Littuko Growing for Forest Enhancement

Philippines

Growing of rattan is done by upland farmers as part of the Community Based Forest Management (CBFM).

Littuko (Calamus manilensis) is a large rattan variety belonging to the climbing-palm family Arecaceae which is commonly found in the Cordillera, Caraballo, and Sierra Madre mountain ranges. It matures in seven years and bears 50 to 70 kilos of fruits each year. Its fruits are sweetish sour when ripe and are gathered around April to September.
The littuko provides green cover to the trees even in the dry months and in case of wildfire,they reinforce the forests' capacity to serve as firebreaks or greenbreaks. It also attract a lot of wildlife ranging from insects (bees, fire flies, and beetles) to birds,bats, and cloud rats. Forests with littuko become equipped with natural guards since the littukos' spines with sturdy thorns discourage people and stray animals to freely enter the forest area and disturb the ecosystem.Conservation of trees is also promoted on this technology.
For the cultivation of littuko, the following procedures are done: (1) Before planting into a seedbed or polyethylene bags (plastic planting bag), the hilar cover of the littuko seed is gently scraped with the use of a sharp knife.Removing the hilar cover enables the tiny plant to easily break out of the seed. (2) The sprout is transplanted to the designated area under the host tree when it reaches six inches in height and with at least three leaves. The chosen host tree is where the littuko can cling on for support to prevent lodging or breakage of stems. (3) Within one to three years, ring weeding is done around the littuko plant.(4) Maintenance and inputs are needed after three years to ensure its growth.
Littuko grows underneath of growing trees in the natural forest. They grow best in rainforests and no cultivation is needed.The area is under a humid agro climate with an average annual rainfall of 2000-3000 mm per year. Land users have an average holding of 0.5-1 hectare for the forestlands or woodlands.Most of them are stewards of the forest through the Community Based Forest Management Agreement (CBFMA) for 25 years and renewable for another 25 years.

left: Littuko seedlings planted in rows for transplanting (Photo: Engr. Evangeline F. Dacumos)
right: Littuko fruits (Photo: Engr. Evangeline F. Dacumos)

Location: Bayombong
Region: Nueva Vizcaya
Technology area: 0.1 - 1 km2
Conservation measure: vegetative
Stage of intervention: rehabilitation / reclamation of denuded land
Origin: Developed through land user`s initiative, 10-50 years ago
Land use type:
Forests / woodlands: Natural
Forests / woodlands: Other
Land use:
Grazing land: Extensive grazing land (before), Forests / woodlands: Other (after)
Climate: humid, tropics
WOCAT database reference: T_PHI047en
Related approach: Community-Based Forest Management (A_PHI007en)
Compiled by: Philippine Overview of Conservation Approaches and Technologies, Bureau of Soils and Water Management
Date: 2015-06-23
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Classification

Land use problems:

- Logging, charcoal making and grazing since it was initially a grassland (expert's point of view)

Land use

Natural
Other
Grazing land: Extensive grazing land (before)
Forests / woodlands: Other (after)
plantation forestry

Climate

humid

Degradation

Biological degradation: reduction of vegetation cover, loss of habitats, quantity / biomass decline

Conservation measure

Vegetative: Others (Involve the use of vines)

Stage of intervention

- Prevention
- Mitigation / Reduction
- Rehabilitation

Origin

- Land users initiative: 10-50 years ago
- Experiments / Research
- Externally introduced

Level of technical knowledge

- Agricultural advisor
- Land user

Main causes of land degradation:
Direct causes - Human induced: deforestation / removal of natural vegetation (incl. forest fires)
Indirect causes: land tenure

Main technical functions:
- promotion of vegetation species and varieties (quality, eg palatable fodder)
- Conservation of trees which serve as host or anchor trees

Secondary technical functions:
- increase in organic matter
- increase of biomass (quantity)
- Control weeds

Environment

Natural Environment

Average annual rainfall (mm)

- > 4000 mm
- 3000-4000 mm
- 2000-3000 mm
- 1500-2000 mm
- 1000-1500 mm
- 750-1000 mm
- 500-750 mm
- 250-500 mm
- < 250 mm

Altitude (m a.s.l.)

- > 4000
- 3000-4000
- 2500-3000
- 2000-2500
- 1500-2000
- 1000-1500
- 500-1000
- 100-500
- <100

Landform

- plateau / plains
- ridges
- mountain slopes
- hill slopes
- footslopes
- valley floors

Slope (%)

- flat
- gentle
- moderate
- rolling
- hilly
- steep
- very steep

Soil depth (cm)

- 0-20
- 20-50
- 50-80
- 80-120
- >120

Growing season(s): (perennial)
Soil texture: medium (loam)
Soil fertility: medium
Topsoil organic matter: medium (1-3%)
Soil drainage/infiltration: good

Soil water storage capacity: medium
Ground water table: on surface
Availability of surface water: good
Water quality: good drinking water
Biodiversity: medium

Tolerant of climatic extremes: temperature increase, seasonal rainfall increase, seasonal rainfall decrease, heavy rainfall events (intensities and amount)
Sensitive to climatic extremes: droughts / dry spells

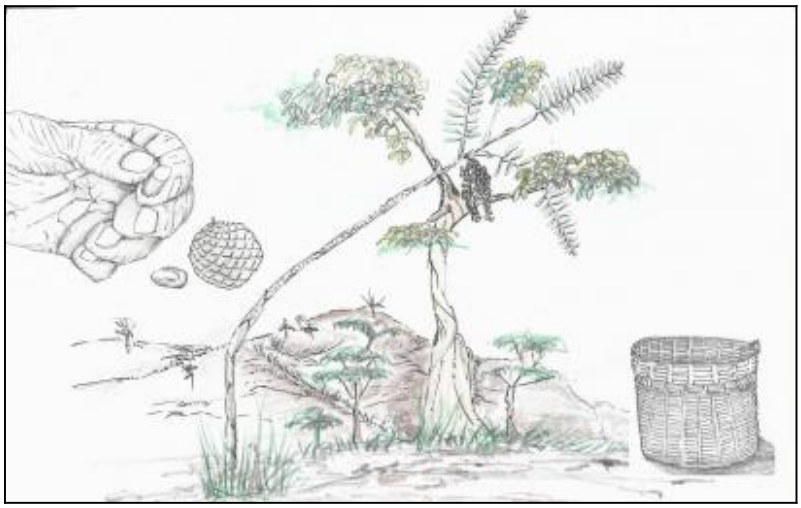
Human Environment

Forests / woodlands per household (ha)

- <0.5
- 0.5-1
- 1-2
- 2-5
- 5-15
- 15-50
- 50-100
- 100-500
- 500-1,000
- 1,000-10,000
- >10,000

Land user: Individual / household, Small scale land users, common / average land users, men and women
Population density: 10-50 persons/km2
Land ownership: state
Land use rights: communal (organised)
Water use rights: communal (organised) (CBFM Agreement, Certificate of Stewardship Contract of 10-25 years)
Relative level of wealth: average, which represents 75% of the land users; 75% of the total area is owned by average land users

Importance of off-farm income: less than 10% of all income:
Access to service and infrastructure: low: health, employment (eg off-farm), market, roads & transport, financial services; moderate: education, technical assistance, energy; high: drinking water and sanitation
Market orientation: mixed (subsistence and commercial)
Purpose of forest / woodland use: other forest products / uses (honey, medical, etc.), nature conservation / protection



Technical drawing

Rattan vine planted in the forest with rattan made basket used in transporting littuko seeds in the market.On top is the scarification of the littuko seed to induce seed growth. (Patricio A. Yambot)

Implementation activities, inputs and costs

Establishment activities

- Nursery establishment through seed bed
- Transplanting

Establishment inputs and costs per unit

Inputs	Costs (US$)	% met by land user
Labour	6.67	100%
Agricultural		
- seedlings	222.22	%
TOTAL	**228.89**	**100.00%**

Maintenance/recurrent activities

- Weeding
- Harvesting

Maintenance/recurrent inputs and costs per unit per year

Inputs	Costs (US$)	% met by land user
Labour	20.00	100%
TOTAL	**20.00**	**100.00%**

Remarks:

Assessment

Impacts of the Technology

Production and socio-economic benefits

+++ increased wood production
+++ increased farm income
+++ diversification of income sources
++ increased crop yield
++ reduced risk of production failure
++ increased drinking water availability
++ increased water availability / quality

Production and socio-economic disadvantages

++ Difficult to harvest since host tree is tall

Socio-cultural benefits

+++ community institution strengthening
+++ improved conservation / erosion knowledge
++ improved cultural opportunities
++ improved food security / self sufficiency

Socio-cultural disadvantages

Ecological benefits

+++ increased soil organic matter / below ground C
+++ reduced emission of carbon and greenhouse gases
+++ increased plant diversity
+++ Conservation of trees is promoted because trees serve as hosts for the growing of rattan
++ increased beneficial species
++ increased / maintained habitat diversity

Ecological disadvantages

Off-site benefits

Off-site disadvantages

Contribution to human well-being / livelihoods

++ The littuko fruits provide additional income to community based forest management implementer/participants.

Benefits /costs according to land user

Benefits compared with costs	short-term:	long-term:
Establishment	slightly positive	very positive
Maintenance / recurrent	slightly positive	very positive

Acceptance / adoption:

100% of land user families (200 families; 70% of area) have implemented the technology with external material support. There is strong trend towards (growing) spontaneous adoption of the technology. Land users are adopting the technology since littuko seedlings nursery are established for the propagation of planting of rattan in the village and its neighboring area.

Concluding statements

Strengths and → how to sustain/improve	Weaknesses and → how to overcome
Littuko fruit is not perishable. It could be stored for a period of time under normal conditions. This could be used as condiments and ornaments. → Providing assistance in processing the littuko fruits such as creating jams, candies and others using the fruit.In this way, the marketability and market value of the product will be increased.	Difficult to harvest since the host tree is tall.It does not grow in open areas and does not stand alone. → Development of a tool that could be used in harvesting the fruit and planting of trees as pole stand to avoid lodging or breakage of littuko vine.
Low maintenance as a crop.Contributory to trees and it helps in the reduction of soil erosion. →	
Littuko vine is multi-purpose. Its' fruits are used for food consumption while its poles are used as handicrafts/furnitures. → Provision of technical assistance in the development of product using rattan as the raw material.	