

# WATER CONSERVATION BY RWH

Arpitha Anand Desai, Alogowda A, Dhanush Gowda R N, Mayank Shashank, Jobies M,  
DR.M.C.Sampath Kumar

1Student, Civil Engineering, BMSCE, Karnataka, India

2Student, Civil Engineering, BMSCE, Karnataka, India

3Student, Civil Engineering, BMSCE, Karnataka, India

4Student, Civil Engineering, BMSCE, Karnataka, India

5Student, Civil Engineering, BMSCE, Karnataka, India

6Professor, Civil Engineering, BMSCE, Karnataka, India

## ABSTRACT

Water collecting and use frameworks have been utilized since antiquated circumstances and confirmation of rooftop catchment frameworks go back to early Roman circumstances. Roman estates and even entire urban communities were intended to exploit water as the chief water hotspot for drinking and residential purposes since no less than 2000 B.C. In the Negev leave in Israel, tanks for putting away overflow from slopes for both local and farming purposes have permitted home and development in zones with as meager as 100mm of rain for each year. The most punctual known proof of the utilization of the innovation in Africa originates from northern Egypt, where tanks running from 200-2000m<sup>3</sup> have been utilized for no less than 2000 years – numerous are as yet operational today. The innovation likewise has a long history in Asia, where water gathering hones have been followed back right around 2000 years in Thailand. The little scale gathering of Water from the overhang of rooftops or by means of straightforward drains into Conventional jugs and pots has been polished in Africa and Asia for a huge number of years. In numerous remote provincial regions, this is as yet the technique utilized today. The world's biggest water tank is most likely the Yerebatan Sarayi in Istanbul, Turkey. This was built amid the lead of Caesar Justinian (A.D. 527-565). It quantifies 140m by 70m and has a limit of 80,000 cubic meters

### Physical Features:

Elevation: 371 metres above sea level

Wind: 18.5 kmph

Soil:

pH level: 7.0(±0.22)

Organic carbon(%): 0.48(±0.02)

Calcium(ppm): 1612(±152.0)

Average annual rainfall: 544 mm

Temperature :

Maximum Average Temperature: 41°C

Average Temperature: 37°C

Average Min Temperature: 27°C



Back view of school building

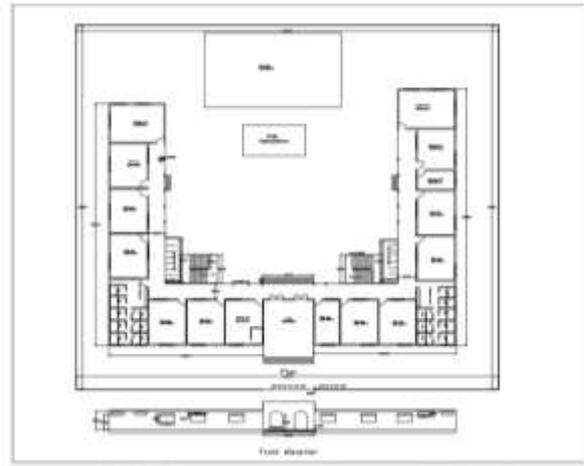
### **The common components of a rainwater harvesting system are:**

*Catchments, Coarse mesh, Gutters, Conduits, First flush, Filters, Storage tanks and Recharge structures.*

### **Rain water harvesting techniques**

*There are two fundamental procedures of rain water harvestings:*

- 1. Storage of water on surface for sometime later.*
- 2. Revive to ground water*



*Plan of the rainwater harvesting area*



*(A) top view*

*(B) side view*

### **BENEFITS OF RAINWATER HARVESTING**

- *Rainwater is a relatively clean and free source of water.*
- *Rainwater harvesting provides a source of water at the point where it is needed.*
- *It is socially acceptable and environmentally responsible.*
- *It promotes self-sufficiency and conserves water resources.*
- *Rainwater is friendly to landscape plants and gardens.*

### **RAINWATER USE**

- *Intermittent – in situations with one long rainy season when all water demands are met by rainwater. During the dry season, water is collected from other sources.*
- *Partial – rainwater is used throughout the year but the ‘harvest’ is not sufficient for all domestic demands. For example, rainwater is used for drinking and cooking, while for other domestic uses (e.g. bathing and laundry) water from other sources is used.*
- *Full – for the whole year, all water for all domestic purposes comes from rainwater. In such cases, there is usually no alternative water source other than rainwater, and the available water should be well managed, with enough storage to bridge the dry period.*

### **ADVANTAGES OF RAIN WATER HARVESTING**

- 1. Provides self-sufficiency to your water supply*
- 2. Reduces the cost for pumping of ground water*
- 3. Provides high quality water, soft and low in minerals*
- 4. Improves the quality of ground water through dilution when recharged to ground water*
- 5. Reduces soil erosion in urban areas*
- 6. The rooftop rain water harvesting is less expensive*

7. Rainwater harvesting systems are simple which can be adopted by individuals
8. Rooftop rain water harvesting systems are easy to construct, operate and maintain
9. In hilly terrains, rain water harvesting is preferred

### **SAFETY CONSIDERATION STORAGE IN GROUND WATER RESERVOIR**

1. For rooftop rain water harvesting through existing tube wells and hand pumps, filter or desalting pit should be provided so that the wells are not silted.
2. Such tube wells if pumped intermittently, increase the efficiency of recharge.
3. If the ground water reservoir is recharged through, shaft, dug well etc., inverted filter may be provided.

### **STORAGE IN TANKS**

1. A storage tank should not be located close to a source of contamination, such as a septic tank etc.
2. A storage tank must be located on a lower level than the roof to ensure that it fills completely.
3. A rainwater system must include installation of an overflow pipe which empties into a non-flooding area. Excess water may also be used for recharging the aquifer through dug well or abandoned hand pump or tube well etc.
4. A speed breaker plate must be provided below inlet pipe in the filter so as not to disturb the filtering material.
5. Storage tanks should be accessible for cleaning.
6. The inlet into the Storage tank should be screened in such way that these can be cleaned regularly.
7. Water may be disinfected regularly before using for drinking purpose by chlorination or boiling etc.

### **Area suitable for rain water harvesting:**

Rainwater harvesting systems can be installed in both new and existing buildings and harvested rainwater used for different applications that do not require drinking water quality such as toilet flushing, garden watering, irrigation, cleaning and laundry washing. Harvested rainwater is also used in many parts of the world as a drinking water source. As rainwater is very soft there is also less consumption of washing and cleaning powder. With rainwater harvesting, the savings in potable water could amount up to 50% of the total household consumption.

### **DISCUSSION:-**

- Now a days cost of the water per liter is quite high compared to that the water collected in this system gives reliable quantity of water. In project area there are two bore wells are provided which operate for the sanitation and gardening purpose so in future we thought about collection of open surface water and recharge the wells.
- In future water collected from surface run off is harvested in bore wells which will serve the purpose of recharging aquifers and fulfill the increasing demand of water.
- As the Rain water is free and clean source of water, the initial cost is zero, we only need a structure which control the wastage of water in the form of rain water harvesting.

### **CONCLUSION:-**

The huge amount of precipitation occurring on the ground can be harvested and utilized for different purposes, if proper collection system is provided. As so many parts of the world facing the problems of water crises, one must understand the importance of water, and should made optimum use of water and adopt efficient methods of collecting and saving the rainwater. The procedure adopted in this study is proven to be costly as per the cost analysis, very easy as per methodology and very efficient as per the discharge calculated.

**REFERENCES:-**

- *Junling Wang, Wan Sun et.al(2015)Case study rainwater utilization and water saving design of village*
- *Jillian Zankowski, Yixin Sun et.al (2014)Design and Selection for Roof Rainwater Catchment*
- *Kudakwashe E. Motsi , Edward Chuma et.al(2004):A Rainwater harvesting for sustainable agriculture in communal lands of Zimbabwe.,Physics and Chemistry of the Earth ,29 (2004) 1069–1073 ?*
- *Rain fall data collected from Jalvidyanbhavan MERI, Nashik.*
- *V.S. Pawar-Patil and Sagar P. Mali(2013) ”Rain Water Harvesting System for College of Engineering, TeerthankarMahaveer University, Moradabad*

