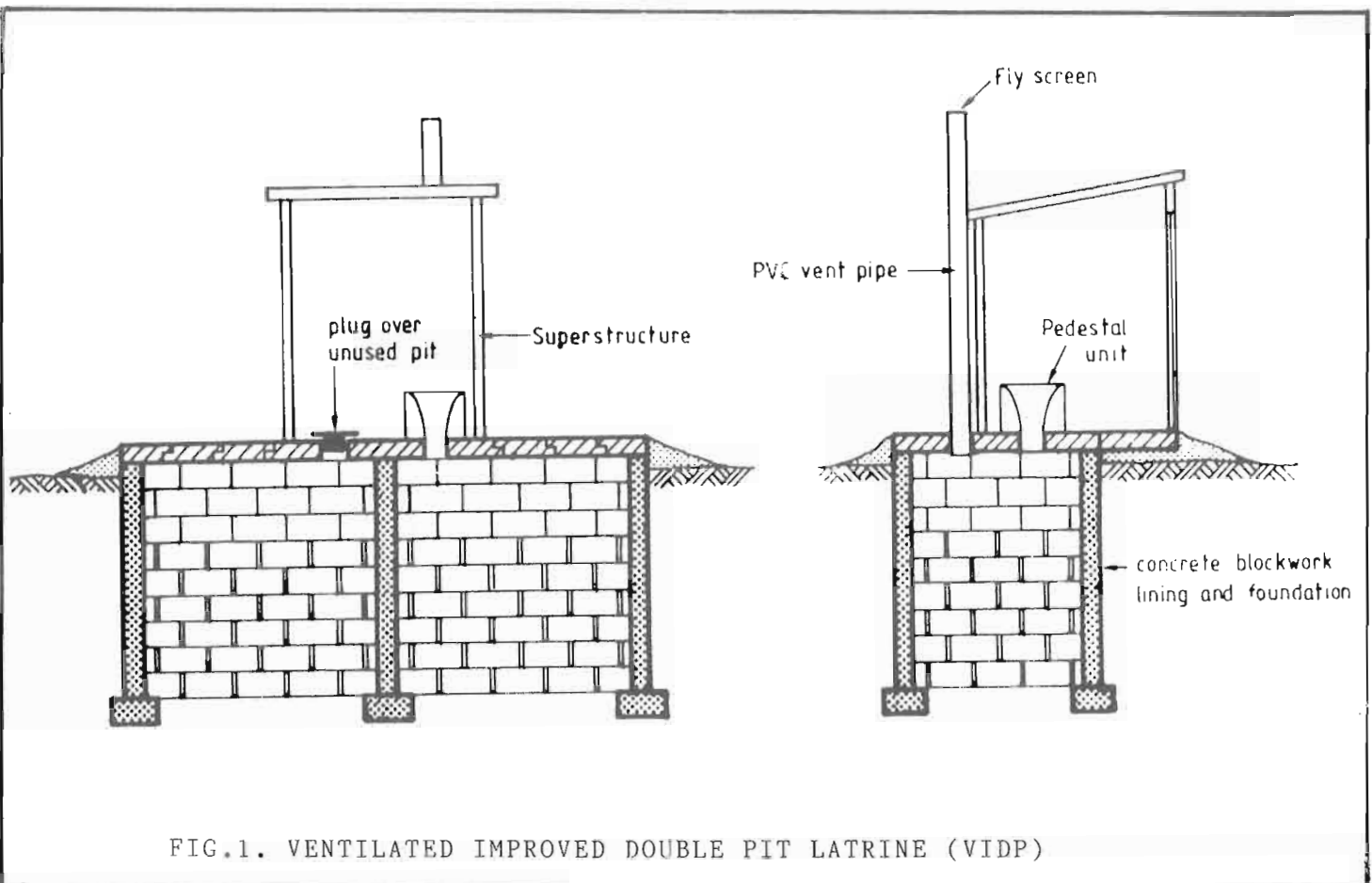
SUMMARY

More than a thousand Double Vault Ventilated Improved Pit-latrines (VIDP) have been built in Maseru, Lesotho. The largest concentrations of the latrines are in the low cost sites and services areas of Katlehong and Khubetsoana. These latrines have also been promoted widely by the Urban Sanitation Improvement Team (USIT) in the rest of the peri-urban area and many rural people have opted for this type of latrine and constructed it with help either from USIT or the Rural Sanitation Project (RSP). Because of the ingress of groundwater in many of these latrines, it has not been possible to achieve complete separation of the contents of the two pits and cross-contamination has been evident in many of them. USIT has therefore been led to re-consider further promotion of this type of latrine.

INTRODUCTION

VIP latrines of the Double Vault type (PIP or VIDP) have been promoted throughout the developing world as an appropriate, affordable and adequate sanitation option offering, above other VIP types, permanence, the avoidance of the dependence on mechanical de-sludging and possibilities of the use of digested contents as a soil conditioner.

This paper deals with the experience of USIT with the double pit latrines in Lesotho. USIT is a multidisciplinary team in the Ministry of Interior concerned mainly with the development and delivery of appropriate sanitation technology for under-privileged urban dwellers in Lesotho. Because of the similarity between the peri-urban areas and the rural areas (especially in the lowlands of Lesotho), most techniques have been transferred unchanged to villages. The VIDP has also been adopted for use by many rural dwellers.



BACKGROUND

The first major thrust in VIP latrines in Lesotho was undertaken in the low income sites and services area of Katlehong in South-western Maseru. The 214 latrines built were both the single and double pit types of concrete block walls and re-inforced concrete cover slabs. The latrines had GRP (Glass Reinforced Plastic) pedestal seats.

Promotion of VIDP Latrines: After the formation of USIT within the Maseru Urban Development Project, VIDPs were promoted widely in Lesotho. In the urban areas they were promoted mainly on the grounds that they would save space by not requiring new pits to be dug each time a latrine fills up. In the rural areas, they were promoted on similar grounds and in addition they would provide digested sludge to be used as a soil conditioner in fields. In both cases there would not be a need for mechanical de-sludging, making the running cost low though at a relatively high capital cost.

Initial Modifications: The first VIDP and VIP latrines in Katlehong were unlined pits with a ring beam. It was recognised at an early stage that due to the soil conditions and the weight of the concrete block superstructure this design was not suitable. The pits were de-sludged and lined. All subsequent pits (903) in Khubetsoana were lined. There were no single pit latrines at all built at Khubetsoana. Gaps were left in the first three to five courses of blockwork in the pit to allow soakage of fluids into the surrounding ground.

COSTS

High Cost of VIDP: It was recognised immediately however that the VIDP latrines used were expensive and were barely affordable by the peri-urban people, let alone the rural people. The first design costs M732 (December 1986 prices, M1= 0.30).

Reducing Costs: USIT immediately embarked on a programme of producing cheaper VIDPs and Table 1 shows the costs of the various VIDP models and approximate times when these were commissioned. The table also shows the cost of the single pit VIPs of similar design for comparison.

OBSERVATIONS OF DOUBLE PIT PERFORMANCE IN MASERU

Misuse of latrines: One of the commonest problems of double pit latrines stems from lack of understanding of the working principles of the latrine. In many cases people have been observed to have been using both pits simultaneously and in schools this is a major problem.

Quality of construction: In order to ensure that the contents of the two pit remain totally separate, the dividing wall between the pits has to be built to a high standard. Such building standards are usually not maintained by local builders and this creates a problem of cross-contamination.

Wet pits: Many of the double pit latrines observed in Maseru had contents of both pits wet. In many of them, water in the unused pit, had risen to the level of the contents of the pit in use even before changing over. Table 2 is an extract from pit emptying records for November, 1986.

TABLE 1 Cost of Various VIP latrine Models used in Maseru

Model Type ²	Year	Cost in 1986 (M)	
		VIDP	VIP
Lehco-op	1979	732	542
Albert	1983	600	-
Mapoteng	1983	474	372
USIT/RSP ²	1986	563	477

1. The costs are for peri-urban areas for concrete block latrines with reinforced concrete floor slabs. In rural areas the use of local materials, especially the abundant rock available, reduces cost significantly.

2. The Model Type notation used here is one used by USIT to differentiate the Models and may not be compatible with references elsewhere.

3. The Model was adopted not for further cost saving but for standardization of components countywide and for simplicity of construction.

TABLE 2 EXTRACT FROM PIT EMPTYING RECORDS, November 1986.

Date	Plot NO.	Chamber Type	Free Water			Nature of Sludge
			Lots	Little	None	
3/11/86	970	VIP			x	Thick
4/11/86	965	VIP	x			Wet
11/11/86	School	VIDP	x			Very liquid
14/11/86	-	VIDP		x		Wet
14/11/86	-	VIDP	x			Wet
18/11/86	887	VIP	x			Very liquid
19/11/86	-	VIP	x			Mostly water
20/11/86	1	VIDP	x			Wet
20/11/86	2	VIDP	x			Wet
20/11/86	3	VIDP	x			Wet
21/11/86	4	VIDP	x			Wet
21/11/86	1851	VIDP	x			Very liquid
24/11/86	1496	VIDP	x			Very liquid
26/11/86	901	VIP	x			Very liquid
27/11/86	1064	VIDP		x		Thickish
27/11/86	962	VIP	x			Liquid
27/11/86	1492	VIDP	x			Watery

N.B. Site Nos 800 - 1000 at Katlehong, (S.W. Maseru); Nos. 1001 upwards at Khubetsoana (North Maseru); and Nos. 1 - 10 at Qoaling (Maseru South).

The table shows that most of the pits had wet contents and the sludge had not thickened enough to be handled manually.

Smells and looks: Most of the wet latrines emptied had smelly contents in both pits. The contents also looked offensive and could not be handled by people. The problem was similar even with school latrines. Contents cannot therefore be used as soil conditioner and people object to handling them in any way.

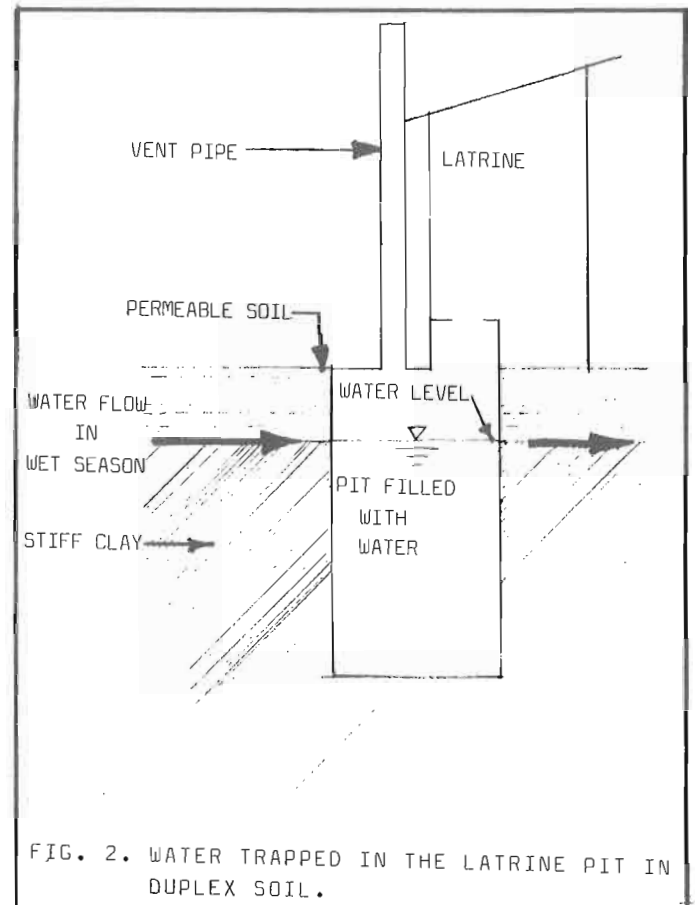
Cross Contamination: In many cases, emptying the contents from one pit led to a subsidence of the contents of the other. This phenomenon showed there was movement of water or wet sludge from pit to pit. (At the time of writing this paper, bacteriological tests are being conducted to determine the extend of cross contamination.)

SOIL CONDITIONS

Duplex soil conditions exist in most of Lesotho's lowlands with a band of stiff clay overlain by a thin layer of permeable soil, usually less than one metre deep. Water below a depth of one metre will generally not be absorbed into the ground. In the wet season, water flowing at the interface of the two soil layers gets trapped in the clay lined pit and can only flow out again through the upper soil layer.

Rock outcrops are common all over the country with the depth to rock averaging less than one metre in most of the settled areas (villages are traditionally sited on land

unsuitable for agriculture) This complicates the problem of construction of deep pit latrines even further, however VIDP latrines need not be deep and, if fully lined, can even be built partly above ground. VIDPs built over rock are less likely to be wet provided the latrine construction is of good quality.



PRESENT USIT APPROACH

As a result of the problems encountered with VIDP systems in Maseru, i.e. because of wet pits, USIT has had to reconsider further promotion of these latrines. In peri-urban areas USIT recommends the construction of de-sludgeable single pit latrines. The proposed sites and services areas in Mafeteng and Teyateyaneng (which are both small district towns) will be provided with de-sludgeable single pit VIP latrines. A mechanical pit emptying service is being developed and one system, the BREVAC LA, is currently being tested. This approach is not feasible in rural areas due to high cost of operation aggravated by the inaccessibility of many villages.

In rural areas USIT recommends the use of single pit latrines of cheap superstructures and unlined pits. The zinc sheet superstructure is the most widely used and USIT has promoted this through the "Upgrading of Local Latrine Manufacturers" project. The superstructure can be moved from pit to pit saving replacement costs. USIT and RSP also promote the use of locally available materials to ensure cheap latrines. A package of slabs and a vent pipe is available from USIT or RSP depots for people to buy and use for VIP latrines in villages. The package currently costs M46.00. On-site slab casting is also being promoted. Most rural people are encouraged to build from local materials. When the pit is full, the householder simply demolishes the superstructure and re-builds it over a new pit. However, several villagers have opted for a VIDP because of its permanence.

CONCLUSION

As mentioned before, over a thousand double pit latrines have been built in Maseru and more in other areas of Lesotho. The comparative cost of these units have been high and household resources could have been saved by the construction of single pit VIPs since a pit emptying service is going to operate in Maseru and other urban areas. The fact that these latrines are reported to have worked well in other places should not be used as a basis for universal adoption in all countries and even from region to region.

Mechanised pit emptying is not viable everywhere and is expensive, therefore the construction of emptyable single pit VIPs may not be a solution that is feasible in all cases.

Proper soil investigations should be made and pilot latrines built to assess performance before large schemes are undertaken. Because of the limited resources available in rural

areas it is even more important to ensure that the double pit latrines are built only where they are bound to work well. Single pit latrines of cheap construction, requiring a new pit to be dug whenever they fill up may be a better solution in most cases in rural areas.

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