



Unstable sand dunes is stabilized using *Casuarina equisetifolia*, a drought resistant, needle leaf specie.

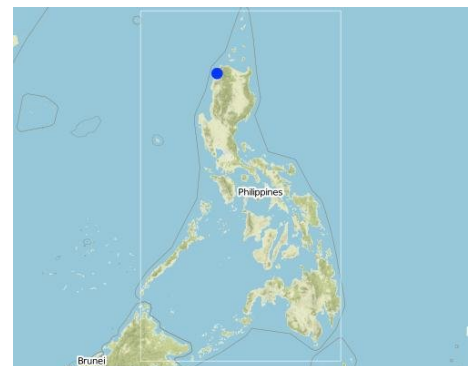
Vegetative Approach in Controlling Wind and Water Erosion in Sand Dune Areas (Philippines)

DESCRIPTION

Using vegetative approach to stabilize sand dune areas along the coast.

The approach uses forest species like *Casuarina equisetifolia* and lately *Acacia auriculiformis* to stabilize the sand dunes which is constantly being eroded by wind and water. Grasses are also allowed to be stabilized by fencing. Fruit trees are becoming more important component of the approach. Mango and cashew can be raised successfully by employing special soil treatment and provision of adequate water supply during the long dry season which lasts for about seven (7) months. The approach is implemented by various sectors. Afforestation is taken care by the Department of Environment and Natural Resources (DENR) and the Local Government Unit (LGU). The establishment of fruit tree plantation was pioneered by the Mariano Marcos State University (MMSU). The university established Techno-Demo Farms using mango and cashew as test crops. These species are well adopted to dry condition. Cashew is well known to thrive under conditions of severe water stress and low nutrient supply. The establishment of orchard was successful using a technique called 'resoiling'. A hole of about 1 x 1 x 1 meter is dug in the sand and natural soil and organic fertilizer is put into it. This will provide better anchorage for the crop and will also supply the needed nutrients and moisture during the early stage. Because the demonstration trial was a success, farmers in the locality adopted the approach. It is capital intensive, however, which is a limitation for farmers short of financial resources. *Gliricidia* planting is also an important component. It thrives well in droughty and fertile-poor soil. *Gliricidia* is used as fuelwood.

LOCATION



Location: Ilocos Norte, Philippines

Geo-reference of selected sites

- 120.636, 18.241

Initiation date: 1970

Year of termination: n.a.

Type of Approach

- ☒ traditional/ indigenous
- ☐ recent local initiative/ innovative project/ programme based



Techno-demo like this convinced landowners that sand dunes can be made productive.



Fencing is an important approach to allow native grasses to be established and stabilized the highly erodible and unstable sand.

APPROACH AIMS AND ENABLING ENVIRONMENT

Main aims / objectives of the approach

1) Stabilization of highly erodible sand dunes. 2) Make the sand dune areas productive for forest and various fruit tree species.

Conditions enabling the implementation of the Technology/ies applied under the Approach

- **Availability/ access to financial resources and services:** financial assistance and government to undertake afforestation and subsequent maintenance
- **Knowledge about SLM, access to technical support:** re-soiling, frequent fertilization, irrigation and planting of drought resistant crops

Conditions hindering the implementation of the Technology/ies applied under the Approach

PARTICIPATION AND ROLES OF STAKEHOLDERS INVOLVED

Stakeholders involved in the Approach and their roles

What stakeholders / implementing bodies were involved in the Approach?	Specify stakeholders	Describe roles of stakeholders
local land users/ local communities	Working land users were mainly men (Individually for farmers owning the land; groups for government land)	

Involvement of local land users/ local communities in the different phases of the Approach

	none	passive	external support	interactive	self-mobilization	
initiation/ motivation	☐	☐	☐	☒	☐	Mainly: Personal Contact; partly: public meetings; For commercial tree crop production; initiation is more on a personal contact with individual farmers
planning	☐	☐	☐	☒	☐	Mainly: personal contact; partly: public meetings; Private land-users made land use plans through personal contact with technologists.
implementation	☐	☐	☐	☒	☐	Casual labor was employed during planting
monitoring/ evaluation	☐	☐	☐	☒	☐	Mainly: measurements/observations; partly: reporting; Periodic observation was done regarding plant/crop performance
research	☐	☐	☐	☒	☐	Demonstration trials were established on-farm

Flow chart

Decision-making on the selection of SLM Technology

Decisions were taken by

- ☐ land users alone (self-initiative)
- ☒ mainly land users, supported by SLM specialists
- ☐ all relevant actors, as part of a participatory approach
- ☐ mainly SLM specialists, following consultation with land users
- ☐ SLM specialists alone
- ☐ politicians/ leaders

Decisions were made based on

- ☐ evaluation of well-documented SLM knowledge (evidence-based decision-making)
- ☐ research findings
- ☐ personal experience and opinions (undocumented)

TECHNICAL SUPPORT, CAPACITY BUILDING, AND KNOWLEDGE MANAGEMENT

The following activities or services have been part of the approach

- ☒ Capacity building/ training
- ☒ Advisory service
- ☒ Institution strengthening (organizational development)
- ☐ Monitoring and evaluation
- ☒ Research

Capacity building/ training

Training was provided to the following stakeholders

- ☒ land users
- ☐ field staff/ advisers
- ☒ school children/students, extensionists/trainers

Form of training

- ☐ on-the-job
- ☐ farmer-to-farmer
- ☐ demonstration areas
- ☐ public meetings
- ☐ courses
- ☒ personal communication

Subjects covered

Advisory service

Advisory service was provided

- ☐ on land users' fields
- ☐ at permanent centres

Farming System Approach: Management/improvement of sand dune area and Adaptability testing.

Institution strengthening

Institutions have been strengthened / established

- ☐ no
- ☐ yes, a little
- ☒ yes, moderately
- ☐ yes, greatly

at the following level

- ☒ local
- ☐ regional
- ☐ national

Describe institution, roles and responsibilities, members, etc.

Type of support

- ☐ financial
- ☒ capacity building/ training
- ☐ equipment
- ☒ technology generation

Further details

Research

Research treated the following topics

- ☐ sociology
- ☐ economics / marketing
- ☐ ecology
- ☒ technology

Research on the productivity improvement of sand dunes was focused on crop adaptability, nutrition and water management.

FINANCING AND EXTERNAL MATERIAL SUPPORT

Annual budget in USD for the SLM component

- ☐ < 2,000
- ☒ 2,000-10,000
- ☐ 10,000-100,000
- ☐ 100,000-1,000,000
- ☐ > 1,000,000

national government 50% and
local community 50%

Precise annual budget: n.a.

The following services or incentives have been provided to land users

- ☒ Financial/ material support provided to land users
- ☒ Subsidies for specific inputs
- ☐ Credit
- ☐ Other incentives or instruments

Financial/ material support provided to land users

Labour by land users was

- ☒ voluntary
- ☐ food-for-work
- ☐ paid in cash
- ☐ rewarded with other material support

IMPACT ANALYSIS AND CONCLUDING STATEMENTS

Impacts of the Approach

little
moderately
greatly

Did the Approach improve knowledge and capacities of land users to implement SLM? Removing the sand in the planting hole and replacing it with fertile soil	No Yes, I Yes, I Yes, I
Did the Approach improve issues of land tenure/ user rights that hindered implementation of SLM Technologies? Security of tenure is important in the practice of SWC	No Yes, I Yes, I Yes, I
Did other land users / projects adopt the Approach? Areas affected by the eruption of Mt. Pinatubo volcano in 1991 adapted the same principle of resoiling to grow high value tree crops.	No Yes, I Yes, I Yes, I

Main motivation of land users to implement SLM

✓ n.a.

Sustainability of Approach activities

Can the land users sustain what has been implemented through the Approach (without external support)?

no
✓ yes
uncertain

CONCLUSIONS AND LESSONS LEARNT

Strengths: land user's view

- It makes idle land productive

Strengths: compiler's or other key resource person's view

- It stabilizes unstable areas like sand dunes
- It makes highly constrained area productive
- It encourages resourcefulness
- It encourages further research

Weaknesses/ disadvantages/ risks: land user's view how to overcome

- Laborious Sourcing of fill materials nearby to lessen hauling cost
- Long gestation period for the crops Good cultural management (fertilization, irrigation)
- Lack of capital

Weaknesses/ disadvantages/ risks: compiler's or other key resource person's view how to overcome

- High plant mortality due to moisture stress Improved water harvesting technique; putting up of irrigation system (e.g. drip irrigation)
- Laborious especially during the 'resoiling' stage Composting on-site. Look for source if 'fill materials' near the site.

REFERENCES

Compiler

Philippine Overview of Conservation Approaches and Technologies

Editors

Reviewer

Deborah Niggli

Date of documentation: March 14, 2017

Last update: March 14, 2017

Resource persons

Jose Rondal (jrondal@info.com.ph) - SLM specialist

Full description in the WOCAT database

https://qcat.wocat.net/en/wocat/approaches/view/approaches_1954/

Linked SLM data

Technologies: Buffer strips and hedges https://qcat.wocat.net/en/wocat/technologies/view/technologies_6162/

Documentation was facilitated by

Institution

- n.a.

Project

- Decision Support for Mainstreaming and Scaling out Sustainable Land Management (GEF-FAO / DS-SLM)

Key references

- 2000 Annual Report: Mariano Marcos State University

This work is licensed under [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International](https://creativecommons.org/licenses/by-nc-sa/4.0/)

