Harvesting rainwater using a simple catchment surface

by Karen Iles

Rainwater harvesting has been gaining much attention recently as a very easy way to improve the quality of life for many Third World women. A farmers' group in Kenya has developed a useful device to catch the water, and various womens' groups have been putting it into practice.

THE ARDUOUS task of providing water for domestic use in the rural areas of the developing world usually falls on the women and children. A considerable amount of time and effort is spent in fetching water from such sources as a river, which may be several kilometres from the home, and from which women may carry between 20 to 25 litres in a single trip. Carrying water over long distances may also lead to serious health problems for women sometimes resulting in disability or even deformity.

During the Water Decade numerous projects have been set up to improve the rural water supplies of developing countries, one type of which is based on the collection of rainwater.

The concept of harvesting rainwater for domestic use is not new. Essentially, what is needed is a catchment surface, most often a house roof or some other naturally occurring catchment area such as a large outcrop of horizontally lying rock. The water is then collected and stored in a variety of containers such as pots and water tanks.

Rainwater offers tremendous potential for reducing the drudgery of fetching water from distant sources. Yet, in many areas this resource has not been fully exploited because of a lack of suitable catchment surfaces, as may be the case in areas where the majority of people have grass-roofed houses. Experience has shown that grass-roofed houses are often unsuitable for harvesting rainwater, particularly if they are circular, making the attachment of gutters impractical.

Building a catchment surface

In an attempt to provide a practical short-term solution to this problem, the Kamujine Farmers' Centre in central Kenya has developed a simple catchment surface which is easily built at individual family homesteads. Several women's groups within the area have adopted the idea.

Known locally as a *sarisa*, this catchment surface consists of four woven, plastic sacks which have been split open and sewn together to form a single sheet with an area of

The sacks are made from woven plastic strands, and will last two years.

The sheet is nailed to two poles and then mounted on four upright poles.

six square metres (see photo). These sacks are similar to hessian ones, but are woven with plastic strands instead. The sacks are of the type used to store flour or grain and can be purchased locally in most villages.

The sheet is nailed between two thin poles which are then nailed on top of four upright poles set in the ground in such a way that the sheet slopes by approximately one foot from front to back. The upright poles need to be at least two metres in height so that the sheet is high enough off the ground to avoid damage by livestock. Several people pull on the vertical poles in opposite directions, thereby making the sheet taut, while thin poles are nailed horizontally to the uprights to keep the whole device rigid (see photo).

A piece of *miari* with the fibrous pith removed (similar to bamboo but without the segments) is attached to the front poles to act as the gutter. Any available vessels, such as pots and drums, are used to collect the rainwater which has run off the *sarisa*.

The sheet does however deteriorate in time if left out in the sun, so it needs to be removed from the upright poles at the end of the rainy season. It can then be stored ready for use in the next rains.

Each *sarisa* will last for three to four seasons — and there are two seasons a year.

At a cost of approximately US$2.75 each, using locally available materials, the *sarisa* is inexpensive and easy to construct.

Field experience

Extension staff from Kamujine built two or three *sarisas* with a women's group (using three or four sacks), after which the women continued making *sarisas* for the rest of their group members. To date 28 such *sarisas* have been built by women in the drier areas below Kamujine, where most people have grass-roofed houses.

Field tests indicate that 40 to 80

Storage vessels are placed below the lower corners to catch the run-off.

litres of water a day can be collected from a *sarisa*, depending on the size and number of storage vessels a family may possess, and the rainfall of the area (mean annual rainfall of 750mm in the drier regions of Kamujine). In practice, the limiting factor to the amount of water that can be collected appears to be the availability of storage vessels. In an attempt to develop the system further the Kamujine Farmers' Centre has recently built several 1,000-litre cement water jars to be used in conjunction with the *sarisas*. This system has not yet been tested in the field.

As well as providing a clean supply of water for drinking and cooking, it appears that the *sarisa* also helps to alleviate some of the pressure on labour during the rains. Women report that they use the time saved from not having to collect water from the river as frequently, in other activities such as planting, weeding and looking after their children.

As a simple technology, built using locally available materials, the *sarisa* goes some way towards helping reduce the drudgery of fetching water from a river during the rains. The system could be developed further by coupling it with inexpensive methods of storing the rainwater harvested, such as water jars and clay pots. During the rainy season of October to November 1987 a four-sack *sarisa* was used to fill a 7,600-litre water tank at Kamujine Farmers' Centre, which has a mean annual rainfall of 1,200mm.

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