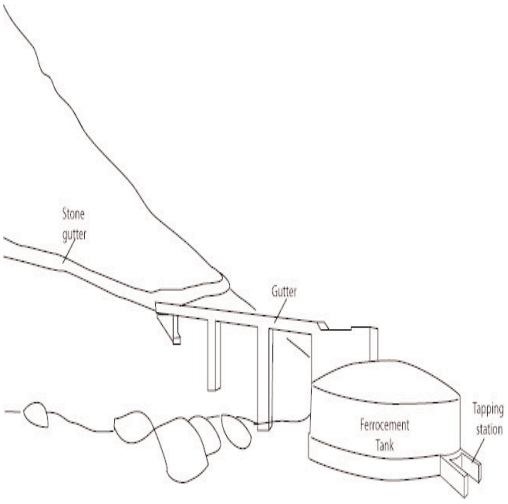
Rock catchment rainwater harvesting

If there are large rocky hills where you live you will know that when it rains a lot of water pours off the rocks. This Action Sheet describes how to develop a rock catchment area, so that the runoff water can be harvested and stored for domestic and livestock use.

What is a rock catchment?
It is a rainwater catchment area developed from a rock outcrop to catch and concentrate runoff into a storage structure for later use. Stone gutters are made to collect the runoff from the rock catchment area, and direct the rainwater into a storage structure. The storage structure can be a tank or reservoir above a dam.



Rock catchment runoff collected in a tank. Image: SEARNET.

Building the stone gutter
The gutter is a stone wall built with rough stones/ hardcore, joined with mortar. It is built around the outer edge of the rock catchment to direct the runoff rainwater into a storage tank or reservoir.

Storing water from a rock catchment
Water can be stored in:
- Brick or ferro-cement tank above or under ground (left)
- A reservoir behind a masonry gravity dam (right).

The main requirement for making a rock catchment is a rock outcrop with a large surface area. You will also need:

- Locally available building materials such as sand, hardcore and ballast.
- Ordinary cement – the amount required depends on size of the catchment and storage structure.
- Skilled person/mason.
- Unskilled people to provide labour.
- Means of transporting materials, such as ox-cart, pickup or wheelbarrow.

The amount of runoff water that you can collect from a rock catchment is determined by the effective catchment area from which rainwater will be collected, and the average seasonal rainfall. The amount of water losses through the rock surface and the shape of the catchment in relation to the storage structure area are also important.

The steps to take in planning a rock catchment.
Step 1: Choose a suitable site with a large area of rock outcrop, where water cannot soak into the ground.
Step 2: Clear and clean the site off vegetation.

Step 3: Mark out the effective catchment area of the rock surface where you plan to collect the rainwater from. This area will be enclosed with gutters.

Step 4: Estimate the amount of runoff volume (m3) anticipated. Runoff volume (m3) = rainfall (m) x catchment area (m2) x runoff coefficient (normally 0.9 for rock surfaces). This volume will guide the design of the rainwater storage structure.

Step 5: Choose the site for the water storage structure or masonry (brick/concrete) gravity dam on the outer edge of a hollow or depression on the rock surface.

Step 6: Design the water storage structure or masonry gravity dam to hold the volume of water. calculated in Step 4.

Step 7: Estimate the amount of material required to build the rock catchment walls and the water storage structure or dam.

Step 8: Organise the team and start to build, during the dry season!

Maintaining a rock catchment

It is important to clean the catchment area and reservoir/tank every season and to repair cracks on the catchment and leaks on the dam or reservoir.

Acknowledgements

This Action Sheet is based on the SEARNET Rainwater Harvesting Technologies Database entry on Rainwater Harvesting with Rock Catchment (www.searnet.org/content.asp?contentid=5&Category=Rainwater%20Harvesting%20Technologies%20Database%20&section=directory).

More information

International Rainwater Harvesting Alliance www.irha-h2o.org
IRC - International Water and Sanitation Centre www.irc.nl

Water Aid www.wateraid.org

References

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Rainwater Catchment Systems for Domestic Supply, J. Gould, and E. Nissen-Petersen, IT Publications, 1999 (Available at Practical Action (ITDG) Resource Centres or available from www.developmentbookshop.com/water-and-sanitation)

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