



Title: Sustainable livelihood and enterprise development through on-farm roof catchment water harvesting in Kwale Location, Makueni County

Target Audience: Farmers, Extension Agents learning and research institutions

Introduction

Mr. Sammy Mwangangi Kimuyu is a farmer and professional photographer from Kwale Location of Makueni County. Mr. Mwangangi has embraced conservation agriculture, which is sustained by an on-farm roof catchment water harvesting and storage technology. The farmer through intervention by agricultural and forestry extension agents adopted technologies in; water harvesting, water and soil conservation, intergrated farming, as well as improved local poultry and pasture production.

The farmer through assistant from extension agents developed a farm plan to act as a model for sustainable livelihood through agriculture.

Objectives

The specific objectives include;

- Rain water harvesting through roof catchment
- Improvement of local poultry farming
- Irrigation agriculture to sustain production of bulb onion
- Mixed farming to diversify farm produce

Approach

Over the years, rainfall in Makueni County including Mukaa area, has been declining leading to low crop production and deterioration of the natural pastures, hence the need for technologies for sustainable livelihoods. Some of the activities undertaken for improved livelihoods include: irrigation agriculture, mixed farming and rainwater harvesting. Mr. Mwangangi harvesting technique involves capture of rain water from rooftops of houses and channeling it to 10,000 litre capacity PVC tanks or excavated tank with a capacity of 80,000 litre which is PVC lined. Water is directed to the tanks through gutters and pipes.

To reduce rain water runoff, mango trees are planted in trenches that hold water for use by the fruit trees.

The farmer has been engaged in agroforestry practices where he plants maize, vegetables and fruits for subsistence and commercial use. The harvested water is used for irrigation mainly of onions through drip irrigation. The farmer also engages in livestock rearing by keeping goats, cows and poultry.

Impact

Rain water harvesting has improved the livelihood of the farmer as it is cheap to sustain once the required infrastructure is established compared to government supplied water. The technique has also helped to improve; water availability, agricultural productivity, food availability and coping mechanisms during dry seasons.

Mixed farming is a source of income as the farmer is able to sell the farm produce, livestock products and contribute to improving soil conservation. In addition, trees create a micro-climate in the farm and acts as a wind break.

Innovations and Success Factors

- Farmers in Mukaa area have embraced the technology of water harvesting. This has been enhanced by agricultural and forestry extension agents through training farmers on water harvesting, water and soil conservation, mixed farming pasture production.
- To avoid leakages, the excavated tank reservoir is lined with a high gauge black polythene lining. The filtering devices are put at strategic points to make sure that the water getting into the reservoir is clean.
- There is need for proper gradient from roof tops to effectively channel water towards reservoir without spillages. This is achieved through constructing and fitting gutters well along rooftops with iron sheets to channel the water towards desired reservoir
- Construct a water collection and storage reservoir of the desired size and fit filtering mechanisms/devises along the collection pipes to ensure water reaches the reservoir free from dirt and other materials such as leaves.

Constraints

Some of the constraints experienced by the farmer include:

- High initial cost for setting up the system.
- Requires technical expertise to set up.
- Fully dependent on rain.
- Water is not safe for human consumption if not treated.
- Reservoir provides breeding space for mosquitoes

Lessons Learnt

Some lessons learnt include:

- Production of vegetables especially bulb onions through drip irrigation using the harvested water is possible even in areas that receive low amounts of rainfall.
- Collaboration among stakeholders such as agriculture and forest service extension is of importance for farmers to succeed in undertaking integrated farming.
- Water and soil conservation is important in improving livelihoods in the drylands.
- Use of simple technologies for roof water harvesting and storage enhances adoption of the practice.
- Optimal use of a small area of land to improve livelihoods through conservation agriculture.
- Establishment of trees by irrigation through bottle feeding technology enhances tree survival in drylands.
- There is need for education and awareness creation as well as capacity building for more community members to adopt the technology.
- The government and development partners could subsidize establishment cost of the technique for vulnerable community members.
- There is need for improving the technology, taking into account best practices in water harvesting.

Conclusion

Water harvesting technique has been embraced by most farmers in Mukaa area and has helped to improve water availability and agricultural productivity. It also has improved food availability and enhanced coping mechanisms during dry seasons.

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