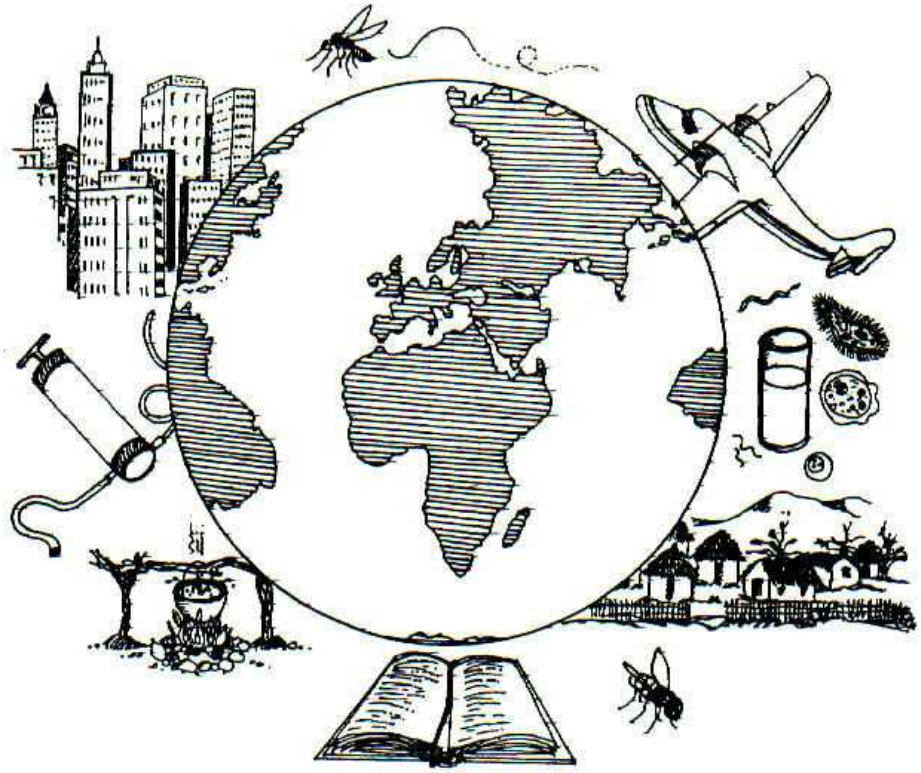
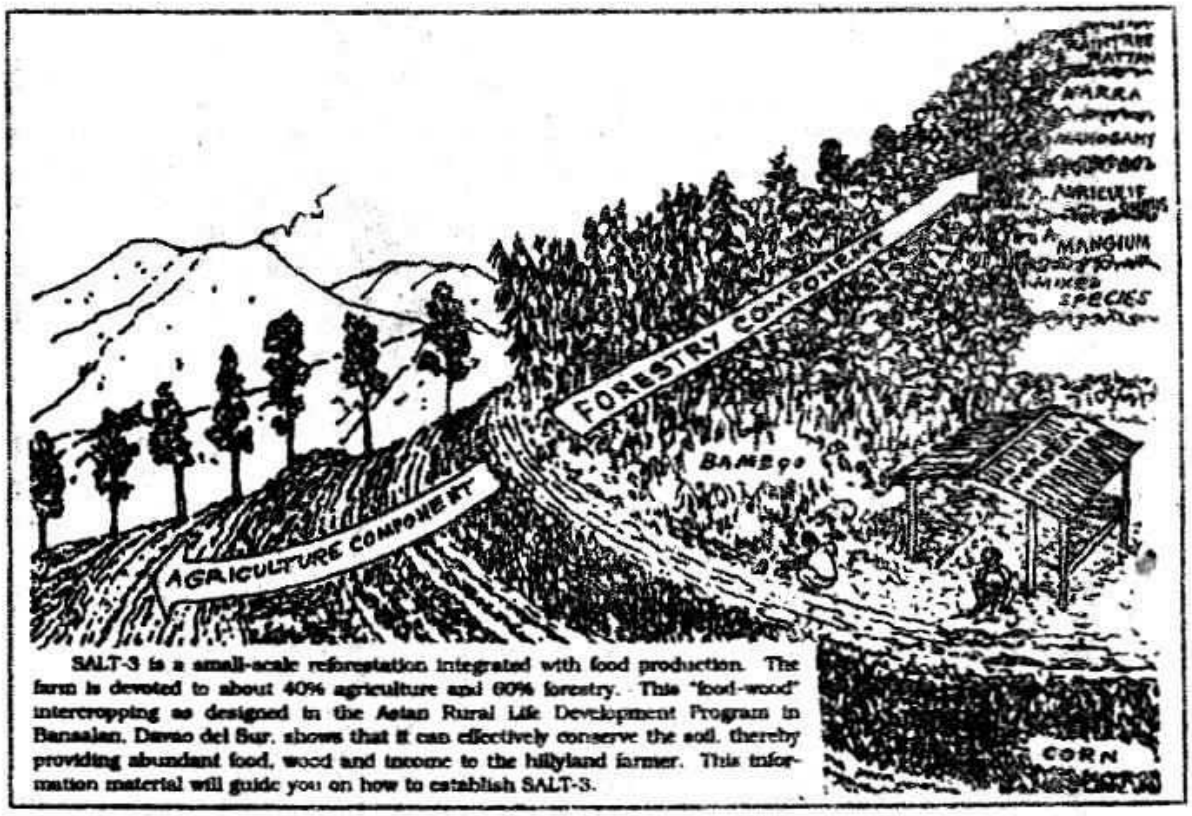
Sustainable Agroforest Land Technology (SALT – 3)

Sustainable Agriculture



Training Pac



SALT-3 is a small-scale reforestation integrated with food production. The farm is devoted to about 40% agriculture and 60% forestry. This "food-wood" intercropping as designed in the Asian Rural Life Development Program in Bansalan, Davao del Sur, shows that it can effectively conserve the soil, thereby providing abundant food, wood and income to the hillyland farmer. This information material will guide you on how to establish SALT-3.

Deforestation, soil erosion and appropriate farming technologies are the three major causes of low farm productivity, thus the manifold poverty in the uplands. Agroforestry is fast becoming one of the sustainable alternatives to sufficient food production and income generation for the uplands. SALT – 3 is a variant agroforestry and here is how to put it up in your hilly land.

STEP 1: SET UP THE AGROFORESTRY NURSERY.

Ensure sufficient supply of planting materials for your agroforest farm by setting up your own nursery. A nursery of abouT 10' x 25' can sufficiently meet the needs of a 2-hectare agroforest farm.

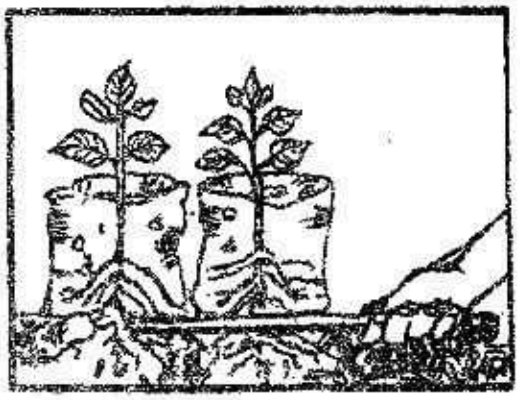
Establish your nursery where it is accessible, with the following fixtures: potting shed, transplant shed, seedbeds, etc. Basic equipment like sprinklers, shovel, spade, should also be available.

STEP 2: CARE AND MANAGE YOUR SEEDLINGS.

For better growth and field survival, the production of healthy and vigorous planting stock is necessary.

- Sow the seeds. Most forest tree seeds are hard to germinate so they need scarification either by mechanical or how water treatment. The most common problem encountered in seed germination is damping off and insect defoliators. Sterilize the soil before sowing the seeds to avoid damping off. Use chemicals when necessary.

  The seedbeds or transplant beds must be kept moist at all times. Mulch and shade the plants.



- Transplant. Prune the roots of species that can be outplanted bare root (mahogany, teak, etc.). Do not allow weeds to compete with your transplant. Fertilizer may be applied in conjunction with watering long before transplanting. Dissolve complete fertilizer (14-14-14 or 15-15-15) at the rate of 10 g/l water.

Harden off seedlings by gradually exposing them to more adverse conditions obtaining in the field. Do this 3-6 months before transplanting. Seedlings ready to be planted should have sturdy, well-developed crowns and many fine, fibrous lateral roots.

STEP 3: ESTABLISH YOUR FOOD CROPS ON THE LOWER HALF OF THE FARM.

Plant your preferred short-term crops on every first or second strips. A strip is a 4-5 m alley created between contour hedgerows. Depending on their suitability to your farm, plant long term crops like citrus, coffee, cacao, banana, black pepper, etc. on every third strip. Then intercrop them with fruit trees, like rambutan, durian, lanzones, guava, siniguelas, duhat, etc. following appropriate planting distances.

The earlier you establish your food and cash crops, the better off you will be in meeting your immediate needs.

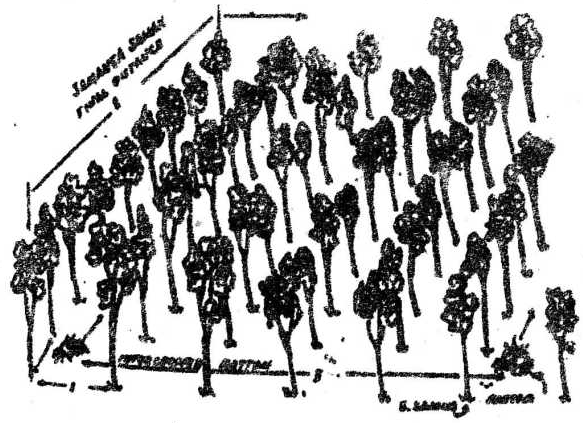
Follow SALT 1 steps in establishing your food crops.

STEP 4: PREPARE THE SITE FOR YOUR WOOD CROPS.
Locate the woodlot at the upper half of the project so that the agriculture component on the lower portion will benefit from the conserved moisture and nutrients from the wood crops.

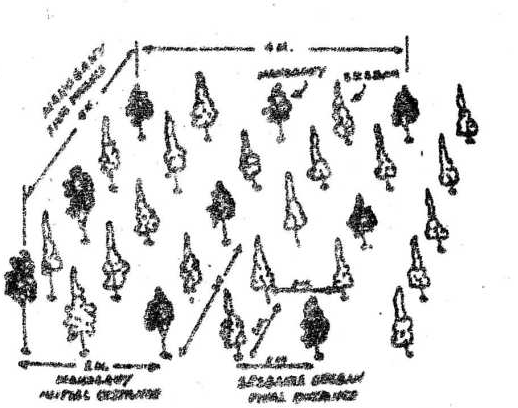
On areas with steep slope and with erodible soil, extra care must be exercised so as not to induce soil erosion when clearing the area. You can use either partial or complete removal of vegetation whichever is more favorable to you. Avoid burning.

STEP 5: COMPARTMENTALIZE AND SPACE YOUR WOOD CROPS.
For a 3-fold object of soil rehabilitation, firewood production and timber growing, you can maximize the use of land space by following the high density strategy of establishing small-scale woodlots.

As jointly designed by representative foresters, agriculturists, farmers and countryside developers consulted by Asian Rural Life Development in developing SALT-3, the following were recommended:



AN INTERCROPPING LAY OUT OF SAMANEA SAMAN AND RATTAN.



AN INTERCROPPING LAY OUT OF MAHOGANY OR NARRA AND S. SESBAN

Component on Top-Down Sequence	HECTARE	SPACING INITIAL	SPACING FINAL	DURATION
1. Rain Tree (s.saman)	1/4	1 x 1 m	8 x 8 m	Long term (15-25 years)
2. Rattan (C.merilli) as in intercrop with rain tree	1/4	8 x 8 m	8 x 8 m	Long term
3. Narra (P indicus)	1/8	2 x 2 m	4 x 4 m	Long term
4. Katuray (S.sesban) as intercrop with narra and mahogany	1/4	1 x 1 m	1 x 1 m	Short term (1-5 years)
5. Mahogany (S. macrophylia)	1/8	2 x 2 m	4 x 4 m	Long term
6. A. auriculiforsis	1/16	2 x 2 m	2 x 2 m	Medium term (6-14 years)
7. A. mangiua	1/16	2 x 2 m	4 x 4 m	Medium term
8. P. dulce & formosa mixed	1/8	1 x 1 m	1 x 1 m	Short term
9. Acid ipil-ipil (L. diversifolia)	1/4	1 x 1 m	1 x 1 m	Short term
10. Bamboo (botany variety)	on border	8 m between hills	8 m between hills	Long term
11. Hedgerows or agriculture component	1/4	4-6 m apart	4-6 m apart	Long term

STEP 6: OUTPUT THE TREES.

This can be started as early as the beginning or up to the middle of the rainy season so that seedlings can get established prior to the dry season.

You can also follow the contour when outplanting although it is not the imperative. Take care not to break the earth-ball when setting the seedling into the planting hole. The upper part of the earth-ball should be level or slightly deeper than the edge of the hole. Soil is filled into the spaces and tamped firmly all around.

For a fast recovery of the seedlings in degraded sites apply basal application of 50 – 100 g of complete fertilizer (14-14-14) mixed with urea (46-0-0) at 50:50 ration. Mulch your seedlings to ensure higher linability.

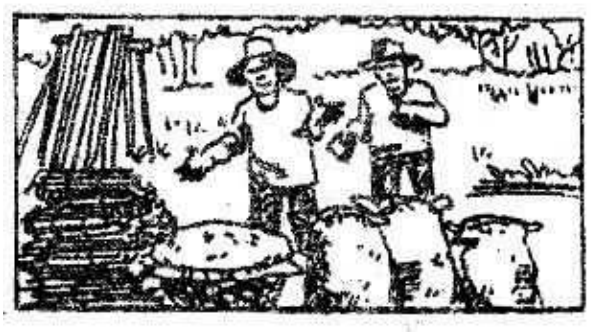
STEP 7: INTERCROP YOUR TREE CROPS. Short and medium term food and cash crops can be interplanted in your forestry component during the first two years. Long-term ones like black pepper and rattan can be incorporated at the beginning of the second year. You can even raise poultry (geese, turkey, muscovy) and small livestock (preferably sheep) underneath the tree crops during the following years.

For effective soil management, see to it that non-legume short-term crops are re[laced by leguminous ones and vice versa in every cropping.

STEP 8: DO TREE STAND IMPROVEMENT.
Apart from regular ring-weeding and liberation cutting, improve the stand of your trees. Remove the malformed trees. Replant the missing hills if you feel the replanted trees can still catch up.

However, replanting is laborious and expensive and should be done only to maintain required spacing or density. This is also performed when mortality is more than 30%.

STEP 9: HARVEST YOUR AGROFOREST PRODUCTS REGULARLY.
Timely harvesting of crops saves waste. All households and useful products must be gathered, processed and marketed. In the forestry components – forage from tree prunings, fuelwood and roundwood from thinnings commence during the second year. Thin out regularly your forestry area until timber crop spacing requirement is complied with.



Here is a suggested schedule of harvesting your forest trees, patterned after Asian Rural Life Development Program Plan.

YEAR	S P E C I E S	HARVESTING METHOD	U S E
1	None	Selective	Fuelwood/charcoal: Leaves for feeds, etc.
2	Sesbania sesban	All-out	Fuelwood/charcoal: Leaves for feeds, etc.
3-5	S. sesban	All-out	"
	Leucaena diversifolia	All-out	"
	Samanea saman	Selective	"
	Pithecelebium dulce	Selective	"
	Mahogany	Selective	Fuelwood and light Construction, etc.
	Narra	Selective	"
	Acacia mangium	Selective	"
	A. auriculiformis	Selective	"
6-14	Bamboo	Selective	Light construction Furniture
	Rattan	Selective	"
	A. auriculiformis	All-out	Fuelwood and light Construction, etc.
	A. mangium	All-out	"
	Narra, mahogany	Selective	Timber and furniture
15-25	Rattan	Selective	Timber and furniture
	Narra, mahogany	All-out	"
	S. saman	All-out	"

SOURCE OF INFORMATION

Asian Rural Life Development Program – Author/Trainer with permission from Harold Watson

Sustainable Agroforest Land Technology (SALT – 3)

Sustainable Agriculture

Workbook

Name : _____

Read pages 1 – 5 of the Training Pac

Answer the following questions

1. What are the three major causes of low farm productivity?
   (a) _____
   (b) _____
   (c) _____
2. What does SALT 3 stand for?
   _____

Matching

3.	_____ Set up the Agroforestry nursery	(a) STEP 5
4.	_____ Care and manage your seedlings	(b) STEP 9
5.	_____ Establish your food crops on the lower half of the farm	(c) STEP 7
6.	_____ Prepare the site for your wood crops	(d) STEP 1
7.	_____ Compartmentalize and space your wood crops	(e) STEP 4
8.	_____ Output the trees	(f) STEP 3
9.	_____ Intercrop your tree crops	(g) STEP 8
10.	_____ Do tree stand improvement	(h) STEP 2
11.	_____ Harvest your agroforest products regularly	(i) STEP 6

Score exercises 1 – 11

STOP!

DO NOT look back at the Training Pac while completing the Review.

Review
(10 points each)

Matching

1. ___ STEP 1	(a) STEP 3
2. ___ STEP 5	(b) STEP 2
3. ___ Care and manage your seedlings	(c) SALT 3
4. ___ Intercrop your tree crops	(d) STEP 9
5. ___ Sustainable Agroforest Land Technology	(e) Compartmentalize and space your wood crops
6. ___ Establish your food crops on the lower half of the farm	(f) Prepare the site for your wood crops
7. ___ STEP 8	(g) STEP 6
8. ___ STEP 4	(h) Set up the Agroforestry nursery
9. ___ Output the trees	(i) Do tree stand improvement
10. ___ Harvest your Agroforest products regularly	(j) STEP 7

Score exercises 1 – 10

STOP!

DO NOT look back at the Training Pac while completing the Pre-Test.

STOP!

You must now prepare yourself for the Pre-Test. In preparation, you may want to follow one or more of these suggestions:

1. Review the Objectives.
2. Rewrite every incorrect exercises in the Workbook.
3. Reread each section of the Training Pac.
4. Relearn each section you still do not completely understand.

Pre-Test
(10 points each answer)

Name the 9 Steps of SALT 3:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____

10. What does SALT 3 stand for?

    _____

Score exercises 1 – 10

STOP!

You must now prepare yourself for the Final Test. In preparation, you may want to follow one or more of these suggestions:

1. Review the Objectives.
2. Review every incorrect exercise in the Pre-Test.
3. Reread each section of the Training Pac.
4. Relearn each section you still do not completely understand.

Sustainable Agroforest Land Technology (SALT – 3)

Score Key

SUSTAINABLE AGROFOREST LAND TECHNOLOGY
SALT 3
SCORE KEY

Page A

1) (a) Deforestation
   (b) Soil erosion
   (c) appropriate farming technologies
2) Sustainable Agroforest Land Technology
3) d
4) h
5) f
6) e
7) a
8) i
9) c
10) g
11) b

Page B (Review)

1) h
2) e
3) b
4) j
5) c
6) a
7) i
8) f
9) g
10) d

Page C (Pre-Test)

1) Set up the Agroforestry nursery
2) Care and manage your seedlings
3) Establish your food crops on the lower half of the farm
4) Prepare the site for your wood crops
5) Compartmentalize and space your wood crops
6) Output the trees
7) Intercrop your tree crops
8) Do tree stand improvement
9) Harvest your agroforest products regularly
10) Sustainable Agroforest Land Technology

FINAL TEST

Sustainable Agroforest Land Technology (SALT – 3)

NAME: _____

DATE: _____

SCORE: _____

FINAL TEST
(10 points each answer)

1. What does SALT 3 stand for? _____

2. Name the 9 steps of SALT 3:

   (a) _____

   (b) _____

   (c) _____

   (d) _____

   (e) _____

   (f) _____

   (g) _____

   (h) _____

   (i) _____

SUSTAINABLE AGROFOREST LAND TECHNOLOGY
SALT 3
FINAL TEST KEY

1) Sustainable Agroforest Land Technology

2) (a) Set up the Agroforestry nursery
   (b) Care and manage your seedlings
   (c) Establish your food crops on the lower half of the farm
   (d) Prepare the site for your wood crops
   (e) Compartmentalize and space your wood crops
   (f) Output the trees
   (g) Intercrop your tree crops
   (h) Do tree stand improvement
   (i) Harvest your agroforest products regularly