

# ROTARY FUNDED SAND DAMS

LEKURRUKI, KENYA



# 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 their livelihoods, such as farming and livestock.

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 people 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.

Since 2014, ED has been working in northern Kenya with the Northern Rangelands Trust and Lekurruki Conservation Trust to construct sand dams to provide water for people, their livestock, and wildlife.

This report details the successful completion of this first Rotary-funded sand dam in northern Kenya, Lekurruki Conservancy, Laikipia County.



# CAUGHT IN A DRYLAND TRAP

The Northern Rangelands is a unique network of 33 community owned conservancies. People and wildlife live side by side, but dwindling water reserves and degrading pasture threaten people's livelihoods and the survival of vulnerable species, often forcing them into conflict over scarce water sources.

This harsh, arid and semi-arid region of northern Kenya has a long history of drought, land degradation, insecurity and conflict, all of which contributed to diminished wildlife populations and increased hunger and poverty. Rainfall is low with the region suffering from significant drought, and an increasingly critical humanitarian situation.

Lekurruki Conservancy has a total population of around 7,200, however due to the population being pastoralists, and predominantly semi-nomadic, this number is always changing. Distance to water is also variable, as often people move their homes to be closer to water and pasture. Where people choose not to move it can take more than 12 hours to collect water, and often people will stay overnight before walking back again, sometimes only bringing 20 litres of water back for up to 9 people. This water is for all domestic use: washing, cooking, and drinking.



Above: Google Earth map of part of Lekurruki Conservancy showing Lekurruki HQ, and the Tassia River where this dam was built



# THE COMMUNITIES

Due to the pastoralist, and semi-nomadic lifestyle of these communities, the entire population of Lekurruki Conservancy is considered one community. The majority are Mokogodo Maasai, but there is also a large population of Samburu, and especially in times of drought, there can be conflict between the Maasai and Samburu over scarce water and pasture resources. This region has a history of conflict, which was especially serious in 2016 and 2017, in part due to serious drought, but was greatly exacerbated by the Kenyan election; culminating in activities having to be suspended for six months during the height of the conflict.

An objective of this programme is to reduce conflict through increased water sources.

Lekurruki Conservancy also has a community-owned tourist lodge where the community receives money per bed night. This money goes into the community funds and is used for the school, repairs of roads among other community projects. Until now, little money was being received by the community because of the cost of ensuring the lodge had enough water. By improving water access for the lodge, this project will also increase income for community projects.



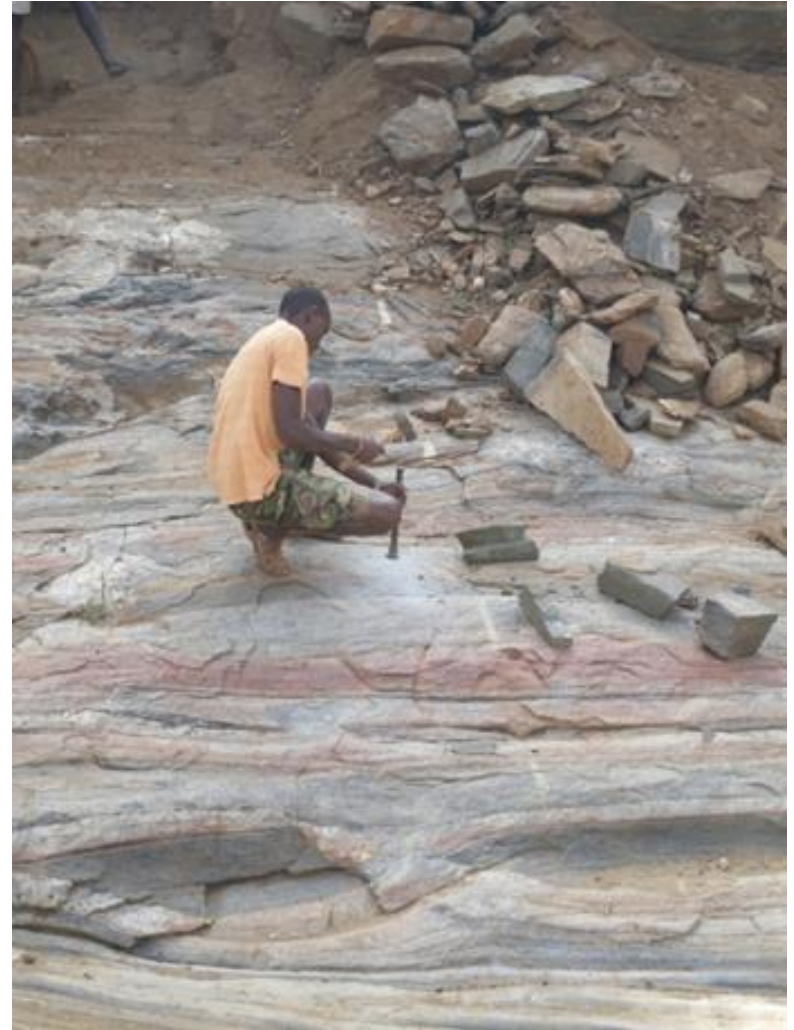
# BUILDING CAPACITY IN SAND DAM CONSTRUCTION

The dams were sited and designed with the Lekurruki Conservancy management team and Board, who are members of Lekurruki Conservancy, with technical support from the Africa Sand Dam Foundation (ASDF).

In 2015, a team attended training at ASDF's office in south east Kenya to build the capacity of the Lekurruki team on the ground in terms of how a sand dam programme works, and what's involved in the process.

In addition, 4 local fundis (skilled builders) from Lekurruki Conservancy were recruited and they spent a month at ASDF training alongside experienced ASDF fundis to build the technical capacity in sand dam construction within a local Lekurruki team, and ensure programme sustainability.

During construction in Lekurruki, an ASDF Dam coordinator and fundi are also present to support the less experienced fundis in constructing high quality sand dams, while the Lekurruki team continue to hone their skills.



Above: One of the trained Lekurruki Fundis preparing the construction site



# CONSTRUCTION PROCESS

A team of 20 community members are recruited for each dam to provide the labour, which includes the collection of rocks, sand, and water. Often a vehicle is also hired for a few days to help with water collection, as water sources are so far away, and dam construction requires a lot of water for mixing cement.

Prior to construction, the Lekurruki Management team ensure all of the appropriate permissions are in place including liaising with the Water Resources Management Authority (WRMA) to obtain formal permission and dam permits.

Once enough rocks, sand and water have been collected, and the Lekurruki fundis have prepared the dam site ready for construction, the materials such as cement and timber are ordered, the ASDF dam team arrives on site, and dam construction commences.

The day after construction is completed, the timber shuttering is removed. Barbed wire used to reinforce the structure is trimmed and any holes or exposed rocks are plastered with mortar. Finally, in order for the dam to reach its maximum strength and to prevent shrinking and cracking, the dam is watered to 'cure the cement' for 4 weeks after construction. Keeping the dam hydrated in this way lets the cement and sand particles bond together.



Tassia C dam under construction

# HOW SAND DAMS WILL WORK

## What is a sand dam?

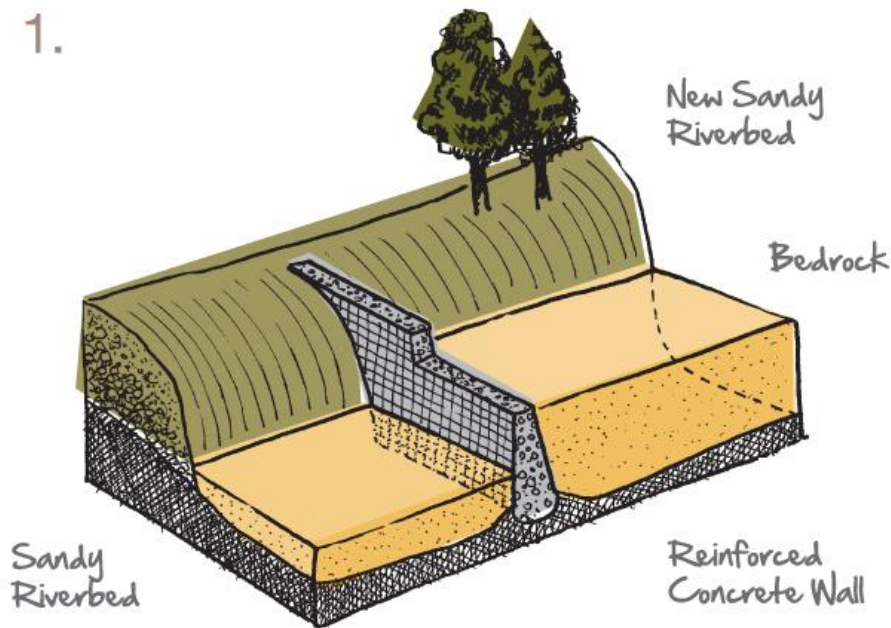
A sand dam is a reinforced concrete wall built across a seasonal sandy river. They are a simple, low cost and low maintenance technology that serves to retain rainwater and recharge groundwater.

They can store up to 40 million litres of water and are widely suited to dryland regions of the world.

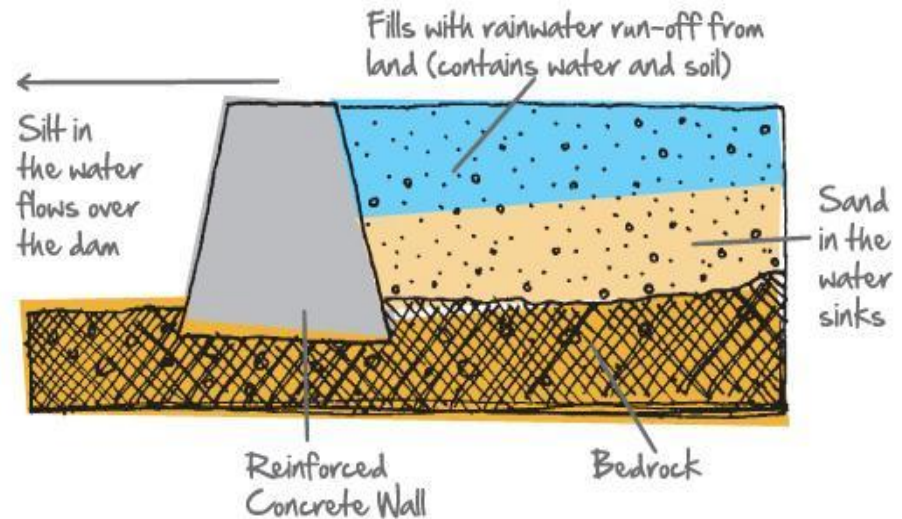
## How do sand dams work?

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.

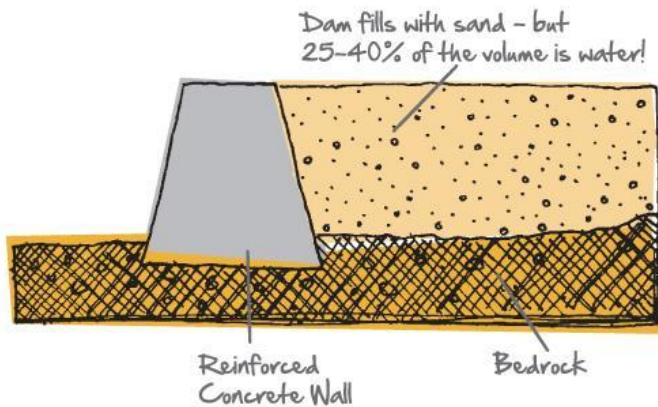


2. 1-3% of water flowing downstream is retained behind the wall





# HOW SAND DAMS WILL WORK



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.

## 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 DAM IMPACT

Thanks to the support of the Rotary Clubs of Woking and Woking District, Lekurruki Conservancy were able to complete their sand dam in October 2017. It has now had 2 rainy seasons and is fully mature. It is holding substantial quantities of water which the community are accessing through scoop holes and a pipeline providing crystal clear water (*bottom right*). There are freshly dug scoop holes on the river downstream with fresh wildlife tracks and evidence of donkeys carrying water, demonstrating both people and wildlife are accessing the water.

The community-owned tourist lodge has also been able to fill their water tanks using water from this dam, which has greatly aided the community's obligation to ensure the lodge has water. Ensuring the lodge had water was a considerable financial cost to the community, which will now be eased, and ensure more money for community funds.

We were told that one of the scoop holes which was full of water (*below left*), was in a place where water had not been present since the river stopped flowing some years ago. There were other areas of greenery and the area was damp behind the dam, adding weight to the hope that a series of dams along this river will result in the Tassia River flowing permanently again, and transforming this area for people, livestock, and wildlife



# SAND DAM IMPACT

Excellent Development recently visited Lekurruki Conservancy, and this sand dam. Since the very heavy and prolonged rains earlier in 2018, this sand dam has matured, and its impact to date has been phenomenal. The community owned Tassia Lodge has been able to keep all of their water tanks full using the water from these sand dams, removing the huge, and expensive burden from the community. The lodge has also been able to attract a larger number of guests, which has increased the amount of money being available for community projects.

Since this dam has matured, the community have received over £7,000 from the lodge, and none of it has been needed to supply water to the lodge; it has all been invested in community projects, including bursaries to help children go to school, and go onto further education.





# HOW FUNDS WERE SPENT

One Sand Dam in Lekurruki Conservancy, Kenya			
	Budget	Expenditure	Variance
Project Mgt & Fieldwork	£ 4,153	£4,153	£0
Finance & Admin Costs	£ 1,396	£1,396	£0
Transport	£ 872	£1,196	-£324
Sand Dams	£13,607	£13,339	£268
Cement	£ 7,150	£4,312	£2,838
Steel and barbed wire	£ 929	£695	£234
Timber Shuttering	£ 791	£769	£22
Tools	£ 161	£327	-£166
Material Transport	£ 1,189	£3,769	-£2,580
Dam permits	£ 125	£96	£29
Skilled Labour	£ 2,219	£2,700	-£481
Abstraction Methods	£ 1,044	£672	£372
<b>Total Charitable Expenditure</b>	<b>£20,029</b>	<b>£20,084</b>	<b>-£55</b>
Fundraising & Communications	£ 2,329	£2,329	£0
Governance	£ 932	£932	£0
<b>Total Budget</b>	<b>£23,289</b>	<b>£23,345</b>	<b>-£56</b>

The budget above shows the actual expenditure of the project- there was a variance in material transport costs, due to the large distances that Rocks and water needed to be transported. Cement was less than budgeted due to the bedrock being closer than initially estimated.

## Acknowledgements

Excellent Development is grateful to all of the Rotary Clubs and Districts who have contributed towards this work. We are also indebted to many individual Rotarians who have dedicated their time and support to helping promote Excellent's particular approach to sustainable development.

For the projects featured in this report, we would particularly like to acknowledge the Rotary clubs of:  
[Woking and Woking District](#)

[And District 1145 and the Rotary Foundation](#)



# THANK YOU FOR YOUR SUPPORT

