

# Quick Reference for Application of Key Techniques in CB-NRM Technical Manuals



Prepared by

**The Project for Community-Based Sustainable Natural Resource Management in the Democratic Republic of Timor-Leste**



From  
the People of Japan



## FOREWORD

Forest degradation and deforestation is one of the critical issues that the Government of Timor-Leste (GoTL) needs to tackle to achieve sustainable socio-economic development in the country. The study made in 2013 shows that approximately 184,000 ha of forest has disappeared between 2003 and 2012 and around 170,000 ha of dense forest has been degraded into sparse canopy forests for the same period.

Community-Based Natural Resource Management (CB-NRM) is an approach to nature conservation by recognizing the rights of local communities to benefit from sustainable management of natural resources (forests, lands, water, and biodiversity) within a designated area. This is an alternative to a top-down regulatory approach, which has not been necessarily effective in many countries, especially when the regulations do not fully cope with the changes in social, cultural, and economic contexts in the countries.

The Project for Community-Based Sustainable Natural Resource Management (the CB-NRM Project) jointly implemented by the Japan International Cooperation Agency (JICA) and the Ministry of Agriculture and Fisheries (MAF), particularly the National Directorate of Forest and Watershed Management (NDFWM), has developed an operative mechanism for CB-NRM in Timor-Leste. The same project has also issued the following manuals over the course of the project to help MAF expand the same mechanism in major river basins in the country.

- ◆ Operation Manual for Establishment of the CB-NRM Mechanism at the Village Level
- ◆ CB-NRM Technical Manuals
  - Vol. 1: Seedling Production and Tree Planting Promotion
  - Vol. 2: Sustainable Upland Farming Promotion
  - Vol. 3: Income Generating/Livelihood Development
- ◆ Manual for Formation of a Watershed Management Council

The CB-NRM Technical Manuals introduce key techniques/skills relevant to sustainable land and forest management as well as livelihood development along with the detailed procedures for provision of hands-on training. They are based on learning from experiences in the field; therefore, we, as representatives of the MAF, strongly recommend that the manuals should be widely used by field practitioners of not only MAF but also other organizations working in the forestry and agriculture sectors as a guiding tool for provision of agriculture and forestry extension services to local communities.



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October 2015



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## **About the CB-NRM Manuals**

The CB-NRM Manuals have been developed and published by the JICA and MAF Joint Project named the Community-Based Sustainable Natural Resource Management to provide practical and useful tools for planners and practitioners in the forest sector in Timor-Leste to enable them to protect and manage natural resources in a collaborative and sustainable manner. There are three (3) types of manuals as shown below.

- i) Operation Manual for Establishment of the CB-NRM Mechanism at the Village Level
- ii) CB-NRM Technical Manuals
  - Vol. 1: Seedling Production and Tree Planting
  - Vol. 2: Sustainable Upland Farming Promotion
  - Vol. 3: Income Generating/Livelihood Development
- iii) Manual for Formation of the Watershed Management Council

The Operation Manual is the main document which spells out the standard operation procedures for introduction and establishment of the CB-NRM mechanism at the village level. It is designed for use by planners, field practitioners, and researchers working/studying in the forest sector in Timor-Leste, especially those who engage in forest protection, watershed conservation, and community forestry in the National Directorate of Forest and Watershed Management (NDFWM).

The CB-NRM Technical Manuals supplement the Operation Manual by introducing relevant techniques and skills which can help rural communities use and manage natural resources, especially lands and forests, in a productive and sustainable manner. They will be used mainly by field extension workers (such as MAF municipal staff: namely, municipal officers, extension officers, and forest guards) and NGO staff, as technical references for their field works.

The Manual for Formation of the Watershed Management Council introduces the process to develop a collaboration platform/framework for sustainable natural resource management at the sub-municipal or sub-watershed level, which can also lay groundwork for expansion of the CB-NRM mechanism on watershed scale. As one of the key approaches to improvement of environmental governance at the watershed level by enhancing coordination and networking among local stakeholders, this manual can be of help for those who engage in watershed management.

This is a quick reference of the Technical Manuals to help users easily follow the procedures introduce key CB-NR techniques in the field.

It is to be hoped that this quick reference would be used by a wide range of stakeholders, especially those who are engaged in the extension works in the agriculture and forestry sectors, as a practical technical reference together with the CB-NRM Technical Manuals.

***Key Techniques for  
Seedling Production  
and  
Tree Plantation***

## Seedling Production and Tree Plantation

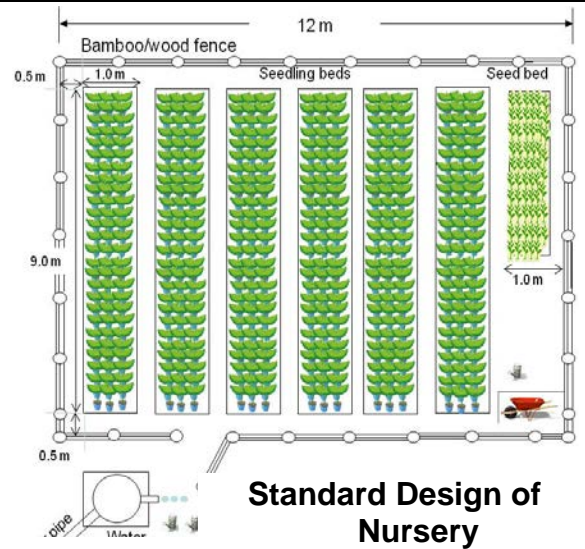
### List of Techniques for Seedlings Production and Tree Plantation

<b>Techniques</b>	<b>Application Month</b>	<b>Quick Reference No.</b>
 <p><b>Nursery Establishment</b></p>	<p><b>March</b></p>	<p><b>1-1</b></p>
 <p><b>Seed Preparation and Sowing</b></p>	<p><b>March - September, May-June</b></p>	<p><b>1-2</b></p>
 <p><b>Preparation of Seedling Pot</b></p>	<p><b>May - June</b></p>	<p><b>1-3</b></p>
 <p><b>Maintenance of Seedlings and Hardening-off</b></p>	<p><b>May - October</b></p>	<p><b>1-4</b></p>
 <p><b>Compost Making and Maintenance</b></p>	<p><b>May - October</b></p>	<p><b>2-1</b></p>
 <p><b>Delineation of Contour Lines</b></p>	<p><b>September-October</b></p>	<p><b>2-2</b></p>
 <p><b>Plantation Layout</b></p>	<p><b>September-October</b></p>	<p><b>1-5</b></p>
 <p><b>Planting</b></p>	<p><b>November-December</b></p>	<p><b>1-5</b></p>
 <p><b>Tending</b></p>	<p><b>January, April-May</b></p>	<p><b>1-5</b></p>

## 1-1. Nursery Establishment

### (1) Design a nursery layout

- Select tree species considering trees' suitability for site conditions and community's interest.
- Determine the target number of seedlings to be produced considering potential mortality (about 20%) and community's capacity.
- Design layout of a nursery with facilities (i.e., a water tank, seed/seedling beds, and side paths) based on the following conditions:
  - 100 seedling pots require 1 m<sup>2</sup>,
  - 50 cm-wide side path is to be placed between seedling beds, and
  - a 1-m-wide per seed bed is to be developed in a nursery.The standard design for about 5,000 seedlings is shown above.



### (2) Select a site

- Select a site for the nursery considering the accessibility to a water source and members' houses, and ground conditions of the site.
- Consult with owners of the land and water source about its use.

### (3) Install a water system

- Connect a water source to the nursery with bamboo pipes/ hoses.
- Place a 200 liter drum can for watering.

### (4) Develop a nursery

- Clear and level the ground.
- Collect local materials such as bamboo and wood, nalo grasses/palm leaves, nails and wires.
- Put fences around the nursery and thatch its roof with nalo grasses/palm leaves.



- ▶ Roof thickness should be adjusted according to insulation intensity of the site.
- ▶ Make wind breaks made of grasses/leaves if the site for the nursery is windy.

## 1-2. Seed Preparation and Sowing Seed

### (1) Collect seeds

- Select healthy and large mother trees which have a well-developed crown or bear quality fruits for timber and fruits species, respectively.
- Collect seeds from mother trees in the harvesting season.

Harvesting Period of Seeds

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sandalwood	-	-	X	X	-	-	-	-	X	X	-	-
Clove	-	-	X	X	-	-	-	-	-	-	-	-
Citrus	-	-	-	-	X	X	X	-	-	-	-	-
Rambutan	-	-	X	X	X	-	-	-	-	-	-	-
Longan	-	-	-	-	-	-	X	X	X	-	-	-
Teak	-	-	-	-	-	-	X	X	-	-	-	-
Mahogany	-	-	-	-	-	-	X	X	-	-	-	-

Note. X: Harvesting period

- In case of no mother tree, procure seeds from reliable sources in the country.

### (2) Pre-treat seeds

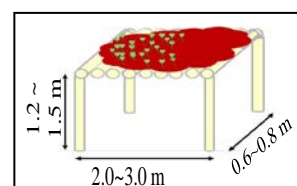
- Pre-treat seeds of the respective species in accordance with the following methods to obtain high germination rate.

Methods of Pre-treatment of Seeds

Species	Methods of pre-treatment of seeds
Sandalwood	1) Soak seeds in cool water from 12 to 24 hours
Clove	1) Remove skin of seeds 2) Soak into water for 1-2 hours
Citrus	1) Mix seeds with ash
Rambutan	Not necessary
Longan	ditto
Teak	1) Put seeds in a rice sack and soak the sack in the cool water for 72 hours. 2) After taking the sack from water, spread seeds in a black-colored container. 3) Expose seeds to sunlight for at least 2 days to dry them.
Mahogany	1) Dry seeds for 48 hours

### (3) Make a seedbed

- Make a 1.2~1.5 m-high seedbed frame.
- Fill with soil mixture (top soils: sands: compost = 2:1:1) in the seedbed.



### (4) Sow and maintain seeds

- Pour water on the seedbed one day before sowing.
- Sow seeds in the seedbed and cover it with dried grasses after sowing to maintain moisture and temperature.
- Water the seedbed twice a day carefully not to dislodge seeds sown.
- Periodically check the germination of seeds sown in the seedbed.

- A shallow bucket with a soft cloth could be used as a seedbed for germination of sandalwood seed in case the number of the seedlings is limited.
- For germination of teak seeds, the seedbed should be covered with a black plastic sheet for 48 hours without watering.



## 1-3. Preparation of Seedling Pot

### (1) Collect soils and other materials

- Collect top/black soils in dense forests or coffee plantations, sub-soils near the nursery, and sands in rivers.
- Procure compost and soil amendments (e.g., rice husk and sown wood dust).

### (2) Mix soils with other materials

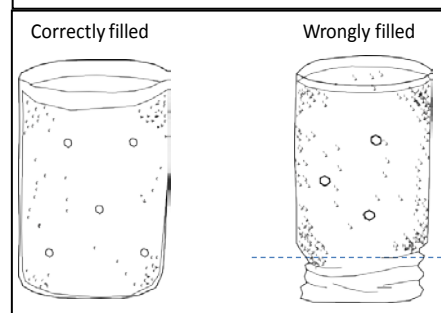
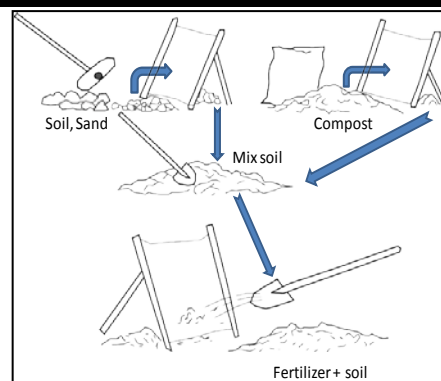
- Sieve soils, sands, and compost using a 5 mm mesh sand strainer.
- Mix top soils, sands, and compost at ratio of 3:1:2 for timber/fruit trees and 1:2:1 for sandalwood.

### (3) Fill soil mixture into poly bags

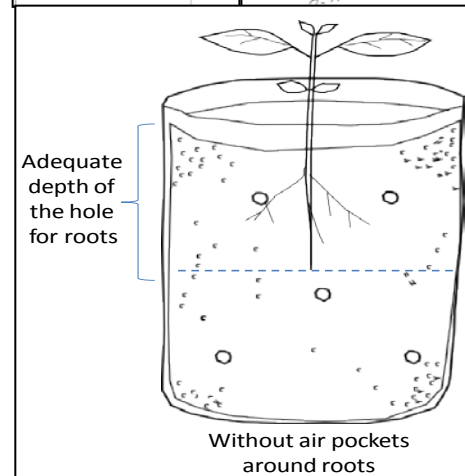
- Fill soil mixture to 1/3 height of a poly bag and shake to fill the mixture evenly.
- Fill up the poly bag with the mixture.
- Repeat b. to prepare the number of pots.
- Place the poly bags in the seedling bed and group 100 of them as one block.

### (4) Transplant sprouts into pots

- Water seedling pots one day before transplanting.
- Collect host plants (*Alternanthera ficoidea*) for planting of sandalwood sprouts.
- Take sprouts from the seedbed holding the lowest leaf junction and soak them in a shallow bowl of water.
- Make a small hole in a pot with a stick.
- Put one sprout in one hole without bending its roots.
- Cover and pat the base of the sprout gently not to leave air pockets around its roots.
- Repeat d. to f. until all sprouts are planted.
- Water the seedling pots, place them in a dark area for a few days and relocate them in a partially shaded area when new leaves sprout.
- Put a label with seedlings' information at each block.



Host plant of sandalwood



► Transplanting shall be carried out in a shaded area and completed within 15 minutes after pricking.

## 1-4. Maintenance of Seedlings and Hardening-off

### (1) Water seedlings

- a. Water seedling pots gently with a watering can until water penetrates to the bottom of the pots in the early morning or late afternoon.








### (2) Weed and relocate seedling pots to keep sufficient space

- a. Hand-pick weeds on seedling pots regularly.
- b. Keep sufficient space between seedling pots.

### (3) Apply liquid fertilizer and cut roots of seedlings

- a. Apply liquid fertilizer when observing nutritional disorder. The method to make liquid fertilizer is shown in Vol. 2 of Technical Manual.
- b. Cut the roots out from the pots.

### (4) Control pests and diseases

Symptom	Cause	Measures
Rolling up &  discolor	Citrus leaf miner 	<u>Application</u> Spray tobacco leaves water to underside of leaves once a week for 2-3weeks. <u>Preparation</u> Mix 2 leaves of tobacco (or 8 sticks of dried leaves of cigarette) with 1 liter of water and dilute to 50% for application. <u>Species subject to be affected:</u> Orange
Spots 	 Spider	<u>Application</u> Spray vinegar water or brewed coffee from underside of leaves. <u>Preparation</u> Dilute vinegar at the rate of vinegar : water = 1: 20 <u>Species subject to be affected:</u> Teak
Holes 	Grasshopper/ Leaf roller 	<u>Application</u> Spray decoction of green banana skin to the insects. <u>Preparation</u> Boil 1 liter water and add one handful of green banana skin. Brew it for 30 minutes. Remove the banana skin by filter. <u>Species subject to be affected:</u> Mahogany, Orange
White mildew 	Fungus No image	<u>Application</u> Apply plant ash or splay diluted vinegar with 20-30 times of water. <u>Species subject to be affected:</u> Orange

▶ When finding a symptom of pests/diseases on seedlings, immediately isolate the affected ones from others to prevent spreading of pests and diseases.

### (5) Harden off seedlings

- a. Reduce the frequency of watering a few weeks before planting so that the seedlings can be adapted to the external environment.
- b. Stop applying liquid fertilizer a few weeks before planting.
- c. Stop cutting roots one month before planting.
- d. Remove thatch of the nursery to expose seedlings to sunlight one month before planting.

## 1-5. Planting and Tending

### (1) Design a plantation

a. Design a layout of a plantation according to the following guidelines.

Objective	Fruit/industrial plant production	Timber production
Target site	Home garden/ backyard farms	Shifting cultivation area
Tree species	Fruit trees, Leguminous trees, Sandalwood	Timber species (e.g., Teak and Mahogany)
Planting interval	Fruit trees: 4-7 m, Perennial crops: 1-2 m, Leguminous trees: 3-4 m	Timber trees: 3 m
Image of Plantation	<p>The diagram shows a home garden layout with several rows of plants. The top row consists of 'Shade tree' plants. Below them are 'Coconut' trees, 'Banana' plants, and 'Newly planted banana' plants. Further down are 'Fruit trees' and 'Newly planted tree (Fast growing leguminous trees)'. The bottom row shows 'Newly planted tree' plants.</p>	<p>The diagram shows a timber plantation layout on a slope. It features a grid of trees with dimensions: 3m between rows, 1.5m between trees in a row, and 2.6m between trees in a row. A legend indicates that stars represent 'Teak' and crosses represent 'Mahogany'. A dashed line indicates the 'Contour line delineated using "A-frame"'. A vertical arrow on the right indicates the 'Slope'.</p>

### (2) Dig planting pits

- Dig as many pits as the number of seedlings are planted in a plot. The pit should be 40 cm in depth and 40-60 cm in diameter.
- Put top soils separately from sub soils beside the hole.

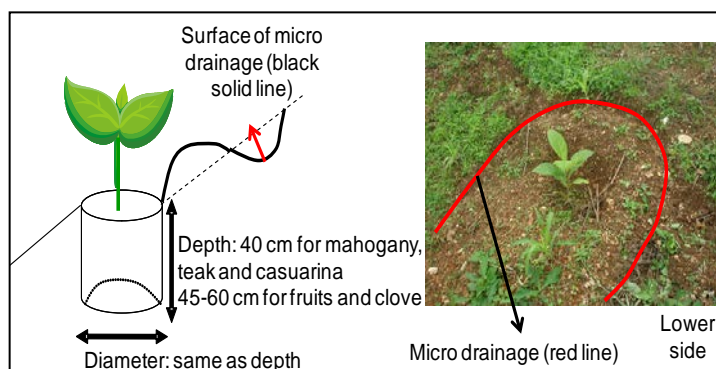
- ▶ *Pitting shall be completed a few weeks before planting.*
- ▶ *Digging sufficient size of pits is requisite for high survival of seedlings.*

### (2) Refill planting pits with soils and compost

- Refill the pits with sub-soils mixed with compost, and cover them with top soils.

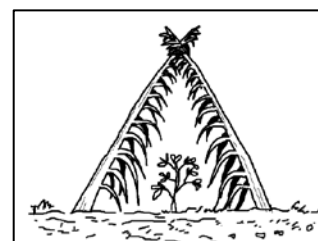
### (4) Plant seedlings

- Select seedlings higher than 20-25 cm and transport to the plot.
- Dig a hole as large as the seedling pot in each pit.
- Remove plastic pots and plant seedlings in the holes.
- Make a U-shaped micro drainage area in the upper slope of each seedling.



### (5) Maintain seedlings for a few years after planting

- Weed grasses within 50 cm radius from seedlings every two months during the rainy season.
- Cover the bases of seedling with weeded grasses.
- Cover seedlings with shades made of local materials (e.g., coconut leaves), if necessary.



***Key Techniques for  
Sustainable Upland Farming***

## List of Techniques for Sustainable Upland Farming

Techniques	Application Month	Quick Reference No.
 <p><b>Compost Making and Maintenance</b></p>	May - August	2-1
 <p><b>Delineation of Contour Lines</b></p>	July - August	2-2
 <p><b>Application of Contour Composting Terrace</b></p>	August and November	2-3
 <p><b>Cultivation with Compost Application</b></p>	August - October	2-4
 <p><b>Selection of Seeds/ Planting Materials</b></p>	October	Refer to full version of the manual
 <p><b>Making and Application of Liquid Fertilizer</b></p>	November - February	2-5
 <p><b>Weeding and Mulching</b></p>	December - February	Refer to full version of the manual
 <p><b>Post-harvesting and Storage of Seeds</b></p>	April - May	Refer to full version of the manual

## 2-1. Compost Making

### (1) Select the location for a compost pit and digging of a hole

- Decide the location of a compost pit, which should be close to a source of water and a farm to which compost is applied.
- Dig a pit, which should be 2 m long, 1.5 m wide, and 1 m deep for 3 tons of compost.
- Make another pit next to the 1<sup>st</sup> one, if possible.



- ▶ *The volume of compost should be determined according to the size of farm. **At least 2~4 tons of compost is needed for 1 ha of farm.***
- ▶ *The 2<sup>nd</sup> pit should be as large as the 1<sup>st</sup> one.*

### (2) Collect and prepare materials

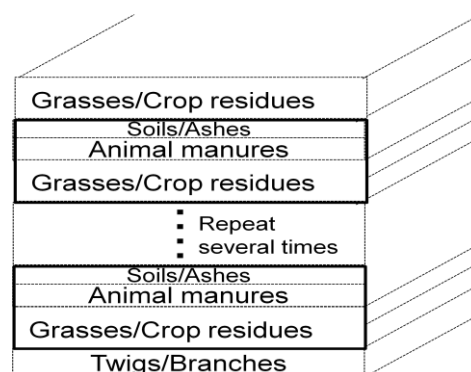
- Collect the following materials.
  - ◆ Vegetative materials (e.g., grasses/weeds, stalks of maize/banana, leaves of caliandra/ sesbania/gamal, and coffee husk)
  - ◆ Animal manure (e.g., cow dung, goat dung, and chicken dropping)
  - ◆ Top/black soils and ashes
  - ◆ EM (if possible) or tua mutin/papaya flesh
- Chop the vegetative materials into small pieces at the site.



- ◆ *The mixture ratio of vegetative materials to animal manure should be 2:1.*
- ◆ *You should use EM or tua mutin/papaya flesh to facilitate the process of fermentation and produce quality compost.*

### 3) Pile materials

- Stratify the materials at a height of 5~10 cm each.



## Sustainable Upland Farming

- b. First put a layer of maize and banana stalks or other stuff rather difficult to decompose, and then put a layer of grasses/weeds and that of animal manure.
- c. Cover the layer of animal manure with soils and ashes, and pour a lot of water after putting the layer of soils and ashes.
- d. Repeat b and c alternately until they fills up the pit.
- e. In the course of layering, put a hollowed-out bamboo pole with holes at the center of the pit for ventilation.
- f. Pour again a lot of water on the top of the pile.
- g. Cover the surface with banana leaves or plastic cover.
- h. Put thatch over the pit to protect compost from direct exposure to sunlight.

### (4) Maintain compost

- a. As compost will become very hot during its fermentation process, leave it for 3~4 weeks. But add water to the compost regularly to maintain its moisture contents.
- b. When it cools down, (i) move compost to another pit turning the inside out and the upside down (if two pits are made) or (ii) take out compost, mix it well, and refill the pit with it. (if only one pit is made).
- c. Pour a lot of water while filling the pit with compost
- d. As compost will gain heat, leave it again for about 3~4 weeks.
- e. When the temperature of compost gets cool, do activities b to d again.

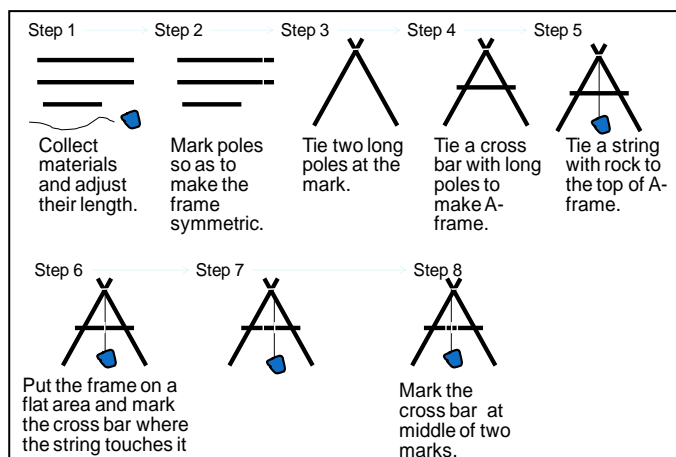


- ▶ *Compost should be mixed well when being moved or refilled in order to decompose all materials of compost evenly.*
- ▶ *You should start producing compost in May/June so that you can collect fresh grasses and weeds in the localities.*
- ▶ *You should maintain the moisture content of compost to facilitate the process of decomposition.*

## 2-2. Delineation of Contour Lines<sup>1</sup>

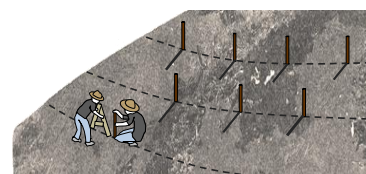
### (1) Collect the following materials and make A-frames<sup>2</sup>

- ◆ Long wood/bamboo: 2 pcs. x 2 m and 1 pc x 1 m
- ◆ Fist-sized rock: 1 pc.
- ◆ String/thin rope: 2 m
- ◆ Nails/wires/binding strings
- ◆ Tools: hammer/machete/ knife
- ◆ Make A-frames as shown right.



### (2) Process to Delineate contour lines using A-frame

- a. Stick the first stake at the edge of the farmland and put the left leg of an A-frame at the first stake.
- b. Adjust the right leg to make the string pass through the midpoint of the crossbar and stick another stake at the right leg.
- c. Move the A-frame to the right by placing the left leg at the stake where the right leg previously was put.
- d. Adjust the left leg again until the string passes through the midpoint, and again stick a stake at the right leg.
- e. Follow the process up to the edge of the farm.
- f. Take another point 1 m downwards in a vertical direction using a 1 m long stick. Do the activities from a. to e.
- g. Repeat the activities from a. to f. until all the contour lines are delineated.



- ▶ You should take out all grasses in a farm before using an A-frame, or you cannot delineate contour lines correctly.
- ▶ You should use a 1 meter-long stick to measure distance between contour lines.

**The contour line is not correctly delineated as the lines were taken without clearing the areas.**

<sup>1</sup> A contour line is a line that is the same level all the way across a slope.

<sup>2</sup> An A-frame is a tool used to mark places of the same level on a hillside



## 2-3. Application of Contour Composting Terraces

After delineating contour lines, contour compost terraces should be introduced over the entire farm.

### (1) Make canals and put grasses

- Dig a canal about 50 cm wide and 30 cm deep along each contour line.
- Make a bund on the downward edge of each canal using the excavated soils.
- Dig diversion canals on the edges of a farm to drain excess water.
- Put grasses/weeds in the canals.

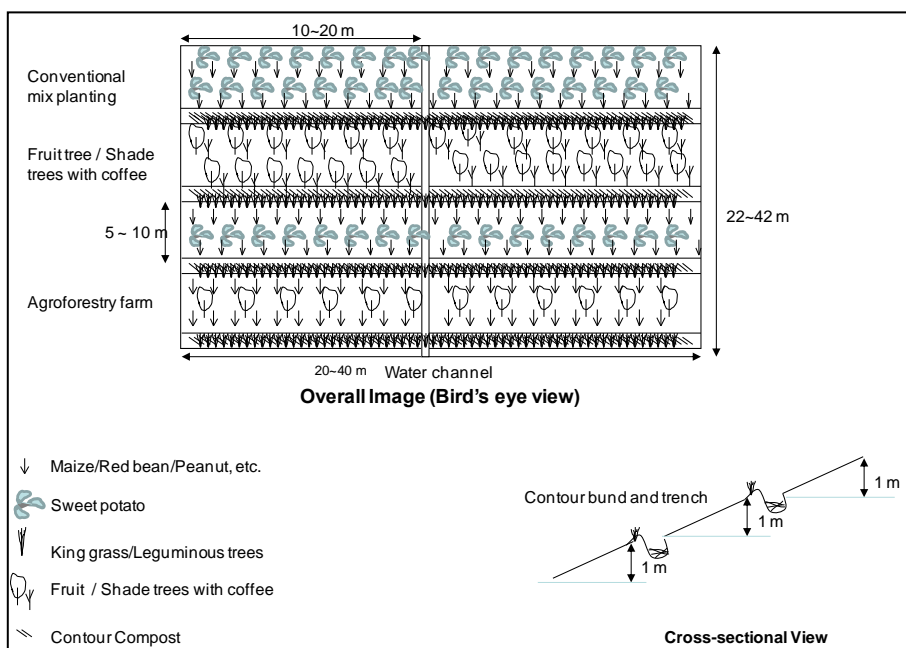
### (2) Plant grasses/leguminous trees as hedgerow

- Plant king grasses on contour bunds as hedgerows and leguminous trees (gamal/caliandra) in front of the bunds to strengthen the stability of contour bunds.

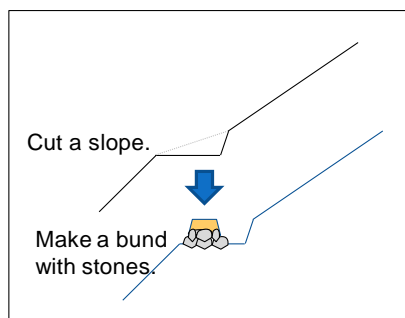


The standard design of a farm with contour compost terraces is shown right.

- ▶ *In case the contour bunds are fragile, you should apply wattles to protect bunds.*
- ▶ *In case a farm is stony, you should use stones as bases of the bunds.*



**Wattles should be applied when soils are too fragile to make bunds.**



**Stones should be used as bases of**

## 2-4. Cultivation, Application of Compost, and Planting

### (1) Cultivate a farm

- Clear/Cut grasses in the plot in August.
- Plow the plot with a hoe and incorporate remnants of weeds into soils in September/October.

### (2) Apply compost to a farm

#### Line application

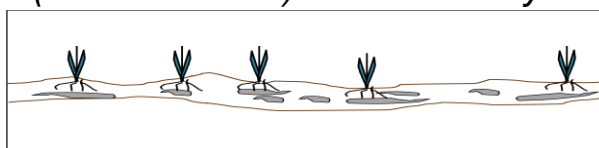
- Dig thin furrows (10 cm wide and 20 cm deep) along the lines where maize and other crops are sown.
- Put compost evenly in the furrows (50 kg or 2 sacks of compost is recommended for a 50 m-long furrow.)
- Cover compost with surface soils.

#### Hole application

- Dig small holes (10~20 cm in diameter and 20 cm in depth) where corn seeds are sown.
- Put 100~200 g of compost in each hole.
- Cover compost with surface soils.



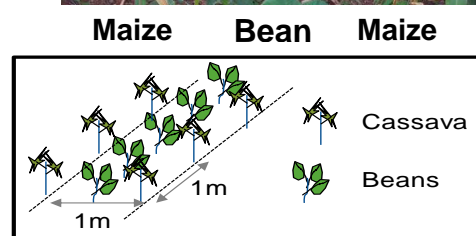
- ▶ Compost should be applied at least 2 weeks before planting to ensure its effectiveness.
- ▶ Compost should be incorporated into soils (under the surface) so that root systems of crops (such as maize) can effectively absorb nutrient.



### (3) Sow seeds/Plant

Crops should be planted in a semi-intensive manner as follows.

Combination	Spacing
1. Maize & Beans	Maize: 1.0 m x 0.5 m Beans (red bean): 1.0 m x 0.3 m
2. Cassava & Beans	Cassava: 1.0 m x 1.0 m Red beans (climbing type): 1.0 m x 0.3 m
3. Peanut	0.3 m x 0.3 m
4. Maize & Sweet potato	Maize: 1.0 m x 0.5 m Sweet potato/pumpkin: 1.0 m x 0.5 m
5. Cassava & Pumpkin	Cassava: 1.0 m x 1.0 m Pumpkin: 1.0 m x 0.5 m



## 2-5. Making and Application of Liquid Fertilizer

### (1) Collect and prepare materials

- Procure a large-sized container, such as a plastic bucket or drum can, and clean it.
- Collect ingredients of fertilizer: 5-10 kg of cow dung/other animal manure, 30-40 kg of grasses and leaves of leguminous trees, tua mutin/tempe/EM, and 200 liters of water.



- ▶ Use fresh manure since it has more nutrients.
- ▶ If possible, mix different types of manure. Chicken droppings are more nutritious.
- ▶ Put one (1) shovel of ashes to add minerals to liquid fertilizer.

### (2) Make liquid fertilizer by mixing materials

- Put a rice sack filled with animal manure into the container.
- Put chopped crop residues/grasses and leaves and tua mutin/tempe/EM into the container.
- Pour water until the container is filled.
- Cover the container to protect its contents from contamination/dilution.
- Stir the contents with a stick for 5~10 minutes every day for 2~3 weeks.
- The contents can be used 2~3 weeks later.



### (3) Apply liquid fertilizer with weeding and mulching

- Weed grasses in a farm 3 weeks after planting of maize (1st weeding).
- Scoop up clear surface water in the container and dilute it with 20 times amount of water.
- Apply the diluted water to maize after the 1st weeding.
- Cover the soil surface around crops with weeded grasses (mulchig).
- Repeat items a. to d. 1 month after the 1st weeding (2nd weeding) and another 1 month after the 2nd weeding.



- ▶ Mulching is effective in controlling weeds and maintaining moisture contents in soils.
- ▶ Use the leaves of leguminous trees for mulching if available.

***Key Techniques for  
Income Generation/  
Livelihood Development***

**List of Techniques for  
Income Generation/ Livelihood Development (IG/LD)**

<b>Techniques</b>	<b>Application Month</b>	<b>Quick Reference No.</b>
 <p><b>Identification of Potential IG/LD Activities</b></p>	<p align="center"><b>April</b></p>	<p align="center"><b>3-1</b></p>
 <p><b>Drying Method: Herbal Tea Production</b></p>	<p align="center"><b>May - June</b></p>	<p align="center"><b>3-2</b></p>
 <p><b>Drying Method: Dried Sweet Potato Production</b></p>	<p align="center"><b>July</b></p>	<p align="center">Refer to full version of the manual</p>
 <p><b>Soaking Method: Salted Vegetables Production</b></p>	<p align="center"><b>May and August</b></p>	<p align="center"><b>3-3</b></p>
 <p><b>Soaking Method: Pickled Vegetables Production</b></p>	<p align="center"><b>June</b></p>	<p align="center">Refer to full version of the manual</p>
 <p><b>Frying Method: Cassava Chips Production</b></p>	<p align="center"><b>October</b></p>	<p align="center"><b>3-4</b></p>
 <p><b>Home Manufacturing Option: Sewing</b></p>	<p align="center"><b>December - February</b></p>	<p align="center"><b>3-5</b></p>
 <p><b>Management of IG/LD Activities</b></p>	<p align="center"><b>April - May</b></p>	<p align="center"><b>3-6</b></p>

### 3-1. Identification of Potential IG/LD Activities

Prior to hands-on training, potential IG/LD activities shall be identified and selected through a resource inventory.



- (1) **Assess potential resources**
  - a. Conduct “resource mapping” and “transect walking” to assess land use and major resources in a village in a participatory manner.
  - b. Conduct “seasonal calendar” to confirm the seasonality of major products in a village.

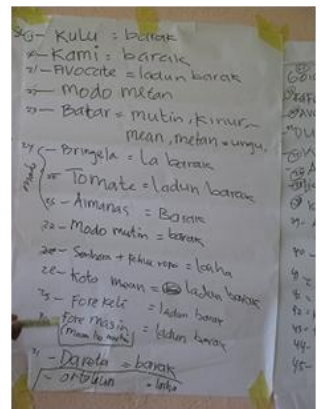
Production Schedule		Month											
Name of Crop	Time	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Cassava (Ai farina)	Sowing												
	Harvesting												
Cassavachips	Production												
	Sales												

- c. Discuss possible uses of the identified resources for production.
- d. Assess the volume of the resources available.
- e. Identify the potential IG/LD activities.

(2) **Select the potential IG/LD options**

- a. Make a list of resources with potential IG/LD activities (processed products).
- b. Evaluate potential IG/LD activities in terms of the following evaluation criteria.

Criteria	Point of discussions
Applicability	Possibility of applying techniques used for potential IG/LD options.
Impact	Estimated number of household who can benefit from the
Sustainability	Volume of and accessibility to resources used for production
Marketability	Possibility of marketing of processed products
Affordability	Estimated costs of start-up and operations of potential IG/LD options.



- c. Prioritize potential IG/LD activities based on the results of evaluation and select 3~5 priority ones.



## 3-2. Drying method: Herbal Tea Production

### (1) Collect healthy leaves

- Collect healthy leaves from medicinal/herbal plants.
- Remove dirty, insect-eaten, diseased and oddly-shaped parts of leaves.

▶ *Leaves shall not be collected in unhygienic areas, such as kitchen, toilet and animal pen to prevent bacterium contamination.*

### (2) Clean and sort out collected leaves

- Wash leaves well and remove foreign matters (e.g., mud, sand, worms, and insect eggs).
- Remove dirty or bad shaped ones.
- Wipe up water well from leaves.
- Cut leaves to uniform their size.

### (3) Dry leaves

- Spread leaves on a mesh tray evenly.
- Cover the tray with a black cloth to protect leaves from direct exposure to sunshine. Put the tray under a roof during nights and rainy time.
- Dry leaves for 1 week until they can easily crached when grabbed.

### (4) Sort out and pack them

- Put dried leaves on a white paper and check their color, and dryness to select those that meet the quality standard.
- Pack the qualified leaves into packages.
- Label the packages of product.
- Store them in a clean stocker with dry silica gel.



**Standard quality**

- ▶ *Do not make herbal tea when you are sick to prevent contamination.*
- ▶ *Moisture content in dried leaves should be less than 10%.*
- ▶ *At least 4-times training are needed to transfer the techniques/skills.*

### 3-3. Soaking Method: Salted Vegetable Production

#### 1) Wash and dry vegetables

- Select fresh leafy vegetables.
- Cut off their roots and dirty parts and wash vegetables well.
- Dry vegetables for 0.5~1 day.



#### (2) Salt and pickle vegetables

- Place the semi-dried vegetables in a poly-bag in a bucket.
- Put salt between vegetable leaves and pour water.
- Close up the poly bag and press by foot until it becomes less flexible.
- Open the poly bag and add a pinch of chili and one spoonful of turmeric powder.
- Close up the poly bag loosely and place weight stones on the bag with an insect net cover.
- Put the container in a cool and dark place for a few months.
- Check the condition once a week and remove excessive water when necessary.



#### (3) Packing and labeling for marketing

- Pack the measured 200 gram of vegetables into poly bags.
- Label the packages of product.
- Keep them in a cool and dark place until they are marketed.



- ▶ Cover a bucket with an insect net to prevent the infestation of maggot.
- ▶ Any leafy vegetables can be used for salted vegetables.
- ▶ Apply much salt if the shelf life of the products needs to be prolonged.



### 3-4. Frying Method: Cassava Chips Production

#### (1) Wash, peel, and slice cassava

- Wash and peel cassava, and remove its dirty parts.
- Wash peeled cassava well.
- Slice them into 1 mm with a slicer.
- Remove thick and deformed slices.

#### (2) Pre-treat, wash and dry the slices

- Soak the slices (3 kg) into water (5 lit.) mixed with salt (1 spoon) and lime (1/2 spoon) for 10 minutes.
- Wash the slices 5 times and put them on a drainer.
- Spread the slices on a big mesh tray and dry them in the sun for 10 minutes.

#### (3) Make seasonings and toppings

<Lime and chili flavor seasonings >

- Remove seeds of dried chili and cut into small pieces.
- Pound dried lime leaves and mix with the sliced chili and salt.

<Garlic with pepper flavor seasonings>

- Ground pepper and salt in a stone grinder.
- Fry sliced garlic at 170-185°C until they turns golden.

#### (4) Fry and season chips

- Fry the slices in 2 lit of oil at 170-185°C until they turns golden.
- Drain off oils and spread them on a kitchen paper to cool them down.
- Sprinkle seasoning powder with a tea strainer before chips get cold.
- Add topping on the seasoned chips.

#### (5) Pack chips and label the packages

- Measure chips and pack before they get wet.
- Label the package of products.

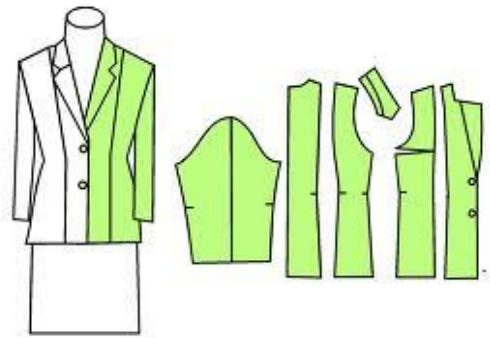


### 3-5. Home Manufacturing Options: Sewing Clothes

Mending and making of clothes by using a sewing machine is another option for women to earn cash income without depending on natural resources.

#### (1) Make a pattern of clothes and cut a cloth

- a. Make a pattern of clothes.
- b. Trace the pattern on a cloth with a chalk.
- c. Cut the cloth along with the drawn lines with a scissors and make parts of clothes. (Leave some seam allowance when cutting the cloth.)
- d. Attach the parts to each other with marking pins.



#### (2) Baste and fit the clothes

- a. Baste the parts roughly.
- b. Fit/Adjust the basted clothes to/with a person who put it.

#### (3) Sew a clothes

- a. Sew the parts together.
- b. Remove basting thread and needles.
- c. Press the clothes with an iron.
- d. Remove waste threads and clear cotton dust from the sewing machine, and oil its moving parts.



- ▶ *At least 2 sets of training shall be held to enable women to acquire sewing skills.*
- ▶ *Check the condition of a sewing machine and also check if any needles are left after use of the machine.*





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# Referéncia lais ba aplikasaun tékniku xave sira iha manual tékniku CB-NRM



**Prepara hosi**

**Projetu Jestaun Rekursu Naturál Sustentável Bazeia ba Komunitade  
República Democrática Timor-Leste**





## LIA MAKLOKEK

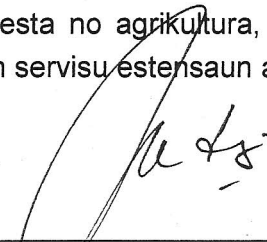
Degradasaun floresta no deforestasaun mak asuntu importante ida-ne'ebé Governu Timor-Leste (GoTL) preziza rezolve hodi atinje dezenvolvimentu sósiu-ekonómiku sustentável iha rai laran. Estudu ne'ebé hala'o iha tinan 2013 hatudu katak pelumenus 184.000 ha hosi floresta lakon ona entre tinan 2003 no 2012 no maizumenus 170.000 ha hosi floresta ho densidade nakonu hetan ona degradasaun sai floresta ho densidade uitoan iha períudu hanesan.

Jestaun Rekursu Naturál Bazeia ba Komunidade (CB-NRM) mak aprosimaun ba konservasaun natureza ho rekoñese komunidade lokál sira-nia direitu atu benefisia sira hosi jestaun rekursu naturál sustentável (floresta, rai, bee, no biodiversidade) iha área ne'ebé termina ona. Ida-ne'e mak alternativu aprosimaun reguladór hosi leten mai kraik, ne'ebé seidauk efetivu iha nasaun barak, liuliu bainhira regulamentu sira labele hatán hotu mudansa sosiál, kultura no kontestu ekonómiku iha rai laran.

Projetu Jestaun Rekursu Naturál Sustentável Bazeia ba Komunidade (Projetu CB-NRM) ne'ebé implementa hamutuk hosi Japan International Cooperation Agency (JICA) no Ministériu Agrikultura e Peska (MAP), partikulármente Diresaun Nasionál Floresta no Jestaun Bacias Hidrograficas (DNFGBH), dezenvolve tiha ona mekanizmu ne'ebé la'o daudaun ba CB-NRM iha Timor-Leste. Projetu ne'e mós hasai manuál tuirmai iha kursu projetu, atu ajuda MAP hodi habelar mekanizmu ne'ebé hanesan, iha mota prinsipál sira iha rai laran.

- ◆ Manuál Operasaun ba Estabelesimentu Mekanizmu CB-NRM iha nivel Suku
- ◆ Manuál Tékniku CB-NRM
  - Vol. 1: Produsaun Ai-oan no Promosaun Kuda ai
  - Vol. 2: Promosaun Toos Rai-lolon Sustentável
  - Vol. 3: Hasa'e Rendimentu/Dezenvolvimentu Vida-moris
- ◆ Manuál ba Formasaun Konsellu Jestaun Bacias Hidrograficas

Manuál Tékniku CB-NRM sira introdús tékniku/abilidade xave ne'ebé relevante ba jestaun rai no floresta sustentável no mós dezenvolvimentu vida-moris ho prosedimentu detallu ba provizaun treinamentu prátika direktamente. Hirak-ne'e bazeia ba aprendizajen hosi esperiénsia iha terrenu; Tanba ne'e, ami, hanesan reprezentativu MAP, rekomenda tebes katak, pratikante terrenu, la'ós de'it MAP, maibé mós organizasaun seluk ne'ebé servisu iha setór floresta no agrikultura, tenke uza manuál ne'e, hanesan instrumentu matadalan ba provizaun servisu estensaun agrikultura no floresta ba komunidade lokál sira.

  
Manuel Mendes  
Diretór Nasionál

Diresaun Nasionál Floresta no  
Gestaun Bacias Hidrograficas  
(DNFGBH), MAP

Outubru 2015  
  
Raimundo Mau  
Diretór Gerál Floresta, MAP

## **Kona-ba Manuál CB-NRM**

Manuál CB-NRM sira-ne'edezenvolve no públika hosi Projeitu Konjunta JICA no MAP hanaran Jestaun Rekursu Naturál Sustentável Bazeia ba Komunitade, atu fornese ekipamentu prátiku ne'ebé útil ba planeador no pratikante sira iha setór floresta iha Timor-Leste, hodi fasilita sira atu proteje no maneja rekursu natural sira ho maneira ne'ebé kolaborativu no sustentável. Materiál sira-ne'e kompostu hosi tipu manuál tolu (3), hanesan hatudu iha kraik ne'e.

i) Manuál Operasionál ba Estabelesimentu Mekanizmu CB-NRM iha Nivel Suku

ii) Manuál Tékniku CB-NRM

Vol. 1: Produsaun Ai-oan no Kuda Ai

Vol. 2: Promosaun To'os Rai-lolon Sustentável

Vol. 3: Hasa'e Rendimentu/Dezenvolvimentu Vida-moris

iii) Manuál ba Formasaun Konsellu Jestaun Bacias Hidrograficas

Manuál Operasionál ne'e mak komponente prinsipál ne'ebé espesifika prosedimentu Operasaun padraun ba introdusaun no estabelesimentu mekanizmu CB-NRM iha nivel suku. Manuál operasionál ida-ne'e dezeña atu planeador, pratikante, no servisu hanesan peskizadór/estudante sira iha setór floresta iha Timor-Lestebele uza, liuliu sira-ne'ebé envolve iha protesaun floresta, konservasaun bacias hidrograficas, no floresta komunitária iha Diresaun Nasionál Floresta no gestaun Bacias Hidrograficas (DNFGBH).

Manuál Tékniku CB-NRM sira suplementa Manuál Operasionál, introdús tékniku no abilidade relevante sira-ne'ebé bele ajuda komunitade rural, hodi bele uza no maneja rekursu natural sira, liuliu rai no floresta, ho maneira ne'ebé produtivu maibé mós sustentável. Manuál sira-ne'e tenke uza, prinsipalmente hosi servisu estensaun terrenu sira, hanesan funsióriu MAP munisípiu (ezemplu, funsióriu munisípiu, estensionista, no guarda floresta sira) no mós funsióriu ONG sira, hanesan referénsia tékniku ba sira-nia servisu iha terrenu.

Manuál ba formasaun Konsellu Jestaun Bacias Hidrograficas, introdús prosesu dezenvolvimentu kolaborasaun plataforma/kuadru servisu ba jestaun rekursu natural sustentável iha nivel postu-administrativu ka sub-bacias hidrograficas, ne'ebé bele mós hanesan servisu baze ba espansaun mekanizmu CB-NRM iha eskala bacias hidrograficas. Tanba manuál ida-ne'etak aprosimasaun esensial ida, hodi hadi'a governasaun ambiente iha nivel bacias hidrograficas, liu hosi hametin koordinasaun no rede servisu entre organizaun relevante okál sira. Manuál ida-ne'e bele uza hodi ajuda sira-ne'ebé envolve iha jestaun bacias hidrograficas.

Ne'e referensia lais ida hosi Manuál Tékniku hodi Ajuda uzadór sira ho fasil halo tuir prosedimentu sira ne'ebé introdus xave tékniku CB-NRM iha terrenu.

Tanba ne'e espera katak referensia lais ida ne'e sei uza hosi organizaun relevante oi-oin, liu-liu sira ne'ebé envolve iha servisu estensaun iha setór Agrikultura no florestál, hanesan referensia téknika prátika hamutuk ho Manuál Tékniku CB-NRM.



***Xave Tekniku ba  
Produsaun Ai-oan no Kuda Ai***

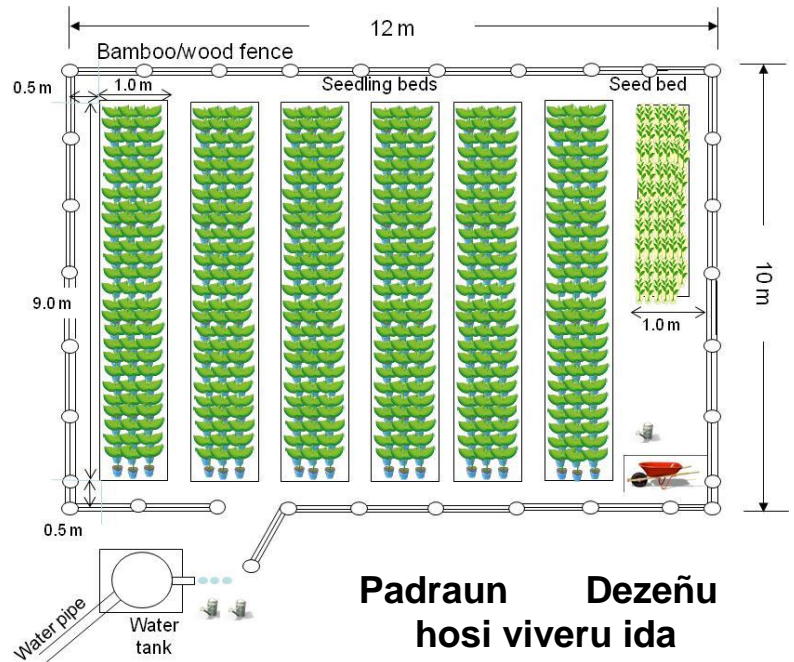
**Lista hosi Tékniku kona-ba Produsaun Ai-oan no Kuda Ai**

<b>Tékniku</b>	<b>Fulan Aplikasaun</b>	<b>Referensia Lais No.</b>
 <p><b>Estabelesimentu Viveru</b></p>	<p><b>March</b></p>	<p><b>1-1</b></p>
 <p><b>Preparasaun Fini no Kari'i</b></p>	<p><b>Marsu-Setembru, Maiu-Juñu</b></p>	<p><b>1-2</b></p>
 <p><b>Preparasaun Pot Ai-oan</b></p>	<p><b>Maiu - Juñu</b></p>	<p><b>1-3</b></p>
 <p><b>Manutensaun no Hato'os Ai-oan</b></p>	<p><b>Maiu - Outobru</b></p>	<p><b>1-4</b></p>
 <p><b>Halo Kompos no Manutensaun</b></p>	<p><b>Maiu - Outobru</b></p>	<p><b>2-1</b></p>
 <p><b>Deliñasaun Lina Ma'leuk</b></p>	<p><b>Setembru- Outobru</b></p>	<p><b>2-2</b></p>
 <p><b>Dezeñu plantasaun</b></p>	<p><b>Setembru- Outobru</b></p>	<p><b>1-5</b></p>
 <p><b>Kuda</b></p>	<p><b>Novembru- Dezembru</b></p>	<p><b>1-5</b></p>
 <p><b>Atendementu</b></p>	<p><b>Janeiru, Abril-Maiu</b></p>	<p><b>1-5</b></p>

# 1-1. Estabelesimentu Viveiru

## (1) Dezeña Modelu Viveiru nian

- a. Hili espésie ai, konsidera kondisaun fatin ne'ebé favoravel no interese comunidade nian.
- b. Determina númeru ai-oan tarjetu ne'ebé sei prodús, konsidera potenciál mortalidade (maizumenus 20%) no comunidade nia kapasidade.
- c. Dezeña modelu viveiru ho nia fasilidade sira (Ezemplu, tanke bee, kanteiru fini/ai-oan, no dalan ki'ik iha viveiru) bazeia ba kondisaun tuirmai: i) ba vazú ai-oan 100 presiza área 1 m<sup>2</sup>, ii) dalan ki'ik ho luan 50 cm sei halo entre kanteiru ai-oan sira, no iii) fatin kari fini ho luan metru 1 sei harii iha viveiru laran. Dezeñu padraun ba maizumenus ai-oan 5.000 mak hanesan hatudu iha leten.



**Padraun Dezeñu hosi viveru ida**

## (2) Hili fatin viveiru

- a. Hili fatin ida hodi harii viveiru, konsidera asesibilidade ba bee-matan no membru sira-nia uma no kondisaun rai iha viveiru ne'ebé sei harii.
- b. Konsulta ho rai-na'in no bee-na'in hodi halo konkordánsia atu bele uza rai no bee ne'e.



## (3) Instalasaun sistema bee

- a. Liga bee-matan ba fatin viveiru uza au/mangeira.
- b. Tau bidón 200 litru iha viveiru hodi rega ai-oan sira.



## (4) Harii viveiru

- a. Hamoos no halo tetuk rai.
- b. Kolleita materiál lokál sira hanesan au, ai, du'ut *nalo*/tali-tahan, pregu no arame.
- c. Halo lutu hale'u viveiru no taka uma kakuluk ho du'ut *nalo*/tali tahan.

► Uma kakuluk nia mahar tenke ajusta tuir intensidade manas iha fatin refere.  
► Didin netik viveiru uza du'ut/ai-tahan se karik iha fatin viveiru ne'e iha anin maka'as.

## 1-2. Preparasaun Fini no Kari Fini

### (1) Kolleita fini

- Hili fini ne'ebé saudavel no ai-inan ne'ebé moris boot no ho ai-tahan no sanak di'ak ba espésie ai-indústria ka iha fuan ne'ebé di'ak ba eespésie ai-fuan.
- Kolleita fini hosi ai-inan iha respetiva tempu kolleita.

Períodu Koileta Fini

Espésie	Jan	Fev	Mar	Abr	Maiu	Juñu	Jullu	Aug	Set	Out	Nov	Dez
Ai-kameli	-	-	X	X	-	-	-	-	X	X	-	-
Cengkeh	-	-	X	X	-	-	-	-	-	-	-	-
Derok	-	-	-	-	X	X	X	-	-	-	-	-
Rambutan	-	-	X	X	X	-	-	-	-	-	-	-
Kelengkeng	-	-	-	-	-	-	X	X	X	-	-	-
Ai-teka	-	-	-	-	-	-	X	X	-	-	-	-
Ai-mahoni	-	-	-	-	-	-	X	X	-	-	-	-

Nota. X: Tempu kolleita

► Karik mak laiha ai-inan. Buka fini hosi fonte ne'ebé kredivel iha ita-nia rain.

### (2) Pre-tratamentu fini

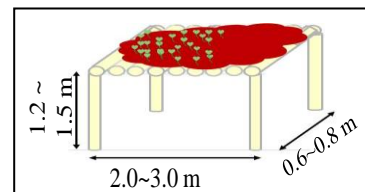
- Pre-tratamentu fini ba respetiva espésie haktuir métodu sira tuirmai ne'e hodi hetan jerminasaun ne'ebé aas.

Metodu pré-tratamentu fini

Espésie	Metodu pré-tratamentu fini
Ai-kameli	1) Hoban fini iha bee malirin durante oras 12 to'o 24
Cengkeh	1) Hasai tiha kulit li'ur 2) Hoban iha bee durante oras 1-2
Derok/sabraka	1) Kahur fini ho ahi-kadesan
Rambutan	La presiza
Kelengkeng	La presiza
Ai-teka	1) Tau fini iha saku foos nia no hoban iha bee malirin durante oras 72. 2) Depois hoban foti sai saku ne'e hosi bee laran, tau iha balde metan ka kontentór metan ida. 3) Habai fini sira-ne'e iha loro-matan pelumenus durante loron 2 hodi hamaran fini sira-ne'e.
Ai-mahoni	1) Habai fini durante oras 48

### (3) Halo kanteiru fini

- Halo kuadru kanteiru nian ho aas-1.2~1.5 m.
- Enxe rai ne'ebé kahur ona (rai-leten: rai-henek: kompos = 2:1:1) iha kantadeiru fini.



### (4) Kari'i no mantein fini

- Rega kanteiru loron ida molok kari'i fini.
- Kari'i fini iha fatin kari'i fini no taka fini fatin ho du'ut maran depois de kari'i fini hodi mantein konteúdu umidade no temperature.
- Rega fatin kari'i fini dala rua loron ida ho kuidadu atu fini ne'ebé kari'i ona labele haksoit sai.
- Observa jerminasaun fini iha fatin kari'i fini bebeik.

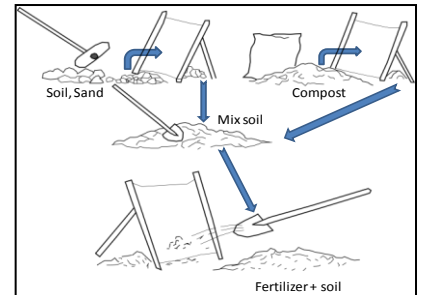
► Balde badak ida ho hena mamar ida tau iha okos bele uza hanesan fatin kari'i fini ba fini ai-kameli se número ai-oan uitoan de'it.

► Ba jerminasaun fini ai-teka, fatin kari'i fini tenke taka ho plástiku metan no labele rega durante oras 48.

### 1-3. Preparasaun vazú (pot) ai-oan

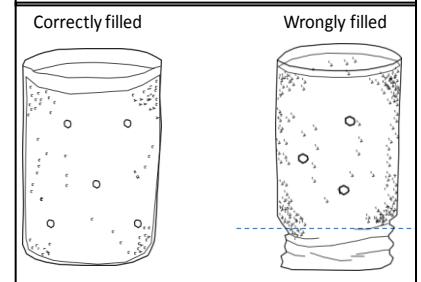
#### (1) Kolleita rai no materiál sira seluk

- a. Kolleita rai-leten/rai-metan iha floresta ho densidade nakonu ka plantasaun kafé, rai-okos besik viveiru, no rai-henek hosi mota.
- b. Prokura kompos no materiál ne'ebé bele hadi'a rai (Ezemplu, hare-kulit no ai-rahun).



#### (2) Kahur rai ho materiál seluk

- a. Pineira rai, rai-henek no kompos uza pineira dai-matan 5mm.
- b. Kahur rai-leten, rai-henek no kompos ho proporsaun 3:1:2 ba espésie ai-indústria/ai-fuan no 1:2:1 ba ai-kameli.



#### (3) Enxe rai ne'ebé kahur ona ba polybag

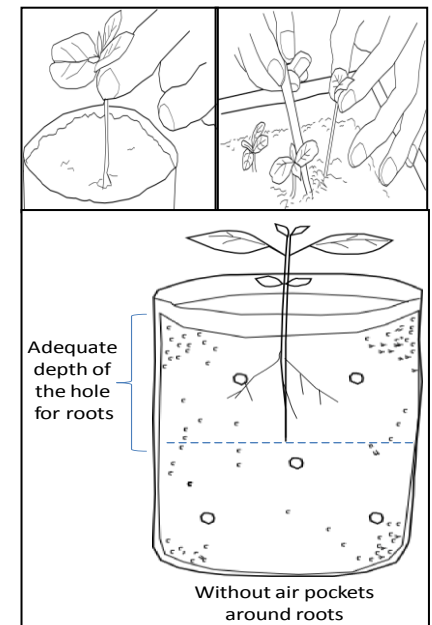
- a. Enxe rai ne'ebé kahur ona to'o 1/3 hosi polybag nia altura no doko polybag ne'e atu enxe rai ho uniforme.
- b. Enxe poly bag to'o nakonu ho rai ne'ebé kahur ona.
- c. Repete fali a, b. hodi prepara vazú ba ai-oan sira.
- d. Rai vazú ai-oan 100 ba kada kanteiru.



Ai-inan ba ai-kameli

#### (4) Transplanta fini-oan ba vazú

- a. Rega vazú loron ida antes transplanta.
- b. Kolleita ai-inan (*Alternanthera ficoidea*) bainhira kuda fini-oan ai-kameli.
- c. Foti fini-oan hosi fatin kari fini kaer iha tutun no hoban iha basia badak ne'ebé tau ona bee.
- d. Halo kuak ki'ik iha vazú uza ai-sanak.
- e. Tau fini-oan iha kuak, labele halo kle'uk ninia abut.
- f. Taka rai-kuak no hanehan baze ai-oan neineik, atu labele husik anin hale'u fini-oan nia sistema abut.
- g. Repete fali d. to'o f., to'o fini-oan hotu kuda.
- h. Rega vazú ai-oan, rai iha fatin nakukun ba loron balu no muda ai-oan ba fatin ne'ebé hetan naroman uitoan bainhira tahan foun mosu ona.
- i. Tau marka ho informasaun kona-ba ai-oan ne'e iha kada kanteiru.



► Transplanta ai-oan tenke hala'o iha fatin mahon no tenke remata transplanta iha minutu 15 depois fokit fini-oan.

## 1-4. Kuidadu ai-oan no hatoos ai-oan

### (1) Rega ai-oan

- a. Rega vazú ai-oan neineik ho regadór to'ó bee tama vazú ai-oan nia okos iha dadeer saan ka loro-kraik.








### (2) Hamoos du'ut no muda vazú ai-oan hodi mantein espasu ne'ebé suficiente

- a. Hamoos du'ut iha vazú ai-oan ho liman regulármente.
- b. Mantein espasu ne'ebé suficiente entre vazú ai-oan sira.

### (3) Aplika adubu-been no tesi sai ai-oan nia abut

- a. Aplika adubu-been bainhira haree sintoma moras nutrisaun. Métođu atu halo adubu-been hatudu iha Vol.2 hosi manuál tékniku.
- b. Tesi sai abut sira-ne'ebé sai ona hosi vazú ai-oan.

### (4) Kontrola peste no moras

Symptom	Kauza	Sasukat
Ai-tahan nakdulas no troka kór 	<i>Citrus leaf miner</i> 	<u>Aplikasaun</u> Rega bee ne'ebé kahur ona ho tabaku, hosi ai-tahan nia kotuk, semana ida dala ida ba semana 2-3. <u>Preparasaun</u> Kahur tabaku-tahan 2 (ka sigarru lolon 8) ho bee litru 1 no kahur to'ó 50% ba aplikasaun. <u>Espésie ne'ebé hetan atake: Saburaka</u>
Metan-metan iha ai-tahan 	Labadain 	<u>Aplikasaun</u> Rega tua-sin been ka kafé ne'ebé fermenta ona, hosi ai-tahan nia kotuk. <u>Preparasaun</u> Kahur tua-sin ho proporsaun tua-sin:bee = 1:20 <u>Espésie ne'ebé hetan atake: ai-teka</u>
Ai-tahan kuak 	Lala'ek ( <i>Grasshopper/ Leaf roller</i> ) 	<u>Aplikasaun</u> Rega insetu ho been hosi hudi-kulit matak da'an. <u>Preparasaun</u> Da'an bee litru 1 no aumenta hudi-kulit matak liman isin ida. Da'an ba minutu 30. Ta'es sai tiha hudi kulit bainhira atu uza. <u>Espésie ne'ebé hetan atake: Ai-Mahoni, Saburaka</u>
Ai-tahan kór-mutin 	Kulat ( <i>Fungus</i> ) Laiha imajen	<u>Aplikasaun</u> Aplika ahi-kadesan ka rega ho tua-sin ne'ebé kahur ho bee dala 20-30. <u>Espésie ne'ebé hetan atake: Saburaka</u>

► *Bainhira haree sintoma peste/moras iha ai-oan, imediatamente izola ai-oan ne'ebé afeta ona hosi ai-oan sira seluk, hodi prevene peste/moras hada'et ba ai-oan sira seluk.*

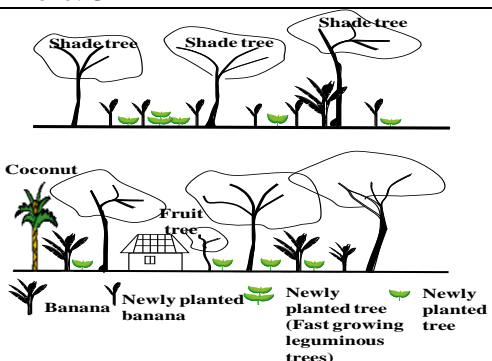
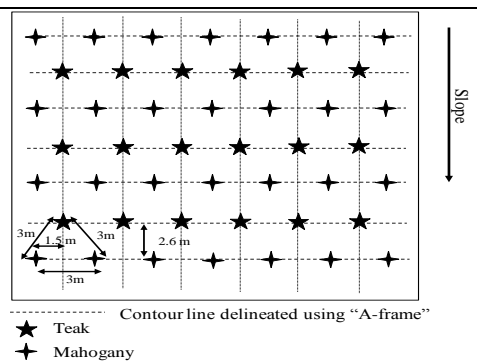
### (5) Hatoos ai-oan

- a. Redús frekuénsia rega semana balu molok atu kuda, atu nune'e ai-oan bele adapta ho ambiente li'ur.
- b. Hapara aplika adubu-been semana balu molok atu kuda.
- c. Hapara tesi ai-oan nia abut fulan ida antes atu kuda.
- d. Hasai tiha mahon iha viveiru, atu nune'e bele hetan/kona loro-matan fulan ida molok atu kuda.

# 1-5. Kuda no Kuidadu

## (1) Dezeñu plantasaun

a. Dezeña modelu plantasaun tuir matadalan sira hanesan tuirmai ne'e.

Objetivu	Produsaun espésie ai-fuan/ai-indústria	Produsaun espésie ba ai-kabelak
Fatin tarjetu	To'os uma-hun/to'os uma-kotuk	Área to'os muda ba mai
Espésie ai	Espésie ai-fuan, legume, ai-kameli	Espésie ba ai-kabelak (ezemplu, ai-teka no ai-mahoni)
Espasu entre ai-oan	Espésie ai-fuan: 4-7 m, ai-inan: 1-2 m, Ai-fore: 3-4 m	Espésie ai-kabelak: 3 m
Imajen hosi plantasaun		

## (2) Ke'e rai-kuak sai fatin kuda

- a. Ke'e rai-kuak tuir kuantidade ai-oan ne'ebé sei kuda iha to'os. Rai-kuak tenke ho kle'an 40 cm no diámetru 40-60 cm.
- b. Tau rai-leten separadu ho rai okos iha rai-kuak nia sorin.

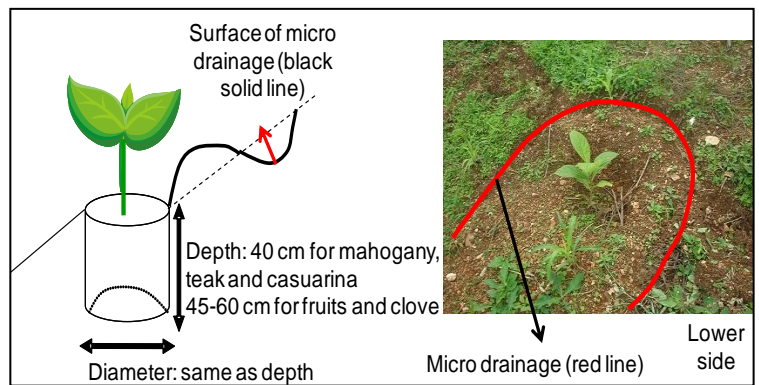
- ▶ Rai-kuak tenke ke'e hotu ona semana balu molok kuda.
- ▶ Ke'e rai-kuak ho medida suficiente garantia ai-oan moris ho di'ak

## (3) Enxe filafali rai-kuak ho rai no kompos

- a. Enxe filafali rai-kuak ho rai-okos ne'ebé kahur ho kompos, no taka ho rai-leten.

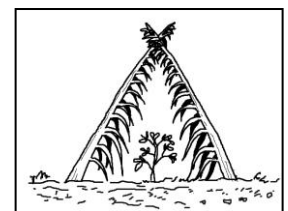
## (4) Kuda ai-oan

- a. Hili ai-oan ne'ebé aas liu hosi 20-25 cm no lori ba to'os ne'ebé atu kuda ba.
- b. Ke'e rai-kuak ho boot hanesan vazú ai-oan.
- c. Hasai plástiku vazú ai-oan no kuda ai-oan iha rai-kuak.
- d. Halo drenajen mikro modelu-U iha parte leten hosi kada ai-oan.



## (5) Kuidadu ai-oan ba tinan balu depois kuda

- a. Hamoos du'ut ho raiu 50 cm hosi ai-oan sira kada fulan rua durante tempu udan.
- b. Taka ai-oan sira-nia hun ho du'ut ne'ebé hamoos/fokit.
- c. Halo mahon uza materiál lokál (Ezemplu, nuu tahan), karik nesesáriu.



***Xave Tékniku ba  
To`os Foho Lolon Sustentável***



## Lista hosi Tékniku kona-ba To'os Foho Lolon Sustentável

	<b>Tékniku</b>	<b>Fulan Aplikasaun</b>	<b>Referensia Lais No.</b>
	<b>Halo Kompos no Manutensaun</b>	<b>Maiu - Agostu</b>	<b>2-1</b>
	<b>Deliñasaun Lina Ma'leuk</b>	<b>Jullu - Agostu</b>	<b>2-2</b>
	<b>Aplikasaun Teras Kontur Kompos</b>	<b>Agostu no Novembru</b>	<b>2-3</b>
	<b>Fila Rai ho Aplikasaun Kompos</b>	<b>Agostu- Outobru</b>	<b>2-4</b>
	<b>Selesaun Fini/Material atu Kuda</b>	<b>Outobru</b>	<b>Refere ba manuál sira versaun tomak</b>
	<b>Halo no Aplikasaun Adubu Been</b>	<b>Novembru - Febreiru</b>	<b>2-5</b>
	<b>Hamos Du'ut no Tau Mulsa</b>	<b>Dezemburu - Febreiru</b>	<b>Refere ba manuál sira versaun tomak</b>
	<b>Pos-Koilleta no Rai Fini</b>	<b>Abril - Maiu</b>	<b>Refere ba manuál sira versaun tomak</b>

## 2-1. Halo Adubu Orgánica (*kompos*)

### (1) Hili fatin atu halo *kompos* no ke'e rai-kuak

- Deside fatin atu halo *kompos*, ne'ebé besik ba bee-matan no to'os ne'ebé *kompos* ne'e sei aplika ba.
- Ke'e rai-kuak ho naruk 2 m, luan 1.5 m, no kle'an 1 m ba *kompos* ton 3 .
- Ke'e rai-kuak seluk besik ida primeiru ne'e, se posivel.

- ▶ *Volume kompos ne'ebé sei halo tenke determina tuir to'os nia tamañu. Pelumenus kompos tonelada 2-4, presiza ba to'os ektare ida (1).*
- ▶ *Rai-kuak segundu nia tamañu tenke hanesan ho rai-kuak primeiru.*

### (2) Kolleita no prepara materiál sira

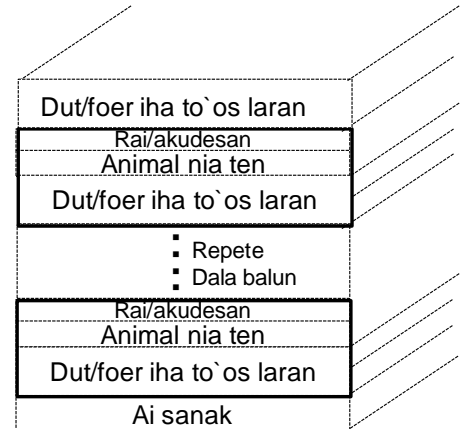
- Kolleita materiál hanesan tuirmai.
  - Materiál vejetativu (ezemplu du'ut, batar/hudi-kain, *caliandra*-tahan/*sesbania*/*gamal*, kafé-kulit)
  - Animál-fo'er (ezemplu, karau-teen, bibi-teen, manu-teen)
  - Rai-metan/leten no ahi-kadesan.
  - EM (karik posivel) ka tua-mutin/ai-dila tasak
- Tetak materiál vejetativu sira sai ki'ik.

- ▶ *Atu mistura materiál vejetativu ho animál-fo'er tenke ho proporsaun 2:1.*
- ▶ *Ita-boot tenke uza EM ka tua-mutin/ai-dila tasak atu fasilita prosesu fermentasaun no prodús kompos ho kualidade di'ak.*



**(3) Butuk materiál sira**

- Halo dalas ba materiál ida-idak ho mahar 5-10 cm ba kada dalas.
- Primeiru tau uluk batar-kain no hudi-kain ka materiál seluk ne`ebé susar atu dodok, depois tau du`ut no animál-fo`er nian.
- Taka animál-fo`er ho rai no ahi-kadesan, no rega bee ne`ebé suficiente depois tau dalas rai no ahi-kadesan.
- Repete no b no c troka-malu to`o rai-kuak nakonu.
- Bainhira halo dalas, tau au iha rai-kuak nia sentru ba ventilasaun.
- Rega tan bee ne`ebé suficiente ba dalas leten.
- Taka dalas nia leten ho hudi-tahan ka plástiku.
- Harii mahon iha kuak leten atu proteje *kompos* hosi loro-manas.



**(4) Manutensaun *Kompos***

- Husik *kompos* ba semana 3-4 tanba sei sai manas loos durante prosesu fermentasaun, maibé rega *kompos* regulármente atu mantein ninia konteúdu umidade.
- Bainhira malirin, i) muda *kompos* ba rai-kuak seluk, muda parte leten ba kraik (se karik halo rai-kuak rua) ka ii) foti sai *kompos*, kahur didi`ak, no enxe filafali ba rai-kuak (se karik halo rai-kuak ida de`it).
- Rega bee ne`ebé suficiente bainhira enxe rai-kuak ho *kompos*
- Tanba *kompos* sei manas filafali, husik *kompos* ne`e to`o semana 3-4.
- Bainhira *kompos* nia temperature malirin, hala`o atividade b to`o d.

► *Kompos tenke kahur didi`ak bainhira muda ka enxe filafali atu materiál hotu-hotu dodok ho di`ak.*

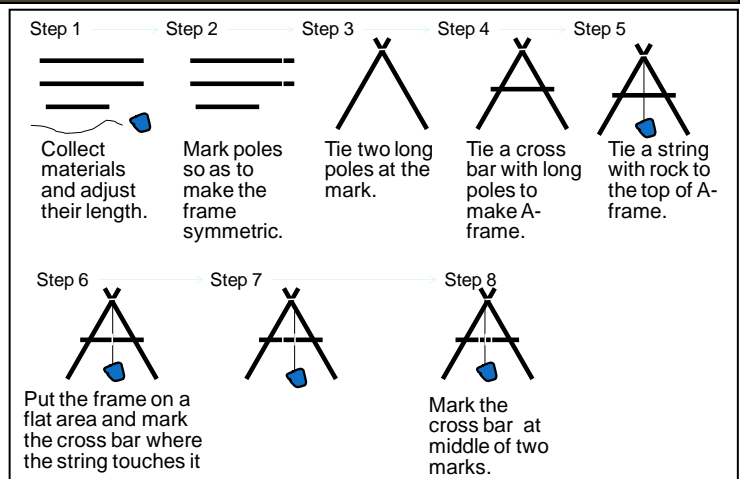
► *Ita-boot tenke hahú prodús kompos iha fulan-maiu/juñu, atu nune`e ita-boot bele kolleita du`ut matak iha lokalidade.*

► *Ita-boot tenke mantein kompos nia umidade, atu fasilita prosesu dekompozisaun.*

## 2-2. Delineasaun Liña Kontur (liña-maleuk)<sup>1</sup>

### (1) Kolleita materiál hanesan tuirmai no halo kuadru A<sup>2</sup>

- Ai/au naruk: lolon 2 x 2 m no lolon 1 x 1 m
- Fatuk natoon: 1
- Fiu/tali: 2 m
- Pregu/arame/tali ki'ik
- Ekipamentu: martelu/katana/tudik
- Halo kuadru A hanesan hatudu iha figura liman lo'os



### (2) Halo liña kontur uza kuadru A

- a. Tidin ai-riin dahuluk iha to`os ninin parte klaran no tau Kuadru-A nia ain-karuk iha ai-riin dahuluk.
- b. Ajusta parte ain-loos hodi halo fiu liuhosi parte klaran hosi ai-klaran no tidin ai-riin ida seluk iha ain-loos.
- c. Muda Kuadru-A ba parte liman-loos liuhosi tau ain parte karuk iha ai-riin ne'ebé tidin ona iha parte loos ne'ebé tidin antes.
- d. Ajusta tan ai-riin karuk to`o fiu liuhosi parte klaran, no tidin tan ai-riin ida iha parte ain-loos.
- e. Tuir prosesu ne'e to`o iha to`os ninin seluk.
- f. Foti pontu seluk metru 1 ba kraik iha diresaun vertikál uza ai-sanak ho naruk 1 m. Halo atividade hosi a to`o e.
- g. Repete atividade hosi a to`o liña kontur hotu delinea iha to`os.



- ▶ *Ita-boot tenke hasai du'ut iha to`os molok uza kuadru A, selae ita-boot labele halo liña kontur ho loloos.*
- ▶ *Ita-boot tenke uza ai-sanak ho naruk 1 m atu sukat distánsia vertikál intervalu entre liña kontur*

<sup>1</sup> Liña kontur mak liña ne'ebé nivel hanesan iha rai lolon.

<sup>2</sup> Kuadru A mak ekipamentu nebe uja atu marka fatin iha nivel hanesan iha foho lolon.

**Liña kontur ne'ebé la marka ho loloos tanba liña sira-ne'e marka bainhira seidauk hamoos área ne'e.**

## 2-3. Aplikasaun Terrasu Kontur ho Kompos

Depois delineasaun liña kontur, terrasu kontur ho kompos tenke introdus iha parte hotu-hotu to'os nian.

### (1) Halo kanál no tau du'ut

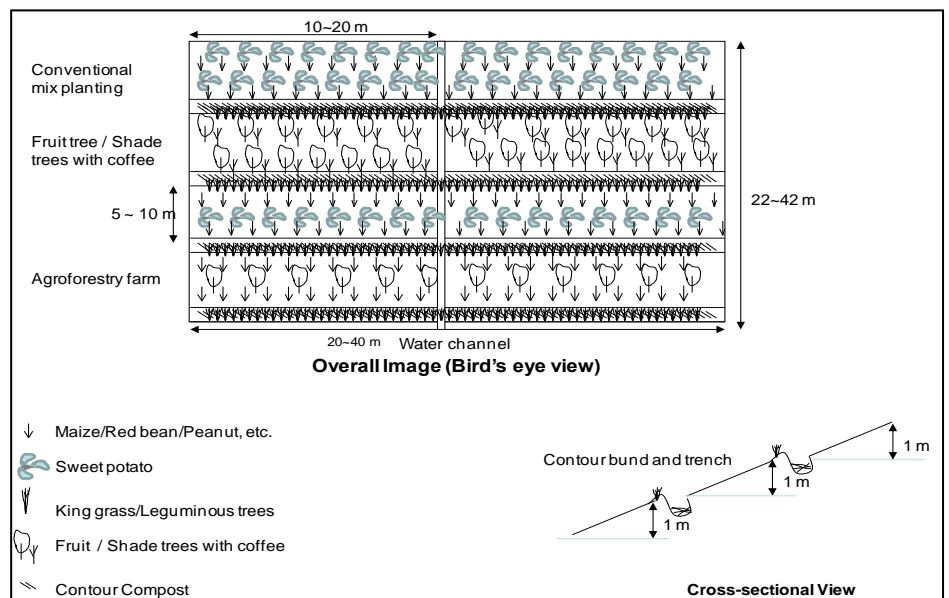
- Ke'e kanál maizumenus ho luan 50 cm no kle'an 30 cm tuir liña kontur.
- Halo kabubun liña kontur iha parte kraik ninin hosi kada kanál nia uza rai ne'ebé ke'e ona.
- Ke'e kanál nia dalan-sees hosi to'os ninin hodi soe tiha bee ne'ebé sulin makas liu.
- Tau du'ut iha kanál.

### (2) Kuda du'ut/ai-legume hanesan mahon

- Kuda du'ut-elefante tuir liña kontur hanesan mahon no legume (*gamal/caliandra*) iha liña kontur oin atu hametin estabilidade liña kontur nia kabubun.



Dezeñu padraun hosi to'os ho terrasu kontur kompos mak hatudu iha sorin-loos ne'e.

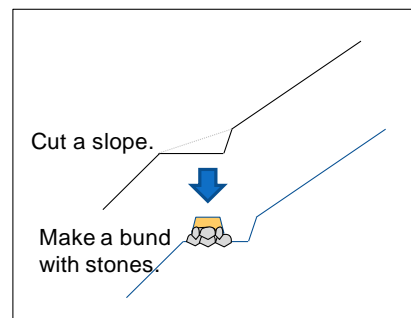


► Karik kabubun liña kontur ne'e rahuk, ita-boot tenke aplika lutu atu suporta kabubun nee.

► Karik to'os ne'e fatuk, ita-boot tenke uza fatuk sira-ne'e hanesan baze ba kabubun.



**Fatuk tenke uza hanesan baze ba kabubun.**



**Lutu tenke aplika bainhira rai-ne'e rahuk atu halo kabubun.**

## 2-4. Kultivasaun, Aplikasaun *Kompos*, no kuda

### (1) Kultivasaun to`os

- Hamoos du`ut iha kanteiru iha fulan-agostu.
- Fila rai ho karau-dikur no hatama du`ut ba rai-laran iha fulan-setembru/outubru.

### (2) Aplika *kompos* ba to`os

#### Liña aplikasaun

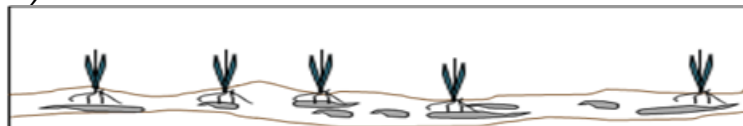
- Ke`e rai-kuak (ho luan 10 cm no kle`an 20 cm) tuir liña ne`ebé batar ka ai-han seluk sei kuda ba.
- Tau *kompos* iha rai-kuak ne`e (*kompos* 50 kg ka saku 2, rekomenda ba rai-kuak iha liña ho naruk 50 m.)
- Taka *kompos* ho rai.

#### Aplikasaun ba rai-kuak

- Ke`e rai-kuak ki`ik (ho diámetru 10-20 cm no kle`an 20 cm) ne`ebé batar sei kuda ba.
- Tau *kompos* 100-200 g ba kada rai-kuak.
- Taka *kompos* ho rai.



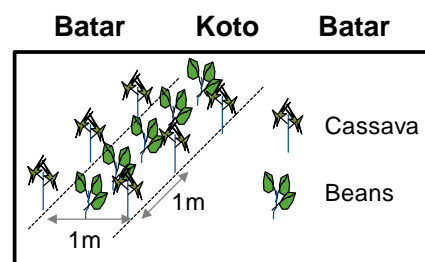
- ▶ *Kompos tenke aplika pelumenus semana 2 antes kuda, atu asegura ninia efetividade.*
- ▶ *Kompos tenke inkorpora ba rai (iha okos) atu nune`e sistema ai-han nia abut (hanesan batar) bele absorve nutriente ho efetivu.*



### (3) Kuda fini/ai-oan

Ai-han tenke kuda ho maneira semi-intensivu hanesan tuirmai.

Kombinasaun	Espasu
1. Batar no koto	Batar: 1 m x 0,5 m Koto (koto-mean: 1 m x 0,3 m)
2. Ai-farina no koto	Ai-farina: 1 m x 1 m Koto-mean (nani): 1 m x 0,3 m
3. Fore-rai	0,3 m x 0,3 m
4. Batar no fehuk-midar	Batar: 1 m x 0,5 m Fehuk-midar/lakeru: 1 m x 0,5 m
5. Ai-farina no lakeru	Ai-farina: 1 m x 1 m Lakeru: 1 m x 0,5 m



## 2-5. Halo no Aplikasaun Adubu-been

### (1) Kolleita no prepara materiál

- Prokura fatin ne'ebé boot, hanesan balde ka bidón, no hamoos.
- Kolleita ingrediente ba adubu: karu-teen/animál-fo'er seluk 5-10 kg, du'ut no legume tahan 30-40 kg, tua mutin/*tempe*/EM, no bee litru 200.



- ▶ *Uza animál-fo'er ne'ebé sei fresku, animál-fo'er fresku ne'e nutriente barak liu.*
- ▶ *Se posivel, kahur animál-fo'er oioin. Manu-teen kontén nutrisaun barak liu.*
- ▶ *Aumenta ahi-kadesan kanuru rai ida (1) hodi aumenta mineral sira ba adubu-been.*

### (2) Halo adubu-been liuhosi kahur materiál sira

- Tau animál-fo'er iha saku no tau ba balde laran.
- Tau ai-han restu/du'ut no ai-tahan ne'ebé tetak ona, no tua mutin /*tempe*/EM ba balde laran.
- Rega bee to'o balde ne'e nakonu.
- Taka balde atu proteje adubu-been nia konteúdu hosi kontaminaun/hamihis.
- Kedok adubu-been ne'e ho ai-sanak ba minutu 5-10 loron-loron durante semana 2-3.
- Adubu-been ne'e bele uza depois semana 2-3 .

### (3) Aplika adubu-been ho hamoos du'ut no tau *mulsa* (ai-tahan rahun)

- Hamoos du'ut iha toos, semana 3 depois kuda batar (hamoos primeiru).
- Kuru adubu-been hosi balde no kahur ho bee dala 20 ninia volume.
- Aplika adubu-been ne'ebé kahur ona ho bee ba batar depois hamoos primeiru.
- Taka rai-leten besik ai-horis ho du'ut (tau *mulsa*).
- Repete item a. to'o d. fulan 1 depois hamoos primeiru (hamoos segundu) no ida seluk tan, fulan ida depois hamoos segundu.



- ▶ *Mulsa ne'e efetivu atu kontrola du'ut no mantein konteúdu umidade iha rai-laran.*
- ▶ *Uza legume-tahan hanesan materiál ba mulsa, karik disponivel.*

***Xave Tékniku ba  
Hasa'e Rendimentu no  
Dezenvolvimentu Vida Moris***



**Lista hosi Tékniku kona-ba  
Hasa'e Rendimentu/Dezenvolvimentu Vida Moris (IG/LD)**

<b>Tékniku</b>	<b>Fulan Aplikasaun</b>	<b>Referensia Lais iha No.</b>
 <p><b>Identifikasaun hosi Atividade IG/LD Potensial</b></p>	<b>Abril</b>	<b>3-1</b>
 <p><b>Métodu Habai: Produsaun Xá Herbal</b></p>	<b>Maiu - Juñu</b>	<b>3-2</b>
 <p><b>Métodu Habai: Produsaun Fehuk Midar Maran</b></p>	<b>Jullu</b>	Refere ba manuál sira versaun tomak
 <p><b>Métodu Hoban: Produsaun Modo Masin</b></p>	<b>Maiu no Agostu</b>	<b>3-3</b>
 <p><b>Métodu Hoban: Produsaun Modo-Budu</b></p>	<b>Juñu</b>	Refere ba manuál sira versaun tomak
 <p><b>Métodu Sona: Produsaun Kripik Aifarina</b></p>	<b>Outobru</b>	<b>3-4</b>
 <p><b>Opsaun Manufatura iha uma nian: Suku</b></p>	<b>Dezemburu - Febreiru</b>	<b>3-5</b>
 <p><b>Jestaun hosi Atividade IG/LD</b></p>	<b>Abril - Maiu</b>	<b>3-6</b>

### 3-1. Identifikasaun Atividade (IGLD) ne'ebé potensial

Priór ba treinamentu prátika direktamente, sei identifika no hili atividade IG/LD ne'ebé potensial liuhosi rekursu inventáriu.



**(1) Avalia rekursu potensial sira**

- a. Halo "mapa rekursu" no "observasaun terrenu" hodi avalia rai ne'ebé uza no rekursu prinsipal iha suku ho maneira ne'ebé parsipativu.
- b. Halo "Kalendáriu estasaun" hodi konfirma tempu hosi estasaun produktu prinsipal sira iha suku.

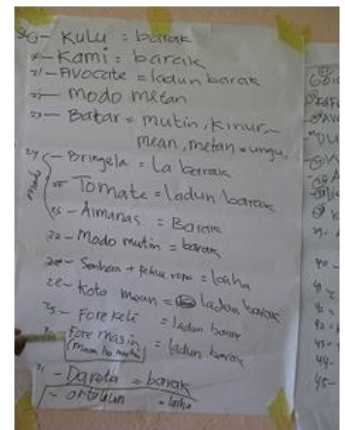
Production Schedule		Month											
Name of Crop	Time	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Cassava (Ai farina)	Sowing												
	Harvesting												
Cassavachips	Production												
	Sales												

- c. Diskute possibilidade utiliza rekursu ne'ebé identifika ba produsaun.
- d. Avalia volume hosi rekursu ne'ebé disponivel.
- e. Identifika atividade IG/LD ne'ebé potensial.

**(2) Hili opsaun IG/LD ne'ebé potensial**

- a. Halo lista rekursu ho atividade IG/LD ne'ebé potensial (produktu prosesamentu).
- b. Avalia atividade IG/LD ne'ebé potensial iha termu kritériu avaliasaun tuirmai.

Kritériu	Pontu diskusaun
Aplikabilidade	Posibilidade hosi aplikasaun tékniku ne'ebé uza ba opsaun IG/LD ne'ebé potensial.
Impaktu	Estima número uma-kain ne'ebé sei hetan benefísiu hosi opsaun ne'e.
Sustentabilidade	Volume no asesibilidade ba rekursu sira-ne'ebé uza ba produsaun.
Marketing	Posibilidade marketing hosi produktu prosesa ne'e.
kustu ne'ebé selu	Kustu estimadu hodi komesa no operasaun opsaun IG/LD ne'ebé potensial.



- c. Prioriza atividade IG/LD ne'ebé potensial bazeia ba rezultadu avaliasaun, no hili atividade prioridade 3-5.



## 3-2. Métopu Habai: Produsaun Xá Herbal

### (1) Kolesaun ai-tahan ne'ebé Saudavel

- Kolleita ai-tahan saudavel hosi ai-horis medisinál/*herbal*.
- Hasai fo'er, hetan estraga hosi insetu, moras no modelu ladi'ak hosi ai-tahan sira.



► *Labele kolleita ai-tahan hosi área sira-ne'ebé la ijiéniku, hanesan, dapur, hariis-fatin no animál luhan hodi prevene kontaminasaun baktéria.*

### 2) Hamoos no hili ne'ebé di'ak hosi ai-tahan ne'ebé kolleita

- Fase ai-tahan sira ho di'ak hodi hasai fo'er sira hanesan, tahu, rai-henek, ular oan, no insetu sira-nia tolun.
- Hasai tiha ai-tahan fo'er ka sira-ne'ebé la di'ak.
- Hamaran didi'ak ai-tahan sira.
- Ko'a ai-tahan hodi halo uniforme sira-nia tamañu.



### (3) Hamaran ai-tahan

- Nahe lekar ai-tahan sira iha bandeja.
- Taka bandeja ho hena metan hodi proteje ai-tahan sira hosi kona loro-matan maka'as diretamente. Rai bandeja iha fatin mahon durante tempu kalan no bainhira udan.
- Hamaran ai-tahan ba semana 1 to'o ai-tahan sira-ne'e fasil rahun bainhira kaer.



### (4) Hili sai ai-tahan diak no tau ba embalajen

- Tau ai-tahan maran sira ba surat-tahan mutin ida no observa sira nia kór no maran, hodi hili sira-ne'ebé tuir kualidade padraun.
- Empakota ai-tahan sira-ne'ebé kualidade di'ak ba embalajen.
- Tau marka iha embalajen.
- Rai pakote xá *herbal* sira iha fatin moos ho jél *silica* maran.



**Kualidade padraun**

- *Labele prodús xá herbal bainhira ita-boot moras, hodi prevene kontaminasaun.*  
► *Konteúdu umidade ai-tahan maran tenke menus hosi 10%.*  
► *Pelumenus treinamentu dala haat presiza hala'o hodi transfere tékniku/abilidade sira-ne'e.*

### 3-3. Métopu Hoban: Produsaun Modo-masin

#### (1) Fase no hamaran modo

- Hili modo tahan ne'ebé fresku.
- Ko'a sai modo nia abut no parte sira-ne'ebé fo'er no fase modo didi'ak.
- Habai modo loron sorin to'o loron 1.



#### (2) Tau masin no budu modo

- Tau modo tahan ne'ebé maran natoon ba plástiku laran no hatama iha balde boot ida.
- Tau masin iha modo-tahan nia let sira no fui bee ba plástiku laran.
- Taka no kesi plástiku nia tutun no hanehan plástiku ne'e ho ain to'o modo ne'e sai menus fleksivel.
- Loke plástiku ne'e no aumenta ai-manas rahun uitoan no kinur rahun kanuru isin ida ba plástiku laran.
- Kesi plástiku tutun, falsu de'it, no tau fatuk todan ida iha plástiku leten no taka rede insetu nian.
- Rai balde ne'e iha fatin malirin no nakukun ba fulan balu.
- Observa modo nia kondisaun kada semana no hasai tiha modo been ne'ebé resin bainhira nesesáriu.



#### (3) Empakota no tau marka ba marketing

- Empakota kada modo ne'ebé tetu ona 200g ba plástiku laran.
- Tau marka ba pakote.
- Rai iha fatin malirin no nakukun to'o fa'an ba merkadu.



- ▶ *Tau rede insetu nian hodi prevene ataka ular-oan.*
- ▶ *Kualkér modo tahan bele uza halo modo masin.*
- ▶ *Aplika masin barak karik hakarak aumenta/hanaruk produktu nia prazu.*

### 3-4. Métopu Sona: Produsaun Batatiñas Ai-farina

#### (1) Fase, loke kulit, no ko'a ai-farina

- Fase no loke ai-farina kulit, no hasai tiha parte sira-ne'ebé fo'er.
- Fase ai-farina ne'ebé loke ona kulit didi'ak.
- Ko'a ai-farina sira-ne'e ho mihi 1 mm uza *slicer* ida.
- Hasai ai-farina ne'ebé mahar liu ka rahun.

#### (2) Pre-tratamentu, Fase no habai ai-farina ne'ebé ko'a ona

- Hoban ai-farina ne'ebé ko'a ona (3 kg) iha bee (litru 5) ne'ebé kahur ona ho masin (kanuru 1) no ahu (kanuru ½) ba minutu 10.
- Fase ai-farina ne'ebé ko'a ona ne'e dala 5 no tau ba *drainer* hodi hasuli sai bee
- Nahe ai-farina ne'ebé ko'a ona ne'e iha bandeja boot no habai iha loro-matan ba minutu 10.

#### (3) Preparasaun temperu no *topping*

<Sabór derok no ai-manas >

- Hasai ai-manas musan no tetak ba rohan-rohan ki'ik.
- De'ut derok-tahan no kahur ho ai-manas rohan sira-ne'ebé ko'a ona no masin.

<Sabór liis-mutin no pimenta>

- De'ut pimenta-musan ho masin iha fatuk tuku.
- Sona liis-mutin iha mina ho manas 170-185°C to'o liis sira-ne'e muda kór sai kinur di'ak.

#### (4) Sona ai-farina no tau temperu

- Sona ai-farina ne'ebé ko'a ona iha mina litru 2 ho manas 170-185°C to'o fehuk sira-ne'e sai kinur di'ak.
- Hamaran mina no nahe batatiñas sira-ne'e iha surat-tahan hodi halo malirin batatiñas sira-ne'e.
- Rega temperu rahun ba batatiñas uza makta'es xá nian antes batatiñas sai malirin
- Aumenta *topping* ba batatiñas sira-ne'ebé kahur ona ho temperu.

#### (5) Embalajen batatiñas no tau marka

- Tetu batatiñas no tau ba embalajen molok sira absorve umidade.
- Tau marka ba embalajen produtu.

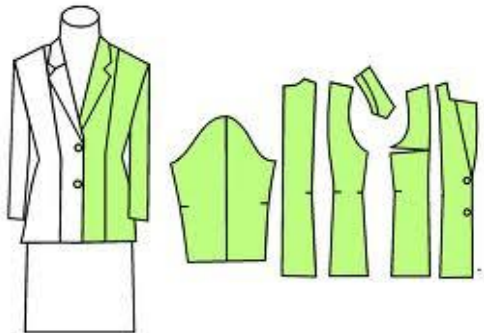


### 3-5. Opsaun Manufatura iha Uma: Suku roupa

Hadi'a no halo roupa uza mákina suku mak opsaun ida seluk ba feto sira atu hetan osan sein dependénsia ba rekursu naturál sira.

#### (1) Halo dezeńu padraun roupa nian no tesi hena

- Halo dezeńu padraun roupa.
- Riska dezeńu ne'e iha hena leten ho jís.
- Tesi hena tuir liña ne'ebé dezeńa ona ho tezoura no halo parte hosi roupa. (husik parte balu atu suku nian bainhira tesi hena)
- Tutan parte sira ba malu ho daun marka nian.



#### (2) Aliñava no prova roupa

- Aliñava parte ne'ebé atu suku.
- Prova/ajusta roupa ne'ebé aliñava ona ho na'in.



#### (3) Suku roupa

- Suku parte sira hamutuk.
- Hasai kabas aliñava no daun marka sira.
- Estrikan roupa ne'ebé suku.
- Hasai kabas restu no hamoos kabas rahun hosi mákina suku, no tau mina mákina ba parte sira-ne'ebé halo movimentu.



- ▶ *Pelumenus tenke hala'o treinamentu pakote rua (2), atu nune'e feto sira bele aprende tékniku/abilidade suku roupa.*
- ▶ *Observa kondisaun mákina suku no mós observa karik iha daun ruma hela depois uza mákina ne'e.*





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**Meeting Memo for the Kick-off Meeting with Working Team on Policy Making on CB-NRM**

<b>No. of Memo: 1</b>	
1. Topic	- Introduction of the Working Team - Objectives and roles of the working team and its members - General guidelines on the operations of the working team
2. Participants	NDF: As shown in Attachment JICA Team: Mr. Mizuguchi, Mr. Isolino, Yoshioka
3. Place	NDF conference room
4. Date & Time	16:15-17:30 pm, August 1 <sup>st</sup> , 2011
<b>5. Points of Discussion/Observation</b>	
<p>After brief explanations of the outlines of the Project and the working team for making a new policy on CB-NRM by the MAF and JICA Project Teams, the members exchanged the views and opinions on CB-NRM and policy making as summarized below.</p> <ul style="list-style-type: none"> <li>- Mr. Luis Mendez, Head of Department of Planning of NDF, expressed his concerns about the effectiveness of the village regulations in controlling cutting trees, citing that i) the Tara Bandu initiated by the Ministry of Solidarity in Suco Metinaro did not include the specific rule to prohibit cutting trees; ii) the village regulations installed in the village were not effective in regulating the activities of local communities for forest protection; and iii) the introduction of the village regulations might benefit only Lia Nain.</li> <li>- The JICA Project Team explained that the village regulations would be prepared by local communities with the facilitation of the NGOs and JICA and MAF Project Teams so that the village regulations should be in line with the existing government regulations. He further explained that the village regulations developed by local communities in the project villages prohibited local communities from cutting trees without permission of suco leaders or license from MAF and the same only allowed them to collect dead/fallen trees in the villages.</li> <li>- Mr. Luis expressed his worry/concern about the difficulty in making a new policy on CB-NRM as he did not have enough information on the Project.</li> <li>- The Team showed its apology for short notice of the meeting due to time constraints and explained that a new policy on CB-NRM would be drafted through a series of discussions among the members of the working team for about five years and the Project planned to provide the members of the working team sufficient information and data necessary for examination and deliberation for policy formulation.</li> <li>- Mr. Mario Nunes, Advisor for Minister of MAF in Forestry, suggested that a new policy on CB-NRM should specify a certain target, as it implicated a wide range of fields from marine resources to underground mineral resources. He shared his experience in ARP-III implemented by WB that it was difficult for NDF to monitor the project activities due to the lack of human resources. He further questioned if the Project had already developed the draft policy on CB-NRM.</li> <li>- The Team responded that the policy to be developed by the Project should be aimed at forest resources and therefore considered as the sub-policy for the existing forest policy issued in 2008. The Team explained that a new policy on CB-NRM, which the Team currently had in its mind, would aim to specify the processes and procedures for introduction and promotion of CB-NRM, such as PLUP, in the target watershed in future. The Team also emphasized that the working team was the one who would prepare the draft policy by 2015.</li> <li>- The Team further explained that the new policy document aimed to ensure that NDF could receive necessary financial and administrative support from MAF when implementing a project in a similar</li> </ul>	

nature to the Project in the future.

- Mr. Mario agreed with the ideas of the Team that the Project would develop a new policy document for promotion of CB-NRM to obtain the necessary support from MAF and such a policy document should be developed by NDF itself through discussions among the heads of the departments. He stated that such an arrangement would enable NDF to continue the project activities or implement a similar project in future, unlike the case of other past projects, such as ARP, in which no project activity had been continued after the end of the said project.
- Mr. Luis asked for further clarification of community-based natural resource management questioning if the Project should coordinate with other ministries as some natural resources as well as lands other than forestland were outside the jurisdiction of NDF.
- The Team stated that natural resources to be covered by the Project might include those related to forest, such as water resources, in principal, but specifically focus on forest resources. Besides, the Team mentioned that the Project should coordinate with other national directorates of MAF as it would deal with sustainable agricultural development including sloping agriculture or rehabilitation of aged coffee plantations, so that local communities can use the existing farms in a sustainable manner while protecting forests.
- Mr. Adelino Rozario, Chief of Section of NTFP, agreed with Mr. Mario that CB-NRM implied a wide range of topics and suggested that the term of CB-NRM should be changed to CBFM if the Project would focus on the forest resources. He also questioned if i) the Project aimed to develop a policy on watershed management as a continuation project of the former JICA Study and ii) there would be any support from the Team when implementing the policy after 2015.
- The Team suggested that there might be a possibility of changing the project title from CB-NRM to CBFM in the mid-term evaluation if such a change was considered reasonable. The Team further explained that i) the new policy would aim to promote sustainable forest management at the village level since a community-based approach was considered more realistic under the current circumstances of Timor-Leste, where the resources and capacities of the government were limited, and ii) the Project would end in October 2015 and it was not certain if JICA would continue any project after the Project.
- Mr. Manuel da Cruz, Head of Department for Production, asked how they could make a policy without any relevant data on CB-NRM. The Team responded that the Team would provide the results of the Project in the course of the Project, which could be used for making a new policy.

6. Notes/Issues:

- It was agreed that the working team would organize a meeting every 3 months and the next meeting would be held in September 2011.

Signed by: \_\_\_\_\_

Name: Yayoi Yoshioka