



Harvesting Water to Increase Productivity

In Sudan, an IFAD-supported project helped beneficiaries develop a technique to collect and use water efficiently. Two main results? Increased agricultural productivity and reduced impact on the environment.

Agricultural productivity in the semi-arid region of North Kordofan is very low, mainly because the soil – which locals call *gardood* – is solid, clayey and sandy, and cannot fully absorb water. To make things worse, the land is sloped so that water flows along the surface without reaching the roots of plants. In light of this, Sudan's Agricultural Research Corporation, IFAD and FAO helped farmers introduce a water-harvesting technique that consists of using chisel ploughs to excavate soil to a depth of 25-30 cm and erecting shields (dust barriers) of approximately 60 cm. Deep ploughing increases the permeability of soil without making it vulnerable to erosion by wind and rain. At the same time, shields help retain the water so that the soil can be saturated with it. The shields can also be opened to release excess water.

Country:
Sudan

Direct Beneficiaries:
Small farmers, livestock keepers

Results:

- The number of farmers who adopted the water-harvesting technique totaled 3,344.
- Average sorghum productivity increased up to eleven-fold, from 77 to 840 kg/feddan (32 to 353 kg/hectare).
- Average cultivated area decreased from 8.2 to 2.5 feddans (3.4 to 1 hectares), thereby reducing the rate of deforestation and rangeland degradation.
- Household income of farmers increased 41 per cent.
- Incidence of rural poverty in the project area was reduced by 50 per cent.

Main Lessons:

- Project beneficiaries should be involved as much as possible in developing new techniques and in disseminating them, through training, field trips and farmers field schools.
- Technology-oriented projects that overlook marketing aspects in the design phase may run into problems later on, especially if the project is replicated or expanded in the same area.



BASIC INFO

Sources:

A Case Study of North Kordofan Project in Sudan (IFAD/IDRC/KariaNet Proceedings of the 3rd Annual Thematic Workshop, 2007)

Project Name:

North Kordofan Rural Development Project

Project Starting Date:

2000

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WEB PAGES

IFAD operations in NENA and CEN:

<http://www.ifad.org/operations/projects/regions/pn/index.htm>

IFAD learning notes:

<http://www.ifad.org/rural/learningnotes/index.htm>

KariaNet:

<http://www.karianet.org/>

IFAD case studies:

<http://rpr.ifad.org/node/489>
(username and password: "guest")

Background

Um Ruwaba and Bara are two of the four provinces that make up the semi-arid state of North Kordofan in western Sudan. The major productive occupations – rainfed cropping, livestock rearing and utilization of rangeland and forest products – are dependent on rainfall, which is low and unreliable; soil fertility, which is generally poor; and the state of rangeland vegetation and forest cover. Irrigated farming is only possible in a limited area in the south of Um Ruwaba and on a small scale using wells in Bara.

A series of droughts in the 1980s and early 1990s devastated livelihood systems. What's more, in-migration was taking place from areas to the south affected by civil strife. In the late 1990s, systems were recovering following a succession of favourable seasons. However, a self-imposed structural adjustment and reform programme was carried out without external support. This stop-and-start reform process resulted in major imbalances in the economy.

Against this background, in 2000 IFAD launched the North Kordofan Rural Development Project to improve the standard of living of the local communities, in particular to help ensure their food security and enhance their resilience to drought and other natural disasters.

Harvesting Water

Farmers from 25 villages located in the rural administrative unit of Al-Rahad in Um Ruwaba participated in assessing their needs. First, they identified the main problem: agricultural productivity in areas where rainfed crops are cultivated – especially sorghum, which is the main food crop for the population – is very low, because of insufficient rain (around 300 mm per year) and

because *gardood*, as the local soil is called, is so solid and impermeable that crops cannot absorb the rain.

The farmers then identified potential solutions: with the support of Sudan's Agricultural Research Corporation and FAO, they developed a water-harvesting technique that increases agricultural productivity significantly. Chisel ploughs are used to excavate soil to a depth of 25-30 cm – to increase the permeability of soil – and shields (dust barriers) of approximately 60 cm are erected – to retain the water so that the soil can become saturated.

Disseminating the Technique

In 2003, a first demonstration of the water-harvesting technique was carried out in five villages with the collaboration of 25 previously trained farmers, each of whom had adopted it on plots of two feddans (0.84 hectares). The project provided improved sorghum varieties and covered the costs of ploughing, whereas the farmers built the shields and did other tilling operations.

Following the success of the experiment, the project's results were disseminated through one-day field trips with researchers and farmers from more than ten villages, and through farmers field schools. As a consequence, the number of farmers who adopted the water-harvesting technique increased to 402 in 2004, 1,349 in 2005 and 1,448 in 2006, for a total of 3,344 farmers (115 of whom were women). Average productivity increased as much as eleven times, while average cultivated area decreased by more than two-thirds – thus saving other natural resources such as trees and pastures that used to be cut down to expand crop cultivation.

Marketing Surpluses

Originally, the project focused on increasing production and

productivity but overlooked the marketing aspect: where would the products be sold, and for how much? Village markets are the main outlet for most agricultural products in the area, but prices are so low that farmers can hardly cover the cost of production. Also, most farmers in the area sell their products right after the harvest in order to cover the most pressing needs of their families. This creates an oversupply, which lowers prices even further. It has been estimated that if farmers could sell their products three to five months after the harvest, they would get prices from 50 per cent to 100 per cent higher.

To take advantage of this potential, the project helped develop marketing strategies that allowed farmers to achieve a reasonable profit margin. In particular, the project: 1) advised farmers to acquire loans from the village funds, in exchange for storing the harvest in the village store until prices increased; 2) provided farmers with information about crop prices in local markets through field counsellors, and advised farmers to listen to market information broadcasts via radio; and 3) promoted gathering the harvests of several small farmers together in order to increase their bargaining power and ability to sell products in nearby cities.

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