

**SECOND FOLLOW-UP WORKSHOP**

**HELD AT**

**EMBU (*EMCO HOUSE*)**

**15th to 17th June 1994**

**BY**

**KENYA/JAPAN SOCIAL FORESTRY TRAINING PROJECT**  
**KITUI.**



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## **BACKGROUND**

The First phase ended in November, 1992 of the Kenya/Japan Social Forestry Training Project after seven years of implementations. The programme has two major categories of implementation. One is at Muguga where the higher Extension officers are trained and at Kitui lower level or grassroots Social Forestry Training is undertaken.

In the first phase a total of 870 participants went through Kitui Centre and as a matter of course improvement to the material of offered during the phase I, follow-up workshops were decided on with aims of bringing together ex-participants from each District at a point for three to four days. The first of a such Follow-up was in Machakos District and the next was scheduled for Meru, Tharaka-Nithi and Embu Districts. But due to the number of participants involved, Meru districts was left out.

The Workshop was then organized and took place in Embu EMCO building board's room.

The participants invited were drawn from courses 20th to 38th who have at least stayed a year practicing what was learnt during the first phase.

The workshops are very important in shaping subsequent training in phase II.

WORKSHOP OBJECTIVES(S) & AIM(S)

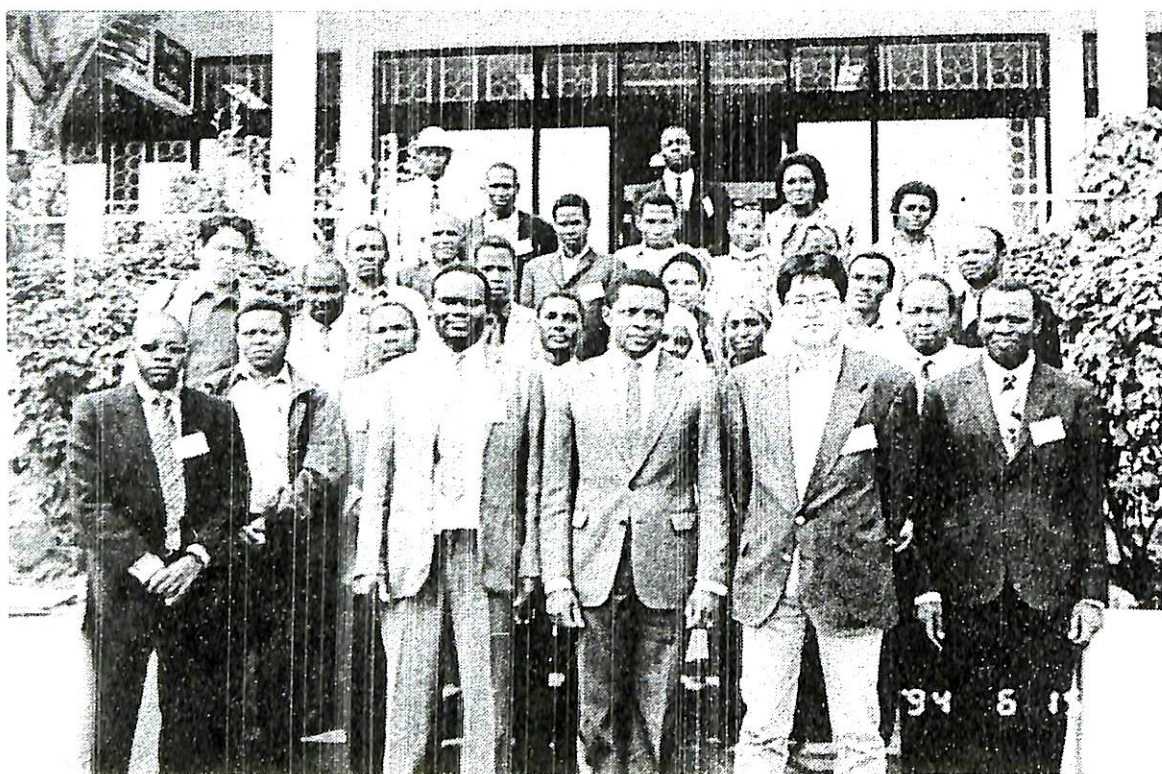
Objectives

1. To provide a forum for the Kitui Regional Training Centre trained farmers from (Embu, and Tharaka Nithi Districts) between February 1991 and February, 1992, so as to be able to share experiences and formulate recommendations on new farming practices so far attempted by them as a result of their training.
2. To enhance their motivation towards adoption of the onfarm agroforestry practices.

Aims

1. To evaluate the impact of the training on the farmers.
2. Discover & assess the major constrains in the adoption and practicing of some of the introduced techniques.
3. Discover any other new techniques formulated by individual farmers with a purpose of testing them and incorporating them in our future training scheme.
4. Evaluate the overall attitudes of the farmers towards the various techniques introduced to them during training.





Group photo after official opening of the workshop  
at Embu in front of EMCO house

**WELCOMING SPEECH FOR THE OPENING OF FOLLOW-UP WORKSHOP  
EMBU 15TH 17TH JUNE 1994 BY JOSHUA K. CHEBOIWO PROJECT MANAGER**

The D.C. Embu District  
(PF) - Eastern Province  
Head of Departments  
Our guest farmers  
Ladies and Gentlemen

Kenya/Japan Social Forestry Training Project is deeply grateful for your presence today in the opening of our Second Follow-up Workshop to be organised by the Kitui Regional Social Forestry Training Project.

The Project is jointly implemented by Kenya Forestry Research Institute (KEFRI) and Japan International Cooperation Agency (JICA). The Project is based in Kitui and is by policy to serve the semi-arid areas of Eastern Province in areas related to trees and environmental conservation in order to enhance sustainable socio-economic development in the region. The project conducts tailor made training courses in terms of literacy and education for a number of grassroot level target groups namely: Primary school teachers, farmers, women farmers, field technical assistants, community leaders and nursery foremen. By May, 1994 the Project had conducted upto 56 courses involving over 1,200 trainees from 6 Districts of Eastern Province: Kitui, Machakos, Makueni, Tharaka-Nithi, Embau and Meru.

Our training courses provide available agroforestry and environmental related ideas and innovations to the front line extension facilitators and farmers in order to improve their capacity to cope with changing land use challenges. The Guest of Honour Sir, training is a very expensive exercise and in order to monitor the impact surveys and hold follow-up Workshops. The event we are witnessing today is a get together between our former trainees and our training officer. This kind of gathering offer opportunities for our officers learn to interact with the farmers and learn from them how our training courses have been useful in their daily farm management duties. The farmers will be exposed to more technical latest advances in agroforestry in the ASAL.



## 2nd Follow-up Workshop Proceedings

This has been a summary of the activities which our training programme carry out in the region and what this important meeting of us is all about. With those few remarks I welcome the Guest of Honour the D.C Embu to offer us some word of advice and officially open the follow-up Workshop. Mr. Muli Malombe you are welcome to address the participants and guests.

**Thank you.**

**OPENING SPEECH BY DISTRICT COMMISSIONER/EMBU  
FOR AGROFORESTRY FARMERS:**

I take this opportunity to extend my thanks to the Organizers of this Workshop (KEFRI/JICA).

I am informed that most of you went through training at Kitui between 1991 and 1992.

The importance of this Workshop to our Government in collaboration with the Government of Japan is that it aims at encouraging the public into a farming practice that involves the planting of trees, Agricultural crops, and Livestock keeping simultaneously on the same piece of land.

Most of us have had to plant various Agricultural crops purposely for earning revenue from their sales or merely for domestic consumption. It must be understood that since Independence, the population that is to depend on the limited available land resource has swollen up. This has resulted in the Government excising some of its land (e.g. Forestry reserves, National reserves) to the public for settlement and farming.

This pressure has also driven the Government into programmes of educating the public on the importance and benefits of practicing mixed farming. Therefore I am once again extending my gratitude to the Government of Japan for the active participation in terms of its continued financial, and technical assistance.

Hence, the importance of this Workshop is not only teaching, but also to evaluate how much you gained from your previous trainings, how much you have practiced so far and the problems that you have encountered. So that future trainees can be able to benefit more. Education has a beginning but has no end therefore it is your duty to extend the knowledge you gained at Kitui plus that you will gain in this workshop to your fellow farmers without delay.



TO INCREASE AGRICULTURAL BY PRACTICING  
SOIL CONSERVATION TECHNIQUES:

Most of us have adopted the practices of Agricultural crop and Livestock farming but the number of people who have adopted or are practicing tree planting on their farms still remains small. It is not a must that you have a large farm so as to practice tree planting. Trees can be interplanted with your other crops or along your farm boundary. When the trees mature, they can be utilized for timber or firewood depending on the type of trees you planted. However, the most important role of trees is that " They highly assist in stopping soil erosion and also replenish the soil with minerals".

Therefore if all of us practice tree planting on our individual farms, we will be combating soil erosion collectively.

The Government is encouraging *Agroforestry* type of farming that is why the Ministry of Agriculture including other Ministries are seriously involved in preaching it.

It is my hope that when you leave here at the end of this workshop, you will be like Agroforestry teachers. You have been educated so as to educate others.

Therefore, I am thanking you for your commitment and hope that this is not a beginning nor an end of such kind of workshops. Here you will only be introduced to new techniques. But it remains your duty to develop them depending on conditions in your local areas. So it is my wish that you will Co-operate with the Government to spread farming practices in Kenya. Last but not least I extend my gratitude's to all who participated in organizing to make this Workshop a success.

Thank you and GOD bless you.

(P.M.M. Malombe)  
District Commissioner,  
Embu District.

*Complementary Remarks - Mr. G. Muturi  
Kitui Pilot Forest Manager.*

The guest of honour - Mr. Shitemi (D.O.1), (D.C.'s representative Embu District), farmers, our resource persons and my fellow colleagues at the Kitui Social forestry Training Project, your presence is enough testimony on the importance placed on environmental issues by each one of you. Indeed, your being here is not without sacrifice considering you had other activities that required your attention. On behalf of the organizers of this workshop, I would like to extend our heartfelt gratitude to you the guest of Honour sir, for having time to open this important occasion and to farmers for their good turn-up. It is your participation that makes us feel successful.

The guest of honour, sir, it was encouraging to note in your highlights the priority given to environmental issues by our government. Indeed, such is not localized but has become a global concern. To achieve our objectives in environmental conservation, farmers including those in Kenya have to be enriched with appropriate technologies to be used in sustainable exploitation of natural resources, rehabilitation of degraded lands, and diversification of goods and services to be reaped from land and trees. With the assistance of the government of Japan, through JICA (Japan International cooperation Agency), the farmers attending this workshop have been trained on recent approaches to social Forestry. This, if well practiced has a lot of potential in Kenya.

Nevertheless, we, the project staff appreciate that technology transfer is not without difficulties. Such may arise from the way messages are passed during course secessions or from unique factors that are peculiar to certain areas. It is such difficulties we expect to hear from the farmers during the few days that we shall be here, as this will be an important input for planning our courses in future. Once again I would like to thank you for your participation.

Finally, I have been requested to invite you to a group photographs that will commemorate this event and to a luncheon thereafter.



**RECENT AGROFORESTRY PRACTICES  
FOR SEMI-ARID LAND**

**MR. MAUSHE H. KIDUNDO,  
DRYLAND APPLIED RESEARCH AND  
EXTENSION PROJECT (DAREP)  
P.O BOX 27,  
EMBU.**

**INTRODUCTION:**

Before examining the agroforestry practices in Kenya Semi-arid (ASAL) lands a brief mention in the nature of the Asal itself is necessary. The most significant aspect of Kenya's Asal is its comparatively large size-82 percent of total land area of Kenya (or 473,00 sq. Km). Equally significant is the fact that its environmental status is very fragile with a highly variable climate, extensively poor soils of inherently low fertility and prone to serious erosion and a vegetation cover of predominantly low fodder and economic value.

Another aspects of growing importance is the increasing human and animal population brought about by both the natural population growth of inhabitants resident in the Asal and by increased immigration from higher potential areas. Trends in land use from pastoralism to sedentarization. Consequently land conversion from pastoral to agricultural cropland is increasing. Shifting cultivation in areas like Eastern Kitui, Samburu, West Pokot, Turkana, Mbere and Tharaka are clearly evident.

In these circumstances, there is a justified need to incorporate appropriate land management practices which will both conserve and improve the land production base. Agroforestry is one such practice.

**DEFINITION:**

Agroforestry is a land use system in which trees are deliberately grown in close association with agricultural crops and/or animals on the same piece of land either in spatial mixture or time sequential.

There must be both ecological interactions between the components and economic benefits derived from their products.

The term is generic being used to describe the integration of three dominant land use enterprises: forestry, agriculture and pastoralism. It embraces the following:-

- Silviculture - the deliberate use of land for the concurrent production of agriculture crops and trees or shrubs.

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- Silvopastoral - A land use system in which trees or shrubs are managed from the production of wood and the rearing of animals.
- Agrosilvopastoral - System in which land is managed for the production of agricultural crops, trees products and for the rearing of animals.

Its aim is to optimize the positive interactions between the components (trees, crops and animals) as outlined above and between these components and the physical environment in order to increase and diversity production in a sustainable manner (Lundgren and Raintree, 1983). The central feature in agroforestry land use system is the multipurpose tree (MPTS). The choice of the right species is crucial in the success of an agroforestry package.

Trees have the unique attributes based on their "closed self-sustaining circle". In this circle, trees absorb the available nutrients back into the soil through deposition of leaves, twigs, branches e.t.c. Thereby replenishing it; and yet they absorb more nutrients from the soil beginning another round of the circle.

This virtually non-ending circle of nutrients uptake, deposition, uptake and deposition assists in the maintenance and improvement of soils and its fertility (King, 1978). In addition tree cover provides a line of defence against erosive, agents (wind and water) though minimizing surface erosion, assists in conservation of water and prevents flooding.

Based on the attributes of trees and with a judicious selection of trees and with a judicious selection of trees to plant of specific riches in the landscape, agroforestry can be considered as playing both a productive and a protective role.

### *Productive Role of Agroforestry:*

A wide range of products in the form of food, wood for various purposes and other raw materials are harvested as direct outputs from agroforestry intentions. See Table I.

#### *Table I*

Potential contributions of tree products from an agroforestry intentions. (source; Rocheau and Raintree, 1987).

1. Human food from tree (fruits, nuts, leaves, cereals substitute e.t.c)
2. Livestock fodder (leaves, twigs, pods).
3. Nutrients from trees through.



- Nitrogen fixation
  - Access to greater volume of soil nutrients through deep-rooting trees.
  - Improve availability of nutrients associated with higher ratio exchange capacity and organic levels.
4. Fuelwood for cooking and heating.
  5. Pyrotic conversion of production (charcoal, oil, gas).
  6. Producer gas from wood or charcoal feedstages.
  7. Ethanol from fermentation of high carbohydrates fruits.
  8. Methanol from destructive distillation or catalytic synthesis process using wood, feedstocks.
  9. Oils, latex, other combustible sapsandresins.
  10. Building materials for shelter and construction.
  11. Wood for a variety of craft purposes.
  12. Fruits, nuts, etc, for drying other food processing industries.
  13. Tanning, essential oil, medicinal ingredients e.t.c

**Protective Role of Agroforestry:**

The usefulness of agroforestry also lies in the services trees plays in protecting and improving the environment. The main protective roles are listed in Table 2.

**Table 2.**

Potential protective contribution of trees in agroforestry intervention. (Source: Rocheleau and Raintree, 1987).

1. Soil and water conservation effected by runoff and erosion controlling arrangements of trees infarming systems.
2. Microclimate amelioration associated with properly designed arrangements of trees (e.g. shelterbelts, dispersed shade trees in crop and grazing lands).
3. Improvements of soil moisture retention in rained cropping systems and pastures through improved soil structure and microclimatic effects of trees.
4. Regulation of streamflow for reduction of flood hazards and more even supply of water, reduction of runoff and improvement of interception and storage in infiltration galleries.

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5. Protection of irrigation and soil conservation works by hedgerows of trees.
6. Improvements of drainage from water for animal consumption on fodder trees.
7. Augmentation of windpower using appropriate tree arrangements to create venture effects (wind power is proportional to the cube of wind velocity).
8. Shade for humans, livestock and shade - living crops.
9. Windbreaks and shelterbelts for protection of settlement, cropland and pastures.
10. Living fences for protecting cropland, pasture enclosures and animal sheds.

### AGROFORESTRY PRACTICES IN SEMI-ARID KENYA

#### Planting in Cropland:

This is an agroforestry practices where trees are either intentionally planted or allowed to regenerate and grow naturally in fields. Trees may benefit from weeding, fertilizer and protection given to crops. These crops in turn benefit from litter fall and nutrient extraction from the sub soil and its recycling.

Alley cropping or hedgerow intercropping is perhaps the best known but least understood of all agroforestry practices in croplands. While there are many variations, alley cropping most often consists of dense hedges of multipurpose trees planted in rows between wide strips of annual crops. The hedges are lopped to provide mulch (green manure) which is applied to cropped areas to fertilize and cover the soil.

Another arrangement is multistorey, closely spaced trees intercropped with annual plants. The arrangement is based on shade tolerant understorey crops and on a greater diversity of tree and hedge row species. It resembles home gardens except that it occurs on croplands.

#### FALLOW CROPPING:

Fallow are croplands left without crops for periods ranging from one season to several years. Main goal here is to control insects pests, diseases and weeds associated with previous cropping and to cover depleted soil nutrients. Once the soil recovers, the crops are re-introduced for one or more seasons, after that the fallow is repeated.



**PLANTING IN BETWEEN PLACES:**

Live fences and living fences posts are used in dryland areas to protect people and their dwellings, crops, animals and other property. They are designed to fence animals in or keep people and animals out of a particular space.

Boundary planting is used in demarcating particular pieces of land and make boundaries between properties or clear. Even where it is not important to mark the boundaries, boundary spaces many provide a convenient site for planting productive trees and shrubs that do not fit ion with other land uses else where.

Windbreaks may also be planted. They are often but not always located on boundaries between properties of fields. Their main function is to protect homes, crops, pastures and soils and water resources from damage by winds. They may cover small plots to large field and are normally multistoried, including one or more rows of trees placed across the path of prevailing wind.

**AGROFORESTRY PLANTING IN PUBLIC PLACES:**

Planting in public places like roads, paths, markets, schools, most of which do not include agroforestry practices may provide an excellent site for demonstration of new agroforestry practices or species to the local community.

**AGROFORESTRY PRACTICES ON PASTURES AND RANGELANDS:**

Trees play important role in increasing rangelands productivity and by conserving the environment. While grasses and herbs dry up in the dry season, trees and shrubs remain green for a longer time thus providing forage to livestock and flowers for bees. Some grass species actually grow better under shade. Naturally occurring trees may be managed selectively or multipurpose trees and fodder shrubs may be planted, either dispersed as individuals, in lines , along contours or in clumps or blocks. Nitrogen fixing trees are more preferable.

**MAJOR PROBLEMS IN AGROFORESTRY SUCCESS IN ASAL:**

For large areas in drylands, especially those away from villages and water sources, protection of natural regeneration is the only cost effective method of tree establishment because planting tree seedlings usually required a substantial labour (and sometimes cash).

Seedlings could be raised through nurseries which must be well protected from livestock (goats). Small nurseries could be established upto family level. Direct sowing into posts is better than using seedbeds.

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Sunken nursery beds are better as they use less water. Water seedling at the right time (morning and evening). Root pruning must be timely and hardening off is important before planting out.

Termites and aphids are usually a problem in Asal nurseries. Insecticides may be necessary but alternative exists. Explore them (ash, soapy water, urine e.t.c).

Preparation for planting must be done in good time before rains. Prepare holes in time and plant after a good moisture content build up. Weed occasionally until seedling establishes well.

Where possible use of cuttings or windings could be used in seed difficult germinating tree species. Direct seedlings and stump seedling could also be applied.

Good water harvesting techniques (microcatchments) sunken pits, contour ridges, rock bunds, and V. shaped bunds are very important for tree establishment in dryland areas.

### TREE MANAGEMENT:

Trees (planted and natural) should be managed for desired purposes. Management techniques appropriate in these areas include, pruning, lopping, root pruning, coppicing, pollarding e.t.c.

### DAREP PROJECT:

The dryland Applied Research and Extension Project (DAREP), which took over the Dryland Applied Project (DAREP), started in July, 1993. DAREP is a KARI/KEFRI/NRI project located at Regional Research Centre-Embu. It covers areas of Agroecological zones 4 and 5 of Embu, Tharaka/Nithi and zones 6 of Isiolo Districts DAREP has an expanded mandate and includes adaptive research on agronomy, livestock and agroforestry as well as tools.

1. To identify, with farmers, the constraints to improved production income and sustainable productivity.
2. To identify solutions to those constraints through applied research on sites and with farmers on their farms, which are appropriate for a range of Social groups.



3. To develop or identify relevant technologies in the field of crops varieties, crop protection, new crops, tillage methods, soil fertility, soil and water management, animal health and production, agroforestry and other topics.
4. To work towards sustainable and replicable institutions for effective multi-disciplinary adaptive research which link with local planning institutions.
5. To identify, develop, evaluate and disseminate appropriate methodologies which promote farmers participation in research identification, design content and interpretation.

**AGROFORESTRY IN DAREP:**

1. The first step was to diagnose the farmers problems. Informal diagnostic surveys have been done both in Tharaka/Nithi and Embu Districts. From both areas, the main constraints facing agroforestry development include:
  - Termite damage
  - Lack of appropriate seedlings
  - Moisture stress
  - Lack of awareness.
  - Poor extension services
  - Lack of tangible quick returns from trees.

2. **DIAGNOSTIC FRUIT TREE PLANTING:**

Willing farmers were provided with fruit tree seedlings. Each farmer was given 12 seedlings to plant. There were three species: *Mangifera indica* (varieties, Apple, Vandyke, Kent, Sensation, Alfonso, Sabre, and Tommy Atkins), *Psidium guajava*, *Carrica papaya*, Solo and sunrise). For mangoes and pawpaws where there were many varieties farmers were to choose for themselves the varieties. Monitoring of trials is after three (3) months.

**The main objectives were:-**

- To determine farmers preferred niches on the farm for planting tree species, especially fruit trees.
- To access the biological performance of each species.
- To study farm management and utilization of each tree species.

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Results so far are preliminary. Indications are that there is a wide variation on farmer management of trees.

### 3. ALLEY CROPPING EXPERIMENT:

This tries to test different width (alleys). (3.7.50 and 6.0) and different tree species (sena atomaria: L. Leworephara Gliricidia sepium, and Cajanus cajan).

### PLANNED TRIALS:

1. Termite control.
  - This experiment will compare the effectiveness of widely used conotions by farmers with the expensive termicides.
2. On-farm tree nurseries.
  - To initiate, train farmers, village elders e.t.c. and assess there performance. Also to be assessed in the appropriateness of the recommended propagation techniques.
3. Multistory boundary planting
  - The use of different species apart from Commiphora and Euphobia for live fencing and incorporating trees for wind breaks.
4. Tree propagation and management techniques.
5. Water harvesting experiments.

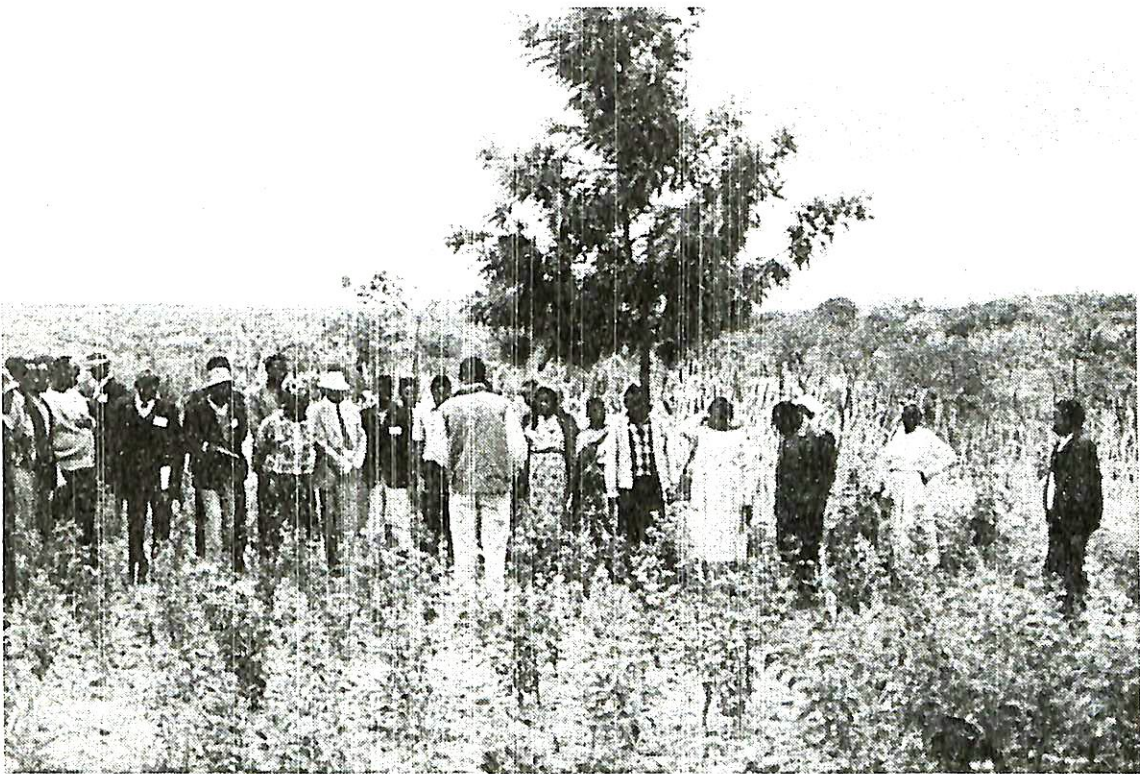


**CASE STUDY: Machan'ga Field Station**  
**KARI/KEFRI/ICRAF (EMBU)**

The case study was undertaken at Machan'ga, a field station, where the participants were exposed to various trials including testing of various crop species and varieties, enhancement of soil moisture retention, soil improvement and agroforestry.

Also two farmers who collaborate with DAREP in the potential Zone of Embu District were visited.

Participants were exposed to practices and techniques e.g species trials, Evaluation trials and soil moisture, retention methods, trials as displayed in the photographs below.



Case study at DAREP Station Machang'a Embu.



## Reccommendations on Case Study

The participants were impressed by the effort being put in by the Dryland Applied Research & Extension Project (DAREP) to identify drought resistant varieties crops, Agroforestry species, tried and effort to improve on crop survival and yields. They requested the Scientists to avail their findings and seed to the targeted areas as soon as their research work is concluded.

Noting that, Agroforestry intervention undertaken by DAREP was just taking root, the participants constantly pressurized on the need to avail as many as possible suitable multipurpose tree species for application in the low potential areas of the Districts.

To sum up the field excursion a round table group discussion in 3 groups was undertaken, and from which the following matters arose.

- (i) The use of root suckers in propagation of *Melia volkensii* (Mukau-Kamba) was predominantly applied in the area under study.
- (ii) A mixture of *Melia volkensii* extractive and chicken dropping had been tried and found to be an effective local termite repellent. However more research has to be undertaken to ascertain this.
- (iii) There is urgent need for farmers in the low potential areas to have accurate timing of the rains during crop and tree planting so as to improve crop performance and seedling establishment test in order to validate Scientific recommendations given to them, this was evident by comparative assessment of crop performance on the local farms and progress.
- (iv) The participants recommended that there should be a tied liason between the field Agricultural, soil conservationists forestry experts and the farmer if the intended agroforestry objectives were to be achieved.
- (vi) The Experts and participants observed and discouraged the Monoculture practices in tree planting as aguard against unexpected hazards e.g. pests & disease outbreaks.
- (vi) Experts and participants recommended the use of organic farming especially green manure was elaborated upon as it can easily be prepared from local vegetation and agroforestry tree species that produce high quantities of forage, it is not toxic, and comparatively cheap if purchased.

## GROUP DISCUSSION

Farmers have varied experiences and indigenous knowledge that could be useful to a large section of our society. Coupled with having attended with a farmer's course at the Social Forestry training centre Kitui. a forum to share their experiences was provided in the form of group discussion specifically and follow-up workshop in general. A number of leading questions were formulated ranging from techniques they learned from the training centre and tried at home to local innovations they may have come up with in response to problems to guide the discussions. Here therefore follow the group discussion deliberations.

### Group 1

#### Members

1. Mr. Namu Njeru
2. Mrs. Caudensia Wakere Kitheka - Rapporteur
3. Mrs. Abishagi Ileri
4. Mr. William N. Mwaniki
5. Mr. Mutegi Gaichu
6. Mrs. Patricia Muthoni
7. Mr. Mureithi J. Githaria
8. Mr. Kisili K. Kabatha
9. Mr. Antony Nyaga
10. Mr. J. K. Lugadiru - Training Manager, Kitui SFTP.
11. Mr. N. M. Muniafu - Training Officer, Kitui, SFTP.
12. Mr. Sakino - Training Expert, Muguga, SFTP.

### Topic 1

During the Kitui Social Forestry Training Centre farmers course various forestry appropriate techniques, practicals, demonstrations and field trips were undertaken.



- i) Which of the techniques have you tried in your farming so far?
- \* Nursery establishment, techniques and management including seed bed establishment.
  - \* Organic farming.
  - \* Planting and tending techniques.
  - \* Adoption of appropriate and useful tree species.
  - \* Agroforestry
  - \* Grafting & budding techniques.
  - \* Soil conservation.
- ii) Which of the techniques are you benefiting from most?
- \* Organic farming - generated income from vegetable and tomato sales.
  - \* Nursery - soil seedlings raised and got profit.
  - \* Agroforestry - maintains soil fertility and helps in soil conservation.
  - \* Useful tree species for social forestry.
  - \* Grafting & budding - Realized high growth rate for fruits grafted and budded.
  - \* Application of compost manure.
- iii) Which are the major problems you are facing in practicing them?
- \* Lack of polytubes
  - \* Termite control
  - \* Lack of water
  - \* Pest and diseases
  - \* Lack of tools e.g. wheelbarrow, spade, jembe, rake, panga, pruning knives and watering can.
- iv) Which other new techniques have you managed to develop so far that you feel could be added to our training scheme?
- \* Mixture of poultry and water for termite protection.
  - \* Mixture of pepper, tobacco and water for insects protection.

- v) Which of the techniques did you find not useful?
- \* All techniques learnt were useful, none of them were useless.

**Topic 2**

During your two weeks course at the Kitui Regional Training Centre farmers course, Agroforestry techniques was emphasized most.

- i) What advances have you made so far as a result of your training?
- \* Established fodder grazing units and planted fodder trees together with crops.
  - \* Planted trees on benches especially fruits
  - \* Hedgerow inter cropping
  - \* Planted most agroforestry trees.
- ii) What other new techniques have you been exposed to?
- \* Use of *Azadirachta indica* in controlling termites.
  - \* Application of organic manure instead of fertilizers.
- iii) What major problems are you faced with?
- \* Lack of marketing
  - \* Lack of seeds
  - \* Lack of tools e.g. wheelbarrow
  - \* Pests & diseases
  - \* Scarcity of water
  - \* Lack of technical advice from extension agents e.g. forestry & agriculture.



Group 2

Members

1. Mr. John Muli Muasya
2. Mr. Fredrick Kinyua Mwaniki - Rapporteur.
3. Mr. Amos Ireri Nyaga
4. Dr. Mwalimu Muriithi
5. Mrs. Veronicah Nyambura
6. Mrs. Julia Igoki Namu
7. Mr. John Njiru Kigoro
8. Mr. C. Osore - Training Officer, SFTP, Kitui.
9. Mr. T. Hirota - Training Expert, " "
10. Mr. P. Tuwe - K.A.R.I., EMbu.

Topic 1

During the Kitui Social Forestry Training Centre farmers course various forestry appropriate techniques, practicals, demonstrations and field trips were undertaken.

- i) Which of the techniques have you tried in your farming so far?
- \* Nursery establishment, techniques and management.
  - \* Initiation of women and men.
  - \* Useful tree species and appropriate tree species for social forestry.
  - \* Agroforestry practices.
  - \* Planting, tending and tree management techniques.
  - \* Grazing land & livestock management.
  - \* Recommended fruit trees, grafting & budding.
  - \* Soil and water conservation.

- ii) Which of the techniques are you benefiting from most?
- \* Agroforestry
  - \* Budding/grafting & recommended fruits.
  - \* Appropriate & useful trees
  - \* Grazing land & livestock management.
- iii) Which are major problems you are facing in practicing them?
- \* Lack of seeds
  - \* Water problem
  - \* Lack of tools and materials
  - \* Pest and diseases
- iii) Which other new techniques have you managed to develop so far that you feel could be added to our training scheme?
- \* Application of boiled leaves + water mixture of Azadirachta indica for termite control.
  - \* African marigold + tobacco + water for pest and diseases control
  - \* Proper spacing of calliandra calothyrsus helps to control pest and diseases affecting them.
- v) Which of the techniques did you find not useful?
- \* None was not useful.
  - \* Course duration should be increased to 3 weeks.

## Topic 2

During your two weeks course at the Kitui Regional Training centre farmers course, agroforestry techniques was emphasized most.

- i) What advances have you made so far as result of your training?
- \* Planted fuelwood trees together with crops.
  - \* Combining fodder trees with crops.



- \* Hedgerow inter cropping
  - \* Planted windbreaks
  - \* Fallow cropland farming & crop rotation.
- ii) What other new techniques have you been exposed to?
- \* Planting agroforestry species in very straight lines (line planting) together with crops and along the fence.
- iii) What major problems are you faced with?
- \* Lack of seeds
  - \* Water shortage
  - \* Lack of tools and material e.g. wheelbarrow, roof catchment materials etc.

Group 3

Members

1. Mr. Nthenge Munyuoki
2. Mr. Fredrick M. Muchai - Rapporteur
3. Miss. Susan I. Ngari
4. Mr. Harrison N. Mbura
5. Mr. Patrick K. Muriithi
6. Mr. Charles M. Nthuni
7. Mrs. Mary Njeru
8. Mrs. Teresia M. Nderi
9. Mr. G. Muturi - Pilot Forest Manager - SFTP, Kitui.
10. Mr. M. J. Otieno - Training Staff - S.F.T.P., Kitui.
11. Mr. Y. Kubo - Training Expert, S.F.T.P, Kitui.
12. Mr. Mauche - Resource person, K.A.R.I., Embu.

Topic 1

During the Kitui Social Forestry Training Centre farmers course various forestry appropriate techniques, practicals, demonstrations and field trips were undertaken.

i) Which of the techniques have you tried in your farming so far?

- \* Nursery establishment, techniques and management.
- \* Agroforestry practices.
- \* Useful & appropriate tree species
- \* Soil & water conservation
- \* Grazing land & livestock management
- \* Recommended fruit trees
- \* Grafting & budding
- \* Organic farming
- \* Bee keeping

ii) Which of the techniques are you benefiting from most?

- \* Agroforestry

- \* Bee keeping
  - \* Useful & appropriate trees
  - \* Soil & water conservation
- iii) Which are the major problems you are facing in practicing them?
- \* Lack of water
  - \* Lack of seeds
  - \* Pests and diseases
  - \* Lack of tools and materials
- vi) Which other new techniques have you managed to develop so far that you feel could be added to our training scheme?
- \* Application of Azadirachta indica + poultry waste for termite control.
- v) Which of the techniques did you find not useful?
- \* None.
  - \* Course duration should be increased to 3 weeks.

## Topic 2

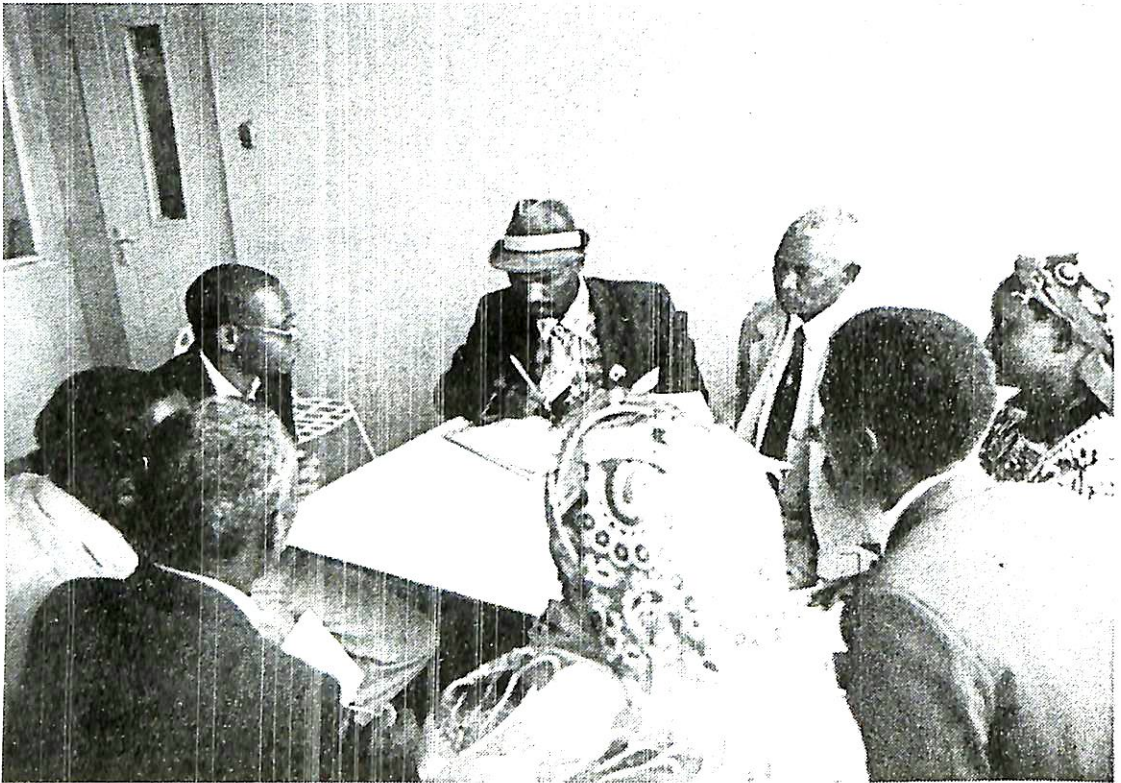
During your two weeks course at the Kitui Regional Training Centre farmers course, agroforestry techniques was emphasized most.

- i) What advances have you made so far as a result of your training?
- \* All have carried out most techniques covered.
- ii) What other techniques have you been exposed to?
- \* None apart from the ones covered.
- iii) What major problems are you faced with?
- \* Destruction of crops by birds and insects due to inter cropping.





Group I during group discussion



Group 2 during group discussion





Group discussion (Group No. 3)



**Remarks and Recommendations on the discussion:**

1. Most of the farmers still recalls what were learnt except no group mentioned on Seed collection and Handling and seed pre treatment, hence seed procurement and treatment were presented as problems.
2. The most favourite subject the farmers seem to enjoy practicing are:-
  - (i) Grafting and budding
  - (ii) Usefulness of trees not only in one perspective but wide spectrum e.g. medicine, agroforestry, Bee-keeping.
  - (iii) Grazing land and Livestock management.
3. Problems centered mainly :-
  - (i) Water Scarcity.
  - (ii) Termites.
  - (iii) Technical advice missing.

A key factor in successful social forestry within a Community, is seed availability procedure, so it is recommended that in future courses a good seed collection, handling and pre treatment to be designed and be as simple as possible. Nursery practice lectures should be on very small units oriented , rather than the conventional nursery practice.

Budding and grafting lecture is very useful to a farmer if can be simplified to farmers context it will be well and good. It will also be noted that this was the only subject farmers wanted a recapitulation.

The trained farmers workshop participants did not see any of the courses useless or any new courses to be added but insisted on increasing duration time to 3 weeks, with no proper reason which leaves one wondering.

***VOTE OF THANKS BY - JAPANESE TRAINING  
EXPERT (MR. K. SAKINO) - FOLLOW-UP WORKSHOP  
(EMBU).***

The Guest of Honour D.F.O (Mr. S.G. Ngarua), Course Moderator Mr. Muniafu, organizers, fellow training officers, participating farmers ladies and gentlemen.

I have great pleasure to be with you during this closing ceremony of the second farmers' follow-up workshop here at Embu.

Firstly, I congratulate all farmers participants for having spared some of their precious time to attend this Workshop. Also I wish to express my sincere appreciation for the effort put in by participating farmers especially as evidenced in their group discussions and presentations which was a clear indication of their commitment towards this follow-up workshop.

During the presentations, many challenging issues were raised. I was also pleased to note that you have put into use the knowledge and skills you acquired during your training at Kitui Social Forestry Training Centre. However from this Workshop it has been noted that you are still facing some outstanding problems and difficulties related to tree planting.

It is my sincere hope that from this Workshop you have gained some new knowledge and skills that will assist you to solve some of your daily problems in tree planting and agroforestry in particular. These will assure you of some successes in your efforts of tree planting.

What has arose in this Workshop is the idea that you need alot lower level technical inputs, especially from the local Community leaders and Frontline extension officers employed by the Government.

Everybody must understand that land has become limited and therefore to be able to cope up with life, other farming technologies like organic farming must also be practiced. Rainfall intensity and pattern is constantly changing, therefore we also encourage farmers to also plant drought resistant crops and trees especially the indigenous ones. Since most of them have adapted themselves to these changes over years.

I am also requesting you not to fully rely on the big departmental tree nurseries that may be quite far from you but advice you to start up your own small nurseries.

Above all I am urging you to take seriously what you have been taught and practice it. To demonstrate my participation in extending agroforestry I will give each of you a copy of a book entitled Forestry techniques authored by HBL Evans on behalf of EMI. (Embu Meru integrated Project) explaining in details the various appropriate forestry techniques.

Last but not least my office is open to any of you incase of a problem.

With this, I declare this Workshop officially closed.

Thankyou and have safe journeys back home and may GOD bless you all !!

Mr. Ngarua  
(District Forest Officer)  
Embu.



***VOTE OF THANKS BY - JAPANESE TRAINING  
EXPERT (MR. K. SAKINO) - FOLLOW-UP WORKSHOP  
(EMBU).***

The Guest of Honour D.F.O (Mr. S.G. Ngarua), Course Moderator Mr. Muniafu, organizers, fellow training officers, participating farmers ladies and gentlemen.

I have great pleasure to be with you during this closing ceremony of the second farmers' follow-up workshop here at Embu.

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What has arose in this Workshop is the idea that you need alot lower level technical inputs, especially from the local Community leaders and Frontline extension officers employed by the Government.

However the project had already foresighted this and initiated courses aimed at equipping the Frontline extension officers and making local Leaders to have some basic understanding of the whole activity. These courses including other courses for primary school teachers are conducted at Kitui Social Forestry Training Centre. Also on a higher level of the above mentioned courses, the Project trains District level officers at its Muguga National Training Centre.

The Centre trains mainly the District and Divisional Extension officers in the following subjects- Agriculture, Livestock, Social Services e.t.c . Also secondary school teachers are also trained so that they can also extend the knowledge through their schools.

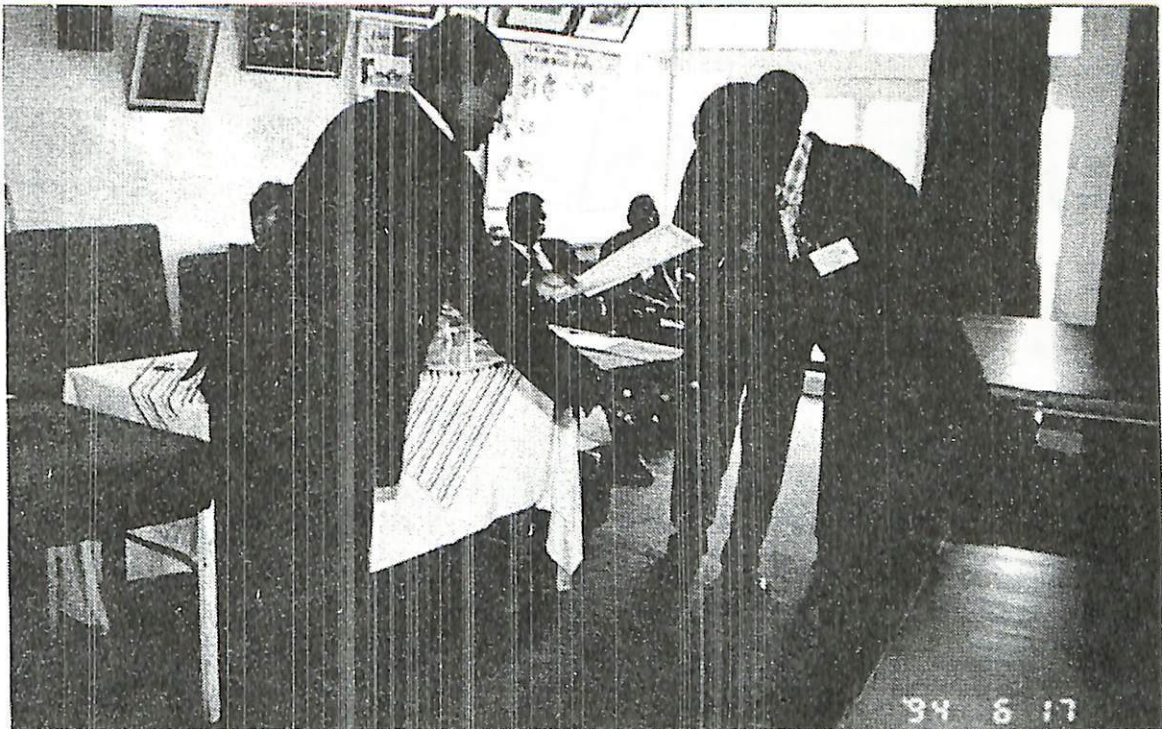
With this, it is my hope that those who are graduating now will go out and assist in passing the gained knowledge to the intended target groups so as to enhance tree planting and Agroforestry activities.

Finally, I would like to express my sincere appreciation for your committed participation and wish you fruitful success back home.

Last but not least I also extend my thanks to the entire organization of EMCO Embu Co-operative Society for allowing us to use their facilities.

Thankyou very much.

*Asante sana !!*



During Awards presentation by Mr. Ngarua D.F.O. (Embu).





Closing ceremony  
The P.F.O. Eastern province as the Guest of Honour  
represented by Mr. S. G. Ngarua  
(Third seated from left behind the table)

**KITUI REGIONAL SOCIAL TRAINING CENTRE COURSE PROGRAMME**

**Follow-up Workshop, 15th - 17th June 1994**

Date	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	
14/Jun/94 (TUE)	<i>Arrival of Organizers</i>										
15/Jun/94 (WED)	Preparation of Venue by Organizers			Arrival & registration of Trainees			Opening Ceremony (D.C. Embu)	Lunch	Recent Agroforestry Practices for Semi-arid Land (Mr. Maushe)	Tea Break	Continued
16/Jun/94 (THU)	Case Study to On-farm Agroforestry Site (Demonstration of Agroforestry Practices) (Mr. Tywe and Mr. Maushe)			Tea Break	Continued (Demonstration) (Mr. Tywe and Mr. Maushe)			Lunch	Discussion Regarding Case Study (Mr. Tywe, Mr. Maushe & S.F.T.P. Officer)	Tea Break	Preparation for Presentation (S.F.T.P. Officer/Experts)
17/Jun/94 (FRI)	Group Discussion (S.F.T.P. Officers & Experts)		Short Presentation & Recommendation Session (Reporteur)	Tea Break	Comments from resource persons & Continued Recommendation Formulation (Resource Persons)			Closing & Lunch (P.F.O. Eastern Province)	<i>D e p a r t u r e</i>		

## LIST OF MATERIALS & EQUIPMENTS

1. Note books
2. Document wallets
3. Biro (bic) pens
4. Name tags for participants, resource personnel and organizers.
5. Writing pads.
6. Pamphlets - How to plant trees written in 2 different languages i.e Kiswahili & English.
7. Stickers - miti ni mali.
8. Time -table (workshop programme).
9. Flip charts and two stands.
10. Chalk - different colours.
11. Manila papers - different colours
12. Mark pens - small, medium and big - different colours
13. Empty tape cassettes for recording proceedings.
14. Over-head & slides Projectors.
15. Agroforestry slide trays.
16. Portable screen
17. Transparencies & markers.
18. Two extension codes & two plugs (Adapters)
19. 2 Cameras & print/slides films.
20. 2 pairs of scissors.
21. Seal Tape & glue.
22. Typewriter, typing papers, eraser and ribbon
23. Certificates of participation.
24. Traveling expenses claiming sheets
25. 1 Metre 1 - T - square and 3 short (12") rulers.
26. 5 Erasers.
27. Registration forms.
28. Stapler & staples.
29. Social Forestry Techniques Part I (for resource persons and guests.
30. Black -board eraser (duster).
31. Video dec (video cassette recorder) and screen



## 2nd Follow-up Workshop Proceedings

32. Video cassettes (environmental)
  - (1) Kilimo Mseto (Agroforestry).
  - (2) Trees for life
  - (3) Plant trees & Conserve forests
  - (4) The Africans - A triple Heritage.
33. On farm tree nursery handbook (for resource persons)
34. Pilot forest calendars & More Trees Better life - Miti ni Mali handbook (issued to participants together with certificates of participation)
35. Video camera and a tripod.
36. 1st follow-up workshop held at Five Hills hotel 1993.

### PUBLICATIONS DISTRIBUTED TO PARTICIPANTS

1. Kenya/Japan Social Forestry Training Project (Phase II). More Trees Better Life - Miti ni Mali Handbook.
2. Kitabu cha kueneza maarifa Juu ya Mimitu published by Embu, Meru, Isiolo Project, EMI Forestry Project.
3. KEFRI/JICA - How to plant trees pamphlets written in two languages (English & Kiswahili).

**LIST OF ORGANIZERS:**

**1. Guest(s) of Honour**

- |    |                                   |   |                 |
|----|-----------------------------------|---|-----------------|
| 1. | Embu District Commissioner        | - | Opening session |
| 2. | Eastern Provincial Forest Officer | - | Closing session |
| 3. | Embu District Forest Officer      | - | Closing session |

**2. Resource Persons**

- |    |               |   |                                    |
|----|---------------|---|------------------------------------|
| 1. | Mr. G. Muturi | - | Pilot Forest Manager - SFTP, Kitui |
| 2. | Mr. P. Tuwe   | - | K.A.R.I - Embu                     |
| 3. | Mr. Maushe    | - | KEFRI - Embu.                      |

**3. Organizers:**

- |     |                            |   |                               |
|-----|----------------------------|---|-------------------------------|
| 1.  | Mr. Joshua K. Cheboiwo     | - | Project Manager, SFTP, Kitui. |
| 2.  | Mr. Jesse K. Lugadiru      | - | Training Manager, SFTP, Kitui |
| 3.  | Mr. Nixon M. Muniafu       | - | Training Officer " "          |
| 4.  | Mr. Chahilu M. Osore       | - | Asst. Training Officer, " "   |
| 5.  | Mr. Michael J. Otieno      | - | Training Staff " "            |
| 6.  | Mr. Sakino                 | - | Training Expert SFTP, Muguga  |
| 7.  | Mr. Y. Kubo                | - | Training Expert " Kitui       |
| 8.  | Mr. T. Hirota              | - | Training Expert " "           |
| 9.  | Mrs. Redemter K. Mutembei- |   | Typist SFTP, Kitui.           |
| 10. | Miss. Rose K. Mbithi       | - | Typist " "                    |

**4. Drivers:**

- |     |                         |   |                             |
|-----|-------------------------|---|-----------------------------|
| 11. | Mr. Chrisantus O. Ndege | - | SFTP, Kitui.                |
| 12. | Mr. Evans Ogake         | - | " "                         |
| 13. | Mr. Z. Kuria            | - | " Muguga                    |
| 14. | Mr. Joel Ng'ang'a       | - | " Kitui                     |
| 15. | Mr. George N. Mwema     | - | Bus Conductor, SFTP, Kitui. |

