MINISTRY OF AGRICULTURE & LIVESTOCK DEVELOPMENT

AGRICULTURAL ENGINEERING DIVISION

SOIL & WATER CONSERVATION BRANCH

SOIL AND WATER CONSERVATION PROJECT (SIDA)

PLAN OF OPERATION - 1986/87 - 1988/89

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1. BACKGROUND OF THE PROJECT

The Agricultural sector in Kenya is the backbone in the country's economy. About 80% of the population is engaged in agricultural production in one way or another, half of the labour force is employed in it and 30% of GNP is delivered from agriculture.

Most of the population is living in high potential areas for agriculture, which however, just covers about 20% of the total area of the country. As Kenya has a population increase of about 4% per annum, people are forced out to areas with less favourable conditions for agriculture. This means that people are cultivating on steeper and steeper slopes or are moved out to arid and semi-arid areas which are especially prone to crop failure, soil erosion and land degradation.

The Kenyan Government was very quick to be aware of soil erosion as being a major threat against the environment and hence the livelihood of the people within the country. Kenya took up this matter as a pioneering country during the Stockholm conference on Environment in 1972.

As a result of this, an agreement was reached between Kenya and Sweden for Swedish support to a Soil Conservation Project, implemented through the Ministry of Agriculture and Livestock Development (MOALD).

The Soil Conservation project then started in 1974 with four pilot districts and has thereafter expanded to cover 39 districts all receiving financial and advisory support.

During the seventies when the project just covered a few districts the planning and recommendations were more local. With the expansion of the programme into more districts the planning policy and techniques went more general and applicable for the whole country. In the future the project again will be more diversified, taking into consideration the different agroecological and social conditions within the country.

The soil and water conservation project is managed by the Government of Kenya with financial support from the Government of Sweden through the Swedish International Development Authority - (SIDA). The day to day management of soil conservation funds is the responsibility of the Soil and Water Conservation Branch (SWCB) within the Agricultural Engineering Division of the Ministry of Agriculture and Livestock Development (MOALD). There are other donors assisting soil and water conservation projects in various parts of the country. Most of these projects are located in arid and semi arid areas and are as well coordinated by the Soil and Water Conse vation Branch.

MAIN OBJECTIVES

The overall objective of the project is to contribute to the fulfilment of one of the National goals stated in Sessional Paper No. 1 of 1986 ("Economic Management for Renewed Growth"), namely Food Security. Many different measures have to be taken to reach the goal. Some of them are mentioned in Figure 1 where the inter-relation between goals and activities is described. For example it is clear that if the utilization of arable land could be improved, it should be possible to increase the production of food. One way of increasing utilization of arable land is through soil conservation measures on steep slopes thus creating more appropriate land for cultivation. Another way is to undertake soil and water conservation measures in low rainfall areas thereby improving the possibilities for cultivation. One way of contributiong to food security is thus through increased utilization of arable land. The soil conservation project is aiming at that.

Another of the sectorial goals in figure 1 is to increase the yields. Of course the yield depends on a lot of factors such as soil characteristics, climate and farming operations, like seedbed preparation, date of sowing, type of seed, use of fertilizer or manure and weeding intensity.

Several studies have indicated that there is a substantial increase in yields after terracing. Terracing not only preserves the topsoil containing available essential nutrients for plant growth but also increase the infiltration and conservation of water on cultivated land. Promotion of terracing is one of the project activities.

The project goal is not to concentrate on mechanical work as construction of cut-off drains and terraces. The project has a broader concept including biological measures for erosion control through improved farming and closer link with extension and other subject matter specialists. Thus the soil conservation project can be seen as one important component to improve farm management aiming at higher achievements in the field through improved extension attributed to improved training, development and studies (research) of different methods. All activities performed by the project are supposed to contribute to the development of these areas. The projects main activities and supporting activities are described in the following chapters.

Summary of goals, objectives and activities for the Soil Conservation Project

National Goals	Sector Goals	Project Goals	Production Goals	Activities	Supporting Activities	Resources Budget
Greater Employment Creation	Efficient Utilization of existing resources	Land tenure	Intensify research (case studies)	**Extension** School Approach programme cut-off drains terraces		**Financial** - GOK Contribution
Provision of basic needs	Efficient land utilization	Pricing system Improve farm management	Improve Extension Activities Improve training	Support to nur. Women group apprach Seed collection units	Purchase of vehicles and motor bikes	- Donor contribution
Food security (self-sufficiency in food production)	Sustainably utilization of arable land Increase yield	Utilization of high yield varieties Promotion of AI & Zero Grazing	---------- Development of methods physical biological broaden concept ----------------	Nursery H/books Agroforestry Pilot study semi arid area	Financial support to spearhead Branch and Districts	**Organization** **Personnel** - GOK Staff - Expt. Staff - Consultants
	Improve storage	--------------		**Training** Training of trainees		
Improved rural-urban balance	Improvement of nutritional status and food utilization	-------------- --------------		Seminars courses formal training studies abroad Development of training materials Monitoring & Evaluation		

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Greater Employment Creation	Efficient Utilization of existing resources	Land tenure	Intensify research (case studies)	Extension: School Approach programme; cut-off drains; terraces		(Finance) - GOK Contribution
Provision of basic needs	Efficient land utilization	Pricing system; Improve farm management	Improve training; Improve Extension activities	Support to women group approach; Sand collection units	Purchase of vehicles and other bikes	- Donor contribution
Food security (self-sufficiency in food production)	Sustainability utilization of arable land; Increase yield	Utilization of high yield varieties; Promotion of AI & Zero Grazing	Development of methods physical biological broaden concept	Nursery Blocks; Agroforestry; Pilot study semi arid area	Financial support to spearhead Branch and Districts	Organization Personnel - GOK Staff - Expt. Staff - Consultants
	Improve storage	------------	------------	Training: Training of trainees; Seminars; courses		
Improved rural-urban balance	Improvement of nutritional status and food utilization	------------		formal training studies abroad		

3. Extension

Extension is the main tool to reach the earlier mentioned sectorial goals i.e. increased yields and increased utilisation of arable land together aiming at increased and sustained food production.

The project aims to reach about 14 million people living on 1.9 million farms in the rural areas. Out of these farms it is estimated that about 1.5 millions need some soil conservation measures. These farms are the target group for the soil conservation extension programme. The soil conservation project works through the national extension programme which aims at providing relevant and timely advice to the farmers. This is based on the methodology of Training and Visits (T & V)

The T & V project is implemented in such a way that each technical assistant (TA) or Junior Technical Assistant (JTA) involved, visits a group of farmers (consisting of a contact farmer and 4 - 8 follower farmers) on a fixed day and time, once every fortnight. Every fortnight prior to visiting these farmers, the TA/JTA attends a training course in which the extension messages he is expected to deliver to the farmers in the following fortnight are given.

The nature and content of the extension messages depends on the expected activities of the farmers during the coming month. The subject matter taught to the TAs during the fortnight training, varies in scope from crop husbandry, soil conservation, animal husbandry to home economics.

The teaching of the TAs is done by the District and Divisional subject matter specialists (SMS).

3.1. Soil Conservation Extension Methology Within the National Extension Programme

In broad terms, soil conservation subject matter is incorporated into the training and visit system. Although no uniform approach has been adopted, every province has tried to fit soil conservation messages into the T & V system, taking into consideration ecological, social and group activities in the Provinces.

The general pattern in Soil Conservation Extension within the T & V system is as follows:

Main Growing Season:

Within this period the messages include:

- Land preparation: Showing the best ways to ensure minimum soil erosion and maximum water infiltration into the soil.
- The time of planting and the application of fertilizers and manures to ensure a proper crop stand and ground cover.
- Tree and fodder planting.
- Maintenance of soil conservation structures.

These messages are delivered to the contact farmers during the TA/JTA scheduled visits, together with other relevant crop and livestock messages.

Off Season in Crop Production

This is the soil conservation peak period and refers to the period between harvest and land preparation for the following growing season.

The main soil conservation activities are:

- Laying out of structures.
- Digging and maintenance of the soil conservation structures (cut-off drains, terraces etc.).
- Training in soil conservation for all cadres of staff.

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- Training in soil conservation for all cadres of staff.

Some examples for the soil conservation calendar are given in Appendix I.

The support of the administration is very important for the implementation of soil conservation measures. At public meetings, barazas, which are held by the Chief of the location the farmers are informed about Soil Conservation and what is expected of them. Awareness is hence created. The Chiefs are also expected to help the extension staff in implementing the soil conservation works.

In many areas extension staff can work through various groups, especially good results in soil conservation have been reached through assistance in areas having well established women groups or self help groups.

As the extension cover is very good with an average density of one extension officer for about 400 farmers, it is assumed that given messages should reach almost every farmer. The experience shows that up to 100,000 farmers per year should adopt new ideas like soil conservation measures.

. Programme strategies

The policy of the messages has to consider legal, biological and technical aspect of erosion control. No cultivation of land is permitted on slopes exceeding 55%,on less steep slopes soil conservation measures has to be undertaken. Also the riverbanks have to be protected from cultivation.

Soil conservation must be seen as part of sound farm management. When the TA is approaching the farmer, he should firstly take into consideration biological soil conservation measures such as cultivation pattern, proper plant population, early planting, contour farming strip cropping etc.

The integration of livestock into soil conservation is also an important part in stimulating fodder grass production on terrace edges, giving manure for the fields, etc.

If the experience shows that these measures are not enough, the use of physical soil conservation meassures should be considered.

The physical measures includes various types of terraces, like fanya juu, bench and trashline terraces. It also comprises cutoff drains and artificial waterways. Some of the cutoff drains are fully subsidized as they are considered to benefit more than one farmer. As the artificial waterways are regarded as continuation of cutoff drains and terraces they are also subsidized up to 100%. The farmers are expected to dig the terraces themselves after the technical assistant has made the layout.

The extension is also involved in gully control and rehabilitation of eroded areas. As it is a very difficult and expensive undertaking to rehabilitate large gullies the efforts are laid on small farm gullies for demonstration purpose trying to use materials available localy. Land rehabilitation has so far combined the functions of demonstration and trials.

3.3. Changes in Direction

There will be no major changes in the extension strategies. The soil conservation messages will continue to be incorporated in the T&V system. However the TAs will be better prepared for the extension work in soil conservation through improved training. They will also have more area specific recommendations when the new training material which takes into consideration the agroecological zones in Kenya is developed. In general the approach in soil conservation will be more adapted to local conditions taking into consideration different social patterns, climate, soil etc.

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Supporting Activities to Extension

3.4.1. Training

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In the future more emphasis will be laid on biological soil conservation measures, the use of simple vegetative measures for erosion control, for example grass strips, trashlines and bush hedges will be stressed further. The role of livestock in soil conservation must also be more incorporated into the messages. Farmers need more advice on zero grazing methods, production of fodder crops on terraces, fencing, improvement on breeds, herd composition, water supply etc.

The subsidy to cutoff drains and artificial waterways and gully control will be more diversified. In areas where soil conservation has not "taken off" the subsidies for these structures should still be continued. However some areas are now so much aware of the need of soil conservation and it can be assumed that the subsidies can be withdrawn gradually and directed into other activities like training. Emphasis will be given on advise for the farmer, not doing the work for him.

As the pilot project for semi arid areas is going to take off during the period, the extension staff in areas similar to the pilot project must be given the opportunity to pick up the experience for the special conditions in arid and semi arid areas gained through the project. The experiences will be transmitted through excursions and training activities. This will on an early stage given the frontline staff ability to transform the experience from this project into messages to other farmers.

Supporting Activities to Extension

4.4.1. Training

This very important activity of the extension will be increased during the period. The extension staff, TAs and JTAs must be more confident in biological conservation measures, layout of structures, area specific recommendations, etc. Also the supervising staff (District and Provincial Soil Conservation Officers' Extension Officers) must broaden their knowledge both theoritically and practically, so that they can give adequate support to the frontline staff (TAs, JTAs).

3.4.2. The ability for senior staff to train their subordinates will also be strengthened through the training of trainers courses. School Approach Programme will orientate the youth in Soil and Water Conservation to assure Kenya conserve land in the future.

3.4.3. Agroforestry: will concentrate on activities to create awareness and increase the knowledge for this very important soil conservation activity.

3.4.4. Nurseries: will given continued support to the extension, through stimulating increased planting of fruit, fodder and multipurpose trees. They will also produce appropriate grass species and fodder legumes for the different climatic conditions within the project. The approach to support women groups and other organised farmers groups will strengthen the soil conservation in general.

3.4.5. Monitoring and Evaluation

will give advice and indicate new adjustments or directness to be taken in the soil conservation extension programme.

3.4.6. Transport

The supervising staff will have better means to support the frontline staff through the increment in transport capacity which will take place during the 3 year period.

Lack of supervision for various reasons, has formerly been a weak point in the extension programme.

3.4.7. Other Communication Means

The use of radio and television shall be considered in order to spread out soil conservation messages.

3.4.8. Supervision from Headquarters

Through the strengthening of the training and extension section with one more officer, HQs will be given some capacity to follow up the extension work in the field. At the moment the capacity of HQs. staff hardly allows for any such activities. To actually follow up what is happening on the ground in order to support weak points, correct what is going wrong etc must be seen as a very important undertaking.

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4. TRAINING

4.1. Goal

The goal for the training programme is to reach approximately 1.5 million farmers needing soil conservation. All levels of civil servants in contact with the farmers have to be informed and trained on the usual methods of soil conservation. Leaders, teachers have all to be informed and trained on erosion control measures to teach the farmers.

4.2. Target Groups

The target groups for the training programme are the Ministry of Agriculture and Livestock Development Extension staff, Administrative officials, officials from the Ministries of Enviroment and Natural Resources, Water Development and Transport & Communications. The Ruling Party (KANU) leaders, Women groups leaders, school teachers and farmers all add to the list of target groups.

To reach all the target groups mentioned above different courses (seminars) have been planned as follows:

4.3. Inservice Training

4.3.1. Training of Trainers

Currently Soil and Water Conservation Seminars for AOs and TOs are carried out by the Headquarters staff and the Regional Soil Conservation Unit at the Swedish Embassy. There is a backload of AOs and TOs to be trained in Soil Conservation Techniques at these seminars. Concerted efforts have to be made to speed up training of these officials to enable them dessiminate correct soil conservation messages to farmers whenever they visit the farmers or the frontline extension staff. It is for that reason that a few PSCOs have to be selected and pedagigically trained in order to organize and carry out soil conservation courses in their provinces. This will enable MOALD to gradually decentralise the present National Courses held in Nairobi and Nyeri and transfer the training responsibility to the Provinces and Districts.

The total cost for the 3 years period will be K£ 9,800.

Summary of Training in Soil Conservation

TABLE

of Course	Target Group	Objectives	By Whom
nal Soil rvation	Priority Soil Conservation Officers, Other Agricultural Officers to fill up	Refresh formal training Practical approach Adjust to real needs for work	Headquarters Regional Soil Conservation Unit
Conservation ers	PSCOs, DSCO	Pedagogical/ technical to give ability to organise training at Provincial/District level	HQs in collaboration with other authorities
es for Govt. ers	Goverment Officers within Agriculture, Forestry, Transport Administration etc	Policy matters, stimulate inter-ministerial collaboration	HQs Provincial Staff soil conservation on trainers
ncial seminar	Provincial District Division, Agric. Staff	correct mistakes Locally adopt approach in soil conservation	HQs. Provincial staff soil conservation on trainers
rs courses	Higher level leader-ship/people like politicians, church leaders etc	Create awareness of soil Cons. Ability to guide the people	HQ Provincial Staff soil cons. trainers
TAs Courses	Technical Assistants/ Junior Technical Assistants	Inservice training in soil conserva-tion for front-line extension staff	District SCO/ trainers
TAs ining	Technical ass. Junior technical assistants	Update know-ledge in soil conservation care, more experience	District SCO Soil Conservation traineers

iefs/Asst. iefs courses	Chiefs/Asst. Chiefs	Create awareness of soil conservation. Ability to guide the people	District Divisional SCO/ Soil Conservation trainers
achers	Primary Secondary school teachers	Create ability to teach soil conservation and guide the pupils	District/Divisional SCO Soil Conservation trainers
Club/Young rmers club	4K Club/Young farmers club members	Stimulate the members interest in soil conservation and farm management	District/Divisional SCO/Soil Conservation trainers
rmers/group leaders	Innovative farmers, soil conservation committee leaders, Women group leaders	Create ability for the leaders to guide their groups in soil conservation	District/Divisional SCO. Soil Conservation trainers Technical Assist.
rmers field day	Interested farmers in the district	Demonstration of soil conservation	District/Divisional SCO Technical Assist. Chief

. SCHOOL APPROACH PROGRAMME

5.1. Main Objectives

- Orientate youths into soil and wa
of making them appreciate the im
all activities of soil conservat

- Use children as agents of change
in the area of soil conservation
influence their parents on accep

If our children today would accep
be assured of a conserved land i
continue to be youths in Primary
sted by Review Mission 1985.

The number of schools assisted i
districts the originally assiste
very well and this has motivated
schools. (Other districts have
need to expand).

5.2. Districts and Schools under the Pro

The table below shows the district

Province	District
Central	Kiambu
	Muranga
	Nyeri
	Nyandaru
	Kirinyag
Eastern	Meru
	Embu
	Kitui
Rift Valley	Nakuru
	Narok
	Laikipia
	Kajiado
	Baringo

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in the district differs. In some
ted schools have not been doing
ed staff to recruit some other
e recruited new schools they felt

rogramme

t and the schools under the programme.

ct	No. of Schools
	Seven
a	two
	four
rua	two
aga	three
	four
	two
	three
	four
	two
ia	two
o	four
o	two

Province	District	No. of Schools
Nyanza	Siaya	two
	S/Nyanza	two
Western	Bungoma	Two
	Kakamega	two
Nairobi	Nairobi	two
	TOTAL	51 Schools

5.3. Strategy

The youths will be oriented through demonstration of tree nurseries as well as construction of soil conservation structures in the school garden. The following will assist in speeding up their orientation.

1. Inclusion of the schools into the T&V contact groups.
2. Training the teachers and leaders in the school committees.
3. Exposing H/Masters where possible through tours, into the dangers our land is experiencing due to soil erosion and instilling the idea of the high number of future Kenya's population that is passing through their education system.

N:B. A school may be having over 1500 pupils and if all are reached with the message of conservation, then many families have been reached.

5.4. Expansion & Costs

1985/86 No. of schools	Cost K£	1986/87 No. of schools	Cost K£
48 (within the Programme		20 (Expansion)	2000

1987/88 No. of Schools	Cost K£	1988/89 No. of Schools	Cost K£
30 (Expansion)	3000	50 (Expansion)	5000

N.B. Not included in the above figures are the schools that the programme will have expanded into and will not be sponsored by us directly. Due to the increased No. of trained teachers there is an expectation of increased interest and hence expansion.

6. NURSERIES

6.1. Nursery Development

Within the period 1987/88 a gradual changing of the nursery policy is to be done. A number of the best nurseries, geographically well distributed areas where the soil conservation project is operating are to be turned into central nurseries.

These nurseries will operate as service and training centres to serve women groups and organized farmers groups in terms of:-

- training and extension
- supplying mother plants and seeds
- supplying propagation material
- the selected women groups and organized farmers nurseries may also be given inputs during the first two years. After this period the nurseries should be able to continue on their own.

The nurseries to be turned into central resource centres have to be selected by considering the following points.

- geographical site
- suitable site in terms of water, soil, mother trees, schools an other basic factors.
- good management, if the target cannot be reached the funds shal be withdrawn.
- Nurseries established and supported by the SWCB will continue tc produce fruittrees and fodder/forest trees as has been in the past.

6.2. Training Component

The training component for nurseries should be strengthened, expanded and decentralized to provincial level. It will include planning, management and technical training. The training will be modified to the needs of the districts and have a duration of one week.

A new updated nursery management manual will be produced in 1987. The cost for it is estimated to be K£ 6500. Access to training facilities such as classrooms and accommodation makes it necessary to locate at least some of the central nurseries near FTCs since there have been management and financial problems at the FTC nurseries, the funds to those nurseries should not go through the FTC but through the DAO.

Costs Nursery Training Component - Table

Province	1986/87 Target (NO)	YR I Input (K£)	1987/88 Target (NO)	YR 2 Input (K£)	1988/89 Target (NO)	YR 3 Input (K£)
Central	25	750	35	1050	40	1200
Coast	35	1050	40	1200	45	1350
Eastern	40	1200	50	1500	50	1500
Nyanza	25	750	35	1050	35	1050
R. Valley	65	1950	90	2700	90	2700
Western	25	750	35	1050	40	1200
	215	6,450	295	8,550	310	9,000

6.3. Central Seed Unit

A central seed unit at HQ will be established with the aim to provide the nurseries with seeds difficult to process or store at the local nurseries. This will also enable transfer of seeds from areas that do not easily get some varieties of seed. Funds will be provided for local seed collection of indigeneous trees.

Output/Target

Seeds to be collected, stored and processed (In KG)	1986/87	1987/88	1988/89
	80	250	250
Input (In KG) Year	1986/87	1987/88	1988/89
Investment			
Cold store	-	5000	-
Containers	250	250	-
Seed Processor	500	-	-
Maintenance			
Seed collection	500	1500	1500
Seed processing	250	500	500
Maintenance cold store	-	250	250
	1500	7500	2250

Change in price policy

Farmers have a tendancy of using exotic forest tree species instead of indigeneous trees. This has led to a situation where the indigeneous trees are left in the nurseries. Since many of these exotic species represent a higher economic value the price for these trees should also be higher. Therefore, the nursery section will differentiate the prices for forest trees to increase the rate of adoption by farmers.

6.5. Tentative time Schedule

1986/87

The nurseries are to be supported as in the past. The nursery section are going to make an inventory of women group nurseries and visit them during the year.

1987/88

The soil conservation nurseries are to be supported as in the past. The section at the Headquarters is preparing the changing by selecting a number of nurseries in one or two provinces. The changing is to be discussed with the concerned districts before preparing the work-plan 1988/89.

1988/89

The selected central nurseries will start to operate. The nursery section has to follow up those nurseries and support them in their work. A number of nurseries in other Provinces will be selected and prepared to change into central nurseries.

1988 -

Gradually all the Provinces will be provided with these central nurseries. The changing process will need at least 5 to 6 years time otherwise there will be a risk if decreasing the tree production during the process.

7. AGROFORESTRY

Although woody components traditionally have been included in management systems in tropical agriculture the term agroforestry is still unknown by many farmers.

Agroforestry means a farming system using woody perennials together with annual crops and for pasture at the same unit of land. Conseqently an agroforestry system has always two or more outputs, increasing the total yield of the land. Since the system includes woody perrenial, its cycle is always more than one year. An Agroforestry system has also a positive effect on the enviroment since it is an ecologically more complete than monocropping.

1987/88

The soil conservation nurseries are to be supported as in the past. The section at the Headquarters is preparing the changing by selecting a number of nurseries in one or two provinces. The changing is to be discussed with the concerned districts before preparing the work-plan 1988/89.

1988/89

The selected central nurseries will start to operate. The nursery section has to follow up those nurseries and support them in their work. A number of nurseries in other Provinces will be selected and prepared to change into central nurseries.

1988 -

Gradually all the Provinces will be provided with these central nurseries. The changing process will need at least 5 to 6 years time otherwise there will be a risk if decreasing the tree production during the process.

7. AGROFORESTRY

Although woody components traditionally have been included in management systems in tropical agriculture the term agroforestry is still unknown by many farmers.

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7. Agroforestry Programme 1986-1989

- Create awarness and increase the knowledge about agroforestry by including the topic in soil conservation and nursery management training.
- A manual in agroforestry for soil conservation and nursery staff will be published.
- A simple pamphlet and posters for distribution to farmers and leaders are to be produced.
- Working out lists and recommendations for nurseries on suitable agroforestry trees and their uses.
- Cooperation with other organization such as International Council of Research in Agroforestry (ICRAF), Kenya Woodfuel Development Programme (KWDP) and Kenya Renewable Energy Development Programme (KREDP).

7.2 Tentative budget Agroforestry

	1986 /1987 No of publications	Cost K£.	1987,1988 No. of publications	Cost K£.	1988,1989 No. of publications	Cost K£
Agroforestry Manual						
Artwork		2500				
Printing cost	10000	12500				
Pamphlet						
Artwork				2000		
Printing cost			75000	30000	75000	30000
Posters						
Artwork		2000				
Printing cost	20000	10000				
Total cost		27000		32000		30000

8. MAI-MAHIU SEMI ARID AREA- SOIL CONSERVATION PILOT PROJECT

8.1. Background

When Kenya attained her political independence in December, 1963, the European settled farms became the main focus for settling the landless Kenyan Africans. Majority of these farms were in Rift Vally Province and indeed Nakuru district was entirely settled by the european farmers. It therefore became an area to which the majority of the people from high potential areas moved to. The movements to these farmers took several forms. Majority moved in as members of farm buying companies, others moved in as Government assisted settlers though the Settlement Fund Trustees; an arrangement between Kenya and British Governments which concerned itself with the smooth transfer of those farms, while other formed coperatives to purchase those farms.

The recent policy by the Government to subdivide the large scale farms into smaller holdings places a challange to conservationists to formulate a workable conservation system in such areas.

Mai Mahiu Semi Arid area is one of such areas where the people from high potential areas have moved to settle. These farmers have moved in with their on land utilization practices acquired over the years in the regions they have migrated from.

8.2. The Problem

Soil erosion and land degradation in semi arid lands of Kenya has been a big problem for quite a time. The situation has been aggrevated by cultivation of these areas without due consideration of the land use potential. Inherent practices such as overstocking and charcoal burning have been a headache.

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Wrong exploitation of natural resources for agricultural and domestic uses has led into accelerated soil erosion and land degradation in these marginal areas.

Uncontrolled soil erosion and land degradation due to human activity has resulted into widespread rainsplash erosion, sheet erosion and serious gully erosion in these areas.

8.3. Factors leading to the selection of this site

Although there are large areas with similar soil erosion and land degradation in this country, there are a number of reasons why Mai Mahiu has been chosen as a starting area. Other areas can be gradually incorporated at a later stage.

The factors leading to the selection of Mai Mahiu as a pilot semi-arid soil conservation area as follows:

1. Mai Mahiu although is administratively in Nakuru District is peripheral to high potential area of sorrounding districts of Kiambu and Nyandarua.
2. The populatin is composed of 22,591 households and according to 1979 cencus the entire area is inhabited by 61,840 people and this figure is rising steadily.
3. The proximity of Mai Mahiu to Nairobi and Nakuru will enhance proper coordination of the pilot project by the teams from DAO Nakuru and SWCB. in the Headquaters.
4. According to records held by D.O.'s office Naivasha, the rainfall of the area averages at 634 mm in a period of 63 years. This figure maybe lower or higher depending on the direction one moves to. The annual mean temperature is 24.4 C.
5. The majority of the area falls under agroecological zone 5 and 6 (see page 388 of Farm Managment Handbook Vol. II Part B Central Kenya). Although zone 6 is described as Upper Midland Ranching Zone population

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pressure has caused people from higher potential zones to permanently settle in this region. The area has thus been opened up for cultivation and one of the serious limitations of this kind of Agriculture is the shallowness of the soils in that area. Desertification is on the way if nothing is done and done NOW.

8.4. Objectives

1. The principal objective of a pilot soil conservation project in Mai Mahiu Semi Arid area is to learn about the strategies to be applied in similar areas in the country. Once this objective has been attained Soil Conservation on Semi Arid Areas will be included in the SIDA sponsored Soil Conservation Programme.
2. The second important objective is to try and develop a long term conservation system which can be relied on to develop sustainable production which will be capable to improve the quality of Agricultural Production in Semi Arid Areas. The basic frame work of such strategy is NOT outlined in this proposal.
3. To identify the priorities of the measures to be taken. Certain measures should be taken as soon as the proposal is being implemented, but a development leading to land management practices design will be the main goal.
4. To formulate an economic strategy aimed at diversifying other sources of livelihood of the population of the area. It is anticipated here that Soil Conservation practices which will be developed in the pilot area in conjuction with appropriate economic strategy is going to provide a context within which sustainable production system able to support the population and reduce environmental degradation may evolve.

8.5. Related Past Studies

In addition to new information to be obtained from the area, there are four studies which ought to be taken into consideration for more details while implementing these proposals. These studies are as follows:-

1. Proceedings of A Soil Conservation Workshop on Grazing Lands 9th April - 12th April 1985 -Printed in Nairobi.

2) ICRAF Report on Consultant Report and Project Proposal for SIDA/KENYA Soil Conservation Programme. September 10 1985

3) Soil Conservation in Kenya. Joint Review Mission Kenya/ Sweden 1985

4) Post Graduate Thesis on Mai Mahiu Soil Conservation Problems by Hilda M. Mukui 1985.

.6 Main Activities

(A) Seven main activities are proposed as follows:-

1) Consultations with :
   (a) MOALD/Donor
   (b) The implentors on the ground
   (c) The local leaders (DDC etc)

2) Work plans

3) The budget

4) Procurement of stores for the project

5) Monitoring and Evaluation: Follow up visits from Head/quarter, Provincial and Districts by subject matter specialists.

6) Training
   - Agricultural Staff
   - Farmers
   - Other leaders

7) Review teams

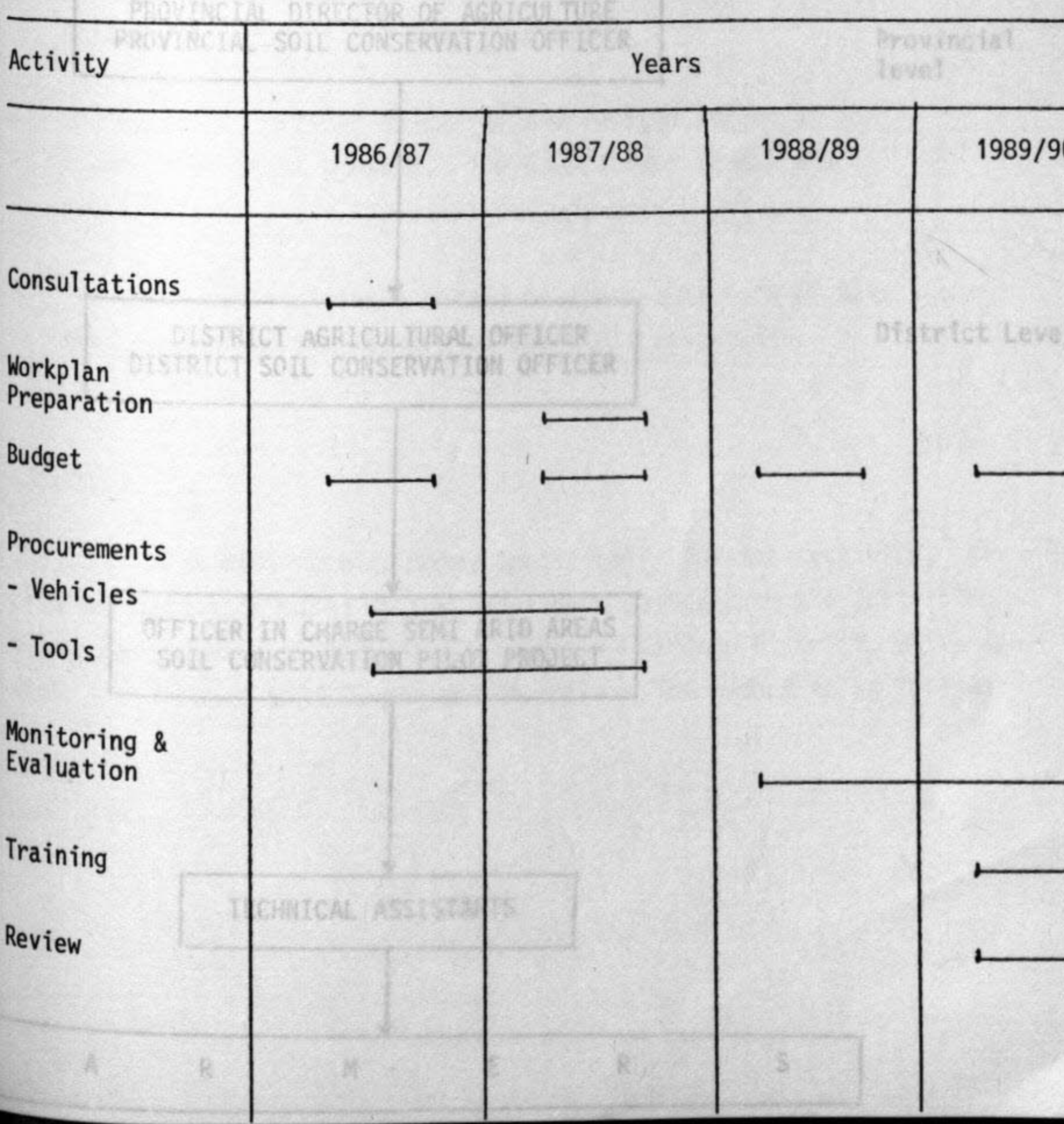
(B) Supporting activities

Staffing
Additional Transport

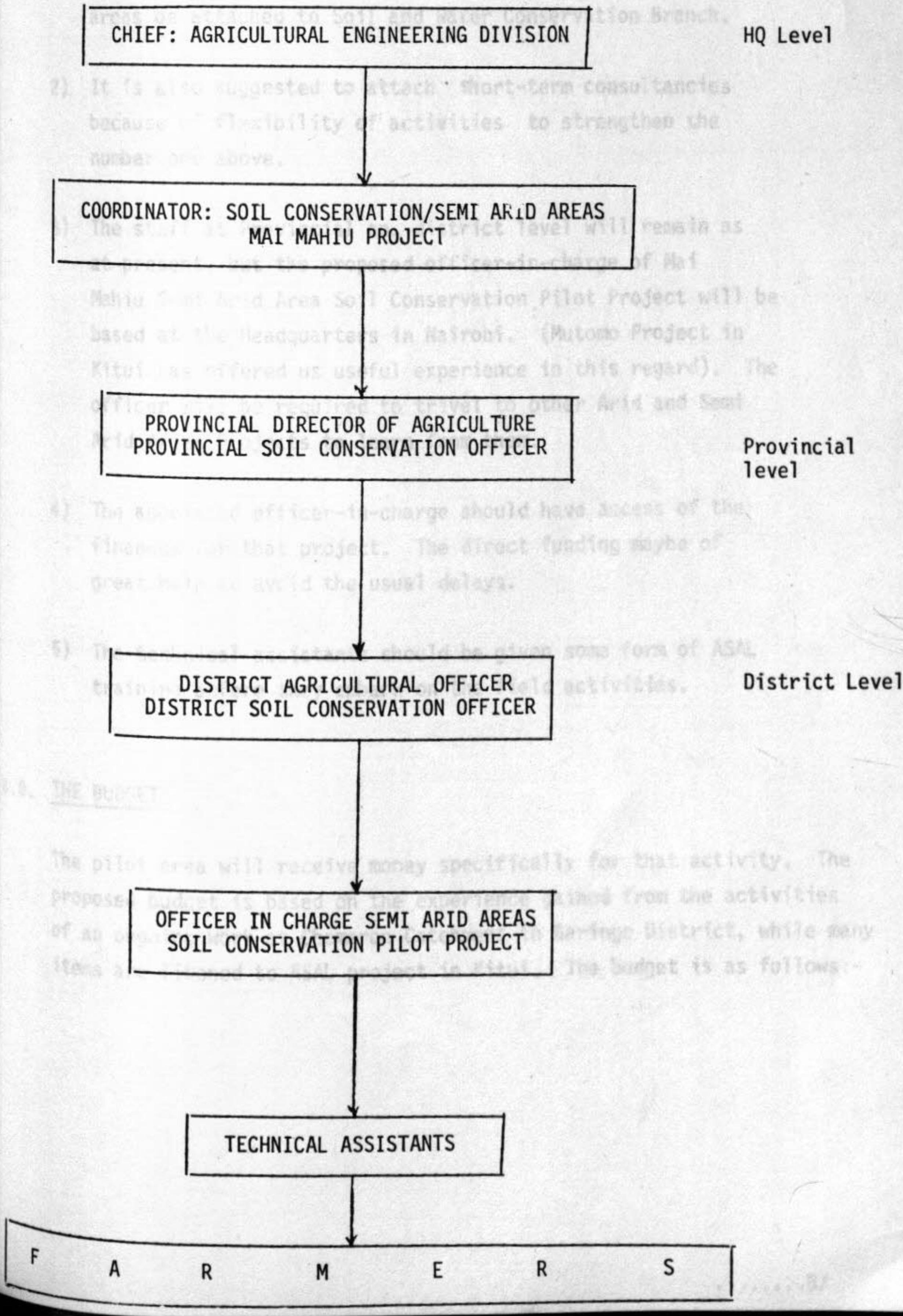
8.7. The Time Table

The area proposed for pilot project is characterized by low and erratic rainfall which is often sporadic and of high intensity. Sufficient thought must therefore be given to the timing of the proposed activities. This timing must try to cover the rainfall pattern as much as possible so that lessons of what should be done and what should be avoided could be learnt. In this regard it is proposed to link the activities with the findings of Dryland farming station at Katumani and also with the experiences gained at the ongoing E.M.I. and [illegible]tomo Soil Conservation Programmes. It is proposed that initial work begin during 1986/87 financial year. Specifically January 1987.

The time table will run as follows:-



HE ORGANISATIONAL STRUCTURE OF THE SOIL AND WATER CONSERVATION IN ARID SEMI AREA PILOT PROJECT



PROPOSED BUDGET FOR MAI MAHIU SEMI ARID AREA SOIL CONSERVATION PILOT PROJECT

Item	Name	Estimate 1986/87 K£	Estimate 1987/88 K£	Estimate 1988/89 K£	Estimate 1989/90 K£
100	Transport Operating Expenses	22,000	22,000	22,000	23,100
110	Travelling & Accommodation	3,000	3,000	3,000	3,150
153	Farm Inputs	2,000	2,000	2,000	2,100
154	Training	2,000	2,000	2,000	2,100
174	Purchase of Stationery	50	50	50	53
184	Consultancy fees	8,000	8,000	8,000	8,400
220	Plant and Equipment	15,000	15,000	15,000	15,750
	Additional Transport	30,000	-	-	-
403	Soil Conservation Works	25,000	25,000	25,000	
		107,050	77,050	77,050	52,552

ANNEXE I - TABLE OF PROPOSALS FOR SOIL CONSERVATION MEASURES IN MAI MAHIU SEMI ARID AREA
SOIL CONSERVATION PROJECT (Source:- Consultant Report and Project oposal ICRAF 1985)

FALLOW LAND: CURRENT SITUATION		SCENARIO AT NEXT STAGE	PROPOSED S.C. MEASURES	LEVEL OF INPUTS
SLIGHTLY OR MODERATELY DEGRADED	WITH EXISTING S.C. STRUCTURES AND FENCES	PROBABILITY FOR AGRICULTURE :HIGH	- Reinforcement and maintenance of physical structures, completed with biological measures - Reinforcement of fences - Treatment of major erosion features by physical and biological measures - S.C. Measures for short and long term production	HIGH
	WITH EXISTING S.C. STRUCTURES, NO FENCES		Same as above with fencing in addition	
	WITHOUT S.C. STRUCTURES AND FENCES	PROBABILITY FOR AGRICULTURE : MEDIUM	- Essential biological measures with simple physical measures as supplements - Reinforcement of fences - S.C. Measures for short and long term production	MEDIUM
	WITHOUT S.C. STRUCTURES, NO FENCES		Same as above with fencing in addition	
VERY MARGINAL AND/OR DEGRADED		PROBABILITY FOR AGRICULTURE : LOW	- Essentially fencing with strict control of acces - With limited enrichment with valuable trees and shrubs - S.C. measures mainly for protection, production as a secondary objective	LOW

3.9 Proposed Measures

Fallow Lands, Slightly to Moderately Degraded

This does not exclude the possible presence of very localised severe erosion features, such as gulleys, to be treated with complementary physical and biological measures. All works, even those not directly productive, are considered as a necessary investment to increase and sustain the overall productivity of the land.

With existing Soil Conservation Structures

The presence of old terraces, benches, cut-off drains and other structures has been noted at many sites. They should be rebuilt or consolidated (re-shaped or possibly redisigned into smaller structures) and vegetated. Such relict structures could also be complemented by vegetation strips (trees, shrubs, grasses) on contour lines and/or by scattered multipurpose trees and shrubs planted in microcatchments. Development of existing valuable trees or shrubs should be improved through water run-off harvesting methods. Woody perennials should include:

Leguminous sp. Many of these are suitable for soil restoration (N. Fixing capacity). In addition legumes are quite often excellent fodder species and produce good quality fuelwood:

Acacia Senegal. For fodder, fuelwood and "gum arabic; an excellent species to maintain soils and increase fertility

Acacia tortilis.

Acacia holosericea, linarioides and aneur. Exotic shrubs for fodder (especially the second) and soil conservation to be planted in lines or strips.

Prosois africana for fodder, fuelwood, small construction wood/craftwood, numerous medical uses; relatively quick growth.

.........2/

Prosopis juliflora exotic species, for fodder pods edible, excellent fuelwood, charcoal, fenceposts (high durability)

Cassia Siamea. To be planted only on deep and more humid soils. For fuelwood and soil stabilization

Leucaena Leucocephala. To be planted on well watered soils (or microcatchment areas). Drought resistant varieties to be selected for fodder, mulch, fuelwood and soil restoration.

Parkinsonia aculeata

Fruit trees

Citrus sp. usually very appreciated by local population

Zizyphus mauritiana

Balanites aegyptiaca. Fruit is eaten (like dates) seed provides a good quality oil. Provides hard wood for crafts (tool handles and kitchen implements).

Other species

Terminalia Brownii: Indigenous species, growth relatively quick, maily for timber, charcoal, and dry season/drought fodder, often left in croplands.

Croton megalocarpus. Indigeneous species, quick growth, mainly for fuelwood, to be planted on the most humid sites.

Azadirachta indica. Exotic species ("neem") for fuelwood and building materials. Very good growth on poor/degraded soils, strong rooting system. Quite efficient in soil conservation (humidity kept, p^H increased) many medicinal uses. Pesticidal properties (azadirachtine from seeds), also good for shade.

- Existing live fences (generally built with larger cuttings of Commiphora sp.) should be reinforced, doubled if necessary and completed by various multipurpose trees and shrubs. Unfenced fallows should be enclosed with live

fences following the traditional plantation technique of commiphora. (well known locally) combined with other multipurpose species.

Other species for fencing should include:

Zizyphus mauritiana (coppiced or pollarded)
Acacia mellifera (also a good fodder species)
Balanites aegyptiaca(coppiced or pollarded)
Erythrina abyssinica(easily propagated by cuttings)
Euphorbia Tirucalli

Grasses can also be planted or sown in lines or strips to fix furrows, benches, or terraces. The following species are suggested.

Bana grass (P. purpureum X P. typhoides)
Cynodon Dactylon (colonizing, stoloniferous grass)
Cenchrus ciliaris (quite common in the region)
Eragrostis superba high quality forage; scratching methods for reseeding can be used.

Without Existing Soil Conservation Structures

In the fallows without existing S.C. structures, most of S.C. Measures should consist of vegetation planted in contour lines (strips or lines of trees, shrubs, and grasses) with multipurpose trees and shrubs planted in microcatchments in the areas between strips.

On the steeper slopes, cut-off drains and other structures should be built to store or slow down run-off. These should be reinforced with vegetation strips.

Development of existing valuable trees and shrubs should be augumented by water run-off harvesting methods in addition to the planting of multipurpose trees and shrubs in microcatchments.

Fallows should be fenced with live fences on the model of existing traditional Commiphora fences and mixed or reinforced with other multipurpose trees and shrubs suitable for fencing.

Candidates species within the fallow or for fencing are the same species as those already listed in the previous section. However, in this case more emphasis is accorded to leguminous trees (for soil restoration) and shrubs which provide better cover for the soil surface.

Very Marginal and/or severely degraded fallows

On this type of fallow land (larger gulleys, sheet erosion on most areas, soil compacted or often completely denuded, vegetation cover very poor in quality and quantity.....) management should be carried out with low level input, consisting essentially of:

- Fencing the areas with woody perennials that give quick, positive results. These include: Commiphora sp. Euphorbia Tirucalli, and Erythrina abyssinica, all of which can be propagated by large cuttings. Once fenced, these areas warrant essentially biological measures: isolated (dispersed) trees and shrubs planted in microcatchments or in clumps of mixed species on very localised features (i.e. depressions with deeper soils)

- Species planted at these sites should be very hearty, (tolerate drought and poor soil conditions). Those suggested are: Acacia Senegal, Prosopis africana, Prosopis juliflora, Acacia holosericea, Acacia Linariodes, Zizyphus mauritiana, Balanites aegyptiaca and Azadirachta indica.

Particular attention should be given to existing woody cover. For example species of the Capparaceae family (such as Boscia angustifolia, Cadaba farinosa, Maerua and Capparis sp.), provide very valuable fodder. Their development and productivity can be further enhanced by water harvesting methods. All methods applied should aim to establish a dense vegetation cover as quickly as possible, with a low level of inputs (i.e. dense plantations of cuttings of Commiphora sp., Erythrina abyssinica and Euphorbiaceae).

........5/

10. Training

The proposed training program for the project area presupposes a combined effort between normal ministry and district activities and project-specific activities (with funding costs also shared). The training activities will apply to three distinct groups: project staff and their colleagues at the location division and district levels; residents of the division (farm families, self help groups, school children and teachers); and project and district level staff working in similar environments and farming systems in other parts of Kenya.

Training will combine formal and informal approaches including:

- 1 day orientation courses for farmers and for district and local staff (2 separate courses in each district, 1 in district HQ, 1 at sub-location center).

- intensive on-the-job field training in technical and organizational skills for project staff and immediate supervisors (3 weeks at project start-up including reconnaissance of enviroments in project areas, dialogue with farmers and community groups, site choice for trials, planning of first trials, work plan for project: followed by 1 week sessions at 6-month intervals).

- annual planning/training workshops (3 days) for all soil and range officers and assistants in Nakuru district will combine training in specific conservation, production and management techniques with participants' evaluation and suggestions for project improvement.

- in final year, workshops for selected residents in project areas will provide field exercises and specific training in conservation, as well as discussion of techniques, planning.

- in second and third years quarterly field days for farmers will provide a discussion forum, as well as demonstrating specific techniques to farmers from the two sublocations; these will aim at a large fairly diverse group and may involve transportation to sites outside the project area.

- one seminar (1 week) for project and district staff from several districts will use the project areas as a discussion - example of specific technologies in zone 5 as well as research and extension methods and project management approaches for small projects (year 2 or 3).

- educational and promotional literature for general distribution will inform project area residents and agricultural staff of the problems addressed by the proect, the proposed solutions and searches-for-solutions, and the project plan of action (booklets, leaflets, posters cassette tapes in Gikuyu and Kiswahili).

- specific training materials for farmers, self-help groups, schools and agricultural staff will describe how to apply new land use systems, farm planning methods and technologies to develop productive, stable grazing lands in association with croplands and bush lands (small handbooks and cassette tapes in Gikuyu and Kiswahili.

8.11. Equipment

To carry out the project, the following basic equipment should be provided.

Nursery: The proposed project is based on use of vegetation to fight soil erosion. This requires a substantial stock of plant and material (trees, shrubs and grasses), with all the necessary equipment to manage a nursery viz. :germplasm, seeds store (fridge), irrigation material (pump, pipes, water tank......), soil blocks machine, agrochemicals, containers and other minor equipment, including tools, for a potential production of 1 million seedlings per year.

The nursery site should be selected depending on the availability of water resources and access roads. For seed supply, one would address priority projects or programmes in ASAL of Kenya.

Seed Orchard, Multipurpose Plant Collection

Near the nursery, a seed orchard should be set up, planted with promising multipurpose woody species to provide germplasm to the project area at a first stage, and possibly to all the ASAL areas of Kenya, later on. The same operation should be done with grasses and woody perenials to be multiplied through vegetative propagation (cutting orchard) on different plots. Finally a demonstration/collection plot of multkpurpose trees and shrubs should be established in a setting where tree management could be demonstrated. Orchards and demonstration plots should be established progressively (in addition to the nursery) on a area of 10 ha which necessitate: extra minor equipment/tools; material for fencing the plots and for individual tree seedling protection; and complementary watering/irrigation equipment, such as taps.

Vehicles

For the transportation of all material - especially of seedlings and tools to the field - a 4 wheel drive pickup, suzuki types should be provided by the project. For staff travel (extension agents) 6 motorcycles (50 cc) Cars and motorcycles are purchased duty free. It is recommended to choose types and brands available in Kenya to avoid long delays in delivery.

Tools

The project should give tools (pickaxes, forks, spades, bars.....) to the farmers engaged in soil conservation works (one to two thousand tools per year).

Material for fencing

Government farms and nursery/orchards plots should be fenced with barbed wire (with eventual addition of live fences as demonstration of planting and management techniques).

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Vehicles

For the transportation of all material - especially of seedlings and tools to the field - a 4 wheel drive pickup, sturdy types should be provided by the project. For staff travel (extension agents) 6 motorcycles (50 cc). Cars and motorcycles are purchased duty free. It is recommended to choose types and brands available in Kenya to avoid long delays in delivery.

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Buildings

On the nursery site, simple buildings including one office, one toilet and a store room should be set up and equipped (furniture, water and electricity conveniences).

Inputs for Training

- 5 work-months/year (x 3) (HQ staff and/or consultants)

- lodging, meals, meeting place and transport for participants in national seminars (2)

- lodging meals, meeting place and local transport for district level workshops (3)

- transport for HQ staff or consultants (field training visits)

- transport and meals and meeting place for 30 residents for annual workshops

- time and production inputs for preparation, reproduction, distribution of promotional, educational and training materials (including tapes and cassette players as well as books).

Calendar of events

To assure the full success of the proposed activities it is necessary that timing be given careful attention.

The field operations depend on:

the availability of plants in the nurseries;
the availability of trained personnel and technical data;
the availability of equipment

9. MONITORING & EVALUATION

9.1. Aim

In order to come up with a fully addressed monitoring and evaluation mechanism, there should be a methodology whose aim is to provide qualitative and quantitative information. This information (data) will aid district planners to target their efforts in soil conservation towards the most needed areas in line with the soil conservation objectives and policies of the Ministry or Agriculture and Livestock Development.

9.2. Objective

- To provide systematic, reliable and valid information from technical and socio-economic studies which can be translated into appropriate conservation strategies.

9.3. Components

In order to realize the above objectives the monitoring and evaluation section will emphasize the following strategies.

Reports

For a programme dealing with soil and water conservation, it is not sufficient to have a monitoring system which is confined merely to achievement and constraints in technical and budgetary terms. The system needed is one based on firm understanding of the problems which the programme intends to solve; these include socio-economic issues.

As such, the current reporting formats for annual and semi-annual reports will be modified in such a way that

scope is given to comments and ideas about local constrains and options. This will be from the Sub-locations right up to District level, these reports would be subjected to quantitative and qualitative analysis before they are forwarded to the MOALD (SWCB). Field follow-ups by the DAOs, PDAs to check on actual work done against the reports shall be an important aspect in this regard.
In line with this; appendix 1 (Page) show an annual schedule of activities of the SWCB staff. This schedule shows clearly that reports from the District form the baseline as regards scheduling of the other activities like budgeting, work programmes, consultations etc. hence their importance.

Besides that semi-annual reports should be submitted to SIDA by 31st of March and 30th of September each year according to the specific agreement between Sweden and Kenya. By 31st March, an annual plan of operation for the following financial year shall be submitted to SIDA for approval.

2 Field follow-ups

The SWCB staff shall continue its periodic sampling mission to satisfy themselves on the overall implementation of soil conservation works.
This will include:

a. Monitoring and quantifying the relative effectiveness of various conservation practices, land uses and cover conditions in preventing and minimizing soil erosion.
b. Utilization of funds.
c. Discussions on the overall impact of the programmes.

The information gathered from those visits (b) will later be used during the Budget and Planning for subsequent financial years.

3. Specific studies

These will include drawing out detailed soil conservation profiles, as well as technical and socio-economic studies. However, it will not be possible to carry-out these studies in all the districts.

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Specific studies

These will include drawing out detailed soil conservation profiles, as well as technical and socio-economic studies. However, it will not be possible to carry out these studies in all the districts.

Few selected districts will be covered and the work will be carried out by either the SWCB staff with the assistance of field staff or through the consultancy channel. Part of consultancy fund should be set aside to cover mainly the socio-economic studies.

Specific studies are as follows

Soil conservation profiles: The aim of profile studies is to get a more comprehensive picture of the present state of soil erosion or the resource available for conservation work. This will be done through interviewing the TAs in their areas of operation. This will be conducted by the SWCB staff, PSCO and DSCO.

Socio-economic case studies: To be done by interviewing the farmers. Such studies are to be carried out on consultancy basis.

Technical evaluation: To be done by making field observation on a sample of farms. Such a study requires about 4-6 weeks per district and will be carried out by the SWCB staff.

Economic evaluation: Measurement of yields. This study is a continuation of the work done by Mr.Fiquiredo and Mr. Holmberg. It is suggested that the study should include at least 2 seasons and in the same area as one of the previous studies. This study could be done as a consultancy work.

Pilot Project in Semi-arid Area

A pre-study should be done (1986/87) and one area chosen where some different approaches could be introduced. This work needs one officer at the Headquarters who would work on it on full time basis.

Summary of the studies

Activity	1986/87	1987/88	1988/89
	No. of districts to be covered		
a. Soil conservation profiles (interviews with extension staff)	3	6	6
b. Socio-economic studies (interviews with farmers)	2	2	2

c. Technical evaluation field observations on the farms	2	2	2
d. Economic evaluation measurement of yields	2 →		
c. Pilot project in semi arid areas	1	3	-
f. Field follow-ups (by SWCB staff)	20	20	20

There will be short courses for the SCOs on how to do these studies (profiles, socio-economic and technical studies). It is, however anticipated that all studies could not be done by the personnel within the branch and districts, it is therefore estimated for consultancies as stated earlier.

Estimated Costs ('000 K£)	1986/87	1987/88	1988/89
Transport	10	10	10
Travelling & Accommodation	15	15	17
Travelling	1	1	1
Stationeries	1	1	1
Consultancies	40	45	45
Purchase of Equipment	10	1	1

ADDITIONAL TRANSPORT

The reports from Districts and regular follow up visits by the Headquarters staff indicate that transport problems have been cited to be the main cause of Soil Conservation implementation failure in the Districts.

The SIDA Review Mission of 1985 witnessed these problems too and the Mission recommended that the transport level be strengthened especially for supervision and training purposes. It is quite clear that there are too many officers at District or Divisional level sharing very few vehicles. A total of 1,400 senior staff are sharing 238 vehicles giving a ration of 6 officers to 1 vehicle-see appendix 2 for details.

Proposals.

During the three year programme the following is the target on transport procurement.

	86/87		87/88		88/89	
	NO.	K£(000)	NO.	K£(000)	No.	K£ (000)
New Land Rovers	15	150	15	150	10	100
New Minibuses	2	25	2	25	2	25
New motorbikes	60	60	80	80	60	60
TOTAL		235		255		285

This will strengthen the soil conservation officers with one new land rover per district and motorbikes in the divisions. The transport will be used by district and divisional soil conservation officers.

For more details see appendix 2.

11. PROCUREMENT OF HANDTOOLS AND EQUIPMENT

The purchase of handtools and equipment for soil conservation works shall continue to be performed by the Headquarters. But one or two districts can be authorised to purchase specific tools locally. The tools should, however, be bought where they are cheapest. If the tools are locally made and are of the same quality as imported ones, then a higher price of up to 20% can be accepted.

A policy of the distribution of tools procured centrally by the SWCB should be formulated to ensure that the tools reach the soil conservation target groups and project sites.

For details see appendix. 3

Additional equipment

For the running of the activities in different sections within the soil and water conservation project at HQs and district level it will be necessary to purchase additional equipment. The cost estimates are.-

Year	1986/87	1987/88	1988/89
Costs for purchase of Equipment (K£000)	115	116	118

This includes projectors, maps, wordprocessor, tools and watering cans etc.

12. STAFFING - GOK CONTRIBUTION (KENYAN SUPPORT INCLUDING COSTS)

	Level of Education	No.	Earning K£.(000)
Ministry SWCB	various (JG.L&M)	7	25.2 x10% = 25.2
Province PSCO	various (L&M)	7	25.2 x*95% = 23.9
District DSCO	various (K&L)	41	123 x*95% = 116.9
Division DSCO	Diploma (JG'G'	200	360 x*30% = 108.0
Location	Certificate (J.G.'F'	(1000)	960 x*35% = 336
Sublocation	no. professional Education J.G. 'E'	(2500)	1500 x*35% = 525.0
Total Contribution per annum			1,135

* According to the 1985 review mission, it was found that the extension staff concerned with soil conservation do not spend all their time on soil conservation matters. A rough estimate on time percentage allocated to soil conservation work is as follows:

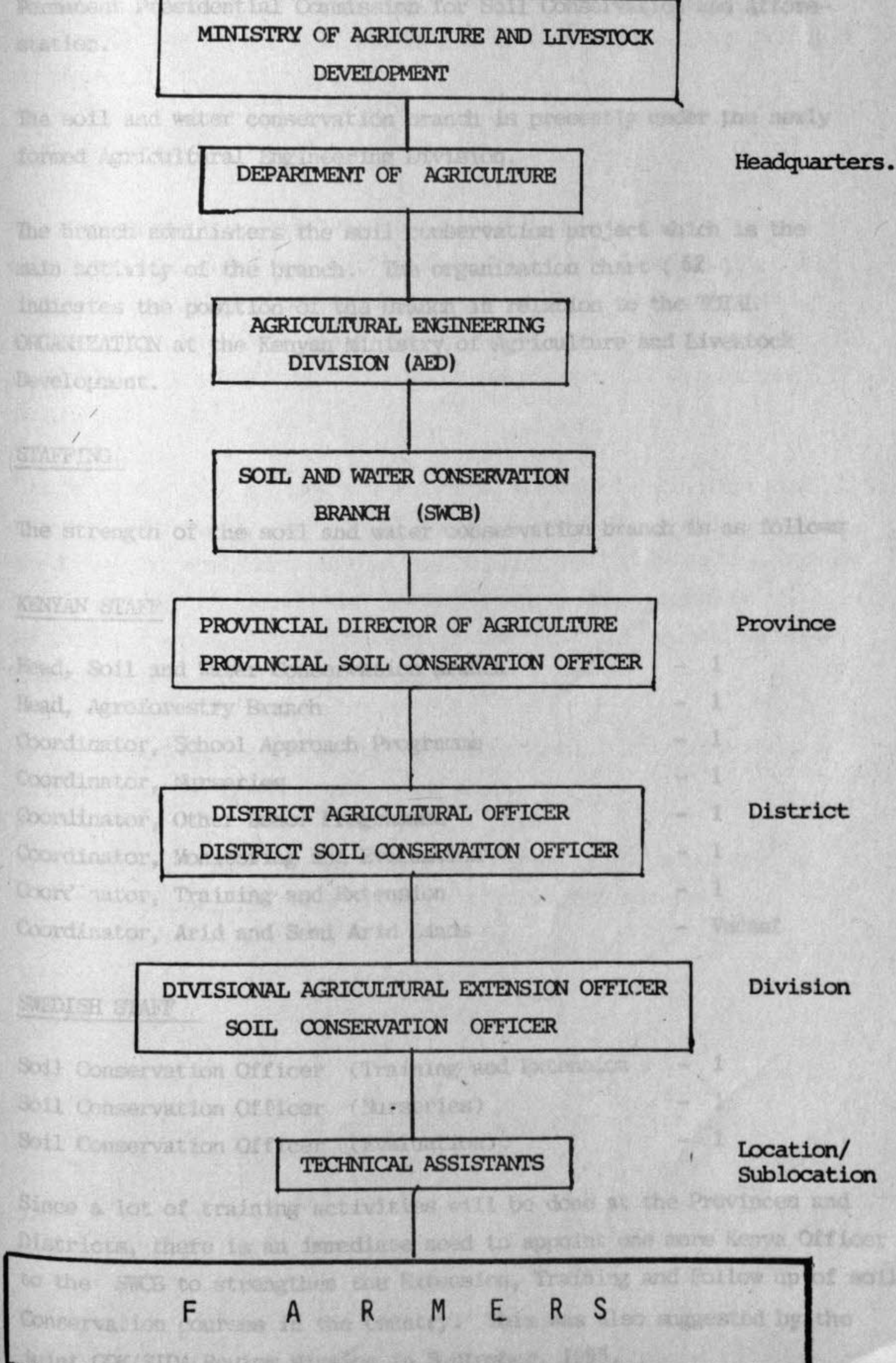
Ministry HQs.	-	100%
Province	-	95%
District	-	95%
Division	-	30%
Locationa	-	35%
S.Locations	-	35%

The salary scales are based on the current 1986 scales.

Summary:

No. of staff - 3,755
Expenditure - K£.1,135,000

13. ORGANIZATION, STAFFING AND ADMINISTRATION



13. ORGANIZATION, STAFFING AND ADMINISTRATION

	MINISTRY OF AGRICULTURE AND LIVESTOCK DEVELOPMENT
Headquarters.	DEPARTMENT OF AGRICULTURE
	AGRICULTURAL ENGINEERING DIVISION (AED)
	SOIL AND WATER CONSERVATION BRANCH (SWCB)
Province	PROVINCIAL DIRECTOR OF AGRICULTURE PROVINCIAL SOIL CONSERVATION OFFICER
District	DISTRICT AGRICULTURAL OFFICER DISTRICT SOIL CONSERVATION OFFICER
Division	DIVISIONAL AGRICULTURAL EXTENSION OFFICER SOIL CONSERVATION OFFICER
Location/ Sublocation	TECHNICAL ASSISTANTS
	F A R M E R S

3.1 ORGANIZATION

The soil and water conservation programmes receive ~~total~~ support from the government of Kenya. The campaigns on soil and water conservation are fully supported by the Office of the President, through the Permanent Presidential Commission for Soil Conservation and Afforestation.

The soil and water conservation branch is presently under the newly formed Agricultural Engineering Division.

The branch administers the soil conservation project which is the main activity of the branch. The organization chart (52) indicates the position of the Branch in relation to the TOTAL ORGANIZATION at the Kenyan Ministry of Agriculture and Livestock Development.

3.2 STAFFING

The strength of the soil and water conservation branch is as follows

KENYAN STAFF

Head, Soil and Water Conservation Branch	- 1
Head, Agroforestry Branch	- 1
Coordinator, School Approach Programme	- 1
Coordinator, Nurseries	- 1
Coordinator, Other Donor Programmes	- 1
Coordinator, Monitoring and Evaluation	- 1
Coordinator, Training and Extension	- 1
Coordinator, Arid and Semi Arid Lands	- Vacant

SWEDISH STAFF

Soil Conservation Officer	(Training and Extension	- 1
Soil Conservation Officer	(Nurseries)	- 1
Soil Conservation Officer	(Evaluation)	- 1

Since a lot of training activities will be done at the Provinces and Districts, there is an immediate need to appoint one more Kenya Officer to the SWCB to strengthen the Extension, Training and Follow up of soil Conservation courses in the country. This was also suggested by the joint GOK/SIDA Review Mission in September, 1985.

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In order to spear-head the development of resource conservation in Arid and Semi-arid areas in Kenya, a full time Kenyan Officer should be posted to the SWCB within the year 1986/87. See also the recommendations of the Arid and Semi Arid land Pilot Project proposed on the same.

13.3 Administration

The present project administration is based largely on the current Government Policy of the District Focus for Rural Development. This requires that all the development resources of finance, personnel and transport including plant and equipment shall be made readily available at the District Level for accelerated rural development programmes.

The funds for this project are issued to the District in line with the approved work plans. The DAO is the AIE holder and is assisted in the financial administration by the District Soil Conservation Officer who should scrutinise all the project payment vouchers and if satisfied, recommend their payment to the DAO. The payment is then processed by the District Accountant.

At the Divisional level the DAO allocates funds to the DAEO and SCO according to the agreed annual work plans.

The LEO and the TAs/JTAs implement soil conservation works against the funds allocated to each location/sub location per year.

11. BUDGET . ESTIMATES IN K£. (000)

ITEM	TITLE	ESTIMATES 1986/87	1987/88	1988/89
001	Aid staff	120	120	120
100	Transport	247	256	269
110	Travelling & Accom.	265	325	364
154	Training	272	335	372
174	Stationaries & Printing	121	167	179
184	Consultancies	80	84	53
190	Miscelleneous	22	22	22
210	Purchase of Additional vehicles.	205	175	125
212	Purchase of motorbikes	60	80	60
220	Purchase of tools & equipment	304	334	373
403	on farm activities	535	625	745
	TOTAL	2,231	2,523	2,682

ESTIMATES IN K£ (000) 1986/87

	100	110	154	174	184	190	212 210	220	403	Total
TRAINING *	45	177	162	93	25	5	-.	71	-	578
EXTENSION	160	60	1	2	-	5	235	173	510	1,146
NURSERIES	10	10	6	25	7	5	-	35	-	98
SEMI-ARID AREAS	22	3	2	1	8	2	30	15	25	107
MONITORING & EVALUATION	10	15	1	1	40	5	-	10	-	82
TOTAL	247	265	172	121	80	22	265	304	535	2,011

*Not including the 100,000 K£. for external training and courses.

ESTIMATES IN K£ (000)   1987/88

	100	110	154	174	184	190	212 210	220	403	
TRAINING*	44	237	222	134	25	5	-	71	-	738
EXTENSION	170	60	1	2	-	5	255	198	600	1,291
NURSERIES	10	10	9	30	6	5	5	49		119
SEMI-ARID AREAS	22	3	2	-	8	2	-	15	25	77
MONITORING & EVALUATION	10	15	1	1	45	5	-	1	-	78
TOTAL	256	325	235	167	84	22	255	334	625	2,303

*Not including the 100,000 K£. for external training and courses.

ESTIMATES IN KE. (000) 1988/89

	100	110	154	174	134	190	212 210	220	403	TOTAL
TRAINING *	47	274	259	146	-	5	-	74	-	805
EXTENSION	180	60	1	2	-	5	185	240	720	1,393
NURSERIES	10	10	9	30	-	5		43		107
SEMI-ARID AREAS	22	3	2	-	8	2	-	15	25	77
MONITORING & EVALUATION	10	17	1	1	45	5	-	1	-	80
TOTAL	269	364	272	179	53	22	185	373	745	2,462

*Not including the 100,000 K£. for external training and courses.

APPENDIX 1A CALENDAR OF SOIL CONSERVATION ACTIVITIES (HIGH RAINFALL AREAS)

	MONTHS											
ctivities	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
. Farm visits for on farm advice on soil conservation.												
. Layout and construction of cutoff drains artificial waterways and terraces.												
. Planting on cutoff drains and terrace Embankments.												
. Maintenance of Soil Conservation structures												

APPENDIX 1B CALENDAR OF SOIL CONSERVATION ACTIVITIES (MEDIUM RAINFALL AREAS)

	MONTHS											
Activities	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
1. Farm visits for on farm advice on Soil Conservation.												
2. Layout and construction of cutoff drains, artificial water ways and terraces.												
3. Planting grass on cutoff drains and terrace Embankments.												
4. Maintenance of Soil Conservation structures.												

CALENDAR OF SOIL CONSERVATION ACTIVITIES (LOW RAINFALL AREAS)

	MONTHS											
ACTIVITIES	January	February	March	April	May	June	July	August	September	October	November	December
1. Farm visits for on farm advices on soil conservation.												
2. Layout and construction of cutoff drains artificial waterways and terraces												
3. Planting on cut-off drains and terrace embarkments.												
4. Maintenance of Soil Conservation structures.												
5. Rehabilitation of eroded lands												

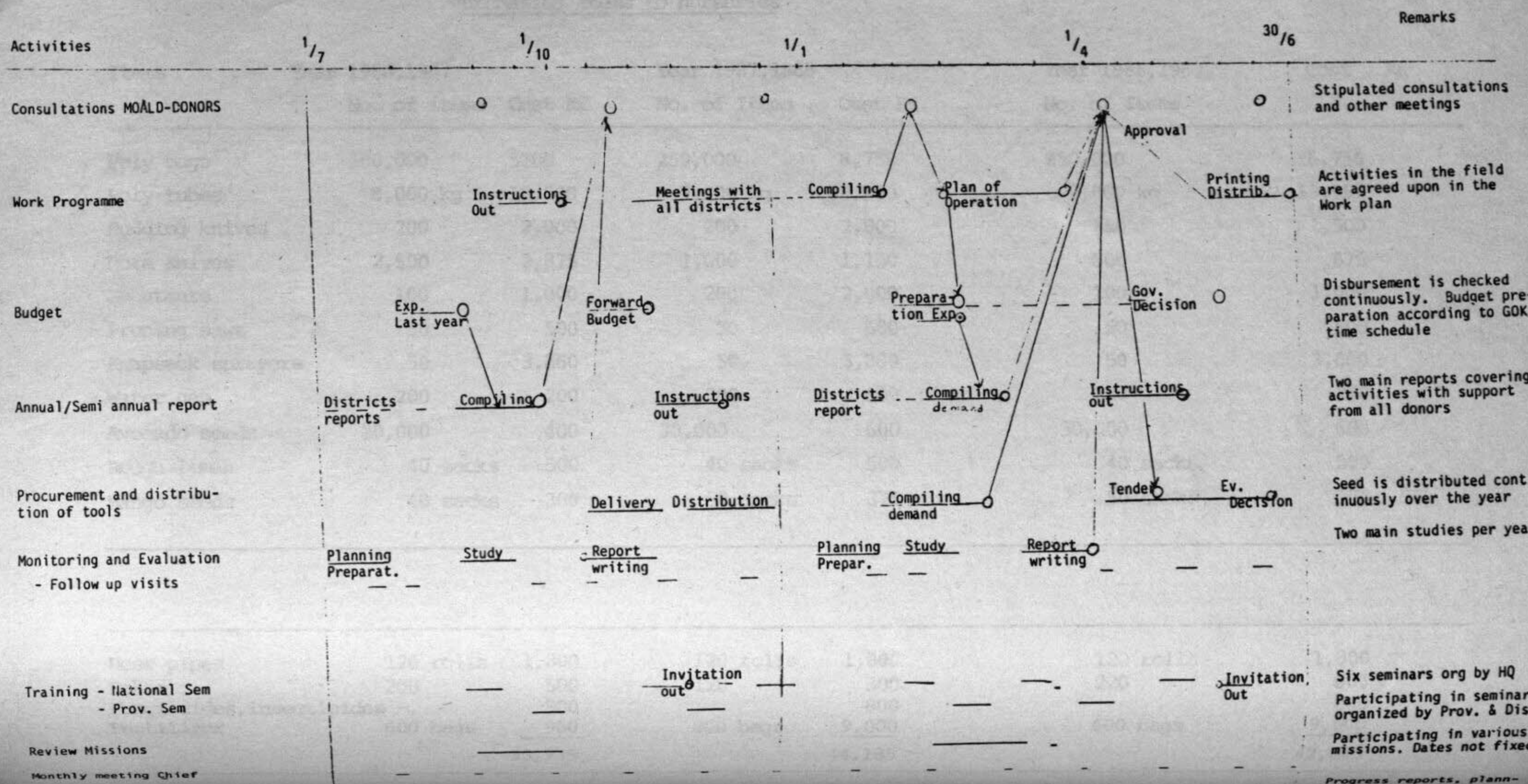
Appendix 2 Cost and duration for soil conservation in service training

Name of course	Year	86/87	87/88	88/89
1. Soil Conservation trai:ers	No. to train	20	20	20
	Duration (days)	10	10	10
	Costs (K£.)	3000	3300	3500
2. National seminars	No. to train	180	150	120
	Duration (days)	10	10	10
	Costs (K£.)	27000	24750	21000
3. Courses for Govt. officers	No. to train	360	400	500
	Duration (days)	3	3	3
	Costs (K£.)	16450	19800	26250
4. Provincial Seminars	No. to train	-	200	200
	Duration (days)	-	10	10
	Cost (K£.)	-	33000	35000
5. Leaders	No. to train	-	500	500
	Duration (days)	-	3	3
	Costs (K£.)	-	24750	26250
6. TAs/JTAs	No. to train	1025	600	600
	Duration (days)	13	13	13
	Costs (K£.)	39975	25350	27300
7. TAs/JTAs Retraining	No. to train	1922	1000	1000
	Duration (days)	5	5	5
	Costs (K£.)	28830	16250	17500
8. Chiefs/Asst Chiefs	No to train	1425	800	800
	Duration (days)	3	3	3
	Costs (K£.)	12825	7800	8400
9. Teachers	No. to train	4698	3000	3000
	Duration (days)	1	3	3
	Costs (K£.)	14094	29250	31500

of course	Year	86/87	87/88	88/89
4K Club/Young farmers club members	No. to train	-	500	500
	Duration (days)	-	2	2
	Costs (K£.)	-	300	3500
Farmers/group leaders	No. to train	-	1000	1000
	Duration(days)	-	3	3
	Costs (K£.)	-	9750	10500
Farmers field day	No. to train	38780	50000	60000
	Duration	1	1	1
	Costs (K£.)	19390	25000	48000
Total	No. to train	48,680	58,170	68,240
	Total No. of training days including farmers farmers	73,768	80,600	90,600
	Total No. of training days excluding farmers	34,988	30,600	30,600
	Costs K£	161,564	222,000	258,700

Appendix 1 4

ANNUAL ACTIVITIES



APPENDIX 5

Purchasing items to nurseries

Items	Year 1986,1987		Year 1987,1988		Year 1988,1989	Cost K£
	No. of items	Cost K£	No. of Items	Cost K£.	No. of Items	
Poly bags	200,000	5200	250,000	6,750	250,000	6,750
Poly tubes	8,000 kg	12,500	9,000 kg	13,950	9,000 kg	13,950
Budding knives	200	2,000	200	2,000	150	1,500
Mora Knives	2,500	2,875	1,000	1,150	500	675
Secateurs	100	1,000	200	2,000	100	1,000
Pruning saws	50	500	50	500	50	500
Knapsack sprayers	50	3,860	50	3,860	50	3,860
Water can	200	200	200	600	200	250
Avocado seeds	20,000	400	30,000	600	30,000	600
Rough leman	40 sacks	500	40 sacks	500	40 sacks	500
Mango seeds	40 sacks	300	50 sacks	375	50 sacks	375
Hose pipes	120 rolls	1,800	120 rolls	1,800	120 rolls	1,800
Rakes	200	500	120	300	220	605
Fungi cides, insecticides	-	800		800		800
Fertilizer	600 bags	900	600 bags	9,000	600 bags	9,000
		33,735		44,185		42,665