Training women to build ferrocement water tanks and latrines

As the main transporters and users of water, women need to be included in water supply and sanitation developments. This is one of the aims of a new programme at the University of the South Pacific.*

THE Women's Development Training Programme began in 1984, at the Institute of Rural Development of the University of the South Pacific in Tonga. It focuses on the role of rural women in development, concentrating on upgrading their skills so that they can work more effectively in the community. The main objective is to provide appropriate training for community workers who are in a position to pass on their skills.

In 1985, a six-week-long regional workshop was held to provide such training. One of the main sessions aimed to increase the participants' knowledge of water supply and sanitation systems, placing them in a better position to assess the needs of their communities and to provide more appropriate solutions for their problems.

Objectives

There were four specific objectives of the session on water supply and sanitation:

- To make participants aware of the range of water supply and sanitation systems available for different environments
- To teach the value of such systems for the health and well-being of the community
- To share and practise technical skills for water supply and sanitation systems, and to discuss their extension
- To practise the financial management skills necessary for implementing water supply and sanitation projects, namely cost and budget planning, record keeping and book-keeping.

*From the Report of the 1985 Rural Training Workshop edited by Sue Fleming. Sue Fleming works at the Women's Development Training Programme, Institute of Rural Development, University of the South Pacific, Tonga.

This article concentrates on the third objective – training women to build ferrocement water tanks and latrines.

Water tank

The water tank, constructed from ferrocement, was approximately 2m in diameter and 2.25m high, with a domed top and a capacity of around 1,500 gallons. It was built with weld mesh as reinforcement, in addition to chicken wire, avoiding the need for formwork which is expensive and may not be appropriate in isolated areas requiring a limited water tank programme. The skills necessary for building ferrocement water tanks provide the basis for working with a variety of designs, and the acquisition of additional skills in formwork would be comparatively easy, if required. The size of the tank can be easily varied, as the principles behind its construction remain the same.

The tank was built in four main stages: the base, walls, top and lid. The base area was first prepared to make sure there was a strong foundation. Next, the area for the base was marked out using bricks which, covered with plastic, later became the base's formwork. Weld mesh and chicken wire were cut to size, with an overlap for the walls; then cement, reinforcing, and cement again were applied to the base.

The walls were built up with weld mesh, and covered with chicken wire. This was plastered with cement, left to set, then plastered again, inside and out. The outlet pipe was also inserted at the base of the tank.

The top was made on a soil mould (dampened soil will do) covered with plastic. It was also reinforced with chicken and other wire. As with the walls, plastering was done in three stages, allowing time in between each application for the cement to set. An overflow pipe was inserted at the join between the sides and the top. The lid made for the top included a water entrance hole covered with mosquito netting. Lastly, a hole was dug under the tap, lined at the bottom with stones to make a soakaway, and the sides covered in cement. Water can flow out without getting dirty.

The ferrocement water tank is reinforced with chicken wire.

Reinforcing the top of the VIP latrine.

VIP latrine

The design for the Ventilated Improved Pit (VIP) latrine, drawn up at the Institute for Rural Development, is particularly aimed at low-lying swampy areas, or areas with a high water-table. In this design the base slab of the latrine is raised off the ground by four cement slabs, joined to form a water-tight box over the pit. The adaptation of the design to suit less difficult conditions is extremely easy (placing the base slab at, or closer to, ground level).

Work on the latrine involved making the reinforced cement base slab, with a hole for the toilet pedestal and a ventilation hole for the pipe, along with four reinforced cement slabs for the sides of the base. The pit site was marked, and the area one foot around it reinforced with concrete and wire mesh. The pit was dug to a depth of six feet, and the top of the pit lined with chicken wire and cement to prevent erosion.

With the pit complete, the base was erected on top of the reinforced concrete area. Once the base was cemented together, the pedestal was installed over the hole in the base. Last, the house was built, and the ventilation pipe placed outside the toilet house with mosquito netting over the top of the pipe to prevent flies from entering.

The VIP latrine was positioned so the sun fell on the ventilation pipe. Air circulation through the ventilation pipe will also be encouraged if the pipe is painted black.

Following the successful completion of the VIP latrine and the water tank, maintenance problems associated with the technologies were discussed, including how to mend holes and cracks in water tanks. The participants were also made familiar with the different PVC pipe fittings, with the inside of the tap and with washers.

The cost and potential retail price of the VIP latrine and the water tank were worked out according to Tongan prices. Ways in which costs could be reduced were considered, especially through the use of more appropriate locally available items in the different countries of the South Pacific.

Throughout the construction of the water tank and VIP latrine, the emphasis was on the adaptability of the different skills required. Modifications to the designs were discussed, allowing them to be changed to suit individual needs.

The technical skills learnt included the use of wooden moulds, making cement using different mixtures, reinforcing cement with weld mesh and chicken wire, plastering, and the use of tools such as tin snips, pliers, bolt cutters, hacksaws, hand drills, screwdrivers and floats for plastering.

Many of these manoeuvres were new to the majority of the women, and although some of them were initially apprehensive, the overwhelming feeling at the end of the exercise was decidedly that of a sense of achievement and one of confidence and enthusiasm.

Building the walls of the latrine.