Annex 1. Enterprise Catalogue

Livelihood Farmer Field Schools

Enterprise Catalogue

SUSTAINABLE LIVELIHOOD DEVELOPMENT PROJECT IN THE MAU FOREST COMPLEX

About this Enterprise

This catalogue has been prepared for Livelihood Farmer Field Schools (LFFS) under TCP Sustainable Livelihood Development in the Mau Forest Complex. Each menu represents a learning enterprise package, which consists of the benefit, cost estimate, remarks, period for establishment and management, possible layout with illustrations and some pictorial images. Most of the learning options are designed in combination with income generating or livelihood support activities to attract farmers' interest in participation.

The group members are expected to select their LFFS learning enterprise from this Activity Catalogue and develop a learning plan after conducting the "Learning Expectation Session". Please read the enterprises carefully and discuss among the members which option might be the most appropriate in your area and worth trying through LFFS. This catalogue may help the members to learn some possible solutions for livelihood improvement and environment conservation which they can practice on their own farms in parallel to the learning process.

11th March, 2010

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& Shinji Ogawa

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How to select Learning Enterprises

Step 1

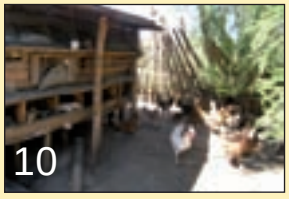
Select Forestry Related Enterprise From the options

Select Tree Nurseries

Since you need seedlings

Step 2

Select Livelihood Improvement Enterprise From the options



Identify Your Learning Enterprise for LFFS

1. Wood Lots for Timber

Grevillea wood lot

Cost Estimate (an example)

Requirement	Quantity	Unit Price (Ksh.)	Total
Seedlings of Species1	9 + (1)*	10/seedling	100
Seedlings of Species 2	9 + (1)*	10/seedling	100
Option 1 (Fertiliser Testing)			
Seed of Food Crop (Common)	1.2 kg	50	60
Fertilizer	5 kg	50	250
Manure	15 debes	Local collection	
Option 2 (Variety Testing)			
Seed of Food Crop (Improved)	0.6 kg	250	150
Seed of Food Crop (Common)	0.6 kg	50	30
Total with Option 1			510
Total with Option 2			380

*for replacement

Benefit

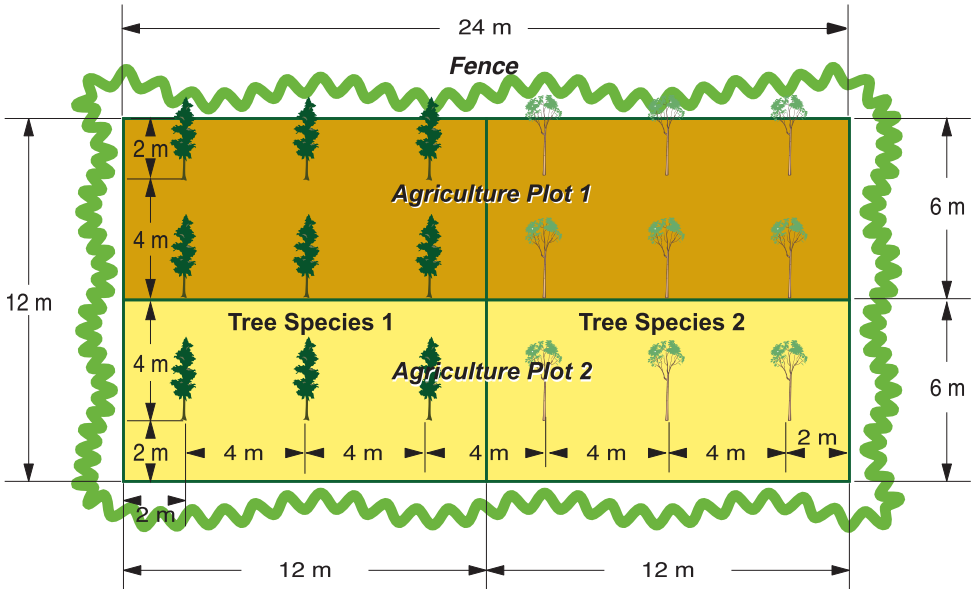
- Provision of timber after 12 20 years for domestic use and income generation.
- Soil is continuously covered and protected against erosion.
- Farmers could produce food crops for one to two years until trees cover the land.
- Provision of firewood from pruning and thinning from woodlot.
- Provision of fodder by some species like Grevillea.

Remarks

- Seedlings can be produced in nurseries, if the nursery enterprise has been selected by the group.
- No more intercropping two to three years after the establishment of wood lot.
- After tree establishment there is no income up to the time the trees are harvested.

Possible PTD Design

Species Testing with Crop Experiment



Establishment & Management Period

Activities	Duration
Planning & Designing	1 day
Land marking & preparation	1 2 days
Planting	1 days
Monitoring	Every 4 weeks
Tinning	After 5 6 Years
Harvesting	After 12 20 Years

2. Wood Lots for Poles & Firewood

Eucalyptus tree planting

Cost Estimate (an example)

Requirement	Quantity	Unit Price (Ksh.)	Total
Seedlings of Eucalyptus	9 + 36 + (5)*	10/ seedling	500
Seed of Food Crop (Improved)	0.6 kg	250	150
Total			650

*for replacement

Benefit

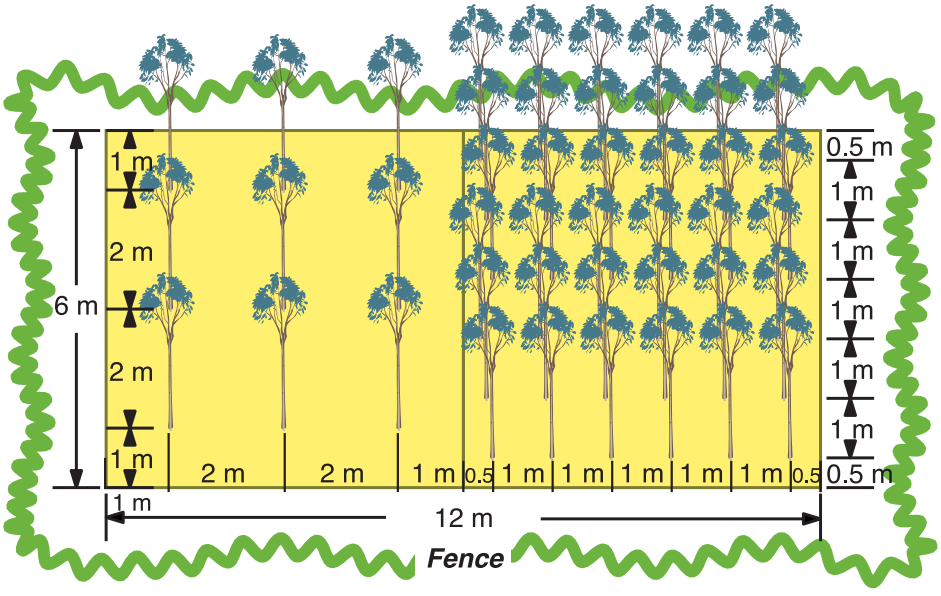
- Provision of construction poles and firewood for household use or sale to the existing market.
- Generation of income within a short period (3 to 5 years) if the products are sold to the market.
- Farmers could produce food crops for the first year if trees are planted in wider spacing.
- Stumps will protect the land continuously if coppicing species like Eucalyptus are planted.

Remarks

- Seedlings can be produced in the nurseries, if the nursery enterprise has been selected by the group.
- After one year, the tree crowns will interfere with crop production – no more crops planting.

Possible PTD Design

Species Testing with Crop Experiment



Establishment & Management Period

Activities	Duration
Planning & Designing	1 day
Land marking & preparation	1 2 days
Planting	1 days
Monitoring	Every 4 weeks
Harvesting	After 3 4 Years

3. Fruits Orchard

Eucalyptus tree planting

Cost Estimate (an example)

Requirement	Quantity	Unit Price (Ksh.)	Total
Fruit Seedlings (Variety 1)	3 + (1)*	150	600
Fruit Seedlings (Variety 2)	3 + (1)*	150	600
Fruit Seedlings (Variety 3)	3 + (1)*	150	600
Manure	4.5 bags	Local Collection	
Option 1 (Fertiliser Testing)			
Seed of Food Crop (Common)	3.6 kg	50	180
Fertilizer	15 kg	50	750
Manure	455 debes	Local collection	
Option 2 (Variety Testing)			
Seed of Food Crop (Improved)	1.8 kg	250	450
Seed of Food Crop (Common)	1.8 kg	50	90
Total with Option 1			2,730
Total with Option 2			2,340

*for replacement

Benefit

- Provision of fruits within a short period (2 3 years) if the fruit trees are grafted.
- Distribution of income throughout the year if there are several varieties planted.
- Provides nutrients and vitamins to the household from the fruits.
- Combined crops provide food at same time.
- Provision of scions for grafting to expand orchard.

Remarks

- Fencing of Fruits Orchard is necessary for protection against animals.
- They require intensive care for pests and diseases and require fungicides and pesticides especially during flowering and fruiting.
- Spacing of trees varies depending on the species (Consult a Specialist).

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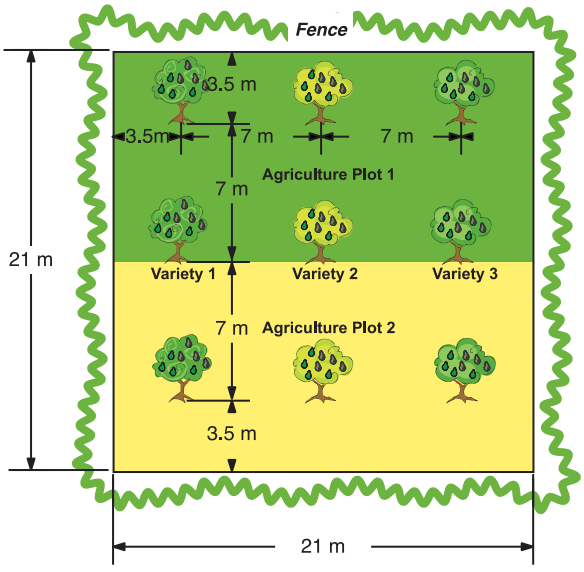
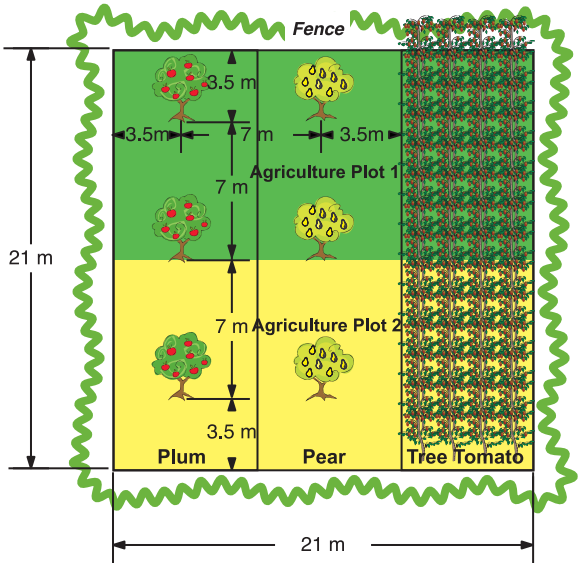
Possible PTD Design

Variety Testing



Species Testing



Establishment & Management Period

Activities	Duration
Planning & Designing	1 day
Land marking & preparation	1 days
Planting	1 days
Monitoring	Every 4 weeks
Harvesting	After 3 5 Years

4. Fodder Bank for Livestock

Mulberry trees planted along boundary of a farm

Provision of fodder

Silk worm production

Cost Estimate (an example)

Requirement	Quantity	Unit Price (Ksh.)	Total
Fodder Tree Seedlings (Species 1)	30	10 / seedling	300
Fodder Tree Cuttings (Species 2)	30	10 / seedling	300
Fence	36 m	Local material	
Total			600

Benefit

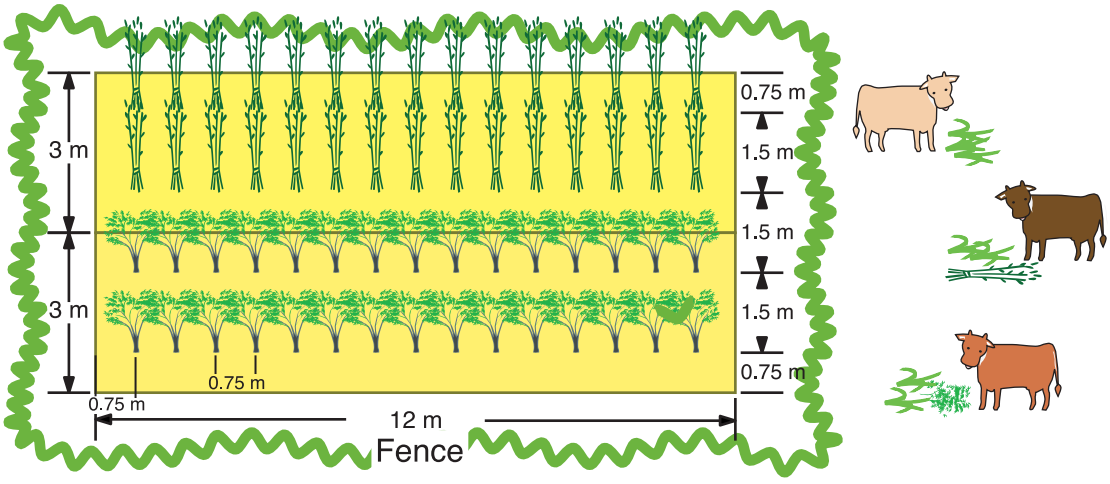
- Provision of fodder for livestock in dry season after 2 to 3 years.
- Protection of slopes, river banks or farm boundaries with fodder tree species.
- In case mulberry trees were planted, provision of feed for silk worm for silk production in future (Comprehensive training necessary).

Remarks

- Fodder tree seedlings such as Mulberry, Calliandra, Sesbania, Leucaena can be produced in the nurseries.
- Mulberry seedling can be produced vegetatively from cuttings.
- Trees planted must be fenced permanently but more especially in early stage of establishment.
- In case of Sesbania, trees have to be replanted after 3 4 years.

Possible PTD Design

Species Testing



Establishment & Management Period

Activities	Duration
Planning & Designing	1 day
Land marking & preparation	1 days
Planting	1 days
Monitoring	Every 4 weeks
Harvesting	After 2 3 Years

5. Bamboo Planting

Bamboo planting after three years

Bamboo Seedlings

Bamboo baskets

Cost Estimate (an example)

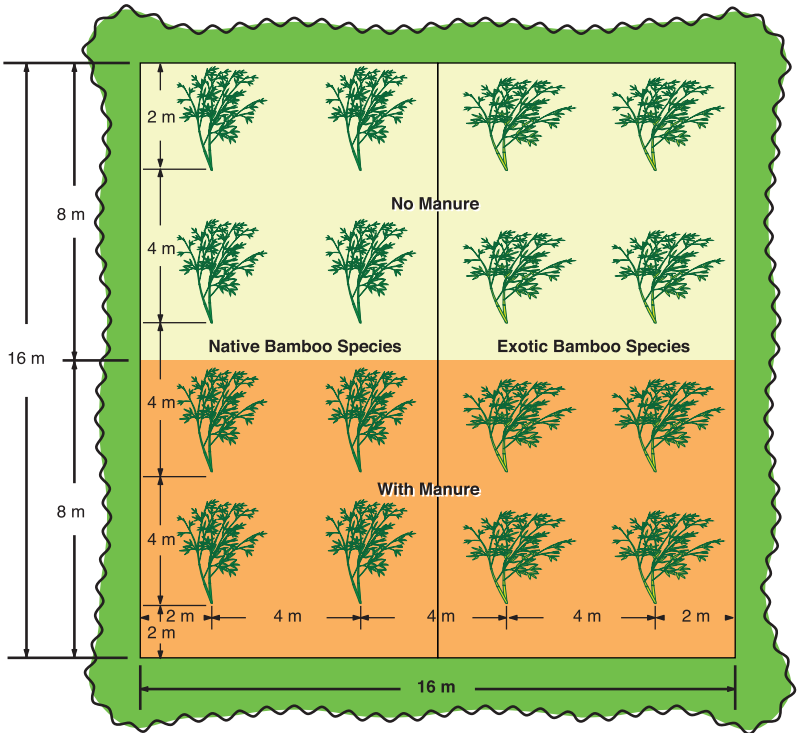
Requirement	Quantity	Unit Price (Ksh.)	Total
Native Bamboo Seedlings	8	100	800
Exotic Bamboo Seedlings	8	100	800
Seed of Food Crop (Common)	1.0 kg	50	50
Manure	2 bags	Local Collection	
Fence	64 m	Local material	
Total			1,650

Benefit

- Production of bamboo materials for both domestic and industrial use after 4 to 8 years.
- Soil and land conservation in steep areas.
- Production of fodder in dry period when the bamboos are well established.
- Employing appropriate harvesting method, replanting will not be necessary for a very long period.

Remarks

- Seedling can be produced in the nursery, if the nursery enterprise has been selected by the group.
- Fencing of the bamboo planted area is crucial since they are very palatable to animals.



Possible PTD Design Species Testing

Establishment & Management Period

Activities	Duration
Planning & Designing	1 day
Land marking & preparation	1 day
Planting	1 day
Monitoring	Every 4 weeks
Harvesting	After 3 5 Years

6. Tree Nurseries

Eucalyptus tree planting

Cost Estimate (an example)

Requirement	Quantity	Unit Price (Ksh.)	Total
Seeds of various tree species			1,500
Polythene tubes (small)	2,000	0.4	800
Polythene tubes (big)	500	0.6	300
Nursery Soil	32 bags	Local Collection	
Forest Soil	12 bags	Local Collection	
Compost Manure	8 bags	Local Collection	
Sand	12 bags	Local Collection	
Jembe *	2	180	360
Spade *	2	250	500
Panga *	2	150	300
Soil sieve	2 m	200/m	400
Watering Can	2	300	600
Fence	40 m	Local material	
Funggicide	200g	350	350
Insecticide	200ml	Herbal Medicine	
Secateurs	2	500	1,000
Knife	5	Local material	
Scion	350	5	1,750
Total			7,860

* Use existing farm implements as much as possible to reduce the cost.

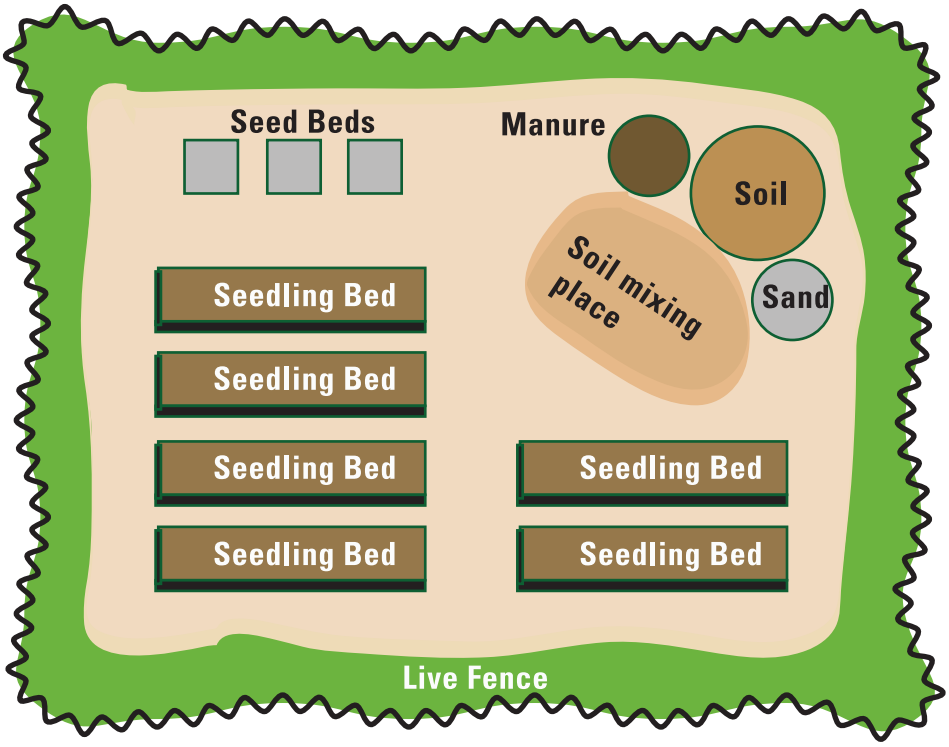
Benefit

Whichever forestry related enterprise you take, tree seedlings will need to be produced. Although a small scale nursery requires daily care and constant supply of water, it is easy to start and manage, and has the following advantages:

- Members can raise the required species.
- It may supply seedlings at low cost and close to the planting sites
- It may act as an income generating activity if the seedlings are sold.

The table on the left, which estimates nursery materials may help members to calculate the total amount of required fund for establishment.

Possible Layout



7. Home Garden

Home garden with several types of vegetables

Cabbage

Snow Pea

Cost Estimate (an example)

Requirement	Quantity	Unit Price (Ksh.)	Total
Seeds of Vegetable 1	50 g	500/250g	100
Seeds of Vegetable 2	50 g	750/250g	150
Seeds of Vegetable 3	1 Kg	50/Kg	50
Seeds of Vegetable 4	2 Kg	50/Kg	100
Manure	4 bags	Local Collection	
Fungicide	200g	350	350
Insecticide	200ml	Herbal Medicine	
Fence	32 m	Local material	
Total			750

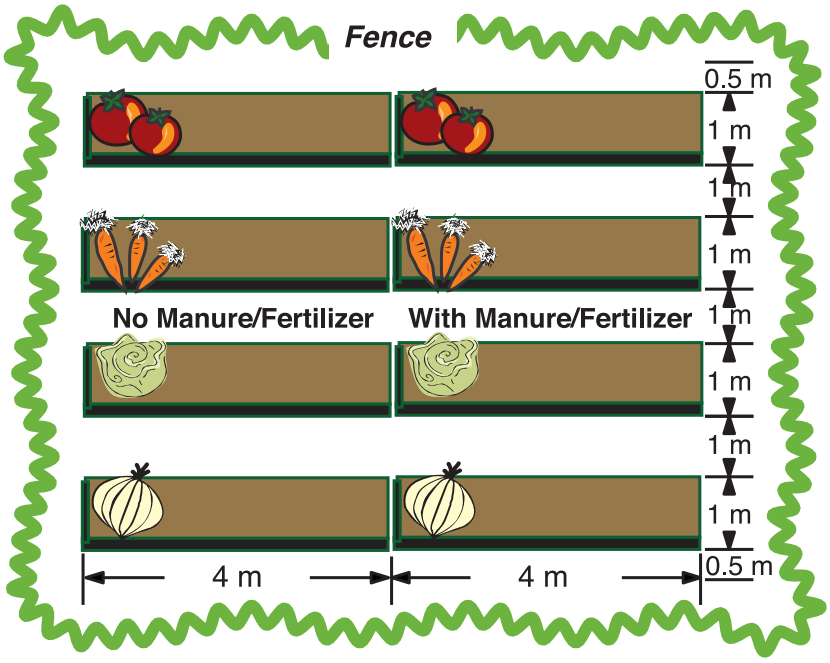
Benefit

- It can be started on a very small piece of land.
- It provides food (vegetables, tubers, fruits, herbs, spices, etc.) and improves nutrition.
- Generation of income within a short period (3 to 8 months) if harvest is sold to the market.

Remarks

- They require intensive care to control pests and diseases sometimes through use of fungicides and pesticides.
- Fencing of all of the planted area is necessary.
- It is also good to conduct a market price survey.

Possible PTD Design



Establishment & Management Period

Activities	Duration
Planning & Designing	1 day
Land marking & preparation	1 day
Planting	1 day
Monitoring	Every week
Harvesting	After 3 8 months

8. Beekeeping

A FFS apiary with several types of hives

Cost Estimate (an example)

Requirement	Quantity	Unit Price (Ksh.)	Total
Langstroth Beehive	1	4,000	4,000
Kenya Top Bar Hive or Box Hive	1	2,500	2,500
Local Beehive	2	500	1,000
Wire mesh (Queen Excluder)	1 m	200	200
Hanging Wire	10 m	20	200
Treated Posts	3	200	600
Suits	1	4,000	4,000
Smoker	1	1,000	1,000
Beehive Tool	1	350	350
Gum Boots	3	900	2,700
Torch	1	200	200
Total			16,750

Benefit

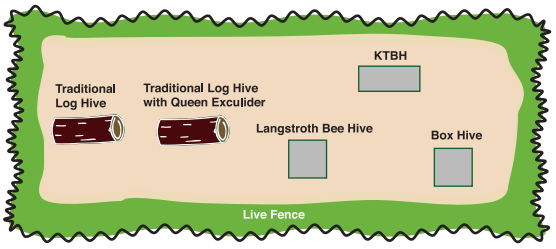
- Provides honey for consumption and sale.
- Requires little labour input after installation.
- Gives quick returns on investment.
- Improves cross pollination of surrounding plants and crops thus increasing production.

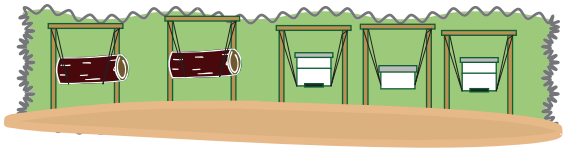
Remarks

- Initial cost of establishment and accessories is high.
- Requires enough experience in proper management of bees, apiary and honey harvesting and processing.

Improved log hive with queen excluder

Possible PTD Design





Langstroth & Box type Bee hives

Snow Pea

Establishment & Management Period

Activities	Duration
Planning & Designing	1 day
Land preparation	1 days
Hive setting	1 days
Monitoring	Every week
Harvesting	After 3 5 months

9. Fish Farming

Small fish pond prepared for fish farming

Cost Estimate (an example)

Requirement	Quantity	Unit Price (Ksh.)	Total
Fingerlings of Tilapia	80	3	240
Fingerlings of Catfish	8	5	40
Feeds (Initial)	50 Kg	30	1,500
Fish Net	4	200	800
Total			2,580

If you employ manual labour for digging the fish pond, it will cost around 12 man/day (12 MD x 300 = Ksh. 3,600)

Benefit

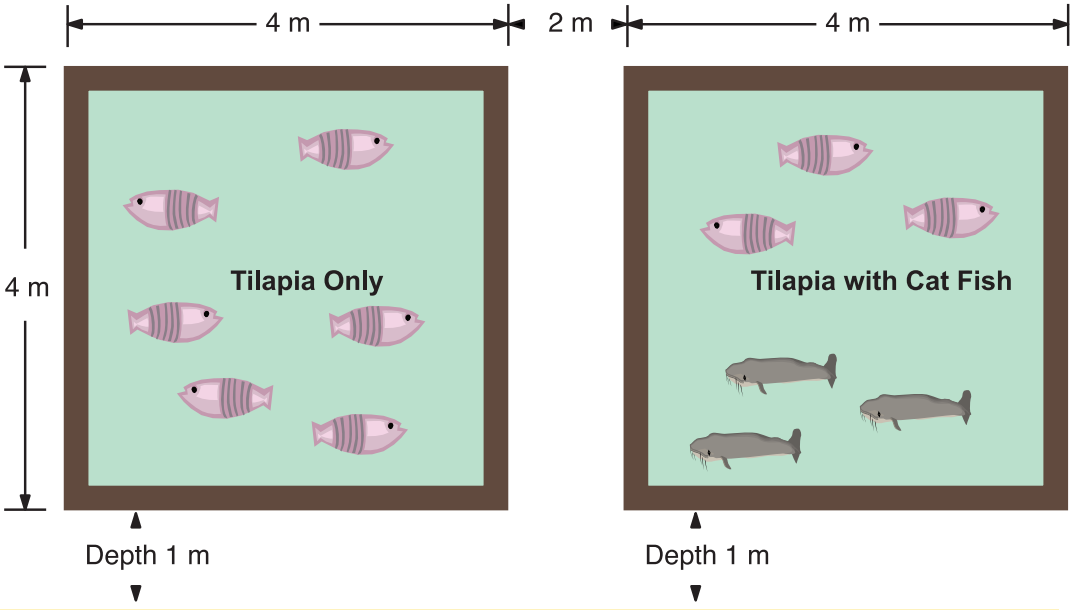
- Provision of food and source of protein.
- Generation of income within a short period (8 to 12 months) if the product is sold in the market.
- Requires little labour input after installation.
- Fish can feed on larvae of harmful insects like mosquitoes.

Remarks

- In case of porous soil, use of plastic sheet at the bottom and sides of the ponds is recommended.
- Fingerlings have to be carefully sourced.
- It is recommended that fingerlings from other sources be added after 2 years to revitalise productivity.

Possible PTD Design

- Compare size of different fish species if their fingerlings are available.
- Compare different feeding practices (Traditional and Concentrated).



Establishment & Management Period

Activities	Duration
Planning & Designing	1 day
Land marking & preparation of ponds	3 days
Releasing	1 day
Monitoring	Every week
Harvesting	After 8 12 months

10. Poultry Keeping

semi-caged

Free

Cost Estimate (an example)

Requirement	Quantity	Unit Price (Ksh.)	Total
Day old chick (Grade)	20	70	1,400
Chick (Local)	20	30	600
Housing Material			500
Wire mesh	8 m	200	1,600
Feeders	2	200	400
Drinker	2	200	400
Drugs & Vaccines			1,200
Feed (Initial)	70 kg	50	3,500
Total			9,600

Benefit

- Provides meat/eggs for consumption and sale.
- Requires little labour input.
- Gives quick returns on investment.
- Poultry manure provides good fertilizer and animal feed.

Remarks

- Diseases eg NCD, Typhoid & coccidiosis have to be taken care of.
- Requires daily monitoring for feeding, watering and collection of eggs, thus a full time assignment of members.

Possible PTD Design

- Compare the period until initial egg production between Local and Grade chicken.
- Compare the production of eggs between free, semi caged and fully caged chicken.
- Compare the two different types of feeds on both Local and Grade chicken.
- Compare the frequency of egg production and price of eggs from Local and Grade chicken.

Establishment & Management Period

Activities	Duration
Planning & Designing	1 day
Preparation	2 days
Monitoring	Every week
Production	After 6 8 months

11. Dairy Animal Management

(only in case the group provides animals)

Cost Estimate (an example)

Requirement	Quantity	Unit Price (Ksh.)	Total
Cuttings of Napier Grass	216	5	1,080
Seeds of Rhodes Grass	2 kg	600	1,200
Fertilizers	6 kg	50	300
Housing Material		Host farmer's Cost	
Drugs, Mineral licks, Vaccines, Acaricides		Host farmer's Cost	
Total			2,580

Benefit

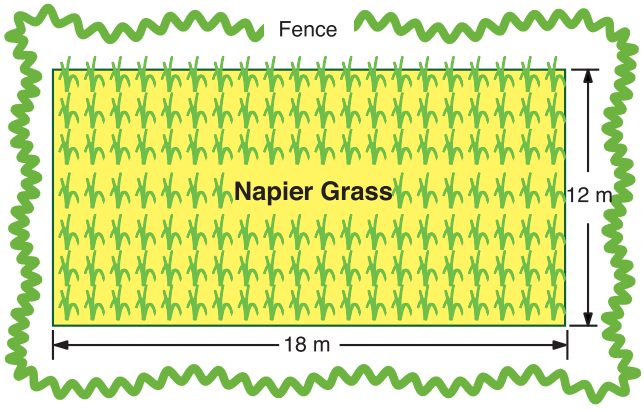
- Better milk production in quantity and quality.
- Zero grazing allows use of limited space.
- Good source of manure for crops and fodder production.
- Animal is confined hence no need to roam around.

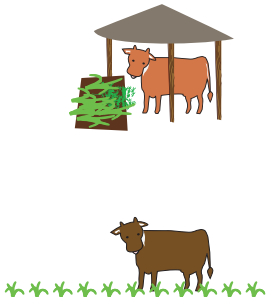
Remarks

- Use member's existing livestock as host animals.
- Use existing livestock keeping structure or construct small paddocks or zero grazing unit if required.
- Fodder bank should be established nearby (with Napier Grass or/and Rhodes grass).
- Simple silage practice can be introduced to ensure availability of animal feed during dry period.
- Need to have adequate water nearby and hygiene is of outmost importance.
- Highly labour intensive.

Possible PTD Design

- Compare the milk production before and after start of feeding animals with cut and carry fodder grass.
- Compare health of animals before and after feeding animals with cut and carry fodder grass.
- Compare the workload or labour needed before and after start feeding with cut and carry fodder grass.





Establishment & Management Period

Activities	Duration
Planning & Designing	1 day
Preparation	1 day
Planting	1 day
Monitoring	Every week

Annex 2. Study Guide

Livelihood Farmer Field Schools

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About this study guide

This Study Guide has been prepared for Livelihood Farmer Field Schools (LFFS) under TCP Sustainable Livelihood Development in the Mau Forest Complex. Each activity or enterprise represents a learning package, which consists of the objectives, materials, possible layout, procedure and questions to discuss.

Most of the learning options are designed in combination with income generating or livelihood supporting activities to attract farmers' interest in participation.

The group members are expected to select their LFFS learning enterprise from the Enterprise Catalogue and develop learning plan after conducting "Learning Expectation Session". Please, read the menu of enterprises carefully and discuss among the members which option might be most appropriate enterprises in your area and worth trying through LFFS. The catalogue is supposed to help members to discover some possible solutions for livelihood improvement and environment conservation.

The emphasis of this guideline is on self guiding as it is written in simple straight forward language for both technical staff as well as the farmer facilitators. The implementation of this guideline will improve the performance of different groups and provides a diversity of options for the farmer field schools not only in the project area but in other areas as well.

11th March, 2010

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NONE

1. Wood Lots for Timber

Objectives

In this trial you will compare the performance of two timber species planted with agricultural crops at a moderate spacing and crop yields during the first one or two years.

Material

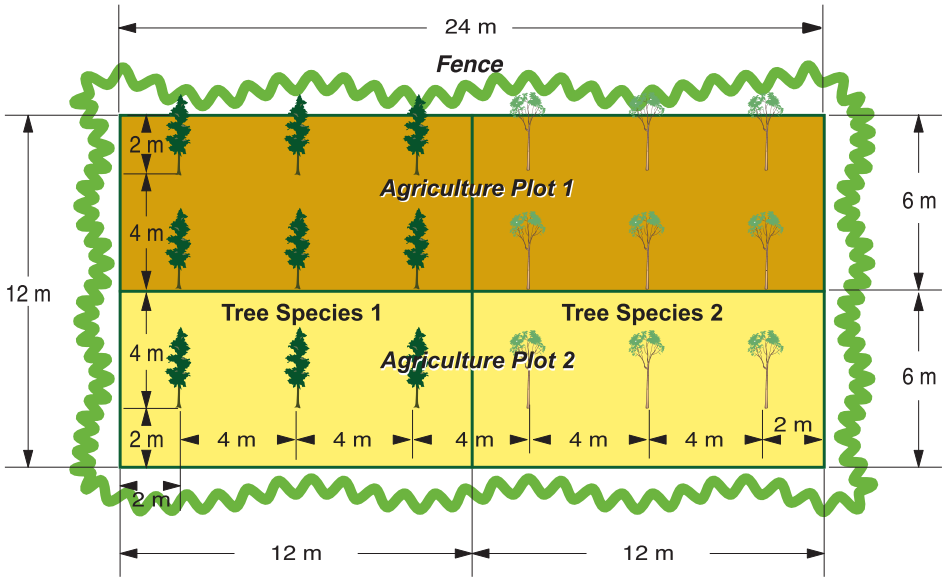
Implements for land preparation and cultivation, supply of maize/sorghum/millet seeds, seedlings of species 1and species 2 as chosen by the group, sticks, tape measure, ruler, string, note books and pencil.

Layout

Implements for land preparation and cultivation, supply of maize/sorghum/millet seeds, seedlings of species 1and species 2 as chosen by the group, sticks, tape measure, ruler, string, note books and pencil.

Procedures

1. Select a piece of land measuring 24m by 12m with relatively uniform soil characteristics on a flat or gently sloping area. This land should be provided by one member of the group – the "host farmer".
2. Prepare the land by clearing of bushes and shrubs before the rain season starts. The land should also be ripped using an oxen plough to increase infiltration of rainwater.



3. Divide the plot into two equal plots of 12m by 12m for the two (2) tree species before the rains start as shown in the layout above.
4. At the same time, divide the plot perpendicular to the first division into two equal plots of 24m by 6m for agriculture crop testing: you can compare a new variety of maize against local variety; one crop variety with manure and without; or one crop variety with fertilizer and without.
5. Stake out the two plots at a spacing of 4m by 4m before the rains start.
6. Dig tree planting holes measuring at least 30cm by 30cm wide and 30cm deep.
7. Before the onset of the rains, identify a source of seedlings of the selected species, purchase and deliver them near the planting site.
8. Construct fences surrounding the plot. This is done to ensure that the whole plot is protected from animals even after harvesting of crops.
9. After the onset of the rains, plant the tree seedlings of the two selected species as early as possible so that they can take advantage of the rains for a long period.
10. Plant the agricultural crop for the trial selected. Use the recommended by agriculture extension officers in your area for spacing between rows, and seeds in a row.
11. Weed the plot according to normal farming practice. Oxen ploughs should be used to plough the land between crops to improve water infiltration and its subsequent conservation.
10. At regular intervals during the season, monitor crop and tree growth i.e. tree survival, tree damage, tree height, crop length, number of live and dead leaves and record the observations of at least three (3) maize plants in each of the four plots of 12m by 6m. Observe pests and diseases both in trees and crops.
13. When the crops are ready, the group should meet and agree on the day to harvest.
14. From each of the four plots of 12m by 6m harvest carefully each plot separately and measure the yields from each plot and compare the yields.
15. Compare the survival and height of the two tree species selected.

Questions to discuss

- Was there a crop yield difference between the different plots?
- Was there any difference in tree height growth and survival between the two selected species in year one and year two?
- Were there any advantages and/or disadvantages of intercropping each tree species with food crops?
- What were some of the problems encountered in the establishment and management of the woodlot?

2. Wood Lots for Poles and Firewood

Objectives

In this trial, you will compare the performance of a wood fuel species planted at two different spacings. Agricultural crops like beans can be planted in both plots at different spacing to compare the yields during the first year.

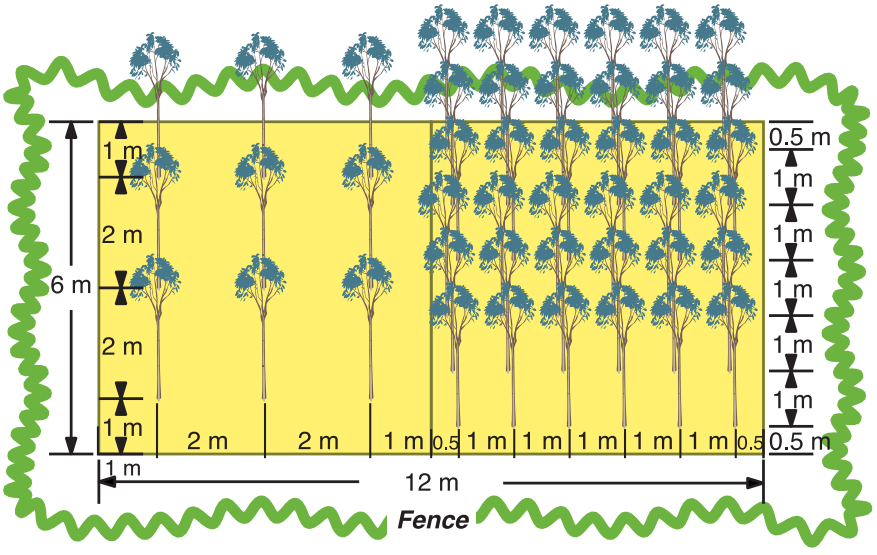
Material

Implements for land preparation and cultivation, supply of beans, seedlings of wood fuel species as chosen by the group, sticks, string, tape measure, ruler, pencil and note books

Layout

Procedures

1. Select a piece of land measuring 12m by 6m with relatively uniform soil characteristics on a flat or gently sloping area. This land should be provided by one member of the group – the "host farmer".
2. Prepare the land by clearing the bushes and shrubs before the rainy season starts. The land should also be ripped using an oxen plough to increase infiltration of rainwater.



3. Divide the plot into two equal plots of 6m by 6m for two (2) tree species before the rains start as shown in the layout above.
4. At the same time, divide the plot into two equal plots of 6m by 6m for agriculture crop testing, you may compare: a new variety of maize against local variety; one crop variety with manure against without; or one crop variety with fertilizer against without.
5. Stake out one plot at a spacing of 2m by 2m and the other at 1m by 1m before the rains start.
6. Dig tree planting holes measuring at least 30cm by 30cm wide and 30cm deep.
7. Before the onset of the rains, identify where seedlings of the selected species are available, purchase and deliver them near the planting site.
8. Construct fences surrounding the plot. This will be done to ensure that the whole plot is protected from animals for a long period after harvesting of crops.
9. After the onset of the rains, plant the tree seedlings of the two selected species as early as possible so that they can take advantage of the rains for a long period.
10. Weed the plot according to normal farming practice. Oxen ploughs should be used to plough the land between crops to improve water infiltration and its subsequent conservation.
11. At regular intervals during the growing season, monitor crop and tree growth i.e. tree survival, tree damage, tree height, crop height, number of live and dead leaves and record the observations of at least three (3) maize plants in each plot of 24m by 6m. Observe pest and disease both in trees and crops.
12. When the crops are ready, the group should meet and agree on the day to harvest.
13. From each of the two plots of 6m by 6m, harvest carefully each plot separately, measure the yields from each of the plot and compare the yields.
14. Compare the survival and height of the two tree species selected.

Questions to discuss

- Was there a crop yield difference between the two plots?
- Was there any difference in tree height and survival between species 1 and species 2 after one and two years?
- What were some the problems encountered in the establishment and management of the woodlot?
- Were there any advantages and/or disadvantages of intercropping each tree species with food crop?

3. Fruit Orchards

Objectives

In this trial you shall test the performance of different varieties of fruits e.g. avocadoes or citrus in terms of size and quality of fruits, the flowering and fruiting time, and pest and drought resistance.

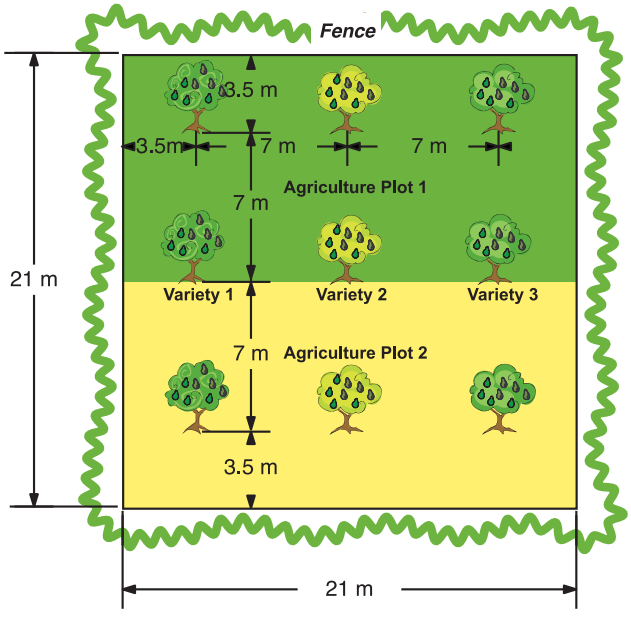
Material

Implements to prepare the land and undertake cultivation, seedlings of different grafted avocado varieties, maize/sorghum/millet and bean/green gram seeds, notebooks, pencils and measuring tapes to be obtained.

Layout

Procedures

1. Select a relatively flat field of 22 by 22 metres.
2. 2. Before the start of the rains, clear the land of bushes and shrubs. This should also be ripped using an oxen plough to increase infiltration of rainwater.



3. Mark the planting points at a spacing of 7m by 7m in 21m by 21m plot so that the plot has 9 fruit trees. Dig holes of 90cm by 90cm by 90 cm for the planting of the fruit tree seedlings. This is only applicable for avocadoes; for the other fruit tree seedlings, use 60cm by 60cm by 60cm as shown in the layout above.

4. At the same time, divide the plot into two equal plots of 21m by 10.5m for agriculture crop testing. You may compare: a new variety of maize against local variety; one crop variety with manure against without, or one crop variety with fertilizer against without.
5. In each fruit seedling planting hole, put a third of a 90kg bag of animal manure. Mix it with the topsoil to fill the hole.
6. Select three appropriate fruit varieties (Avocado: Hass, Fuerte, Gwen, Bacon, Pinkerton, Reed, Lamb Hass and Zutano among others.)
7. Before the onset of the rains, identify where the selected varieties of Avocado fruit seedlings are available, purchase and deliver them near the planting site.
8. Plant the agriculture crops between the rows of fruit trees using the spacing recommended by agriculturists for the area.
9. Plant pigeon peas in the outer strip of 2.5m width surrounding the plot. This will be done to ensure that the whole plot is protected from animals for a long period.
10. Immediately after the onset of rains, plant the three different varieties of Avocado fruit tree seedlings each in its own row of three trees.
11. Weed the plot according to normal farming practice. Oxen plough should be used to plough the land between crops to improve water infiltration and its subsequent conservation.
12. During the growing season, monitor the crop growth rate, count the number of leaves, number of cobs, and record other observations of three (3) maize plants in each plot of 21m by 10.5m. Also monitor pests and diseases.
13. At regular intervals, monitor the fruit seedling survival, height and count the number of branches and branchlets of the fruit trees, any pest and disease problems and monitor the time of flowering for each fruit tree species.
14. When the crops are ready, the group should meet and agree on the day to harvest.
15. From each of the two (2) plots of 21m by 10.5m carefully harvest each plot separately and measure the yields from each of the sub plots.

Questions to discuss

- At what time did the different fruit varieties start flowering and fruiting?
- Is there any difference in crop yield in the first and second year? What is the probable cause?
- Which variety among the three fruit varieties performed best?
- What are the advantages and disadvantages of having different varieties of fruit trees?

4. Fodder Bank for Livestock

Objectives

In this trial you shall discover the benefits of growing fodder trees on the farm for feeding livestock. Fodder is green vegetation from trees that is harvested and fed to animals without allowing the animals to feed directly on them. Manual harvesting of fodder helps to ensure the availability of animal feed during the dry season.

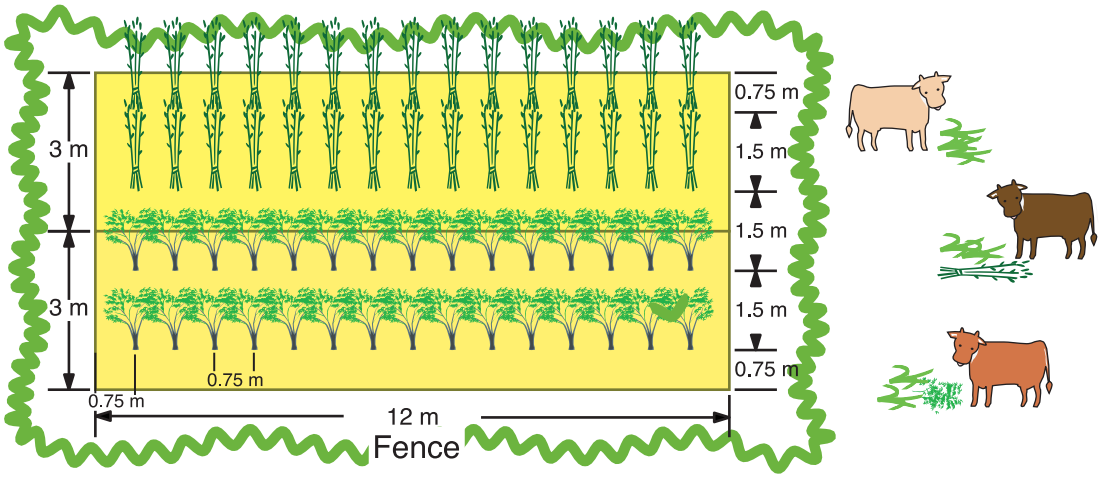
Material

Implements for land preparation and weeding, supply of seedlings/cuttings of the two selected species and beans/green gram, sticks, notebooks, pencil, ruler and tape measure.

Layout

Procedures

1. Select a field with relatively uniform soil characteristic on a flat or gently sloping land.
2. The land should be at least 6m by 12m so that two species may be tried on plots of 3m by 12m each.



3. Before the rainy season, clear the bushes and shrubs. The plot should also be ripped using an oxen plough to increase infiltration of rainwater.

4. Stake the plots for the planting spots at a spacing of 1.50m by 0.75m. Dig holes of 30cm by 30cm by 30 cm for the planting of the fodder tree species seedlings as shown in the layout above.
5. Before the onset of the rains, identify where seedlings of the selected two species are available, purchase and deliver them near the planting site.
6. Plant beans/green gram between the rows of trees in the two plots uniformly using the spacing recommended by agriculturists for the area.
7. Construct fences surrounding the plot. This will be done to ensure that the whole plot is protected from animals for a long period after harvesting of crops.
8. After the onset of the rains, plant the fodder tree seedlings as early as possible so that they can take advantage of the rains for a long period.
9. Weed the plots according to normal farming practice. Oxen ploughs should be used to plough the land between crops to improve water infiltration and its subsequent conservation.
10. At regular intervals during the year, monitor the following in all the plots: height growth of the planted trees, survival of the trees and the number of branches. Monitor pests and diseases on both trees and crops.
11. Harvest the crops from each plot separately and record the yields.
12. When the fodder is ready for harvesting, measure the weight of the fodder harvested in each plot every time in kilograms. Feed the same amount to a specific number of animals and compare the result with the common animal feeds.
13. Do a cost benefit analysis to evaluate the advantages and disadvantages of growing the two different fodder tree species together with agricultural crops.

Questions to discuss

- Is there any difference in yield i.e. weight of material cut from the two fodder tree species; what do you think was the reason?
- What are the advantages and/or disadvantages of cutting and carrying the feed to the animals?
- Was there a noticeable change in health and milk production among the animals fed on the fodder?
- Was there any fodder species preference among the livestock?
- Were there any problems encountered while introducing the animals to the fodder?

5. Bamboo Planting

Objectives

In this trial you shall discover the benefits of growing fodder trees on the farm for feeding livestock. Fodder is green vegetation from trees that is harvested and fed to animals without allowing the animals to feed directly on them. Manual harvesting of fodder helps to ensure the availability of animal feed during the dry season.

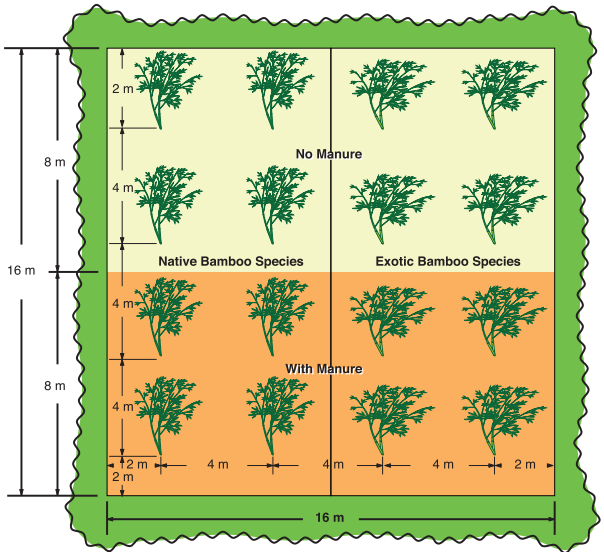
Material

Implements for land preparation and weeding, supply of seedlings/cuttings of the two selected species and beans/green gram, sticks, notebooks, pencil, ruler and tape measure.

Layout

Procedures

1. Select a relatively flat field of 16 by 16 metres.
2. Before the start of the rains, clear the land of bushes and shrubs. This should also be ripped using an oxen plough to increase infiltration of rainwater.



3. Mark the planting points at a spacing of 4m by 4m in the 16m by 16m plot so that the plot can take 16 bamboos. Dig holes of 30cm by 30cm by 30 cm for the planting of the bamboo tree seedlings.

4. At the same time, divide the plot into two equal plots of 16m by 8m for agriculture crop testing: you may compare one crop variety (maize) with fertilizer against without.
5. Select two bamboo varieties (Indigenous/Local and Exotic).
6. Before the onset of the rains, identify where the selected varieties of bamboo seedlings are available, purchase and deliver them near the planting site.
7. Plant the agriculture crops between the rows of bamboo using the recommended spacing by agriculturists for the area.
8. Construct a fence surrounding the plot. This will be done to ensure that the whole plot is protected from animals for a long period.
9. Immediately after the onset of rains, plant the two varieties of bamboo seedlings each in a 16m by 8m plot as shown in diagram above.
10. Weed the plot according to normal farming practice. Oxen ploughs should be used to plough the land between crops to improve water infiltration and its subsequent conservation.
11. During the growing season, monitor the crop growth rate, count the number of leaves, number of cobs, and record other observations of three (3) maize plants in each plot of 8m by 8m. Also monitor pests and diseases.
12. At regular intervals, monitor the bamboo seedling survival, height and count the number of new shoots and any pest and disease problems for each bamboo variety.
13. When the crops are ready, the group should meet and agree on the day to harvest.
14. From each of the four (4) plots of 8m by 8m carefully harvest each plot separately and measure the yields from each of the sub plots.
15. Crops can be planted in the second year in the same manner.

Questions to discuss

- How was the yield difference between the crops planted with fertilizer/manure and without?
- Is there any difference in crop yield between the first and second year? What is the probable cause?
- Which variety of bamboo performed better in terms of survival and growth?

6. Tree Nurseries

a. Seed pre-treatment using water

The process of germination starts once the seeds have obtained an adequate amount of water thus initiating the development of the young embryo. The intake of this water varies with species depending on the prevailing condition. In this trial, you are to learn through comparison whether pre treating seeds with hot water or soaking them in cold water overnight will improve their germination.

Treatments

- Soak seeds in cold water overnight
- Pre treat seeds with hot water
- Control (do not soak)

Duration

1 Month.

Procedures

1. Select a tree species for trial and obtain some seed of the same. Divide randomly some 300 seeds into three equal portions of 100 seeds each. Subject one portion to hot water pre treatment; soak one portion in cold water overnight while you leave the other portion untreated. Sow the three portions under similar conditions. Check daily and water the seedbed when it is dry.

2. When germination starts, count germinated seedlings from each treatment on a daily basis and prick out.

AESA parameters

Number of germinated seedlings and time taken.

Summary table

Treatment	Germination (no. of seedlings by day)	Total no. of seedlings	Germination %	Remarks
	1 2 3 4 5 6 7 8 9 10 11 12 13..... .....24 25 26 27 28 29 30 31			
Hot water				
Cold water				
Control				

Questions to discuss

- How many seedlings germinated in each seedbed?
- How many days did it take for the seed to start germinating in each treatment?
- How long did it take for germination to end in each treatment?
- Apart from the time of germination, is/are there any other difference(s) in the characteristics of seedlings?
- What were the advantages and disadvantages of the two different pre treatments in terms of germination and health of the seedlings?

b. Species germination performance

After sowing of seeds of different species, some will germinate immediately while others will take some time. While delay in germination is not a negative effect, it is necessary for you to know for planning purposes which species germinate fast and those that are slow. This shall therefore guide in the future planning of nursery activities so that seedlings are retained in the nursery for as little time as is necessary to produce a healthy and sturdy stock.

Treatments

The various commonly sown species in the locality shall be divided in two general groups. These are the slow growing and the fast growing species. They shall be sown under similar conditions in specific parts of a seedbed.

Duration

1 Month

Procedure

A seedbed shall be prepared and divided into four sections. In each section 100 seeds of a single species shall be sown. The whole bed shall have the same soil media, watering regime and cover for shade if applied. The germinated seedling shall be counted and pricked out into the pots.

Slow growing species shall be germinated between May and June while the fast ones shall be sown between December and January.

AESA parameters
Number of germinated seedlings.

Summary table

Species	Number of seedlings Germinated by day	Total no. of seedlings	Germination %	Remarks
	1 2 3 4 5 6 7 8 9 10 11 12 13..... .....24 25 26 27 28 29 30 31			
A				
B				
C				
D				

c. Difference between direct and indirect seed sowing

Seeds can be sown either directly into poly bags where they are maintained until they are ready to plant out in the field or they can be sown in seedbeds and later pricked out into bags. Normally the procedure used depends on the size of the seed; for very small sized seeds, it is advised that the same are sown in seed beds while the big sized ones can be sown using either method. The objective of this trial is to determine the most appropriate sowing method for large sized seed.

Treatments
Direct and indirect sowing of seed.

Duration
2 months

Procedure
Take 200 big size seeds of the same species and divide them into two sets of 100 seeds each. Sow 100 into individual pots and sow the remaining 100 into a seedbed. Subject the seeds to similar watering and shade if any is provided. Give time for germination to take place as observations are made regularly.

AESA parameters

- Numbers of germinated seed
- The period taken to germinate and
- Number of seedlings established.

d. Difference between direct and indirect seed sowing

In this trial you will learn through comparison the best soil mixture to use in raising seedlings. Some soils have adequate plant nutrients while others are deficient in a number of plant nutrients. As a result some soils shall greatly improve with addition of either manure or fertilizers but others will register minimal growth improvement. You will therefore compare the growth performance of seedlings in the usual soil on the farm with seedlings of the same species grown in the same soil mixed with: manure, sand, fertilizer or a combination of the same.

Treatments

These are application of a mixture of:

- Soil, manure, sand and fertilizer
- Soil, manure and sand
- Soil and manure
- Soil only

Procedure

Assemble the materials at the nursery i.e. soil, sand, manure and fertilizer. Mix them into proper proportions. From each mixture, pot 100 containers of equal size. Transplant one hundred seedlings of the same species and size into each of the four different batches of containers. The pricking out should be done on the same day. All the seedlings should be given the same treatment thereafter as part of the management.

Arrange each treatment in one block for easy identification. Monitor the growth performance of the seedlings in each treatment every week and record the observation. Measure the height of five (5) randomly selected seedlings in each treatment once a week.

Duration
2 to 3 months

AESA parameters
Height of seedlings and the girth

Questions to discuss

- Which kind of problems have you observed in each treatment?
- Are there any advantages and/or disadvantages of using sand, fertilizer or manure in the potting soil?

e. Species performance

Different tree species grow at different rates under similar conditions. However, while many species are suitable for timber production, their growth rates are quite different. As a result some provide the products at an early age than the others.

The objective of this trial is to determine the growth rates of timber producing species at the nursery stage.

Treatments
The species are Cypress, Pine, Eucalyptus and Grevillea.

Procedure
Assemble 50 young seedlings of relatively uniform size and age of each of the four species: Cypress, Pine, Eucalyptus and Grevillea. Subject them to similar growing conditions but specifically ensuring no water logging conditions prevail at any time. Sample 5 seedlings randomly of each species during AESA taking every two weeks.

Duration
3 months

AESA parameters
Height of seedlings and the girth

f. Shade effect

In this trial you shall test the effect of shade on the growth development of different species to determine those species that may require shade

and those that can be raised in the open. You shall compare the growth development of seedlings of each species both under shade and in the open sun. The seedlings shall be tested both during the wet season and the dry season. The other nursery treatments for the seedlings such as watering, soil mixture or weeding shall be maintained the same so that the only difference is the application of shade.

Seedlings in the open

Seedlings under shade

Procedure

Stage 1: shading after pricking out for 2 months
Place ten seedlings of a specific species under shade and ten in an open area. Observe for one week and conclude the result.

Stage 2: shading during the dry season
Place ten seedlings of the same species as in stage 1 above under shade and ten in an open area. Water adequately to keep both treatments under the same moisture condition since the trial is to compare seedlings in the sun and those under shade and not watering frequency (obviously in open area, the seedlings may require more frequent watering).

AESA parameters
Stage 1: Survival rate

Stage 2: Height, girth, number of leaves, survival and a statement of their growth vigour

As these trials take a short period, the FFS may decide to try several species, one at a time to gain knowledge on the different species they encounter in their locality.

g. Types of seedling beds

There are numerous types of seedling beds in use. However, some are more appropriate for use in different climatic zones than others. In this

trial, you are expected to learn the different types of bed to use in your area. Two types of beds shall be considered: these are the sunken beds and the raised beds. The other nursery conditions shall be maintained the same, which is, the species, age of seedlings, spacing, size of pots and the watering regime.

Raised seedling bed

Sunken seedling bed

Procedure
Immediately after pricking out, put 50 seedlings into each of these two beds.

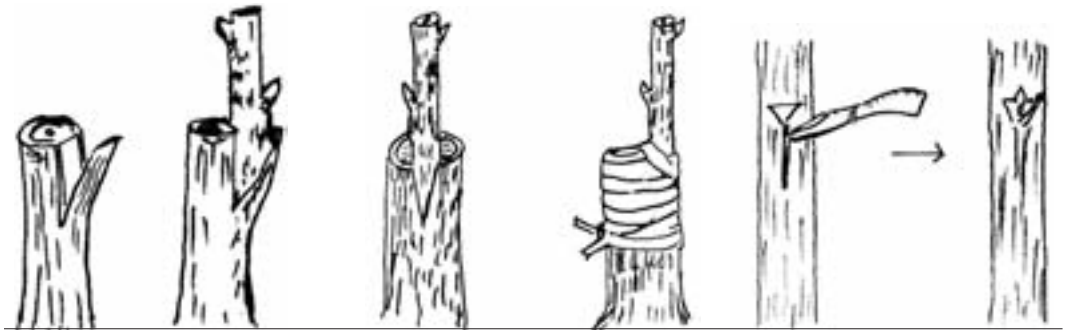
Duration
1 month

It is possible to conclude this test even within a shorter period depending on the growth rate of the species.

AESA parameters
Height, girth, survival of seedlings, number of leaves.

h. Different techniques of grafting

In this trial, you are expected to learn the different grafting techniques for mangoes. The main question shall be; which among the various grafting techniques is more appropriate than the others? Two grafting techniques shall be compared; these are the side or splice grafting and the top, cleft or wedge grafting. The other conditions including the size of rootstock, the source and size of scion and the general management of the grafts shall be maintained as similar as possible. For mangoes, the best season for this practice is May. The grafts shall be observed for a period of four (4) weeks.



Side grafting Cleft grafting Budding

Procedure
Select 50 rootstock of relatively the same size for two grafting treatments. Acquire 60 scions also of equal size as the root stock from a common source for mangoes. Prepare and graft 25 root stocks using top grafting and the other 25 using side grafting. Observe weekly and record the number of success.

To ensure the person responsible for grafting does not get tired doing one technique and do the other rather badly, the 2 techniques should be implemented simultaneously and the same person(s) should do both.

AESA parameters
Number of successful grafts, number of branches developed, girth.

Questions to discuss
- Which method was more difficult and why?
- Which method was more successful and why?
- What were the advantages and disadvantages of both grafting techniques?

i. Post grafting management of seedlings

In this trial you are expected to learn through comparisons the most appropriate technique for successful grafting in as far as the covering of the grafts is concerned. The key question shall then be: do we need to cover the newly grafted seedlings with a polyethylene bag?

The treatments in this trial shall be: newly grafted seedlings covered with polyethylene bags and others not covered. The other management practices shall be maintained as similar as possible including the variety of fruits, the grafting technique and all other nursery practices.

Covered grafts

Not covered

Duration
21 days

Procedure
Graft 50 seedlings of mangoes of the same variety and cover each seedling with a polyethylene bag. Graft another 50 seedlings using the same batch of scions and root stock and leave them uncovered. Put all the grafted seedlings close together such that they are tended together at all times including during watering.

AESA parameters
Number of successful grafts.

j. Effect of age of root stock on rate of grafting success

While undertaking grafting, it is often that the required rootstocks are not available in the nursery. These are consequently obtained from other nurseries, where they are normally remnants from the previous year's stock (which are generally old) or the newly raised stock, which are often very young and tender. The objective of this trial is to establish which is the most appropriate rootstock to use for grafting in such situations?

Treatment
Two types of rootstocks of the same species shall be obtained: old and young. These shall be grafted with scions from the same source and grafted using the same technique. For each batch, 20 grafted seedlings shall be prepared. All of them shall be subjected to similar nursery practices.

Duration
21 days

Procedure
Graft 20 old seedlings of mangoes and another 20 young ones using the same batch of scions. Put all the grafted seedlings together but in a

manner that is easy to identify each of them. Give the grafted seedlings similar nursery management practices.

To ensure the person responsible for grafting does not get tired doing one rootstock and do the other rather badly, the 2 rootstocks should be implemented simultaneously and the same person(s) should do both.

AESA parameters
Number of successful grafts.

k. Effect of position of a seedling in a seedling bed

This trial presupposes that the position of a seedling in a bed has some bearing on the tending and therefore the health of the seedling. The key question then is; does the position of the seedling in a bed affect its growth performance?

Treatment
A total of 144 seedlings of the same species shall be pricked out on the same day into polyethylene tubes/bags of the same size filled with the same soil medium. These shall be arranged in a 12 by 12 arrangement in a bed. The seedlings shall then be subjected to similar tending practices

Duration
3 months

Procedure
After pricking out, arrange the seedlings in rows of 12 until the 12th row. Seedlings in the outer 2 rows on all 4 sides shall be considered as being in the periphery while those in the inner 8 by 8 rows shall be considered to be in the middle. Therefore, 80 seedlings are in the periphery while 64 are in the middle.

AESA parameters
Survival, height growth, girth.

I. Effect of fertilizer and manure on seedling growth

The soil in our farms is normally deficient in plant nutrients due to continuous cultivation . However, this is the only soil available on the farm for raising the forest trees before planting them in the field.

While the growth rate may be negatively affected by lack of or limited plant nutrients, addition of fertilizer and/or manure may improve the growth rate and therefore shorten the nursery duration. The key question in this trial therefore is: is there any effect on the growth rate of seedlings as a result of adding either fertilizers or manure?

Treatment
Select 300 young seedlings of the same species, age and in similar containers. Divide them into 3 batches of 100 seedlings each. In batch 1 add fertilizer (approximately 5 gm per seedling). In batch 2 add manure (2 handfuls per seedling) and then mix thoroughly with the soil and water heavily. Batch 3 shall be left as the control.

Fertilizer

Manure

Control

Duration
3 months

Procedure
Put 300 seedlings of relatively the same size in 3 batches of 100 seedlings each. Among the first batch of 100 seedlings, add fertilizer at the rate of 1 teaspoonful per seedling. In the second batch add manure at the rate of one handful per seedling while the third batch shall be left as it is.

Subsequently give similar nursery management treatments to the 3 batches.

AESA parameters
Height growth, girth.

m. Watering frequency

The common believe among tree growers, is that watering must be carried out twice daily at all times to produce healthy vigorously growing seedlings. As a result there is a general tendency of over watering of seedlings in some situations, such as during cold period thus causing retarded growth or death of seedlings. This is especially so among pine seedlings. Consequently as tree growers, you need to know how frequently you should water the seedlings of different species.

Treatment

Treatments involving different watering frequency shall be applied. These are:

- Water once daily
- Water twice daily and
- Water once every other day

Once per day

Twice per day

Once every other day

Duration

4 months

Procedure

Select 150 seedlings of the same species that are relatively young and of the same size. Divide them into 3 batches of 50 seedlings each.

Seedlings in batch 1 are to be watered once daily, batch 2 to be watered twice a day while batch 3 shall be watered after every other day. All other nursery practices should be maintained the same for all three batches. For example you shall use the same water source, seedlings put in pots of same size and watering must be done properly and at the same time (either evening or morning for all seedlings whenever it is done).

AESA parameters

Height growth, girth, survival.

n. Effect of root pruning on seedlings growth

Root pruning involves the cutting back of roots of seedlings that normally develop beyond the confines of the container. It is done to ensure that the seedlings do not get established in the nursery. Therefore it remains easy to shift seedlings in the nursery from one point to the other including taking them to the field during planting. However, this operation interferes with the normal growth of the seedlings. Consequently, considering that it is essential that sturdy seedlings of the right size must be raised in the nursery, the key question is, is it necessary to root prune?

Treatment

After pricking out 100 seedlings into polyethylene bags, divide randomly into two groups of 50 seedlings. One batch of 50 seedlings shall be subjected to root pruning whenever the roots develop beyond the confines of the container while the other batch of 50 seedlings shall be left with no disturbance. Other nursery operations shall be maintained in a similar manner as much as is practical. During weeding of seedlings, the ones not to be root pruned should not be lifted, as this causes the roots to be severed.

Seedlings not root pruned

Root pruned seedlings

Duration

4 months

AESA parameters

In the nursery: Height, girth.

In the field: Survival, height growth.

7. Home Garden

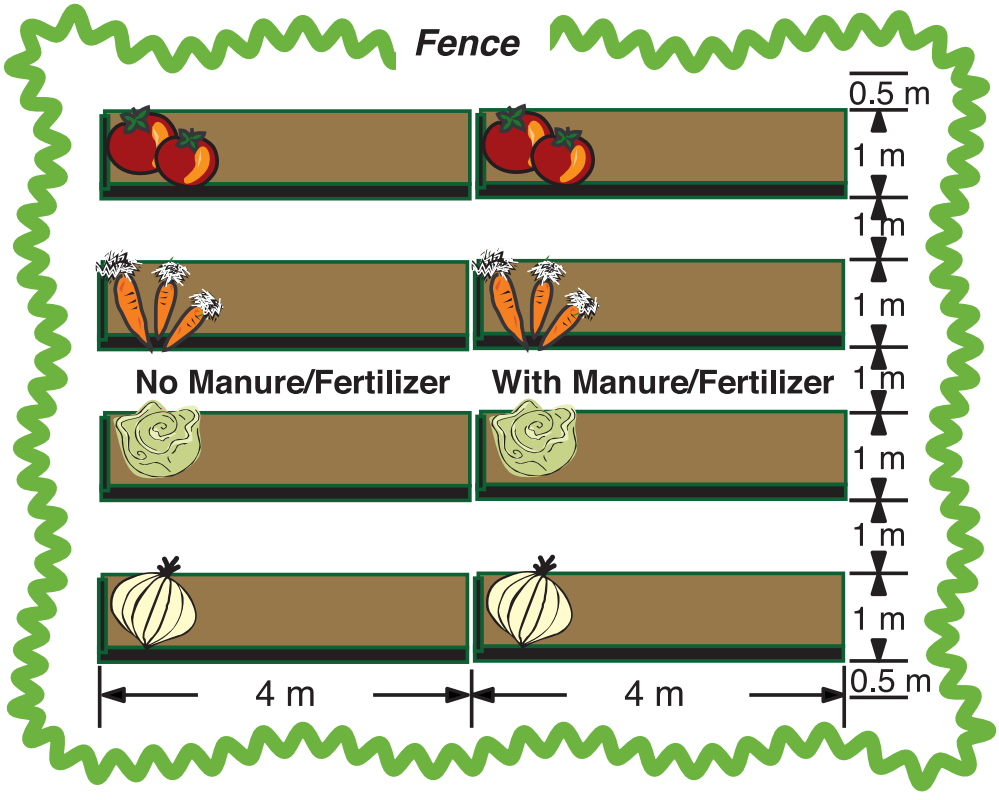
Objectives

In this trial, you will test the four main species or varieties of vegetables, root crops, herbs/medicinal plants or spices, in the traditional home garden. You shall practice the propagation and management, monitor the performances and compare the production and cost effectiveness.

Material

Implements for land preparation and cultivation, seeds of several vegetables, small fruits, root crops, herbs/medicinal plants/spices, locally available organic manure, fertilizer, chemicals, tape measure, ruler, sticks, string, notebooks and pencil.

Layout



Procedures

1. In each sub group select one favourable species to try. If there are many sub groups intending to try the same species, it may be necessary to differentiate the subgroups by assigning different varieties of the same species and compare their performance. The facilitator shall, while respecting the members preferences, guide them not to select inappropriate species, which are unlikely adapt to the environmental conditions of the particular location.
2. Select a piece of land measuring 8m by 8m with relatively uniform soil characteristics on a flat or gently sloping area near the homestead. This land should be provided by one member of the group – the "Host Farmer".
3. Members shall also enter into an agreement with the host farmer on the sharing of the product after harvesting.
4. Prepare the land by clearing and hoeing before the sowing.
5. Mark and stake out the plot (8m by8 m) with sticks or poles in four small planting ridge of 1m by 4m as shown in the layout. The ridges should be along the contour.
6. Divide each row into two and agree on which side to apply manure/fertilizer and which side to be left as the control (see the layout figure). Apply manure/fertilizer into the side of the row agreed by the group.
7. Construct a fence to protect from livestock including chicken.
8. Develop the seedbed separately for the species, which require it. Transplant to the rows developed. If the species do not require a seedbed and the planting materials are big enough, plant directly into the rows.
9. Develop the ridges and plant the seed/seedling/planting materials. Spacing and height of rows will depend on the species selected. If you are not sure consult an agriculturalist. Each species shall be planted at the spacing recommended.
10. The group can reduce the cost of chemicals by using tobacco, Datura, hot pepper, Neem or other herbal extract, etc.
11. Weed the plot according to normal farming practice.
12. At regular intervals during the season, monitor crop growth performance i.e. height, circumference, number, width and length of leaves; number and size of corns, and record the observation of at least three plants in each plot of 4m by 1m. Observe pest and disease both in crops also.

13. When the vegetables/root crops/herbs/medicinal plants/spices are ready, the group should meet and agree on the day to harvest.
14. During harvesting, record the yields and if the produce is sold, record also the income from each side of 1m by 4m ridge and each of the four vegetable species or varieties for further cost benefit analysis.

Questions to discuss

- Was there any yield difference between the half ridge with fertilizer/manure or mixture of fertilizer and manure, and the control (the half row without manure or fertilizer)?
- What measures has the group put in place to ensure harvesting is done well?
- Were there any advantages and disadvantages of using fertilizer or manure on the yields?
- What were some of the problems encountered in the establishment and management of the garden?

8. Beekeeping

Objectives

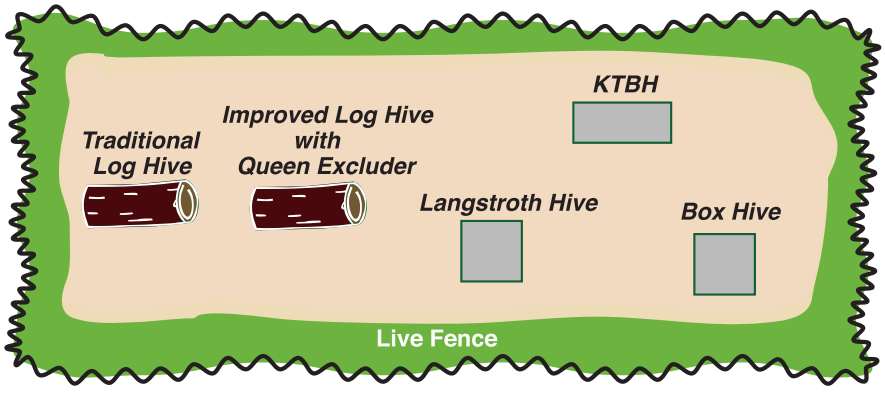
Beekeeping generates income in the short term through production of honey, beeswax and other products (2 to 3 times a year depending on season and environmental conditions). For learning purposes, in this trial you will compare the performance of several types of bee hives: Langstroth hive, Box hive (similar to Langstroth type but without an inner frame), Traditional log hive, Improved log hive with queen excluder and Kenya Top Bar hive(KTBH) to determine the most appropriate type for the members.

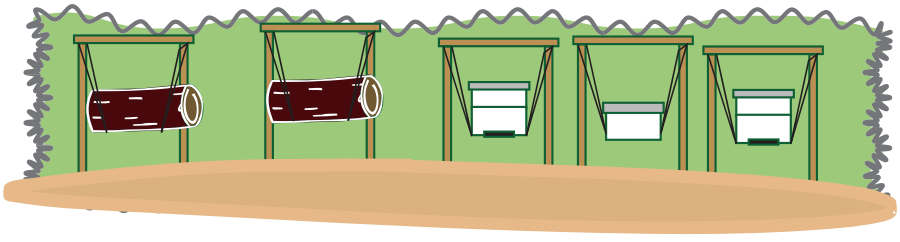
Material

Langstroth Beehive, Kenya Top Bar Hive or Box Hive, Local Beehive, Wire mesh (Queen Excluder), Hanging Wire, Treated Posts, Bee Suits, Smoker, Hive Tools, Gum Boots, Torch..

Layout

2 to 3 types of hives can be selected depending on the provided learning budget.





Procedures

1. At the beginning of the enterprise, you can ask members to list all flowering plants around the site including crops and weeds e.g. Acacia, Eucalyptus, Beans, Sun flower so that they can understand the existing vegetations or resources which will benefit the bees. Since nectar and pollen are the principal diet for bees, farmers should understand which kinds of flowering plants are available in the area. Through long term AESA observations on flowers, farmers may realize and appreciate the importance of existing vegetation especially forest resources.
2. Start preparing in February or August. March and September are good months for accumulation of honey by bees because the intensity of sunlight is high during these months. March is also a flowering season for many acacia trees.
3. Site selection and Preparation: The site for an apiary should be far from human activity such as homesteads and grazing areas. The site should have shade for hives and free from weeds and bushes, which will attract ants or other bee enemies.
4. Colonization: Initially start with only the Brood Box (without Super Box) in the apiary. When bee swarms in the area start (usually end of March), hang or put the hives on the trees at the height of 2 to 3 m, the usual height the traditional hives are hung. This is because swarms of bees usually fly at that height. If natural forest is close to your place, you can hang the box temporarily in the forest to catch bees.
5. Transferring the colonised hive to permanent site and first inspection: After 2 weeks, put down the hives at the apiary and conduct the first practical/open hive inspection. If the colony has developed in less than 4 frames out of 10 to11, you can conclude that it is a weak colony. In this case release the queen and hang hive again to catch another swarm. If more than 5 frames are occupied, you can conclude it is a strong colony and you can continue with the colony. [Whether a colony is strong or weak will depend on the queen's capacity but if you keep weak colonies for a long time, this will attract wax moth which eventually destroys them].
6. Weekly AESA observation (Visual Inspection): Visual observations should be conducted during weekly AESA sessions. The following parameters are important to be considered.

   General Site Observations:
   - Cleanliness or sanitary condition: Weeds/grasses around the apiary
   - Activeness of bees: Whether bees are flying in and out actively
   - Pests and Enemies around: are there ants or beetles getting into the hive?
   - Ants (Preventable by hanging hive with wire smeared with grease)
   - Big Beetles (Reduce the size of entrance holes in hive)

Others Surrounding Environment Analysis:

- Availability of Flowers: Flowering Plants, Species, Quantity
- Availability of Water: Source (Rivers, Ponds, Others), Distance Information on which month different kind of flowers are available in the area or the phenological data of the different tree species collected by the groups will be a very good source of information for new farmers who want to start beekeeping and even for researchers.

An example of AESA sheet is shown in next page:

7. Monthly inspection: Conduct practical open hive inspection monthly. Wear bee suits properly, use smoker to reduce aggressiveness of bees. Open hives to inspect pests and diseases, count how many frames are occupied by the colony. For monthly AESA, both visual & practical open hive inspection data should be recorded. Practical AESA parameters are as follows:
   Colony assessment:
   - Number of frames occupied
   - Pests and enemies in the Hive
   - Diseases
8. If you find that all frames in the brood box are fully occupied during monthly inspection and there are many flowers around, put queen excluder and super box on the top of brood box. Only honey will be stored in the super box since the queen will not able to lay eggs in the super box. If you find all the frames in the first super box are occupied and again there are still many flowers around, you could add a second super box for increased honey production.
9. The amount of honey, that is, weight produced and the prices sold from each hive will be recorded for each hive separately. The data will be summed and analysed after 6 months or one year to compare the performance of each hive in terms of quantity of honey produced and income generated.

Beekeeping AESA Chart

Name of FFS:_____ Sub-group:_____

AESA No._____ Week No. ____ Date:_____

General Information

Type of Hive: _____

Date of Colonization: _____

Date of putting Super Box 1: _____

Date of putting Super Box 2: _____

Age of Colony (weeks): _____

Practical Inspecti on Data (Monthly)

No. of Frames Occupied in Brood Box: _____

No. of Frames Occupied in Super Box1: ____

No. of Frames Occupied in Super Box2: ____

Occupied Frames Increase since last AESA

_____

Visual Observation Data (Weekly)

Weather: _____

Temperature: Very Hot/Medium/Cool

Time of Observation: _____

Activeness of Bees:

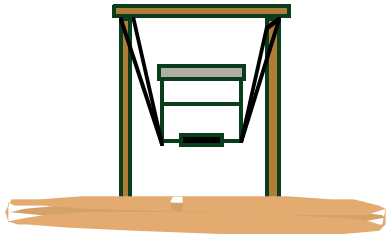
Beehive 1 _____

Beehive 2 _____

Beehive 3 _____

Weeds/Grasses: _____

Pest/Diseases: _____



Flowering Plants

Species (Trees, Crops, etc)	*Quantity (Plenty/Medium/Few)*

Water Availability

Source (Rivers, Ponds, etc)	*Distance (km)*	*Quantity (Plenty/Sufficient/Little)*

Observations

1. _____
2. _____
3. _____
4. _____
5. _____

Recommendations

1. _____
2. _____
3. _____
4. _____
5. _____

Questions to discuss

- How many Kilograms of honey have been produced from each type of hive (calculate per year); which type produced more honey?
- Which hive produced better quality honey?
- From the different types of hives, are there any other products rather than honey that you may get in future?
- Which type of hive is easier to manage?
- Compare the cost of each hive and the quantity of honey harvested. Which is the most cost effective type?

9. Fish Farming

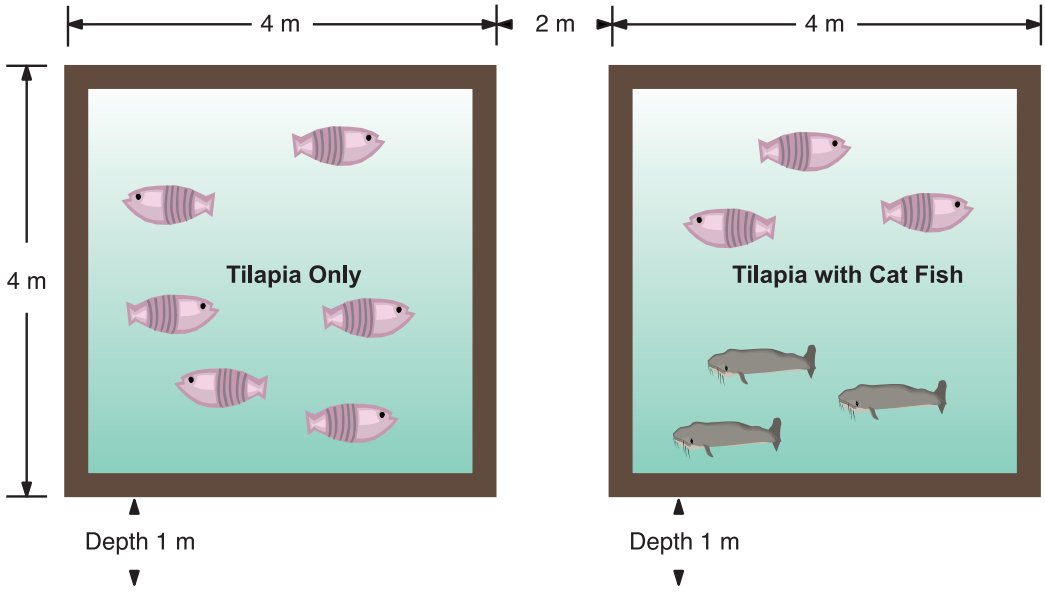
Objectives

In this trial you will introduce a comparative experiment either between sole species and combined species of fish in the pond.

Material

Fingerlings of Tilapia, Catfish, Fish Feeds (Initial), Fish Net.

Layout



Procedures

1. Select a relatively flat site where there is permanent water at all times. Clayish soil is better.
2. Construct two fish ponds. The commercial size of fish pond should be 200 to 300m3 but for FFS practice and experiment, 4m x 4m x 1m (16m3) will be applicable. If the ponds are constructed close to each other, it will be easy to connect them together after the experiment. The depth of the pond should not be more than 1m.
3. In case the area has poromeric (porous) soil, use plastic sheet at the bottom and sides to maintain water in the pond.

4. Consult your fishery officer to get advice especially in construction design of the appropriate pond.
5. Put fresh water into the pond. Appropriate depth will be 70 80 cm. Refill the water after the initial soaking, to the 70 80 cm depth. Leave for a few days to warm the water. For Tilapia, 24 30°C is a favourable temperature.
6. Find and purchase fingerlings of Tilapia (Oreochromis niliticus) and Catfish (Clarias gariepinus) and release into the ponds according to the plan of experiment (in case of two 4 x 4m pond, 40 Tilapia fingerlings in each pond and 8 of fingerlings of Catfish in one of the ponds. Feed them with same quantity of concentrated feed several times per day or as instructed by the fishery officers in the area.
7. If two species of fingerlings are not available, release the same number of Tilapia fingerling into both ponds (in case of two 4m x 4m pond, 40 Tilapia fingerlings in each pond). Feed one pond with concentrated feed and the other with traditional feed.
8. Monitor fish and water condition every week. Sample some fish and measure them on a monthly basis.
9. After 10 to 12 months, capture all fishes and measure their weight and evaluate the results of both ponds.

Questions to discuss

- In which pond was the growth of Tilapia better? Is there any advantage of combining tilapia with catfish in the same pond?
- In which pond was the growth of Tilapia is better when fed with different feeds? Is there any advantage in using concentrated feed over the traditional feed?
- Among the male and female fish, which grew faster? What kind of growth strategy can be taken to improve fish growth?
- In your opinion, is fish farming really profitable considering the cost and work load involved?

10. Poultry Keeping

Objectives

In this trial you will introduce a comparative experiment either between local and grade chicken or the difference in growth of same class of chickens under traditional and modern feeding system.

Material

Day old chick (Grade layer), Chick (Local breed), Housing Material, Wire mesh, Nails, Feeders, Drinkers, Drugs & Vaccines, Feed (Initial).

Procedures 1. Different types of chicken

1. Agree among members on which type of chicken rearing method; free range, semi caged or full caged the group is going to use.
2. Construct two appropriate sized cages as agreed among the members.
3. Procure same number of local and grade chick e.g. 20 local chick and 20 grade ones.
4. Feed both of them with the same chick feed using the same quantity and frequency as recommended by the livestock officer of the area.
5. At regular weekly intervals during the year, monitor the size and health condition among the local and grade chicken.
6. When they start laying eggs, record the number produced daily for one month.
7. Summarise the production among local and grade chicken and analyse the result and conclude.

Procedures 2. Different methods of chicken rearing

1. Agree among members on the type of chicken the group is going to raise and how many.
2. Agree among members on the husbandry methods; free range, semi caged and full caged, the group is going to compare.
3. Purchase agreed number (e.g. 40) of agreed type of chicken and divide into two populations (e.g. 20 + 20).
4. One group may be reared semi caged while the other is left free ranging.
5. Feed both of them using the same diet with equal quantity of feed at the frequency recommended by the livestock officer of the area.

6. At regular weekly intervals during the year, monitor the size and health condition in both groups of chicken.
7. When they start laying eggs, record the number of egg produced daily for one month by each group.
8. Summarise the production under both husbandry and analyse the results and conclude.

Procedures 3. Different types of feed

1. Agree among members on which types of chicken the group is going to raise and how many.
2. Agree among members on which type of chicken rearing method; free range, semi caged and full caged the group is going to use.
3. Purchase the agreed number (e.g. 40) of agreed type of chicken and divide into two populations (e.g.20 + 20).
4. Feed one population with the diet recommended by the livestock officer while the other is reared through traditional or conventional practice.
5. At regular weekly interval during the year, monitor the size and health condition in both groups of chicken.
6. When they start laying eggs, record the number of egg produced daily for one month.
7. Summarise the production from both groups of chicken, analyse the result and conclude.

Questions to discuss

- Was there any difference in the period before initial egg production between local and grade chicken?
- Was there any difference in the production of eggs between free range, semi caged and full caged chicken?
- Was there any difference between the two different types of feeds on both local and grade chicken?
- Was there any difference in the frequency of egg production and price of eggs from local and grade chicken?

11. Dairy Animal Management

Objectives

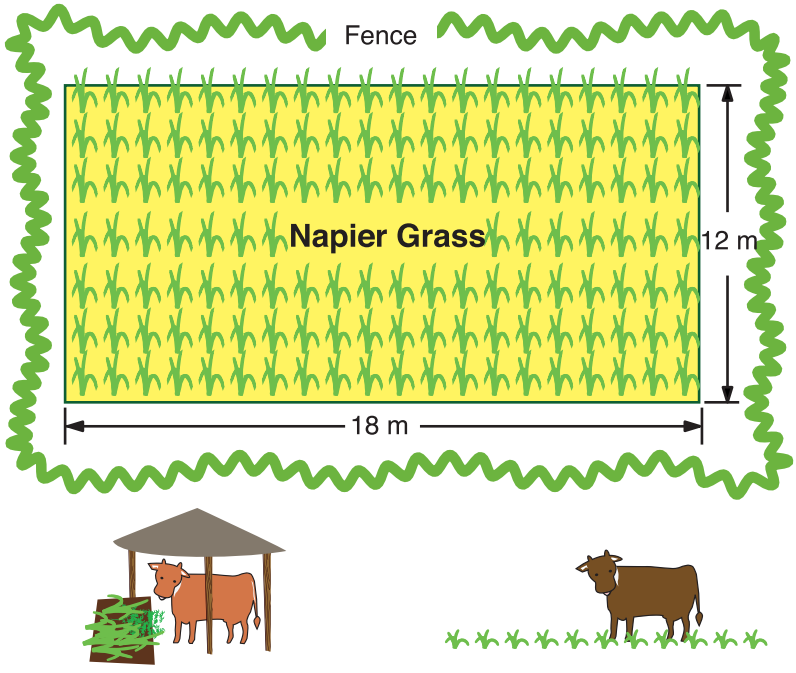
In this trial you will introduce and experiment with cut and carry fodder grass for dairy animal feeding and evaluate the change in milk production, health condition of animals and general workload before and after introduction of the system.

Material

Napier Grass Cuttings, Fertilizers, Housing Material for making paddocks or zero grazing unit, Nails, Drugs, Mineral licks, Vaccines, Acaricides.

Layout

Procedures



1. Select a field with relatively uniform soil characteristic on a flat or gently sloping land. The land should be at least 12m by 18m.
2. Before the rainy season, clear the land of bushes and shrubs. This should also be ripped using an oxen plough to increase infiltration of rainwater.

3. Before the onset of the rains, identify where the cuttings of Napier Grass are available.
4. After the onset of the rains, purchase and deliver Napier Grass cuttings to the planting site.
5. Mark the planting spots in the plots and dig planting holes at a spacing of 1m by 1m. Plant Napier Grass cuttings as early as possible so that they can take advantage of the rains for a long period.
6. Construct a fence surrounding the plot. This will be done to ensure that the whole plot is protected from animals at all times.
7. Weed the plot according to normal farming practice. An oxen plough should be used to plough the land between crops to improve water infiltration and its subsequent conservation.
8. At regular weekly intervals during the year, monitor the following in the plot: height growth of the planted grass, milk production and the health condition of the animal.
9. When the fodder grass has been established, harvest and weigh fodder and start feeding the animals.
10. Record milk production daily and health condition of the animals weekly.
11. Evaluate the advantages and disadvantages of feeding Napier grass to milking animals.

Questions to discuss

- Was there any difference in milk production before and after feeding animals with “cut and carry” fodder grass.
- Was there any difference in the health of animals before and after feeding animals with “cut and carry” fodder grass.
- Was there any difference in the workload or labour requirement before and after starting to feed the animals with “cut and carry” fodder grass?

Annex 3. Repository of Templates

Annex 3-1. FFS Session Checklist 1

District		Division		Date	
Group name				Membership	
Facilitator Name				No. of Sessions carried out so far	

Check Item	Observations/Problems			
Group performance in general				
Attendance of members (Check Register Book. Is it recorded properly?)	Attendance at the particular day		Attendance general until date	
Schedule/Time Table (Existing, Are they followed, Flow of activities, Starting time & Ending time?)				
Time keeping? Learning Norms (Existing? How? Are they followed?)				
Learning site general (Location, seating facilities, etc.)				
Use of stationary (Check proper use and use of colors in AESA Chart) Are they enough? Is there lack or shortage of any learning material? Need addition of any?				

Check Item	Observations/Problems	
Sub-groups (Existing? Name? Motto? Number? Role? Active?)		
The Host team Existing? Role? Active?		
The Role of the Facilitator Mode of Facilitation How?		
Enterprises How is host Farm Establishment? Progress so far?		
PTD Is it relevant? Well addressed to farmers needs? Need to modify or change?		
AESA taking, Processing & Presentation (Stage of crops, AESA sheet)	Date Started:	No. of AESA to date
	NB: If no AESA that day, ask for last AESA taken and get the details	
Special Topics Existing? Which topic covered? Was it relevant? Mode of Presentation: (Teaching or Facilitating?)		

Check Item	Observations/Problems
Group Dynamics Which type? Level of Participation? Is the message clear? Is it relevant?	
Record Keeping Existing? Which type of records?	
Weekly Report Was it written properly? Is input and extension cost well calculated?	
Monitoring by other officers Who visited? Partial visit or full backstopping?	
Level of Empowerment Equity among members? Transparency? Full Participation? Confidence? Knowledge/ Techniques, etc.	
Other IGAs	
Level of funding	
Other Remarks:	

Annex 3 2. FFS Session Checklist 2

Backstopping Officer		Facilitator Name		
FFS Name		District		
Date		Attendance	M:	F:

Group Performance Check Items

1	Punctuality Starting Time	Good, Fair, Poor	2	Punctuality of Farmers	Good, Fair, Poor
3	Display of Timetable	Good, Fair, Poor	4	Sub groups	Good, Fair, Poor
5	Participation of Host Team	Good, Fair, Poor	6	Time Keeper	Good, Fair, Poor
7	Equal Participation in AESA Taking	Good, Fair, Poor	8	Appropriateness of AESA Measurement	Good, Fair, Poor
9	AESA Note Taking	Good, Fair, Poor	10	Time Allocation for AESA Taking	Good, Fair, Poor
11	Use of Colour in AESA Preparation	Good, Fair, Poor	12	Equal Participation in AESA Processing	Good, Fair, Poor
13	Time Allocation for AESA Processing	Good, Fair, Poor	14	Use of Pointer	Good, Fair, Poor
15	Appropriateness of Today's Topic Maintenance of Stationary	Good, Fair, Poor	16	Use of Talk Ball Coherence of group (group Organization)	Good, Fair, Poor
17	Appropriateness of learning site	Good, Fair, Poor	18	Coherence of Group (Group Organization)	Good, Fair, Poor
19	Appropriateness of Learning Site	Good, Fair, Poor	20	Sitting Arrangement	Good, Fair, Poor
21	Closeness of Learning Site to PTD sites	Good, Fair, Poor	22	Attendance general till date	Good, Fair, Poor
23	Attendance at the Particular Day	Good, Fair, Poor	24	General Attendance until date	Good, Fair, Poor
25	Proper Roll Call Book Keeping	Good, Fair, Poor	26	How have the Norms been followed?	Good, Fair, Poor

Facilitation Skill Check Item

27	Confidence in Facilitation	Good, Fair, Poor	28	Facilitation VS Teaching	Good, Fair, Poor
29	Tone of Voice	Good, Fair, Poor	30	Plainness of Language	Good, Fair, Poor
31	Facilitation Skills in Encouraging Equal Participation	Good, Fair, Poor	32	Sensitivity for Socially Vulnerable Groups	Good, Fair, Poor

Facilitation Skill Check Item

33	Wrap up Skills after AESA Presentation	Good, Fair, Poor	34	Knowledge and preparation of Today's Topic	Good, Fair, Poor
35	NOT Taking Lead (Dominance)	Good, Fair, Poor	36	Neutralism in Facilitation	Good, Fair, Poor
37	Punctuality	Good, Fair, Poor	38	Use of Sub groups	Good, Fair, Poor
39	Use of Local Knowledge	Good, Fair, Poor	40	Flexibility	Good, Fair, Poor
41	Understanding of Enterprises	Good, Fair, Poor	42	Respects to Farmers	Good, Fair, Poor

Gender & Illiterate Consideration Check Item

43	Attendance of Women Members	Good, Fair, Poor	44	Seating Position of Women Members	Good, Fair, Poor
45	Women's participation in Sub Group Activity	Good, Fair, Poor	46	AESA Presentation by Women	Good, Fair, Poor
47	Women's participation in Discussion	Good, Fair, Poor	48	Women's Participation in Dynamics	Good, Fair, Poor
49	Overall Interest by Women Members	Good, Fair, Poor	50	Talk Ball to Women	Good, Fair, Poor
51	Equal rights and Responsibility between Men and Women	Good, Fair, Poor	52	Equal overload to Women	Good, Fair, Poor
53	Participation of Illiterates in Sub Group Activity	Good, Fair, Poor	54	Arrangement/Support for non literate Members	Good, Fair, Poor

Remarks of the Backstopper

Remarks of FFS Facilitator

FFS Facilitator: _____ Sign: _____ Date: _____

Backstopper: _____ Signed: _____ Date: _____

Annex 3-3. Mobile Phone Weekly FFS Report

	Questions	Reporting Value
1.	Code of FFS	
2.	Date	
3.	Starting time	
4.	End time	
5.	No FFS Members attended on time	
6.	No of FFS Members came late	
7.	No of FFS Members left earlier	
8.	No of FFS Members absent	
9.	Did Facilitator come to the Session?	Yes / No
10.	Did Facilitator come on time?	Yes / No
11.	Performance of Facilitator	Excellent/Good/Fair/Poor/Bad
12.	Performance of FFS Members	Excellent/Good/Fair/Poor/Bad
13.	Issue to discuss with PMU?	Yes / No
14.	Do you authorize payment to Facilitator?	Yes / No
15.	Total Saving up today.	Ksh.
16.	Balance of Group Learning Fund	Ksh.
Issues to be discuss with PMU:		
Observations		

Annex 3-4. Facilitator's Monthly Report

Name of Facilitator							Enterprise(s)	1.	Date	
								2.		
Name of FFS								3.	District	
Week	Date	AESA No.	Attendance W	M	T	Host Team	Field Activities	Special Topics	Group Dynamics	Remarks
1										
2										
3										
4										
5										
Observation(s)							Group Problem(s)		Recommendation(s)	
Concluding Remarks:										

Annex 3-5. Problem Report by Facilitators

Facilitator Name		District		FFS		Date	

Problem	Action taken/ Countermeasures	Suggestions by the Facilitator	Recommendation by HQ

Annex 3-6. Empowerment Process Report

Group		District		Division		Month	

Individuals Members

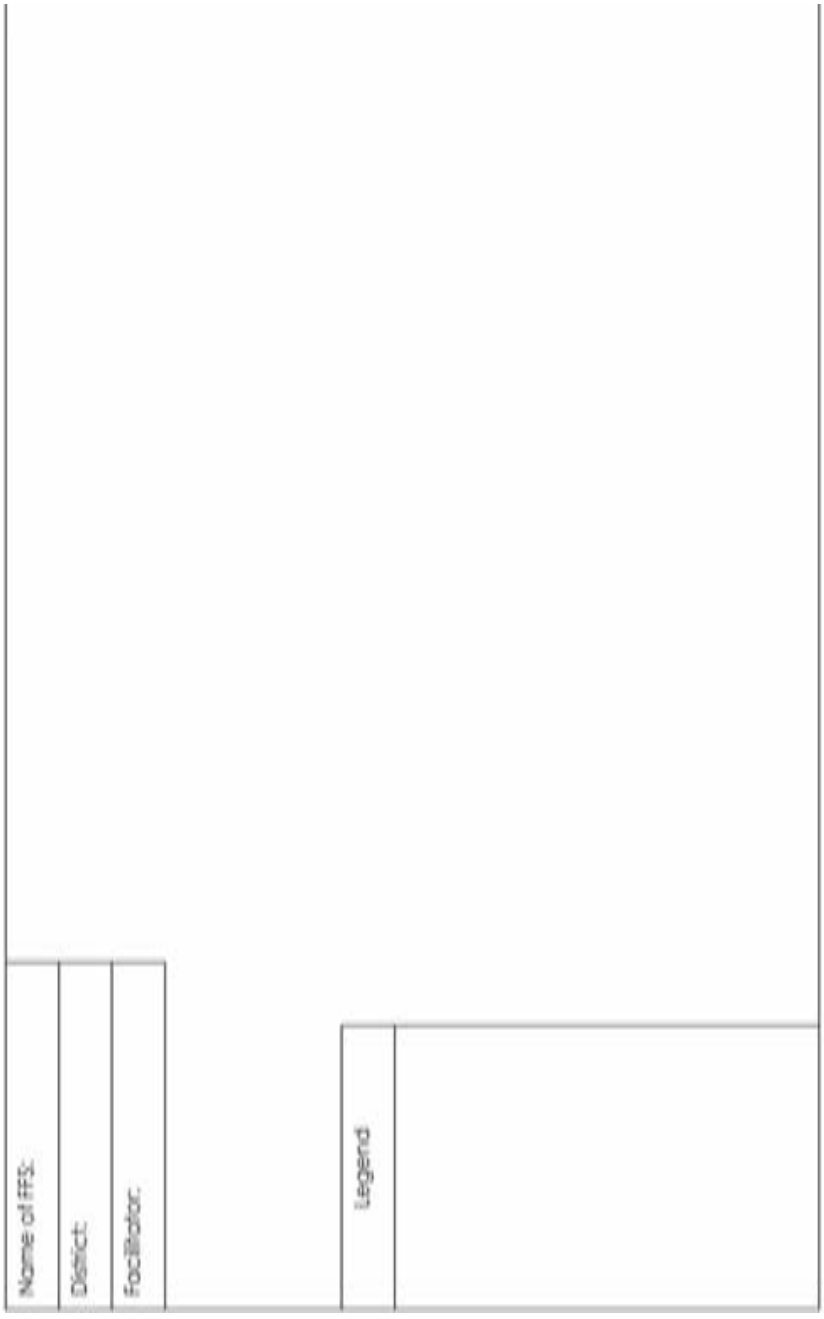
Examples of Change	No.	Name	Changes Observed	Background/Remarks
• Participation in group activity improved • Became confident in presentation • Became less shy in front of others • Became more social to others • Become better in self-explanation • Tried new ideas by him/herself • Taught what he/she learnt to others • Realized own hidden talent • Became respected by others • Became disciplined • Attend to other functions • Started to go to a formal school/studying • Got employment • Got more income • Got more time to try other new things • More diversified farm/ GA activities	1			
	2			
	3			
	4			
	5			

Group

Examples of Change	No.	Changes Observed	Background/Remarks
• New bylaw/reinforced existing bylaw • Time management improved • More cohesive	1		
• Full participation by all members • More participation indecision making • Less dominance of group officials	2		
• mproved leadership skill • Started new group activities/ GAs • ncrease of group fund • Applied/Acquired fund/assistance	3		
• More transparent in fund management • Group fund accounting improved • Less disparity among the members	4		
• Participated in community events • Became popu ar with the neighbors • ncrease of members • Re ated to the formation of new group	5		

Note & Report when the changes were observed

Annex 3-7. Group Location Map



Annex 3-8. RuralInvest Module 2 Form

RuralInvest>

MODULE 2 PROFILE FORMAT

BACKGROUND INFORMATION

Date: _____

Enterprise Title: _____

Location: Community: _____

District: _____

Province: _____

Number of families in the group: _____

Investment Cost : Total Cost _____ Cost per family _____

Name of Facilitator: _____ Name of FFS: _____ Tel.: _____

Provide below a brief description of the proposed enterprise, including: a) justification and objectives; b) description of the investment; c) activities to occur under the project; d) description of participants/beneficiaries; and e) proposed project management and organization.

RuralInvest>

MODULE 2 PROFILE FORMAT – INVESTMENT COSTS

ENTERPRICE TITLE: _____ **Date:** _____

COMMUNITY: _____ **ORGANISATION:** _____

INVESTMENT (Item) 1	UNIT OF MEASUREMEN 2	QUANTITY 3	COST PER UNIT 4	TOTAL INVESTMENT			LIFE OF ITEM (years) 8	SALVAGE VALUE		ANNUAL INVESTMENT COST 11 = (5-10)/8
				TOTAL 5 = 3x4	APPLICANT CONTRIBUTION 6	EXTERNAL FUNDING 7 = 5-6		PER UNIT 9	TOTAL 10 = 9x3	
9.1 A. GOODS – MATERIALS										
1.										
2.										
3.										
4.										
5.										
6.										
7.										
8.										
9.1 SUBTOTAL - GOODS										
10.1 B. LABOUR										
1.										
2.										
3.										
4.										
SUBTOTAL – LABOUR										
TOTAL										

RuralInvest>

MODULE 2 PROFILE FORMAT

INCOME AND OPERATING COSTS PER ACTIVITY

Complete this page for each product, crop or activity of the project
When existing activities are affected, complete this page for activities with and without project

Production/Activity:

UNIT OF PRODUCTION: _____ (1) **NO. OF UNITS OF PRODUCTION** _____ (2)

DURATION OF EACH CYCLE (in months to a max. of 12) _____ (3) **NO. OF CYCLES PER YEAR:** _____ (4)

INCOME					
INCOME ITEM 5	**UNIT OF SALE** (kg, qq, etc.) 6	**OUTPUT/UNIT OF PRODUCTION/CYCLE** (units sold) 7	**SALE PRICE** (price/unit) 8	**TRANSPORT COST** (cost/unit) 9	**TOTAL INCOME PER CYCLE** 10=7x(8-9)
1.					
2.					
3.					
INCOME PER UNIT OF PRODUCTION PER CYCLE (11)					
INCOME PER UNIT OF PRODUCTION PER YEAR (12) = (11) x cycles per year (4)					
VARIABLE OPERATING COSTS					
INPUTS/MATERIALS 13	**UNIT** (kg, head, etc.) 14	**QUANTITY/UNIT OF PRODN/ CYCLE** 15	**COST PER UNIT** 16	**TRANSPORT COST/UNIT** 17	**TOTAL COST PER CYCLE** 18=15x(16+17)
1.					
2.					
3.					
4.					
5.					
6.					
COST OF MATERIALS PER UNIT OF PRODUCTION (19)					
LABOUR 20	**NUMBER OF PERSONS** 21	**WORK PERIOD** (day, month) 22	**NUMBER OF PERIODS PER CYCLE** 23	**COST PER PERIOD** 24	**TOTAL COST PER CYCLE** 25=21x23x24
1.					
2.					
3.					
4.					
LABOUR COST PER UNIT OF PRODUCTION PER CYCLE (26)					
VARIABLE COST PER UNIT OF PRODUCTION PER CYCLE (27) = (19) + (26)					
VARIABLE COST PER UNIT OF PRODUCTION PER YEAR (28) = (27) x cycles per year (4)					
INCOME MINUS VARIABLE COST: PER UNIT OF PRODUCTION PER YEAR (29) = (12 - 28)					

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MODULE 2 PROFILE FORMAT - TOTAL INCOME AND COSTS

When activities with and without project are considered, total figures of activities without project must be subtracted from total figures of activities with project

PRODUCT OR ACTIVITY	NO. OF UNITS OF PRODUCTION	INCOME		VARIABLE COSTS		INCOME MINUS VARIABLE COST	
(page 3: first line)	(page 3: point 2) 1	PER UNIT/YEAR (page 3: point 12) 2	TOTAL 3 = 1x2	PER UNIT/YEAR (page 3: point 28) 4	TOTAL 5 = 1x4	PER UNIT/YEAR (page 3: point 29) 6	TOTAL 7 = 1x6
1.							
2.							
3.							
4.							
5.							
6.							
7.							
TOTAL PER YEAR							

GENERAL COSTS (entire project) 8	UNIT (visit, month, etc.) 9	NUMBER OF UNITS/YEAR 10	COST PER UNIT 11	TOTAL COST PER YEAR 12=10x11
1.				
2.				
3.				
4.				
5.				
TOTAL GENERAL COSTS PER YEAR				

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MODULE 2 PROFILE FORMAT

FEASIBILITY & SUSTAINABILITY

DESCRIBE ANTICIPATED MARKET (for income generating projects, specify selling place, buyer and conditions):

PRELIMINARY FEASIBILITY – INCOME GENERATING PROJECTS ONLY

1. **ABILITY OF THE PROJECT TO COVER ITS COSTS**

   TOTAL INCOME PER YEAR (1) = page 4: Total in Column 3 _____

   TOTAL VARIABLE COSTS PER YEAR (2) = Page 4: Total in Column 5 _____

   TOTAL GENERAL COSTS PER YEAR (3) = Page 4: Total in Column 12 _____

   NET INCOME PER YEAR (4) = (1) – (2 + 3) _____

2. **NUMBER OF YEARS OF NET INCOME REQUIRED TO COVER THE EXTERNAL INVESTMENT**

   TOTAL EXTERNAL INVESTMENT (Page 2: total in Column 7) _____

   NUMBER OF YEARS REQUIRED (external investment / net income per year) _____

3. **NET ANNUAL INCOME AFTER ALLOWING FOR INVESTMENT COST**

   ANNUAL INVESTMENT COST (Page 2: Total in Column 11) _____

   NET ANNUAL INCOME AFTER INVESTMENT COST _____
   (net income per year from calculation 1 above – annual investment cost)

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RURALINVEST PROFILE FORMAT – SOCIAL COSTS

PRELIMINARY BENEFICIARY ESTIMATES

1. INVESTMENT PER BENEFICIARY

TOTAL INVESTMENT (Page 2: Total in Column 5) _____ (1)

Applicant Contribution _____ % [(Page 2: Column 6/Page 2:Column 5) * 100]

External Contribution _____ % [(Page 2: Column 7/Page 2:Column 5) * 100]

PROJECTED NUMBER OF DIRECT BENEFICIARIES _____ (2)

Indicate if this is: Families _____ **Individuals** _____

TOTAL INVESTMENT PER DIRECT BENEFICIARY _____ (3)
(1) / (2)

EXTERNAL INVESTMENT PER DIRECT BENEFICIARY _____ (4)
[(Page 2: Column 7 / (2)]

2. ANNUAL COST PER BENEFICIARY

TOTAL ANNUAL COST (Page 4: Column 5) _____ (5)

Of which: Variable Costs _____ % [(Page 5a: Point 2/Page 5a: Point 4) * 100]

General/Overhead Costs _____ % [(Page 5a: Point 3/Page 5a: Point 4) * 100]

ANNUAL COST PER BENEFICIARY (5)/(2) _____ (6)

DESCRIBE THE SOURCE OF FUNDS REQUIRED TO KEEP THE PROJECT FUNCTIONING (for non-income generating projects):

3-9. Final Session Report

Name of FFS Group: _____

District: _____

Division: _____

Name of Facilitators: _____

3-9-1. Ballot Box Exercise

No	Questions	No of Members	
		Correct	Wrong
1			
2			
3			
4			
5			
6			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

Result of Discussion/Observation/Recommendation:

3-9-2. PCE Analysis: Enterprise 1:_____

Result of Discussion 1: Differences observed between the plots

Evaluation Criteria	Plot 1	Plot 2	Plot 3	Comment

Result of Discussion 2: Which one seems more suitable for your farm?

Result of Discussion 3: And why do you think so?

Result of Discussion 4: Advantage of PCE

Result of Discussion 5: Advantage of AESA

Other Observation/Recommendation:

3-9-3. Result of Cost Benefit Analysis

Calculation of total expenditure

	Plot 1	Plot 2	Plot 3
Seeds	Ksh.	Ksh.	Ksh.
Manure	Ksh.	Ksh.	Ksh.
Fertiliser	Ksh.	Ksh.	Ksh.
Other farm input	Ksh.	Ksh.	Ksh.
Total	Ksh.	Ksh.	Ksh.

Cost Benefit Analysis

	Plot 1	Plot 2	Plot 3
Yield	Kg	Kg	Kg
Price* per kg	Ksh.	Ksh.	Ksh.
Total Value	Ksh.	Ksh.	Ksh.
Total Expenditure	Ksh.	Ksh.	Ksh.
Profit	Ksh.	Ksh.	Ksh.

Quantification

	Plot 1	Plot 2	Plot 3
Quantified yield per acre	Kg	Kg	Kg
Quantified product value per acre (1)	Ksh.	Ksh.	Ksh.
Quantified cost/expenditure per acre (2)	Ksh.	Ksh.	Ksh.
Quantified profit per acre (1) - (2)	Ksh.	Ksh.	Ksh.

Result of Discussion/ Conclusions/ Recommendations:

3-9-4. Result of Self Evaluation Session

Question 1: Most EXCITING experiences by the members:

	Most exciting experiences
1	
2	
3	
4	
5	
6	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	

Question 2: Most disappointing experiences by the members:

	Most disappointing experiences
1	
2	
3	
4	
5	
6	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	

Question 3: Changes in the Group:

Changed Where?	Before FFS	After FFS

Question 4: Changes in the FFS Members:

Changed Where?	Before FFS	After FFS

Question 5: Changes in the MEMBERS' FARM:

Changed Where?	Before FFS	After FFS

Observation/ Comments/ Recommendations:

Question 6: Overall evaluation of the Livelihood Farmer Field School

5. Very Good 4. Good 3. Fair 2. Bad 1. Very bad

Observation/ Comments/ Recommendations:

3-9-5. Result of Way Forward Session

1. PCE/AESA

2. IGA

3. FFS

4. Other activities

5. Proposed Action Plan and the Level of Group Commitment

6. Observations/Recommendations/Comments by Facilitator:

Annex 3-10. RuralInvest Module 3 Format

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Beneficiary/Group Analysis

Date: _____

Project Name: _____

Name of LFFS: _____

Name of Cluster: _____

Name of Representative of the Cluster: _____

Location: _____ Division: _____

District: _____ Province: _____

Number of families in applicant group: _____

Investment Cost : Total Cost _____ Cost per family: _____

Prepared by: _____ Organisation: _____ Tel.: _____

Description of Beneficiaries

No of Beneficiaries

Direct beneficiaries

Men	
Women	
Children	
Total	
Families	

Indirect beneficiary

Men	
Women	
Children	
Total	
Families	

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Qualitative Analysis

Background
Project Objective
Principal Activities
Technologies to be utilised
Technical assistance and training requirements

Environmental sustainability/impact
Anticipated Market
Organization and management
Principal assumptions and risks
Comments/remarks from the LFFS Facilitators

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Investment Costs

PROJECT TITLE: _____ Date: _____

NAME of FFS: _____ Name of Cluster: _____ Cluster Representative: _____

INVESTMENT (Item) 1	UNIT OF MEASUREMENT 2	QUANTITY 3	COST PER UNIT 4	TOTAL INVESTMENT			LIFE OF ITEM (years) 8	SALVAGE VALUE		ANNUAL INVESTMENT COST 11 = (5-10)/8
				TOTAL 5 = 3x4	APPLICANT CONTRIBUTION 6	EXTERNAL FUNDING 7 = 5-6		PER UNIT 9	TOTAL 10 = 9x3	
A. Goods and Material										
1.										
2.										
3.										
4.										
5.										
6.										
7.										
SUBTOTAL-GOODs										
B. Labour										
1.										
2.										
3.										
4.										
SUBTOTAL – LABOUR										
C. Professional Service										
1.										
2.										
SUBTOTAL – Professional service										
Total										

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General Costs

SUPPLY AND SERVICES

DESCRIPTION 1	UNIT TYPE 2	NO OF UNITS 3	UNIT COST 4	TOTAL COST		
				TOTAL 5 = 3x4	OWN RESOURCES 6	EXTERNAL RESOURCES 7 = 5-6
1.						
2.						
3.						
4.						
5.						
TOTAL						

PERSONNEL

DESCRIPTION 1	UNIT TYPE 2	NO OF UNITS 3	UNIT COST 4	TOTAL COST		
				TOTAL 5 = 3x4	OWN RESOURCES 6	EXTERNAL RESOURCES 7 = 5-6
1.						
2.						
3.						
4.						
5.						
TOTAL						

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Blocks

NAME OF BLOCK 1. _____

Length of cycle (months)	
Unit of production	
Cycles 1 per year	
Cycles (first year) 1 per year	

Production chronology for the first year

Month																								
Production/Activities																								
Harvest/Sale																								
Receipt of payment																								

Production pattern

Year										
Number of units of production per cycle										

Sales income (**per unit of production per cycle**)

Item	Sales Unit	Units produced	Quantity used internally	units sold	Unit sales price	transport cost / unit	Total income	Total cash income
1.								
2.								
3.								
4.								
5.								
Total								

Input/Material cost (**per unit of production per cycle**)

Item	Purchase Unit	Units used	Quantity drawn from own resources	Quantity purchased	Unit Cost	transport cost / unit	Total cost	Total Cash Cost
1.								
2.								
3.								
4.								
5.								
Total								

Labour cost (**per unit of production per cycle**)

Item	Sales Unit	Units used	Unit cost	Quantity drawn from own resources	Quantity purchased	Total cost	Total Cash Cost
1.							
2.							
3.							
4.							
5.							
Total							

NAME OF BLOCK 2. _____

Length of cycle 5 month(s)	
Unit of production acre	
Cycles 1 per year	
Cycles (first year) 1 per year	

Production chronology for the first year

Month																								
Production/Activities																								
Harvest/Sale																								
Receipt of payment																								

Production pattern

Year										
Number of units of production per cycle										

Sales income (per unit of production per cycle)

Item	Sales Unit	Units produced	Quantity used internally	units sold	Unit sales price	transport cost / unit	Total income	Total cash income
1.								
2.								
3.								
4.								
5.								
Total								

Input/Material cost (per unit of production per cycle)

Item	Purchase Unit	Units used	Quantity drawn from own resources	Quantity purchased	Unit Cost	transport cost / unit	Total cost	Total Cash Cost
1.								
2.								
3.								
4.								
5.								
Total								

Labour cost (per unit of production per cycle)

Item	Sales Unit	Units used	Unit cost	Quantity drawn from own resources	Quantity purchased	Total cost	Total Cash Cost
1.							
2.							
3.							
4.							
5.							
Total							

NAME OF BLOCK 3. _____

Length of cycle 5 month(s)	
Unit of production acre	
Cycles 1 per year	
Cycles (first year) 1 per year	

Production chronology for the first year

Month																								
Production/Activities																								
Harvest/Sale																								
Receipt of payment																								

Production pattern

Year										
Number of units of production per cycle										

Sales income (per unit of production per cycle)

Item	Sales Unit	Units produced	Quantity used internally	units sold	Unit sales price	transport cost / unit	Total income	Total cash income
1.								
2.								
3.								
4.								
5.								
Total								

Input/Material cost (per unit of production per cycle)

Item	Purchase Unit	Units used	Quantity drawn from own resources	Quantity purchased	Unit Cost	transport cost / unit	Total cost	Total Cash Cost
1.								
2.								
3.								
4.								
5.								
Total								

Labour cost (per unit of production per cycle)

Item	Sales Unit	Units used	Unit cost	Quantity drawn from own resources	Quantity purchased	Total cost	Total Cash Cost
1.							
2.							
3.							
4.							
5.							
Total							

NAME OF BLOCK: # . _____

Length of cycle 5 month(s)	
Unit of production acre	
Cycles 1 per year	
Cycles (first year) 1 per year	

Production chronology for the first year

Month												
Production/Activities												
Harvest/Sale												
Receipt of payment												

Production pattern

Year										
Number of units of production per cycle										

Sales income (per unit of production per cycle)

Item	Sales Unit	Units produced	Quantity used internally	units sold	Unit sales price	transport cost / unit	Total income	Total cash income
1.								
2.								
3.								
4.								
5.								
Total								

Input/Material cost (per unit of production per cycle)

Item	Purchase Unit	Units used	Quantity drawn from own resources	Quantity purchased	Unit Cost	transport cost / unit	Total cost	Total Cash Cost
1.								
2.								
3.								
4.								
5.								
Total								

Labour cost (per unit of production per cycle)

Item	Sales Unit	Units used	Unit cost	Quantity drawn from own resources	Quantity purchased	Total cost	Total Cash Cost
1.							
2.							
3.							
4.							
5.							
Total							

NAME OF BLOCK: # . _____

Length of cycle 5 month(s)	
Unit of production acre	
Cycles 1 per year	
Cycles (first year) 1 per year	

Production chronology for the first year

Month												
Production/Activities												
Harvest/Sale												
Receipt of payment												

Production pattern

Year										
Number of units of production per cycle										

Sales income (per unit of production per cycle)

Item	Sales Unit	Units produced	Quantity used internally	units sold	Unit sales price	transport cost / unit	Total income	Total cash income
1.								
2.								
3.								
4.								
5.								
Total								

Input/Material cost (per unit of production per cycle)

Item	Purchase Unit	Units used	Quantity drawn from own resources	Quantity purchased	Unit Cost	transport cost / unit	Total cost	Total Cash Cost
1.								
2.								
3.								
4.								
5.								
Total								

Labour cost (per unit of production per cycle)

Item	Sales Unit	Units used	Unit cost	Quantity drawn from own resources	Quantity purchased	Total cost	Total Cash Cost
1.							
2.							
3.							
4.							
5.							
Total							

NAME OF BLOCK: # . _____

Length of cycle 5 month(s)	
Unit of production acre	
Cycles 1 per year	
Cycles (first year) 1 per year	

Production chronology for the first year

Month																								
Production/Activities																								
Harvest/Sale																								
Receipt of payment																								

Production pattern

Year										
Number of units of production per cycle										

Sales income (per unit of production per cycle)

Item	Sales Unit	Units produced	Quantity used internally	units sold	Unit sales price	transport cost / unit	Total income	Total cash income
1.								
2.								
3.								
4.								
5.								
Total								

Input/Material cost (per unit of production per cycle)

Item	Purchase Unit	Units used	Quantity drawn from own resources	Quantity purchased	Unit Cost	transport cost / unit	Total cost	Total Cash Cost
1.								
2.								
3.								
4.								
5.								
Total								

Labour cost (per unit of production per cycle)

Item	Sales Unit	Units used	Unit cost	Quantity drawn from own resources	Quantity purchased	Total cost	Total Cash Cost
1.							
2.							
3.							
4.							
5.							
Total							

NAME OF BLOCK: # . _____

Length of cycle 5 month(s)	
Unit of production acre	
Cycles 1 per year	
Cycles (first year) 1 per year	

Production chronology for the first year

Month																								
Production/Activities																								
Harvest/Sale																								
Receipt of payment																								

Production pattern

	1	2	3	4	5	6	7	8	9	10
Number of units of production per cycle										

Sales income (per unit of production per cycle)

Item	Sales Unit	Units produced	Quantity used internally	units sold	Unit sales price	transport cost / unit	Total income	Total cash income
1.								
2.								
3.								
4.								
5.								
Total								

Input/Material cost (per unit of production per cycle)

Item	Purchase Unit	Units used	Quantity drawn from own resources	Quantity purchased	Unit Cost	transport cost / unit	Total cost	Total Cash Cost
1.								
2.								
3.								
4.								
5.								
Total								

Labour cost (per unit of production per cycle)

Item	Sales Unit	Units used	Unit cost	Quantity drawn from own resources	Quantity purchased	Total cost	Total Cash Cost
1.							
2.							
3.							
4.							
5.							
Total							

Annex 4. Example of TOF programme for Extension Facilitators

DAY	TIMES	TOPIC	FACILITATOR
SUNDAY		ARRIVAL	
Monday	8.00-10.00	Welcome address Outline of course programme Overview of the project and workshop objectives Overview FFS in forest extension Official opening	
	10.00-10.30	BREAK	
	10.30-1.00	Participatory introduction of participants Leveling of expectation Setting of learning norms Participants grouping and class Functions of host team Ballot box exercise	
	1.00-2.00	LUNCH	
	2.00-4.00	Introduction to FFS methodology (background to FFS) What is FFS Objective of FFS Principles of FFS	
	4.00-4.20	BREAK	
	4.20-6.00	Key characteristics of FFS approach Group dynamic activity (Nine dot game)	

DAY	TIMES	TOPIC	FACILITATOR
Tuesday	8.00-8.20 8.20-10.00	Recapitulation Concept of ecosystem Field work on ecosystem concept	Host team
	10.00-10.30	BREAK	Host team
	10.30-1.00	Presentation and discussion of field work Concept of what is this/what is that? Field exercise Field work presentation	
	1.00-2.00	LUNCH	Host team
	2.00-4.00	Concept of AESA Steps of conducting AESA Field activity on AESA Field work processing	
	4.00-4.20	BREAK	Host team
	4.20-6.00	Presentation of field work	

DAY	TIMES	TOPIC	FACILITATOR
Wednesday	8.00-8.20 8.20-10.00	Recapitulation Participatory discussion on forest policy	Host team
	10.00-10.30	BREAK	Host team
	10.30-1.00	Principles of experimentation Introduction to Participatory Technology Development (PTD) Steps in establishing PTD in FFS sites	
	1.00-2.00	LUNCH	Host team
	2.00-4.00	Field Exercise on PTDs Field work processing and presentation	
	4.00-4.20	BREAK	Host team
	4.20-6.00	Examples of Forestry PTDs & Livelihoods PTD (Activity catalogue)	

DAY	TIMES	TOPIC	FACILITATOR
Thursday	8.00-8.20 8.20-10.00	Recapitulation Participatory discussion on group dynamics	Host team
	10.00-10.30	BREAK	Host team
	10.30-1.00	Participatory discussion on special topics concept Concept of participation	
	1.00-2.00	LUNCH	Host team
	2.00-4.00	Conflict management Lessons learnt on FFS and experience-sharing Video show on FFS	
	4.00-4.20	BREAK	Host team
	4.20-6.00	Brief on FFS Field Visit	

DAY	TIMES	TOPIC	FACILITATOR
Friday	8.00-8.20 8.20 -1.00	Recapitulation Field visit: (i) Subuku FFS (ii) Ogligei FFS	Host team All
	1.00-2.00	LUNCH	Host team
	2.00-4.00	Processing of data from field activity	All
	4.00- 4.20	BREAK	Host team
	4.20- 6.00	Presentation of feedback from field visit	All

DAY	TIMES	TOPIC	FACILITATOR
Saturday	8.00- 8.20 8.20 - 10.00	Recapitulation Introduction to non-formal education methods	Host team
	10.00-10.30	BREAK	Host team
	10.30- 1.00	HIV and AIDS Gender	
	1.00- 2.00	LUNCH	Host team
		FREE	

DAY	TIMES	TOPIC	FACILITATOR
Monday	8.00-8.20	Recapitulation	Host team
	8.20-10.00	Steps in conducting FFS implementation • Classical approach • Steps in Livelihood FFS approach	
	10.00-10.30	BREAK	Host team
	10.30-1.00	Ground working • Village Immersion ("Do-it-yourself-in-the-Village") • Formation of new groups • Selection from existing groups Selection of participants Site and host farmer selection Learning site preparations & stationeries	
	1.00-2.00	LUNCH	Host team
	2.00-4.00	FFS curriculum Field school schedule	
	4.00-4.20	BREAK	Host team
	4.20-6.00	Drug and substance abuse	

DAY	TIMES	TOPIC	FACILITATOR
Tuesday	8.00-8.20	Recapitulation	Host team
	8.20-10.00	Participatory discussion on • Communication skills • Folk media	
	10.00-10.30	BREAK	Host team
	10.30-1.00	Participatory Discussion on • Facilitation Skills • Leadership skills	
	1.00-2.00	LUNCH	Host team
	2.00-4.00	LFFS management formats Participatory Monitoring and Evaluation (P.M. &E)	
	4.00-4.20	BREAK	Host team
	4.20-6.00	P.M. & E continued Ballot Box Exercise Brief on FFS Field Visit	

DAY	TIMES	TOPIC	FACILITATOR
Wednesday	8.00-8.20	Recapitulation	Host team
	8.20 -1.00	Field visit: (i) Thairira FFS (ii) Kikapu FFS	All
	1.00-2.00	LUNCH	Host team
	2.00-4.00	Processing of data from field activity	All
	4.00- 4.20	BREAK	Host team
	4.20- 6.00	Presentation of feedback from field visit	All

DAY	TIMES	TOPIC	FACILITATOR
Thursday	8.00-8.20 8.20-10.00	Recapitulation Participatory Discussion on • Entrepreneurship	Host team
	10.00-10.30	BREAK	Host team
	10.30-1.00	Participatory discussion on FFS - • Field days • Graduation • Post graduation activities • Networking & collaboration in FFS	
	1.00-2.00	LUNCH	Host team
	2.00-4.00	Participatory discussion on • Grant Proposal writing • Finalization of FFS curriculum and action plan	
	4.00-4.20	BREAK	Host team
	4.20-6.00	Way forward/Development of action plan Rehearsal of Mini FFS	

DAY	TIMES	TOPIC	FACILITATOR
Friday	8.00-8.20	Recapitulation Presentation of action plans	Host team
	10.00-10.30	BREAK	Host team
	10.30-1.00	Implementation framework Course Evaluation	
	1.00-2.00	LUNCH	ALL
	2.00-4.00	Presentation of folk media & mini FFS by participants Awarding of certificates Official closing	
SATURDAY		DEPARTURE	

Annex 5. Example of TOF Programme for Farmer Facilitators

DAY	TIMES	TOPIC	FACILITATOR
Monday	8:00-10:15	Official opening Overview of TOF programme Introduction of participants Leveling of expectation Setting of learning norms Sub-groups & function of host team Overview of the FFS approach	ARGO Head
	10:15-10:30	BREAK	Host team
	10:30-12:30	FFS Time table FFS learning site Host farm	
	12:30-14:00	LUNCH	Host team
	14:00-15:30	Facilitation What is this what is that?	
	15:30-15:45	BREAK	Host team
	15:45-17:00	Concept & Importance of AESA	

DAY	TIMES	TOPIC	FACILITATOR
Tuesday	08:00-08:15	Recapitulation	Host team
	08:15-10:15	AESA practical session Principle of experimentation	
	10:15-10:30	BREAK	Host team
	10:30-12:30	Case study on experimental design Examples of experimental design	
	12:30-14:00	LUNCH	Host team
	14:00-15:30	Participatory discussion on agricultural & forestry enterprises	
	15:30-15:45	BREAK	Host team
	15:45-17:00	Result analysis Field visit briefings Recapitulation	

DAY	TIMES	TOPIC	FACILITATOR
Wednesday	06:30	Departure to FFS site	Host team
	09:00-12:30	Visit FFS group	
	12:30-14:00	LUNCH	Host team
	14:00-17:00	Feedback of FFS activities Experience sharing	

DAY	TIMES	TOPIC	FACILITATOR
	08:00-08:15	Recapitulation	Host team
Tuesday	08:15-10:15	Farming as business Income Generating Activities Cost Benefit Analysis	
	10:15-10:30	BREAK	Host team
	10:30-12:30	Record keeping Learning Proposal Weekly Report	
	12:30-14:00	LUNCH	Host team
	14:00-15:30	Group dynamics / Folk Media Exchange Visit	
	15:30-15:45	BREAK	Host team
	15:45-17:00	Field day Evaluation of FFS	

DAY	TIMES	TOPIC	FACILITATOR
	08:00-08:15	Recapitulation	Host team
Friday	08:15-10:15	Graduation Event Calendar Participatory Discussions on Post graduation activities	
	10:15-10:30	BREAK	Host team
	10:30-11:00	Question & Answer Session	
	11:00-14:00	LUNCH	Host team
	14:00-15:30	Preparation of Facilitation Plan Presentation of Facilitation Plan	
	15:30-15:45	BREAK	Host team
	15:45-17:00	Course evaluation Presentation of Folk Media Official closing	