ENVIRONMENTAL STUDIES & LIFE SCIENCES

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Bio-sustainability

Rain water harvesting

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Rain Water Harvesting

- **Rainwater harvesting** is the collection and storage of rain, rather than allowing it to run off
- Rainwater is collected from a roof-like surface and redirected to a tank, cistern, deep pit (well, shaft, or borehole), aquifer or a reservoir with percolation

Rain Water Harvesting

- It is one of the simplest and oldest methods of self-supply of water for households, and residential and household scale projects usually financed by the user
- However, larger systems for schools, hospitals and other facilities can run up costs only able to be financed by companies, organization and governmental units

Rain Water Harvesting

- Applications of rainwater harvesting in urban water system provides a substantial benefit for both water supply and wastewater subsystems by reducing the need for clean water in water distribution systems, less generated storm-water in sewer systems, and a reduction in storm-water runoff polluting freshwater bodies

Rain Water Harvesting

- Tamil Nadu was the first state in India to make rainwater harvesting compulsory for every building to avoid groundwater depletion
- In Bangalore, Karnataka, adoption of rainwater harvesting is mandatory for every owner or the occupier of a building having the site area for newly constructed building measuring 30 ft × 40 ft and above dimensions

Rain Water Harvesting

- In this regard, Bangalore Water Supply and Sewerage Board has initiated and constructed “Rain Water Harvesting Theme Park” in the name of Sir M. Visvesvaraya in 1.2 acres of land situated at Jayanagar, Bangalore

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Rain Water Harvesting Theme Park, Bangalore

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Rain Water Harvesting

- **Components of a rain water harvesting system:**

1. **Catchments:** The catchment of a water harvesting system is the surface which directly receives the rainfall and provides water to the system.
2. **Coarse mesh:** at the roof to prevent the passage of debris
3. **Gutters:** Channels all around the edge of a sloping roof to collect and transport rainwater to the storage tank

4. Conduits: are pipelines or drains that carry rainwater from the catchment or rooftop area to the harvesting system

5. First-flushing: A first flush device is a valve that ensures that runoff from the first spell of rain is flushed out and does not enter the system. This needs to be done since the first spell of rain carries a relatively larger amount of pollutants from the air and catchment surface.

6. Filters: used to remove suspended pollutants from rainwater collected over roof. A filter unit is a chamber filled with filtering media such as fibre, coarse sand and gravel layers to remove debris and dirt from water before it enters the storage tank or recharge structure.

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Rain Water Harvesting

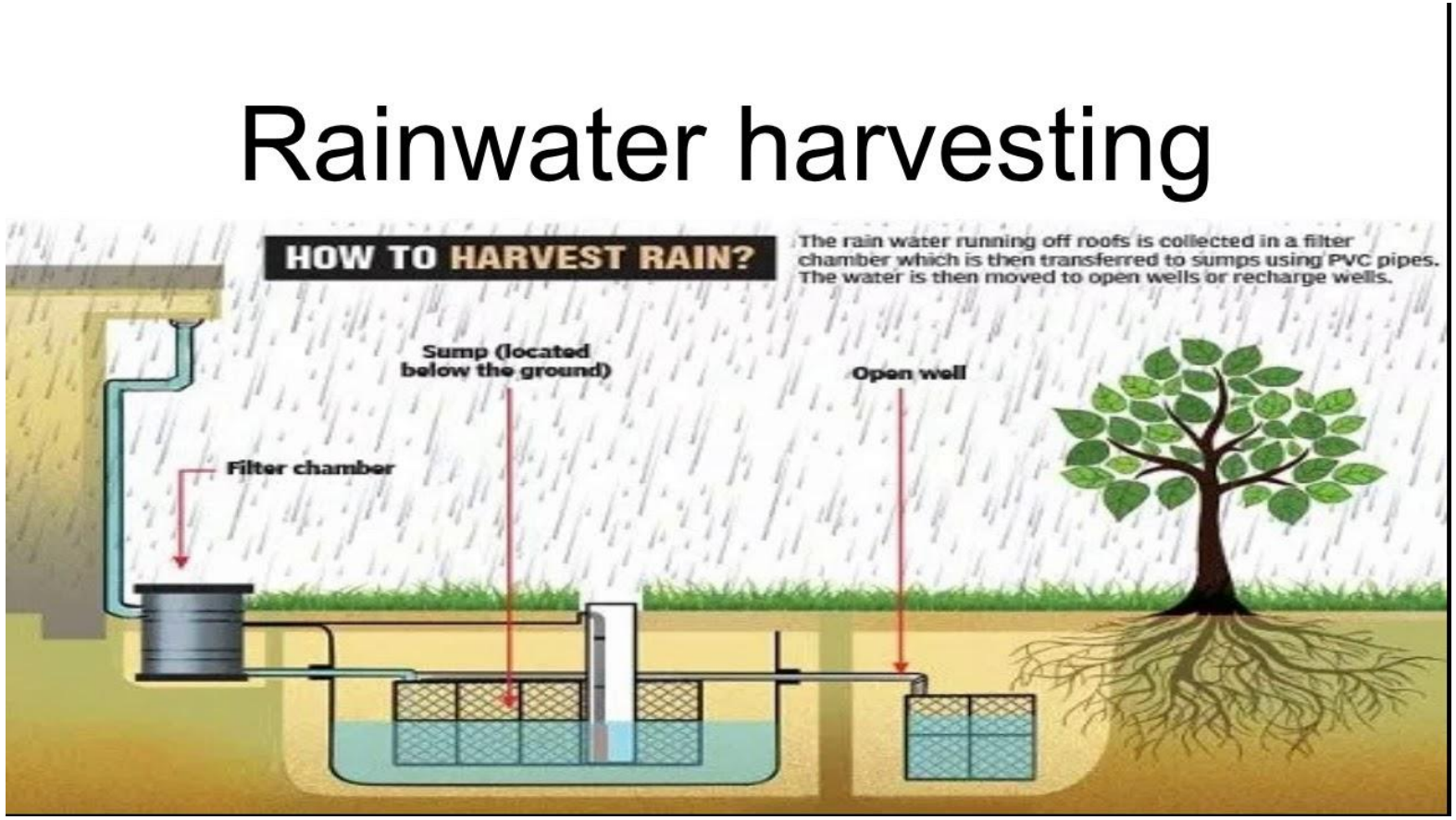

Image source: https://www.edusquad.com/2019/

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Rain Water Harvesting

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Rain Water Harvesting

- **Advantages:**
- It provides water when a drought occurs, can help mitigate flooding of low-lying areas, and reduces demand on wells which may enable groundwater levels to be sustained
- Simple installation
- Easy to operate and maintain
- Needs no power and operates at low gravity pressure (0.1 bar upward)

Rain Water Harvesting

- The system is capable of providing a constant flow of about 40 litres of rainwater per hour, enough for drinking, cooking and bathing purposes
- Maintains nearly constant volume irrespective of water pressure
- Cost per 1000 litres is as low as US$ 2 to 3

THANK YOU

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