



Low-cost Arborloo offers Ethiopians health and agriculture benefits

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In one of the poorest countries of the world, a very simple form of ecosanitation is catching on. Not only is the Arborloo a low-cost, safe way to dispose of excreta, but it also provides compost that can support the growth of valuable trees.

If there were ever a country in need of ecological sanitation, it is Ethiopia – with her poverty, poor health, and widespread food insecurity. This historically rich and culturally diverse country is suffering terribly from soil degradation, deforestation and recurring drought. Estimated sanitation coverage is a dismal 6 per cent in rural areas – and Ethiopia is 85 per cent rural. Furthermore, about 15 million Ethiopians are at constant risk of not having enough food to cover nutritional needs, and about 8 million chronically fail to meet their food needs.

The Arborloo offers immediate relief for these problems. This innovative ecological toilet was designed by Peter Morgan in Zimbabwe and introduced to Ethiopia by Catholic Relief Services (CRS) and its partners. In just half a day and for a household cost of \$5 or less, a family can have a simple latrine and the start of a fertile pit for a fruit tree or other food plant.

Easy solution for complex problems

The Government of Ethiopia has set a goal of 100 per cent sanitation coverage by the year 2015. At current rates of progress, however, the World Bank estimated in 2003 that it will take 100 years to get full rural sanitation coverage, not allowing for population growth. Various sanitation programmes have been implemented in recent years, but few have gained traction. Among the factors inhibiting progress are the high cost of conventional toilets in relation to income and difficulties digging the

deep pits required in rocky and sandy soils.

The Arborloo shows great promise for reversing this trend and enabling rapid coverage in rural communities. Designed for one year's use by an average family, the Arborloo is a shallow pit latrine about one meter deep. It requires only a small, inexpensive concrete slab, which may need some additional support depending upon soil conditions. A family can easily dig the shallow pit, position the slab, and build a basic privacy structure around the Arborloo in half a day. After latrine use, each person adds a cup of ash and soil mixture to the pit to control fly breeding and odour and facilitate composting.

In addition to providing sanitation, the Arborloo also allows families to increase their food security. When a pit fills to capacity, family members can move the slab to cover a newly dug pit and plant a fruit tree or other plant on top of the full pit. The pit's rich compost fosters abundant plant growth, enabling families to create an orchard or garden over time. The Arborloo can be used to grow any food plant, such as pumpkins, tomatoes, spinach, bananas or papayas.

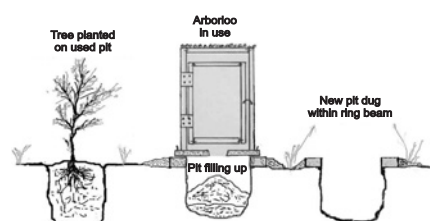


Figure 1. Sketch of Arborloo by Peter Morgan

What makes the Arborloo different?

The difference between a conventional pit latrine and the Arborloo is that the Arborloo is designed for planting while a conventional pit latrine is designed for excreta disposal. A pit latrine is usually about 3 m deep and is designed for 10 or more years of use and then closed. An Arborloo is about one meter in depth for about one year's use, and leaves, soil and ash are added to aid composting and to create a home for a tree. While there is a tradition in Africa of planting on old pit latrines, a pit latrine is not truly an ecological toilet because its availability for planting is limited to every 10 years or so, most of its nutrients from excreta will never be accessible to plants and, importantly, pit latrines may contaminate the water table, an unlikely event with the Arborloo.

Some other ecological toilet designs rely upon urine diversion. This is necessary when the chamber for receiving excreta is above ground and the contents of the chamber must remain relatively dry either for desiccation of the faeces or for soil composting in the chamber. Since the Arborloo pit is in the soil, any excess fluids can drain naturally into the surrounding soil. The addition of the soil/ash mixture also maintains a good moisture balance, and the microorganisms at work need some moisture in transforming excreta to compost.

The Arborloo works best in rural areas where there is space for trees, while some other ecological toilet

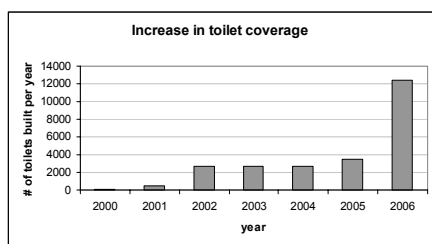


Figure 2. Toilet coverage in CRS Ethiopia project areas 2000–2006. In mid-2005, the Arborloo was introduced and resulted in a rapid increase in coverage.

designs are better suited for urban areas. In Ethiopia, farmers desperate for growing fruit trees like to make their Arborloo pits smaller so that they will fill in four months and will be ready for planting seedlings. These farmers have plenty of space and a strong desire to begin producing fruits for food and income.

Piloting the Arborloo

In 2006, CRS supported construction of 12,400 Arborloos with hand-washing facilities in a variety of cultural and geographical locations around Ethiopia. The agency is still drawing lessons from the pilot project, but initial results show that full sanitation coverage can be achieved in rural communities in a relatively short period of time. Furthermore, at the end of one year families can have one or more fruit trees or other food plants that provide produce for both consumption and sale. As a result, the Arborloo makes a modest contribution toward relieving chronic problems of poor sanitation, food insecurity, soil degradation, deforestation and poverty in Ethiopia.

Prior to 2006, the CRS sanitation programme had witnessed rather slow results. In 2000 and 2001, the programme constructed demonstration Ventilated Improved Pit (VIP) latrines with a household cost of US\$100, driving this cost down to \$12 by 2004 by changing the design to a conventional pit toilet. Even as costs were lowered through simpler designs, replication remained low to non-existent in most places. Families showed little enthusiasm for digging a 3 m-deep pit in rocky or sandy soils, an especially difficult task for the elderly and female-headed households. Families also had

little understanding of what benefits might result.

CRS began the Arborloo pilot in mid-2005 by asking 10 volunteer households in three locations to give it a try. Volunteers were given free slabs. When the pit filled to capacity, the families were given a fruit tree seedling to plant on the pit as well as a control seedling to plant in normal soil at the same time. CRS asked each household to care for both trees in the same way and compare growth and fruit output.

Almaz Tefera was one of the first sanitation pioneers to take up the challenge. Almaz's community, near the town of Wonji in eastern Ethiopia, was an avocado-growing region 30 years ago, before recurrent droughts and deforestation. The 295 households previously had no toilets and had to fetch water from a river 8 km away. The topsoil in the area is depleted, wind whips through the village and dust devils swirl most of the year. When rain does come, it arrives in torrents, washing away topsoil.

In 2003, Almaz, her husband and seven children nearly starved to death in a famine that struck Ethiopia. Due to drought, their rain-fed crops of wheat and barley failed. Food and water distributions saved Almaz's family and many thousands of others, but preventive actions needed to be undertaken to avoid recurrence.

CRS helped the community build a reliable water supply system in 2004. Water alone wouldn't provide full health benefits and food security, however. Almaz told CRS that she would try absolutely anything to improve her life, including the new concept of an Arborloo. Now Almaz has a small orchard of fruit seedlings growing on four former Arborloo pits, and by 2008 she should have regular and abundant avocados and mangoes from these trees, with surplus to sell. Even better, her demonstration Arborloo resulted in full sanitation coverage in her community by the end of 2006.

Lasting behaviour change

Several factors played a role in the success of Almaz's Arborloo and that of 12,000 others. First, the very low cost of the Arborloo makes the latrine attractive, along with its ease of construction – a shallow pit and a 'no-fuss' privacy structure that is easily moved. Second, farmers quickly appreciate the fertilizing value of the pit compost, especially when they compare the growth of tree seedlings. This also enables families to foresee a return on their \$5 investment. Third, toilet slabs were painted bright colours that attracted a great deal of attention, especially among the children who wanted to use the little 'tree seedling' toilets. Women also note that the smooth surface of the slab is easy to clean.



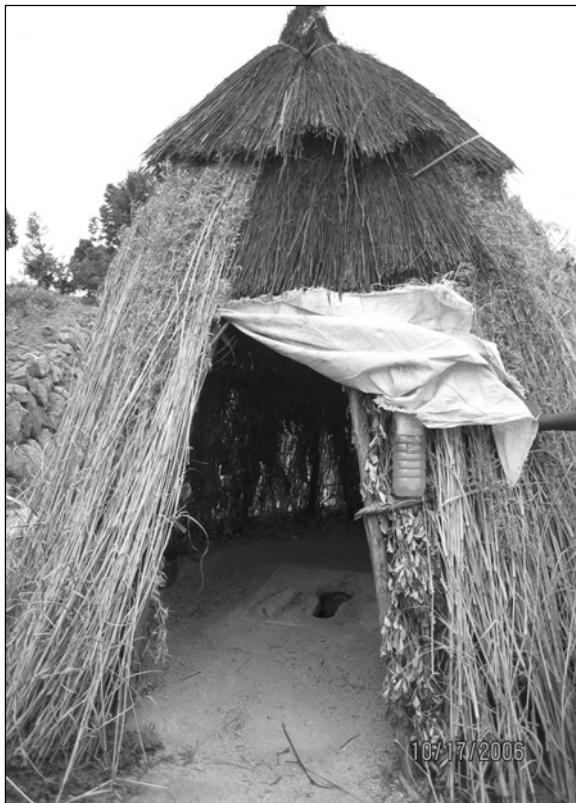
Almaz and her children in 2004



Almaz's Arborloo

The CRS sanitation programme is now moving forward with plans to build another 14,000 Arborloos in 2007, primarily in nomad communities in Eastern Ethiopia. Many artisans have been trained to make the small slabs, but materials are often hard to come by. Project partner organizations still have to assist in getting materials, and often have to cover the cost of slabs for the

poorest families. Slowly, however, the Arborloo is becoming a part of Ethiopian rural culture by providing a payback for efforts made. Several families already have small stands of four or five fruit trees, as they chose to dig smaller pits in order to fill them more quickly. They report that the production of papaya and pumpkins from these pits is double that of control plants. Families



A privacy structure of thatch

are also teaching children to no longer waste their excreta through open defecation, as use of the Arborloo is now seen as a family asset.

In addition to working directly with communities, CRS collaborates closely with government officials through training, planning and implementation. Civil servants receive rewards through the government system when sanitation coverage increases, creating an incentive for them to consider the Arborloo as a sanitation option in their areas. Government officials have also noted that the areas covered by the CRS sanitation programme have not been affected by outbreaks of acute watery diarrhoea.

Promisingly, in October 2006, the Government of Ethiopia endorsed ecological sanitation as a good option for the country as it strives to reach its Millennium Development Goals. In addition to the Arborloo, other ecological toilet designs for rural and urban areas are being adapted by other organizations for use in Ethiopia. Through teamwork and community mobilization, Ethiopia might just reach its Millennium Development Goal of 100 per cent sanitation coverage. Regardless, the Arborloo has shown itself to be an excellent sanitation solution for Ethiopia and holds promise for the rest of Africa.

About the author

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Further reading

Morgan, Peter (2007) *Toilets that make Compost*, can be downloaded (6.5MB) from: http://www.ecosanres.org/toilets_that_make_compost.htm.
Winblad, U. and Simpson-Hebert, M. et al., (2004) *Ecological Sanitation*, Stockholm: Sida.
CRS website: http://www.crs.org/our_work/where_we_work/overseas/africa/ethiopia/arbtor_loo.cfm