



In Himachal Pradesh, India, poly-lined tanks are useful and cost-effective for water harvesting.

Water storage on sloping lands

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Many farmers in the Himalayan region transport water from long distances to raise nurseries and establish seedlings of vegetable crops. This is in spite of the fact that plenty of water is available from monsoon and winter rains which is wasted as runoff. Furthermore, there are some perennial springs whose outflow is lost.

Due to poor economic conditions, the mountain farmers are not in a position to install pumping units to lift water to steep heights from deep gorges. The majority of them have land holdings of less than 0.5 ha. They practise a subsistence-type of agriculture which is completely rainfall dependent. The hilly areas, on the other hand, are bestowed with favourable soil, climatic and geographical conditions which are not found to be in the plains. The land is used for the growing of a variety of crops. However, the major limitation is the scarcity of irrigation water during critical periods of crop growth.

Water storage is a problem in earthen, dug-out tanks due to the shallow depth and boulder-ridden nature of the soil. Cement concrete tanks are not

only costly to construct but develop cracks and hence fail to store the water required during critical periods.

Poly-lined tanks

Water can be effectively stored in small poly-lined tanks with a protective cover over the polyethylene sheet prepared from discarded empty synthetic cement bags or fabric sheet (interwoven with plastic sheet). This cover protects the polyethylene sheet from the direct effects of sunlight. If there are roots protruding or pointed stones underneath, then another protective cover beneath the polyethylene sheet can also be provided.

Pumping unit not required

Gravity is nature's gift to a hill farmer. A water storage tank can be suitably located to make use of gravity while providing irrigation to the field below the tank. One galvanised iron delivery pipe of 4-5 cm diameter can be installed at the base. A suitable opening/closing mechanism like a tap system may be provided at the other side of the tank, where a flexible rubber pipe of the desired length can be connected or tightened with polyethylene sheet so as to make the joint water-tight.

Precision not required

Any farmer can construct such a tank since no special skill is needed. No side slopes are required. A rectangular trench of the desired length and breadth, depending upon the availability of the land, is dug out. In mountainous areas farmers grow crops in bench terraces where the slope may be as steep as 40%. Therefore length and breadth of the tank can be suitably adjusted. The water stored at the end of upper terrace can be utilised through gravity in the next lower terraces.

If there is any small perennial outflow from a natural spring then it can be diverted to the tank. When the rains are of low intensity, even water from a nearby roof-top can be directed to the tank. In some mountainous areas there are small gravity streams. During lean periods water from these streams can be diverted to the tank and used when required. These tanks can thus serve as auxiliary tanks. Fish culture in these tanks, where the possibility of replenishing with flowing water exists, can further boost the economy of a mountain farmer.

Costs involved

The only cost involved is the purchase of black polyethylene sheet (200 to 250 micron). Its present cost is about Rs. 90/- (about US\$ 2.50) per kilogram. About 40 kg of black polyethylene sheet of 250 micron thickness and 6 kg of fabric sheet (@ Rs. 90/- per kg) to cover the polyethylene sheet are required for lining a tank of the dimensions 20m x 3m x 1m. If at any time some leakage is observed then the hole can easily be plugged by using a piece of polyethylene sheet and joining it with hot bitumen.



Dung beetles will be rolling up the themes again. When we publish a Newsletter on a certain theme, we hope that readers will digest it so that new ideas can emerge. In this section "Keep Rolling" you have a chance to present further information about themes highlighted in previous issues, thus giving still more food for thought and action.



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Further information on the procedure for construction can be obtained from the author.