Bohol Agricultural Ecosystems

A TRANSECT REPORT

13 April 2021

Transect Survey Conducted

- Bohol – October 9 – 11, 2019
- Siquijor – October 24 – 25, 2019
- Negros Oriental – November 5 – 8, 2019

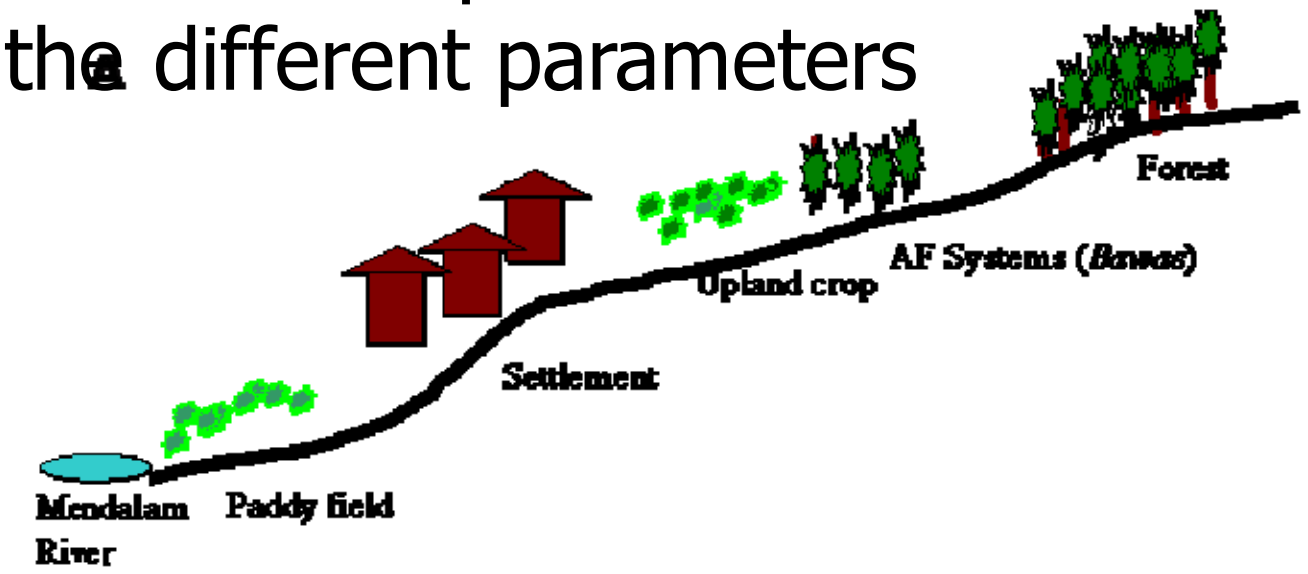

Philippine Sea
South China Sea
LUZON
EASTERN VISAYAS
LEYTE
VISAYAS
Sulu Sea
MINDANAO
MALAYSIA

OBJECTIVES

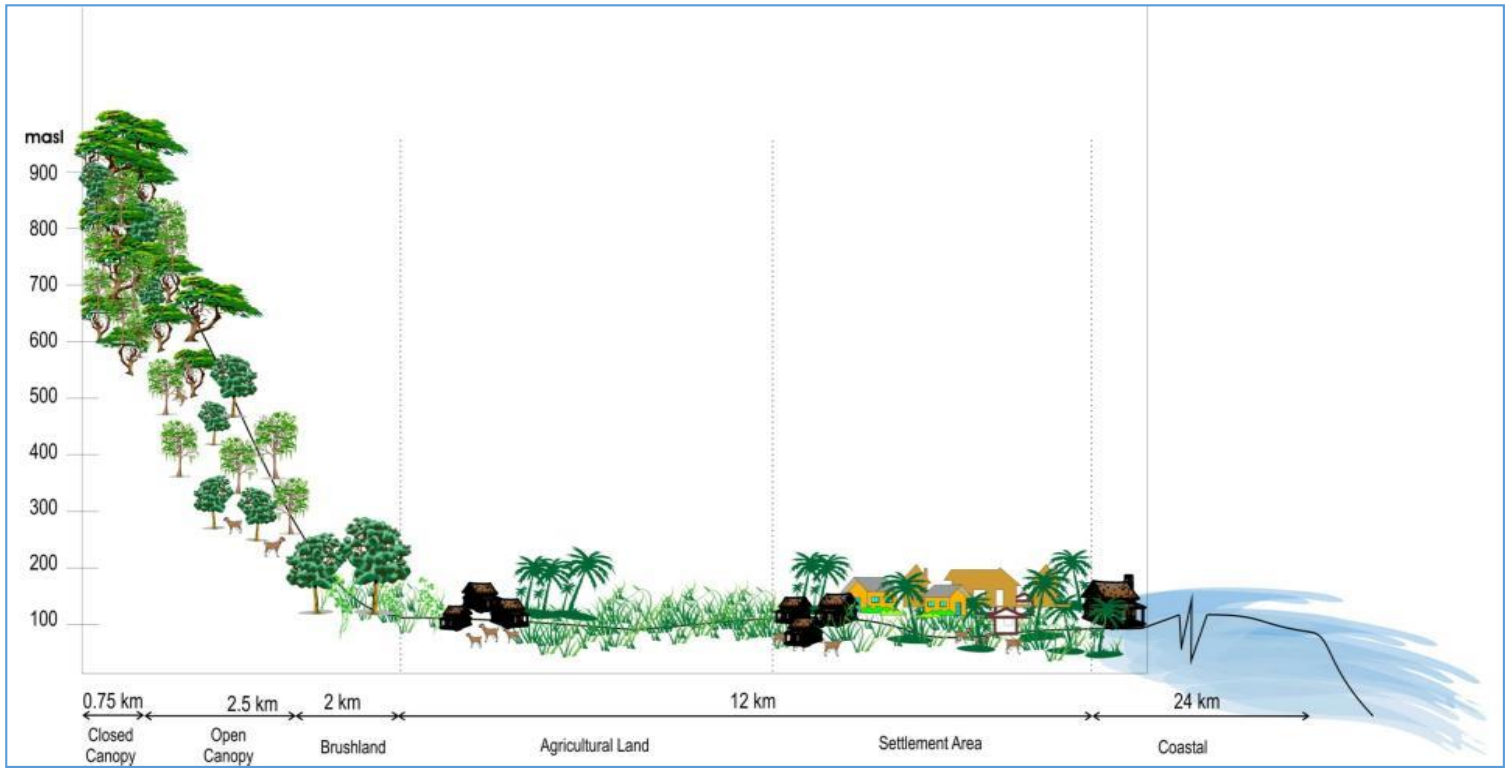
- To know what is transect and its importance;
- To conduct transect survey in the province of Bohol, Siquijor, and Negros Oriental;
- To identify the dominant crops, livestock, cropping systems and production constraints in Bohol, Siquijor, and Negros Oriental; and
- To recommend possible solutions to some agricultural problems in the target provinces.

WHAT IS TRANSECT?

- **Transect** is a path along which one counts and records occurrences of the species of study (e.g. crops, animals, fishery sector etc.).
- Depicts a cross- sectional view of the different agro-ecological zones that provides a comparative assessment of the existing zones using the different parameters



Landscape view of crops being grown in the different ecosystems



DENR, NCIP	LGU, DA, DAR	LGU, DENR	LGU, BFAR, MARINA, PCG

TRANSECT

- is a narrow section through natural feature across the earth's surface or ecosystems, along which observations and/or measurements are taken based on overall scenario or situation of the aforesaid areas.
- Transect is the walk-through observation and documentation of the different ecosystems from ridge to reef of the AMIA project site.

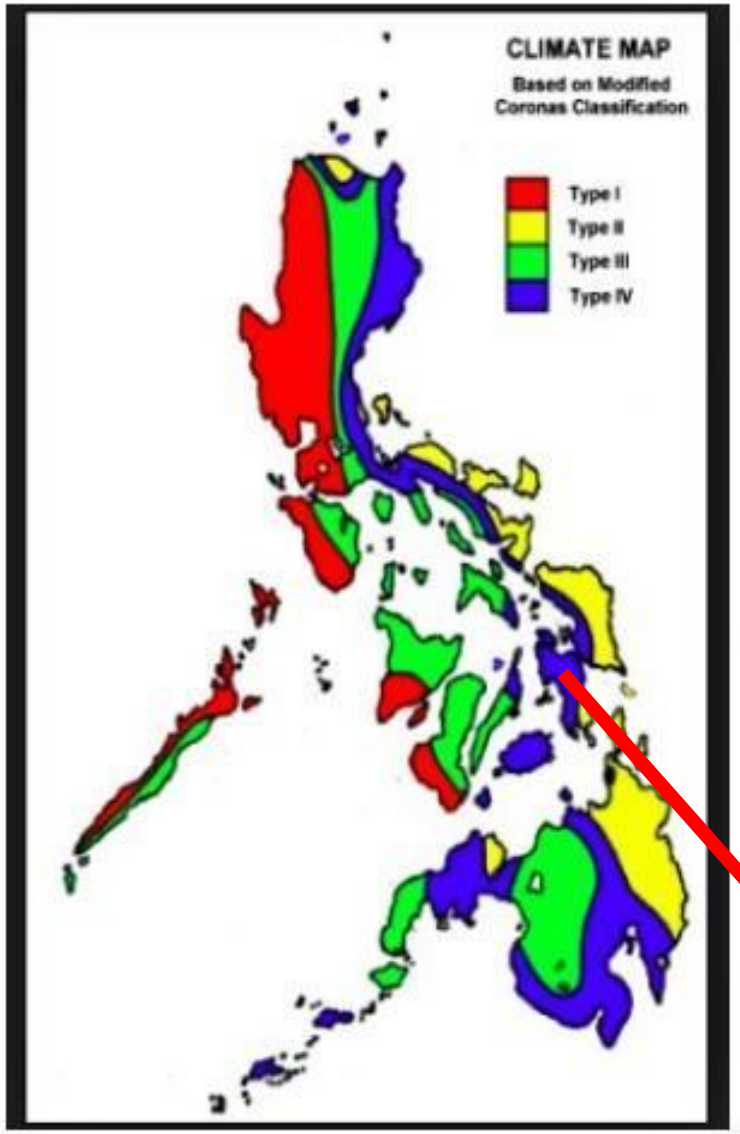
IMPORTANCE OF TRANSECT

- This is vital in assessing the best cropping systems, cropping pattern, suitable crops, livestock and other resources in order to map out the best cropping systems that are adaptable and can mitigate climate change, and apparently sustainable and resilient to the problems brought by unexpected environmental maladies due to CLIMATE CHANGE.

IMPORTANCE OF TRANSECT

- Physical features
- Locally evolved technologies and management systems
- Crops and Agriculture
- Local vegetation
- Micro environment
- Problems and opportunities
- Household and economic activities

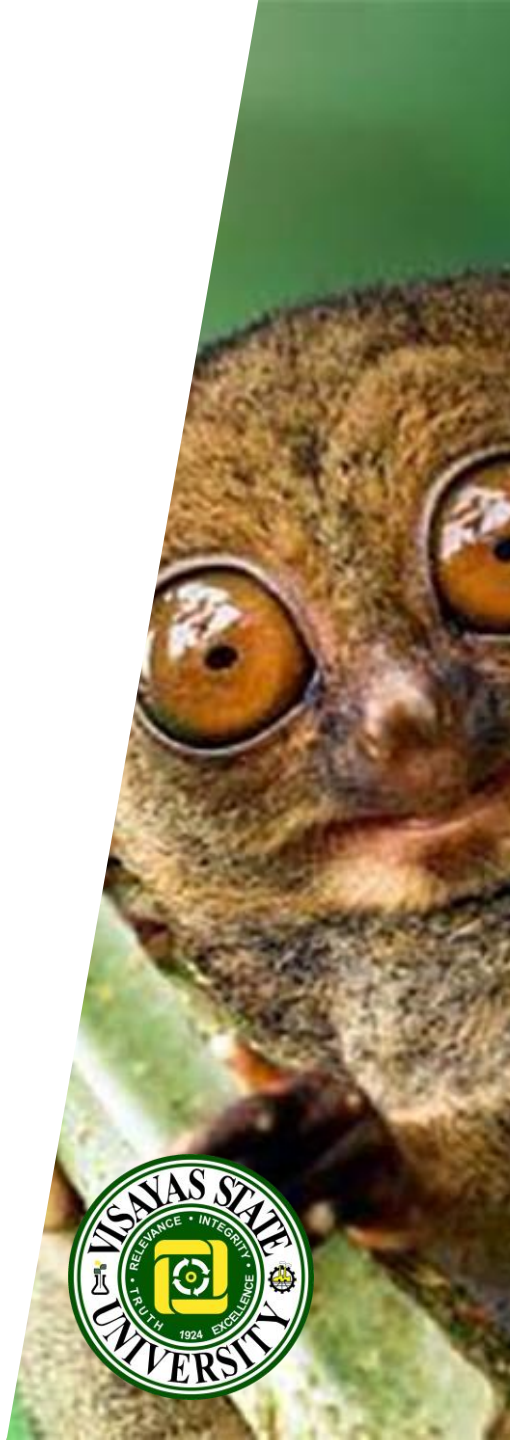
Transect Results



Type	Dry Season	Wet Season
I	November - April	Rest of the year
II	No dry season	Maximum rain period from December to February; Minimum rainfall during the period from March to May
III	Short dry season either during the period from December to February or from March to May	No very pronounced maximum rain period
IV	No dry season	Rainfall evenly distributed throughout the year

BOHOL

- 1st provincial income class island province in Central Visayas Region
- divided into 3 congressional districts, comprising 1 component city and 47 municipalities
- land area of 4,821 sq km and coastline of 261 km (162 mi) long
- 10th largest island of the Philippines
- agricultural products include rice, corn, coconut, mango and poultry



BOHOL

- known for coral reefs and unusual geological formations – the Chocolate Hills
- Presence of Philippine Tarsier, an indigenous primates
- the terrain is basically rolling and hilly and about half of the island is covered in limestone
- inner areas of the island are low mountain ranges, the interior is large plateau with irregular landforms
- has 114 springs, 172 creeks and 4 main rivers: Inabanga River, Loboc River, Abatan River, Ipil River

BOHOL: Climate

- November to April - northeast monsoon (Amihan) prevails. Except for a rare shower, this is the mildest time of the year. Daytime temperatures average 28 °C (82 °F), cooling at night to around 25 °C (77 °F)
- August to October -the southwest monsoon (Habagat) The weather during this season is not very predictable, with weeks of calm weather alternating with rainy days

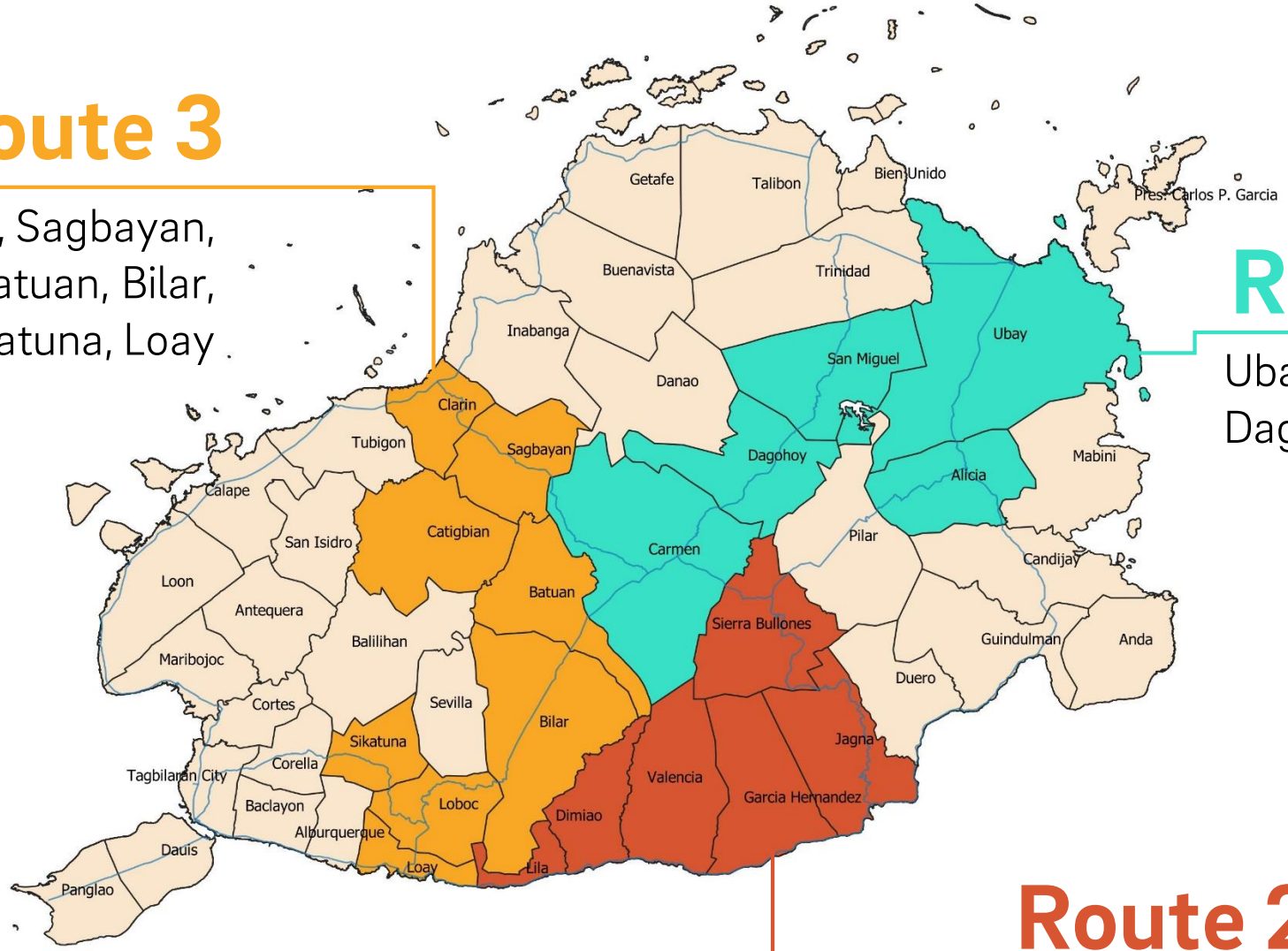
CLIMATE OF BOHOL

- Has a type 4 climate
- There is no distinct dry season but the heavy wet season generally occurs in December.
- Bohol has a combination of warm and cool climatic zones, thus the prevailing climate is ideal for the cultivation of a wide range of agricultural crops.

Bohol Transect Routes

Route 3

Clarin, Sagbayan, Catigbian, Batuan, Bilar, Loboc, Sikatuna, Loay

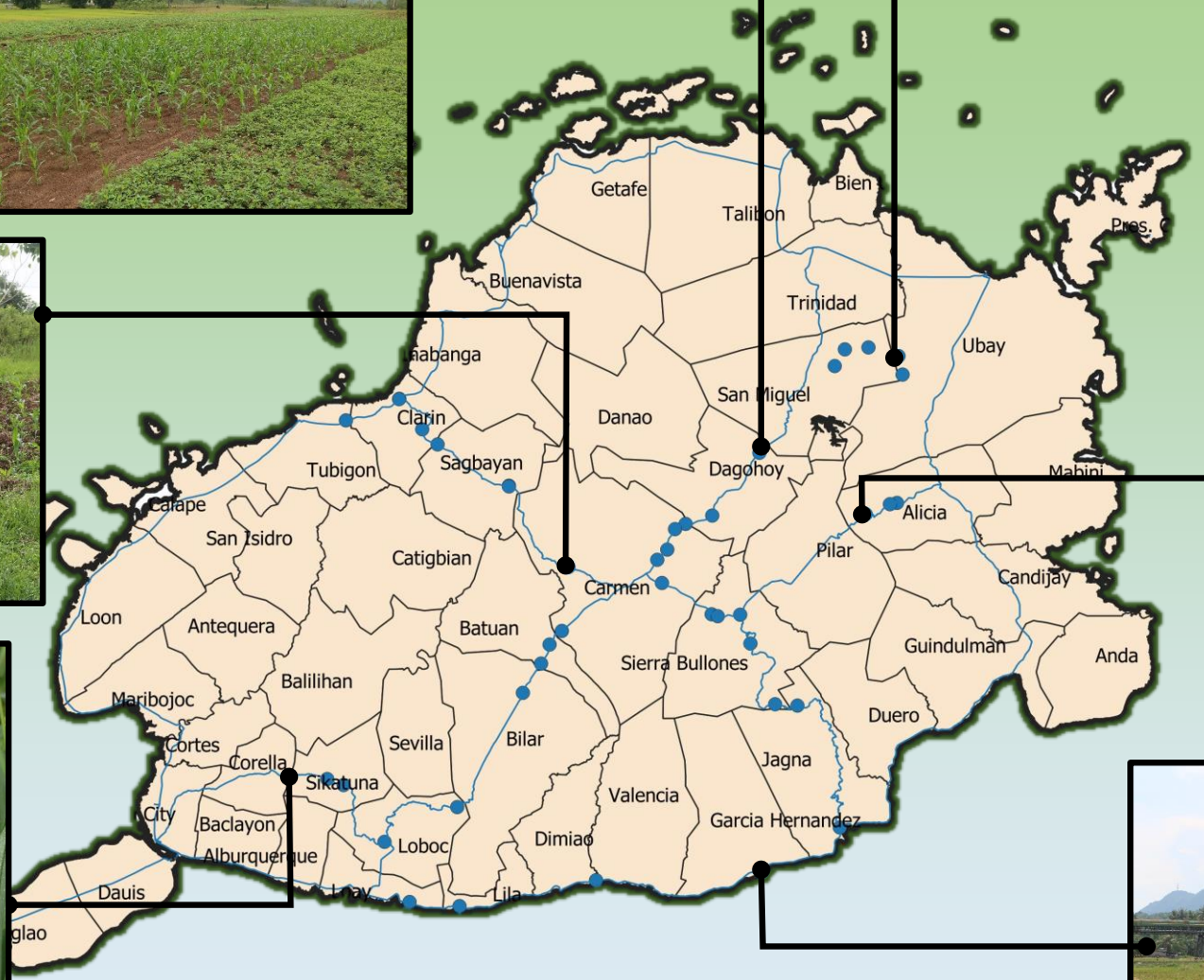


Route 1

Ubay, Alicia, San Miguel, Dagohoy, Carmen

Route 2

Lila, Dimiao, Valencia, Garcia Hernandez, Jagna, Sierra Bullones



Bohol Sampling Points

Soil Type	clay, loam	clay, sandy clay loam, clay loam	clay, sandy clay loam, clay loam	clay, clay loam	clay, clay loam
Cropping Systems	intercropping, multiple cropping	monocropping	crop rotation, sole cropping, sequential cropping	multi-storey, alley, multiple cropping	multi-storey, multiple cropping
Dominant Crops	coconut, banana, fruitcrops, palm oil, corn	rice	rice, corn, legumes, rootcrops	coconut, banana, corn, fruitcrops, forest/timber trees, palm oil	forest/timber trees, coconut, palm oil
Weeds	grasses, sedges, broadleaves	grasses, sedges	grasses, sedges, broadleaves		broadleaves, grasses
Animals	carabao, cattle, chicken	carabao, cattle, chicken			chicken
Constraints	poor soil nutrients, limited moisture (severe during dry period)	poor soil nutrients, flooding, limited irrigation water		unproductive hills, degraded soil, acidic, soil erosion, limited soil moisture	soil erosion, prone to landslide

Route 1

Upland Plain **Irrigated Lowland** **Rainfed Lowland** **Hillyland** **Mountainous**

Soil Type	loam, clay loam		clay loam	clay, clay loam, calcareous	calcareous soil
Cropping Systems	alley, mixed, multiple cropping	monocropping	sole, crop rotation	alley, multiple, multi-storey	multi-storey, multiple cropping
Dominant Crops	coconut, banana, fruitcrops, corn, vegetables	rice	rice, rootcrops, corn, vegetables	coconut, banana, corn, fruitcrops, rootcrops, legumes, forest trees	forest/timber trees, vegetables, ornamentals
Weeds	grasses, sedges, broadleaves				grasses, broadleaves
Animals	cattle, carabao, hogs, chicken	carabao, cattle, chicken		carabao, cattle, goat	chicken
Constraints	limited soil moisture	flooding, flashflood, siltation	Limited irrigation water	limited soil moisture, soil erosion, landslide	soil erosion and landslide

Route 2

Upland **Irrigated Lowland** **Rainfed Lowland** **Hillyland** **Mountainous**

Soil Type	clay, clay loam			clay	
Cropping Systems	mixed cropping	monocropping	crop rotation, sole cropping	multi-storey, multiple, strip cropping	multi-storey, mixed cropping
Dominant Crops	coconut, banana, vegetables, melon, rootcrops	rice	rice, corn, vegetables, rootcrops	coconut, banana, corn, vegetables, fruitcrops	forest/timber trees, coconut, banana, fruitcrops
Weeds	grasses, broadleaves	grasses			
Animals	carabao, cattle, hogs, chicken			cattle, goats, chicken	chicken
Constraints	limited soil moisture	limited irrigation water, flooding	limited water supply	unproductive hills, oil erosion, limited soil moisture	soil erosion, poor nutrients, shallow topsoil

Route 3

Upland **Irrigated Lowland** **Rainfed Lowland** **Hillyland** **Mountainous**

Soil Type & Analysis

Soil Analysis Result: Bohol

Municipalities	pH	%OM	P(ppm)	K(ppm)
San Miguel	4.6	Medium High-Moderately High	Low	Low-Sufficient
Ubay	4.8	Moderately Low-Medium High	Moderately low	Sufficient
Dagohoy	5.7	High-Very High	Low	Low-Sufficient
Carmen	5.8	Medium High-Very High	Low-Moderately low	Sufficient
Alicia	6.1	High-Very High	Moderately low	Sufficient
Sierra Bullones	6.6	Medium High-Very High	Low-Moderately high	Low-Sufficient

Soil Analysis Result: Bohol

Municipalities	pH	%OM	P(ppm)	K(ppm)
Garcia Hernandez	7.1	Medium High	Moderately high	Sufficient
Dimiao	7.2	Medium High	Moderately high	Sufficient
Sikatuna	7.2	Very High	Low	Sufficient
Tubigon	7.2	Medium High	Moderately high	Sufficient

Soil Analysis Result: Bohol

Municipalities	pH	%OM	P(ppm)	K(ppm)
Clarin	7.5	Medium High-Very High	Low-Moderately low	Low-Sufficient
Batuan	7.6	High-Moderately High	Low-Moderately low	Sufficient
Bilar	7.6	Very High	Low	Sufficient
Jagna	7.6	High-Very High	Low-Moderately low	Sufficient
Lila	7.6	Medium Low	Moderately high	Sufficient
Loay	7.6	Medium	High	Sufficient
Loboc	7.6	High-Very High	Moderately low-Moderately high	Low-Sufficient
Sagbayan	7.6	High-Medium High	Low-Moderately high	Low-Sufficient

Soil Analysis – Interpretation and Mitigating Measures

Soil Type	Interpretation of Results of Analysis	Mitigation Measures
Clay	Slightly acidic which hampered Phosphorus utilization	Apply organic materials/fertilizers to increase pH and improved Phosphorus utilization
Calcareous	Strongly alkaline which hinder translocation of Phosphorus	Apply inorganic fertilizer to neutralize its alkalinity Planting of deep-rooted and shallow-rooted agronomic and horticultural crops thru crop rotation is encouraged Planting of peanut in alkaline soil is recommended
Sandy clay	Presence of limited nutrients (N & K) and slightly acidic which hinder utilization of P Low N due to leaching (downward movement of nutrient)	Apply organic materials/fertilizers to increase pH Adopt crop rotation using deep-rooted and shallow-rooted crops to maximize utilization of soil nutrients and minimize leaching Ex. Planting of rootcrops (deep-rooted), vegetables (shallow-rooted) in rotation Planting of legumes as soil builders in enhancing soil fertility

AGRICULTURAL PROBLEMS OF BOHOL PROVINCE

AGRICULTURAL PROBLEMS

- Drought
- Soil erosion
- Acidic soil
- Degraded soil

OTHER STRATEGIES

- Increase and rationalize investments in irrigation development.
- Increase adoption and sustainable application of modern farming in the three provinces
- Promote farm mechanization in Bohol.
- Increase availability and adoption of quality production inputs
- Ensure mechanisms for easier access to finance
- Promote diversified and integrated farming systems
- Adopt adaptable cultural management practices

CONCLUSION

- Dominant Crops:

- Bohol: rice,corn, coconut, banana, mango and palm oil.

CONCLUSION

- Environmental Problems:

- Bohol: Limited irrigation water & soil moisture, soil acidity, unproductive uplands and hillylands

CONCLUSION

- The dominant livestock are carabao, cattle, goat, hogs and chicken
- Common problems are soil erosion, deforestation, soil degradation, lack of irrigation water, pests & diseases, and peace and order situation.
- Possible solutions are Reforestation/Agroforestry, SALT, Palayamanan, use of HYV and pest resistant varieties, multi-storey cropping, organic farming, crop rotation/switching, planting of peanut in alkaline soils, & application of ammonia fertilizer in highly alkaline soils.

CSA Technologies & Recommendations

HAZARDS	Traditional Practice
Soil Erosion	Conventional farming techniques
Flooding/ Drought/ Typhoon	Mulching

Soil conservation technologies (contour farming (SALT) minimum tillage)

Reforestation/Agro-forestry

Adaptive crop calendar

Crop switching/rotation/

Farm Diversification (Integrated)

Crop Diversification (Multi-storey)

Alley cropping – wind break

Climate resilient varieties (submergence, drought, and heat tolerant, early maturing and good eating quality)

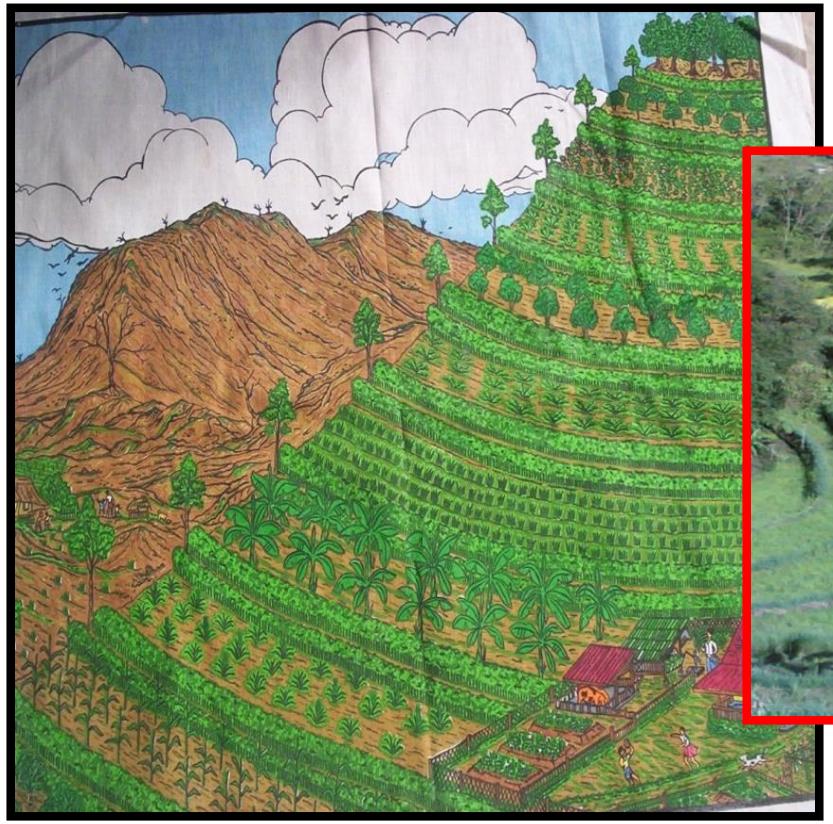
CSA Strategies in Increasing Crop Productivity to Combat Climate Change

- Climate Smart Agriculture (CSA) Practices (Corn-Peanut Rotation, Protected Veg. Cultivation, Cereal/Rootcrop + Legume Intercropping etc.)
- Sustainable Agriculture
- Agri-tourism
- Crop-Animal Integration (Cattle and goats)
- Agroforesry
- SALT – Sloping Agriculture Land Technology (Terracing, Hedgerow planting – lemon grass, kakawate and horse raddish tree etc.)

Cropping Systems Strategies

Climate Smart Agriculture

Sloping Agriculture Land Technology (SALT)



Agroforestry

Daghang Salamat

TOOD NA SALAMAT SA INYONG TANAN