

FREQUENTLY ASKED QUESTIONS – Rainwater Harvesting (RWH)

Compiled by



1. What is Rainwater Harvesting (RWH)?

RWH is the technique of collecting, storing and distributing rainwater for multiple uses. The collected water can be stored for direct use or diverted for borewell/groundwater recharge.

In simple terms it is a way to capture the rainwater when it rains, for later use.

2. Who can practice RWH?

You, me and everybody! It will not only provide you with water in times of acute water shortage, but will also recharge the groundwater and increase its level.

3. Why should I implement RWH?

Rainwater is the ultimate source of all the fresh water that we use. In India, rainfall occurs in short periods of high intensity, allowing the rain falling on the surface to flow away fast. This leaves little scope for recharging the groundwater, which results in water scarcity in most parts of the country. Through RWH, this erratic rainfall can be conserved, stored & used as per convenience, either directly or for recharging groundwater.

4. Where can RWH be implemented?

RWH can be done in homes, apartments, societies, schools, institutions, commercial premises and any other space as long as there is a catchment area in the form of a roof or open space to capture the rain.

Domestic rainwater harvesting is a relatively simpler affair, where even a rain barrel can serve as a storage unit for rooftop RWH. Individual homes have successfully implemented this easy and eco-friendly method of augmenting household-level water availability. Farmers also have implemented RWH to transform a barren piece of land into a self sustainable, lush green farm.

5. Is RWH only feasible for new buildings?

No, existing buildings can also implement RWH by modifying the existing plumbing and making additions, if necessary.

6. What quantity of rainwater can be collected?

The rainwater harvested depends upon the catchment area, the rainfall pattern in the area and the drainage/ collection system used.

To understand the potential for rainwater harvesting, let's take the example of a house in Delhi with a terrace area of 100 sqm. Taking the average annual rainfall in Delhi as 600 mm, and assuming 70%

harvesting efficiency (as some rainwater will be lost due to evaporation, collection etc.), we can calculate the amount of water harvested thus:

$$\begin{aligned}\text{Volume of water harvested} &= 100 \times 0.6 \times 0.7 \\ &= 42,000 \text{ litres}\end{aligned}$$

This volume is more than twice the annual drinking water requirement of a 5-member family, whose average daily drinking water requirement is 10 lpcd.

7. What is the cost involved?

The cost will vary depending upon the catchment area and the conveyance/ storage structures finalised. RWH can be installed at a very low cost in large plots where public buildings, schools & colleges are located, and this cost is negligible to the total construction cost, if integrated with the building design.

If planned in an existing building, the cost is higher due to extra plumbing involved, but the returns are rich in terms of recurring benefits.

8. What types of filters are needed for RWH? Which type is needed if the rainwater is to be used for flushing toilets?

Various kinds of filters are used in RWH. If the rainwater is to be used for flushing toilets alone, there is no need for any filter but the roof needs to be kept reasonably clean. If necessary, a grating can be fixed at the inlet point to the loft from the roof.

For more: Need horizontal, stainless steel filter for RWH

9. Can the stored rainwater in storage tanks be used for cooking and drinking?

The rainwater that falls on the roof is pure, but since it comes in contact with various surfaces on its way to the storage units, some dust and leaves may get carried away with it. This can be reduced if the terrace is swept before the rains. However, even if some dust or leaves go into the sump, they do not cause any harm as long as the water is boiled before consumption.

Various filters can be utilised to remove such suspended pollutants from the rainwater collected to make it safer for consumption.

10. What are the various types of RWH?

Rainwater harvesting can broadly be divided into 3 categories based on the types of usage, the area in which harvesting is carried out and the people involved.

- Storage or recharge: Based on the type of usage, structures can either be used to store the collected water for direct use or to recharge groundwater.
- Urban-rural difference: Urbanization has resulted in the shrinking of open spaces as well as unpaved areas. This has resulted not only in flooding of cities but has also caused water scarcity due to groundwater depletion in general and saline water intrusion in coastal cities. While rural harvesting is mostly traditional and is carried out in surface storage bodies like rivers, tanks, ponds, lakes etc., urban harvesting, due to lack of open space for capturing the runoff, is mostly in sub-soil storage as groundwater recharge.

- Rooftop & driveway harvesting: When we say rainwater harvesting, the first thing that comes to our mind is the terrace. This greatly restricts the scope of rainwater harvesting as a considerable amount of water that falls around the built-up area is let out of the building as run-off. Driveway run-off water should not be led into a sump for immediate use or to a source well, but it can very well be directed into recharge wells.

11. What are the basic components of a RWH and conservation system?

- Catchment areas that include roofs of buildings and open spaces.
- Storage units that can be a barrel, a tank or even a sump.
- Conveyance mechanism which transports the water falling on the catchment area to the storage unit.

12. What are the characteristics of a good RWH system?

The RWH system must ensure that not a drop of rainwater falling within the premises is let into the sewerage or wasted as runoff. This can be achieved only if the method adopted within the premises satisfies the following criteria:

- Completeness: Both rooftop and driveway runoff water must be harvested.
- Apportioning of water: To avoid overload of any one system, leading to overflow and loss.
- Proper design: Volume of water likely to flow through and the nature of the soil in the area should be considered.
- Maintainability: Design should incorporate features allowing for periodic maintenance of the structure.

13. Can existing structures be used for RWH?

Existing unused structures like dried open wells, sumps etc can be used for RWH as also defunct borewells, instead of constructing recharge structures. This will also reduce the total cost.

14. What does artificial recharge to groundwater mean?

It is a process by which the groundwater is augmented at a rate exceeding that obtained under natural conditions of replenishment. Any man made scheme or facility that adds water to an aquifer may be considered to be an artificial recharge system.

15. What are the various types of recharge structures ?

Recharge structures are constructed to allow rainwater to replenish groundwater. The various ways in which recharge can be done is through:

- Abandoned dugwell
- Handpump
- Recharge pit
- Recharge trench
- Gravity head recharge tubewell
- Recharge shaft

16. What are the benefits of RWH ?

The benefits include:

- Flood mitigation: Appropriately designed recharge structures in open public spaces, will help keep the roads from flooding. When water is not allowed to leave the premises, the chances of it choking up the roads are minimal.
- Increasing groundwater levels: Marked improvement of both the quantity as well as the quality of the groundwater in areas which have implemented rainwater harvesting
- Greater water availability: Rainwater collected in storage tanks is available as and when needed
- Prevents soil erosion and flooding especially in urban areas

17. Is RWH a new trend?

RWH can be traced back to thousands of years in India. Our ancestors traditionally harvested rainwater through tankas, johads, madakas and many such local innovative structures that can be seen even today, across the country.

18. Which of the states have taken action to promote rainwater harvesting ?

In compliance to CGWA (Central Ground Water Authority) directions, steps have been taken by states/UTs to promote and to make rainwater harvesting mandatory. Andhra Pradesh, Gujarat, Haryana, Himachal Pradesh, Kerala, Madhya Pradesh, Maharashtra, Tamil Nadu, Ranchi Regional Development Authority, Bombay Municipal Corporation and Pimpri – Chinchwad Municipal Corporation, Municipal Corporation of Ludhiana, Improvement Trust, Jalandhar, Jaipur Municipal Corporation, Mussorie Dehradun Development Authority, and Union Territories of Delhi, Daman & Diu and Puducherry have made necessary provisions in their building bye-laws to make installation of rain water harvesting systems mandatory.

References

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- Centre for Science and Environment
- Rainwater Club
- Akashganga Trust
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- Central Ground Water Board