

Recharge Techniques and Water Conservation in East Africa

Up-scaling and Dissemination of the good practices with the Kitui sand dams



Sand Dam in Kitui

Acacia Institute /SASOL

Request for funding of component 2 by
START

Project 3002-178

vrije Universiteit *amsterdam*



Institute for
Environmental
Studies (IVM)



SASOL
Foundation
Kitui -Kenya

INTRODUCTION

This document presents a programme aimed to promote the successful up scaling of community based sand dams (and related water conservation techniques) based on the experiences of the **construction of 450 sand dams by the SASOL foundation in the region of Kitui, Kenya in the period 1995-2005. Up scaling** of sand dam construction can significantly contribute to provide water to rural communities in arid and semi arid region provided that the dams are properly sited, its construction is appropriate to the local conditions and if the communities are effectively involved in construction and management of the dams. The challenge is to incorporate these requirements in an up scaling process that facilitates the construction of dams in large numbers.

The programme is initiated by SASOL and the Acacia Institute but is aimed to include sand dam experiences from other organizations as well and to bring together interested partners to develop the programme further and to contribute to the funding and the implementation of programme components. The program consists of a number of components. One component focuses on the organisation of an international workshop where experiences both in Kenya and outside are shared in order to establish a global sand dam network. The project would like to involve START to partly fund this workshop.

BACKGROUND

Storage of water to bridge periods with low rainfall and dry rivers is a key element in securing water supply to rural and urban populations. This is particular the case in semi-arid and arid regions outside the reach of perennial rivers and where there is no groundwater available. Storage needs are sharply increasing due to growing population and water demand, catchment degradation and changes in climate variability. Provision of sufficient storage capacity will be the main challenge for water managers in reaching the Millennium Development Goals

Water security for urban water schemes may include alternative options such as construction of dams, long distance conveyance of water or desalination. For rural water supply such solutions are generally too costly and complicated. Storage provisions for rural water supply require low cost systems with easy maintenance that can be constructed and operated with a high degree of community involvement.

Water conservation (or water harvesting) techniques are known since ancient times in arid and semi arid regions for example in the Middle East. Also today there are numerous examples of rural communities, often with the help of NGO's and local water authorities, which have developed such systems in many countries. These systems include a variety of recharge and storage techniques and include both rainwater harvesting and conservation of surface run-off through (direct or indirect) groundwater recharge (IAH, 2003¹).

Although based on the same principle, the technology used in different countries or regions is generally adapted to the site specific (hydro-climatological and socio-economic) conditions.

¹ IAH-NCC (2003), "Management of Aquifer Recharge and Sub Surface Storage, *Making use of our largest reservoir*". Seminar 18-19 December 2002 in Wageningen, The Netherlands.

This is also reflected in the different names used in different regions for almost similar technologies (Appendix 1; IAH, 2003¹).

The significance of the Sasol experience in Kitui (Kenya) is the sand dams construction in cascades, providing a substantial source of water in one catchment for drinking purposes and for small scale productive use (livestock watering, small scale irrigation)

This programme is an initiative to use the experiences in Kitui as a case study to upscale the construction of sand dams in other parts Kenya and in the surrounding countries. The challenge is to develop an effective strategy to accelerate the construction without affecting the community based approach. Such a strategy should be based on an exchange of existing experiences and the dissemination of good practices.

PROJECT OBJECTIVE AND APPROACH

The overall objective of this initiative is to contribute to scaling up of community based small water conservation schemes in order to reach more consumers but without affecting the principle of the community based approach.

This proposed programme intends to thoroughly evaluate the experiences of SASOL in the last 10 years (component 1) and use it and as input to a seminar (component 2) that will result in action plans for construction of these (or similar) systems in other regions in Kenya and the surrounding countries (component 3 and 6). The workshop will also feed SASOL with information on the establishment of sand dam management groups (component 4) and on long term monitoring requirements (5). The coordination is with SASOL and the Acacia Institute but partners are sought to participate in funding and implementation of the different components.

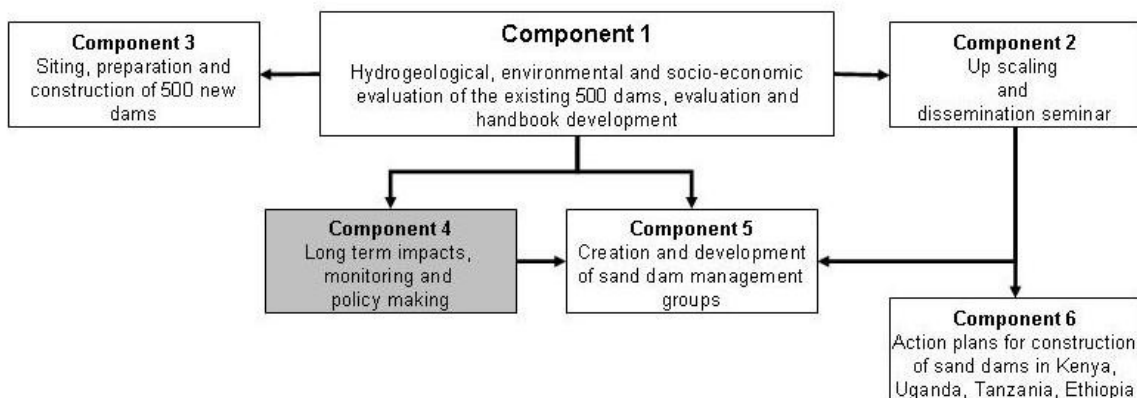


Figure 1 Components of program

Currently part of component 1 is being executed and funded by Aqua4All. The subcomponent is aimed at the collection and review of all the information needed to come to a balanced evaluation of the functioning of the completed sand dams in Kitui district. The scope of work covers both the hydrological, environmental and socio-economic aspects of

the performance of the dams. After an expert evaluation this component should result in a handbook on sand dam development.

INVOLVEMENT START IN PROGRAM

START is requested for funding of component 2, the international workshop. The total cost of workshop (preparation and implantation) is estimated to be in the order of Euro 150,000. The good practices and generic elements from the SASOL experience as concluded by the evaluation will be an important input in the workshop aimed to initiate similar programmes by NGO's in other provinces in Kenya and in the neighbouring countries and to develop and promote the construction of sand dams becomes part of the national water resources management strategies. The workshop could also be used to share experiences with countries outside the region and to establish a global sand dam network

The proposed seminar is a regional workshop in Machakos with the following objectives:

- To present the Kitui experiences as a detailed case study in which all the success factors and pitfalls of the programme are addressed
- To exchange these experiences with the participants and explore the generic elements of a successful approach and the elements that are location specific
- To develop a strategy for local communities and NGO's in selection of the technology and for the implementation of water conservation programmes
- Discuss the embedding of the strategy in the national water policy
- To discuss financing options (credit system, community contribution, grants)
- To discuss the need for a permanent structure for exchange (global network)
- To assess the need for (technical and institutional) support to NGO's/communities working on water conservation development on water (helpdesk function).

The main target audience for the workshop is NGO's working in rural water supply in the East African region (Kenya, Tanzania, Uganda and Ethiopia) and representatives from the national water ministries of these countries. In addition we propose to invite a selected number of persons from countries outside the region where water conservation is widely applied (for example India, Brazil, South Africa, West Africa) to share the practices in these countries with the experiences in East Africa.

The desired output of the workshop should include:

- Strategy and action plans for the participating countries and NGO's to start (or accelerate) the construction of these systems
- A (global) network and strategy for exchange of experiences and good practices in support to accelerated construction of community based water conservation systems

SIGNIFICANCE OF THE PROGRAMME

Sand dams are a cost effective way to provide water to rural communities during period of drought. The experiences in Kitui indicate that main advantages are the community-based construction of the dams, low evaporation losses, the long lifetime of the dams (20-30 years or even longer) and the low maintenance cost as well as recharge of the ground water which impacts positively on the ecology.

The 450 dams constructed by SASOL and the local communities in the last 10 years show that on average one dam provides water in the dry season to 150 people on average. The present cost of dam is Euro 8,000-9,000 of which Euro 5, 000- 6,000-investment cost and Euro 3000 contribution of the community (in construction labour, materials {river rocks, sand and water and artisan support}).

This programme aims to upscale the construction of sand dams in the East African region through the evaluation of the SASOL dams (component 1) and the organization of a dissemination and up scaling seminar (component 2). Components 4 and 5 are more specifically geared to the situation Kitui but will also generate lessons and experiences that are useful for sand dam programmes in other regions. There is a fundraising need for an extra 500 dams for Kitui(Component 3)

The programme preparation and coordination cost and the cost of these components (2 and 3) are in total approximately 400,000 Euro. The output of the programme is the successful construction of 500 new dams by SASOL and action programmes for dam construction in other parts of Kenya and in Ethiopia, Tanzania and Uganda. If each of these programmes results in the construction of 500 dams, the total spin-off will be 2500 dams serving almost 400,000 people with a total investment cost of about 14 million Euros.