

# PROMISING RWH TECHNOLOGIES IN KITUI

Keziah Ngure

Kitui District is an area of low and poorly distributed rainfall and this poses a great danger to food security. However, it is also an area that carries a lot of livestock namely indigenous cattle, goats and chicken. Donkeys and oxen are used as draught animals. The crops planted include millets, sorghum, cowpeas, pigeon peas, green grams, oranges, mango, pawpaw and passion fruit. These agricultural activities are constantly threatened by inadequate and unreliable rainfall in Kitui District. The most promising technology for overcoming this problem is rainwater harvesting.

## What is Rainwater Harvesting?

This term is used to describe methods of collecting and concentrating various forms of runoff from various sources and for various uses. There are several technologies in use in Kitui District. Some have yielded good results while others need to be reconsidered. An evaluation of each technology was done so as to identify the best practices or technologies in rainwater harvesting for Kitui District. This was necessary because the duplication and adoption of technologies by the communities depends on their understanding of all aspects of each technology. In Kitui, the following on-farm technologies have been successful:

### Fanya Juu Terraces

These terraces are constructed along the contours in farms to reduce the slope, retard runoff and increase infiltration, thus conserving soil and retaining moisture. In Kitui District, their construction is supervised by staff from the Ministry of Agriculture and Rural Development or Kitui Agricultural Project, which is funded by DANIDA. In some cases, the farmers go ahead without this input from the technical staff and this could be hazardous as it has resulted in severe soil erosion in some cases.

The embankment traps the water giving it more time to infiltrate while the channel acts as a retention ditch. The land between terraces develops into a level table and is planted with crops especially maize and legumes. This is the most practiced method of flood harvesting in Kitui. It also forms the base onto which other on-farm flood harvesting technologies are practiced. Where possible, runoff from roads, footpaths, animal tracks and pasture is directed in to well conserved land.

The *fanya juu* terraces are common in the Central Division and the surrounding areas for example Mitinyani, Mitonguni and parts of Yatta. This is attributed to the fact that these areas receive slightly more rainfall and efforts in rainwater harvesting have been rewarding. Consequently, adoption rate by farmers is very high with about 80% of cultivated land conserved. Another reason for high adoption is the fact that these areas benefit more from donor support as they are near Kitui town where many donor organizations have their offices. Another reason for high adoption is that the land is under individual tenure system and farmers have title deeds as opposed to other areas in Kitui where land is freehold.

Success of *fanya juu* terraces depends on stabilization, which may be done by planting grass on the embankment. This helps to hold soil particles together and therefore the embankment cannot easily be washed down by heavy floodwater. Repair and maintenance is also important. Any section that is washed down by heavy floods needs to be repaired. This needs the existence of *Myethya* (self help) groups that hold discussions on catchment maintenance.

The advantages of bench terraces include increased yield resulting from high moisture availability, reduced soil erosion, increase recharging rates of shallow wells and easy planning of

crop rotation and farm management. More trees and fruits are planted and survive since farmers plant them above the terrace embankment. That it is a labour intensive exercise and is therefore expensive and if poorly constructed, can cause severe erosion are some of the disadvantages of bench terraces. To make the use of bench terraces more successful, it recommended that *fanya juu* terraces are excavated with the assistance of technical staff to avoid causing erosion, planting grass on the embankment should be intensified and the use of *Fanya juu* for pasture should be encouraged. Freehold tenure system should be replaced by individual tenure system to encourage investing in terracing

### Banana Channels

Inside the retention ditches some farmers dig pits of various sizes. Organic manure is then put in these pits which are then planted with bananas. The bananas benefit from the stored water and the increased moisture held by the organic manure.

### Pawpaw Pits

These are pits that are dug and filled with organic manure and topsoil after which pawpaw seedlings are planted. The preferred variety is *solo* because it is drought resistant. To harvest a lot of runoff, the pits are used in conjunction with semi circular bunds on flat or gently sloping land. To achieve the flat or gently sloping land, the *fanya juu* terraces are not used and Agriculture Officers recommend use of organic manure only. This technology is practiced in Yatta Division by only twenty farmers with the largest acreage being 0.5 ha. The reason why only Yatta Division is practicing this technique is because the technology is the initiative of the Soil and Water Conservation Officer. Kitui Agricultural Project helps the officers to implement what they have proposed to do.

*Continued next page*

*Continued from previous page*

Where possible, external runoff from roads and pasture is directed into the pawpaw farms. This method of rainwater harvesting was introduced in 1998 and 1999. The pawpaw fruits were ready for harvesting for the first time after one year. For some farmers, the technology has completely changed their lives as the harvest once sold gives an income which they had no idea would ever come their way only two years ago. The potential for pawpaw pits lies in its flexibility to be planted with other crops e.g. mangoes, trees for agroforestry, oranges and passion fruits and these need to be encouraged.

Other practices that enhance water storage / infiltration into the soil include:

**Deep cultivation**

This is recommended as it softens the soil making it more receptive to rainwater. Any existing hard pans are also broken thus increasing infiltration of water into the soil.

**Use of organic manure**

Besides adding the nutrients required by plants and planted crops, organic manure makes the soil sponge-like and greatly increases the soil capac-

ity to hold moisture. In Kitui, organic manures are not very easily available because the animals are allowed out to graze in open pasture.

**Cultivating and Planting**

Along the contour, this practice involves the introduction of micro-catchments that trap rainwater for use by the planted crop. In Kitui, the practice of planting along the contour is done by the majority of the farmers.