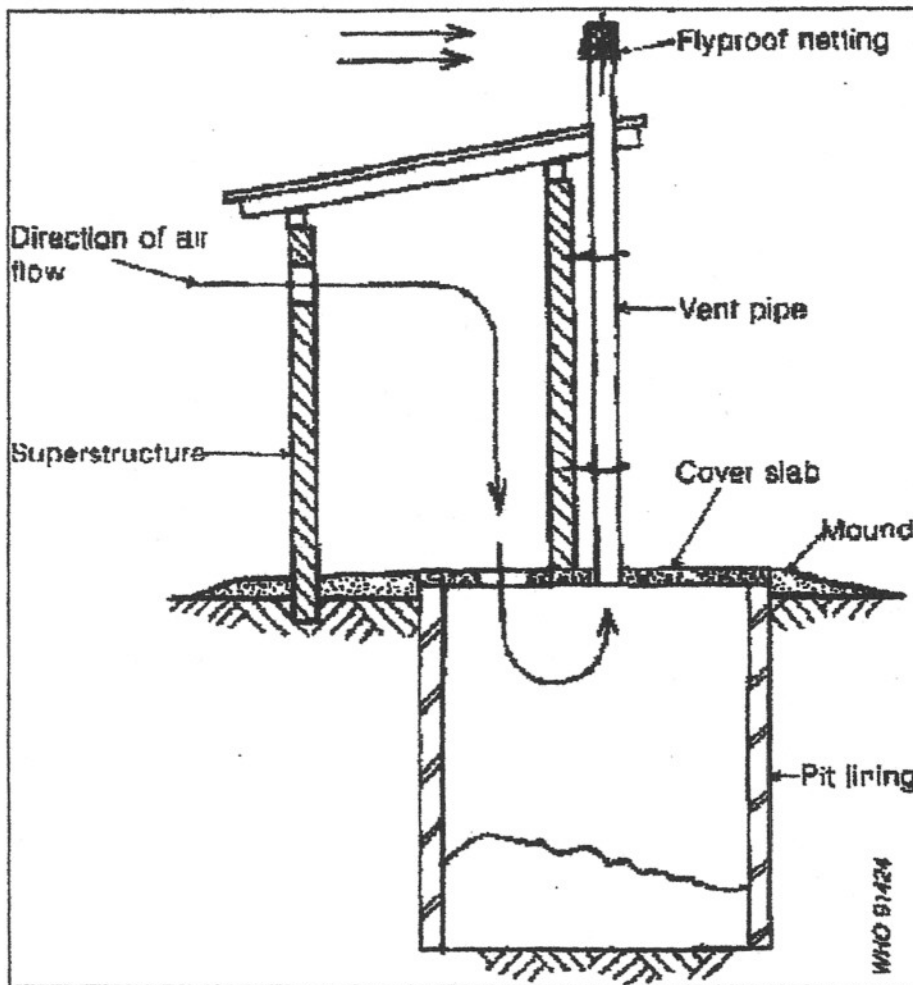


# H2O FOR LIFE

## 2.1 BILLION PEOPLE LACK ACCESS TO ADEQUATE SANITATION

### VIP Latrines

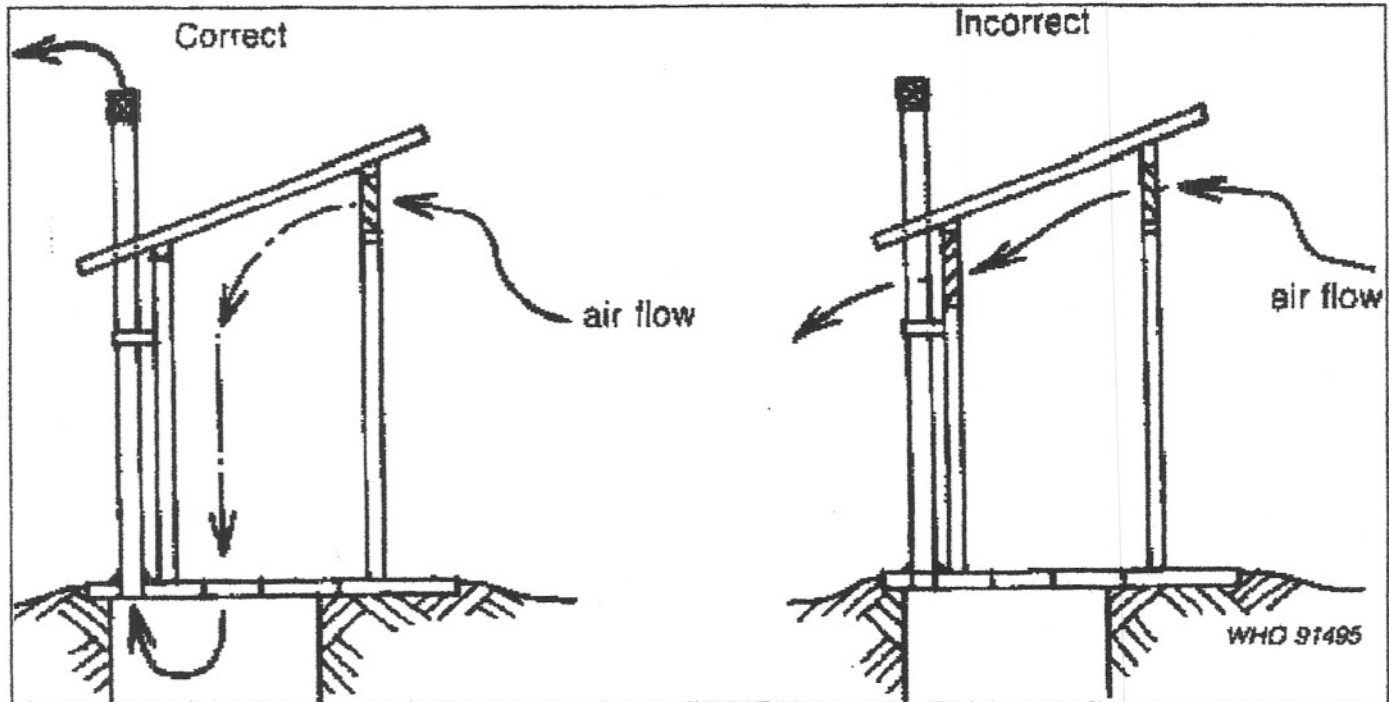


These are also known as ventilated improved pit (VIP) latrines. The major nuisances that discourage the use of simple pit latrines - smell and flies - are reduced or eliminated through the incorporation of a vertical vent pipe with a fly-screen at the top.

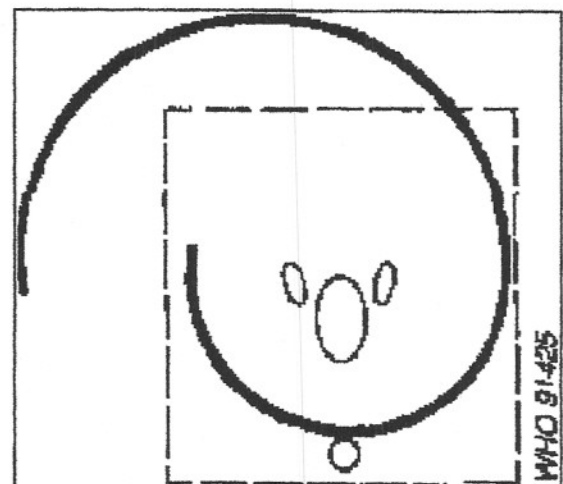
Wind passing over the top of the vent pipe causes a flow of air from the pit through the vent pipe to the atmosphere and a downdraft from the superstructure through the squat hole or seat into the pit. This continuous flow of air removes smells resulting from the decomposing excrete in the pit and vents the gases

to the atmosphere at the top of the vent pipe rather than through the superstructure. The flow of air is increased if the doorway of the superstructure faces the prevailing wind. If a door is fitted, it should be kept shut at all times (except when entering or

leaving) to keep the inside of the latrine reasonably dark, but there should be a gap, normally above the door, for air to enter. The area of this gap should be at least three times the cross-sectional area of the vent pipe.



The superstructure can also be constructed in the form of a spiral (right, looking down from top). This excludes most of the light whether a door is fitted or not. The defecation hole must be left open to allow the free passage of air. The vent pipe should extend at least 50 cm above the latrine superstructure except where the latter has a conical roof, in which case the pipe should extend as high as the apex. Air turbulence caused by surrounding buildings or other obstructions may cause reverse air flow, leading to foul odors and flies in the superstructure. Air flow may also occur at lower wind speeds because of solar radiation heating the air in the vent pipe, causing the air to rise. The vent pipe should then be placed on the equator side of the superstructure. It may be painted black to increase solar absorption.

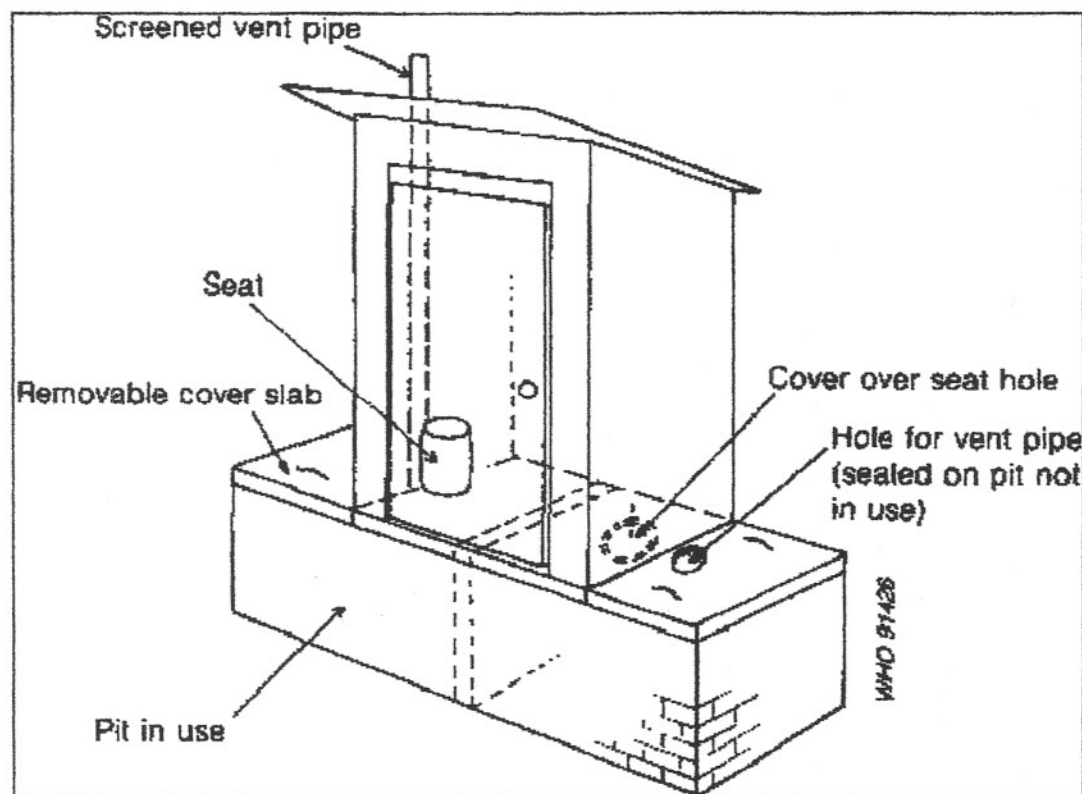


In latrines relying on solar radiation for ventilation, foul odors are sometimes experienced in the superstructure at certain times of the day (usually early morning). This occurs where the outside air temperature is colder than the air in the pit, which may prevent the air circulating. Very little can be done to prevent this, other than sealing the defecation hole at night.

In addition to removing odors from the pit, the screened vent pipe significantly controls flies. Flies are attracted to the pit by the odor coming from the vent pipe but are unable to enter because of the screen. A few flies enter the pit through the squat hole or seat, and lay eggs in the pit. New young flies attempt to leave the pit by flying towards the light. If the latrine superstructure is kept sufficiently dark, the major source of light is at the top of the vent pipe, but the screen prevents the flies from escaping there and they eventually fall back into the pit to die.

Well-constructed and maintained VIP latrines combat all the problems associated with simple pit latrines, except mosquitoes. However, they are considerably more expensive than simple pits, since a ventilation pipe and full superstructure are required. Because the defecating hole is directly over the pit they accept any form of anal cleaning material without blocking. Routine operation is limited to keeping the superstructure clean, ensuring that the door (where fitted) is kept closed, occasionally checking that the fly-proof netting on top of the vent pipe is not blocked or broken, and pouring water down the vent pipe once a year to remove spider webs.

### Ventilated double-pit latrines



Although it is usually best to provide large deep pits, this may not be possible where rock or ground water lie within one or two meters of the ground surface. A variation of the VIP latrine suitable for such situations has two shallow pits side by side under a single superstructure. The pits are usually lined with

bricks or blocks – they may even be elevated pits, rather than dug. Each pit may have its own squat hole or seat. Alternatively, slabs may be movable, one with a hole for the pit in use and a plain slab for the other pit. Whichever design is used, only one hole must be available for defecation at any time. The latrine may be provided with two ventilation pipes (one for each pit) but more usually only one is fitted, to the pit in use. The hole for the ventilation pipe for the pit not in use is sealed. As with single VIP latrines, the superstructure must be kept partially dark at all times to discourage flies.

## Operation

One pit is used until it is filled to within about half a meter of the top. The defecation hole over the full pit is then sealed and the one over the empty pit opened. Where necessary, the ventilation pipe is moved from the full to the empty pit, and the vent hole in the slab of the full pit sealed. The second pit is then used until filled to within half a meter of the top. The contents of the first pit can now be removed and the pit reused. The pits must be large enough to allow each pit to be used for at least two years. This ensures that when the pit contents are dug out most of the pathogenic organisms have died.

Double-pit latrines can be considered as permanent installations. The small effective capacity (0.72 m<sup>3</sup> for a family of six, using a sludge build-up rate of 60 liters per person per year) enables pits to be relatively shallow, and therefore easier to empty than deep pits. The pits should extend beyond the superstructure, either to the sides or at the back, with removable slabs for emptying. These slabs should be easy to lift, but should be sealed to prevent flies getting in or out. The central wall between the two pits should be made with full mortar joints and may be rendered with cement mortar on both sides.

As with the single-pit VIP latrine, the double-pit VIP latrine has the advantages of reduced smell and fly nuisance. Also the contents of the latrine dug out every two years or so is a valuable soil conditioner. Double-pit VIP latrines are usually (but not always) more expensive than single-pit VIP latrines, and require a greater operational input from the user, particularly in changing over pits. Some societies have shown resistance to handling the decomposed contents of the pit but this can often be overcome with education and time. Allowing people to see and handle the contents of a pit as it is emptied is the strongest persuader for those concerned.

All projects involving the construction of double-pit latrines must allow for a prolonged support program. Householders need to be reminded to change pits at the right time and should be assisted in doing so. This assistance will probably have to be available for at least the first two pit changes to ensure that the complete cycle is covered.

