

Guidelines for Rainwater Harvesting for large construction projects with built up area equal or more than 20,000 sq mt.

Introduction

The numbers of water stressed regions at various part of the country are increasing due to the rapid growth rate of real estate. The urban areas are facing twin challenges of water scarcity and inadequate capacity of wastewater disposal systems. The rapid growth of urban population leads to escalation of water demand. Meeting these increasing water demand with a geographically constrained water supply system is often a very difficult task. Large construction projects are also being taken up at areas where municipal water supply is yet to be made available. The developers are frequently exploring and abstracting groundwater to ensure the basic amenities at their housing projects. Conservation of ground water is important because it takes years to be replenished. In areas where ground water is used, care must be taken to minimize the quantity of water withdrawn and bring it on par with quantity of water being replenished.

The State Expert Appraisal Committee (SEAC), has been constituted by Ministry of Environment & Forests (MoEF), Government of India as per the notification SO1533 dated 14th September 2006 on Environmental Clearance (EC) procedure in April 2007. The SEAC has taken note of the seriousness of the situation. It has been decided to make rainwater-harvesting mandatory in new large construction projects and to prevent the future imbalance in the hydrology of the development zones.

The Modern Methods

The modern methods of rainwater harvesting can be broadly categorized under two -

- (a) Collection and storage of rainwater for direct use, and
- (b) Groundwater recharging.

A combination of these two are also practiced, where rainwater is collected and stored in containers for direct use while the collected rainwater in excess of the storage capacity is charged into ground (groundwater recharging).

The underlying principle of the rainwater harvesting is to “collect the rainwater when it rains and don't allow rainwater to run away” (runoff). It requires arrangements for collection (usually through gutters and drop down pipelines) of rainwater falling on rooftop and storage of collected rainwater for direct use and/or for groundwater recharge. This method is commonly known as Rooftop Rainwater Harvesting. Rainwater falling on the open spaces around the building (other than rooftop) is also used for rainwater harvesting generally by means of groundwater recharging.

In urban areas, rainwater available from rooftop of buildings, paved areas are drained out. This water can be stored or recharged to aquifer and can be utilized gainfully at the time of need. In urban area, rainwater-harvesting system are designed in a way that it does not occupy large space for collection and recharge system. A few of the techniques of roof top rainwater harvesting in urban areas for recharging of groundwater aquifer are -

- (a) roof top rainwater harvesting through recharge pit,
- (b) roof top rainwater harvesting through recharge trench,
- (c) roof top rainwater harvesting through existing tube wells and
- (d) roof top rainwater harvesting through trench with recharge well.

Rainwater collected from terraces of a cluster of building may be led into nearby ponds (with previous top layer) or in a storage tank. Runoff water can also be diverted into such ponds.

The storage -recharge guideline.

Except the upland at north and dry land at western part the West Bengal has significant ground water reserve. However considering the increased rate of abstraction from agriculture and development projects the SEAC has decided to formulate a rainwater harvesting guideline, which will be economically viable and will lead to conservation as well as better utilization of water.

The rainwater harvesting system has three components:

- the catchments
- the collection System
- the utilization

It has been decided that the rooftop catchments shall be used for the rainwater harvesting. The collection system shall be designed for storage/recharge system as applicable. The water shall be recommended for utilization in car

washing, landscaping, fire fighting etc. Different percentage of storage and recharge has been proposed for different stories of building to keep the cost escalation rate as well as rainwater harvested equitable irrespective of buildings heights. The proponent must follow

**Guidelines for HARVESTING RAINWATER in large building projects
with total built up area equal to more than twenty thousand square meter in the State of West Bengal**

SL No.	Category of Building	Minimum percentage of rain water which should harvested by	
		Surface Storage	Sub-surface Recharge *
1	10 to 15 storied Buildings & Above	40%	60%
2	6 to 10 storied Buildings	35%	45%
3	3 to 5 storied Buildings	25%	15% (recharge or Additional Storage)
4	Less than three storied Buildings	10%	10%

Note

1. While suggesting the guidelines, RWH potential in 1000 sqm Roof Area was considered to be 7, 68, 000 litres annually based on the rainfall characteristics. Uniform utilization of harvested rainwater throughout the year from created Storage Tank was also considered. Based on the above consideration, the storage facility to be created from 1000 sqm Roof area for SL No. 1, 2, 3 were thought to be 3 lakh litres, 2.5 lakh litres and 1.5 lakh litres respectively.
2. * The sub surface recharge proposal including the design of recharge structure and location of recharge structure should be submitted before the State Expert Appraisal Committee for consideration. The total quantity of the rain water which would be harvested by the proponent should also be mentioned in the proposal.
3. However, depending upon the characteristics of soil and ground water regime of a particular site, the percentage of surface storage and sub-surface recharge may vary keeping the total percentage of harvested rain water unchanged. The State Expert Appraisal Committee shall approve such proposal only after review and scrutiny on case to case basis.

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