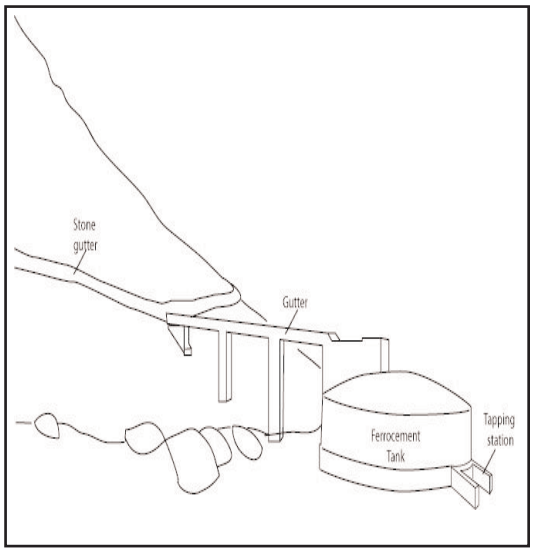
Rock catchment rainwater harvesting

What is this Action Sheet about?

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)

How do you build 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.

How do you store water from a rock catchment?

Water can be stored in a:

- Brick or ferro-cement tank, above ground or underground
- A reservoir behind a masonry gravity dam

What's the main requirement for the development of a rock catchment?

A rock outcrop with a large surface area

What else do you need to develop a rock catchment?

You will need:

- Locally available 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 or wheelbarrow

What determines the amount of runoff water that you can get from a rock catchment?

The amount of water that you can collect depends on:

- The effective catchment area from which rainwater will be collected
- The average seasonal rainfall

- The amount of water losses through the rock surface
- The shape of the catchment in relation to the storage structure area

How do you plan out the development of 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 (m^3) anticipated. Runoff volume ($m^{3)}$ = rainfall (m) x catchment area (m^2) 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!

What do you need to do to maintain a rock catchment?

- Clean the catchment area and reservoir/tank every season
- 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).

FOR FURTHER INFORMATION

CONTACTS

GHARP - Greater Horn of Africa Rainwater Partnership www.gharainwater.org/index.html
International Rainwater Catchment Systems Association (IRCSA) www.ircsa.org
International Rainwater Harvesting Alliance www.irha-h2o.org
IRC - International Water and Sanitation Centre www.irc.nl
Practical Action (formerly known as ITDG) www.practicalaction.org/
SEARNET - Southern and Eastern Africa Rainwater Networkwww.searnet.org
Water Aid www.wateraid.org
WELL (WEDC) www.lboro.ac.uk/well/index.htm

REFERENCES

The Rainwater Harvesting CD , H. Hartung, Margraf Publishers, 2002 Available by emailing: info@margraf-verlag.de or HansFHartung@aol.com
Rainwater Harvesting - The collection of rainfall and runoff in rural areas , A. Pacey and A. Cullis ITDG Publishing, 2002 (available from www.developmentbookshop.com)
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)