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POND DEVELOPMENT ON HILLS

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A scheme "Studies on the development and management of water harvesting structures in lateritic soils of west cost regions" is going on in CPCRI Regional Station, Vittal, D.K. This note reports the results of some low cost lining materials and methods used to prevent infiltration losses. The basic infiltration rate of the area is very high and it comes to around 15cm per hour (half yearly report), obtained by standard procedure using double ring infiltrometer tests.

Percolation studies has also been conducted by digging experimental pits of 1M depth and 1,2M diameter. Two mild stell hollow cylinders of hight 1M and diameters 1.2M and 0.75M are used in place of standard infiltrometer. The bottom surface of the cylinders is lined with different materials, compacted laterite, clay layer, laterite soil and cement with 5% and 10% of cement and HDPE (High Density Poly Ethylene) with sides sealed and not sealed. Another cylinder set is main-

tained with untreated base as control in order to standardise the other meters.

The difference in quantity of water filled in the inner cylinder and the actual volume required to fill the tank up to the reference mark with respect to time is calculated and the corresponding height of water is considered as the initial infiltration rate. The depth of infiltration is noted in stipulated time intervals and the water is refilled up to the reference mark. The water level in the outer cylinder is maintained constant. The readings are noted until a steady stage is achieved.

Out of the six linings tested only three are found to be successful. They are soil cement with 5% and 10% cement content and HDPE with edge sealed. They are kept in observation for few days. The soil used was lateritic. 5% cement content is found to have an average infiltration rate of 0.54cm per hour and 10% cement content is found to be completely sealed. By using HDPE lining with outer seal is also of zero infiltration rate.

By comparing the cost of soil cement and HDPE, soil cement (10%) comes to be Rs. 56 for 10cm thick layer, for HDPE Rs. 30/Sq. M, and for soil cement (5%) Rs 29/SqM.

Eventhough the thickness of the soil cement layer (10%) can be reduced upto 7.5 cm the cost difference of 86% can be reduced only upto 40%. Maintenance of HDPE is difficult only in the case of machanical damage. So in rural areas where possibility of mechanical damage is more, it is better to prescribe soil cement(10%) lining. The soil cement (5%) is not able to completely prevent percolation, and hence cannot be recommended for all regions.

Water can be made available to all the lands below the level of the pond by gravity flow, thereby, irrigation is made possible at minimum cost.

Conclusion

Soil cement lined pond is a major rain water reserve. The draining of earthen drains to the pond increases ground water recharge. It is a highly, economically, viable water harvesting stricture which require no special skill to construct. Provisions of ridges on the drains can reduce the silting of pond and thereby reduces the maintenance cost. Since the drain and structure itself shapes a contour bund, it acts as a soil conservation measure along with water conservation.