

3. New structures recharge groundwater

To collect and harvest rain water mud is as good as stone, and more cost-effective too. These are the findings of a study carried out in the integrated watershed program undertaken by a consortium of partners, led by ICRISAT, in three states of India.



Low-cost mini-percolation tank (earthen structure) at Kothapally watershed, Andhra Pradesh.

In India, through various watershed programs, heavy investments are being made in the construction of groundwater recharging structures for improving the groundwater resources. Currently, masonry type structures are constructed in the watershed programs, which are expensive and difficult to maintain.

As a part of ICRISAT integrated watershed program, a study at three watersheds – Kothapally in Andhra Pradesh, Lalatora in Madhya Pradesh and Gokulpura-Goverdhanpura in Rajasthan – was taken up to assess the cost-effectiveness of various groundwater recharging structures. At these sites several types of structures, viz, earthen check dam, masonry check dam, gabion structure, stone gully plugs, mini-percolation tank, sunken pit and dugout tank, were constructed and evaluated under different soils, rainfall and runoff conditions. Some of the salient findings from the study are as follows:

- In most situations, small earthen structures are found to be most economical for recharging groundwater. The effective unit cost of water storage in small earthen check dams was in the range of Rs 12 to Rs 52 per cu.m, while in case of masonry structures it was Rs 38 to Rs 92 per cu.m.
- Compared to masonry structures, more number of small and medium earthen structures can be constructed with the project money, benefiting more number of wells and farmers (equity of benefits).

- Small earthen structures can be easily constructed and maintained by the local community, improving the sustainability of the structures. Most of masonry structures demands the help of engineers.
- Seven-years (1999–2005) of observations from various watersheds clearly indicate that the small earthen structures can withstand the high rainfall and runoff conditions and are quite stable even under these conditions.
- The small and medium earthen structures play a vital role in recharging groundwater. In most of the situations, these structures will be more cost-effective and sustainable and will provide better equity in the groundwater availability.

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