

RAINWATER HARVESTING FOR IMPROVED FOOD SECURITY

Promising Technologies in the Greater Horn of Africa

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EXECUTIVE SUMMARY

Most of the countries in Sub-Saharan Africa (SSA), especially those in the Greater Horn of Africa (GHA,) are experiencing profound socio-economic and political problems, the most dramatic being food crises and disruptive conflicts. Past interventions, especially large-scale irrigation projects have not been very successful. Such expensive large-scale projects have also left a trail of negative environmental impacts that have discouraged further development. However, smallscale, land-user-oriented innovations and interventions seem to offer the much needed sustainable solutions to chronic food insecurity. One of the promising land-users' initiatives is rainwater harvesting (RWH), storage, utilization and management for agricultural use, i.e. crop and livestock production.

The overall objective of the project was to identify and evaluate the performance of RWH systems in the GHA with the aim of promoting best practices in water management in order to enhance food security in this famine prone region. The achievement of the objectives was enhanced by establishing and strengthening a regional rainwater network—Greater Horn of Africa Rainwater Partnership (GHARP)—that coordinated the identification and evaluation of promising RWH technologies, and will promote best practices in the region. The need for such an activity-oriented network has been identified in a number of forums as a missing link in promoting RWH technologies for agricultural production in the region. Various RWH technologies and systems were identified and promising ones evaluated under different conditions. It is envisaged that adoption of proven practices will have substantial impact on agricultural production in the region. From a socio-cultural perspective, land-users are known to adopt what has been developed from their counterparts rather than untested technologies.

The identification and evaluation of land-users' proven rainwater harvesting technologies forms the basis of promotion and adoption of sustainable solutions to

food insecurity in the GHA. The project recognized this and endeavoured to identify such technologies through participatory evaluation and to promote best practices through GHARP. It is evident from disjointed information from the GHA region that promising technologies exist that require minimum adaptation for replication in other areas with similar climatic, and comparable socio-economic and cultural conditions. One constraint to promotion and adoption of such technologies is inadequate collaboration and networking mechanisms in the region. GHARP intends to address this deficiency by strengthening information exchange among stakeholders.

The justification for the project was based on several factors. First, is the need for improved food security, particularly in the ASAL areas of GHA. Secondly, RWH has been proven to be a viable technology for improving food production under conditions comparable to those existent in much of GHA. Thirdly, although RWH technologies are available “off the shelf” there is inadequate information concerning the factors under which land-users adopt and/or adapt these technologies. The project conducted participatory evaluation of existing RWH systems to identify those factors and conditions under which land-users successfully adopt particular RWH technologies and systems.

The research component of the project involved evaluation of 6 case studies selected from 4 countries (Ethiopia, Kenya, Tanzania and Uganda) in the region. The case studies were based on participatory evaluation in which the land-users participated directly in evaluating the RWH systems, identifying any shortcomings, proposing possible solutions, analyzing various alternatives of addressing the shortcomings, identifying viable and feasible solutions, and adapting and adopting promising RWH technologies and systems. Thus, the project evaluated some of the constraints and opportunities that the land-users experience in their endeavours to address persistent food insecurity. It is evident that many solutions related to adoption of rainwater technologies can be developed by the land-users themselves.

The case studies have the potential to make meaningful contributions towards enhancing agricultural productivity and food security, which has imperatives for social cohesion and reducing social conflicts. The results of the case studies could also enhance sustainable development of rainwater harvesting projects in the GHA region. Although different RWH technologies have worked under similar or diverse climatic and geographical conditions, it should not be assumed that a particular technology would

be viable in another area with similar conditions, especially due to socio-cultural factors. Nevertheless, a technology that has failed in one locality may be a solution to a different area. Moreover, reasons for failures are also learning lessons that would contribute in avoiding past mistakes.

It is evident that there are disparities in the rate of adoption and adaptation, and types of technologies in different countries and even regions within a country. There are various promising aspects of RWH technologies, geared towards improving subsistence food production, being adopted by rural land-users in the GHA. However, despite the success of a number of land-user-initiated RWH systems, the rate of adoption is still low making their impacts marginal. Reports of a farmer producing substantial yield by adopting RWH technology while the neighbours' crop has completely failed during droughts are quite common. Therefore, evaluation and identification of best practices and conditions under which they can be successfully adopted is a prerequisite for promoting RWH technologies. The project addressed some of the root causes of food insecurity, social instability and conflicts in Sub-Saharan Africa, and GHA in particular.

This book provides a synthesis of the case studies and highlights some of the promising RWH technologies that have been identified and evaluated in four countries of the GHA. Moreover, current food security problems and challenges of improving rainfed agriculture are highlighted. The case studies went further and identified the factors that need to be considered to promote these technologies in other part of the region. The challenges and opportunities of each technology have been evaluated with the aim of assisting development partners, land-users, and other stakeholders interested in the promotion and adoption of these technologies. The software, related to livelihood issues, which technical experts have more often than not ignored in the past with disappointing results, has been addressed. The output of this project is expected to be a full package that will assist stakeholders to make decisions on how to promote and adopt or adapt these promising technologies. It is encouraging that governments in the region are starting to identify RWH as a viable technology for alleviating persistent food insecurity and water scarcity in the region.

It is envisaged that the results of these case studies will contribute to enhancing food security in the region. However, for this to be realized, capacity building and awareness creation among stakeholders is a prerequisite. It would not be advisable to adopt some of these technologies without prior analysis of the relevant factors and conditions

under which they perform best. Nevertheless, the case studies have revealed that various rainwater harvesting technologies and systems are viable for different parts of individual countries and the region. Farmers' experiences have proved to be the best learning lessons that have reinforced the need for participatory technology development and dissemination. Therefore, what is needed to address food security in Greater Horn of Africa is to promote best practices through demonstration training on land-users' fields, capacity building of stakeholders, technical improvements and the allocation of more resources to on-farm trials and land-users' exposure. Collaboration and networking would be paramount to achieve widespread promotion and adoption, and hence food security, water availability and improved livelihoods. These factors are elaborated where the same technology was evaluated in different environments, where different approaches were used in its promotion, and land-users have diverse socio-economic and cultural backgrounds. The importance of participatory promotion approaches in enhancing adoption and sustainability was brought to fore.

This book contains six chapters. Chapter one provides the background focusing on food production, food security, and water scarcity in SSA. The potential of RWH for improving food production and reducing water scarcity related conflicts are addressed. Chapter two focus on RWH technologies and systems in general in SSA, and GHA in particular. Chapter three presents the methodology used in carrying out the case studies, while chapter four focus on the case studies. Chapter five focus on the synthesis of the case studies and addresses the factors that affect the promotion and adoption of RWH technologies and systems. It further highlights the impacts of RWH on rural livelihoods. Finally, chapter six draws on conclusions and makes recommendations based on the case studies.