Research into current capacities and possibilities for capacity building in Kitui District, Kenya

Illustration 1: SHG, Yatta division, Kitui district, Kenya

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Acronyms and abbreviations

SASOL	Sahelian Solutions Foundation
DC	Dam Committee
SHG	Self Help Group
ASL / ASAL	Arid and semi arid lands
NGO	Non governmental organisation
TOT	Trainer of the trainers
NRM	Natural resource management
JVDW	Joost van der Woerd

Chapter 1

Introduction

The Kitui district has seen some great changes over the past hundred years and it is only slowly adapting to the new circumstances. The population of the district has risen from 95.000 in 1910 to 640.034 inhabitants in 1989 with an average annual growth of 3.8 %. Partly because of the rise in population and partly because of a preference for agro-pastoralist farming systems in the area, environmental degradation has been on the increase. This process was further aggravated by turning the traditional "surviving grounds" (6000 km^2) for livestock during droughts, into a game reserve. Due to overgrazing and a subsequent lack of food for livestock the area has seen a decline in economic prosperity.

Capacity building defined: capacity building is the "process by which individuals, organisations and societies develop abilities to perform functions, solve problems and set and achieve goals premised on ownership, choice and self-esteem". Capacity building is the "sustainable creation, retention and utilisation of capacity in order to reduce poverty, enhance self-reliance and improve people's lives (World Bank,2004 a).

The research is aimed at collecting data on the current institutions and capacities present in the communities. From the results of the data collection an argument will be made for which capacities need to be developed and what the identified constraints are. The chosen indicators for capacities (chosen through discussion with SASOL) in this regard are knowledge of or skills about: leadership, project management, environmental management, farming practices, operation and maintenance, organisational structures, marketing and finance. It is unclear what the most pressing needs are at this time but creating leadership skills and environmental management are SASOL's current main focus.

SASOL has now been constructing sand storage dams since 1992. According to the philosophy that any type of development in an arid area needs to be preceded by the provision of water, they have focused almost all their attention and resources towards the construction of sand storage dams. This focus is partly dictated by donors since funding guidelines are

strict. At this point 480 sand storage dams have been constructed in 18 catchment areas. The time has come for SASOL to make a paradigm shift towards other forms of development and move away from pure dam construction.
As an organisation, SASOL realises that to ensure lasting success of the development projects, monitoring and evaluation needs to be incorporated in their development strategy, besides the construction of sand storage dams. SASOL has decided to broaden its focus from dam construction to other forms of capacity building whereby their goal is to reach this transfer by 2010.

Environmental management, project management and leadership and water quality and hygiene has been part of SASOL's training program for a few years now. A waterconservation training is being developed at this stage. At the present time one of Sasol's main donor agencies has also agreed to start giving money for other activities besides dam construction and has provided Sasol with some resources to provide the necessary trainings for the communities around the next 250 sand dams to be built in the next five years. The effectiveness of the trainings will be looked into.

At the start up phase of dam construction a dam committee is always formed to oversee the construction process of the dam. The dam committees often BECOME DORMANTafter dam construction because their task is finished. This kind of group activity with a positive result such as provision of water is a clear first step in capacity building. The fact that this form of community organisation is not being built upon is a loss.

The communities cannot be blamed if they don't take proper care of their resources if they have not been equipped to do so. SASOL for instance has not been giving regular follow-ups to the communities (again through lack of funding, the necessity is realised). This is partly the reason why dam committees loose their purpose after construction. When communities are not trained to take care of their resources, the newly presented resources like the sand storage dams or the age old resources like the soil they till, money spent on intervention is not spent with a lasting effect. Besides the need for training / capacity building establishing social structures / institutions is also aimed for because it is believed by SASOL this will harmonise development and give it direction.

The Kenyan ministry of water and irrigation has given the official ownership of water back to the communities. This also means giving the responsibility to the communities to look after this resource. The communities have been given training about the new water act (2002). The ministry has been divided into groups for policy making and water provision with the creation of different institutions. What views exist on capacity building within the ministry and what has been the result of the reorganisation process is the main question here.

The single most important ground for success is knowledge about the needs of the communities. A big hurdle to take here is that people may not know what kind of development they desire, after all how can one choose what one does not know. Therefore the first step is that the options are decided / chosen for them and by getting the support of a community together with a contribution on their part, they also make their choice. If the projects are successful other communities will join in. This will serve as evidence that the communities' needs are met but the starting point should remain asking the communities themselves.

Problem statement

It has been the policy of the government and SASOL for the communities to participate in project development in their locality. This has been conceived in concurrence with the current trend in world wide development that most development is and can only come about as a bottom-up process. The idea is that development should start at the lowest level, the community. The participatory approach thus means to involve it's target community to raise awareness of the problems and create a sense of responsibility within the community to maintain and operate a project. This will then allow the people to enjoy the benefits thereof.

The way a community has organised itself is often of great influence for the success of any project. The sand dam project involves people in construction yet there are many instances whereby the dams have simply been left untended for after construction. Often the organisational structure of the dam committee has dissolved after the communal activities were finished. Those interested in local development, SASOL for instance, need to know what the current levels of knowledge, skills and organisation are in a community in order to inform and organise people effectively. In other words, a prerequisite for capacity-building is knowledge about current capacities and potential for development.

Objective

Research the current capacities and possibilities for capacity building as viewed by the villagers, dam committees, SASOL and the government with a special focus on the possible development of the organisational structures surrounding sand storage dams.

Justification

Almost everybody acknowledges the ineffectiveness of technical cooperation in what is or should be it's major objective: achievement of greater ***self reliance*** in recipient countries by building institutions and strengthening local capacities in national economic management (World Bank, 2004 a)
If the current capacities and the desires for future development by different actors are identified, this could be the foundations on which to base the focus of capacity building, by SASOL and others.

Study questions

1. What are the current capacities of the dam communities and what are the possibilities for capacity-building?

    - What kind of capacity building is desired by the villagers, government and SASOL?
    - What are the current forms of community organisation?
    - To what extent could the DC's constitute the foundation for further community organisation within the dam communities?
    - Which resources are required to bring about the desired capacity building

Chapter 2

Literature review

Capacity building in Africa, an OED evaluation of World Bank Support
Author World bank operations evaluation department, 2004

The key features of capacity building are:

Human capacity: individuals with skills to analyse development needs; design and implement strategies, policies and programs; deliver services and monitor results.

Organisational capacity: groups of individuals bound by a common purpose, with clear objectives and the internal structures, processes, systems, staffing and other resources to achieve them.

Institutional capacity: the formal "rules of the game" and informal norms; for example, in collecting taxes, reporting on the use of public resources, or regulating private business, that provide the framework of goals and incentives within with people and organisations operate.

When dealing with capacity building one needs to consider that when focussing on building one capacity little progress will be made. Only when capacities such as human resources are linked with the availability of a group to work in, which has a proper structure, will that individual be able to put his or her potential to use. During the research different capacities were found in community organisations but rarely in a structured organised form; incorporating all the key features of capacity building.

Human resource development plans paired with changes in institutional framework and organisational structures and processes brought particular success in road sector projects.

When capacity building is treated as a core objective with an integral approach success has been noted. When SASOL tries to attract funding for capacity building, the strategic vision portrayed in a proposal should reflect the necessity for an integral approach.

Capacity building is a long term process that requires a systemic approach and attention to demand for improved public services as well as the supply of well-structured organisations and skilled personnel.

Currently there is a gap, where a link should be, between public services and the community. If this gap can become a link public services can become a starting point for fuelling the capacity building process.

Many projects that address capacity building as a collateral rather than core objectives have ill defined capacity building objectives that are poorly tracked; and shortcomings in the underlying diagnosis of capacity needs and constraints to change often undermine the design of interventions and the achievement of objectives.

*To effectiveness of the training given by SASOL is looked into but not entirely established through the research. It is clear however that the objectives are poorly tracked by SASOL. It is the researchers' view as well that for capacity building to become effective (or increase the effectiveness) capacity building should become a core objective and properly tracked. Or in other words a b*road human resource management framework linked to necessary

organisational and institutional developments *increases the chances of success of capacity building given that the process needs to be monitored as well.*

Virtually all of the bank's regional reports on Africa over the past ten years have emphasized public sector capacity as a binding constraint to development in the region.
At this point it has been established that the ministry of water and irrigation has yet to come to the implementation phase of their projects and suffer from organisational confusion. The ministry of agriculture has resources to provide people with training on various subjects. A registered SHG can apply for such resources. What number of SHG's are registered is unclear, the channels to follow for a community organisation to acquire such resources was not known to the people interviewed. This can clearly be noted as a constraint.

Training manual on project leadership and management
Author SASOL foundation, 2004

Project management seeks to facilitate sand dam site communities to bridge the gap between indigenous and external knowledge to action development. The first step is that the past needs to be examined to find solutions for the future. Identification of reasons for project failure are poor leadership, lack of vision, inability to understand the value of the projects but the community has the power to change and solve problems if united and and if projects are properly planned. The community defines development as "a process of bringing positive change in the community through the use of local and external resources".

This is a clear formulation of some of the capacities lacking in the community which SASOL the tries to address. The research supports the idea that community organisation can serve to bridge the gap between internal and external resources.

Recharge Techniques and Water Conservation in East Africa
author acacia institute, 2005 (draft)

'Since there are no permanent surface or reliable aquifer sources of water, which are likely to be found, the solution to ASL water shortage lies in the maximum use of the received precipitation in catchment areas. It is on record that about 70-90% of the precipitation received in the ASALs is lost through run-off into the drainage channels.

Conservation and management of water on the land, using terraces and contour bunds, will slow down runoff from agricultural lands improving crop and pasture production. Sand dams on the river channels will store bulk water for domestic use and watering of livestock. Bulk water in the dams can be used in growing tree seedlings for re-vegetation. When the trees grow, they play their part in the control of runoff and increase percolation, thereby increasing productivity of the land. The trees and other plants, which grow in the area, add to the stored energy due to evapotranspiration thereby facilitating trapping and storing energy from the sun.
For example, the calorific and time saving on water chores, which is highly significant, if average distance to water sources for households is reduced from 10km to 2km, could be invested in improving production of the land by instituting more water conservation measure.' (ACACIA a, 2005)
The first step in capacity building is to provide communities with water. When this condition has been fulfilled resources become available to address other forms of development. After provision of water another big focus of SASOL is on natural resource management.

'Central in SASOL is commitment to participate development, which cannot be if resource conservation within the framework of time tested technologies sustained by ASAL populations is ignored. This does not mean that the scientific approach, planning and new ideas are not introduced to base communities. It simply means that the beginning point is what is known and sustainable by the base communities as evaluated by multidisciplinary teams. Clearly water is central in this.' (SASOL a, 2003)

'The construction of sand dams is a collective effort. Stage one in the process is the identification of a suitable development by the community. Stage two is the election of a site committee charged with the responsibility of mobilizing local resources for the construction; planning of work, and maintenance and operation of the developed facility. The committee is in charge of all aspects of the construction process together with the assigned artisan. Technical guidance and is by the technical supervisor.' (SASOL a, 2003)

Illustration 2: Construction of the dam is a collective effort

Chapter 3

Research Methodology

This chapter describes the nature of the data required, the methods of data collection, the sampling techniques, the sample size as well as the way both household and dam committee interviews were conducted. Finally it explains data analysis techniques employed.

Nature of data required

The data needed for this research is both primary and secondary data in the sense that socio-economic data at household level as well as information from literature on development issues in Kitui district and on capacity building is required in order to get a broader understanding of the context in which we are trying to analyse capacity building. In addition to this, the data can be described as both qualitative and quantitative, as we have collected opinions from a given number of farmers to identify the current capacities and opportunities for capacity building.

Data collected

Primary data was collected through administration of a standardised questionnaire along with personal interviews.

The standardised questionnaire, the household questionnaire that is, is a structured questionnaire whereby the same questions were asked to 50 different respondents. From the study questions a number of topics were derived to be covered to ensure an overview of current capacities and capabilities while simultaneously identifying what development is requested from within the dam communities. These are respectively: general questions,

farming practices, natural resource management, leadership & project management, operation and maintenance, establishing current organisational structure, marketing and finance, and finally the SASOL evaluation. In cooperation with SASOL staff we adapted the questions and the format for the questionnaire to allow for a coherent and structured analysis of the answers after data collection.

The personal interviews were conducted to capture information that wasn't possible to collect through a questionnaire. These interviews were carried out with key informants whom we believed to have the knowledge required for our research, specifically from the Ministry of Water and Irrigation and the Ministry of Agriculture.
The implications the water act 2002 poses to the communities together with the policy and implementation measures the Ministries uses to deal with the water shortages and reduction of poverty and strengthening communities is looked into.

The secondary data collected consists of the literature review, in which general information about Kitui District is presented. In addition to this, there are some case studies and definitions on capacity building. This literature provides the necessary background information.

Sampling techniques

The Sampling techniques employed in our data collection process are both probability and non-probability techniques. The non probability technique was used in selecting the catchments where we were to visit the dams and households. Due to the local circumstances and constraints in time and resources, it wasn't possible to employ a random selection of catchments and dam sites. Therefore we used the following criteria for selecting the dams:

- Ecological zone
- Maturation stage of the dam
- Land use (agriculture or not which types of agriculture, ie. Irrigation)
- Landscape (hilly, flat etc.)
- Accessibility

With the aid of SASOL field-staff, we decided which locations were accessible, trying to cover all the criteria in the different ecological zones. After the selection of the catchments, a random selection of the households was made.

Sampling frame

SASOL has been active with dam construction in 18 catchments in four different parts of the Kitui district; Kitui West, Kitui Central, the Far South and the Near South. These areas differ significantly topographically and climatologically. All the units within this region had a change of being selected.

Sample size

It isn't feasible to include all the units, to interview all the households, we had to choose a sample size that was possible to cover within the available time while still allowing for the necessary analysis. 14 (out of 18) catchments were selected including 5 divisions. From the selected catchments, 50 household interviews were held and 10 dam committees were interviewed. We have taken into account the number of dams in each ecological zone to decide on the sample size per zone.

Data Analysis

The data collected was analysed by use of both qualitative and quantitative tools. The household questionnaire was analysed in an excel spreadsheet. Large part of this data as well as the other interviews were analysed through subjective judgement.

Limitations of the research (*it was too hot...)*

This research has been carried out in no more than 9 weeks. The results and the limitations of the conclusions and recommendations are dictated by this time frame. The available time for data collection was effectively 4 weeks and determined the sample size of 50 household and 10 DC interviews. The reliability of the data cannot be determined as the sample size is not randomly selected from the entire data frame. consequently, many results could not be quantified to scientifically backup the conclusions.
Translation into and from Kikamba and English caused some distortions between the aim of some questions and the answers eventually obtained. In addition, some questions did not clearly reflect the intentions behind it. As these weaknesses were only discovered during data analysis, some topics could only be covered partially in the report.
A lack of literature or previous knowledge about certain aspects of capacity building and possible means of, and complications with, research in other cultures, further defined the limitations of the data analysis.

Chapter 4

The Household Questionnaire Results

General Questions

These include questions about household size, size of the farm and the level of education of the head of household. The level of education is of interest because it is expected that this influences the way decisions are made on agricultural and non-agricultural practices.

The average household size is 8 people. Most people (29) have farming as their only source of income. In Kitui Central 11 out 25 households get an extra income from casual labour whereas this is the case in only one household in the rest of the district. The area around Kitui town provides more opportunities than most rural areas for people to generate extra income without commuting large distances. The levels of education varied, but the majority of household heads went to primary school only. There were 11 who haven't followed any formal kind of education at all. Usually these people are of old age, and they were young during colonial times. Of our total sample 3 people went to college, all of whom have other regular occupations besides farming. Though it happens everywhere, charcoal burning is done more in the south still than the central region. Around Kanziku 18 out 21 farmers generates extra income through charcoal burning.

The average farm size is 2,33 hectares and 44 farmers keep livestock besides growing crops. In the Far and Near South all the land is communal, in contradiction to Yatta and Kitui Central where all but one farmer interviewed have a title deed to their farm.

Farming Practices

Here we wanted to get an overview of cropping systems, crops grown, yields, use of fertilizer and labour requirements. We wanted to ascertain the current levels of knowledge people have of farming practices. Do they have access to agricultural information and do they take initiative to look for improvement and alternatives?

The cropping systems mostly practised were mixed cropping and mono cropping, namely 38 out of 50, while only 6 practise some form of crop rotation. In most parts of the district, apart from the extreme south, the farmers harvests twice a year. Certified seeds are not commonly bought (only 18%) and when they are bought it is mostly done only for maize. Here it means that when people do not buy certified seeds, the seeds of previous harvest are used because they simply buy locally grown seeds which are stocked by the shop. Selection of seeds or productive plants is therefore uncommon. Virtually none of the respondents admitted to keeping records.

Some distinct differences can be noted in crop choice throughout the district, maize (around 35 farmers) and cow peas are grown, with varying success, throughout the entire district. Pigeon peas, beans, sorghum, millet and green grams are other staple crops in the district. Beans however are not grown in the south and pigeon peas only in the near south.

Very little millet is grown in Kitui central and Chuluni. Green grams are favoured more in the south and vegetable growing only occurs in Kitui Central and Chuluni. This can partly be explained by different climatic conditions, vegetables comparatively need a lot of water, and furthermore because vegetables are more profitable crops than the more traditional crops to the district. The main vegetables grown are kale and tomatoes. In the rural areas buying vegetables poses problems in regards to availability since only on market days someone will be in the position to buy vegetables.

Before entering into the research we had the assumption that most of the produce is for domestic consumption and only a fraction is sold. When looking at the data however this cannot be the conclusion since 27% of the total produce of the staple crops are sold in the district. When having a look at separate regions the picture is largely the same. (see table business oriented farmers)

When looking at the local markets one would assume cabbage to be a staple crop, it is not however due to the high input requirements and it's susceptibility to pests and diseases. REFERENCE

Around 25 of the respondents rely purely on household for the farm labour (this is regardless of region), 15 households get external labour (hired or relatives) to help on the farm. The main bottleneck in labour requirement is weeding, followed by harvest. When farm labour is supplemented, hired labour is often used in Kitui Central and Chuluni, while in other areas of the district relatives are more commonly called to help out on the farm.

How much initiative exists among the farmers to find out about farming practices and natural resource management is a following question. When asked about the means to acquire agricultural information most people have several sources of information and only one respondent answered that there was no need to acquire agricultural information. The most common way to acquire agricultural information is through baraza's, but media, neighbours and NGO's are also major sources of information. Agricultural workshops have been followed by 23 of the respondents and the main subjects were farming practices and natural resource management. When asked why people have not followed agricultural workshops respondents either saw no reason to follow them or, mainly in the rural areas, they had not been offered any training. The new farming practices used after introduction of the sand dam mainly refer to irrigation and terracing but, when asked, 30 people had not assumed any new farming practices.

Below there is a table on pesticide use, the total sample size is 50 households but many simply don’t use any pesticides. One can note that 37 respondents use pesticides for animals and 31 use herbicides for plants. There are also large differences between farmers in application rates. It has not been established why this is.

Table 1: Pesticide use*

What kind of pesticide do you use	Respondents	For which crops	For which animals	Frequency	Were you advised on how to use it (if yes by whom)
Coopers	17		- 14 cattle and goats - 1 goats - 2 donkeys cattle and goats	- 13 when affected - 14 once or twice a week - 3 three times a month - 20 unaware or less than once a month	10 agrovet - 15 label - 4 relatives or neighbours - 2 NGO - 4 not advised - 2 local vet
Tick Fix	20		- 18 cattle and goats - 1 cattle - 1 goats		
BESTOX	4	- 4 pigeon peas - 2 cow peas - 1 vegetables		2 - 6 times a year	- 1 agrovet - 3 label
KARATE	24	- 17 cow peas - 20 pigeon peas - 1 beans - 1 maize - 1 green grams - 1 vegetables		- 21 One - five times a season - 1 depending on the rains - 2 when affected	- 9 agrovet - 12 label - 2 unaware - 1 neighbour - 1 NGO
Local herbs	2	- 2 cow peas, maize, green grams		When affected	Relatives
Tabacco snuff, pipa, ASH	1	- 1 Cow peas, Pigeon peas		When affected	NGO

***** numbers refer to number of respondents. When the total amount of answers is more than the number of respondents more than one answer has been provided.

Natural Resource Management

The government, SASOL and other NGO's have been giving communities training on NRM. For example, in the areas that SASOL is active at a given time with construction of sand dams, they provide the local farmers with a five day training on the importance of terracing, digging ditches, planting trees, especially around the sand dam, and other means of retaining water and preventing soil loss. Which NRM practices have been taken up by those who have been trained and if not, why not.

The first question was whether farmers have erosion on their farm. Most people recognized the fact that they have, only 6 did not. For the second question the underlying idea was to identify how much farmers know about the different types of erosion, their causes and possible measures to limit erosion. Translation into and from Kikamba didn't allow us to get this information as the different forms of erosion cannot be described as such.

SASOL informs the new dam communities about the importance of building terraces, especially near the dam, because on the one hand it improves the infiltration of water in the riverbanks and on the other it reduces siltation of the dam. Terracing has been introduced as an anti-erosion measure a long time ago, even near Kanziku one farmer pointed out he had terraces on his land for over 15 years. Yet still not everybody does it. In the flatter lands of the south it mightn't always be necessary to build terraces and here we can note that only 12 out of 20 farms has terraces. Some of them grow vegetation on the edges to prevent collapsing. For protective vegetation Napier grass is very suitable, it grows well and particularly fast during the rains to provide a more stable edge and to increase the water carrying capacity of the terrace. Furthermore it can easily be cut and dried as fodder for goats and cattle.

Though it is not always supported by the interviews, we've seen several species of trees and crops used on the edges of the terraces. Some examples are peas, beans, cassava, mango trees, indigenous shrubs and many types of grasses. PHOTO In Kitui Central almost all farmers have built terraces at some point but there were many shamba's with worn or badly constructed terraces. Terraces built in straight lines across the shamba and not along the contour-lines is one example of a badly constructed terrace.

Fertilizer is likely to be used when the profits exceed the extra costs. As water is the main limiting factor for production, it is likely that fertilizer will mainly be used for the dearer cash crops, vegetables. The interviews show that out of 10 that use fertilizer, 7 grow vegetables. Out of 19 farmers that grow vegetables, only 7 use fertilizer. It becomes clear that most farmers use animal manure which, as they have a mixed farm anyway, is freely available while at the same time it improves soils structure. Farmers have commented on the fact that fertilizer would have a negative impact on their soil in the long run.

As water is the limiting factor for production, increasing yields should always start with getting more water for the crops. People are told terracing of the riverbanks is necessary to improve the functioning of the sand dam, as well as to prevent erosion. But there are very few people that have taken much initiative on water harvesting, besides building the terraces. 11 farms have ditches or trenches by their terraces to improve infiltration. In Kitui Central this is sometimes done for bananas which are grown in the trenches.

The next question is what different types of trees farmers have in their fields. In combination with the use they have for trees we hope to find out if farmers plant trees for soil conservation, timber or firewood. It turns out most people don't plant trees for reforestation purposes. There's indigenous trees everywhere, in the Central and West most people have fruit trees, but apart from bananas most fruits are for domestic use only. In these regions some

people grow timber, usually blue gum, usually because they were part of a SHG that provided it's members with seedlings.

Charcoal burning is a main cause of deforestation, especially in the south where bush and wood is abundant and any means of control by authorities is very difficult. Around Kanziku 10 out 10 farmers burned charcoal, in around Kisayani 6 out of 10. Generally charcoal burning is done out of necessity. Crops have failed, it hasn't rained properly in quite some time and there aren't any other opportunities to earn a living. A critical note here is that little initiative is taken to conserve the little water available. One of the problems with charcoal burning besides deforestation is that most people producing it won't actually make any real profit from it. A bag of charcoal costs about 100,- Ksh. On average a household produces around 5 bags a week and this will suffice only for domestic food consumption and other necessary domestic purchases. When one combines the labour required to cut the wood and produce the charcoal there is little to no time and money left for development.

As the water storage capacity of the sand dam depends largely on the sand that is trapped behind the wall, sand harvesting should only be done with caution and in limited amounts. Some dams have stated in their by-laws that sand harvesting is only allowed for domestic purposes and in small quantities, whereas others forbid it entirely. 40 out 50 people say they use sand from the dam, only one farmer does so for sale.

Leadership & Project Management

Communities were required by SASOL to found a committee that would be responsible for construction of their dam. How did they go about organising themselves and what are their views on good leadership? Furthermore, is the committee still active and do people have wishes for the future? In the discussion with the dam committees we have also inquired about any initiative to realize these wishes and plans.

As stated before, development should start at the lowest level. Raising awareness on the need and possibilities for development should motivate the people to bring about economic development for a start and eventually a much broader community development. A project that was requested by the people of a village is likely to be managed better than similar project that is to some extent forced upon the community by an NGO, government or other institution. REF

In the case of the sand dams the people are usually informed of the possibilities through a baraza. But that does not mean the idea for the dam came from the local administration, they only called for the meeting. In two instances, a farmer went to their sub chief to call for a baraza. All the dam committees we visited had decided to build a dam through a baraza. Sometimes the sub chief had been contacted by SASOL and sometimes some community members knew about dams elsewhere, about the benefits and called for a meeting.

Of all interviews, 42 people stated that the sand dam was the project of their choice, amongst the alternatives were electricity, a borehole and tree planting. REPHRASE

A committee will function better if its members are suited for the job and not selected because of their popularity or influence within the community. The committee is in all cases selected by voting from all the involved community members. What do people perceive to be important qualities for a leader? Of course there are many answer possible, but some of the more frequent answers include: hard working, honest, available, not selfish, literate or educated.

The topic of gender issues has only been touched upon by the research by finding out what the male female ratio was in the dam committees. Almost always there were more woman than men in the dam committee. The role of chairperson is carried by both men and women. This can be explained by the fact that women are mostly in charge of taking care of the farm and so will be available for dam committee tasks and availability was one of the criteria often mentioned for selecting a dam committee member.

In 16 cases the entire community was involved in construction of the dam. Note that in the area around Kisayani some dams were built where the sub chief made it compulsory to participate in construction for the entire community, as it would be of benefit to all.

When asked directly, most people immediately say they would like to be in a committee, the question of why always took a bit longer to answer. According to the data from the questionnaire most people are willing and suitable to be a committee member because they consider themselves able to lead people or because they want to contribute to the development of the community.

Of all the committees that are still active, several are still constructing the dam or well, or planning to start other communal activities like vegetable growing or tree planting. Only very few are actually active with water distribution, implementation of the by-laws or organising group activities. Most committees dissolve after completion of the dam because they are only formed to oversee construction.

Future Project**?**

21 people wanted more water or water related projects

3 more sand dams

15 no idea.

Operation and Maintenance

Simultaneously with organising and overseeing the construction of the dam and the well the dam committee is responsible for drafting the by-laws that ensure a proper use of the available water and sometimes the sand. Also, they should make plans on catchment protection and dam maintenance. These questions are aimed at establishing how this is done for all the different dams as well as finding out if the dam and its committee live up to people's expectations.

There has only been one instance whereby members have to pay a regular contribution for use of the dam and well. This money is saved to deal with any unforeseen situations. For the rest there is no system in place to solve any problems that might cost money. From the interviews with the dam committees we gathered that most committees just plan to deal with damages after it has happened. They would call a meeting, assemble the entire dam community if necessary, and discuss how to solve the problem. One solution that was mentioned several times is to collect money to buy needed materials such as cement and apply to SASOL for help.

In 21 out of 50 interviews, everybody, including those who didn't construct, is allowed to draw water from the well. In Tungutu, the Yathii catchment and at the Muliluni wa Ndula dam in Siminzi people can become a dam member if they pay contribution. This then gives them full rights to benefit from the dam. Around dams where only members are allowed to draw water there is often the problem of others taking water illegally. They haven't helped with construction and don't want to pay for the water, but they do want the benefits.

This can easily become cause for conflict. Even though in 37 interviews the respondent says there is no conflict about water use, there were contradicting answers around the same dam. Therefore it is hard to quantify matters of conflict. Some causes of conflict are

caused by differences in water use. For example, people who grow vegetables and those near the dam are sometimes possessive of the water. In the Near-South, Kisayani, some dams ration the water several months a year to make the water supply last as long as possible. A problem arises when people take more than their share or don't wait until it's their time when water is rationed.

People have always found water for drinking. The main thought behind the sand dams has always been to provide extra water for development of economic activities such as irrigation. In practise, most water drawn from the dams is for domestic use. The dams have often decreased the distance to their water source, but developing new economic activities hasn't always occurred. Scoop holes and open wells, wells without a pump, are the most common means through which people draw their water. Some dams have been equipped with closed wells with a pump. The advantage is that the actual water source is fairly well protected, and the water can't easily be polluted. We've only encountered ten people that drew water from such a closed well.

The problems that could occur with sand harvesting have been discussed in the chapter on natural resource management. 40 people said they take sand for domestic use, there's only 8 people who stated it's not allowed. However, from different farmers around the same dam we received contradicting answers. Most committees have made rules concerning sand harvesting ,but most people either don't know about them or choose to ignore those rules. Furthermore, committees don't always have the power to apply these rules. Some have tried to tackle this problem by giving the local authorities a copy of the by-laws, to get their aid in enforcing them.

One important part of dam protection is to plant vegetation around the riverbank to prevent erosion. Napier grass is one form of riverbank protection which has been promoted by SASOL for some time now but only 3 respondents admitted to planting Napier grass. In total 10 respondents said they had vegetation around the dam but this includes indigenous trees and unspecified answers. This leads to the idea that respondents mostly don't practice riverbank protection or don't know how to properly do so. One other main issue involved with dam protection is to fence the dam, when asked about dam protection only one person responded that the dam and well were fenced but unfortunately this could not be checked. Two more respondents advised that there was fencing around the dam and when checked upon this meant only the well. Also around one dam trees have been planted and animals aren't allowed near one other dam. How this is enforced remains to be seen since animals are often allowed to roam freely and during the rainy season even watered at the open water behind the dam. Donkeys are often used to collect water from the scoop holes or well. This leads to the conclusion that the dams are mostly not protected, nor the sand that stores the water and contamination of the water and siltation of the dam pose a risk.

Sand dams are built by a community and for a community, an underlying idea is that people should have an equal share of the benefits which sand dams can pose to a community. People who have not helped to build the dam are often not allowed to use the water, hard work is involved in constructing the dam and a general consensus is that other people shouldn't benefit from the hard work one does. However the view on whether or not there is an equal spreading of benefits for community members most reply that those near the dam benefit more (21), while 17 reply with no. There were only 2 respondents to reply that people growing vegetables are possessive about the water, even though this is a small number of people, with growing water availability and expected increase in water demand more problems are likely to occur. People who are near the dam can benefit from the dam more than others because of easy access however it is just as fair to say that comparatively people further away from the dam benefit more because their walking distance to a water source has decreased more than those already close to the riverbed. In any case an answer on how to

bring benefits, other than for domestic purposes, like irrigation to those further away from the dam remains an issue.

Views on responsibility for sand dam maintenance differ quite a bit from respondent to respondent, 25 viewed it as a collective responsibility either of the community or the members of the sand dam, 12 saw the dam committee to be responsible, 6 those near the dam and 5 saw either none or the local authority to be responsible. 24 respondents said that dam maintenance is or should be collective responsibility. The others mentioned mostly the DC or the local authorities. One person said nobody is responsible.

The benefits people expect from the sand dam are mostly for domestic use and livestock (40 out of 50) followed by irrigation (including 10 especially for vegetables) and construction purposes or brick making. For 11 respondents the dam fulfilled the expectations, excluding 6 who are still waiting for the dam to mature, 14 stated that there is not enough water and the rest of the respondents gave varying answers mostly referring to there not being enough water for different purposes. Problems with the salinity were only mentioned once. One should realise however that the respondents have a lot of use for the dam but would like to have more water for other purposes than domestic use and livestock watering for part of the year.

Establishing Current Organisational Structure

A very short chapter, only two questions. The first tries to identify what communal activities are done within the community and how people benefit from them. Furthermore the awareness on the potential of group activities will be investigated. The second question invites the farmer to think of more possible benefits of cooperation with his neighbours. We also want to establish if there are any group activities which could be formalized into cooperations.

Most communal activities are done in a more or less formal way, through Self-Help-Groups. Over thirty of the respondents replied to be active in a SHG. Most of which organise activities such as 'Merry go round'(17), and agricultural activities which often require intensive labour in a short period of time. For example terrace building is often done communally as well as seedbed preparation and weeding. Also tree planting has been a new economic activity developed around several dams and is usually done as a group whereby the profits are shared or an account is used from which the members can loan money for decent interest rates.

When asked about the actual benefits they get out of cooperation with their peers, most answers are related to a reduction in workload and shared profits. Very few seem to be aware of the fact that as a group many things are easier to organise and that, when united, people can more readily make a stand against exploitation and fight for decent prices for their products, may it be charcoal or kiondo's. There are few business oriented farmers or groups who realise the value of economic activities such as marketing their own products or co-operations. When asked about possible benefits one can get from a group, again reducing workload and merry go round was an often found reply while business oriented answers were few. When combining the answers from current benefits and possible benefits 16 respondents reported subjects related to sharing profits, communal farming, exchange of farming knowledge and possibilities for communal borrowing.

Marketing and Finance

Traditionally most farmers growing crops, do so for subsistence purposes. Over the last century money has become virtually the only means of exchange. Have people made the necessary shift towards more business-oriented thinking? If farming is to be considered a business, the farmer needs to be aware of market mechanisms and the benefits to be gained from strategic growing and selling of produce. Of course there are many questions to be asked concerning the marketing and finance part of running a farm. We chose to focus only on the prices farmers receive for their products when selling, what they pay for the same products in the market and whether these prices fluctuate over time. In combination with establishing through which channels they sell we hope to gain a global understanding of how well aware farmers are of what their produce is worth. This is a first premise for running a profitable business.

Everybody who actually sells farm produce, confirmed that prices fluctuate. Yet 18 out of 50 of the respondents sell after harvesting, mostly because they need the money and because they can't store the food at home due to the risk of pests spoiling it. Six people sell when the prices are high, two of which also at other times when they need money. Vegetables are usually sold straight after harvesting simply because they need to be fresh.

Only 4 people keep farm records. Most people don't see any reason to keep records. There is very little awareness among farmers about the possible benefits to be gained from doing so and just two farmers stated that they are being trained or have received training on the value of records for farming.

In the questionnaire table 1, amongst other things, is stated per farm which crops are grown, how much is produced and what quantities are sold. 34 farmers actually sell part of their produce, 4 of which sell less than a hundred kilograms in total. Of all 34 farmers producing crops for the market, 10 grow vegetables. It was found that the main channel of sale is through middle men or retailers. If and how much money a household could gain through communal selling for example poses an interesting research subject. A total of 13 respondents were part of a SHG involved in communal selling, buying or loaning. The data does not support any comparisons on the income of farmers in regards to different modes of sale. The average yearly farm income expressed in KSH was 24885.86. This figure is an average of the 50 household interviews, excluding those farmers whose harvest had failed, by multiplying the total harvest per crop in kilograms with the price they received for their crops. When no figures were available on selling price for a particular farmer an average was used. When one excludes domestic consumption, the average farm income through produce sold is 12900,98. Those able to irrigate their fields and grow vegetables have a substantial higher income than other farmers in the district.

Table 2: Comparison of selling and market prices in Ksh

	Maize	Cow peas	Pigeon Peas	Beans	Sorghum	Millet	Green grams
Average Market Price 06	**19,96**	**33,76**	**32,44**	**46,62**	**22,28**	**24,37**	**50,56**
Average Selling Price 05	12,57	20,86	20,86	26,11	15,33	15,33	24,09
Average Selling Price 06	11	14,24	18,08	25	7,6	9	23,65

The first thing to note is the difference between selling prices in 2005 and 2006. Harvests were much lower in 2005 because of drought and very insufficient rains. The resulting food scarcity caused prices to rise.

In order to improve their standards of living and to boost development subsistence farmers will have to make a shift towards more business oriented thinking. With the available

data the distinction we can make between those who consider farming to be a business and those still farming only for domestic purposes is based on total produce for sale and people's awareness of market price fluctuations. If the produce sold approaches half (45%) of the total production or if a farmer sells when the prices are high, the farmer can be considered business oriented[1]. Literature Review Backup There were a total of 14 farmers with a ratio of selling of over 0,45 and 7 who sell when the prices are high. Only two farmers met both criteria.

SASOL Evaluation

To get and idea of how many people are reached by SASOL's training. How much did they remember and implement?

We touched upon the issue of empowerment since the dam communities have to provide around 45% of the input for the sand dam. This is done to make the community feel it's their dam and they are responsible for operation and maintenance and also because empowerment is part of capacity building in the form of building human resources (OED,2005). Therefore we asked about ownership of the dam and 37 times the response was that either the community as a whole or the members who constructed the dam owned it. Only 5 instances were noted whereby the dam was thought to be owned by either the government or SASOL.

To be able to recommend on training needed in the community, the desire for training was investigated. In other words when talking about capacities and capabilities, what do respondents think they require to take the next steps towards development. There were only 8 respondents who either had no idea on what kind of training would be useful, or who would accept any training offered. Types of training that where requested were mostly on farming practices, planting of trees, fruits and vegetables. There were 7 respondents who specifically asked for training on soil and water conservation or terracing and another 6 wanted training on how to maximise the benefit from the sand dam.

When a SASOL training is given, a selected group from a sub-location attends and it is expected that the information will be disseminated into the community by these people. People don't always attend the whole training because of other commitments or don't show up at all. The question remains if the information is disseminated properly into the community.

15 people participated in trainings offered by SASOL. Two didn't remember what the training was about, but most others said it had been about water conservation, terracing, tree planting or farming practices in general. With 23 respondents the question was not posed if a SASOL training had been given or not and 6 confirmed that no training had been given.

Dam Committee Questionnaire Results

In meetings with the dam committees the aim is to instigate a more free-flowing discussion in which ideas about development and capacity-building are brought up, possibilities for the future discussed and problems with and weaknesses of current community organisation resulting from the dam can be analysed. It is likely that these groups are higher educated members of the community and might show more ideas and initiative because of this. For this purpose there is a separate questionnaire that should function as a guide for such a discussion.

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[1] Definition

All committees have received a structure from SASOL to organise themselves into. The committees consisted of a chairman, a vice-chairman, a secretary, sometimes a vice-secretary, a treasurer, and several members, bringing the total to between 11 and 13 members. The dams constructed after 2002 sometimes had a trustee in the committee as well.

The chairman is responsible for organising the community and getting the participants together for construction. Furthermore, he or she is the link between the community (Committee) and SASOL (represented by the mason). The chairman chairs all the committee and community meeting and is to inform everybody of important issues and decisions made concerning the dam's construction.

The vice-chairman will act as deputy when the chairman is not available.

The secretary, sometimes assisted by the vice-secretary, takes the minutes at meetings, keeps and inventory of all materials and tools. He or she checks attendance, in some cases communicates information to the community and is responsible for recording the bylaws.

The treasurer collects the contribution, the fees paid when absent and pays for food on the construction site and other necessary expenses.

The trustee is a community supervisor, a foreman, and oversees construction.

All other committee members are involved with general decision making. The committee as a whole is responsible for formulating the by-laws.

Of the 10 committees we interviewed 7 said still to be active, two of which were still constructing the dam. Of the others, two committees were also active self-help-groups, active in tree planting, kiondo (basket) weaving, assisting other DC's with organising construction. For the other committees active meant they have assigned a person to oversee use of the well and water, check for sand harvesting or that they are still planning to make a set of by-laws.

The land around the dam belonged mostly to the community (communal) and sometimes it was government owned. Around streams in Kenya the ten meter rule applies. This means that the land around any stream up to ten meter from the riverbank is always owned by the authorities and can't be claimed by any individual. In practice those with shambas near the riverbed sometimes cultivate up to the banks. Around the sand dams whenever this was the case, during construction the land would be given to the community. As a consequence when any person would claim that land he is taken to the local authorities. Therefore communal land around a sand dam means nobody can claim it.

According to the different committees, the water is never adequate, most dams only provide enough water for a certain period, after which water use has to be limited. Also, several committees concluded even though there is enough water for domestic use, supply is inadequate because they had expected water to be available to develop activities such as brick making and tree planting.

A distribution system to regulate water use could help make the water in the wells last. But not all committees restrict water use. Three dam committees limit water use in the dry periods to a number of households per day and three others to a specific amount of water per household per day. For example from January until August, one committee allows its members 4 jerry cans of water (80ltr) and the last months before the short rains only two (40 ltr). Two committees stated there's no need for a distribution system when the well has water because everybody can just take what they need and there is no need either when there is no water because nobody can draw anything from the well. The remaining committees allow water to be taken freely for domestic use as long as the well provides water. Some dams don't provide any water yet. Thanks to the limitations in water use around a couple of wells (combined with a mature dam), everybody gets water all year round. In one case the committee thinks their system to be effective because, even though the well almost runs dry, they manage to make the water last much longer. The committees who don't really have a distribution system find the situation effective and don't see any need for improvement. Two

committees consider the only possible improvement is through the availability of more water. In two groups people came up with the possibility of deepening the well so it would provide water for longer. There are two dams still under construction.

There are a range of by-laws, some were true for all committees and some were not, but in all cases the water from the dam was only for those who constructed the dam, the members. Note that this wasn't nearly always the case with all the dams we visited while interviewing households. In the south however it was more common that the entire community was supposed to help with construction and there simply wasn't an issue who had rights of use. Around 5 dams sand harvesting is only allowed for domestic use, in some cases sand is abundant anyway and there is no need for any restrictions. In two cases it wasn't allowed. Livestock is allowed to be watered at two dams, whereas 3 dams don't allow any animals near the dam. 1 committee has made latrines compulsory for all households around the dam and two have constructed latrines downstream of the dam near the river. For the dams that haven't been finished yet, the by-laws will be laid out after completion.

In order to implement by-laws three dam committees have instituted a fine, sometimes depending on the crime. For cue-jumping when getting rationed water the fines usually lies between 900,- and 1500,- Ksh. At 1 dam the maximum fine is 10 000,- for sand harvesting. Two committees have made a written copy of the by-laws and keep it at the Sub-chief's office so when anybody commits an offence, he or she is taken there for trial. Some other committees don't really have any means of implementing their by-laws, though there are usually plans to fence the dam area to prevent livestock from entering.

None of the committees have any plans or procedures for repair and maintenance of the dam and none of the dams have yet been damaged. The committees still constructing their dams didn't have any ideas on maintenance, but all the others will deal with any problem as it occurs. A course of action that several committees will take when the dam is seriously damaged is to call a community meeting, decide upon the appropriate solution and raise money to pay for any costs.

Most dam committees have received some training on what can and should be done about dam protection, everybody knows about planting trees or other vegetation on the riverbanks and the construction of terraces on the land next to the river to increase the effectiveness of the dam by stimulating infiltration of water in the banks and reducing erosion. Other known measures are the placing of latrines to prevent human waste from polluting the water and fencing of the dam area to stop livestock from wondering around the dam. Three wells are fenced so that cattle can't come too close and kids don't fall in. but otherwise almost all committees are planning to implement activities such as tree planting and the building of latrines. Apart from terracing, which had sometimes already been done before, not many measures have been taken and water is usually fetched from scoop holes or open wells and loaded onto donkeys who therefore enter the riverbeds frequently.

Out of 10 committees, 4 keep records of all the money collected from contributions or fines. The others don't collect money unless they need to cover some large expense, for example, for an artisan to repair the dam. One committee still constructing, wouldn't collect money for water use as they didn't have any means of keeping the money safely and they also plan to collect money whenever it's needed. Those who do collect money and keep records use the money for maintenance activities concerning the dam, well or pump and for implementing protection measures such as setting up a tree nursery for tree planting. For the dams that haven't been finished yet the money is used to provide daily food for the people constructing and to pay for food and a room for the artisan.

The main challenges that committees have had to deal with concerned keeping the people working. In one case construction was paused several times and the committee had to mobilise the whole sub-location, a large area, over and again. The problem of attendance was

caused by two factors; food insecurity on the one hand and the lack of trust in future benefits on the other. Only in one case in the far south the attendance wasn't an issue as the sub chief had told people to work hard and they simply did according to the committee members. Two other problems were the provision of raw materials such as stones and the water for the cement. Lastly, the construction of one dam fell largely in the rainy season, the time people have to work on the land to plant and weed. People needed the jerry cans they used to fetch water, at home. Two groups complained about the agreement that they had to take care of the artisan. Problems with scarcity and food were recurrent as no permanent solution was found. The issue of motivating people was addressed by educating them about the benefits and importance of the dam and by provision of food in cooperation with SASOL. Thirdly, in most communities people divided into groups to take turns in building the dam.

The first three dam committees we interviewed were active as self-help-groups with basket-weaving, loans, vegetable growing, goat keeping, communal farming, terracing, etc. These communities were already active and they had ambitions and ideas about new activities they wanted to develop. The ambitions of the other groups included the implementation of the protection measures and finishing the dam itself. One committee wanted more dams to provide extra water, while simultaneously exploring other possibilities for water use. Most of the skills people would like to be taught about involved realising their plans, setting up tree nurseries and learning about sand dam maintenance. One of the SHG's explained they didn't have much knowledge on community-building, marketing and writing proposals for development project. Another group said they wanted to find ways to equalise the distribution of benefits, to enable people further away from the dams to use the water in other ways besides domestic use.

At this point in the interview we hoped to steer the discussion away from the sand dam, towards possibilities for other types of development. As we consider community organisation to be a first premise for development, we wanted the respondents to agree that an organised group can accomplish more to further development than most individuals alone. The dam committees invariably agreed.

The last three questions were meant to let the respondents work out some steps to realise any plans for community development. The ideas they came up with largely overlapped with plans and wishes in earlier questions. What became clear was that most communities look to NGO's for projects but that they have little knowledge on how to actually ask for help. People don't know the official channels to follow, like writing a proposal, going to their sub-chief and contacting the relevant institution. In addition, water is thought to be the first requirement for any form of development, especially because people primarily think of agriculture and expanding agricultural activities.
Only one committee was able to describe which steps to take to register as a formal organisation.

Conclusions

Farming Practices

Many farmers have supported SASOL's claims that water is a first requirement for increasing productivity. Training on farming practices has been provided by different organisations for several decades now, but yet there were many farmers that requested further training. It is likely that people mention farming practices because they know these trainings are provided. In other words, they request it, not so much because it's what they want, but because they know it to be a possibility. Crop rotation is not practised much and people have limited knowledge on soil fertility and means to preserve fertility and structure.

Irrigation is only possible in Central Kitui and Chuluni, the wettest ecological zone of the district. When vegetables are produced, this hugely increases the farmer's income.

Virtually none of the respondents admitted to keeping records and it is beyond the scope of this research to make statements about declining yields because of poor varieties but as people rarely buy certified seeds, and if they do only for maize, this is worth looking into for further research.

NRM

Large scale reforestation programs have been executed in Kenya, with a new one being started up, such a program has largely failed in Kitui in the past due to low amounts of rainfall. Reforestation by the local population from their own initiative is not supported by the research.

There are very few people that have taken much initiative on water harvesting, besides building the terraces. In SASOL's training on NRM, the part of water conservation, water harvesting and retention is very minimal. They are running trials currently with a training program specifically on water conservation.

As increased water availability is a very first need to increase farm output, there should be a strong emphasis on this in trainings on farming practices and NRM. There are many relatively simple measures that can be taken to save large amounts of water. Because some of these measures require much time and labour it would be useful for people to combine forces either informally or as a SHG to implement some measures on all its members' farms. One example is the HOT POT farm in Tungutu,

Kitui. PHOTOS This farmer is equipped with a diesel pump and a private well at the bottom of his farm. He has implemented many water harvesting measures, some of which don't require a pump and constant supply of water. This farm could function as a model farm and be used to show groups what possibilities there are, how to do it, and what benefits they could get. See Matthew Thompson's report on the HOTPOT farm as a model farm for more information.

Converting firewood to charcoal results in a significant reduction of the total amount of fuel. A shift from use of charcoal to direct use of wood for cooking and other domestic uses would be a first step toward more efficient use of the available resources. However as charcoal is convenient and the main fuel used, people will be reluctant to change. Creating more awareness of the downsides of charcoal burning and research into alternatives should be an area of interest to NGO's, the government and others concerned with development.

From the economic perspective charcoal burning isn't very profitable to the main producers. For example, a bag is worth 500, - KSH in Nairobi, those producing the charcoal in the south of Kitui receive 100,- to 150 KSH per bag. According to Kenyan law charcoal burning is prohibited. In practice it happens regularly and widespread. But because it's not allowed, producers don't have any rights, no means to get better prices. Regulation through legislation that deals with sustainability as well as the producers rights and duties, if implemented right, could be beneficial to the environment while simultaneously providing a economic safety net for the rural part of the population active with charcoal burning. It is worth looking into forms of organisation, that could allow the producers to demand better prices or change the channels through which they currently sell.

Operation and Maintenance

The largest part of the dam committees are no longer active. It is important to note that they were called into existence primarily to oversee construction of the dam. Besides water distribution and enforcement of the by-laws, there are few ongoing activities directly related to the dam that need organisation. One problem resulting from the fact that few DC's remain active is that dam protection measures are rarely carried out.

Furthermore, the importance of enforcement of the by-laws should not be underestimated. Both the household questionnaire and the DC interviews confirmed that enforcement of by-laws are rarely implemented properly. Conflict has arisen around dams whereby people would take water without the right to do so and people near the wells have been possessive of the water. With a strong organisation these kind of conflicts could be resolved.

As resulted from the interviews with the DC's in some cases a distribution system whereby water use is rationed for part of the year, has prolonged the water availability from the well. Therefore it could likely benefit the people around dams that do provide water, but not all year round, to ration their water. This is supported by findings from interviews with dam committees.

Sand dams are constructed to provide people with water for domestic purpose but mainly for the development of economic activities. Economic activities have definitely sprouted up but are localised. In the near south and far south the water has mainly been used for domestic purposes, this will partly be because of the age of the dams. Harsher climatic conditions in the south make it hard to tell if enough water will become available for activities besides domestic use.

Despite the fact that training is always provided about what protection measures people should take, most dams are not protected, nor the sand that stores the water and contamination of the water and siltation of the dam pose a risk. This is supported by the findings of the Ex-change laboratory teams that have investigated water quality in the dams.

According to half the people dam maintenance is the collective responsibility, the other half pointed at the DC or the local authorities. The risk with collective responsibility is that only too often, everybody looks to his neighbour to take action and as a result nobody takes his or her responsibility. Formal structures could be put in place to reduce this risk.

Leadership and Project Management

Even though SASOL sometimes bring the idea of a sand dam to a village, the community decides always whether or not they want the dam and they have to plan and carry out the largest part of the construction themselves.

Major aspects of human capacity are people's self reliance, initiative, vision and self esteem. Very few people show vision, there are few ideas about the future and there's little planning and effort put into long term progress. However, it was confirmed once again that people perceive water as a main requirement for the future.

The fact that training on hygiene, project leadership, how to acquire training for a community weren't requested at all, shows a clear lack of vision on possible areas of development besides agricultural production and practices. In other words there's no structured vision on development, how it encompasses all the different aspects of life and how all these aspects need to be addressed, separately and yet as a whole.

Establishing current organisational structure

A basic informal way of organisation, be it incoherent, is present which could be structured in formal co-operations. The researchers were unaware of the fact that if a SHG is registered it is able to ask for assistance from the government with issues such as training. How many of the respondents are actually registered and how many just sometimes come together as a group is unclear.

Marketing and Finance

There is some business oriented thinking, but the majority of the respondents are not business oriented or only to some extent. Some SHG's would sell farm produce as a group, share the profits and buy household utensils and farming implements communally. Other community organisations produced kiondo's. It was found that, besides being told about the benefits a group could get out of producing baskets, they had very little knowledge and resources to handle the marketing and finance of their enterprise with the result that they received low prices for their products.

SASOL evaluation

Water is thought to be a first requirement for any form of development. This is SASOL's main reason to focus on building a large number of dams throughout Kitui. This is supported by findings from both the questionnaire and the DC interviews, especially because people primarily think of agriculture and expanding agricultural activities as the first step towards development.

Of the people who have participated in SASOL trainings, the majority was positive on the form and content of the trainings. The main benefits they derived from training related to community cooperation, soil and water conservation and other farming practices. These trainings are essential as the dam themselves are only a foundation for future development. Capacity building is the next step and the

current trainings provided by SASOL are only the onset of a more holistic approach to community development for which SASOL, up until now, doesn't have the capacity.

It is understood that SASOL doesn't receive the funding required to do so, but one major weakness in its training program is the lack of recurrence. Only preceding, during and shortly after a dam is constructed in a certain location, do people receive training. In all parts of the district did people express a desire for repetition of past trainings given. In addition, an important issue for SASOL to consider is the current transfer of knowledge to the entire community. The weakest link in training people is where those trained have to pass the skills they have been taught about, onto their community.

Currently the funding SASOL receives is earmarked for very specific targets. In other words, they are donated a certain amount to build a number of dams and provide specific training for the communities involved. No more and no less. If they are to fully transform into a capacity building organisation, it is essential that they get appropriate funding that will allow SASOL to broaden its training program to other areas of development. There are plans whereby TOT's are employed to spread knowledge among the communities. These people are to be trained and supervised for a period of time, development will have to be monitored through the TOT's and progress stimulated or a lack of, addressed. This will have to be done independently for all the communities that SASOL is active in. They need the freedom of spending money flexibly within this frame of capacity building.

Although SASOL is aware that there are some faulty dams, mostly dams from the early days of dam construction, that are leaking, damaged or have problems with riverbank erosion. However in any plans for the next years repair and maintenance of these dams in particular has never been mentioned.

DC interview conclusions

The different tasks within the DC's are clearly defined, they have received a template for the organisational structure from SASOL. In some of the newer committees there an additional task, that of the trustee. This seems to be a positive measure to deal with the often found lack of motivation within the community.

One of the SHG's explained they didn't have much knowledge on community-building, marketing and writing proposals for development project. Another group said they wanted to find ways to equalise the distribution of benefits, to enable people further away from the dams to use the water in other ways besides domestic use. These groups are the more pro-active community organisations with clear ideas about development, but they can't get the assistance they require to implement their ideas.

As we consider community organisation to be a first premise for development, we wanted the respondents to agree that an organised group can accomplish more to further development than most individuals alone. The dam committees invariably agreed.
Most communities look to NGO's for projects but they have little knowledge on how to actually ask for help.

Partly from interviews with the DC's and partly from from discussions with SASOL staff we found a number of factors that restrain the construction of dams. SASOL employees note that one of the hardest things is to motivate a community and get their collective efforts behind the construction process. DC's often have difficulty in mobilizing the community and keeping them active until the dam is finished.

- In every day life people see flashy technological innovations such as cars and mobile phones. This is more appealing than simple but effective innovations such as sand dams.
- It is hard to involve the communities when hard work and sometimes a monetary contribution is expected. The communities are used to receive free gifts from other donors and even payment for work done to improve their own farms.
- The benefits will show only after some time, perhaps years. People like to see immediate results.
- A lot of effort is directed towards provision of daily food so little time is available for development.

These factors are all related to the current mentality of the people toward development and, more specifically, what their role could or should be in improving their own livelihoods.

Which capacity did we find
which lack of capacity did we find
Which capacities need to be developed argue
How should they be developed
Which constraints are present

Recommendations
How do you overcome them

as in overall conclusions moeten ook nog in het kort

Overall conclusion

Some key features of capacity building have been identified by the world bank. Capacity building is defined as a process which develops abilities to perform functions, solve problems and set and achieve goals. It is something which has to be owned, chosen, sustainable, self-reliant and provide the people with self-esteem.

These findings serve as a beacon to establish what capacities are present in the community and which should be stimulated. The construction of the sand dams often only provides people with drinking water but to state that this is the function of the dam together with a little irrigation would show a lack of vision. The construction process also aims to stimulate people to work together, to organise themselves and to be proud of what they achieve. Not all the goals are achieved but as capacity building is a flexible process whereby needs for development continuously change and should be addressed if and when they arise, SASOL is continuously trying to improve its ways to implement these changes. SASOL started dam construction as water was considered the first pressing need to address, with the underlying vision that increased water availability provides people with more time and opportunities to develop other activities. At this point the existing capacities need to be re-evaluated to identify the next step in capacity building.

While the dams are built and starting to provide the community with more water, this next step is to create more awareness on the choices people have and to establish links between the community and those with the knowledge and resources to help them.

Recommendations

Recommendations for future research Ex-change

As this research is only a first baseline study into capacity building, there is ample opportunity for more specific research into each of the topics covered in this report. Based on the conclusions from this report some further recommendations were made concerning specific areas of interest. (See the list below)

- farming practices
  - Pest management
  - Food storage at home[2]
  - To what extent do farmers only use varieties from previous harvest, what is the result on the yields of their crops and which new varieties are available?
- natural resource management
  - Sustainable charcoal burning and alternatives
- leadership & project management
- operation and maintenance
- establishing current organisational structure
  - Map the SHG potential and research possible organisational structure.
- marketing and finance
  - Possible marketing strategies concerning communal selling by SHG, farming cooperations
- SASOL evaluation
  - What is the best way to stimulate knowledge transfer from a TOT to the community as a whole

- Investigate possibilities SASOL funding on capacity building

Recommendations for SASOL

- <u>Investigate possibilities SASOL funding based on capacity building</u>

[2] Pests prevent people from doing so, linked to pest management and marketing strategies for when to sell your products.

- Handouts to support the effectiveness of various trainings and knowledge dissemination.
- Incorporation of farm record training into NRM training?
- Advise committees to limit water use in by laws or on a better distribution system
- Formalised involvement of local authority with the aim of better enforcement of by-laws
- People should be informed of the official channels to follow and the available options for training and resources
- Motivate TOT's : certificates, money, extra training

Recommendations future focus for SASOL

- Formalise planning for dam repair, community independent as well as in conjunction with SASOL
- Focus on existing community organisations, get them registered formalized and further develop them instead of dam committees
- Start developing training on more aspects of capacity building
- SASOL can become a knowledge platform for community organisations for an overview on development options and how to obtain them.

Discussion points

- How will the dissemination from trainer to trainee to community take place.
    - how in future can be improved
- find ways to equalise the distribution of benefits, to enable people further away from the dams to use the water in other ways besides domestic use. How?
- Food storage at home to decrease money spend on buying your own produce back
- How can by-laws be better enforced

Although terracing is practised throughout the district and it has increased as a result from the trainings, it doesn't seem to be done out of a sense of responsibility and commitment towards the dam. What could be done to improve feelings of ownership and care for maintenance within the communities?

Reforestation doesn't serve the short term interests of the local population. Raising awareness on the

importance seems to be the only stimulant to get people to plant trees. It doesn't at all or just barely happen. Could this problem be addressed without direct incentives?

Lit review

results:

ministries

The Kenyan ministry of water and irrigation has given the official ownership of water back to the communities. This also means giving the responsibility to the communities to look after this resource. The communities have been given training about the new water act (2002) but the researchers were unable to obtain an training manual from the ministry. The ministry has been divided into groups for policy making and water provision with the creation of different institutions organisational confusion has so far been the result, even within the ministry there is no clear communication of tasks and responsibilities and an overview is lacking.

Appendices

Appendix A

Household Questionnaire

Why this questionnaire ?
This questionnaire aims at evaluating the impact of the sand dam project.
We hope to increase the benefits of a sand dam to the community. Your answers will be appreciated and kept confidential.

Division:…….. …… Location:…….
Sublocation:…….. Village:…….
Catchment / dam:……

General Questions

2. What is your household size

3. Who is the head of the household
   - mother
   - father
   - older relative

4. What is the level of education of the head of household
   - Primary school
   - Secondary school
   - Colleges
   - None

5. What is the size of your farm

6. What are the household's different sources of income and how much are they
   - farming

- business
- regular employment
- casual labour
- others, specify.....

7. When the crops fail where do you get money for food
   - borrowing money
   - selling animals
   - brick making
   - food borrowing
   - remittances
   - charcoal burning

8. What kind of farming system do you practice
   - Farming, crops only
   - farming, animals only
   - mixed

9. What kind of landownership do you have
   - title deed
   - communal
   - lease
   - Other, specify.....

Farming Practices

Crop	When growing	New variety	Total production	Quantity	Quantity	How is the	Selling	Selling	Market Pr

	nHow often	ty of crop (I)	duce per year	for food	for sale	is produce sold (MM, R, W, DM, O)	rice / KG 2005	rice / KG 2006	ice / KG (when bought, F, H, L)
Maize									
C									

owpeas									
Pigeonpeas									
Beans									
Sorghum									
Mill									

et									
Green grams									
Kale									

I=irrigated crop of the sanddam, MM= middle men, R=retailers, W=wholesalers, DM= direct market, O=other, F=Fair, H=high, L=low

- How do you grow these crops
  - mono cropping
  - mixed cropping, (with agro-forestry)
  - inter cropping
  - crop rotation
  - other……

- How do you obtain the seeds used for planting
- Do you ever use any new varieties of seeds for the same crop
- When do you plant your crops
  - before the rains
  - onset of the rains
  - particular time of the year
- Who provides the farm labour
  mother
  father
  children, specify how many from what age
  relatives
  other, specify.....
- When do you experience peak labour requirements, for what purpose and who provides it
  - In the long(may-sept), short(jan-feb) dry season, long (march-april) short (nov-dec) rains.....
  - Relatives
  - Household
  - Hired
  - Others

  Planting
  Seedbed Preparation
  Weeding
  Harvest
  Other, Specify

What kind of pesticide do you use	For which crops	For which animals	Frequency	Were you advised on how to use it (if yes by whom)

- What kind of pesticides and herbicides do you use

- How do you get agricultural information
  - media
  - extension services (NGO's, ministries)
  - barazas from provisional administration
  - Neighbours
  - other, specify

- Have you followed agricultural workshops recently (Yes/No)
  why (not).....

- Have you adopted any new farming practices since the construction of the sand dam
  - irrigation
  - terracing
  - early planting

Natural resource management

We will start now with asking you some questions on soil erosion.

1. Do you have soil erosion on your farm

2. What types of soil erosion occurs in your fields
   - gully
   - sheet
   - wind
   - other, specify

3. What measures have you taken to combat soil erosion on your land?
   - terraces
     why.....

   - vegetation planted on the edges of terraces
     specify.....

- cover crops
  specify.....
- mulching
- other, specify.....

4. What kind of fertilization do you use
   - compost
   - green
   - animal manure
   - fertilizer

5. What water conservation measures have you taken regarding:
   - run-off
   - improving infiltration
   - water harvesting

6. What type of trees do you have on the farm
   - ornamental
   - fruit trees
   - timber related
   - indigenous

7. What uses for trees do you have
   - charcoal production (domestic - sale)
   - construction / building (domestic - sale)
   - fencing
   - firewood (domestic - sale)
   - medicinal
   - soil conservation
   - shade
   - other.....

8. Do you harvest sand from the river bed yes / no

Leadership & Project Management

1. How did you learn about the dam project

2. Did you participate in the dam construction
   - if no, why not.....

3. Is this the project of your choice yes / no
   - if yes, why.....
   - If not, what would you have preferred.....

4. What are important qualities for a member of a dam committee

5. How was the committee selected

6. How many members does the dam committee constitute now and during construction
   - gender ratio M / F
   - if there are less members now, why.....

7. Did every member of the community participate in construction yes / no

8. Would you like to be in a dam committee or any other committee yes / no
   - Why (not).....

9. Is the dam committee still active yes / no
    - if yes, what are they doing
      if not, why.....

10. Which future project(s) would you like to propose for the community
    specify.....

Operation and Maintenance

1. How do you raise money to pay for dam repairs

2. Are people who haven't helped with construction allowed to use water from the dam yes / no

3. Do you have any conflict about water use in your community yes / no
    - if yes, specify.....

4. How do you draw water from the dam or river for domestic use
    - from a borehole
    - from a well with pump
    - from a well without a pump (open well)
    - from scoopholes

5. Are there any by-laws on sand harvesting yes / no
    - if yes, specify.....

6. Do you plant vegetation around your sand-dam yes / no
    - Specify.....

7. Is the dam area protected yes / no
    - if yes, how

8. Are there people who benefit more from the dams than others yes / no
    - If yes, how and why.....

9. Who is responsible for dam and well maintenance
    - specify.....

10. What are the benefits you were expecting to gain from the sand dam
    - watering livestock
    - water for brick making
    - water for domestic use
    - other.....

11. Is it functioning as well as you expected it would yes / no
    - if no, specify.....

Establishing Current Organisational Structure

1. What are the communal activities done

2. What benefits do you get / could you gain from agricultural cooperation with your neighbours, specify.....

Marketing and Finance

1. Do the prices you receive for your products fluctuate

2. When do you sell and why at that time

3. Do you keep records of what you produce and the prices you obtain for your crops yes / no
    - why.....

SASOL Evaluation

1. What facilities has SASOL provided to the community

2. Who do you think should own the sand dam

3. Did you attend any training offered by SASOL yes / no
    - if yes, which one(s).....

4. If yes, what new skills did you learn from the training

5. What are your comments on the training offered

6. Is there anything more you would like specific training on
    - specify.....

Appendix B

Dam Committees Discussion Questions

10. How did the idea of the dam project arise in the community

11. What are the responsibilities of a dam committee and each of its members

12. Are you still active as a dam committee
    - if yes what have you done

    - if not, why.....

13. Who owns the land on which the dam is built

14. Do you think the dam's water supply is adequate

15. How do you distribute the available water amongst the community members

16. Is this water distribution channel effective

17. How do you think the water distribution could be improved

18. What are the by-laws regarding the sand-dam project
    - Water use
    - sand harvesting
    - livestock
    - irrigation
    - water quality

19. How are these by-laws implemented

- control
- sanctions

20. Has the sand dam been damaged since construction
    - What caused the damage
    - What kind of damage was it
    - Has it been repaired
    - How long did it take for you to get the dam repaired
    - Who repaired the dam
    - Who paid for the repairs

21. Do you have procedures regarding maintenance and repair of the sand dam

22. if not, what would you do

23. If money is collected for water use, do you keep records

24. What happens to the money that is collected

25. As a sand dam committee what challenges have you met
    - How did you deal with them
    - were there some difficulties with encountered problems
    - What would you do different next time
    - are there any problems you haven't dealt with
    - are there any recurrent problems

26. What ambitions do you have as a dam committee

27. Are there any skills you would like to gain from SASOL in the management of sand dams

Appendix C

Interview Ministry of Agriculture on Farmers Field Schools (FFS)

1. What are FFS ?

FFS are requested for by a community Self Help Group (SHG), specifically farmers, who want to ask the ministry for training. The SHG has to be registered with the ministry of culture and social services to be able to apply for a FFS. The Ministry provides a facilitator / expert (based at locational level) on farming practices to train the farmers on appropriate skills and knowledge. The SHG finds a demonstrative farm, a place for theoretical training and a group of interested individuals from the SHG to attend the training.

The training is given in such a way that the SHG first gets theoretical advice and they practice what they have learned at a later stage on the demonstrative farm. An FFS can range from a day to a week. It takes the initiative from the community for any training to be given and transport costs for the facilitator have to be paid[3].

2. What kind of training is offered ?

- Land clearing
- Seed bed preparation
- Cropping systems (e.g. mixed cropping, intercropping, agro-forestry, crop rotation)
- Planting (e.g. spacing, early planting, line planting or random, tree planting, vegetable growing)
- Seed selection (buying certified seeds)
- Soil conservation measures (e.g. terracing, contour bunds, cultivation along contours, tree planting)
- Water harvesting (e.g. digging cut-offs, ditches, trenches)

[3] At the divisional level there are only very few staff, at the time of the interview only one facilitator was noted in Kitui central, their number cannot exceed five per division, a division has a minimum of 15000 people.

- Farming plan (planning ahead of the rainy season what one will use one's land for)
- Livestock rearing

3. How many FFS have been offered so far ?

The FFS are not offered all over the country because they depend on the community initiative. The government offers this service to the community from the viewpoint of participatory development therefore it has to be based on a request from the community.
The one person able to answer this question at the ministry was committed elsewhere.

4. How do people gain access to FFS ?

- Organise themselves in a SHG
- Register with ministry of culture and social services
- Request for any training they want from the ministry of agriculture

5. Limitations about FFS

- Not everybody is aware about this possibility
- The FFS are focused around the centre of a division due to transport limitations, communication is likewise mostly performed around the centre of the division
- The SHG has to provide for the transport costs and other miscellaneous expenses of the facilitator

Appendix D

Interview (1) at the ministry of water and irrigation

1. *What consequences does the water act really pose to the communities in the Kitui district, in regards to water use, ownership and management.*
   The framework for the water policy is ready, but the implementation is still being organized. The water board exists, but is not active as of yet. At this point there exists too much confusion about who works for who and who is actually in charge.

2. *The Water act 2006, as we understood, is a revised version of the water act 2002. what are the changes that have been made. Is this document available.*
   The water act 2006 is the same as the water act 2002
3. *Following public consultation, the Authority shall formulate a catchment management strategy for the management, use, development conservation, protection and control of water resource within each catchment area (water act 2002). What does this mean?*
   At first, the communities would have to run the projects and would pay a 10% revenue to the water board, then the water board will want to take over. The technical staff would work directly for the project and be paid by the communities

4. *What is your view on integrated watershed management or catchment management strategy as it is formulated in the act.*
   Around rivers and waterways, the banks are supposed to be protected and springs need to be fenced to prevent contamination. The implementation is only just being carried out now but the internal service board has the target of providing services to 50-60 % of the communities by 2010.

5. *Are watershed committees / Water boards already in place or do they still have to be formed*
   The minister was supposed to have all the boards up and running, but now they exist just for water provision. At this point there is a project about 41 km away, with two pumping stations around three locations. Representatives from each location are asked to form a committee. The

water user committees are selected by the communities with the intention that when people select their own leaders they will be happy with them.

6. *What kind of remuneration is in place for Water user committees*
   Revenues from water points
7. *I have been told people have been given training on what the 2002 act means for the communities. Can we see such a training manual ?*
   There is no real training manual available. Trainees do receive handouts during training. A pilot "Water for rural communities" was held to inform the communities about the government reform and its consequences. (compiled by consultancy agency)

8. *Is there a view on what role communities play in the catchment management strategy*
   It's for their benefit, they won't be employed

9. *Is there room for dam committees to take over responsibilities from the ministry*
   They are the people that should carry out the protection.
10. *What measures or actions have been undertaken to ensure community participation* There are 6 projects to provide water and employment mostly for domestic use
11. *Or should be taken in your view*
    Repeated training and extension officers for ensuring the implementation of the training over time.

12. *Has research been done on the water resources in Kitui district, what is known about the size of aquifers, recharge rates*
    No data has been or is collected about the actual water availability. Boreholes are spaced 800 meter apart so they don't drain each other. The maximum which can be extracted is 75%. There is no data on recharge rates. Borehole spacing is the only limitation.

13. *Within 3 months after the end of each financial year, the Authority shall prepare an annual report of its work and activities. (water act 2002) Can we see reports of this?*
    There are no monitoring reports available.

14. *As soon as reasonably practicable after the commencement of Part I of this Act, and following public consultation, the Minister shall publish by notice in the Gazette a plan for the transfer of the management and operation of water services to water services boards established under this Act.*
    Has this been implemented
    The planning has been done very fast. The actual structure building, the board, is in place. Now the problem is that the money is with the national water (government contractor), the info exchange is lacking there is little to no communication between various institutions and no overview.

15. *Research has shown that if development at any level is to be achieved water availability is required. What has the ministry in particular done to ensure equitable distribution of resources (read provide water) in Kitui district with the main emphasis on the rural areas*
    There is the district development plan. Proposals come straight from the communities.
    Does the actual community propose?
    The peoples representatives can come with proposals and scenarios.
    Plans have to go through the locational committee, then the divisional committee, information loss does occur.
    If a plan is good the ministry supports it with the technical aspects, and will try to get the necessary funding through NGO's.

16. *What challenges have you met?*
    Mostly the organizational confusion

Interview (2) with Mr. Mutao from Water Resource Management Authority (WRMA), at the ministry of water and irrigation.

The WRMA has been formed under the new water sector reforms, before the ministry was doing everything now there exists a division between policy making and provision of services. The WRMA is responsible for all water resources and manages all water use.
The water resources are: rivers, dry riverbeds springs, many earth dams. The dry river beds carry much water which can be exploited, of the springs only a few are left protected by a forest, most others have

been destroyed by ineffective management of the forest.

The old wateract from 2002 didn't suffice for protection of the water resources, there was no part on enforcement with the new revisions the crimes can be punished. The new by-laws have been on display. In order for the laws to be enforced there has to be a complaint from the community. It will fall under the responsibility of the WRMA to enforce the rules but to this date little has been done on the enforcement side. This is mainly because of lack of training and because they are not fully independent from the ministry yet.

In the future plans each sub region should have two enforcement officers, all staff still has to be trained though. The communities and other stakeholders will be trained on the new rules through baraza's, NGO's shall also be informed. One main change is that a charge of 12.000 Ksh will be put in place for a pumping device be it a hand pump or motorized devices capable of extracting more than 10 m^3 per day. 1200 Ksh will be charged devices only capable of extracting less than 10 m^3 such as a rope pump or open well. When pumps remain unregistered a warning will be given to the person in question to ensure his / her awareness of the law after which a fine will be given.

Education is the key for the proper functioning of the water act from 2002. There is some money available for training.