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Gamma Sigma Delta Honor Society of Agriculture Speaker

Conserving Indigenous Knowledge: Information System towards Food Security and Sustainable NRM in the Cordilleras



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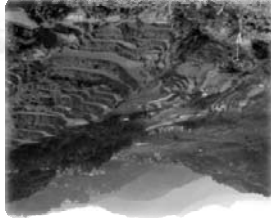


Outline of Presentation

- ❖ **Introduction**
- ❖ **Objective**
- ❖ **Methodology**
- ❖ **Results**
 - Information system (website, database, knowledge analysis)
 - Sustainable NRM strategies
 - Soil fertility management
 - IEC for IK conservation
- ❖ **Conclusions**

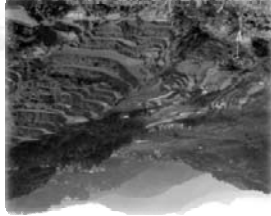
INTRODUCTION

- ❖ Indigenous knowledge (IK) is a systematic body of knowledge acquired by local people through accumulation of experiences, informal experiments and intimate understanding of the environment;
- ❖ IK is also the basis for agriculture, food preparation, health care, sustainable use, management and conservation of natural resource (e.g. indigenous plants, biodiversity, soil and nutrient conservation);
- ❖ Includes a system of classification and management that governs resource use;



INTRODUCTION

- ❖ It is embedded in their community practices, institutions, cultural values and belief systems
- ❖ Recording and documenting is a major challenge because of the tacit nature of IK;
- ❖ The Cordilleras Region of the Philippines has a long history and rich diversity of indigenous knowledge covering all aspects of life including community practices, institutions, relationships and rituals.



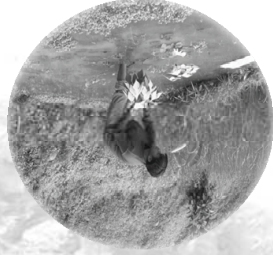
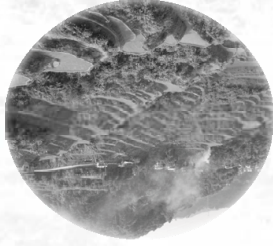
INTRODUCTION

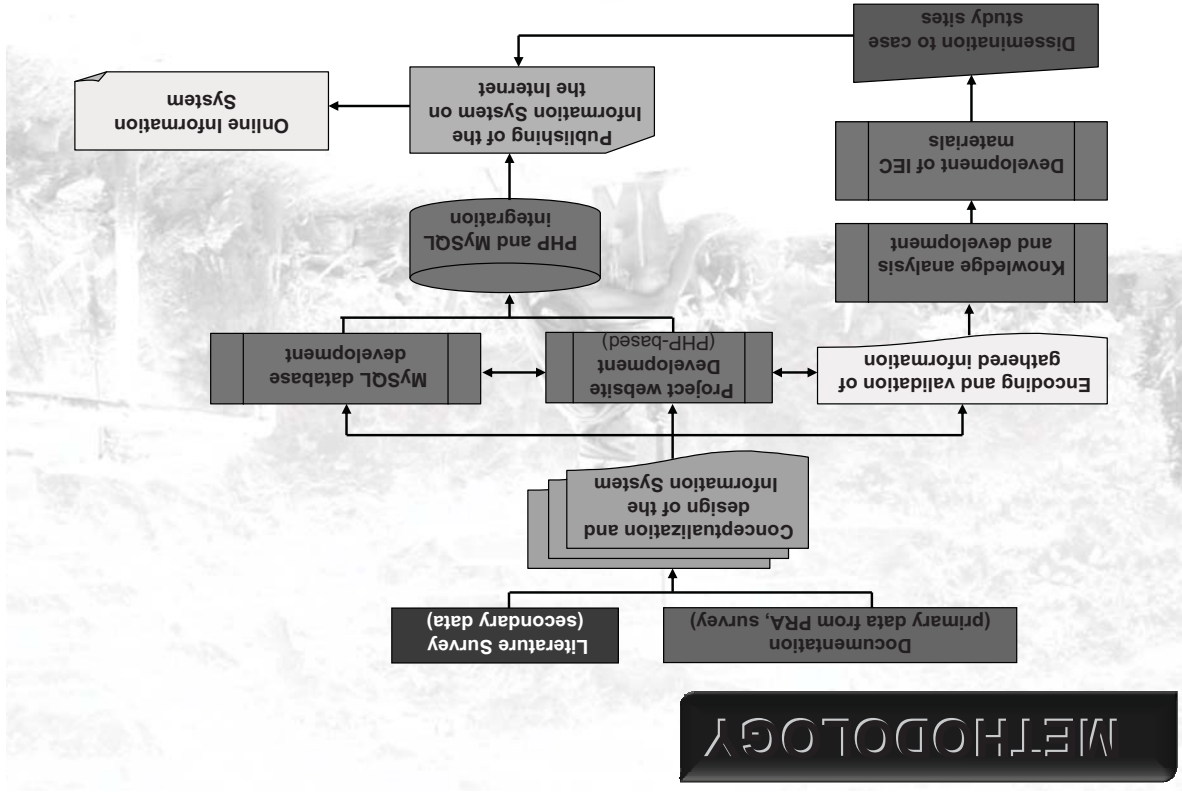
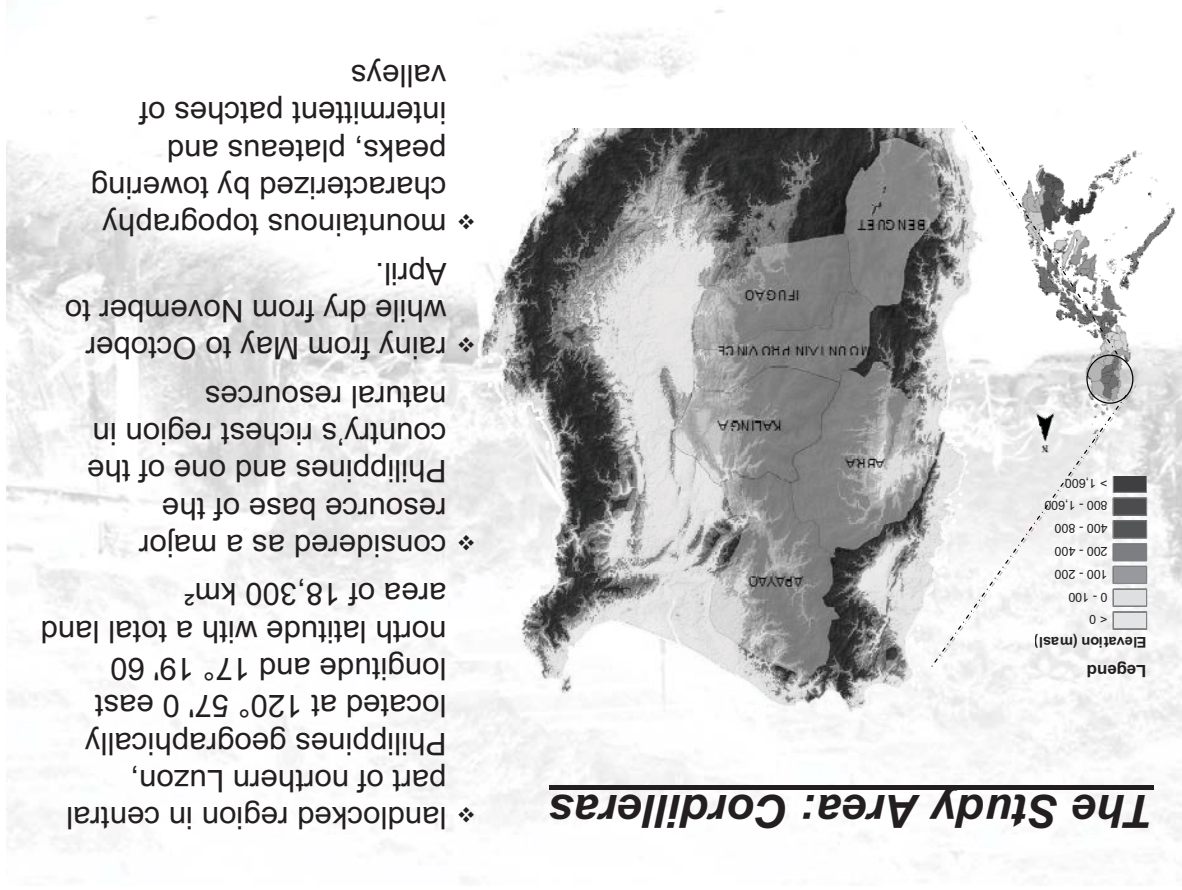
- ❖ Information system can be used in the organization and management of information on indigenous knowledge of upland communities in the Cordilleras of Northern Luzon;
- ❖ This information system will be an important knowledge-base in food security and sustainable natural resource management; and
- ❖ Bioinformatics
- ❖ Participatory approaches in development of communication materials



OBJECTIVE

Integrate the lessons learned from the various Indigenous Knowledge (IK) of the local communities in the Cordilleras. Draw strategic options on environmental communication and education thru information system aimed at conserving IK for food security and sustainable NRM.





Documentation activities



Key Informant (KI) interviews



Focus Group Discussions (FGD)

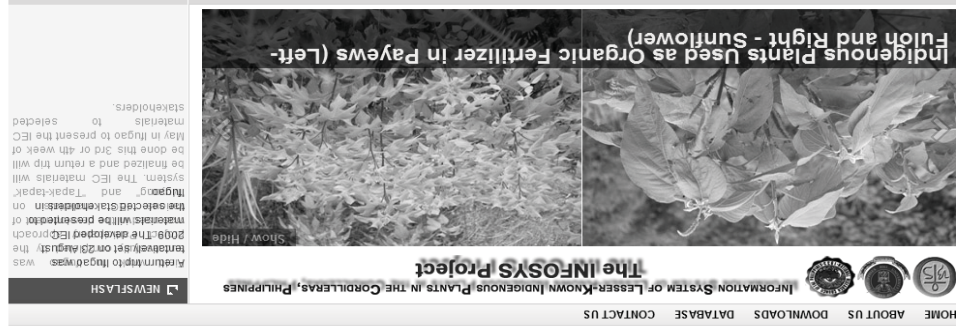


IEC Development Process



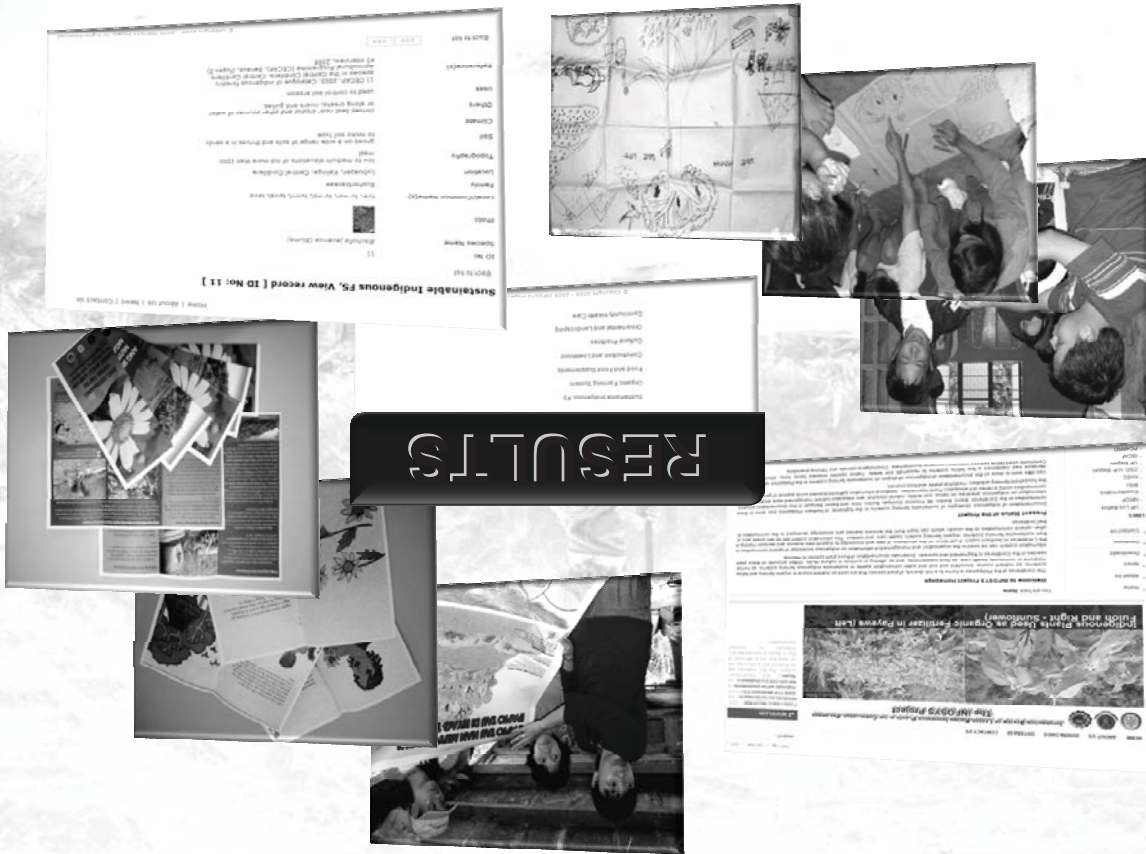
Information System

Project homepage



Site map | Old Site | Link

RESULTS



- PCARD
- ISCAF
- UP Baguio
- CSC, U.P. Baguio
- KASC
- BSU
- Ecoinformatics
- NRCP
- UP Los Baños

LINKS

- Home
- About Us
- News
- Downloads
- Database
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Welcome to INFOSYS Project Homepage

The Cordilleras of the Philippines is home to a rich diversity of plant species that are used as nutrient sources in organic farming and fallow systems, as nutrient source, biocontrol and soil and water conservation agents in sustainable indigenous farming systems, as herbal medicines in community health care, as food supplements, and as offering or symbols in cultural rituals. Written accounts on these plant species in the Cordilleras is fragmented and sporadic. Systematic documentation of these plant species is minimal.

Information system can be used in the organization and management of information on indigenous knowledge of upland communities in the Cordilleras of Northern Luzon. It will focus on the structuring of data and knowledge to support data analysis and decision-making in their sustainable farming systems, organic farming system, health care, and nutrition. This information system will be very useful also to other upland communities in the country which can learn from the lessons learned and knowledge developed by the communities in the Cordilleras.

Present Status of the Project

Documentation of indigenous strategies of sustainable farming systems in the highlands of Northern Philippines was done in three communities in the Cordilleras: Baguio, Mt. Province, Benguet, and Bataan. Benguet in the documentation process. Very little work is done on the documentation of indigenous strategies on sustainable farming systems in the Philippines uplands. Some literature had mentioned a few fallow systems to rejuvenate soil fertility. Fallow species included herbs, forbs, shrubs and trees. The household farming activities, medicinal plants and food sources.

Additional information gathered included some aspects of gender issues in communities using a variety of Participatory Rural Approaches. Integrated nutrient management were elicited from the information on indigenous practices on fallow, soil fertility, natural resource, and integrated nutrient management were elicited from the communities in the Cordilleras. Baguio, Mt. Province, Benguet, and Bataan. Benguet in the documentation process.

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http://www.infosys.econinfoclab.com

Database Information System (DIS)

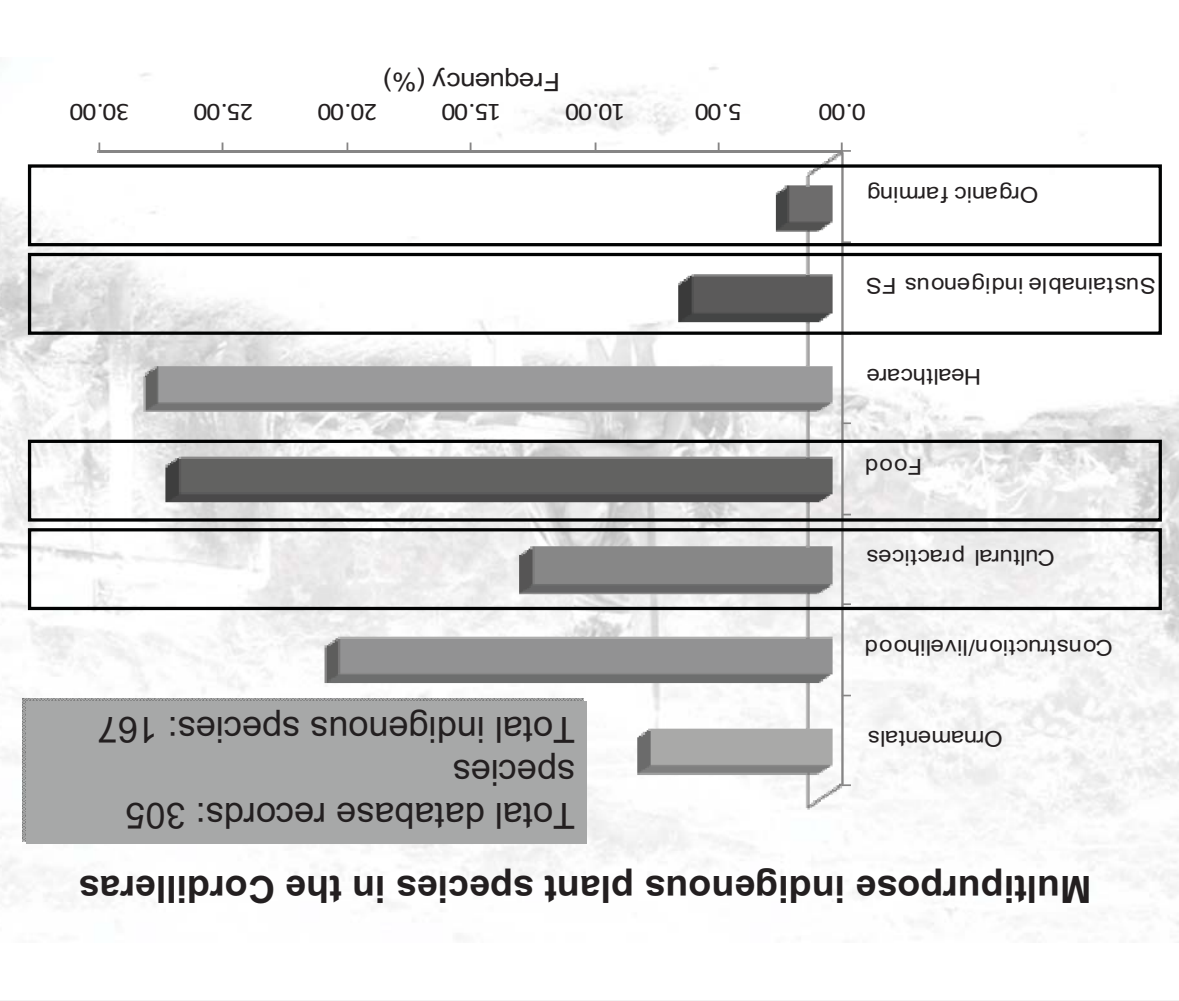
User/viewer login


Database category menu

<http://www.infosys.ecoinfolab.com/database.html>

Components of DIS


- Sustainable indigenous farming systems
- Organic farming system;
- Food and food supplements;
- Construction and livelihood;
- Cultural practices;
- Ornamental, landscaping and gardening; and
- Community health care system (restricted section);

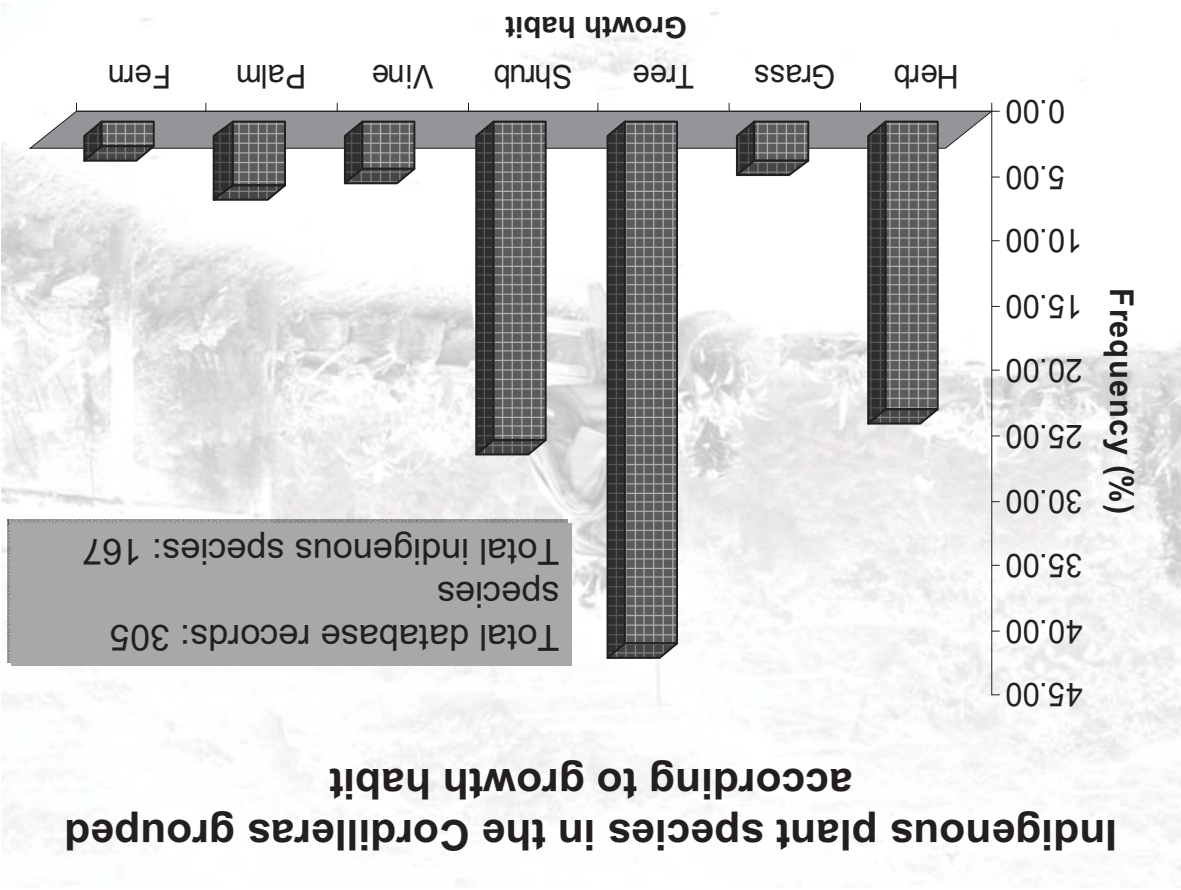




Some indigenous plants used sustainable NRM

Scientific name: *Albizia procera*
Family: Leguminosae
Growth habit: Tree
Common/local name(s): ahlar, adaan, kalai, akleng parang
Usage: shelter belts, forestation plantings and erosion control
Source: CECAP, 2003







Scientific name: *Tithonia diversifolia*

Family: Asteraceae

Growth habit: Shrub

Common/local name(s): lagpaw, mirasol, marapait, sunflower

Usage: organic fertilizer

Source: Lillitt, 2005; Magcale-Macandog and Ocampo, 2005; Key Informant interview, 2008 and 2009





Scientific name: *Ficus minahasse* (Tejism & de Vr.) Mig
Family: Moraceae
Growth habit: Tree
Common/local name(s): hagimit, alumit, alimit, sabfog
Usage: potential agroforestry species (shade tree for coffee, cacao or other plantation crops)
Source: CECAP, 2003



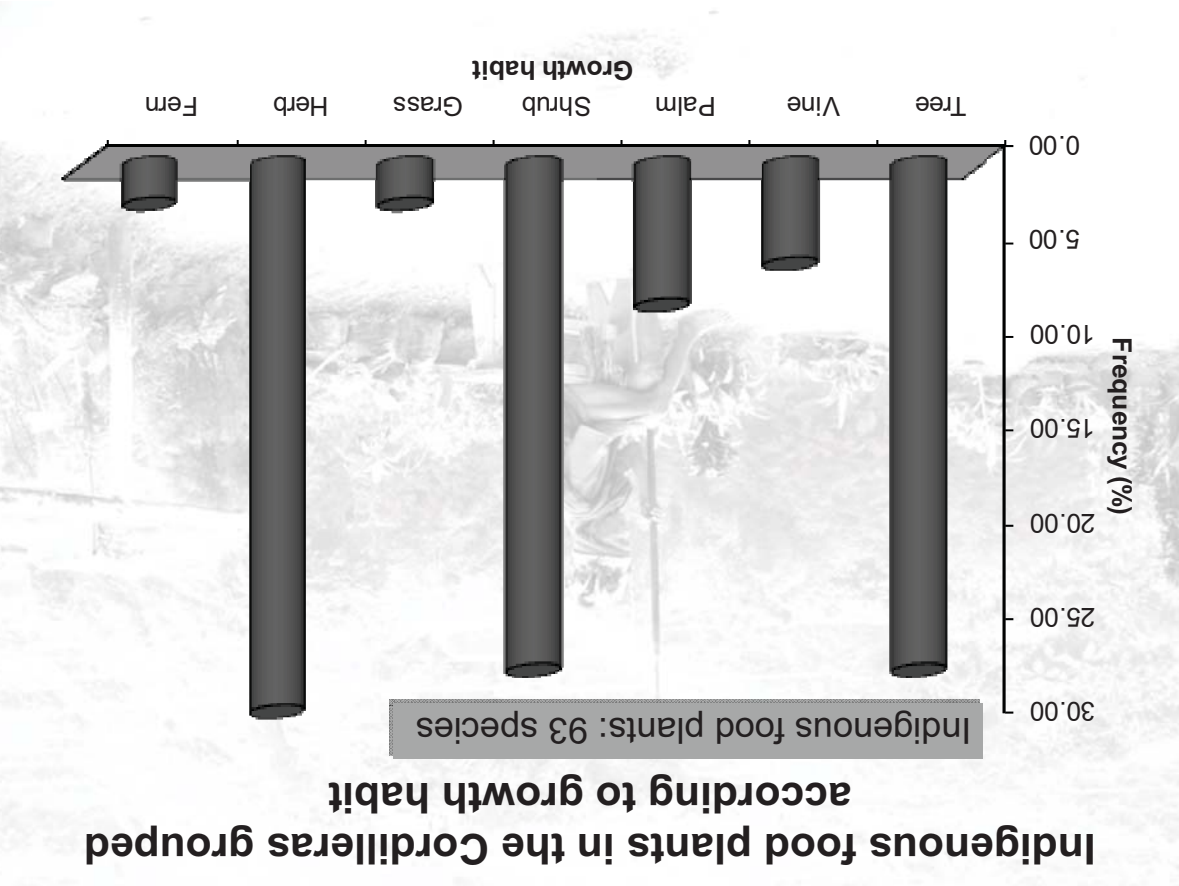
Scientific name: *Erythrina orientalis*
Family: Fabaceae
Growth habit: Tree
Common/local name(s): dapidap, bubug, sabbang, sablang, kabkab, sabrang and gabgab
Usage: potential agroforestry species (shade tree for coffee, cacao or other plantation crops)
Source: CECAP, 2003



Scientific name: *Bambusa blumenia*
Family: Graminae
Growth habit: Shrub
Common/local name(s): kayan tinik
Usage: used for afforestation activities; used to stabilize unstable and eroding slopes and banks
Source: CECAP, 2003

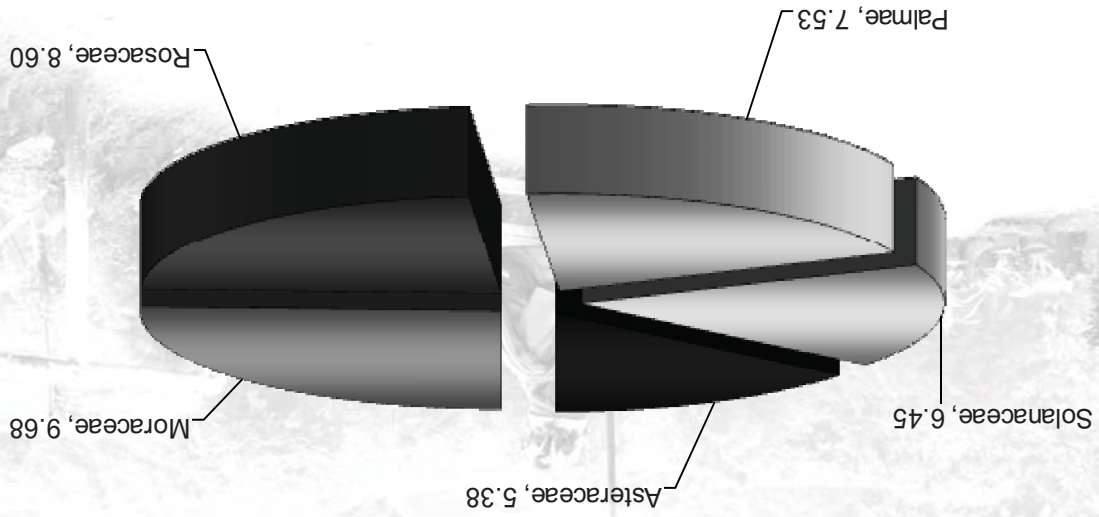
Scientific name	Common/ local name	Family	Source
<i>Ficus Nota (Blanco)</i>	tibig, piwis, tabbog	Moraceae	CECAP, 2003
<i>Ficus pseudopalma</i>	nigoniogan, adalagi, kadiabung, tarabang	Moraceae	CECAP, 2003
<i>Lithocarpus ilanosis</i>	palayon, philippine oak, pallay, poschan, pallayan	Fagaceae	CECAP, 2003
<i>Wrightia pubescens</i>	lanete, lanoti	Apocynaceae	CECAP, 2003

Indigenous trees good for watershed rehabilitation



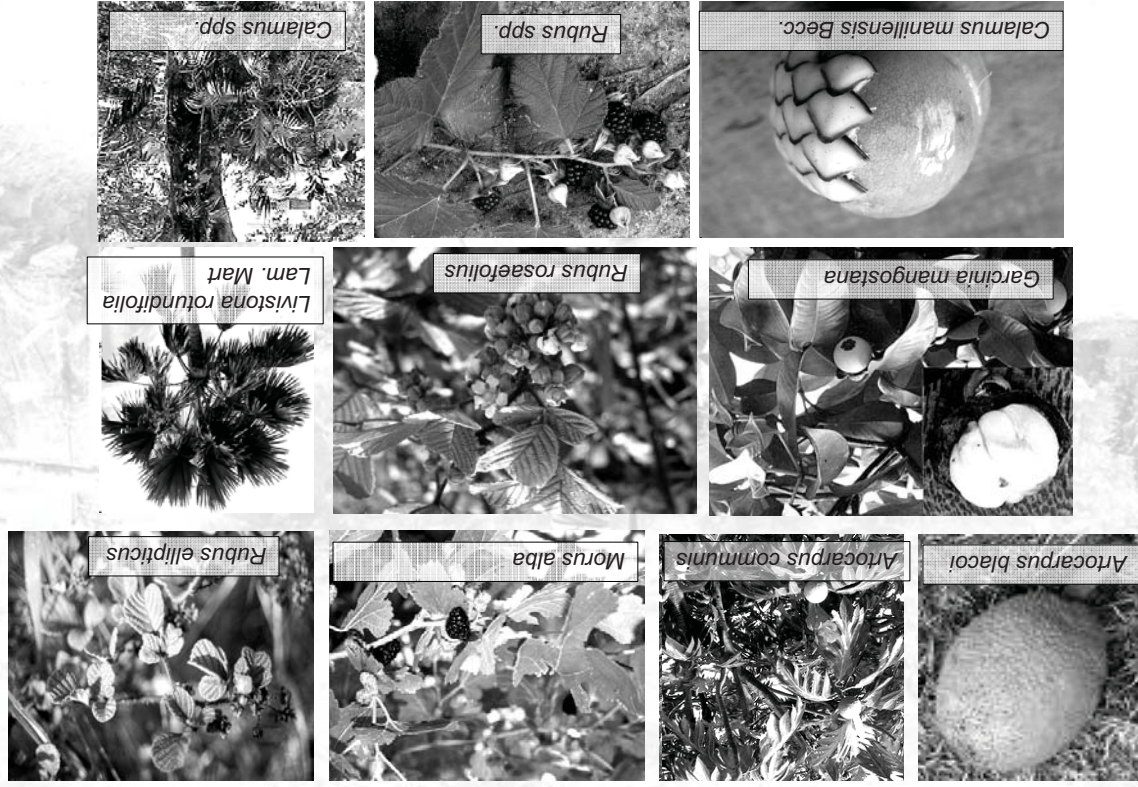
Top five family of indigenous food plants in the Cordilleras

Indigenous food plants: 93 species

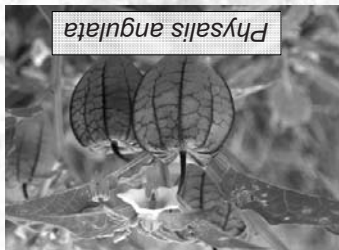
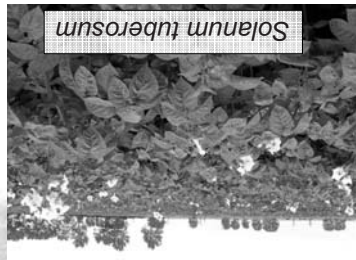
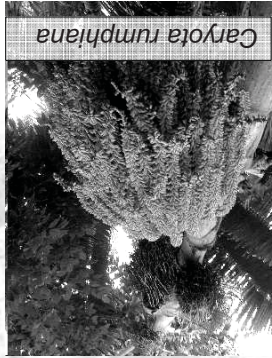


Note: Frequency values in %

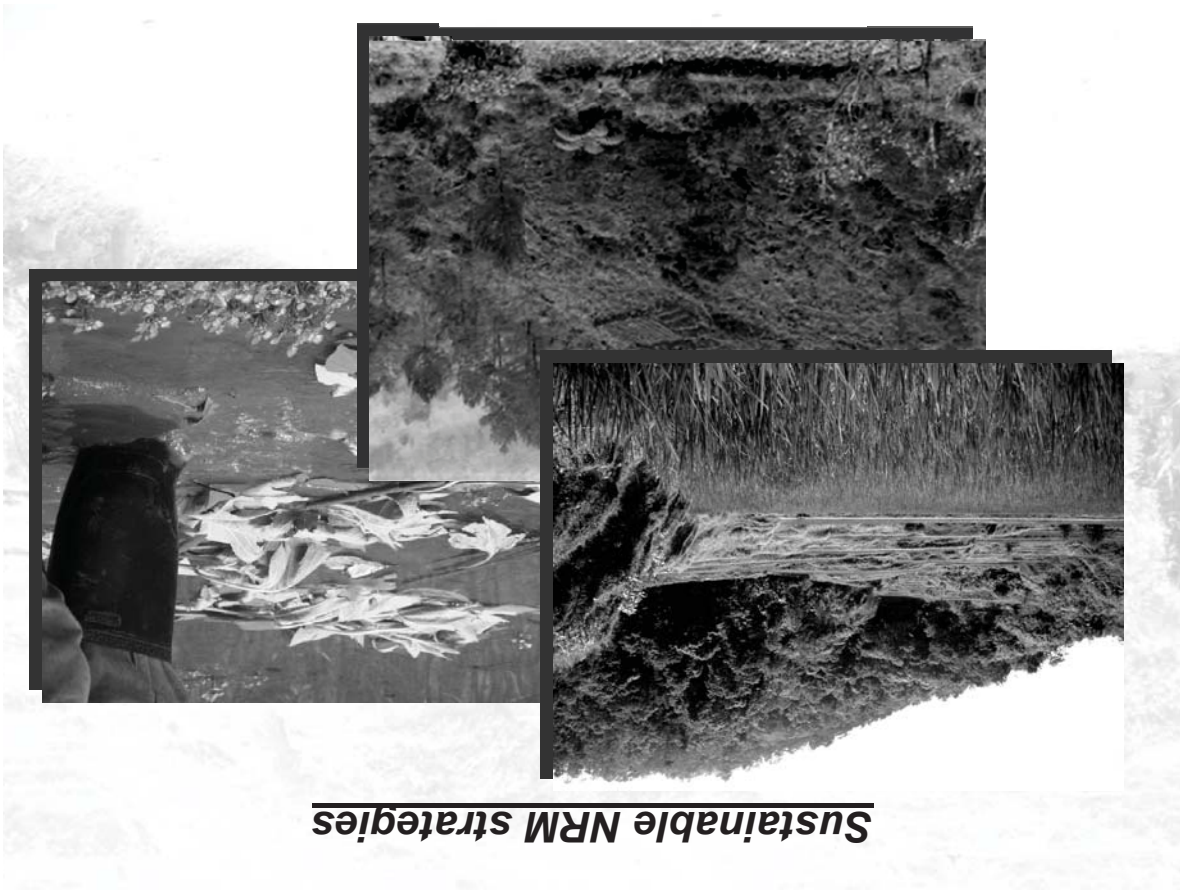
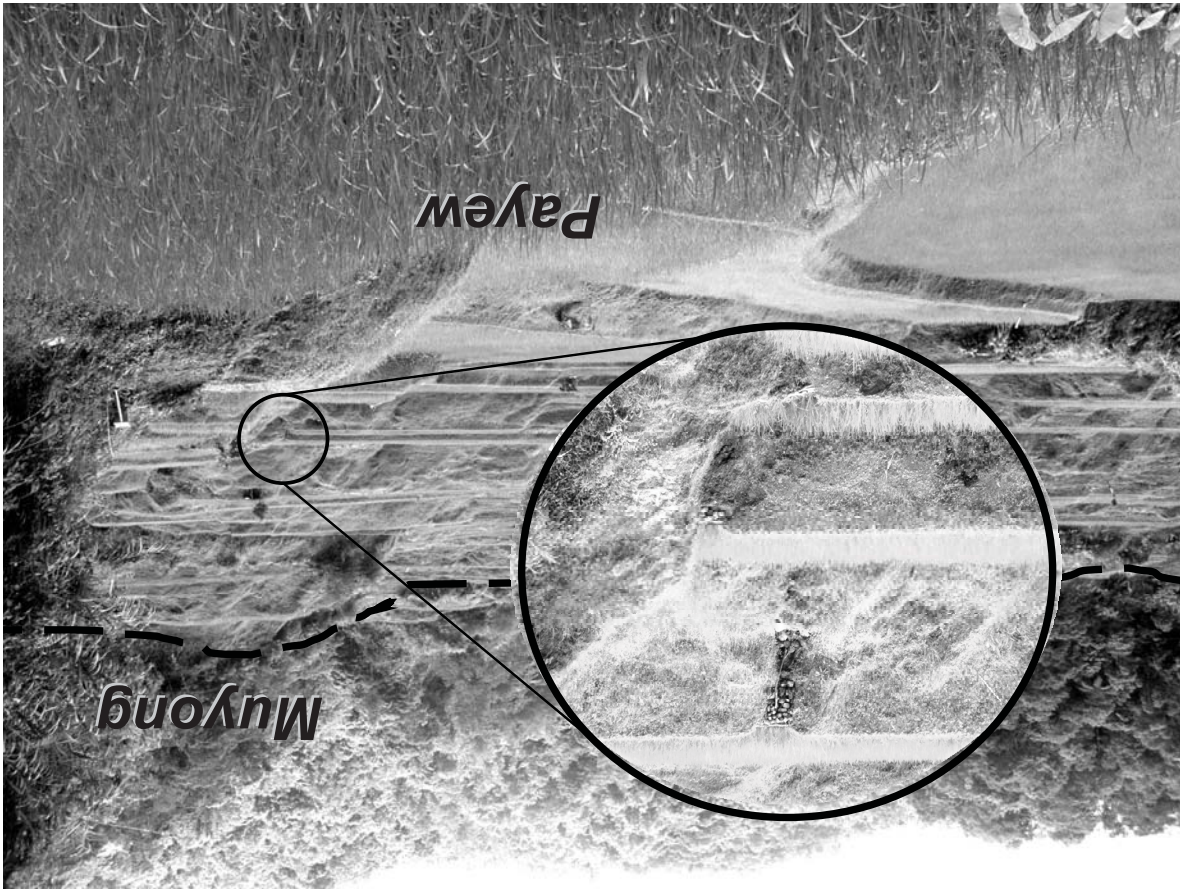
Some of the indigenous plants with edible fruits



Some of the indigenous plants utilized as vegetable/food ingredient

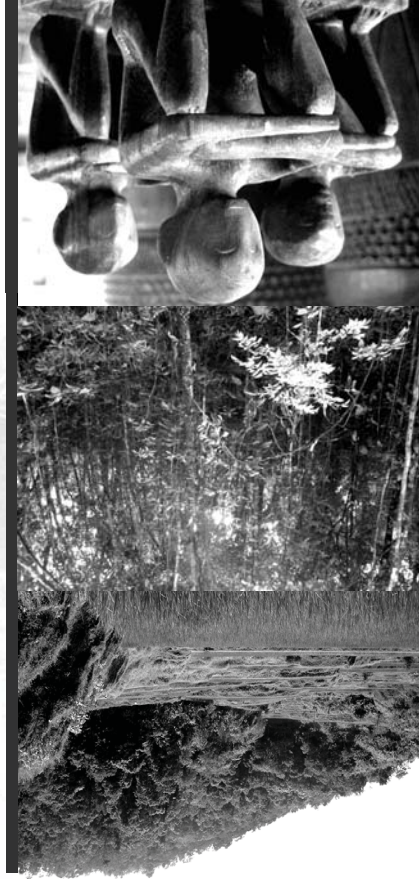


Some of the indigenous plants utilized as vegetable/food ingredient



The “Muyong” or “Pinugo”

- Privately owned, inherited and managed properties
- Important part of agroforestry system to protect the farms in the downslope from erosion and runoff, maintains soil fertility and plant biodiversity
- Internationally recognized as an ideal resource management strategy
- Closely linked with the religious belief system of the people and economic values of trees and crops



- Provides food, housing materials, home furnishing, firewood/fuel, medicinal herbs
- Mostly dominated by the plant family Euphorbiaceae, Moraceae, Meliaceae, Leguminosae, Poaceae, Anacardiaceae and Rubiaceae
- *Cajanus cajan* (“kardis”, cadios), *Calamus manillensis* (“litoko”, edible rattan), *Areca catechu* (betel-nut), *Piper* spp. can be found in Muyong
- In old muyong, indigenous trees can be found mainly dipterocarp such as *Shorea contorta* (white lauan, “apnit”) and *Shorea guiso* (guijo, “tafangew”)



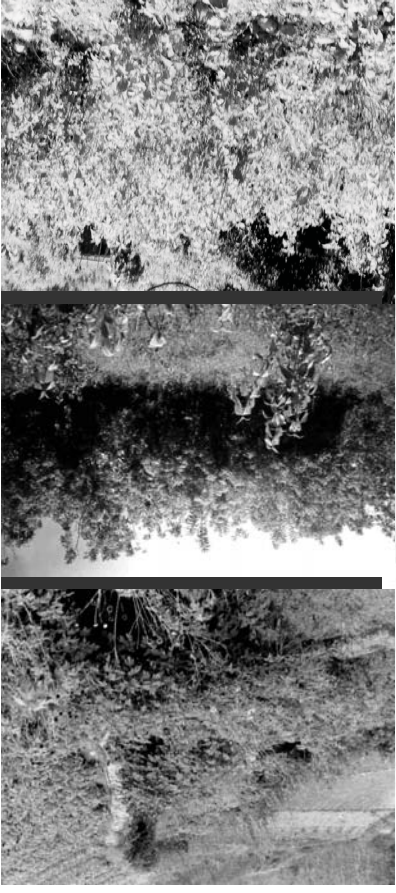
Payew (terraced irrigated fields)

- ❖ Irrigated pond terraces usually with an area of 100-250 m²
- ❖ Packed clay walls of the terraces were later replaced with rocks to effectively control soil erosion
- ❖ Sunflower is also used in this type of indigenous food production system to effectively manage the soil fertility
 - The cuttings of sunflower are incorporated into the soil before crop planting and allowed to decompose before the growing season of rice
 - Farmers believe that the practice of incorporating sunflower helps rejuvenate the fertility of the soil resulting to vigorous crop growth, loosen soil and prevention of sweet potato rotting



Soil fertility management

- ❖ In irrigated rice, farmers use the shoots of wild sunflower (*Tithonia diversifolia*) through the “tapak-tapak” system
- ❖ In upland rainfed rice, chopped dried leaves of *Gliricidia sepium*, *Chromolaena odorata*, or rice hay incorporated during land preparation



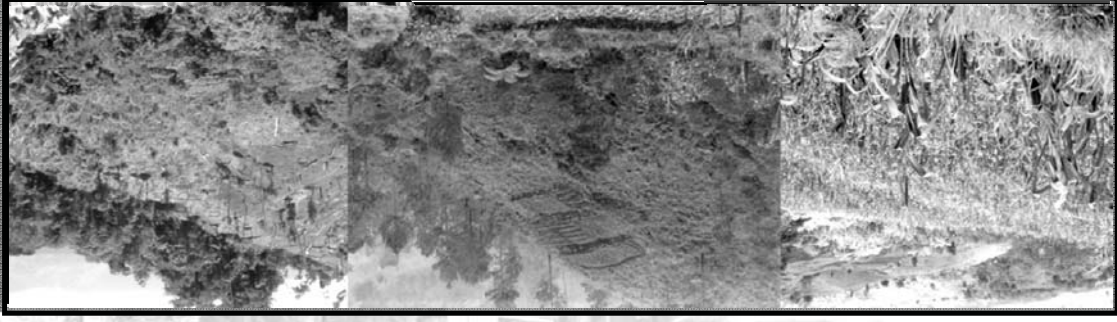
Soil Fertility Management

- During Clearing period, all cut grasses & weeds are burned after drying
- Residues such as maize & millet stover are burned and the ash is applied both as fertilizer and pesticides against ants & aphids
- Removed grasses & weeds are laid as mulch
- Sunflower, rice hulls, & composted weeds may also be applied as organic fertilizer

Food-based production system

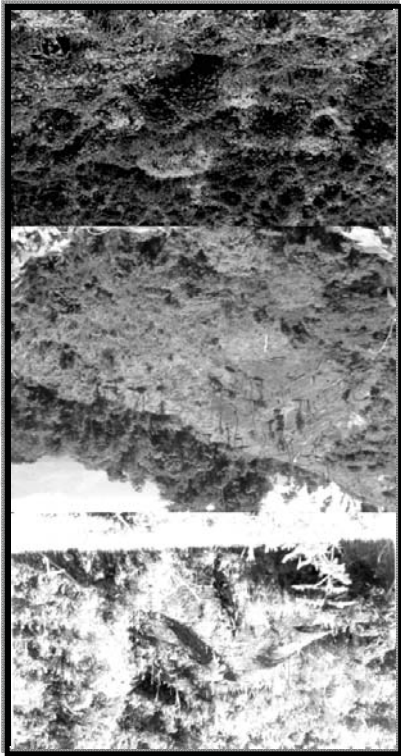
Shifting cultivation or swidden farming

- Common practice in the uplands as a system of food production
- Practice of subsistence upland farmers in cultivating food crops in a patch of cleared forest area
- Continuous cultivation of forest area usually last from 2 to 3 years
- Indigenous people are aware of the importance and value of trees and forest litter in soil fertility and do careful selection of forest areas to be cultivated
- Prescribed burning also improves soil fertility and makes it easier for them to shape their mountains into farms




Uma

- Rainfed upland shifting cultivation found in the sloping areas of the mountain that cover at least 500 m² of land
- Farmers choose sites that are not stony, sloping but not too steep and where trees are more than 20 years old
- The wood from the cut trees are used for building the farmers' house and storage room for the crops to be grown
- In Mt. Province, chosen uma fields are usually heavy or clayey soils to resist soil erosion and are planted to sweet potato, squash, millet, beans, peanut, maize and onion
- Woody shrubs such as *Tithonia diversifolia* (sunflower) and *Gliricidia sepium* ("kakawate") are planted as boundary fence of the uma field to protect the crops from stray animals



FALLOWING IN THE UMA

- After Cultivating the Soil for about four (4) years, residents leave it to Fallow


 Fallow period varies from 1-4 years
 (short fallow) or as long as 20 years

- Rono grass (*Miscanthus sinensis*), wild strawberry, wild sunflower, grasses, pine trees, *Alnus Spp.*, and sweet potato is left to grow in the field during fallow period before the land is opened again for cultivation

- The practice of Fallow management justifies the rare application of fertilizer in the Uma

- Brings Environmental & Socio-economic benefits

Environmental Benefits

- ☐ Fresh air
- ☐ Beautiful scenery
- ☐ More water

Socio-economic Benefits

- ☐ Biodiversity of products (wild fruits, moss, mountain tea, medicinal herbs, etc.)
- ☐ Raw materials (for grass fibers, and wood)

Sweet Potato System

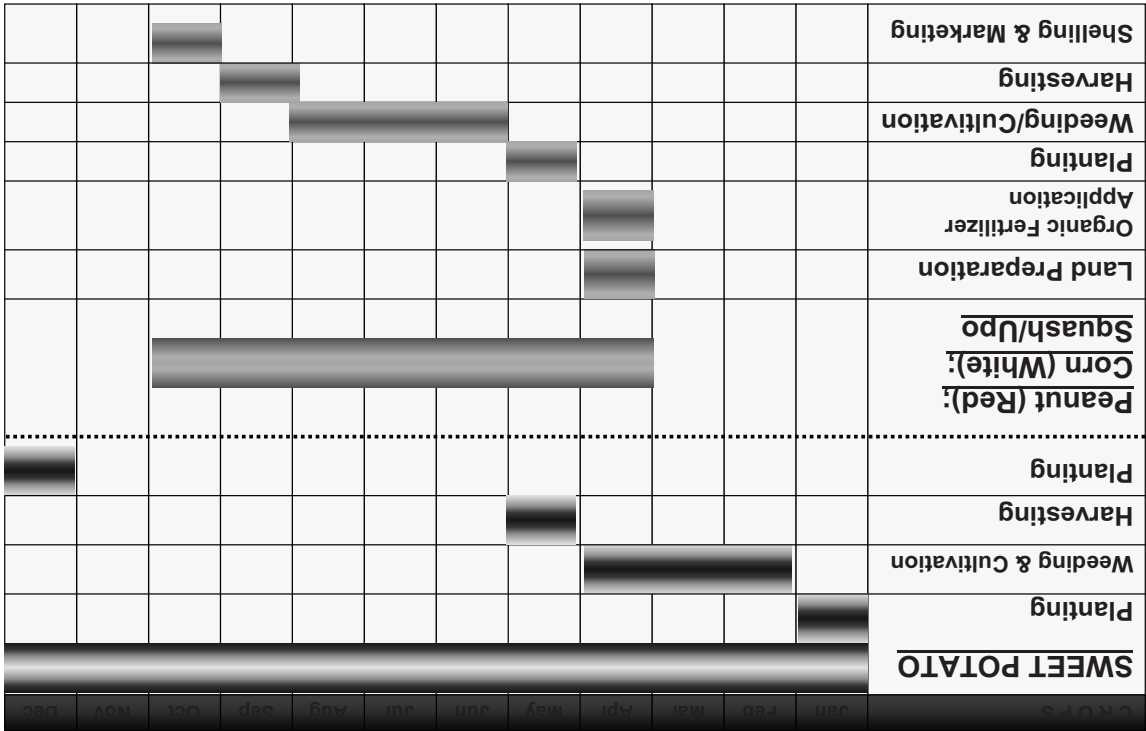
- ☐ Varieties grown: Red (*Ingitanagit, Ginomanab*) and White (*Kalbo-oy, Hinaplid*)
- ☐ Storage roots harvested are big in the first two years of cultivation. By the fourth year of cultivation, it is markedly smaller

- ☐ Sweet Potato vines need regular lifting to concentrate the growth of storage roots. It is practiced twice per cropping year to concentrate storage root growth at the base of the plant

KATUALLE



- ☐ 50 m² piece of land located in gentle sloping areas near the road and houses
- ☐ Less elaborate terracing than *Payaw*
- ☐ Perennially cropped with sweet potato and other crops such as corn, peanut, squash, legumes, cabbage, pepper and onion.



Cropping calendar in KATUALLE

Soil Fertility Management

- ❑ Weeds removed from the farm are placed in between sweet potato crops to act as mulch and organic fertilizer
- ❑ Peanut leaves and plants are applied on the soil surface and will serve as green manure for the next crop (rice or sweet potato)
- ❑ Sweet potato leaves, on the other hand, are left on the soil for the subsequent peanut crop

Sweet Potato System

- ❖ The second staple food and is considered a summer food
- ❖ It is traditional practice that Sweet Potato is relayed or rotated with a rice crop in the Payaw Fields to ensure good rice growth
- ❖ Varieties grown: Red (Akkong, Ingitangit, Ginomanab) and White (Kalbo-oy, Hinaplid)
- ❖ Storage roots harvested remain large over the years
- ❖ The application of uprooted weeds and rice hull in between tubers controls weed growth and tends to concentrate the growth of the tubers at the site



Su-ulian System

- ❖ multi-purpose seed conservation method
- ❖ constructed about 4-5 feet above the fire heart in the kitchen area and about 3 feet under the house roof
- ❖ smoke act as preservative and repels insects and rodents
- ❖ ropes made of indigenous plants such as rattan and wakai are used for drying
- ❖ ladaw, batek, konnakon, uyok, ballokok and bamboo are most preferred indigenous plants as construction material for su-ulian
- ❖ seeds of highly valued plants such as corn, bean, pigeon pea, coffee bean, squash and sorghum
- ❖ mountain tea is also stored and dried in su-ulian



Natural Resources Conservation

- ❑ The **LAPAT** system of Abra
- ❑ “Lapat” : to prohibit; or “parit” in Ilocano.

❑ A century old system of regulating the use of natural resources among the upland Tinguiian tribes e.g. refraining from cutting trees in the forest, gathering rattan, hunting, fishing, etc.

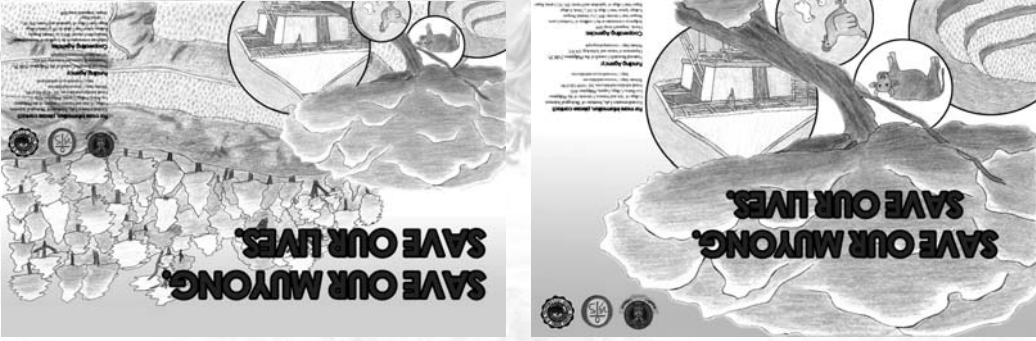


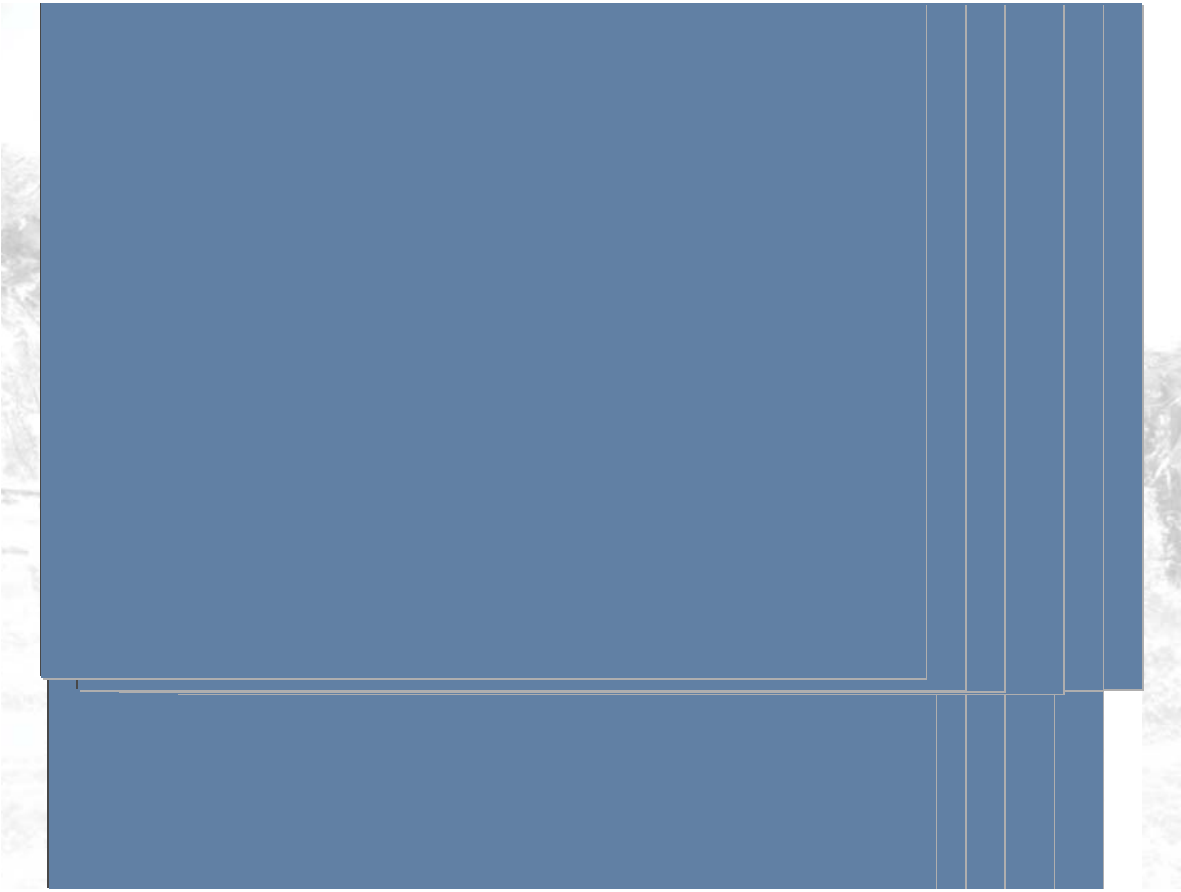
Most effective forms of IEC for IK conservation

- ❖ Community poster
- ❖ Story booklet
- ❖ Radio plug/spot



Prototype posters





Prototype comic story booklets



Prototype leaflets



Radio plug/spot

Script for straight announced radio plug on *Lampaw* (Ifugao and English)

Topic: Use of lampaw to increase rice yield in rice terraces
Length: 30 secs – 1 min

ANNOUNCER:	Inila yu ban u nganey sikreto nu tangunan mapmaphod dib binto' u? Hay, sikreto ya nan pun-usos hi lampaw an puupaluanong hiluta. Munha'haada' hi lampaw hiway punhopenaan ya hiway payo ah'i tanonman. Hahado' ta mapite ah'i' iddum hinan luta, pati nan holo' ya nan dagami. Ipangtiti nanan luta oya ipataba na nan natanom an papage. Pamate bo tuwe hinan dimadag hi page umat hinan kolang. Gapuh nan pun-us usara' hi lampaw an punpalumong nan binto' un pageh ya mapmaphod.
ANNOUNCER:	What is my secret for having abundant harvest? I use lampaw to make the soil fertile. I put the lampaw in the rice seedbed and in the rice field before planting. I incorporate lampaw cuttings into the soil along with the weeds and rice straw and let them decompose there. Once decomposed, lampaw will make the soil dark and enable the rice plant to have good growth. I also use lampaw as pesticide for earthworm. Because I use lampaw as fertilizer, I have plenty of rice harvest.

Radio plug/spot

Script for dramatized radio spot on *Muyong* (Ifugao and English)
Topic: Importance of muyong
Length: 30 secs – 1 min

TATAY:	Imbabale badangana an munlihi hi muyong.
ANAK:	Ama, tanganu an kanayun an linaan tau nan muyong.
TATAY:	Hituway di aton ta umangal nan importante an kakayiw. Te mahapur tau an ipatoh nan muyong tau.
ANAK:	Mahapur taun ipapto nan muyong tau.
TATAY:	O te datuwe kakayiw di pang pangalan tau hinan usalon tau hi pun-amaan hi bale pangaln hi itungu, punhabhatan, pun-abolan ya nan udum pay un usar. Ituwe damdamay mun-od-odat hi dakor an living ya pumhodaan di payo.
ANAK:	Ay athidi gayam? Dapat gayam ipapto tau ua ipa-ongar tau nan muyong tau.
TATAY:	Nipito ah imbabaleh. Tulungana mo imbabaleh hi pangipapto-ah hinan muyong tau. Ipapto tau nan muyong tau. Ipapta tau di biyag tau.

Radio plug/spot

Script for dramatized radio spot on Muyoung (Ifugao and English)

Topic: Importance of muyoung

Length: 30 secs – 1 min

FATHER:	Son, help me clean our muyoung.
SON:	Father, why do we often clean our muyoung?
FATHER:	Because we want the trees to grow in our muyoung.
SON:	So that's why we need to care for our muyoung.
FATHER:	The trees in our muyoung will give us materials for building our house and for fuel. The muyoung will also give us food and materials for weaving. It will also give use water for our rice field.
SON:	If that is so, we have to take care and clean our muyoung.
FATHER:	You are right, son. So, help me to take care for our muyoung. We should take care of our muyoung as we take care of our life.

CONCLUSIONS

- ❖ Results of this documentation activity are very important in understanding the sustainability of the natural resources in these upland communities.
- ❖ The strategies developed through the years by the people of Cordilleras may potentially be replicated other upland areas in the country or other tropical countries to address food security;
- ❖ Indigenous food plants are important alternative food sources in the upland households for household food security;
- ❖ Information System plays an important role in immediate dissemination and conservation of IK systems relating to sustainable NRM and food security; and

CONCLUSIONS

- The IEC materials produced through participatory communication approach are highly understandable, acceptable and attractive to the participating community.
- It also fosters synergy among experts, semi-technical staffs, government workers and the community.
- These types of communication materials if properly disseminated could help in the preservation of IK systems for both the present and future generations.

ACKNOWLEDGEMENTS

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- **Itugao State College of Agriculture and Forestry (ISCAF):** Dr. Napoleon K. Taquiling, Eric Aliguyon and Rusendo Lumidao, workshop participants and local residents
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Thank You!!!

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