



# THE 1<sup>ST</sup> ROTARY-FUNDED SAND DAM IN INDIA

Khirjan Bhoja, Rajasthan, India – completed May 2017

# INTRODUCTION

**Excellent Development** supports dryland communities to build sand dams, providing a reliable and convenient access to clean water. With the time saved from collecting water, people can invest in farming – enabling them to grow more food to eat, store and sell.

We are proud and immensely grateful to have been working closely with Rotary since 2002, to support communities in Kenya, and more recently India to help them to transform their lives through local, reliable and cost-effective water supplies.

Over 200 Rotary Clubs across 20 Districts have come together in a major RIBI wide project in partnership with Excellent to address the problem of drought and food shortage in rural drylands worldwide.

To date, Rotary fundraising efforts have enabled communities to build 51 sand dams and one school water tank. Over 100,000 people now have access to safe water, much closer to home.

This report details the successful completion of this first Rotary-funded sand dam in India, in the village of Khirjan Bhoja, in Barmer District, Rajasthan.

**Together, Rotary Clubs of Reading, Kirkudbright, Dawlish Water, Exteter Southernhay, and Romsey Test provided £15,494 in December 2016 to fund the construction of Khirjan Bhoja sand dam in Barmer District, Rajasthan, India.**



# CAUGHT IN A DRYLAND TRAP

In the drylands of Rajasthan, the scarcity of water has reached critical levels. It is prone to devastating droughts, yet it is part of the mostly densely populated arid zone in the world.

The little fresh water that does exist often has extremely high levels of salinity – it is too salty to be safe to drink, and it is useless for growing crops.

Only 45% of Rajasthan's rural population has access to safe drinking water. The situation is far worse in Marwar, where the lack of water – let alone clean, drinkable water – means that the villagers, most often women, are forced to walk 4-5 kilometres to fetch 20 litres of water at a time.

The burden of water collection traps people in a vicious circle of drudgery and poverty – especially women and children who spend on average six hours per day collecting water. During extended droughts, this can take up to 12 hours per day.

Children, especially girls, often miss school to help their families collect water. This steals time away from more productive activities like farming and education.

The community supported by this project is located in Balmer District (see map on the right).



# HOW THE SAND DAMS WILL WORK

## What is a sand dam?

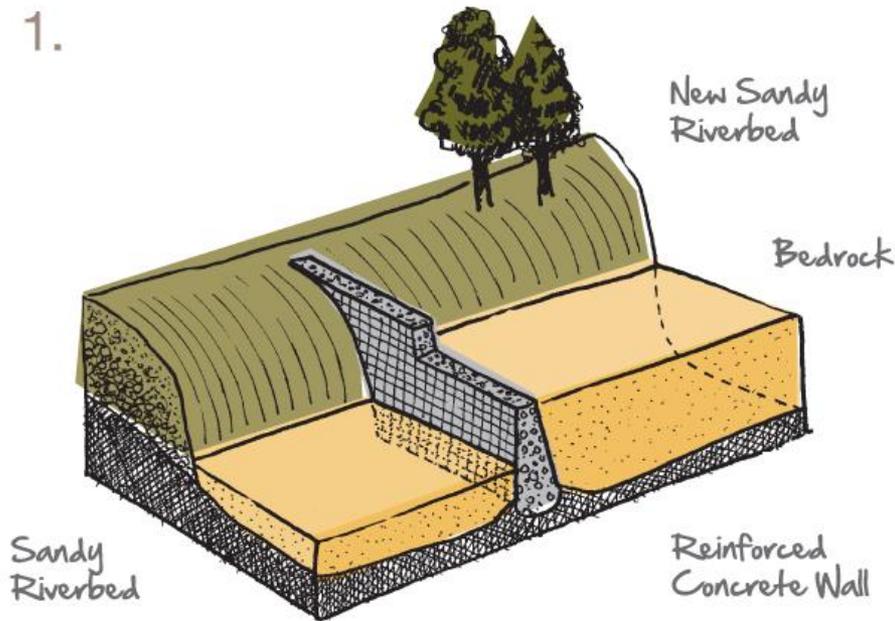
A sand dam is a reinforced concrete wall built across a seasonal sandy river. They are a simple, low cost and low maintenance technology that serves to retain rainwater and recharge groundwater.

They can store up to 20 million litres of water and are widely suited to dryland regions of the world.

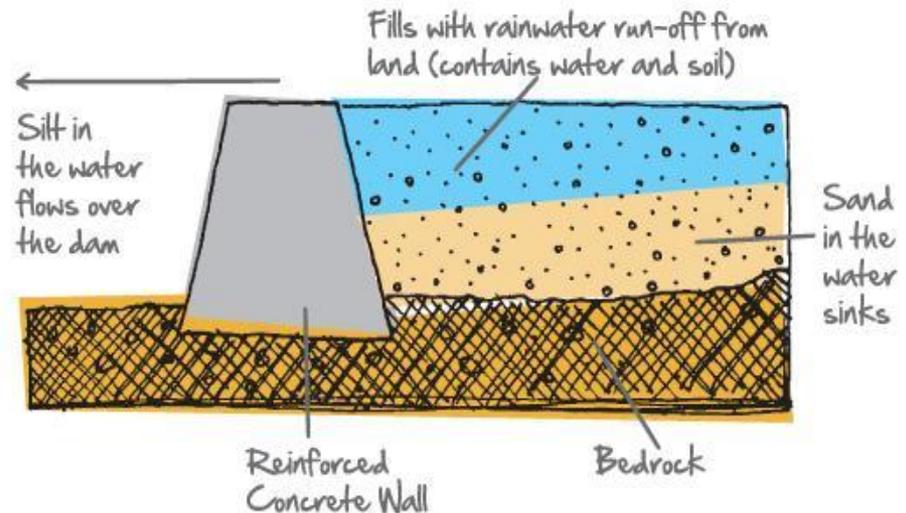
## How do sand dams work?

Seasonal rainfall fills the dam with water containing eroded soil. The soil is made up of silt and sand. The heavier sand sinks behind the dam, whilst the lighter silt washes downstream.

1.

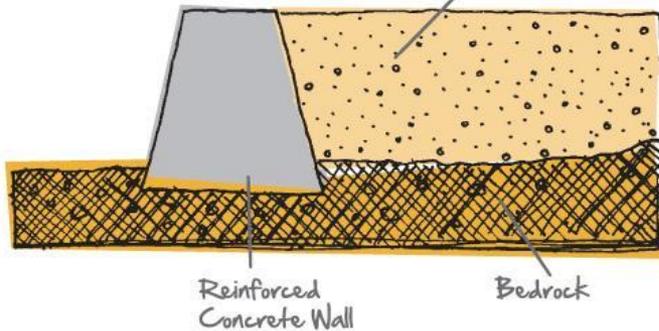


2. 1-3% of water flowing downstream is retained behind the wall



# HOW THE SAND DAMS WILL WORK

Dam fills with sand - but  
25-40% of the volume is water!



## Getting Water from Sand Dams

1. People use traditional scoop holes to collect water from any point along the dam.
2. Infiltration galleries leading to pipes or taps enable water to be abstracted through the dam wall.
3. Infiltration galleries can also be linked to sealed shallow wells with hand pumps.

Sand accumulates behind the dam until it is full to the spillway. 25-40% of this volume is actually water, trapped in the spaces between grains of sand.

Because the water is stored within the sand, it is protected from evaporation losses.



# SAND DAMS IN THE LAND OF DEATH

In 2013, Excellent Development began a pilot programme with in-country partners Jal Bhagarathi Foundation (JBF) in Rajasthan, India, which has to date seen the construction of 15 dams. The most recent two of the 15 dams were completed in the first half of 2017 and include the Khirjan Bhoja sand dam, funded by Rotary.

Khirjan Bhoja village is home to 1,919 people, who will directly benefit from the water provided by the sand dam. Not only should they be able to access clean drinking water via an outlet pipe in the sand dam wall, but the groundwater recharge will replenish the water in the other wells and water pumps in the village.

The sand dam was built near the Government Primary School, Meghawalon Ki Dhani, Talarya in Khirjan Bhoja. The hand pump by the school should be one of the first to benefit from increased water availability. More remote benefits to groundwater may also occur.

There are 3,778 additional people in the surrounding villages of Khirjan Fatehsingh and Khirjan Tibna, who will benefit indirectly from the reduced pressure on their own water supply.

Not only will the sand dam provide water for local people, but it builds on the capacity-building strategy to develop expertise within JBF in sand dam siting, design and construction.



# THE IMPACT OF ROTARY FUNDING

Before this project the communities were collecting water from, open rivers and tube wells often located several kilometres from their homes. Communities often complain that these water sources quickly run dry because of the scarcity of other water points, and/or become dirty and unsafe from contamination by animals and other pollutants. Sand dams will change all of this.

Thanks to Rotary's funding for these sand dams, Excellent Development and our partner, Jal Bhagirathi Foundation have been able to lever funding from other donors, including HSBC Bank to support these communities to achieve water security.

**The primary benefit of the sand dams is the provision of local, reliable water supplies.** This reduces the distance the people, especially women and children have to walk in search of water and saves them time and energy to work on their farms. Farmers are also telling us that the salinity of water is reducing and they are now able to grow crops such as Chilli and Aubergine, which they have not previously been able to grow.

**Increased food production:** Having a local, year-round water supply means people have more time to spend on farming. The water stored in the sand dams can be used to support farming activities such as tree planting and vegetable growing, and there is more water for livestock.

**Improved nutrition:** By having nearby water sources and the availability of fruits and vegetables from the food production activities that will follow this project, children will grow up in a better environment with healthier nutrition. This will improve their health, and their concentration at school.



# SITING, DESIGNING AND CONSTRUCTION

The first stage in the project was for the members of the communities to discuss with JBF Field Staff their specific water needs and preferences and agree the best site from both a practical and a technical perspective .

From a technical perspective, good dam sites need to have bedrock close to the surface, which reduces the amount of cement, steel, and water required.

The community groups- *Jal Sabhas*- then work to raise their contribution. In India communities do not collect the local materials or contribute their time in the form of labour; instead they contribute financially; 30% of the costs of the dam. This is a more culturally acceptable way of contributing than the African model of contributing time and local materials

The actual construction of the sand dams is carried out by construction contractors, who are contracted by the community. JBF technical staff oversee the construction to ensure they are built to design and are of the right quality.



# KHIRJAN BHOJA COMPLETED DAM



# THANK YOU FOR YOUR SUPPORT!

