WHaTeR

WP12: Catchment Study Tanzania

At a Glance

Water user group and WHATER project team discussing WHTs interventions at Bangalala village, Same District, Northern Tanzania.

Flood water diversion WHT in Same District, Kilimanjaro Region. Water from the ephemeral rivers is normally diverted directly into the crop fields. The traditional spate irrigation structures allow some water to be diverted and some to flow further downstream.

The Challenge

Water harvesting techniques, which (WHTs) promote crop production, have been in use for generations in Tanzania. However under current conditions of rainfall decline and increasing food demands, the generation of sufficient runoff from catchment areas for sustainable agricultural intensification has become a major challenge, particularly in semi-arid areas. Technologies, both indigenous and exogenous, are not coping with unreliable and highly variable rainfall and are in need of innovation. Examples are the WHTs used for crop production in the lowlands of the Makanya River Catchment in northern Tanzania. Changing rainfall and land use conditions have affected the catchment's natural resources on which a diversity of stakeholders relies. A recent study on water harvesting technologies identified a number of constraints experienced by farmers practicing micro-dams and spate irrigation technologies in the catchment. This work package investigates technological improvement of these WHTs practised under bimodal low-rainfall conditions of 500 mm per year in the Makanya River Catchment, in order to better conserve and utilize rainfall runoff and hence improve the livelihoods in the area.

Objectives

This work package (WP12) is designed to carry out technological improvements on the existing WHTs in the Makanya River sub-Catchment. More specifically, the work package undertakes the following activities:

- conduct literature review on existence and current use of WHTs; evolution, adoption and technological improvements of WHTs; and their upstream-downstream effects

- identify successes, constraints, and opportunities of the WHTs and propose technological improvements
- improve on-farm WHTs using Participatory Action Research (PAR) approach with involvement of key stakeholders including farmers, NGOs, District and Council

METHODOLOGY

A literature review was conducted on the existence and current use of WHTs in Tanzania. Aspects covered include the evidence of evolution of technologies and their adoption in Tanzania. In addition, a questionnaire survey was conducted among farmers using micro-dams and spate irrigation technologies in the study catchment. The study identified successes, constraints, and opportunities for water harvesting and required technological improvements of existing WHTs disclosed. A participatory workshop was conducted to confirm the findings and agree on the way forward. The workshop involved key stakeholders namely farmers, NGOs, Same District Council officials, research professionals, and technical District officials.

RESULTS SO FAR

The main findings of the literature review were summarized in a report and contributed to a publication titled *Tanzania: bright spots and barriers to adoption* (In: Critchley, W. and Gowing, J. (Eds). 2012. Water Harvesting in Sub-Saharan Africa. Chapter 8. Earthscan, 118-133 pp). The review revealed the *majaruba* system in Tanzania as a sustainable technology for more than 50 years without any external support. Its uptake and up scaling without external intervention is indicative of the adoption potential of WHTs in semi-arid Tanzania.

During the multi stakeholder workshop, the beneficiaries selected the WHTs to be given priority during implementation of the project, and, for each WHT, the system components to be emphasized. Beneficiaries also agreed on their in kind contribution, the contribution by Same District Council, and the contribution to be made by the project during implementation of the RTD activities.

So far, the beneficiaries in the Bangalala and Makanya villages in Same District have contributed in kind towards RTD implementation by collecting stones (320 m^3), sand (148 m^3), and canal excavations (360 m^3) for the RTD works.

A detailed topographical survey map and report of the intervention area have been prepared, the results of which were used to produce detailed hydraulic and structural designs for improving the WHT infrastructures.

Canal construction and improvements are currently on-going. Some of the canals in the midlands take water temporarily stored in the micro-dams (*ndivas*) and convey them into cropping fields. So far, the project in collaboration with beneficiaries has constructed two division boxes and lined 23 m of irrigation canal.

Micro-dam (*ndiva*) in western Pare highlands, northern Tanzania.

EXPECTED OUTCOME

The WP 12 is expected to deliver a synthesis report with WHT guidelines on successes, constraints and opportunities of the WHTs and the proposed improvements. The synthesis will include guidelines and standards for sustainable WHTs.

The guidelines will help in improving the existing WHTs thereby strengthening rainfed agriculture. Through proper runoff water conservation the food production and hence food security will be increased resulting in improved rural livelihood.

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