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Case Study 19

Low cost water tank (1500 litres 23,000 litres)
made of bamboo and plastic film

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India

The low-cost water tank is made of bamboo and plastic film. Villagers in India use a large bamboo basket shaped like a silo, for storing grain. If this silo is internally lined with a food grade polythene film, it can be used as a water tank. The bamboo is made non-biodegradable by soaking it in a solution containing 450g of sodium dichromate, 300g of copper sulphate and 150g of boric acid dissolved in 10litres of water. Such treated bamboo has an outside

life of between 10 and 20 years. The cost of a tank having a capacity of 1500 litres is Rs.1000 (US\$1 = Rs.43). If a larger tank is required, one makes a plinth of cement and stones having the desired diameter, and by using chemically treated bamboo poles, a palisade of bamboo is erected along the periphery of the plinth, like a fencing. The distance between adjacent bamboo poles is about 50 60 cm. The plinth can have a diameter of up to 5 or 6m, but the height of the bamboo palisade should not exceed 120cm because the pressure exerted by the water column on the side walls is determined by the column height. Using the bamboo poles as a skeleton, the entire structure is woven like a wickerwork, using chemically treated bamboo strips. From a distance the structure looks like a giant basket (see Figures 1 and 2). When the structure is internally lined with a food grade polythene film, it can be used as a water storage tank. One can use it to collect run-off water from the roof, or one can even allow the rain to fall directly into the tank. Once the tank is full its top is covered by another film of plastic, which keeps the water clean and prevents evaporation.

[Click here for: Figure 1 - a 1500 litre plastic lined bamboo tank](#)

A tank having a diameter and a height of 1.2m can store 23,000 litres of water, which ensures a daily supply of 60 80 litres of clean drinking water throughout the year. The cost of such a tank comes to about Rs.10,000 (US\$233).

[Click here for: Figure 2 - tank showing cover in place](#)

People often ask if a similar system could be used for lining a pit dug into the soil. We have found at ARTI that the film in such a tank is often punctured by rodents, crabs, insects and even roots of surrounding trees because the bottom of the tank is not surrounded by a rodent or root proof barrier. Because such a tank is below ground level, a leak in the plastic lining is only noticed after the loss of a considerable quantity of water. And even after detection it cannot be repaired. The above ground tank is not only protected from burrowing animals and from tree roots, but because the tank is above ground level, drawing water from it by means of a siphon is also quite easy.

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