

COMPONENTS OF ROOF TOP RAINWATER HARVESTING

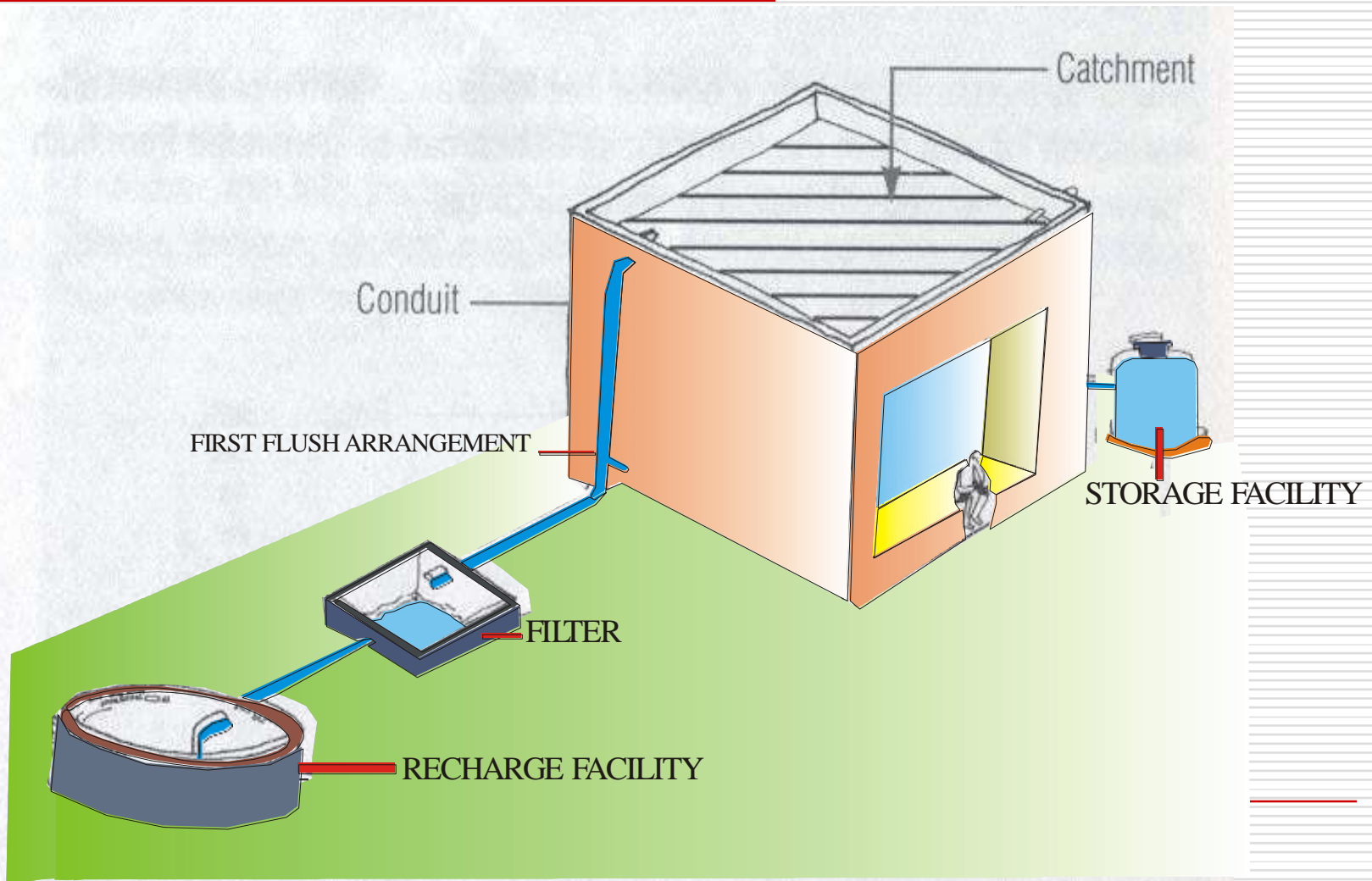


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Schematic diagram of a of typical roof top rainwater harvesting system



Precautions

- ❑ The roof or terraces used for harvesting should be **clean**
 - ❑ **Do not store** chemicals, rusting iron, manure or detergent on the roof
 - ❑ **Avoid using** terraces for **toilet by you and your pets**
 - ❑ Provide gratings at mouth of each drainpipe on terraces to trap debris and floating materials
 - ❑ **Prevent storage** system from contamination
 - ❑ Provision of **first rain separator** should be made to flush first rain
 - ❑ Do not use **polluted water to recharge** ground water
 - ❑ Before recharging arrangements of **filtering should** be provided
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Components of RTRWH system

The system mainly constitutes of following sub components:

- Catchment
 - Transportation (Gutter/ pipes)
 - First flush
 - Filter
 - Storage tank
 - Recharge structure
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Commonly used Terms

Catchment

- ❑ The surface that receives rainfall directly is the catchment. Sloping roof or flat roof.

Transportation

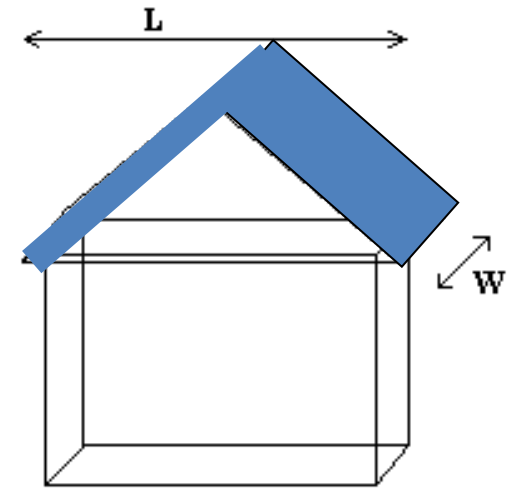
- ❑ Rainwater from rooftop should be carried through gutter & down take water pipes or drains to storage/harvesting system. Water pipes should be UV resistant (ISI HDPE/PVC pipes) of required capacity.

First Flush

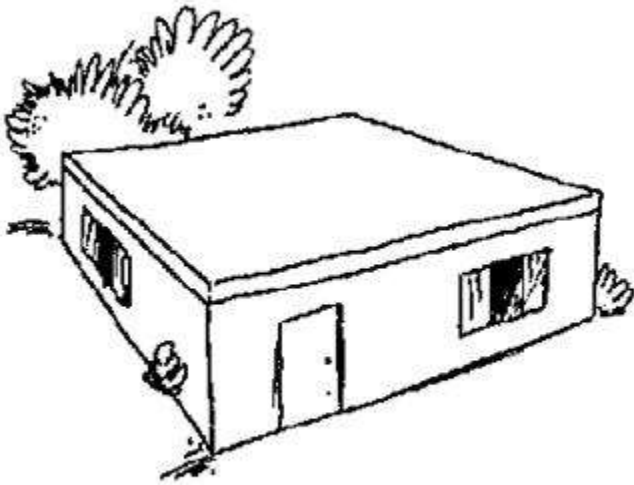
- ❑ First flush is a device used to flush off the water received in first shower. Provisions of first rain separator should be made at outlet of each drainpipe.
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Catchment Area Size

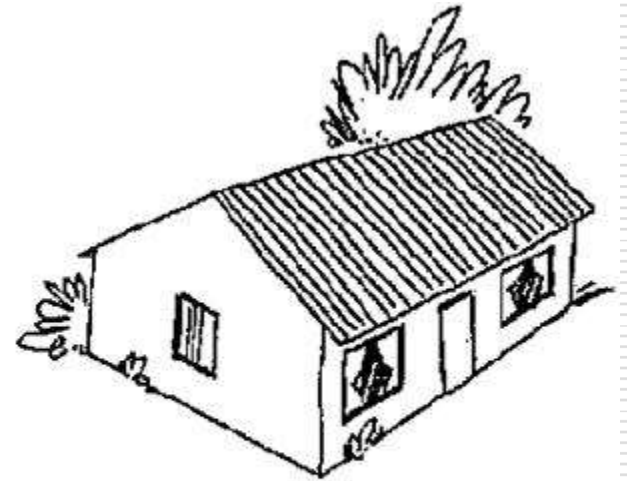
- The size of roof catchment is the projected area of the roof or the building's footprint under the roof.
- To calculate the catchment area (A), multiply the length (L) and width (w) of the guttered area. It is not necessary to measure the sloping edge of the roof.
- Note that it does not matter whether the roof is flat or peaked. It is the “footprint” of the roof drip line that matters.



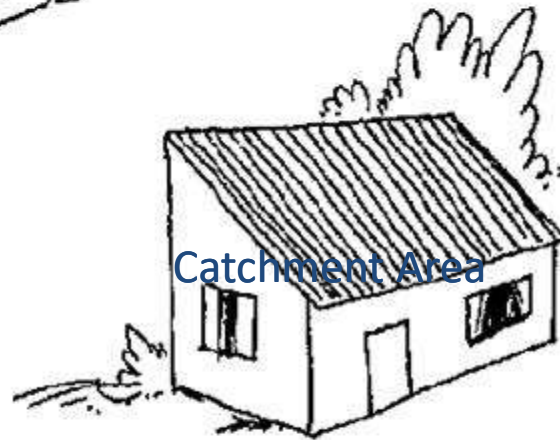
Types of Catchment Area



FLAT ROOF

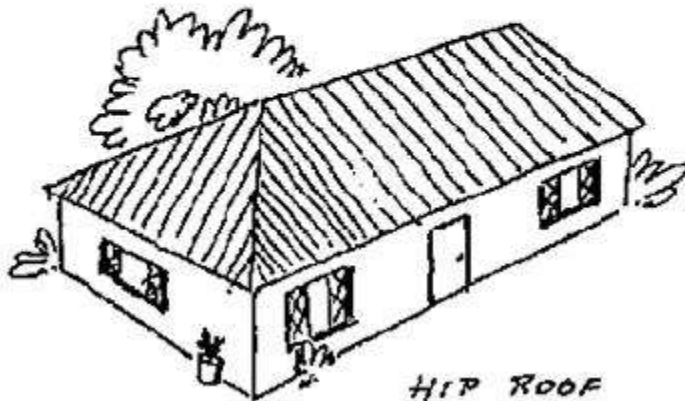


DOUBLE PITCH ROOF



Catchment Area

SINGLE PITCH ROOF



HIP ROOF

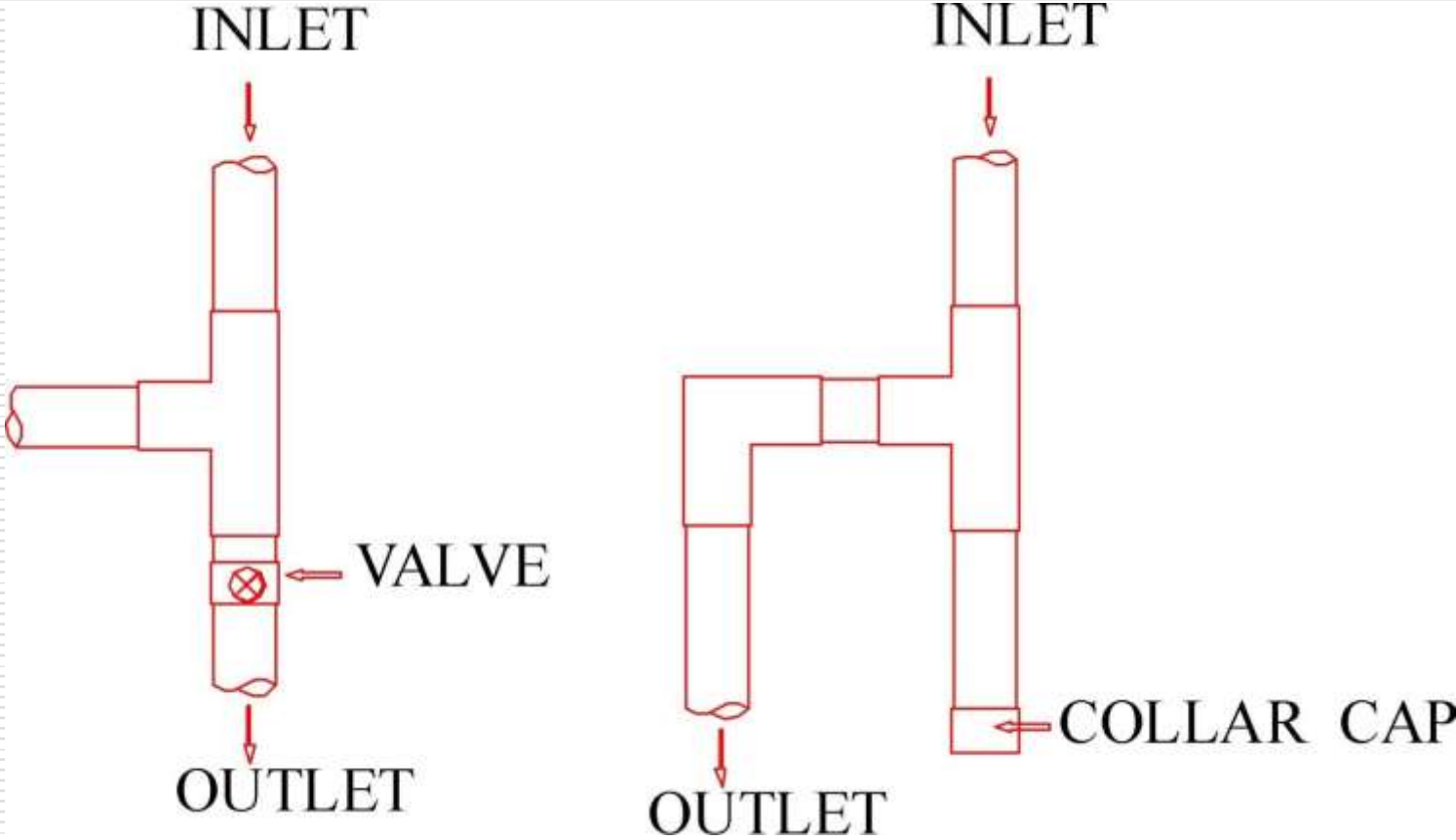


TENT ROOF

Transportation



First Flush

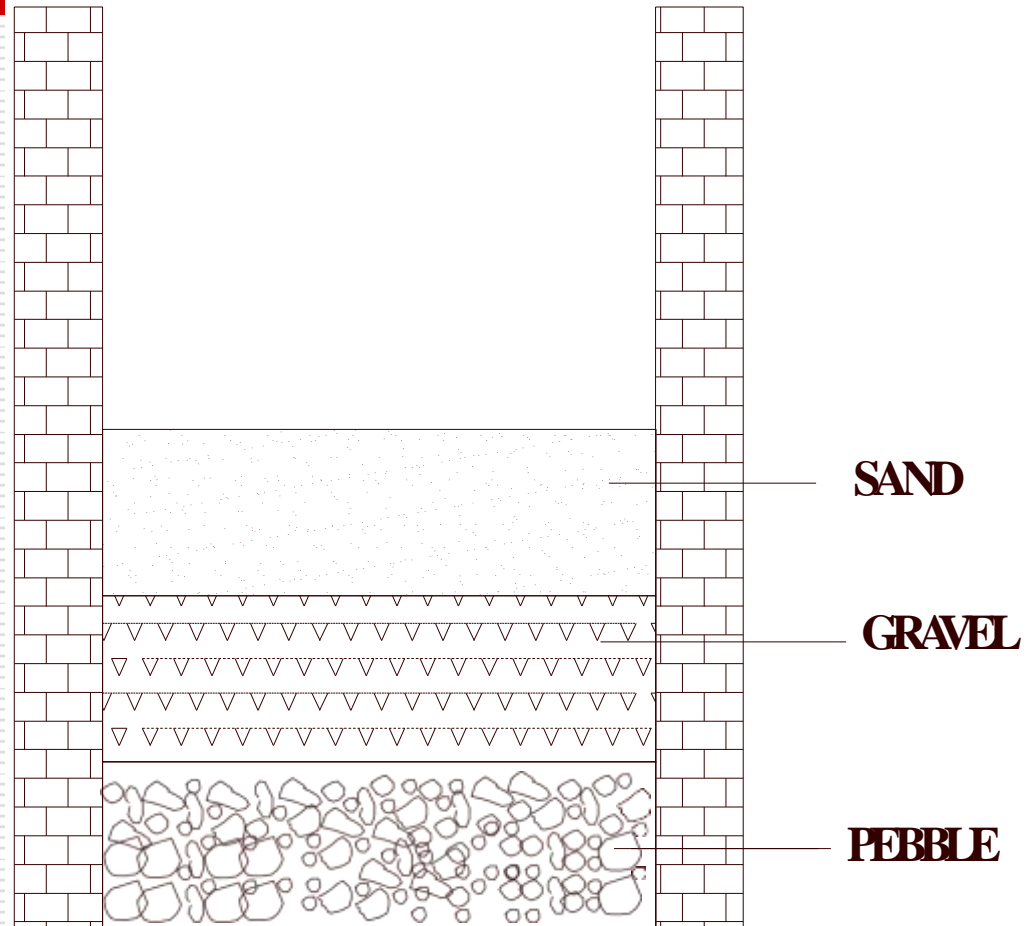


Filteration

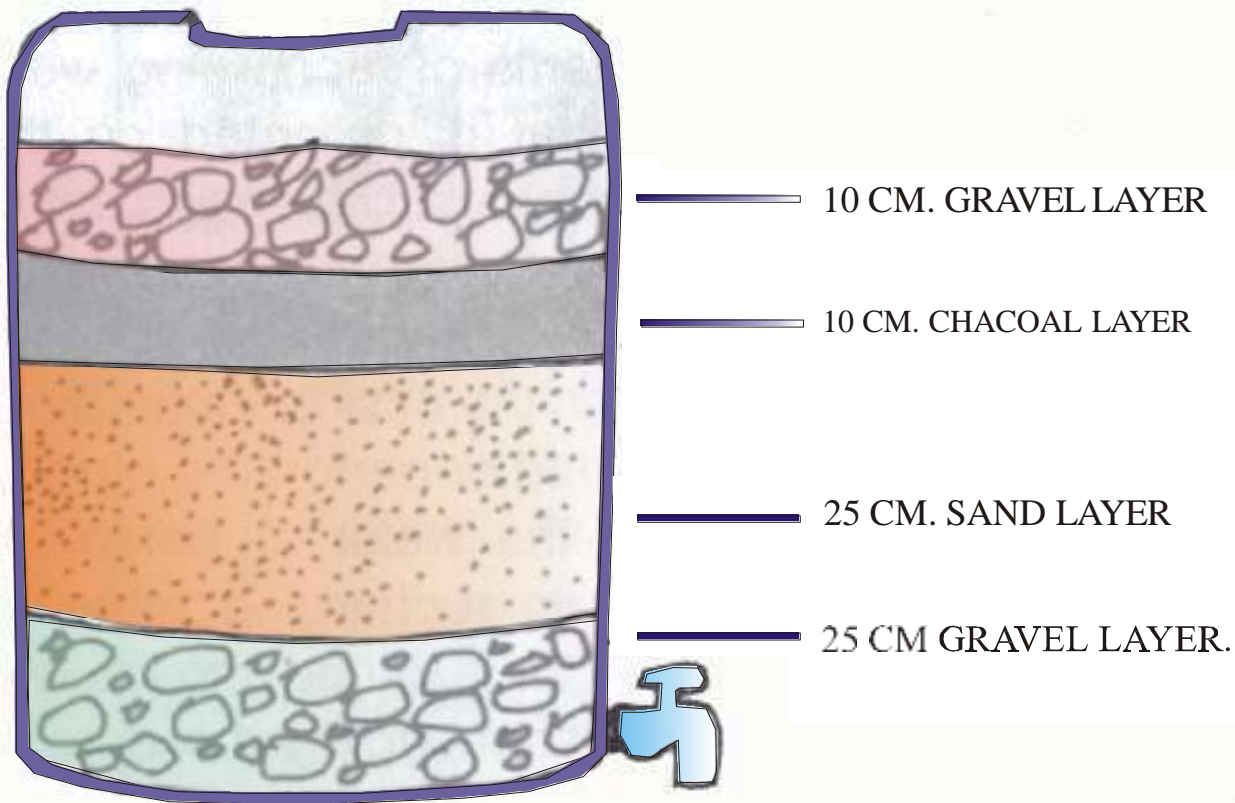
- Sand gravel filter**
 - Charcoal filter**
 - PVC – Pipe filter**
 - Sponge filter**
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Sand gravel filter

- These are commonly used filters, constructed by brick masonry and filled by pebbles, gravels, and sand as shown in the figure. Each layer should be separated by wire mesh.

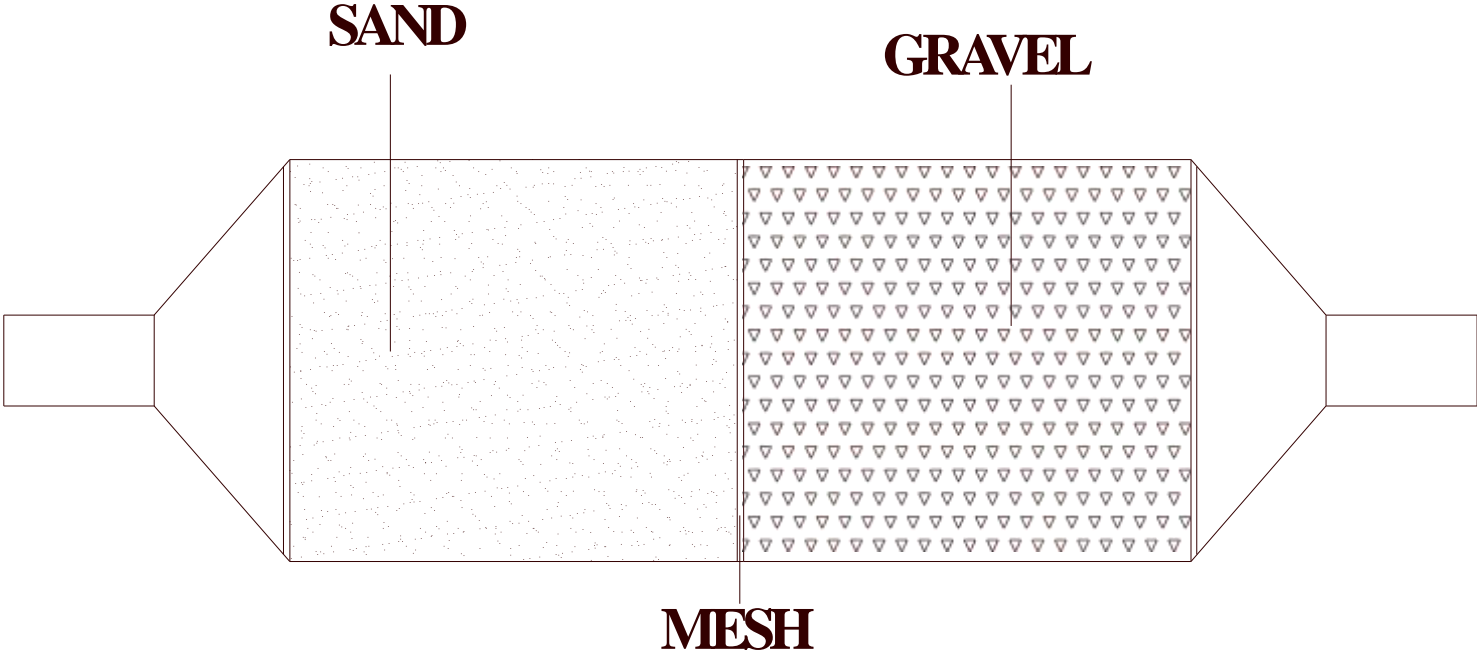


Charcoal filter



Charcoal filter can be made in-situ or in a drum. The drum or chamber should be filled by pebbles, gravels, sand and charcoal as shown in the figure. Each layer should be separated by wire mesh.

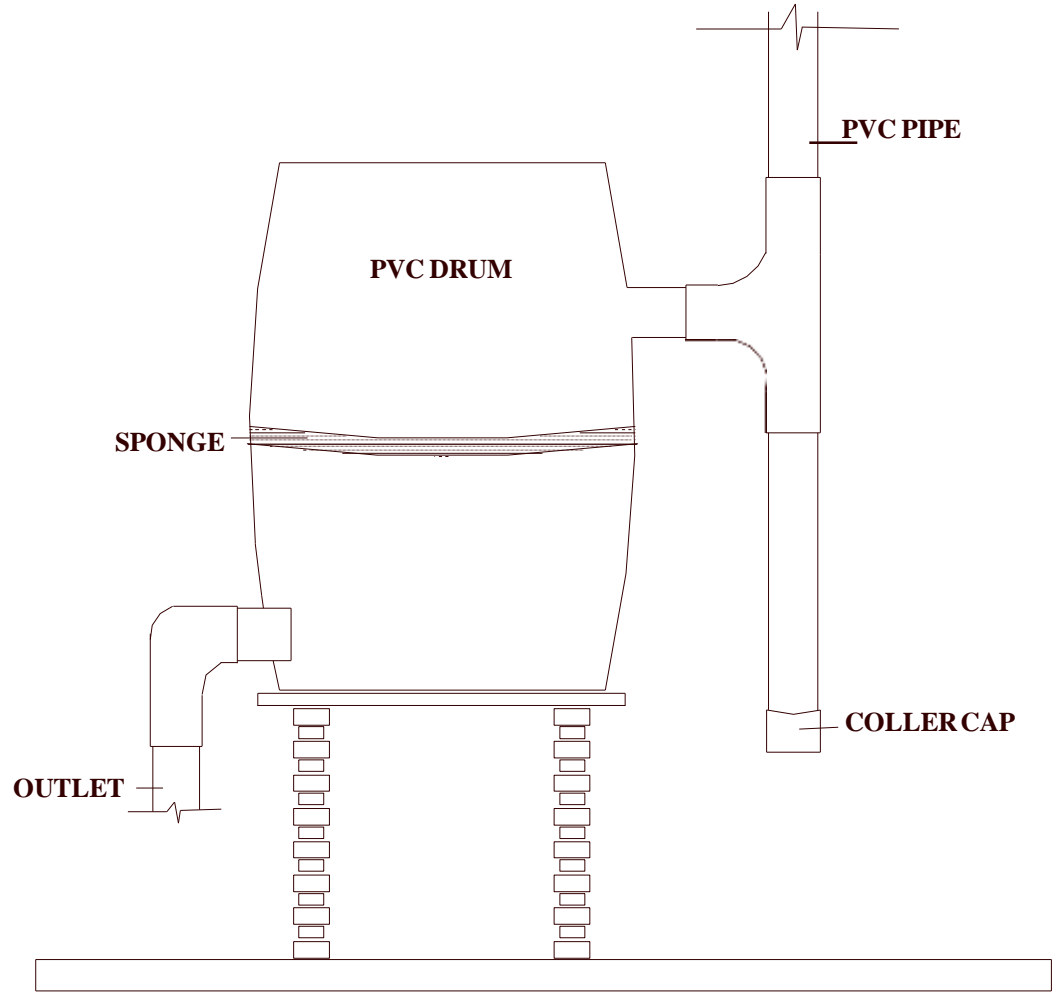
PVC – Pipe filter



PVC PIPE FILTER

Sponge filter

- It is a simple filter made from PVC drum having a layer of sponge in the middle of drum. It is an easiest & cheapest form of filter, suitable for residential units.



Storage Tank (for Direct use)

- ❑ rain water collected from the roof is **diverted to** storage tank.
 - ❑ storage tank has to be designed **according to the water requirements, rainfall and catchment availability.**
 - ❑ Each drain pipe should have **mesh filter** at mouth and **first flush device** before connecting to storage tank.
 - ❑ Each tank should have excess water over flow system. Excess water could be **diverted to recharge system.**
 - ❑ Water from storage tank can be used for **domestic and gardening** purpose.
 - ❑ It is most **cost effective** way of rainwater harvesting.
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Storage tank for Direct use

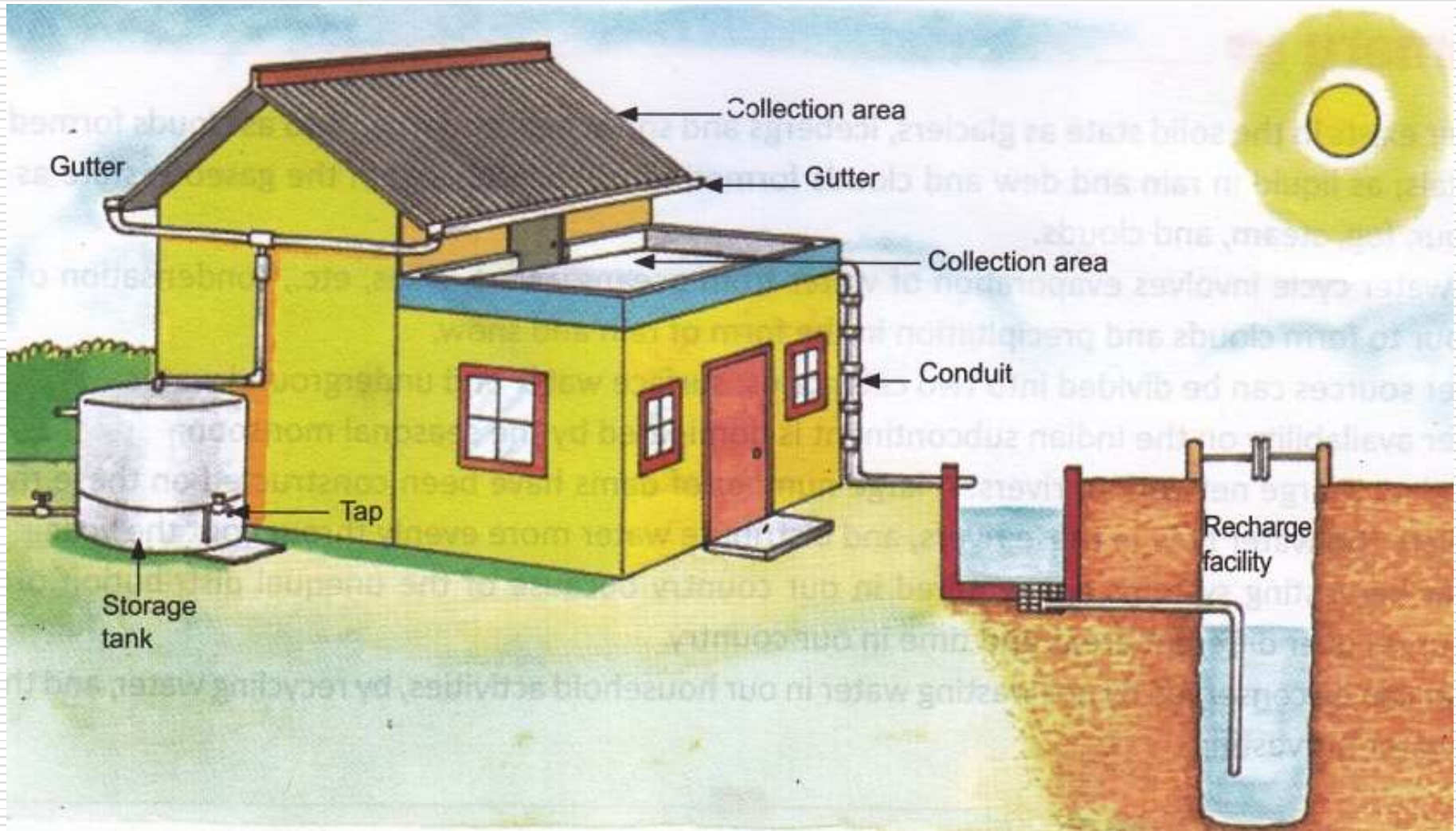


Recharging to ground water aquifers

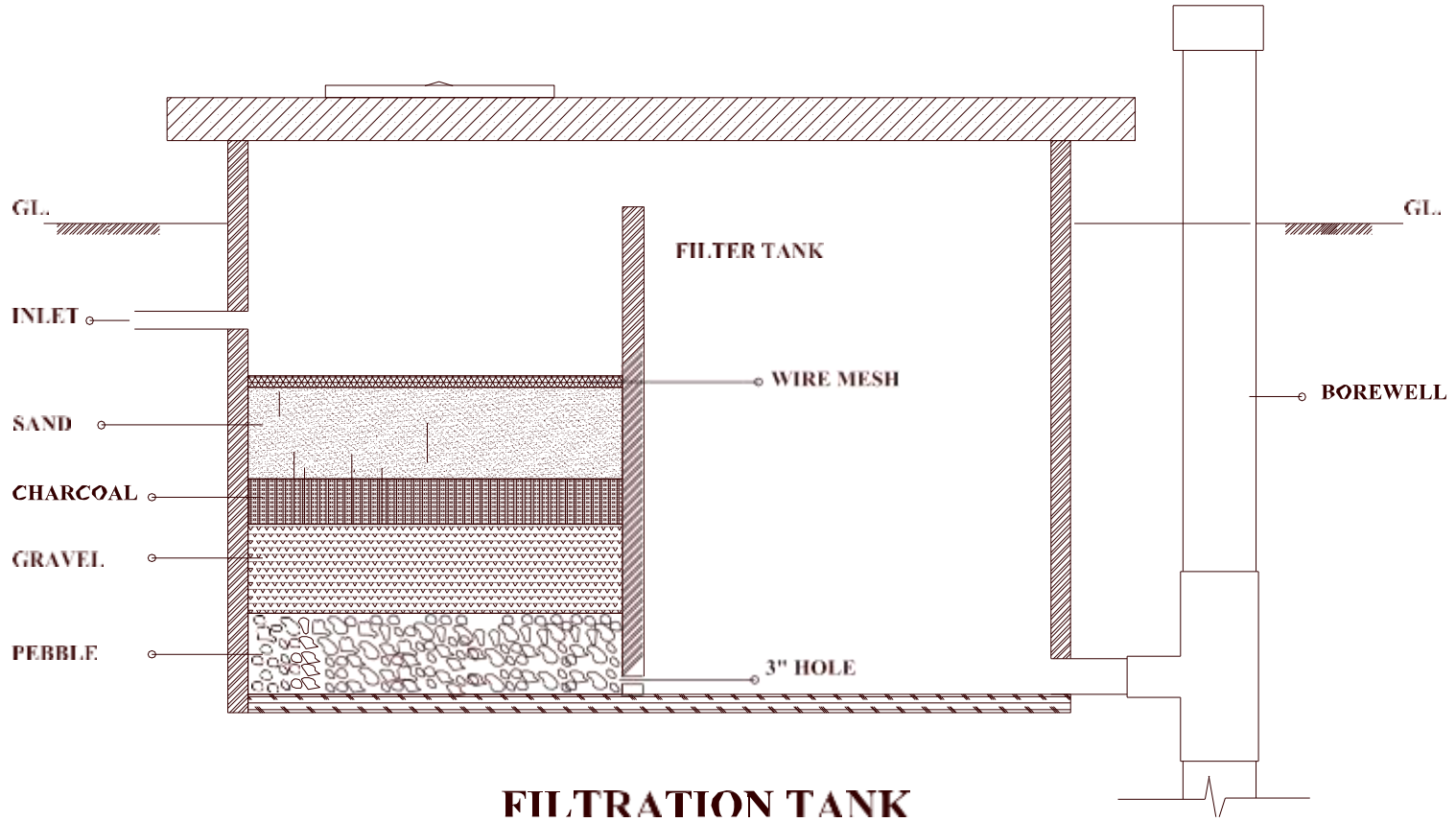
- **Ground water aquifers can be recharged by various kinds of structures to ensure percolation of rainwater in the ground instead of draining away from the surface**

 - **Commonly used recharging methods are:**
 - 1) **Recharging bore wells**
 - 2) **Recharge pits**
 - 3) **Soakaways or Recharge Shafts**
 - 4) **Recharging dug well**
 - 5) **Recharge Trench**
 - 6) **Percolation Tank**
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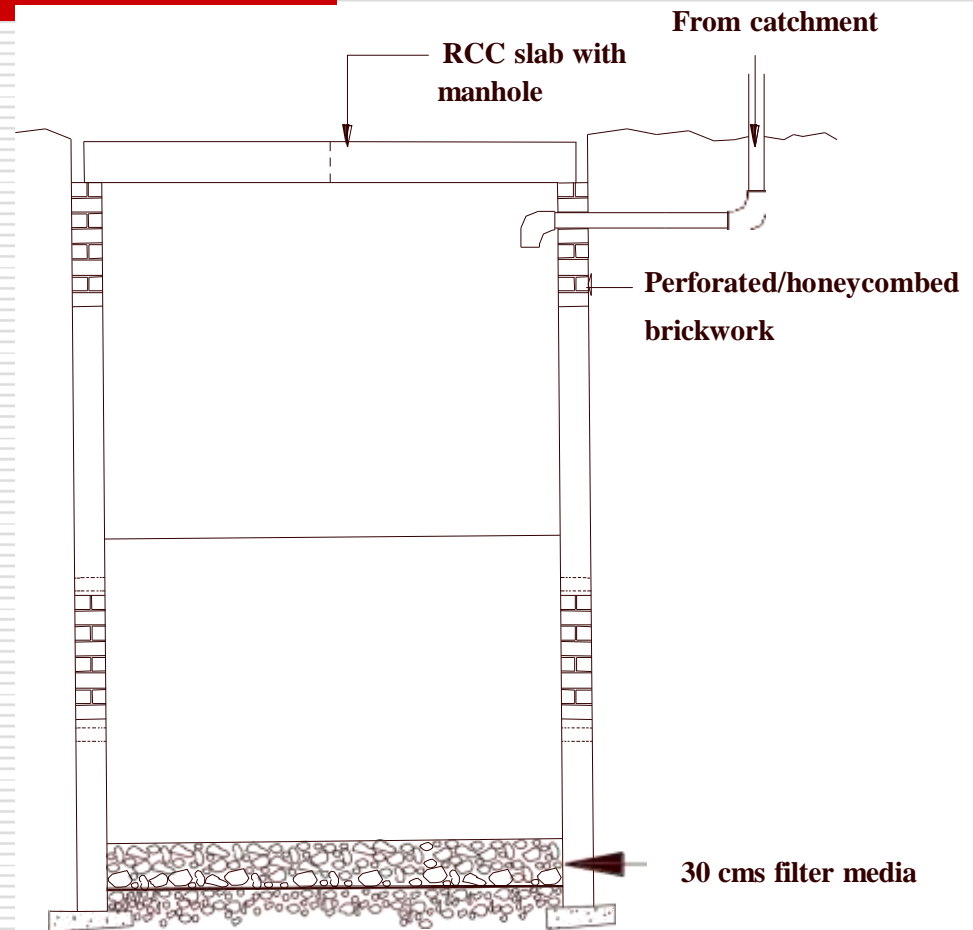
Recharging ground water aquifers



Recharging bore wells

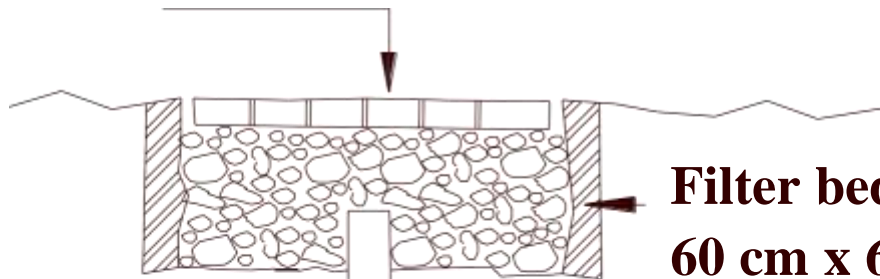


Recharge pits



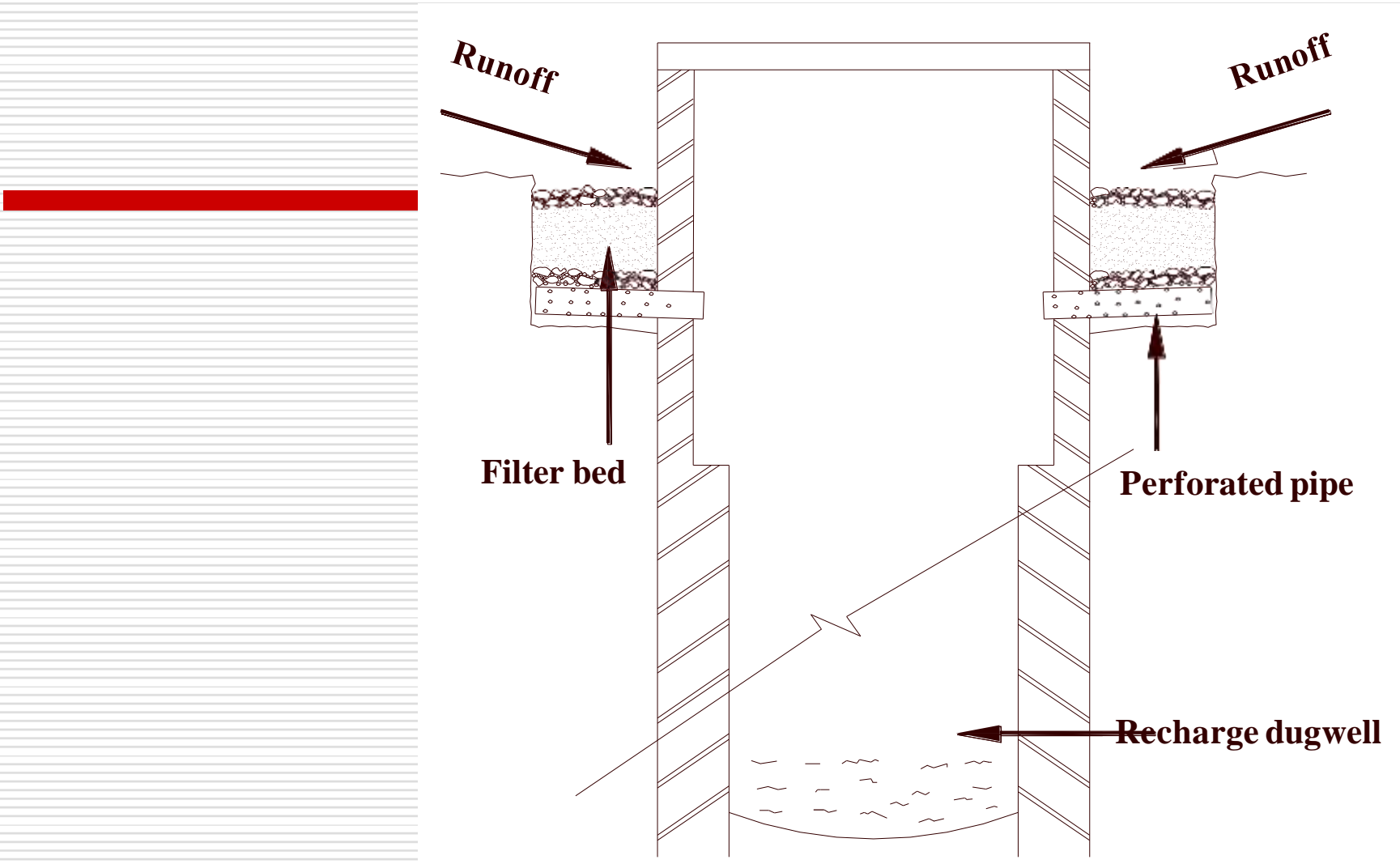
Soak-aways or Recharge Shafts

Perforated cover



Filter bed sump
60 cm x 60 cm. x 60 cm

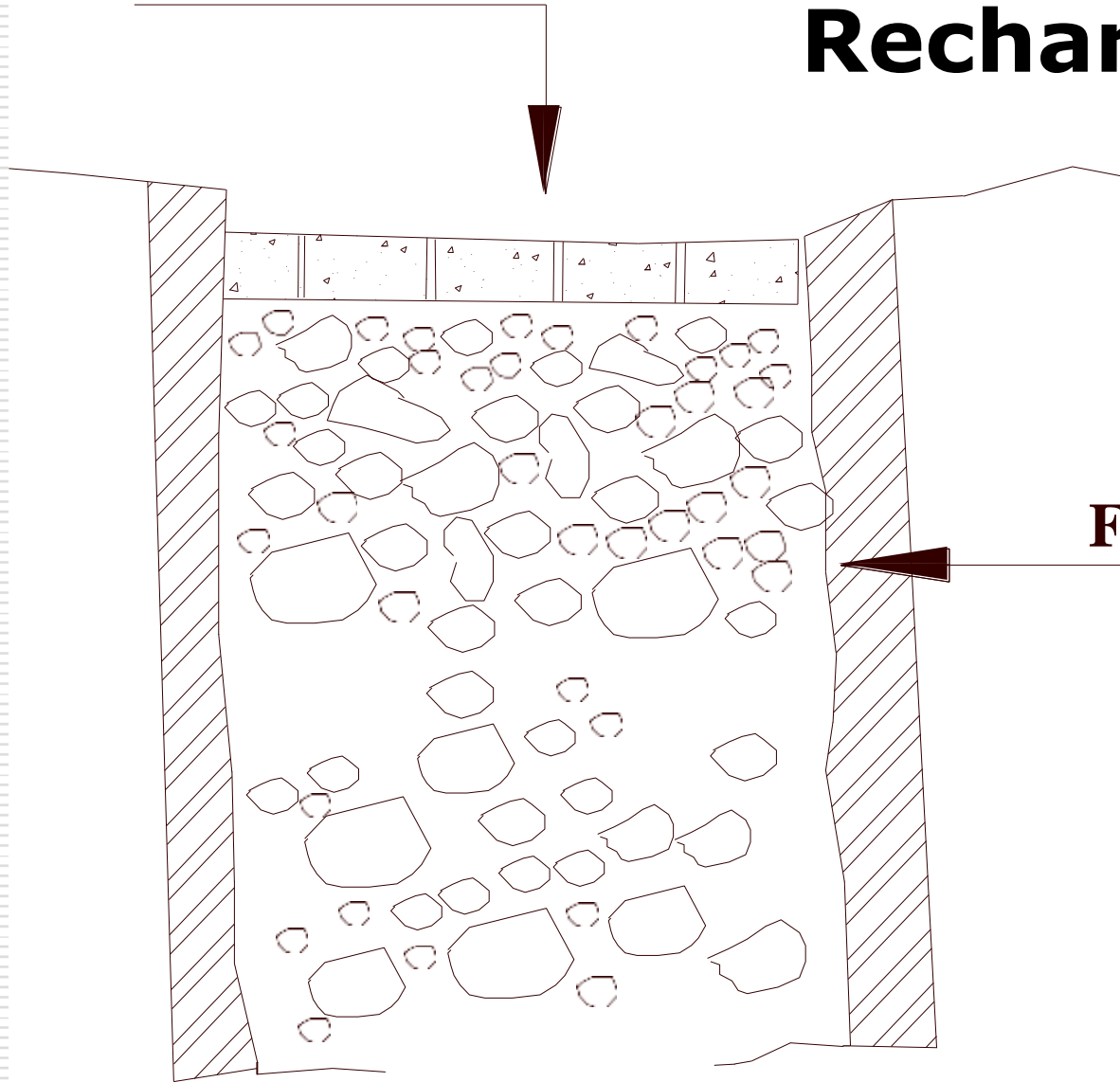
Perforated pipe



~~Recharging dug well~~

Perforated cover

Recharge trench



Filter media

Percolation tanks

- Percolation tanks are the **surface tanks**, which can be built, in big campuses where land is available and topography is suitable.
 - Surface run-off and roof top water can be **diverted to this tank**.
 - Water accumulating in the tank **percolates** in the soil to augment the ground water.
 - The stored water can be **used directly** for gardening and raw use.
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Rainwater-harvesting-slogans

- Harvest the rain, reap the grains
- A drop harvested is a crop harvested
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- Make running water walk.

SOURCE: <https://www.iaspaper.net/>



Make water everybody's business

Thank You
