



Trees as Buffer Zones Philippines

Trees as buffer zones are vegetative measures established in the area to prevent pest from crossing in between blocks. Further, the technology provides haven for flora and fauna which are endemic in the area.

Trees are planted at strategic locations along the road, between blocks, boundaries or in scattered areas within the pineapple plantation. Indigenous trees, "wildlings", which are considered endangered species were preserved in the plantation. Trees serve as habitat for the different tree of faunal species of birds, reptiles, amphibians and mammals.

It assimilates carbon from carbon dioxide in the atmosphere. It also provides shelter/habitat for wildlife species such as birds and temporary shades for laborer during rest time. The trees also improve the aesthetic value of the plantation. The initial step is the identification of specific tree planting areas for supplementation of natural cover. Along road networks are usually consumed as buffer zones. Prior to planting, grass brushing is done followed by hole digging. Maintenance in the area includes brushing of grasses and pruning of the canopy by 5-6 labourers. The area is under humid agro-climate condition with a topography ranging from 1-10% slope. It receives an annual average rainfall of approximately 3072 mm/year. The elevation ranges from 370-890 meter above sea level. Mt. Kitanglad and Agri Development Corporation (MKADC) operates the area where the technology are being practiced. Farmers living within the area are the laborers of the company.

left: Trees planted along boundaries of the block. (Photo: Engr. Djolly Ma. P. Dinamling)

right: Trees are planted between road networks which serve as buffer zones (Photo: Djolly Ma. P. Dinamling)

Location: Valencia City

Region: Bukidnon

Technology area: 0.1 - 1 km²

Conservation measure: vegetative

Stage of intervention: mitigation / reduction of land degradation

Origin: Developed through land user's initiative, 10-50 years ago

Land use type:

Cropland: Tree and shrub cropping

Climate: humid, tropics

WOCAT database reference:

T_PHI054en

Related approach: Integrated Soil and Water Conservation Approach to Improve Biophysical Condition of MKADC (A_PHI009en)

Compiled by: Philippine Overview of Conservation Approaches and Technologies, Bureau of Soils and Water Management

Date: 2015-12-09

Contact person: Jerry M. Manubag, Mt. Kitanglad and Agri-Development Corporation, Lurogan, Valencia City, Bukidnon, (088) 221 4302, manubagjerry@gmail.com



Classification

Land use problems:

- Water logging, soil erosion and monocropping (pineapple production throughout the year). (expert's point of view)

Land use



Tree and shrub cropping

Climate



humid

Degradation



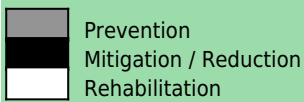
Biological degradation: loss of habitats

Conservation measure

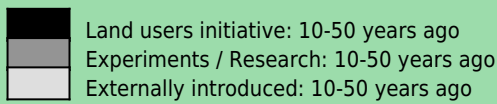


Vegetative: Tree and shrub cover

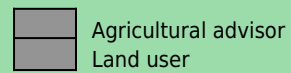
Stage of intervention



Origin



Level of technical knowledge



Main causes of land degradation:

Direct causes - Human induced: other human induced causes, Cutting of trees, excessive pruning

Main technical functions:

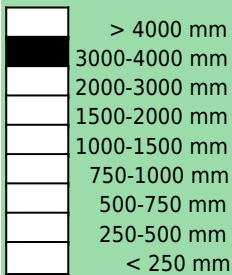
- control of raindrop splash
- control of dispersed runoff: impede / retard
- stabilisation of soil (eg by tree roots against land slides)
- increase in nutrient availability (supply, recycling,...)
- increase of infiltration
- increase / maintain water stored in soil
- increase of groundwater level / recharge of groundwater
- reduction in wind speed
- increase of biomass (quantity)
- spatial arrangement and diversification of land use
- Improve of biodiversity

Secondary technical functions:

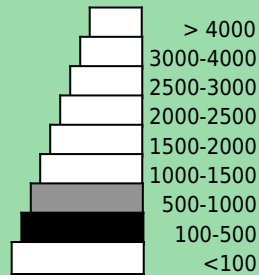
Environment

Natural Environment

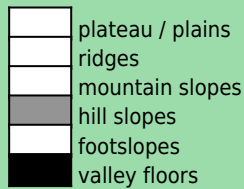
Average annual rainfall (mm)



Altitude (m a.s.l.)



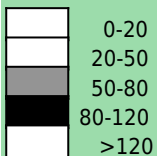
Landform



Slope (%)



Soil depth (cm)



Growing season(s): (trees grow for more than a year)

Soil texture: medium (loam)

Soil fertility: medium

Topsoil organic matter: medium (1-3%)

Soil drainage/infiltration: medium

Soil water storage capacity: medium

Ground water table: 5 - 50 m

Availability of surface water: medium

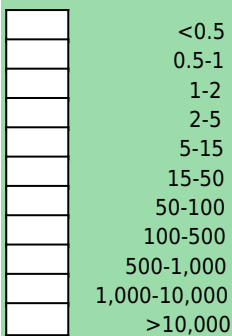
Water quality: good drinking water

Biodiversity: medium

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

Human Environment

Cropland per household (ha)



Land user: employee (company, government), large scale land users, common / average land users, men and women

Population density: < 10 persons/km²

Annual population growth: < 0.5%

Land ownership: individual, titled

Land use rights: leased

Relative level of wealth: average, which represents 100% of the land users; 100% of the total area is owned by average land users

Importance of off-farm income: less than 10% of all income:

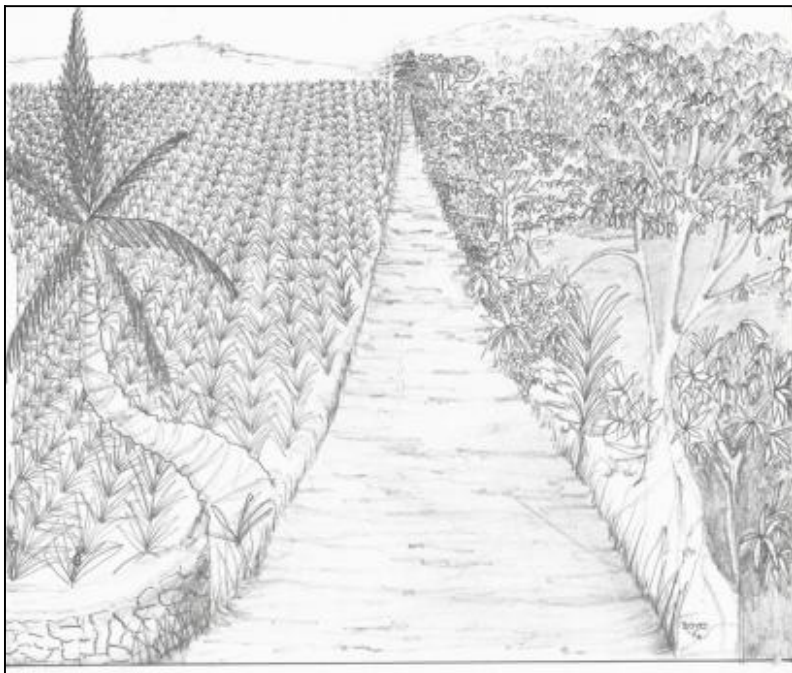
Access to service and infrastructure:

moderate: health, education, technical assistance, employment (eg off-farm), market, energy, roads & transport, drinking water and sanitation, financial services

Market orientation: commercial / market

Mechanization: mechanised

Livestock grazing on cropland:



Technical drawing

Trees planted between blocks of pineapple and access roads (Mr. Patricio A. Yambot)

Implementation activities, inputs and costs

Establishment activities

- Grass Brushing
- Hole Digging
- Planting

Establishment inputs and costs per ha

Inputs	Costs (US\$)	% met by land user
Labour	117.00	100%
TOTAL	117.00	100.00%

Maintenance/recurrent activities

- Brushing of grasses
- Pruning

Maintenance/recurrent inputs and costs per ha per year

Inputs	Costs (US\$)	% met by land user
Labour	78.00	100%
TOTAL	78.00	100.00%

Remarks:

Assessment

Impacts of the Technology

Production and socio-economic benefits

- ++ increased wood production
- + diversification of income sources
- + increased product diversification

Production and socio-economic disadvantages

- + decreased farm income

Socio-cultural benefits

- ++ improved conservation / erosion knowledge
- + improved cultural opportunities

Socio-cultural disadvantages

Ecological benefits

- +++ reduced surface runoff
- +++ reduced emission of carbon and greenhouse gases
- +++ increased / maintained habitat diversity
- ++ reduced hazard towards adverse events
- ++ reduced wind velocity
- ++ improved soil cover
- ++ increased biomass above ground C
- ++ increased soil organic matter / below ground C
- ++ reduced soil loss
- ++ increased animal diversity
- ++ increased plant diversity
- ++ increased beneficial species
- + Serves as temporary shade for laborers/workers

Ecological disadvantages

Off-site benefits

- ++ reduced downstream siltation
- ++ reduced wind transported sediments
- ++ reduced damage on neighbours fields

Off-site disadvantages

Contribution to human well-being / livelihoods

Benefits /costs according to land user

Benefits compared with costs

Establishment

Maintenance / recurrent

short-term:

positive

positive

long-term:

very positive

very positive

Acceptance / adoption:

100% of land user families have implemented the technology voluntary.

Concluding statements

Strengths and → how to sustain/improve

Protection of wildlife by providing food and shelter → Inclusion in the protocol of the company the prohibition of hunting and preying of alien or wildlife species present in the area.

Preservation of wildlings and endemic species by retaining native tree species during clearing operation. → Maintenance and protection of these trees by marking them.

Land user's view agree with experts opinion. →

Weaknesses and → how to overcome

Reduction of the pineapple production area due to the area allocated for growing trees. → Planting of trees that could be beneficial to the company and to the employees such as fruit bearing trees and those that improve the soil condition.

Trees shades some areas for pineapple production. → Regular pruning of the canopy.

Vulnerability to extreme event such as strong winds/typhoons → Introduce new species tolerant to those events

Land user's view agree with experts opinion. →



Copyright (c) WOCAT (2016)