

Key messages

- Rainwater harvesting systems capture rain and runoff water over a collection area, channel and store it, either in the soil for agriculture or in containers for household and other use.
- All stakeholders should be involved using participatory approaches in the planning and implementation of rainwater harvesting systems.
- Effective rainwater harvesting systems can help supply water to beneficiaries throughout an entire year even with minimal rainfall.
- Use local knowledge and new technologies for rainwater harvesting, i.e. rainwater harvesting is not a new concept for most Darfuris, but new technologies may be able to enhance current systems.
- Use local resources, i.e. materials and labour, for the creation of or improvements to rainwater harvesting systems
- **Roof and tank systems:** surfaces should be covered with smooth, grooved surfaces and water should be stored in waterproof, sturdy, affordable tanks.
- **Ground catchments:** located on slopes with less than a 5 per cent grade in steepness, on surfaces that reduce filtration rates and on soils that have the potential to become fertile.

RAINWATER HARVESTING IN NORTH DARFUR

INTRODUCTION

Drylands cover most of North Darfur, with semi-desert and desert areas extending over most of the State's territory. Normally, the yearly rain occurs during a short summer period, and its amount and predictability decrease towards the north of the State. However, some studies describe that recent decades have seen rainfall becoming increasingly unreliable over all Darfur, and document a series of droughts in the area.

Rainwater harvesting can be a viable strategy for coping with water scarcity. It involves capturing and storing rainwater from roofs or ground catchments for domestic, agricultural, industrial and environmental purposes. Well designed systems can provide a community with water for a year or more. Rainwater harvesting is also the principle behind runoff agriculture, which may be used to increase yields and, to a certain extent, to reduce the agricultural risk of drought.

Compared with other water systems, rainwater harvesting is more cost-effective, decentralised and participatory. Including communities in planning and implementation processes helps ensure that the socio-economic needs of communities are met and that there is community support for such projects.

In one case study, a 6 square metre plastic sheet hung between poles was used and was able to fill a 100 litre tank with rainwater after approximately 30 minutes of rainfall in Southern Sudan (Burt and Keiru, 2009).

Simple and practical water reservoirs, or *hafirs*, can be constructed in many areas. By doing this, cultivated land can potentially be increased by up to 11 times in size (Practical Action [A]).

IDENTIFYING SUSTAINABLE PROJECTS

Important considerations for selecting a sustainable system include:

- various uses for the collected water identified, e.g. irrigation and domestic purposes;
- number of beneficiaries anticipated, e.g. the number of humans and animals;
- cost-effectiveness, e.g. the cost of any earth or stone movement has been calculated;
- design simplicity, e.g. materials are available locally;
- water source proximity in relation to community needs, e.g. water is available for construction purposes; and
- community support and acceptance, e.g. community is willing to provide design input, materials or labour.

Additional considerations for ground catchments include:

- appropriateness of the topography, e.g. slopes should not have a grade more than 5 per cent;
- fertility potentials of soil, e.g. soil is deep, not saline-sodic or sandy; and
- vegetation in catchments, e.g. smooth catchments reduce water filtration rates.

EXAMPLES OF WATER HARVESTING SYSTEMS IN NORTH DARFUR (PRACTICAL ACTION [B], WORLD AGROFORESTRY CENTRE 2005)

Check dams

- ✓ Check dams are built across streams, normally in narrow valleys.
- ✓ Check dams slow the speed of water, slow soil erosion, increase the deposition of fertile silt and potentially allow groundwater to recharge.
- ✓ A simple check dam can be built with a wall of rocks.
- ✓ The length of such dams ranges from 50-1,000m.

Hafir dams

- ✓ Hafirs are water reservoirs, dugouts in the ground that hold water.
- ✓ Although size can vary, many hafirs are around 30,000m³ and around 3.5m deep.
- ✓ Hafirs allow the storage of water for long periods of time.
- ✓ Hafirs are not a new concept, but the technologies today can enhance the efficiency of systems.

Negarim micro catchments

- ✓ Negarim micro catchments are one example of a contour scheme used to slow water runoff and can be used for growing trees and bushes.
- ✓ Negarim micro catchments divide a piece of land into diamonds with earth bunds, so there is a hole dug in the lowest corner of the diamond for collecting the small catchment area's runoff.
- ✓ The water collected here is often called "green" water
- ✓ These catchments are normally no more than 100m² in size.

Roof catchments

- ✓ Roofs catchments require covering roofs with iron sheets, grooved plastic or tiles.
- ✓ Tanks are then used to store the collected rain. The type of tank may vary but must be waterproof, sturdy and inexpensive.
- ✓ Surface tank size can range from more than 40m³ for households or more than 100m³ for institutions, e.g. schools and hospitals.

Further reading and resources

Building Small-Scale Water-Harvesting Dams

(Practical Action, 2005).

http://practicalaction.org/practicalanswers/product_info.php?products_id=360

Promoting Rainwater Harvesting Eastern and Southern Africa: The RELMA Experience

(World Agroforestry Centre, 2006).

http://www.relma.org/pdfs/Rainwater_harvesting.pdf

Water: Finding a Pure and Simple Solution to Poor People's Basic Needs

(Practical Action [A]).

http://www.practicalaction.org.uk/docs/about_us/water_practical_action.pdf

Water Harvesting in Sudan

(Practical Action [B]).

http://practicalaction.org/practicalanswers/product_info.php?products_id=66

Innovative Rainwater Harvesting Techniques for Emergencies: Lessons from the Field

(Burt and Keiru, 2009).

http://wedc.lboro.ac.uk/resources/conference/34/Burt_M_-_196.pdf

Darfur Early Recovery and Development Dossier

(Columbia University, 2008).

<http://hrcolumbia.org/darfur/dossier.pdf>

ProAct Network is a Swiss-based non-governmental environmental organisation. Our work aims to help vulnerable communities improve their resilience to disasters, climate change and humanitarian crises, through sustainable environmental management. This briefing note was compiled under the project "Strengthening Environmental Awareness and Building Management Capacity of the Sustainable Action Group's Operations in Sudan", funded by Christian Aid.

Contact:

Av. Alfred Cortot 7D, CH-1260 Nyon, Switzerland
+41 22 362 5384

email: info@proactnetwork.org

www.proactnetwork.org