

# PROMISING RESILIENCE PRACTICES



PEACE, PROSPERITY AND  
REGIONAL INTEGRATION



## Construction of Sand Dams to Harvest Rain Water

Fifteen sand dams have already been constructed in several localities: Three in Arta, four in Dikhil, three in Ali Sabieh, four in Tadjoura and one in Obock

### Introduction

Djibouti lies on the Bab-El-Mandeb strait in the Red Sea. It is a small country situated in the Horn of Africa and has a total surface area of about 23,000 km<sup>2</sup> of which about 5,000 km<sup>2</sup> is covered by territorial waters and lakes. Out of the current population of approximately one million, 20 percent are pastoralists and agro-pastoralists.

Djibouti is predominantly arid and semi-arid, with a cumulative annual rainfall of approximately 150 mm. Water is as precious as it is scarce. Ecological constraints such as an inherently erratic rainfall pattern; rains that often fall as heavy showers and are lost as run-off; and high levels of potential evapotranspiration rates which quickly reduce available moisture and water, limit production systems and livelihoods. Since the country does not have a permanent source of surface water such as rivers or fresh water lakes, it must rely on deep underground water tables, fed by rainwater infiltration, where they exist.

Precipitation levels have dropped to approximately half of the normal quantity, and underground water tables have been drawn down. The scarce rains allow a temporary regeneration of water aquifers, but are clearly insufficient to properly replenish these sources. Many cisterns and shallow wells dry up during the dry season, which lasts from

April to September, increasing families' difficulties to access this vital resource. Drought consequences are enormous. Many herders and rural dwellers have lost their sources of livelihood, and families have seen their incomes drastically reduced. As a result, they have been forced to abandon their homelands and seek refuge in urban centres. Almost 120,000 pastoralists are affected by the drought.

To supplement the available underground waters, surface water is retained by means of a dam (composed of a dike and a spillway) in which the flow water is infiltrated into the infer flux sheet. This provides an alternative source of water for the pastoral communities during the dry season.



#### INTERVENTION AREA

Water resources development and management



#### LOCATION

Arta, Dikhil, Ali Sabieh, Tadjoura and Obock districts in Djibouti



#### STAKEHOLDERS AND PARTNERS

Local communities, water management committees, department of major works



#### BENEFICIARIES

Around 8,000 rural people

## Methodological approach

The concept involves implanted work in gabion in the minor bed of a watercourse allowing the water to slow down and to catch in an excessive depression of the bed. It can be a low structure, normally submerged, built for various purposes, possibly to stabilise the bottom of a stream, or the top of a dam or other structure, or of a natural rising, on which water may pass when it reaches a sufficient level. The cost of a sand dam varies from US \$15,000 to US \$25,000, depending on the geomorphology of the site.

The process of achieving a recharge threshold includes:

- Awareness and identification of the site
- Assessment of potential environmental and social impacts
- A technical feasibility study
- Carrying out the works, including their supervision and control
- Organising the population into a management committee with management rules
- Monitoring and rehabilitation

The beneficiary populations are involved in the entire process, such as site selection, impact assessment and validation of the different sites. They are also responsible for management and monitoring of the infrastructure after completion. Women representation is ensured and currently, there are at least three women in every committee.

## Results

Around 8,000 rural people living near the rivers are benefiting directly from the sand dams. They use the water for domestic consumption, to water their livestock and to irrigate their gardens. Sand dams provide the possibility of off-season cultivation and they have increased fish production.

Since one of the main roles of women in rural areas is to fetch water for the household, the distance to water sources has been reduced, because the sand dams are constructed near their settlements. This means that women have gained more time to carry out other essential activities.

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## Constraints

The major challenge faced during implementation of the practice was the selection of appropriate sites for sand dam construction. It is a difficult task that requires specific

expertise and skills. During construction, unexpected heavy rains flooded the initial excavations at some sites. When work restarted, an additional diversion structure had to be included to protect the works. This all led to construction delays and increased costs.

Lastly, construction can be challenging and dams that are not properly built, may leak. Because of their location in flood-prone areas, the supporting structures, and sometimes the dam itself, need assured finances for regular maintenance.

## Sustainability

For this practice to be sustainable at the institutional, social, economic and environmental levels, projects and programs must involve the Ministry of Agriculture, Water, Fisheries, and Livestock, in charge of Marine Resources, Department of Major Works in the Ministry of Agriculture (DGT) in the project design, so as to ensure its technical support.

## Replicability and up-scaling

The practice was initiated by the Department of Major Works of the Ministry of Agriculture, Water, Fisheries, Livestock in charge of Marine Resources with the technical and financial support of FAO. This Ministry, as well as the Ministry of Habitat, Houses and Environment and development partners recommended the practice.

It was then popularised at the national level by various projects and programs funded by development partners. Consequently, 15 additional sand dams have already been constructed in several localities: Three in Arta, four in Dikhil, three in Ali Sabieh, four in Tadjoura and one in Obock.

During replication and scaling, the following site selection criteria should be considered:

- Gentle slope of the river bed, stable river banks, grain size of sand in the river bed, presence of traditional scoop wells in the river bed and location of settlements.
- In order to avoid floods during construction, the construction should be scheduled to start at the beginning of the dry season.
- Communities should also build sustainable financing models that cover replacement costs, or to receive continued external assistance.



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