

HOW FARMERS CAN OVERCOME DROUGHT

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Most people reading this article have probably never suffered the impact of real famine. They have never found themselves in a situation where they have to ask themselves whether they and their children are going to die since there is no food at all or whether they will ever be able to get or produce enough to eat.

Providing food for the family in the dry areas is a nightmare most of the time because the rainfall is elusive. It is little, unpredictable and sometimes it does not come at all when it is expected. Yet food should always be there, come rain come sunshine.

Mr. Mutua (not real name) lives in a semi arid part of Kitui district where the problems outlined above are experienced, yet, unlike his neighbours, he never lacks food these days. The land produces enough food utilising the little and unreliable rainwater that trickles onto his farm. What is his secret?

Mutua explains, "In arid areas food production lies in rainwater harvesting and conservation."

The following success story is as a result of Fanya juu terracing to harvest rainwater and store it in the soil for crop use. The technology has an added advantage of conserving soil.

The farmer in this story is from Mitonguni division in Kitui district. He lives with his family in his two and a half-acre farm. The land is under individual ownership and he has a title deed. All the land is under cultivation with only a small section for the homestead. He practices mixed farming system and

the main crops include; maize, beans, pigeon peas and fruit trees such as oranges, mangoes, bananas and pawpaws. He uses farmyard manure from the livestock for increasing soil fertility. The organic manure helps conserve the rainwater in the soil, improves fertility and reduces erosion.

Exotic cattle are not a common sight in Kitui district, yet Mr. Mutua keeps one exotic dairy cow of the Ayrshire breed and a few local zebu cattle. The Ayrshire cow is under the zero grazing system. To feed the livestock are fodder crops planted on the embankment of the Fanya juu terraces. His water harvesting intervention ensures there is enough nappier grass for the livestock.

The milk from the dairy cow is sold to the local community at Ksh.35 per litre. On average he sells about 5 litres per day. Due to the rain water harvesting, he is able to produce more than the family consumes. He sells the crops at the local market or to people who come to buy the produce on the farm. Prices range depending on the type of crop and the season.

Food is most expensive and scarce before the next harvest. At this time food-stuffs are imported from outside the district, and at this time some families go without food. However, Mr. Mutua's family is well cushioned against famine – even in such trying times.

Maize is the staple food crop grown in the area. During the long rains the farmer plants *katumani* or *makueni* composites. During the short rains, which have more and reliable rains than the long rains, he

plants hybrid maize. His harvest is always way beyond those of the neighbours who have not attempted to conserve rainwater.

His Fanya juu terraces have been in use for about 10 years and have been highly effective. The terraces ensure no rainwater runoff leaves his farm. Instead, there is an additional water source on his farm which is runoff that he harvests from the road. Runoff from the homestead is also not wasted but is directed to the nearby piece of land.

Before this water harvesting intervention, most of his income used to go to purchase of food and the farm yield was very little during some seasons. In 20% of the seasons he suffered total crop failure while another 60% of the seasons the harvest was little due to moisture stress in the soil. It was only 20% of the seasons that he harvested enough. The situation has changed for the better. Presently the farm is a source of income, his family is better fed, clothed and he **never have** to worry whether the rains are going to be enough, because since then, he has always harvested crops irrespective of the total rainfall.

From available rainfall records, some seasons have had very little rainfall especially the long rains of March – May but this has not caused crop failure in his farm. The years 1992, 1993, 1994, 1995, 1996 and 2000 had rainfall less than 120mm during the long rains. Maize requires about 400mm of well distributed rainfall for average yields. During seasons of average rainfall, he harvests 10 bags (90 kg each) on average while previously all he could obtain was around one bag.

The only problem he has encountered with this intensive rainwater harvesting is peri-

odic water logging. This happens during the seasons of above average rainfall which are expected once every five years according to the local people. However this is not a serious problem as the maize turns slightly yellow but he still harvests enough for his family and for sale.

The Fanya juu terracing demands a lot of labour. In this area every 10 metres of Fanya juu cost between Ksh.100 and Ksh. 200 depending on the height. Mr. Mutua used family labour and hired labour which cost him Ksh.100 for every 10 metres.

Mr. Mutua is a leading example but there are other farmers who have achieved varying degrees of success. Some farmers plant the bananas in the channels. To plant the bananas, pits are dug and filled with a mixture of topsoil and organic manure.

The rainwater in the soil continuously flows down through the soil particles and is actually the same water that is found when shallow wells and boreholes are dug. Water yield in these ground water sources is higher where rainwater harvesting using soil as the reservoir is practiced by several farmers.

Rainwater harvesting is highly influenced by social economic factors like income, land ownership and gender issues. Possession of land title deed gives incentive to invest in terracing, which is an expensive and labour demanding exercise. Those with little income spend time looking for paid employment so as to acquire money to buy food. This leaves little time for farm activities like rainwater harvesting. Women and land ownership plays a major role on land investment. Case studies reveal that women don't own land, so what do they do when their husbands work far away from home? It is reported that they turn away extension advisors

and inform them on the need to visit their homes when the husbands come home on weekends, "*kuja weekend wakati mzee atakuwa*" but of course the extension workers are not available at this time. However the story of the Kimeu's is different.

Mr. Kimeu is employed in Nairobi and has left his wife behind on the farm. She is free to make decisions and implement them without seeking her husband's approval. She had dug Fanya juu terraces in their three-acre piece of land and no runoff leaves their farm. In addition, she has done road runoff harvesting since 1999 which she directs into the cropped land. Every season she harvests crops while her neighbours get a good harvest only once every five years.

In 1998, Mrs. Kimeu implemented intensive soil conservation and water harvesting where he started harvesting any available runoff. Runoff harvesting was possible from the road and the pastureland that lies above the cropped land. No water in form of runoff leaves their shamba but it gets some additional amount from pasture and road.

Most people understand rainwater harvesting to mean collecting and storing rainwater in tanks and dams. While these are very important methods of collecting rainwater, farmers should also be encouraged to practice rainwater harvesting using the soil as the reservoir. There are many methods that can be used and this article has given an insight into the benefits of such technologies. Not all the methods have been covered in this article. One organisation that has been on the forefront in promoting rainwater harvesting technologies in Kenya is Kenya Rainwater Association which gives advice on how to implement these technologies.