HUMAN-FOREST INTERACTION IN ABORLAN GUBA SYSTEM, PALAWAN ISLAND, PHILIPPINES: IMPLICATIONS FOR CONSERVATION AND MANAGEMENT

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Flow of Presentation

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- Methods
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 - Community assessment
 - Model development
- Results
- Recommendation

Background

- Aborlan Guba System
 - □ →Victoria-Anipahan mountain range
 - $\square \rightarrow$ Home of Tagbanua tribe
 - $\square \rightarrow Guba$: Old growth forest





Background

Sub-systems

- Forest ecosystem
- Human ecosystem

System boundaries

- Northwest: Talakaigan river
- Southwest: Manggango river
- West: Deep ravine
- East: Community settlement







Background



Background

 Indigenous peoples (IPs) have been utilizing the forest resources



Objectives

- To determine the floral composition in the forest ecosystem of Aborlan Guba System
- To determine the influence of some socioeconomic characteristics of the people on forest resource utilization

Objectives

- To develop a model that would predict the forest cover change by factoring both current resource utilization and more sustainable management alternatives
- To formulate a sustainable plan for the management of Aborlan Guba System

Methods

- Plant species collection: Quadrat technique (Mueller-Dombois & Ellenberg; Pacardo et al., 2000)
- Nomenclature : most recent revision in the Flora Malesiana project

Methods

Community Assessment

 \rightarrow Key Informant Interview: know the direct users of the forests

 \rightarrow Interview : randomly selected respondents (43% of the 70 households)



Methods

Data Analysis

 \rightarrow Descriptive statistics

 \rightarrow Analysis of variance (ANOVA)

→determine the effect of the socioeconomic characteristics of the respondents on the frequency of harvest of forest products

Methods

The Model

•Developed using STELLA

→ predict forest cover change : current resource utilization and with government intervention

Results: Floral Composition

324 plant species→192 genera & 89 families
 →10% of 3,000-3,500 vascular plants in Palawan
 →4% of 8,000 vascular plants in the Phil.

■ Many Rare Species
 ■ → 59.9% →3 individuals or less



Other Conservation Value

- □ 20% (66) endemic species
 - \rightarrow 9 found in Palawan (6 suspected to be undescribed and new to science)
 - $\blacksquare \rightarrow 16.5\%$ endemicity per ha
- □ 14.5% (47 species) \rightarrow threatened IUCN (2007), Fernando *et al.* (2008) and Sopsop & Buot (2009)

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Family	Taxon	Voucher No.	Exsicatta
Ebenaceae	Diospyros sp.	LBS-0027	LBS 5099 (PBDH)
Fagaceae	<i>Castanopsis</i> sp.	LBS-0313	LBS 5122 (PBDH)
	Lithocarpus sp.	LBS-0252	LBS 5123 (PBDH)
	<i>Quercus</i> sp.	LBS-0245	LBS 5127 (PBDH)
Magnoliaceae	<i>Magnolia</i> sp.	LBS-0040	LBS 5178 (PBDH)
Theaceae	<i>Gordonia</i> sp.	LBS-0217	LBS 5266 (PBDH)

New plant species recorded at Aborlan Guba System



Unidentified new species of *Diospyros*

Unidentified new species of *Castanopsis*

Unidentified new species of *Quercus*



Unidentified new species of *Magnolia*



Unidentified new species of *Gordonia*

Implications

- □ Aborlan Guba System has rich floral composition
- Significant role in Palawan and in global biodiversity
- Habitat destruction \rightarrow local extinction of rare species
 \rightarrow loss of overall biodiversity
- □ Strictest measures → prevent any degradation of the unique genetic resource

Results: Social Component

Direct users of the Forest

- → IPs (Tagbanua) and Migrants (Visayas region)
- \rightarrow Poor



Results

 \rightarrow Main source of income

- Farming
- Gathering of forest resources (rattan poles, almaciga resin, etc.)



Results

 \rightarrow Forest is the main source of herbal medicine

Family	Botanical Name	Local Name	
Menispermaceae	Arcangelisia flava	Albutra	
Araliaceae	Scefflera sp.	Parina	
Pinaceae	Pinus merkusii	Pine tree	
Lecythidaceae	Barringtonia racemosa	Putat	
Rubiaceae	Morinda citrifolia	Bangkudo	
Zingiberaceae	Zingiber sp.	Langkawas	
Lauraceae	Beilschmiedia lucidula	Kalingag	

Problems

If ailments could no longer be healed the natural way

- borrow money from middlemen
- **\square** go to forest frequently \rightarrow gather resources
- $\hfill\square$ Most of the rattan species $\to\,$ rare in the area
- **D** Most of the almaciga trees \rightarrow damaged



Socioeconomic characteristics of the respondents that influenced the frequency of harvest of almaciga resin and rattan poles in *Aborlan Guba System*

Socioeconomic Variables	Harvesting Frequently (everyday), n=19		Harvesting Less Frequent (3X a week or less), n=11	
	Mean	Std. Error	Mean	Std. Error
Annual income*	10,421.05	434.72	27,909.09	3,929.97
Family size*	8.63	0.32	4.18	0.30
Education (no. of years in school)*	2.16	0.44	7.73	0.45
Farm size (ha)*	1.29	0.16	3.77	0.44

* significant at alpha 1%

Results

Some factors believed to influence utilization of resources in the forest

→Inadequate support from the government: market and credit

→ High demand of some forest products

→ Notion that the forest is a free access: government property

Results: The Model

Some Information

- \rightarrow No. of households: 70
- \rightarrow Current population: 490
- → Population increase: 2% per year
- → Annual income: PhP 10,421-27,909
- → Forest area: c. 400 ha
- → Baseline forest cover: 385 ha
- → Forest area cleared for new farms: set to 0.3 ha per household per year
- \rightarrow Clearings due to gathering of non-wood forest products (NWFP) : set to 0.15 ha/household/year
- \rightarrow Forest protection/Reforestation effort: 1 ha per year



Results: The Model

- Projected Forest Cover of Aborlan Guba System under Current Conditions : 50-year Simulation Run
 - \rightarrow Current resource utilization
 - \rightarrow Present economic condition
 - → Increasing population of the known users of *Aborlan Guba* System forest
 - → Extent of government support in reforestation and forest protection program



A model showing the decline of forest cover in *Aborlan Guba System* as affected by some socioeconomic factors

Results

□ Forest cover continuously declines: 3 ha per year

By 2029, forest cover would be 254.31 ha

→less than the recommended forest cover (280 ha) to maintain the stability of local and global ecological function (Woodwell, 1993)

Results

Projection

→ \$ 17,172 or PhP789,912 (PhP 46 dollar-peso exchange rate) will be lost annually based on the 3 ha annual forest loss

Implication

 Current resource utilization practices were not sustainable whether viewed from genetic, ecological or socioeconomic points of view

Implication

□ Without government interventions →sustainable management and/or adoption of conservation principles:

- •The living conditions of local communities will deteriorate
- •The environment will become heavily degraded, with very serious loss of biological diversity

Scenario Building

Alternative Management Scenario of Aborlan Guba System

 \rightarrow Annual income from sale and outside source:

increased to 35,000 and 5,000, respectively

- \rightarrow Population growth rate: reduced to 1%
- → Reforestation and forest protection efforts of the government: increased to 2 ha per year



The best scenario for the management of Aborlan Guba System

Recommendations

For immediate protection of the biodiversity of *Aborlan Guba System*, the whole area must be upgraded from Controlled Use Zone to Core Zone category as the LGU of Aborlan is on the process of updating its CLUP



Map showing the *Aborlan Guba System* as under the Controlled Use Zone of the ECAN framework

Recommendations

For the long term sustainability

 \rightarrow the area be declared into a PA

Researches that would yield results on the sustainable management of the system are encouraged

Recommendations

- The LGU and other organizations should help create employment opportunities for local people
- The people must be empowered to maximize their full potentials in exploring various livelihood opportunities without depleting the forest resources
- The community's farming system practices must be strengthened to increase their income

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MAYAD NA ADLAW (GOOD DAY)