

3. Modifications of the pit toilet

Man's most commonly used toilet, the pit latrine, has been used in some form, on most continents for thousands of years. This concept continues to be the simplest, cheapest and most favoured method of excreta disposal for most of Africa, not counting the towns and cities. But even in the towns and cities, pit toilets are used a great deal. Their relative cheapness, ease of construction and ease of use make them popular. Problems of odour and fly breeding can be largely overcome by fitting a screened vent pipe, or by adding respectable amounts of soil and ash to the pit. Indeed a properly made pit toilet can be as comfortable to use as the best of other conveniences, although of course it must be built outside and very close to ground level. For these various reasons more people use pit toilets than any other form of excreta disposal, world wide.

The pits under most pit toilets are invariably dug about 3 metres deep, although in Kenya they may go much deeper. Most times, pits fill with a mix of excreta and garbage – the pit toilet is a convenient dustbin! Some pits are lined, others not. Most pits are covered with a slab made of wood or concrete, and the house above, made in a thousand different ways, provides privacy. The worst pit toilets are a menace, generating foul odours of the worst possible type and breeding flies in alarming numbers. Those in high water table areas in the denser settlements can also pollute underground water, and wells polluted in such places can carry disease. However, well constructed pit toilets can be a pleasure and comfort to use. They can be odourless and fly free. Well sited, they are not a threat to health in any way. By far the best are those built and used by a family, where they are generally kept clean and tidy. The vast majority of pit toilets are used until their vaults are full, and then they are abandoned, and new facilities built.

But in some countries and some communities, the value of the pit contents as a fertiliser has long been known. In several countries in Africa, and indeed elsewhere, trees are deliberately planted on old toilet pits because they are known to grow well, with the fruits growing large and tasty. Sometimes nature sows a seed in an old pit and a new tree will grow. Sometimes tomatoes or pumpkins will grow out of abandoned toilet pits, no doubt because kitchen scraps have been thrown there. There are some cases where the contents of old pit toilets, after a period of a few years, are deliberately dug out and used as fertiliser on the lands. So in these rather more isolated cases, the usefulness of the pit toilet extends far beyond its normal life. This book attempts to extend the logic of this concept and make it better known and understood. The usefulness of the pit toilet can indeed be extended far beyond its normal working life.

Some basic concepts about pit toilets

Once faeces and urine enter a pit, a process of breakdown begins. The end result is humus. If the pit is filled with excreta and garbage alone, the composting process can take many years to complete, since there is little air in the compacted excreta and few suitable microbes. If the excreta is mixed with other materials like soil, wood ash and leaves, more air is introduced into the mix and also a complexity of microbes which are able to change the excreta into humus more efficiently. The end result is that the composting process is much accelerated. Also excreta filling unlined, earth walled pits composts more quickly than pits lined with bricks or concrete. This shows the important effect the soil and its living content has on composting excreta.

Another interesting aspect is the depth of the pit. In deep pits the contents become more compact, and once again contain less air. In shallower pits, which are less compact, there will be more air, particularly if there is a mix of ingredients. This is particularly so if leaves are added to the mix in addition to soil. Leaves help to reduce the density of the final humus and therefore increase the air content, which in turn makes composting more efficient. Shallow pits are also easier to dig out and further away from the underground water table. The eco-toilets described in this book use shallow pits which are rarely more than 1.5 metres deep.

However, shallow pits do fill up more quickly than deeper ones and it is necessary to strike a balance. If a mix of ingredients is added, the pits will certainly fill up faster, but not as fast as one would think, as much of the bulk of excreta is in liquid form which is partly absorbed by the soil and ash thrown down the pit, and partly leaches away into the surrounding soil. At least 70% of human faeces is made up of water, and when mixed with soil, the volume of composted faeces is much reduced. Actively composting excreta significantly reduces in volume over time. So a balance must be struck and a choice made. Deeper longer lasting pits need less attention, but eventually fill up and are usually abandoned. Shallower pits holding a mix of composting ingredients fill up more quickly, but the resulting humus can more easily be dug out, and used for growing vegetables or for growing trees.

The processes involved are simple and natural, and if care is taken the composted humus is considerably safer than hands soiled after anal cleansing. The increase in food production can be considerable, as this book reveals. This process adds a new interesting dimension to the rather dull story of building toilets. The worlds of sanitation and agriculture are now combined with a definite benefit being gained by the family in addition to the disposal of excreta alone. Food production can be enhanced. Also the eco-toilets, as they are best called, are relatively cheap and easy to make. With a little training it can all be done by the homesteaders themselves.

In this book we look at ways of building and managing the various simple eco-toilets designs. Then the important subject of using the recycled materials in agriculture is discussed and explained in detail with many working examples described.



Simple eco-toilets in Malawi. On the left an *Arborloo*, on the right a *Fossa alterna*