

## PLAN OF WORK

### “The Kitui Agriculture activities after the building of sand-storage-dams”

In assignment of:  
SASOL Foundation

In co-operation with:  
Ex-Change ‘the profit of learning’  
Westerveld Conservation Trust

Co-operative educational institutions:  
Universiteit Wageningen  
Agrarische Hogeschool Larenstein Deventer

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## **1. Introduction**

The Kitui-district is located at the eastern part of Kenya. The main problem in the Kitui district, is that it suffers from a daily water-supply shortage. This water-supply shortage is caused by the dry and arid climate of the area. Some years ago, most people had to walk for 12 kilometers (on average) to satisfy their daily need of water!

The past decade, many technologies have been introduced in Kenya to try to supply water to the communities in the dry periods. A lot of measures that have been taken, proved to be too expensive or unsustainable. Isolated sand-storage dams constructed in Kenya during the colonial period in 1940's and 1950's are still being used and have therefor proved to be sustainable. Moreover, building such sand-storage dams is (relatively) cheap. These were the main reasons for the SASOL foundation to build isolated sand-storage dams.

In 1990 the SASOL foundation was founded. This non-governmental organization was founded to address water problems in arid and semi-arid area's in Africa and focuses on satisfying an important basic need: water. The SASOL foundation, that has a field-office in Kitui-town, built about 300 sand-storage dams in the Kitui-district so far!

Ex-Change is a foundation that was founded only two years ago in July 2001. The main objective of Ex-Change is the development of vocational education in developing countries, at all levels and in all kinds of sectors and occupations. Ex-Change co-operated last year for the first time with the SASOL-foundation. A group of four Dutch civil engineering students, from all levels of education, went to the Kitui-district for three months. They built a sand-storage dam in co-operation with SASOL and the local people. Because this 'ex-change' was considered to be very successful, Ex-Change has now decided to extend its program in the Kitui-district. This year, eight teams will go to Kitui; an agricultural team, a water-management team, a health and nutrition team and another engineering team.

The agricultural team, which is the team who's working-plan you are reading at the moment, will make stock of the agricultural activities in the Kitui-district. The team will do research on the effects of the sand-storage dams on agricultural activities. Moreover, we will try to find out what opportunities exist in agriculture for the locals (thanks to the sand-storage dams). Last but not least; we'll do research on the 'knowledge-system' of the community and we hope to increase the level of knowledge of the local people on growing crops and (maybe) on marketing crops.

## **2. Organization**

This project is a cooperation between two non-governmental organizations: SASOL and Ex-Change. The next paragraph's will give some more information about these two organizations.

### **2.1 Ex-Change**

Ex-Change was founded at July 2001 in The Netherlands. The initiative came from the Dutch national body in Secondary Vocational Education for Metalwork (SOM Opleidingen Metaal). Several institutions in professional education joined the initiative, as well at secondary, higher and academic level. The foundation has the development of vocational education in developing countries, at all levels and in all kinds of sectors and occupations, as it's main objective. Ex-Change functions as a network or front office organization for all institutions and schools including the respective national council's at all educational levels.

To carry out the mission of Ex-Change a three-step approach is used:

1. Projects in developing countries for basic needs.
2. Exchange of students in mixed teams.
3. Exchange of knowledge and educational infrastructure.

### **2.2 SASOL**

SASOL was founded in 1990. This non-governmental organization was founded to address water problems in arid and semi-arid area's and focuses on satisfying an important basic need: water. The founders of this organization have a different vision of development projects than most existing development organizations. In

their opinion, development projects should be a great improvement in the lives of people. They think this can be done by simple, low-cost projects where the community plays a mayor role in solving their own problems. The SASOL foundation has a field-office in Kitui-town. In the Kitui-district, primary and secondary schools in an area of 600 km<sup>2</sup> have been supplied with water by building shallow wells and rainwater storage tanks. The community provided most of the labour and materials for this, while SASOL found funding for cement, reinforcement, transport, masons and supervision. Moreover, SASOL helped building about 300 sand-storage dams in the Kitui-district so far! SASOL is still working on both of this projects.

### **2.3 The Project**

The cooperation between Ex-Change and SASOL started in 2001. Four Dutch civil engineering students went to the Kitui-district that year, for the first Ex-Change pilot-project. They were assigned to build a sand-storage dam together with the local population and SASOL. They were also assigned to increase the knowledge-level of the local population.

Because this pilot-project turned out to be very successful, Ex-Change has decided to continue the cooperation with SASOL and sends about four teams of students to the Kitui-district this year. One of this teams is the 'Agricultural team'.

### **2.4 The Agricultural team**

Ex-Change has as one of it's goals the exchange of students in 'mixed' teams. 'Mixed' means in this context; of different educational levels. The initial plan was to organize a team that would consist of two secondary educated persons, one higher educated person and one person with an academic level of education. Because some problems occurred while organizing the team, the final team now consists of only two persons: Fransz Huizing (higher education, being Hogeschool Larenstein) and Erna Ebbinge (academic education, being Wageningen Universiteit).

#### Fransz Huizing

Fransz is studying at 'The university of professional Education Larenstein' for higher professional agricultural education. He is a third year student. His specialisation is: International Farm Management and Agricultural Trade. Fransz did a practical on Tenerife for 4 months at an ecological vegetables farm and he did a practical in England at a tree nursery with heavy standards. He likes travelling and has been in Egypt for a while. Fransz did research last year at the large garden centre 'Intratuin' where he looked at a lot of different things. For example: The buying-behaviour of men, what could be improved at 'Intratuin', what could be 'new' products for a wider assortment, where the customers came from and how often they bought, routing, knowledge of the labourers etc.

#### Erna Ebbinge

Erna is studying at Wageningen University since September 1999. Her specialisation is in horticulture and she is especially interested in glasshouse-horticulture. She went to New-Zealand and Thailand to travel for a while, but didn't go abroad for her study yet. She finished her first thesis just before going to Kenya. She did this by order of a research institute for plant sciences (PPO). For this thesis, she investigated innovation-behavior of growers of greenhouse-crops in The Netherlands.

### **3. Aims of the project**

We want to find answers on the following questions:

1. What influence did the building of the dams had on the land use of a (sample area) community in Kitui?
2. What is going on in Kitui (agricultural production), and what are the possibilities in Kitui?
3. What are the common problems in Kitui?
4. How do the local people generate knowledge and how do they use it (in agriculture)?

#### **Personal Aims:**

We combined our personal aims because the project group exists only the two of us. There are examples as: 'Learning how to function in an area where situations are more primitive then in Holland', 'Learning how to deal with reverse during the project', 'Learning how to deal with opposition from local people', 'Learning how to deal with an other culture' etc.

We decided to do a project where we draw up an inventory of the results and possibilities of the previous project.

***The following questions rise when dealing with these aims:***

1. What influence did the building of the dams had on the land use of the community in Kitui?

- What kind of influence do the sand dams have at this moment?
- How many people in the area have access to this water?
- How much water is necessary and how much has been used?

So, how efficient is the water management in Kitui?

2. What is going on in Kitui, and what are the possibilities in Kitui?

- What crops are being produced?
- Are there crops that will deliver a better yield?
- How much water is really necessary to grow their crops?
- What types of irrigation methods are being used?
- What kind of soils are being used for agriculture?
- Is there a market or does the community only provide its own needs?
- If there is a market, is there transport?

So, what is forehand and what can be improved?

3. What are the common problems in Kitui?

- Are there high losses in crop yields?
- Is there a high amount of erosion?
- Are there irrigation problems or problems with water quality?
- Are there soil problems?
- What can be done to overcome these problems?

So, what are the exact problems and what can be done to minimise or to solve these problems?

4. How do the local people generate knowledge and how do they use it (in agriculture)?

- What kind of official education in agriculture exists in the Kitui-district?
- Which people 'own' what kind of knowledge?
- Where do the local people get information, how do they learn?
- How do different people use their knowledge and on what basis do they make decisions?

We didn't think it was necessary to write all the questions down that can rise when thinking and dealing with the aims of the project. So, we just have given a few examples. The project is more complex and deals with a lot more research questions.

**Final product**

We'll write a report about the agricultural situation, the problems, limitations and opportunities in the Kitui-district. In this report, recommendations will be made for future agricultural teams. This means that we will discuss interesting or problematic topics (opportunities for the community) in our report, on which we think more research should be done. Moreover, we'll try to give an advice about improvements that can be made for the whole project (Ex-Change/SASOL in Kenya).

**4. Background information**

**4.1 Agriculture in Kenya**

Kenya's economy is heavily dependent on agriculture. 75% of Kenyans make their living from farming, producing both for local consumption and for export. Though its population is high in proportion to its area, Kenya is counted among Africa countries whose food production has kept pace with its population growth. In recent times, only in 1984, a year of drought, was a deficit in food production registered. Agriculture, when defined so as to include fishing, forestry and ranching, made up about 30% of GDP and 19% of wage employment in the formal sector in 1996. It is estimated that agriculture's share of informal-sector jobs is even higher, although data are unavailable. Agriculture brings in over 6% of foreign exchange earnings and provides raw materials for Kenya's agro-industries, which account for about 70% of all its industrial production. Over 50% of export revenue continues to be derived from primary products, notably tea, coffee, sisal, pyrethrum, sugar cane, wheat, and cotton. Only 15% of Kenya's total land area is sufficiently fertile to be farmed, and only 7% can be classified as first class land. Most of the northern region is semi-arid. As the desert encroaches from the north, pressure is mounting for Kenya to implement reforestation plans and to maximise productivity in existing farms.[1]

There have been a number of significant changes in government policies governing land ownership since independence that have affected agriculture. When the policy of reserving land for white settlers was legally ended in 1959, much desirable farmland was transferred to Africans. Today Kenya recognises three broad types of land tenure: government land, trust land, and private or freehold land. Trust land makes up 73% of the total land area. The rights to make use of trust lands are held by individual families, but disposal rights are held by tribes, whose elders must approve inheritance. Trust lands are gradually being converted, however, into freehold lands under an adjudication and registration program introduced in 1956.

Most of the land of high or medium potential for farming lies in the Western Highlands, around Lake Victoria and Mount Kenya, and along the coast. The five districts of Central Province, Kisii District in Nyanza Province and the Embu and Meru Districts in Eastern Province also are developed for intensive cultivation. On traditional farms, Kenyans continue to work the land using ancient subsistence methods. Irrigation projects have been limited, totalling about 11,735 hectares/ 29,000 acres. These projects are mainly located in the Yala Swamp and Kano Plain in West and in the upper and lower Tana River basins. Maize is Kenya's principal staple crop, with legumes falling in second place.

Kenya is only able to supply about 70% of its demand for wheat; an increasing demand for bread, especially in urban areas, has put strain on the country's economy since the cultivation of wheat has an 80% foreign exchange content compared with 50% for maize. Millet, cassava, and sorghum are also important crops. Tea has emerged as Kenya's most important cash crop after a decades-long competition with coffee; its primacy has largely been the result of improved production by small farmers. Kenya now produces more tea than any country in the world except India and China. Coffee continues to be an important export, though relatively less land (about 3%) is used to cultivate it. Kenya's ability to export coffee was long limited by an export quota system. When this system was abandoned in July 1989 and control over the production and marketing of coffee taken away from the Coffee Board of Kenya (CBK) in October 1992, Kenya greatly increased coffee sales. The coffee industry is now liberalised in several ways.

Dealers can now transact their business in US dollars. Farmers are free to sell their coffee outside the central market. The number of licensed marketing agents has markedly increased.

Kenya ranks second in the world in the production of sisal and fourth in the export of cut flowers. The country supplies almost 70% of global demand for pyrethrum. Other agricultural exports include cashew nuts, fruits and vegetables. Agricultural goods are now Kenya's third largest merchandise export.

Beef and dairy cattle are also important to Kenya's agricultural economy. Kenya has one of the most developed dairy industries in Sub-Saharan Africa, with an annual milk production of some 2 billion liters. The fishing industry handled 121,984 tons of fish in 1987, mostly fresh water fish caught in Lake Victoria[2]

[1] Uwechue, Ralph (ed.) 1996. Africa Today, Third Edition, Africa Books Limited, pp.866-867.

[2] Uwechue, Ralph (ed.) 1996. Africa Today, Third Edition, Africa Books Limited, pp.867-868.

Source: [http://www.sas.upenn.edu/African\\_Studies/NEH/k-agric.html](http://www.sas.upenn.edu/African_Studies/NEH/k-agric.html)

We didn't think it was necessary to describe everything of Kenya in the concept working plan. The reason is that we go to Kitui, a district in Kenya. So we just give the information that we think that is needed for realising our plan. Of course there is many information available and we had to make a choice.

#### **4.2 Specific agricultural information of Kenya**

For this part of the background information we decided to make use of internet. We found information at the site: <http://www.fao.org/giews/english/basedocs/ken/kentoc1e.htm>, which is still under construction. So, not all aspects we wanted to add in the part are given here. We now like to show you a couple of pictures that were taken from this site to give an general impression about Kenya.

In picture 1, we can see how Kenya is divided into different parts. The Western, Central, N. Eastern, Eastern and Coast part. Kitui lays in the south of the Eastern part.

Picture 1: Parts of Kenya

Source: <http://www.fao.org/WAICENT/faoinfo/economic/giews/english/basedocs/ken/kenadm1e.stm>

#### ***The meteorological profile of Kenya***

In picture 2 we can see the climatically information of a few big cities in Kenya. It is difficult with this picture and information to give an exact amount of rainfall in the Kitui district, but we can verify these numbers out of the information that is given in paragraph 4.2.

#### Picture 2: Kenya Meteorological Profile

Source: <http://www.fao.org/WAICENT/faoinfo/economic/giews/english/basedocs/ken/kenmet1e.stm>

#### **Population**

The population of Kenya can be seen in picture 3. According to the information that the picture gives us we can conclude that the Kitui district has 25 to 100 inhabitants per square metre.

#### Picture 3: Population Density of Kenya

- Total population (1999): 29 549 000 inhabitants
- Active population (1995): 13620 000 inhabitants
- Rural active population (1995): 78% of active population
- Population annual growth rate (1988-99): 3.09%
- Life expectancy (1989-94): 59 years

Source: <http://www.fao.org/WAICENT/faoinfo/economic/giews/english/basedocs/ken/kenpop1e.stm>

#### **Crop zones**

The main crop zones of Kenya can be seen in picture 4. Here we can see which crops are the most important and where they are grown at most. If we look to the Kitui district, we can see that the major crop, according the web site, is maize. A big part of the district has no growers activities according to the web site. In our information about the Kitui agriculture, at the paragraph 'production patterns in Kitui', we can tell that there are other crops being produced. We concluded that the production of the food crops is: maize, beans, pigeon peas, cowpeas, millet, sorghum, and cassava and green grams; and of the fruit crops is: mangoes, avocados, citrus, lemon and guava.

#### Picture 4: Main Crop Zones of Kenya

Source: <http://www.fao.org/WAICENT/faoinfo/economic/giews/english/basedocs/ken/kencul1e.stm>

#### **The crop calendar of Kenya**

Picture 6 gives a good view of the important crops in Kenya and the time they are sowed and harvested. These schemes are standard and will vary when climate changes. That's why the crops are indicated with 'Long rains' and 'Short rains'. These 'rains' can be replaced by 'irrigation needs'.

#### Picture 6: Crop calendar of Kenya

Source: <http://www.fao.org/WAICENT/faoinfo/economic/giews/english/basedocs/ken/kencal1e.stm>

### **4.3 Background about the Kitui agriculture**

For this information we used the report 'Agricultural Marketing, Marketing opportunities for Kitui District in Kenya: Learning From the Dutch System' that was written by Erik Siepman of TU Delft and Emily Kiema and Mutinda Mungutí of Sahelian Solutions in November 2002. This information was handed out by Henk Haring from Ex-Change.

#### **The ecological conditions**

The Yatta plateau, an undulating plateau of about 1,100 m altitude, characterises the western part of Kitui. The Mutito hills rise to the north of Kitui town while to the east the Mutito escarpment drops down to the lowlands of eastern Kitui.

Soils:

Soils in the region are generally deficient in nitrogen and phosphorus and have low organic matter content. Low infiltration rates and a susceptibility to sealing makes many of the area's soils vulnerable to erosion, particularly since the most intense rains come early in the growing season when ground cover is poor (Sketchley 1978)

#### Watercourses and rainfall:

The only watercourses in Kitui are found along the borders. Within the district, most streams are ephemeral, and springs provide the main source of water. The district therefore is highly dependent upon rainfall. Across such ephemeral streams SASOL has been constructing sanddams through community participatory approaches. The bimodal distribution of the rainfall has its peak in October, December and March till April. February is characterised by a short dry season while a longer one is in July-August. The October-December rains are the most important for agriculture, since they are generally heavier and better distributed for crop growth than the rains in March-April. Rains are highly variable, both on a year-to year basis and between locations. The district is periodically afflicted by drought. The last several years have experienced unusually favourable rainfall, with consequent increase in agricultural production.

#### ***Production patterns in Kitui***

Kitui agriculture is mainly subsistence-oriented, especially outside the Central and Kyuluni Divisions. Central Division farmers generally plant a substantial proportion of their land to food crops (maize, beans, pigeon peas, cowpeas, millet, sorghum, and cassava and green grams). The surpluses are traded off particularly to the local traders and markets. Cotton and tobacco are grown to a lesser extent as cash crops. Livestock keeping is an integral part of the services it provides (in particular plowing), and as a form of saving.

Horticulture is in its take off stage in the Central and Kyuluni and Mutomo Divisions with vegetable growing registering an upward mobility. Vegetables such as Karrella, Brinjals, Okra, Tulia Linda, Tindori and chillies are grown under irrigation along Athi River in Mutomo and Ikutha divisions. Other local vegetables such as tomatoes, sukumawiki (kale), cabbages, capsicums, onions, corianders, spinach and pepper are grown under rain-fed conditions district-wide. Fruit and tree planting is in the increase with mangoes, avocados, citrus, lemon and guava being the common varieties. Apiculture is spread all over the district with the Southern and Yatta divisions being the highest producers of honey. The increased horticultural production in the Central and Kyuluni Divisions can be attributed to the ground water storage projects (Sanddams) and natural resource management and conservation. The farmers use little or no chemicals and fertilisers. The underlying base is that this Divisions fall under the Upper Midland 4 agro ecological zone with a mean rainfall of 850-1000 mm.

#### ***Transport and Marketing Infrastructure***

The district of Kitui is served with a poorly transport system. The Northern divisions are better endowed than the rest of the district and has better roads. In Central Division a tarmac road connects Kitui Town to Nairobi via Machakos and murrum roads provide connections to the Thika-Garissa road, which crosses the northern part of the district, and to the rail line from Nairobi to Mombassa at Kibwezi. Most major markets are connected to Kitui town by murrum or earthen roads. The rural access roads are only passable during the dry season since during the rain they become slippery and muddy. The Kitui-Kibwezi road is strategically important since it connects the district to Mombassa, a major harbour and potential market. Kisai, Ikanga, Mutomo and Ikutha are major trading centers along the same Kitui-Kibwezi murrum road.

Kitui Town is the most important urban centre in the district. In addition, each location has a number of market centres. Markets are held periodically in each centre, typically on weekly basis, although larger centres may have more frequent market days. Marketers of livestock and products such as honey and hides visit these markets to buy from farmers. Local merchants including butchers and grain brokers and agents also buy produce. Posho (grain meal) mills can be found in the vicinity of most market centres. Most centres have small-scale livestock markets and slaughter slabs at which animals are sold and slaughtered by local butchers.

#### ***Grain Market***

The common grain traded are maize, beans, cowpeas, pigeon peas, millet, sorghum, and green grams. Except pigeon peas which are traded fresh and dry, the rest are sold when dry. The most interesting thing in the grain market is the organisational factor. Few wealthy traders with numerous agents mostly control the markets like a cartel; the organisation is informal but very powerful. Information flows between the traders are very high hence enabling them to control the diverse markets. The traders are either grain milling corporations, wholesalers or exporters. They provide capital to selective local traders and middlemen who purchase the grain from the farmers on their behalf. In most cases the local trader sends a big truck, which collects the grain from all the affiliated local traders and agents.

In this way the agents and the local traders set the buying prices. The farmers have no other alternative and lose his bargaining power. This leads to outward exploitation. This is aggravated by the fact that the household granary (stores) have no adequate space and conditions to preserve the grains for long. More still the transport

system is so poor and expensive that the farmer cannot be able to transport his produce to other distant markets where he can fetch back some income as capital.

### ***The Fruit and Vegetable Market***

Fruits and vegetables are grown along sand dams, streams and traditional water sources. They are also grown as rain fed crops during the wet season. The farmers are individual growers with no established contact with other growers in the same line of production. Locally they are arranged in the open air market for sale depending on the quantity demanded. The free market forces of demand and supply set prices depending on the quantity and quality one needs to buy. The arena is a mixture of both retail and wholesale business.

Mostly the sellers are middlemen who buy the products from the farm. Sometimes few farmers undertake the trade themselves. Besides local traders buying for local use and resale, they also buy for sale in distant markets where demand is high. Mombassa City provides a ready market for these fruits and vegetables.

Production is always seasonal with gradual levels of supply ranging from periods of scarcity to plenty. During the peak season the market is saturated with supply surpassing demand. The consequences are too hard to the farmer since the prices drop and the farmer sell the product at throwaway prices to salvage the little he can. By the virtual perishable nature most of them become stale and or dry.

The contributing factors are:

- Lack of appropriate storage facilities; -coolers and refrigerators
- Lack of alternative primary and/or secondary processing
- Poor market timing and information
- Limited markets
- Inadequate transport infrastructures

## **5. Material and methods**

The four main research questions that were mentioned in chapter 3 and that we want to get answers to, can be operationalised by doing research on the following topics:

The inventarisation-part about agriculture (first three questions) consists of three main topics:

1. Studying literature
2. Growth-aspects
3. Chain-aspects
4. Knowledge-system.

The first one, studying literature, is not really a topic: it is more or less integrated in the other two topics. It's made a 'topic' here, because it's an important part of the inventarisation. It's so important, that we decided that it should be dealt with as a separate topic.

### 1. Studying literature

This part is a very important part of the project. We need to search for information in front, because some information might be difficult to get access to in the middle of nowhere. Moreover, we need to be well informed about the climate, crops and soils in Kitui to make our activities more efficient. To give an example: we don't need to do difficult soil-analyses if we know the composition and characteristics of the soil in front. If we've studied literature in front, we will also be able to transmit more information to our Kenyan counterparts.

We will search for information we think we might need in front. We will take information that seems important to us with us to Kenya, either in book-form or as computer-disks. We're trying to find information about characteristics of different crops and about pests and diseases on computer-disks. We'd also like to take a crop-growth simulation program and a laptop with us.

### 2. Growth-aspects

This topic is divided into some smaller subject's that have to be investigated, being:

- **Climate** (partly literature);
- **Soil** (partly literature), find out how dams store water and in what amounts, fertility;
- **Crops** (partly literature), see what has changed, what could change in the near future, machinery that is being used, activities carried out while crop is growing, seed- and planting material, crop rotations etc.;
- **Pests and diseases** (partly literature), find out what pests and diseases occur, why, what damage they cause, what can be done about it, the weed management;



- **Water-management**, water-use for crops, cattle and humans, irrigation, quality of the water, availability of water;
- **Fertilization**, find out if manure is used efficiently, availability/possibility artificial fertilization;

### 3. Chain-aspects

This topic is also divided into smaller subject's:

- **Storage**, need to store yield, storability of crops, possibilities to store crops;
- **Transport**, possibilities of transport to possible markets;
- **Self-sufficiency**, find out if there is enough production to satisfy their own needs, if there is a desire to produce other crops and what crops, possibility to produce for market;
- **Availability of products**, like seeds, machinery, fertilizer, pesticides etc.;
- **Market**, market for products, which products, what market, where, what products are present on existing market;
- **Nutrition**, find out what people eat, which supplements they should eat more of, which crops have what nutritional value;
- **Chain-analysis**, what does a chain exist of, which people are responsible for certain parts of the chain, what is/are the bottleneck('s).

Most of the subject's mentioned under topic's 2 and 3 interact with each other.

### 4. Knowledge-system

Then there are other research-questions that we want to find an answer to:

- How do the local people generate knowledge and how do they use it in agriculture?
- What are the possibilities for capacity building and knowledge transfer?

This 'knowledge' topic is divided in the following subjects:

- Official education system;
- Sources of knowledge-system;
- Kind of knowledge and system of knowledge;
- Use of knowledge and decision making processes;
- What can Dutch teams teach locals and how does knowledge transfer work.

Most of the research will be done by interviewing people and observing situations and activities. For example: we can interview farmers about their production, their self-sufficiency, their nutrition, problems they experience while growing crops. Another example: we can observe the growth of the crops and see what diseases cause damage and in what amount (pest growing cycles). We can also observe the market in Kitui-town and see what is traded here. We can talk to people who are responsible for certain things, for example people of a community office. We will also do research on things like soil-composition and irrigation. For such kinds of things we will need to dig holes for example. We will also try to find out which crops are most suitable for the region.

Materials we need for doing our research are simple:

- Information (in books and on computer-disks);
- Paper (for questionnaires and to write information on);
- Pencils;
- Dictionary (English and Swahili);
- Calculator;
- Laptop (if possible) and computer disks;
- EC-meter and pH-meter;
- Tape measure;
- Shovel;
- Bicycle

Most important for doing our research is our (the whole team) own vision and knowledge.

### Important note!!

The main goal of this project is to make stock of the (changed) agricultural activities in the Kitui-district. This means that there are a lot of different subject's, which we can and should do research on. The broad variety in research subject's, also implies that a lot of different problems can occur, which we cannot address in front. Because of this, we cannot really decide in front what we are going to do exactly. We'll have to wait and see what the situation in Kitui is, what the problems are for the local people and what opportunities exist. We'll make decisions about what we are going to do exactly in cooperation with SASOL. This situation is caused by the nature of the research: investigating as much as possible in agricultural business in a certain region. This also

implies that only general research can be done; we are not going to dig into defined parts of subject's. One of our goals is making a proposal for the next agricultural teams. These teams can dig into subject's we discovered to be important/problematic.

## 6. Planning

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Week	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
<b>Preparations in The Netherlands</b>																	
Members final group known	X																
Gathering info./knowledge	X	X	X	X	X												
Working-plan	X	X															
Presentation working-plan			X														
Personal preparations	X	X	X	X	X	X											
<b>Preparations in Kenya</b>																	
Arrival and stay in Nairobi							X										
Arrival/preparations in Kitui							X										
Orientation on situation							X	X									
<b>Research</b>																	
Orientation/meeting people								X	X								
Preparing questionnaires/interview									X	X							
Experiment in the field *									X	X	X	X	X	X	X		
Interviewing/questionnaires locals										X	X		X	X	X		
Water/soil research village											X						
Crop-growth & disease village											X						
Research market Kitui-town												X					
Interviewing 'important' people												X					
Research other village's (repres.?)													X	X	X		
Writing report												X	X	X	X	X	X
Departure to Nairobi																X	
Departure to The Netherlands																	X

- We're not sure we're going to do an experiment ourselves, because it's timeconsuming and we might have more important things to do. Wel'll decide when we've arrived in the Kitui-district.
- **7. Evaluation**

In this chapter we hope we can come with information that we find out during our stay in Kenya. Our goal is to come with advice for all members that are involved with the project and students that follow us.

Points that are important to discuss here could be:

Learning effects:

- a) About the content, the profession and agriculture
- b) For locals, Sasol and the students
- c) The knowledge transfer, with locals, Sasol, within the team, Netherlands-Kenya
- d) Our personal view about the team, self-reliance and cultural experience.

## References

The following reports have been used to make this plan:

- 1) Bakker, P.; van der Ham, R; Hermeling, V; Willemen, M (2002): 'Plan of work', "Building a sand-storage-dam", Leiden.
- 2) Bakker, P.; van der Ham, R; Hermeling, V; Willemen, M (2002): 'Practical work report', "Building a stone-masonry sand-storage-dam", Leiden.
- 3) Siepman, E.; Kiema, E. K; Munguti, M (2002): 'Agricultural Marketing', "Marketing opportunities for Kitui District in Kenya: Learning From the Dutch System", The Netherlands.