

Assessment of ex-situ household rainwater harvesting systems in Ethiopia

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Introduction

Recently, ex-situ household rainwater harvesting (RWH) systems have been introduced at a large scale in Ethiopia to increase the productivity and income of rain fed farmers. However, their performance has been unsatisfactory according to various assessment report.



Concrete rainwater harvesting tank.

Objective

To identify major bottlenecks of RWH systems contributing to the better understanding of their performance and the identification of options to improve their performance.

Methodology

- Biophysical and socio-economic assessment of three RWH systems, i.e. plastic lined ponds, unlined ponds and concrete tanks.
- Simulation of the water supply capacity of RWH systems in relation to water needs of crops (maize and onion).
- Socio-economic indicators to assess the potential profitability of RWH systems.

Results

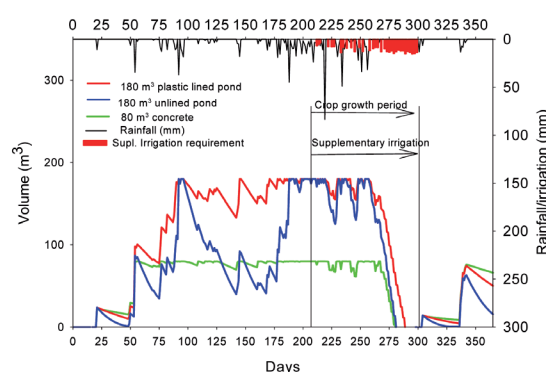
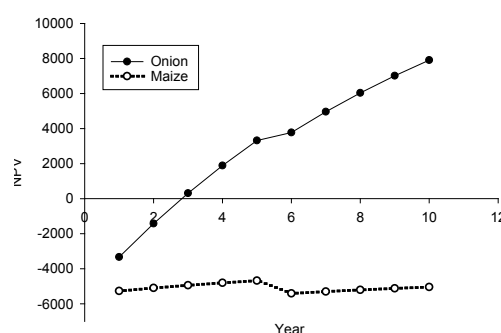


Illustration of simulated water balances of three RWH systems used for the supplementary irrigation of onion. In many situations RWH systems are not able to provide the irrigation requirements of crops. Lined plastic ponds used for growing onions perform best.



Net present value (NPVs) of onion and maize based on a plastic lined pond. Negative NPVs indicate that RWH systems are not economically viable for irrigated maize production. It may be possible to repay RWH investments after three successive years of growing onions.

Conclusions

- The water storage capacity of household RWH systems is generally limited in relation to large crop water needs.
- RWH systems are not economically viable for growing staple crops.
- The economic performance of lined plastic ponds used for cash crop production is best, but is associated with high family labor input for water lifting and application.
- Potentials for RWH systems are site-specific depending on biophysical and socio-economic conditions.