Spherical water tanks

Gedion Shone

For resource poor smallholder farmers in water scarce areas, even small volumes of stored water for supplemental irrigation can significantly improve a household's economic position. The Regional Land Management Unit (RELMA) in Eastern Africa has been promoting spherical water tanks for harvesting rainwater from roofs and other surfaces, similar to the ones promoted by the Gansu Research Institute for Water Conservancy (GRIWAC) in China. Demonstrations and trainings on water harvesting conducted by RELMA inspired the Ethiopian Minister of Agriculture to arrange an exchange visit with GRIWAC in Gansu province.

Advantages of using spherical tanks compared to other shapes:

- The water pressure is evenly distributed within the tank and the tank therefore requires less reinforcement
- A spherical shape has a smaller surface area than square one and thus uses less building material
- The bottom part is directly supported by the ground, further reducing the need for heavy reinforcement materials
- Easy to construct
- No evaporation takes place as the tank is closed.

In order to reduce construction costs, the tanks are built with locally made clay bricks and mortar. The walls are lined with a mixture of cement and clay on chicken mesh and finished off with a *cement nil* water-proof coating. These tanks are less expensive to build than the conventional concrete structures, and experience has shown that they can be built by local masons with only basic building skills. It generally takes only one session of practical training for local masons to master the construction method.

Three types of spherical tanks - semi-circular submerged tank, underground spherical tanks and partially underground spherical tanks - have now been tried out in Ethiopia, Uganda, Kenya and more recently in Tanzania. The size and shape of the tanks can be adapted to local needs. In the Machakos district of Kenya, for example, where arable land is very scarce, the tanks are dug in such a way that the only soil surface that cannot be cultivated is the manhole opening at the top. These tanks are used to irrigate kitchen gardens, enabling farmers to diversify their sources of income. Micro-irrigation schemes are promoted together with commercially available, low-pressure drip irrigation systems. Cheap drip kits (for example, the Chapin bucket kit, see *LEISA Newsletter* Vol 14.1 p 29) save water and labour, and are increasingly being adopted by farmers.

■

Gedion Shone. District Development Programme, P.O. Box 989, Musoma, Tanzania.
Email: ddpmsm@juasun.net




Construction of a spherical tank in Mbarara district, Uganda. Photos: Gedion Shone.