

Water harvesting and irrigation for improved crop and livestock production

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Introduction

Smallholders crop-livestock farming in Eastern and Central Africa is characterized by low productivity due to low and erratic rainfall. Water development for agriculture is a priority, but poorly designed and planned irrigation undermines efforts to improve livelihoods and exposes people and environment to risks. The objective of the study was to introduce and evaluate socially desirable gender-appropriate water harvesting and irrigation strategies to reduce poverty through effective development and management of water harvesting and irrigation in ECA region.

Materials and Methods

Simple and affordable water harvesting (rain water catchment and surface run-off) for human use; crop and livestock production and irrigation technologies were evaluated on 30 households in Kenya (18), Uganda (8) and Tanzania (4).

Results and Discussion

1. Rain water harvesting from roof catchment

A household with 4 people keeping two mature cows was able to harvest up to 30,000 litres of water per season, enough to last 4 months. Clean water offered to the cows improved by 46% (106.1+20.5 litres/cow/day). Family labour (mainly women and children) used to collect water from other sources was therefore shifted to other activities. Water bills of US \$ 20 per month offset. Increased water availability improved milk production from 5.9+3.1 to 10.6+3.1 litres/cow/day and annual household income from milk sale by 80% (US \$ 676.9+3.1).



(1) Construction of a pit (6x3.5x2m)



(2) A dam liner saves on cost of sand, bricks and cement used to build the pit



(3) A perimeter wall is build around the pit



(4) Timber and iron sheets used to cover the tank



(4) A water tank with a capacity of 30,000 litres



(5) A small jerrican used to draw water from the tank



(6) A treadle pump used to pump water from the tank

2. Water harvesting from surface run-off

The water source is used for human use, livestock and crop production. Water harvesting from surface-run off ensured year-round supply of vegetables and increased vegetable yield and household income by up to 500%.



Water lettuce planted on water surface ensures availability of clean water for human use, crop and livestock production

3. Drip irrigation for improved small-scale vegetable production and household income

Farmers made between US \$ 250 -350 from sale of vegetables from a drip-line kit of 10 lines each, 15 metres long for a period of 4 months during the dry season.



Methods used to irrigate vegetables before the interventions



Irrigation system connected to a treadle pump



Drip irrigation

Irrigation technologies evaluated with farmers

Lessons learnt and conclusions

Participatory testing of technologies is key to the adoption of water harvesting technologies and innovations and leads to improved food and household income.

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