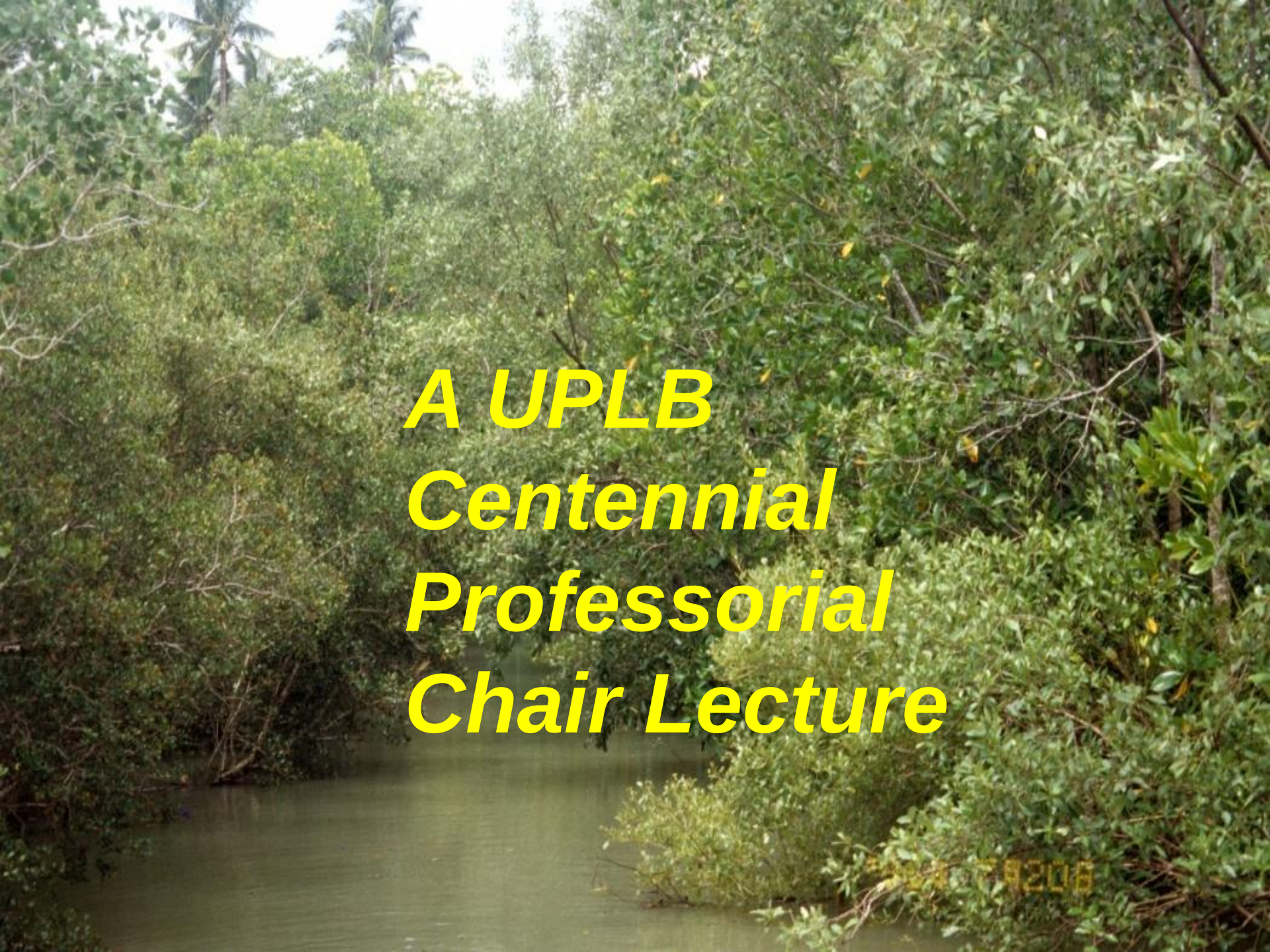

A UPLB
Centennial
Professorial
Chair Lecture

Status, Issues and Concerns of Philippine Mangrove Diversity: Rethinking the Role of UPLB in Crafting a Sustainable Management and Conservation Strategy

Inocencio E. Buot Jr., PhD
Institute of Biological Sciences
College of Arts and Sciences, UPLB

General Objective

To assess the status, current issues and pressing concerns of the Philippine mangrove ecosystems and to rethink the role of UPLB in crafting a sustainable management and conservation strategy.

Specific Objectives

1) To present an inventory of the Philippine mangrove species

2) To determine the current issues and pressing concerns of the Philippine mangrove ecosystems

3) To identify and recommend appropriate sustainable strategies in managing the Philippine mangrove resource so as to sustain the ecosystem services for the marginal populations in the surrounding communities

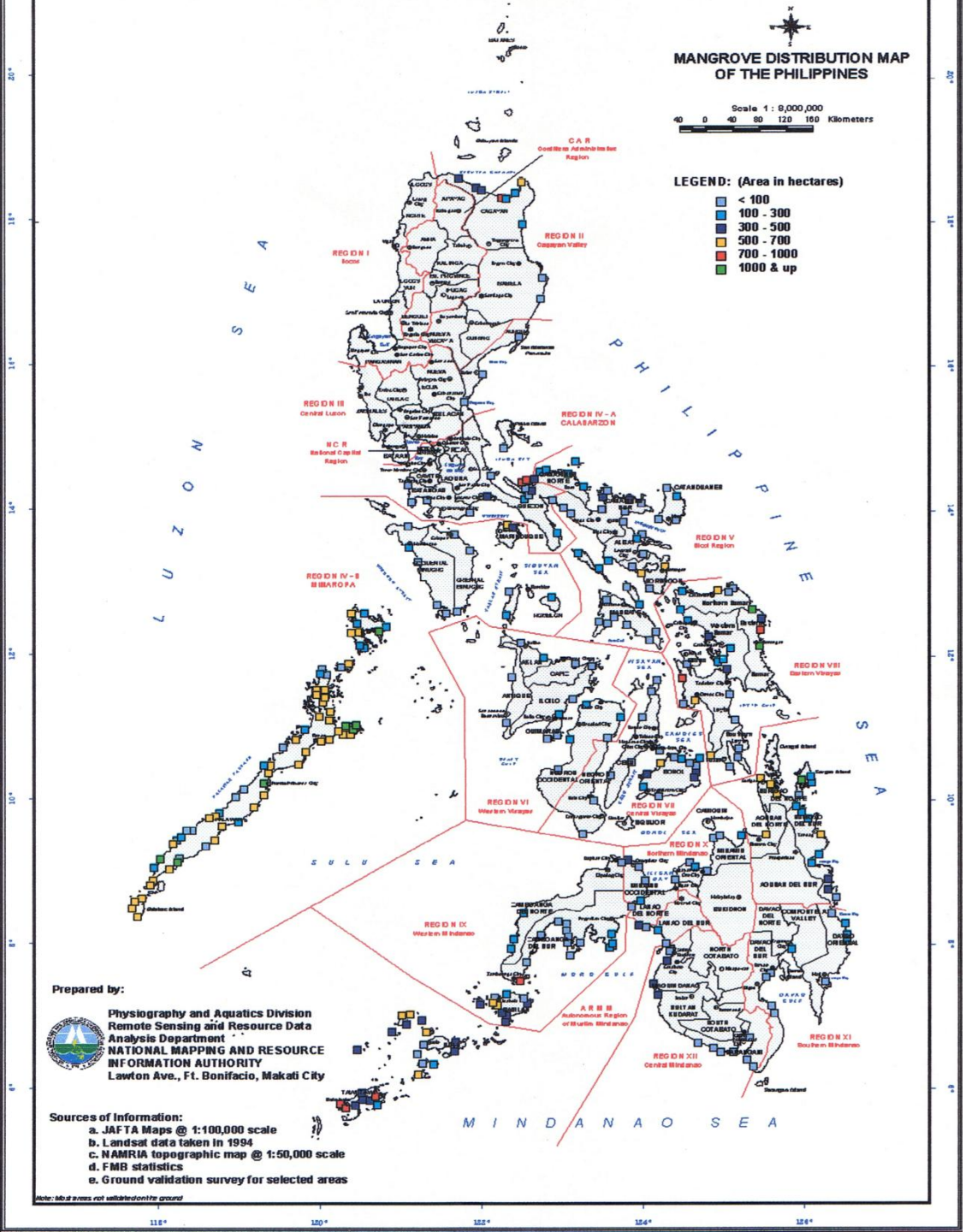
4) To rethink the role of UPLB as a national university in crafting a sustainable management and conservation strategy

INVENTORY

(Sinfuego and Buot 2008)

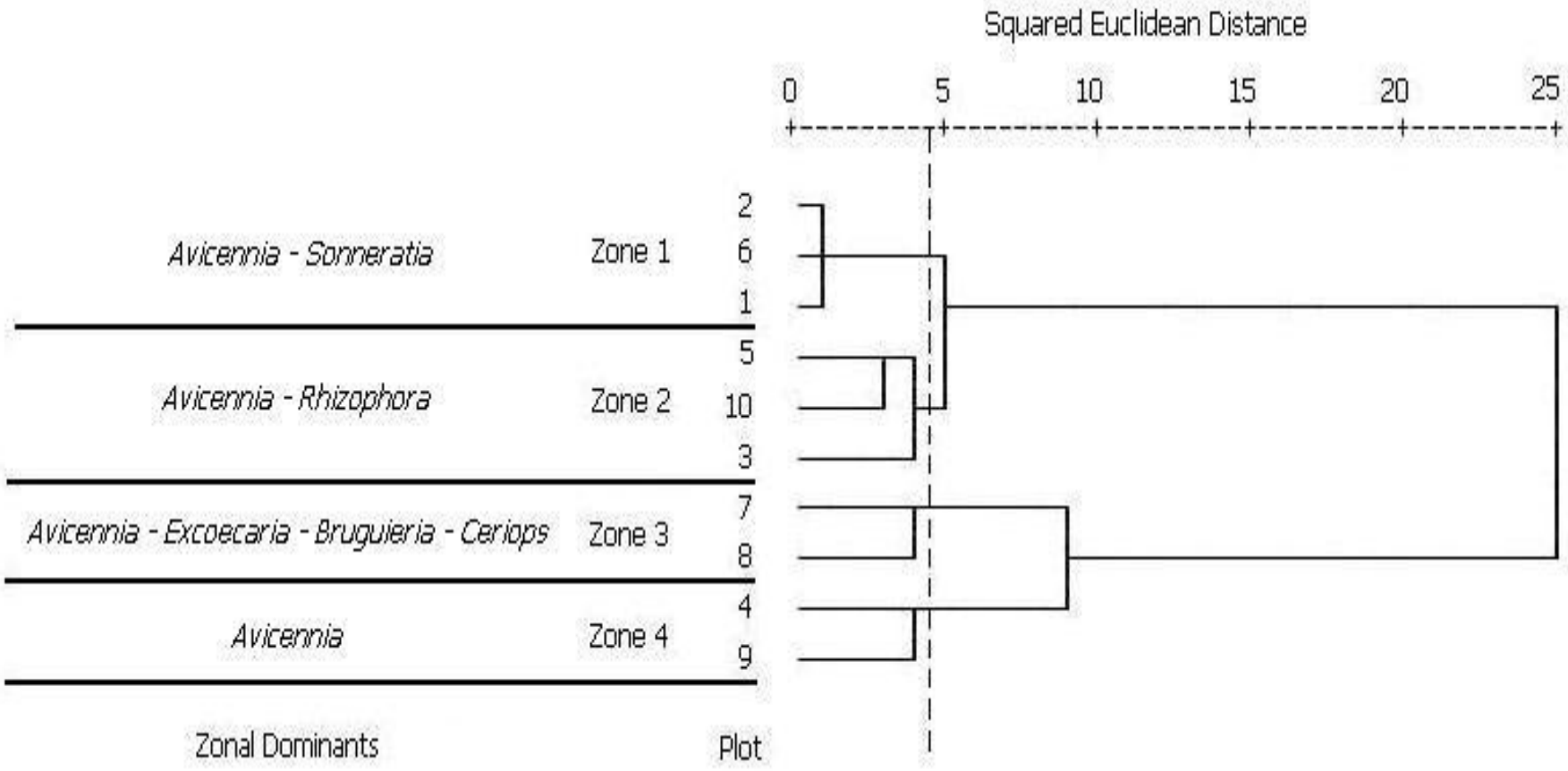
Number of species: 39
Number of genera:18
Number of families:16

Brown and Fishcher (1920), Arroyo (1979), Fernando and Pancho (1980), Tomlinson (1986), Buot (1994), Melana and Gonzales (1996), Palis et al (1997) Aragones et al (1998), Primavera (2000a, 2000b) and Primavera et al (2004).

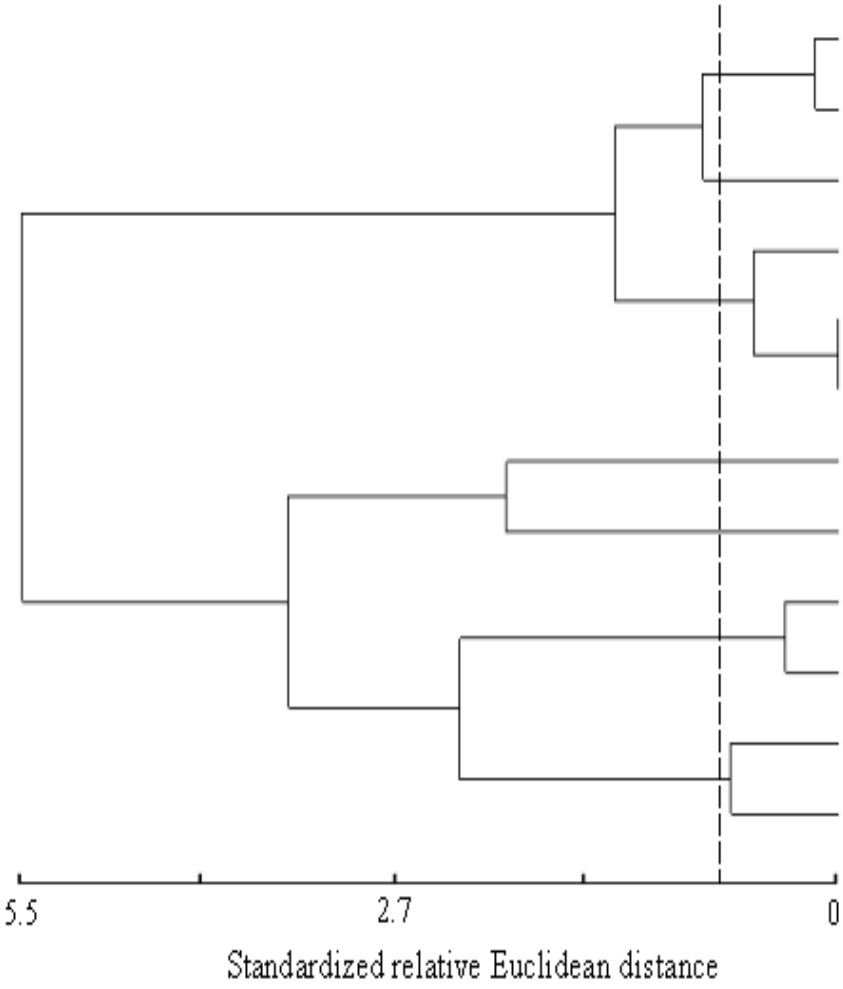


Distribution of mangroves in the Philippines

(NAMRIA (2007)



Dendogram of the ten sampling plots in Ajuy and Pedada Bays constructed by average linkage clustering (between groups) using data on species richness (S) (Sinfuego and Buot 2008).



Site	Locality	Zone	Dominant Species
1	Ngaw A	Zone VII	*Rhizophora apiculata*
12	Hadsaykaow B		
2	Ngaw B	Zone VI	*Rhizophora apiculata-Avicennia*
9	Talaynog A	Zone V	*Rhizophora apiculata-Rhizophora mucronata*
10	Talaynog B		
11	Hadsaykaow A		
3	Rachakrud A	Zone IV	*Avicennia marina*
4	Rachakrud B	Zone III	*Avicennia officinalis*
5	Bangben A	Zone II	*Rhizophora apiculata-Ceriops decandra*
6	Bangben B		
7	Banghin A	Zone I	*Rhizophora apiculata- Xylocarpus granatum*
8	Banghin B		

Dendrogram of twelve (12) sampling sites obtained by the ward's method using the standardized relative Euclidean distance. The seven (7) zones were based on relative basal area (RBA) (Doydee and Buot 2010).

Avicennia and *Rhizophora* were also found dominants in my 2 other studies in Cebu, Philippines (**Buot** 1994) and in Ca Mau, Vietnam (Tinh et al 2009).

Mangrove uses

(Buot 1994, Macintosh 1996,Macintosh et al 2002, Primavera et al 2004,)

fishery products, firewood, animal feed, medicine, food (*Nypa* fruit), wine (*Nypa*), oil, cosmetics (*Xylocarpus, Sonneratia*), pesticide (*Avicennia*), source of tungog (as dye, retardant, etc) (*Ceriops*) especially in Visayas and Mindanao, vegetable for coastal folks (*Sonneratia*), thatching materials (*Nypa*), furniture, chopsticks (*Rhizophora*)

Mangroves as names of places

Avicennia marina, A. alba (piapi)
(Piapi Beach, Dumaguete City)

Pemphis acidula (bantigi)
Bantigi, Luyang, Carmen, Cebu

Scyphiphora hydrophyllacea (nilad)
Maynilad, now Manila

Sonneratia (pedada)
Pedada, Iloilo

Current issues and pressing concerns in mangroves

Mangrove issues and concerns

1. Massive land conversion and overutilization
2. Dwindling ecosystem services in the mangrove forests
3. Implementation of Philippine mangrove legislation
4. Mangrove conservation and rehabilitation

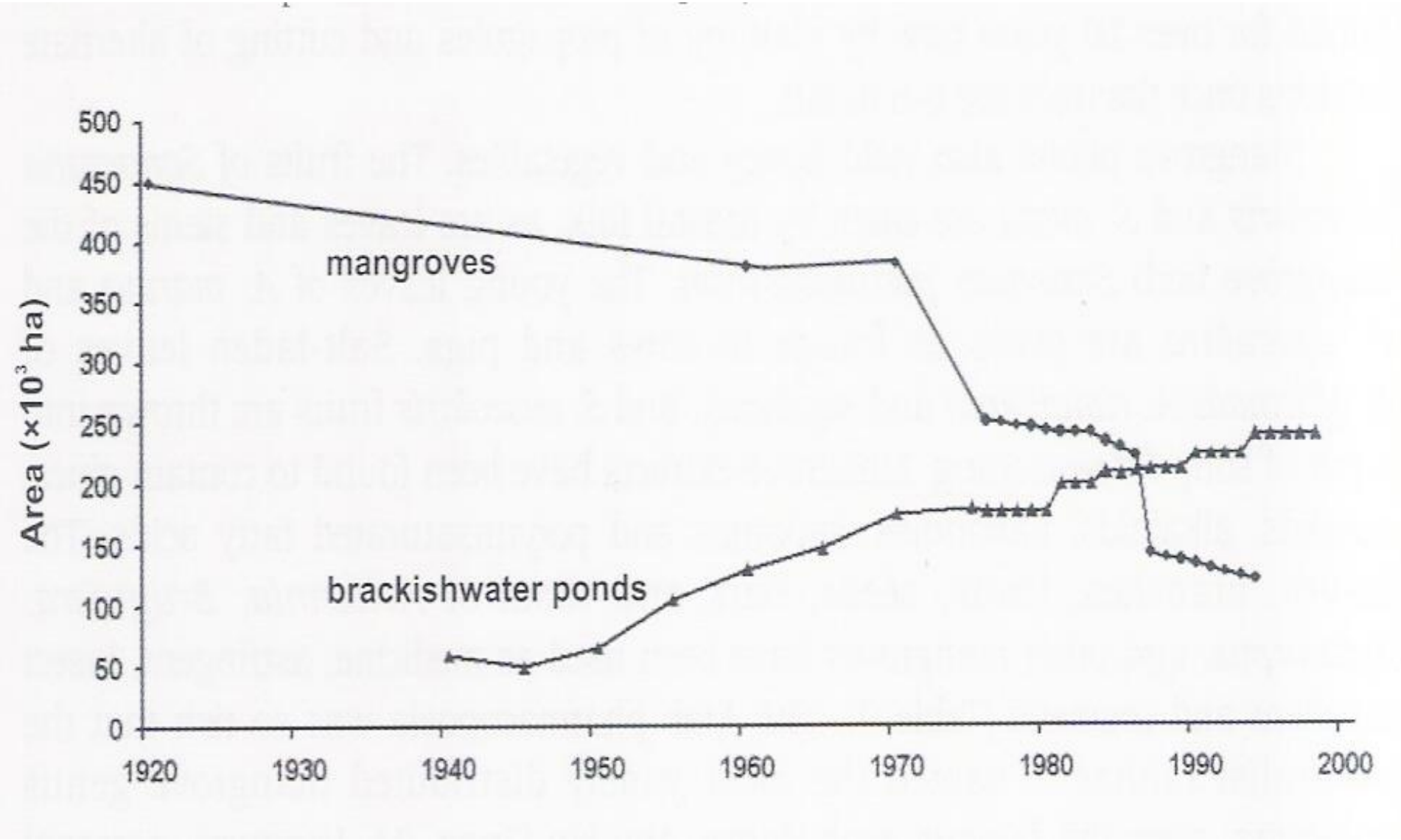
History of decline of mangrove forests in the Philippines

(Primavera et al 2004)

1900 (500,000 ha)

1988 (139,000)

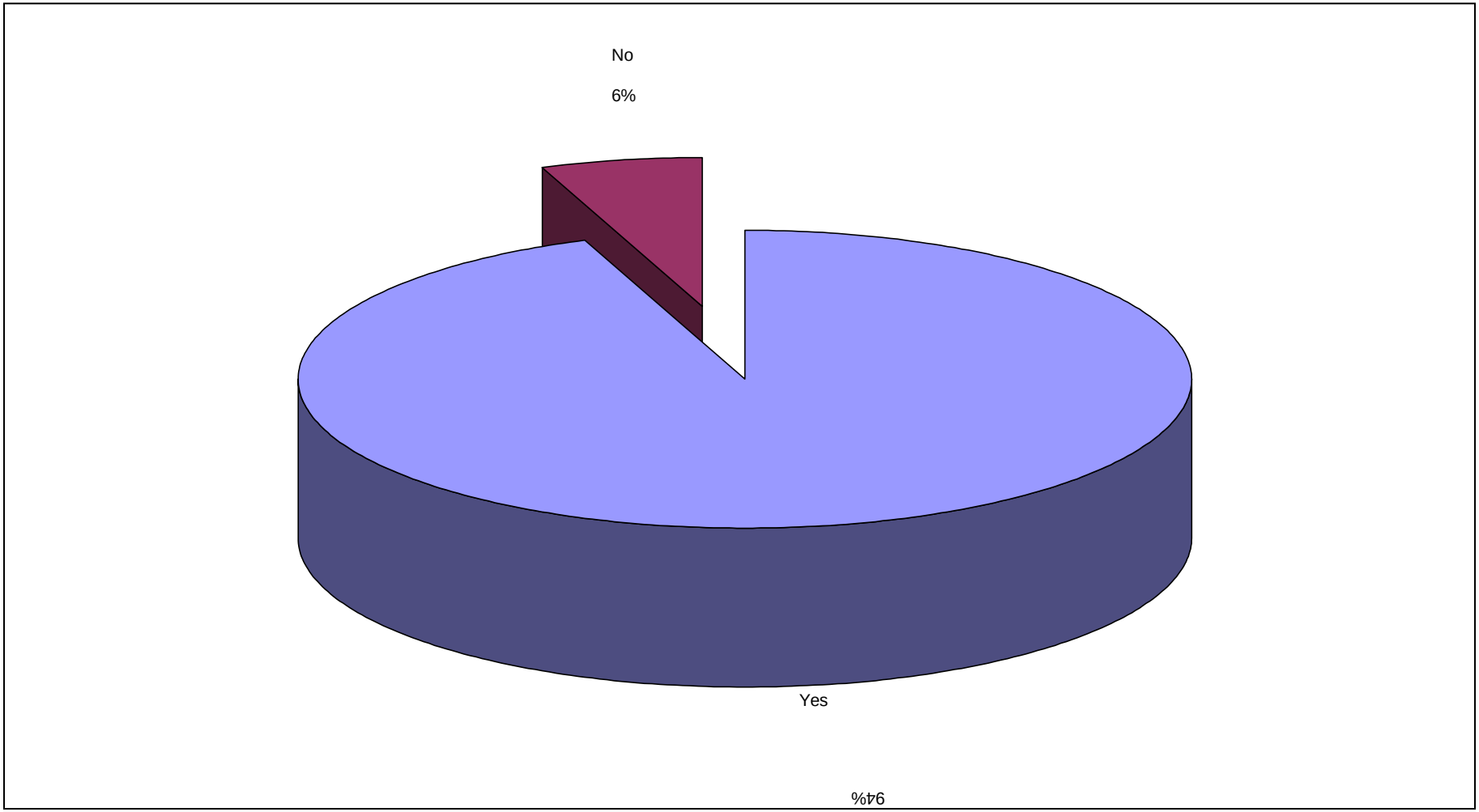
DENR 1998



Fish culture as the major factor causing decline in mangrove hectarage (Primavera 2000a).

Other causes of the decline of mangrove forest

Urbanization (Thailand, Phil)
Development of shrimp farms (Thailand)
Increasing population (Vietnam, Phil)
Development of fishponds (Phil)
Payment of taxes by residents (Phil)



The proportion of the respondents' knowledge on the benefits provided by the mangrove ecosystem (Sinfuego and Buot 2010).

Other functions of the mangroves as perceived by the respondents:
(Sinfuego and Buot 2010)

Breeding ground
Erosion control
Habitat/ shelter
Protection
Source of fry/propagule

The versatility of the mangrove ecosystem in terms of uses, somehow led to the overutilization and hence, decline of the resource

Rethinking the role of UPLB as a national university in crafting sustainable management and conservation strategy in Philippine mangrove ecosystems

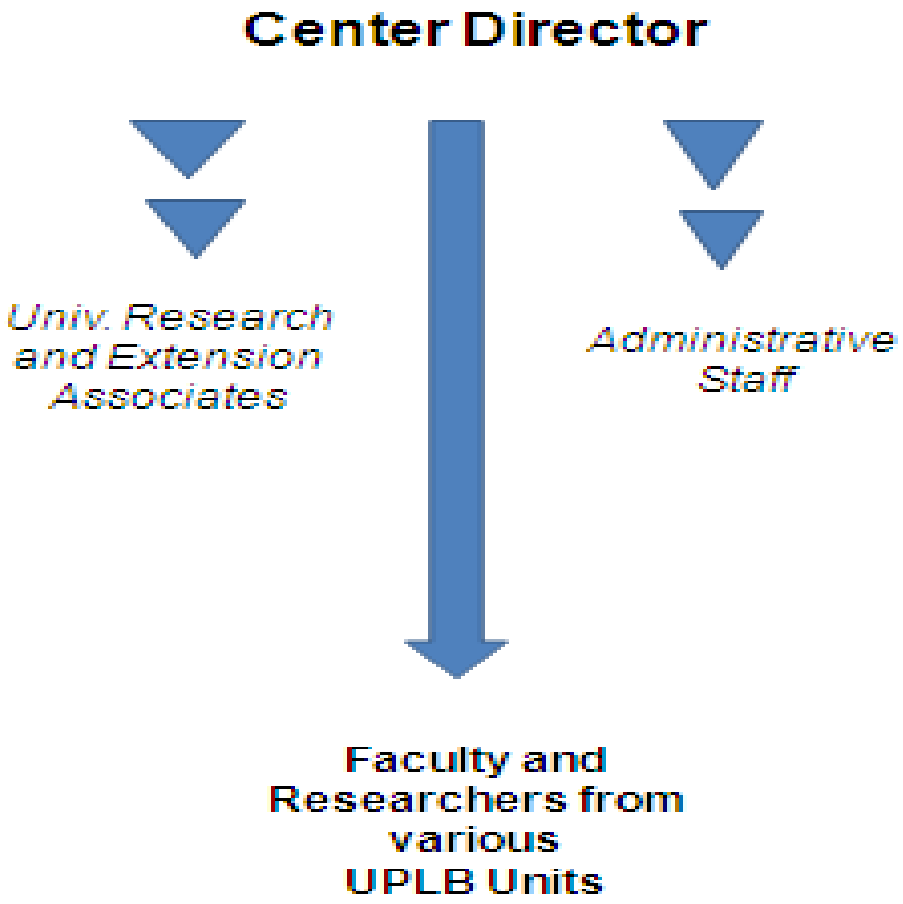
Establishment of UPLB Estuary Research and Training Center (ERTC)

1. formulate science-based sustainable management and conservation strategy for mangrove species and ecosystem

2. prevent species and ecosystem from becoming at risk

3. monitor and maintain the diversity of native mangrove species and habitat types and prevent encroachment of invasive organisms

4. produce appropriate IEC materials and conduct regular IEC activities including training of researchers, technicians, teachers, LGUs and community purok leaders, youths and kids



The proposed organizational structure of the UPLB Estuary Research and Training Center.

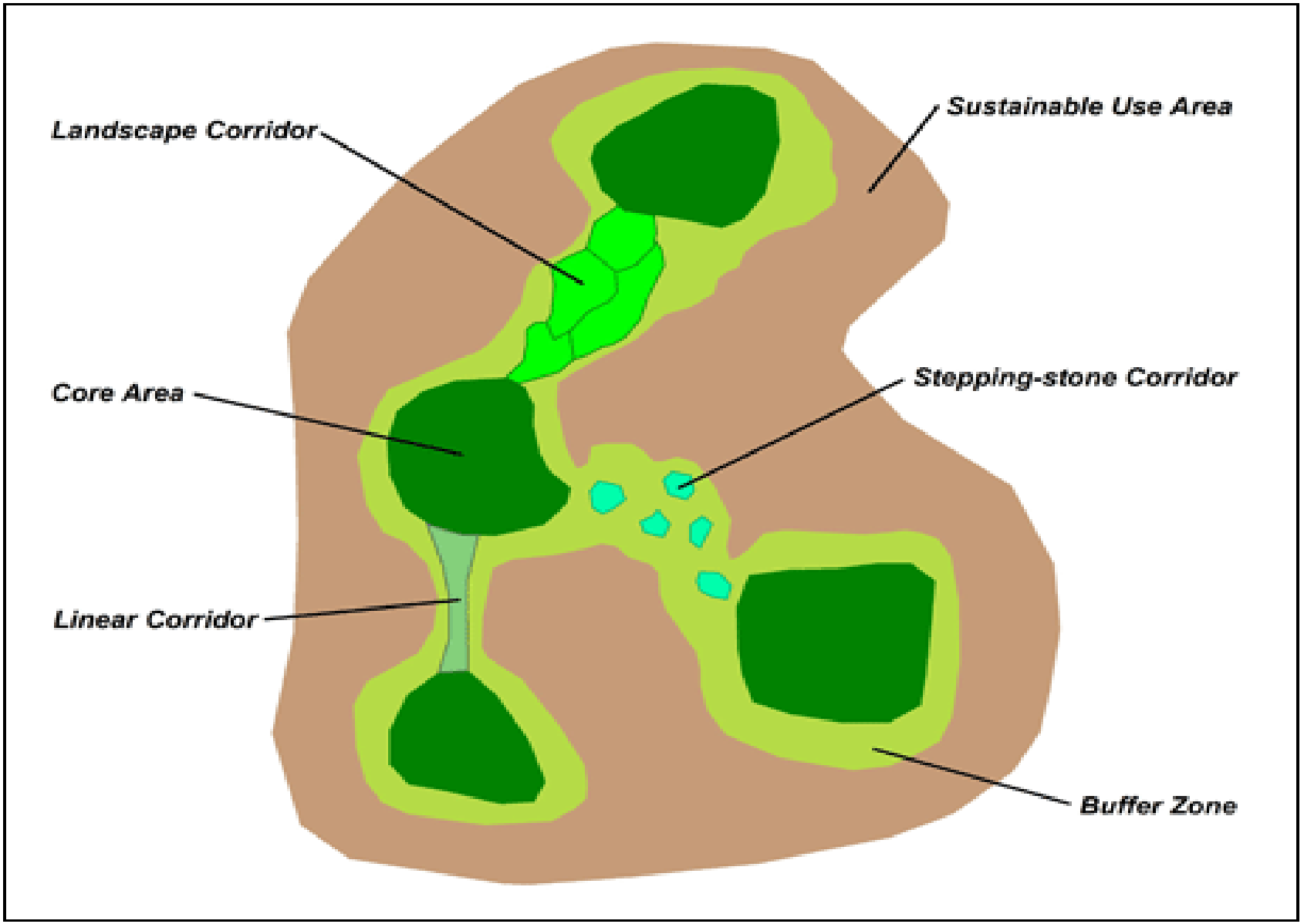
To fulfill its function, the UPLB Estuary Research and Training Center will have to conduct rigorous research, determined to develop an ***empirically-based sustainable management strategy***

Lending technical expertise in spearheading rehabilitation work

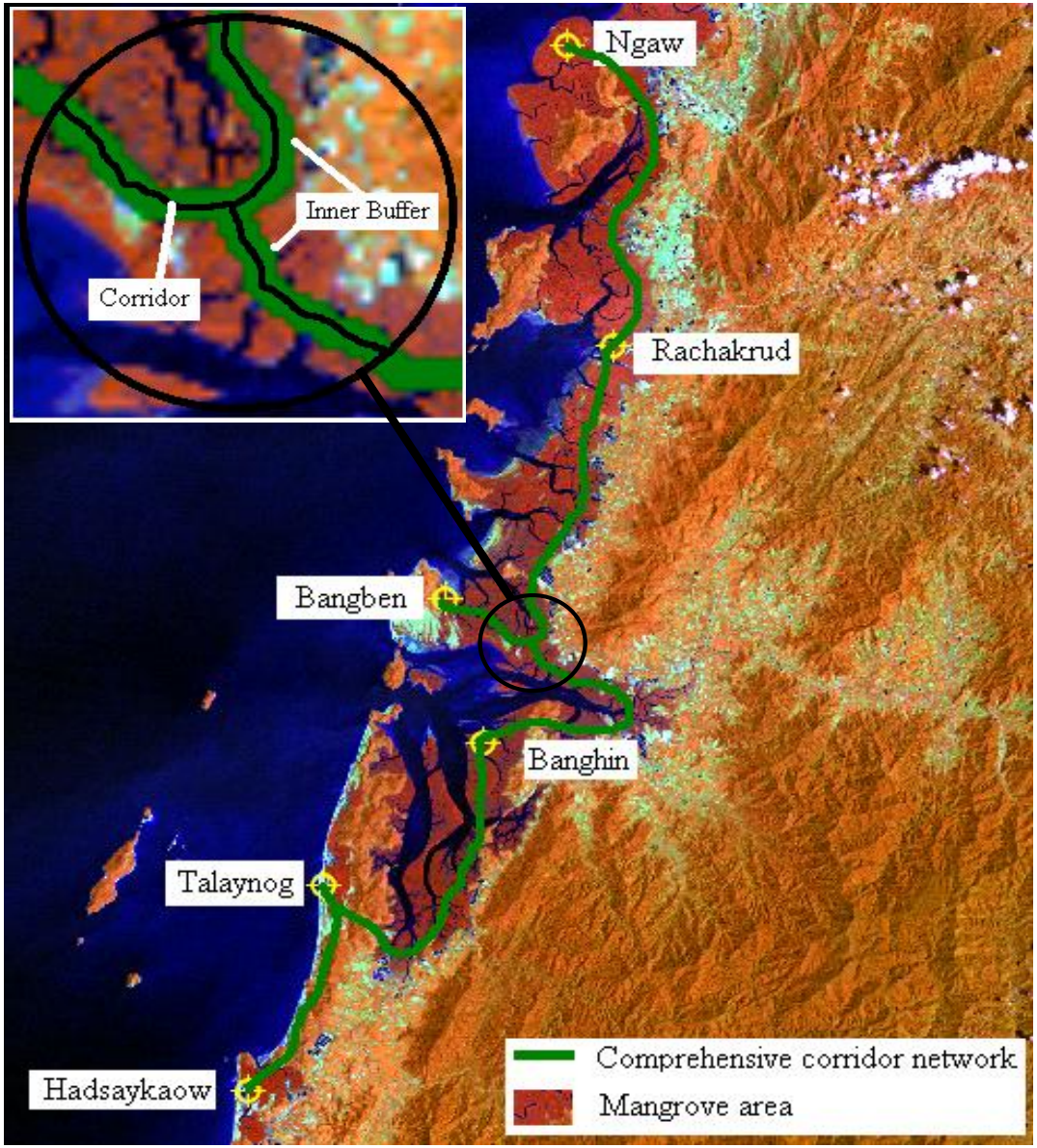
.Constructing biodiversity corridors
.Choosing the right reforestation species

The mangrove landscape is presently terribly fragmented

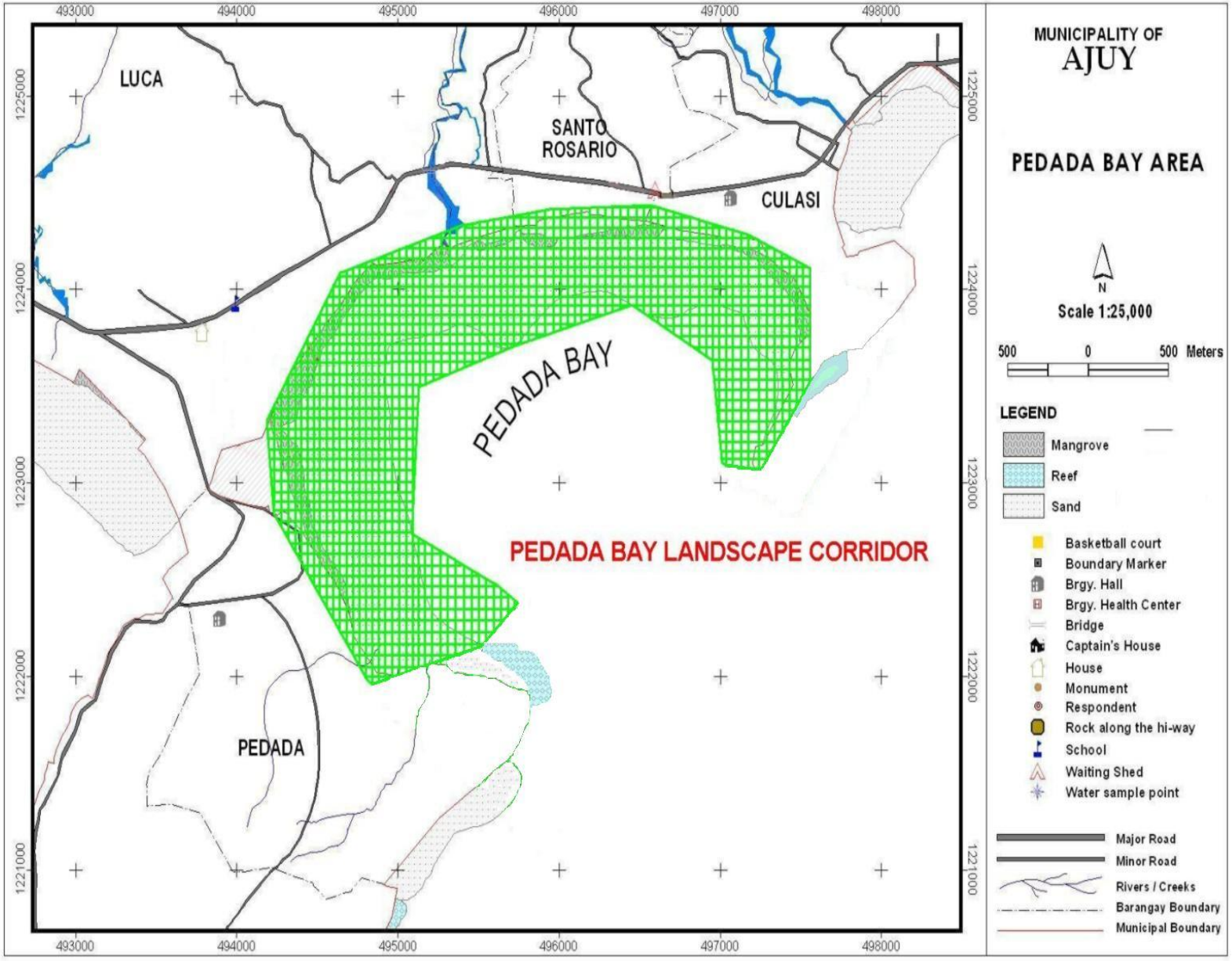
corridor is necessary…!



Types of biodiversity corridors (after ADB 2007).



Corridor network in Ranong, Thailand (Doydee and Buot 2010).



Landscape corridor proposed in Pedada Bay, Iloilo.

Choosing appropriate reforestation species for planting in the corridor

Mangroves have specific habitat/zonal and ecological preferences (Buot 1994, Primavera et al 2004, Sinfuego and Buot 2010, Doydee and Buot 2008, 2010)

Best in low intertidal zones (*Rhizophora apiculata* and sister species)

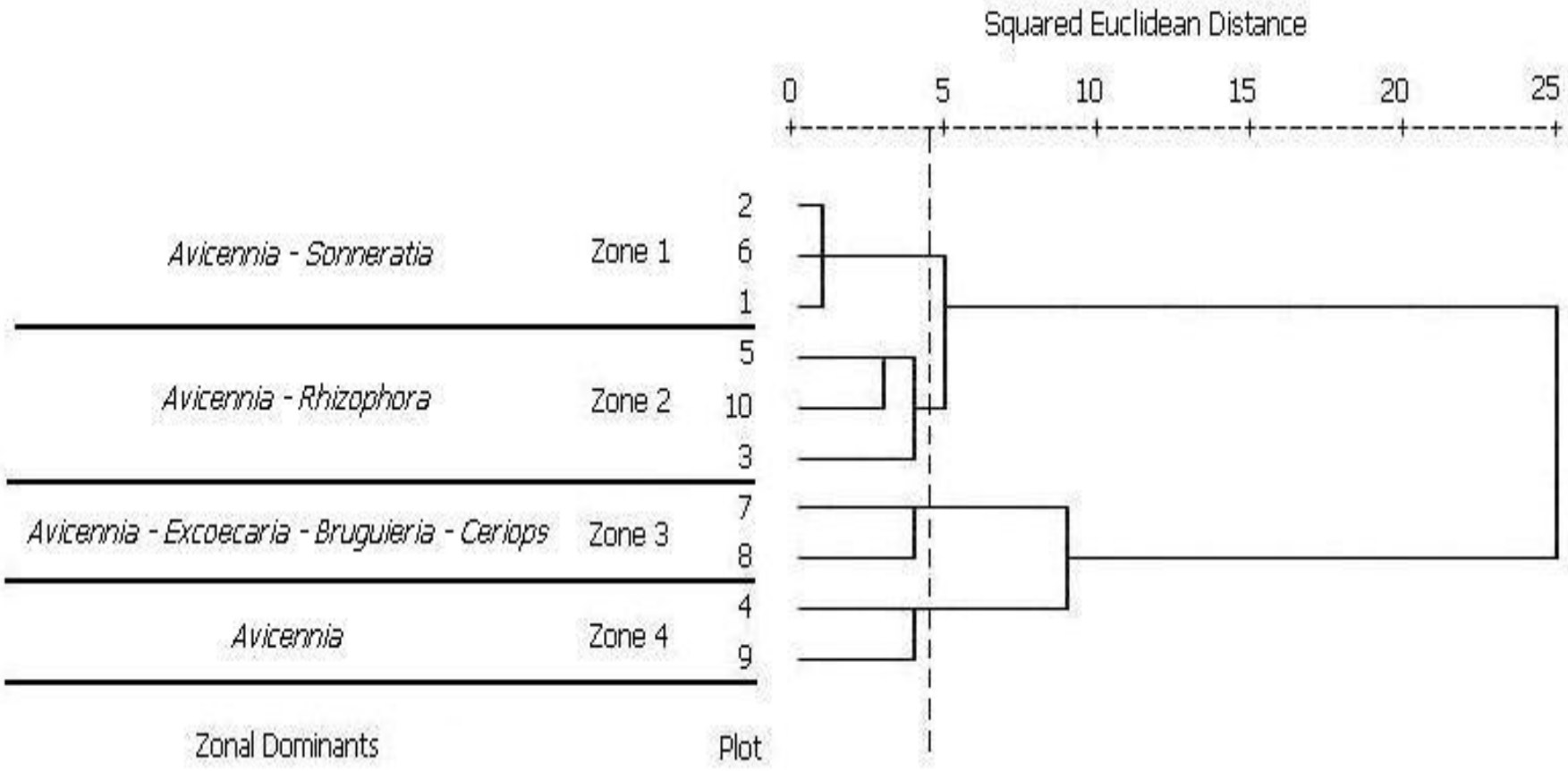
Others prefer mid- to high intertidal (*Bruguiera cylindrica* and *Ceriops decandra*) or upper intertidal zones (*Xylocarpus*, *Lumnitzera*, etc)

***Avicennia* dominated zone**

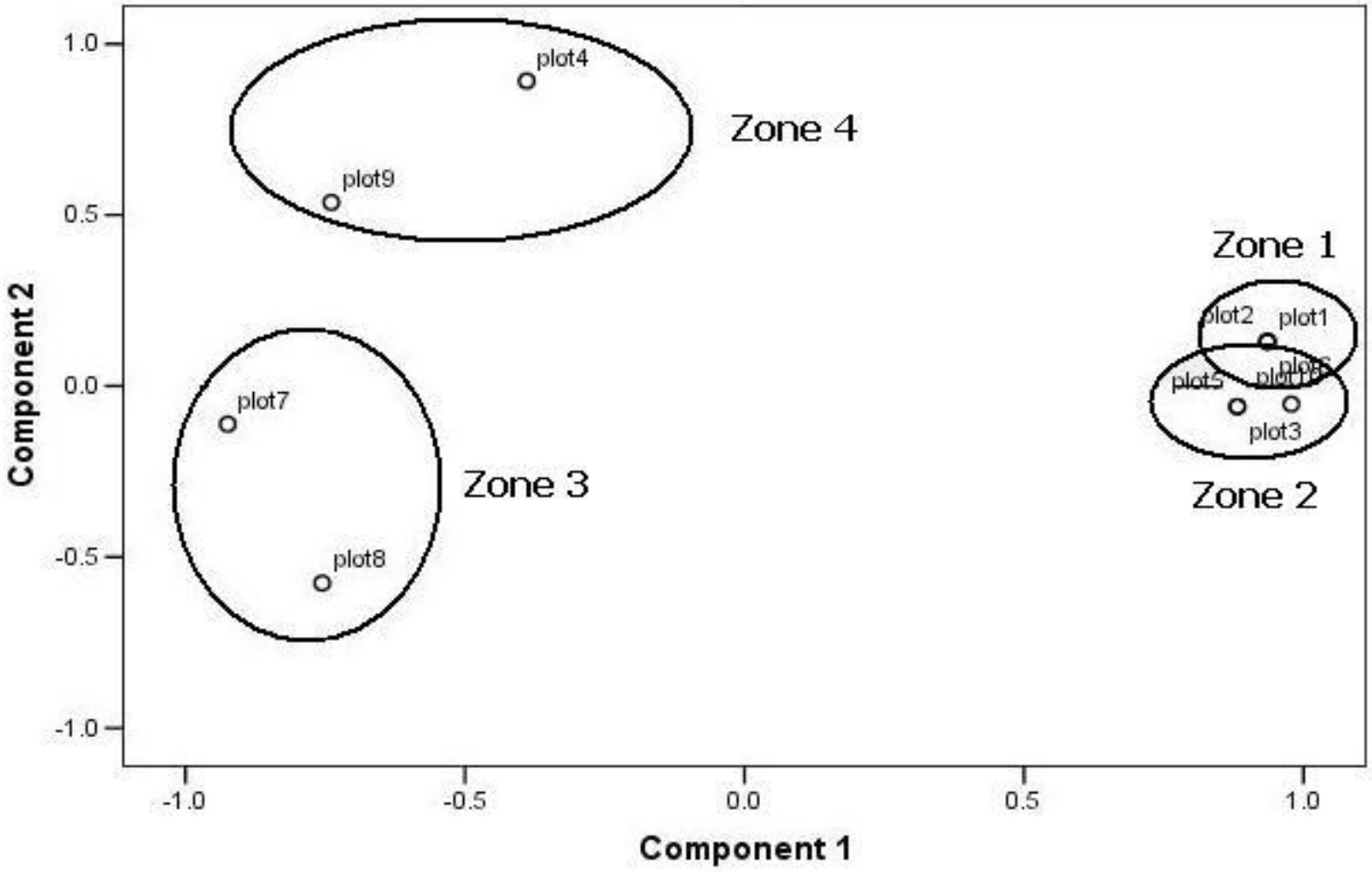
Rhizophora zone

Choosing the right species is a must.

UPLB ERTC should come in…



Review cluster analysis data before decision making



Or look for associations as revealed in Ordination Analysis as a guide

Corridor establishment will be a total failure if the right species is not taken into account. **UPLB ERTC can be of big help here.**

Enjoining LGUs in implementing policies geared towards sustainable mangrove ecosystem conservation and management

In Vietnam, policy on zoning in Ca Mau Cape National Park (Decision No.116/QD-TTG) **is strictly and satisfactorily implemented**

Protected zone… *no habitation*

Buffer zone… *sustainable shrimp farming in between 2-3 rows of mangrove trees*

Economic zone… *intensive shrimp farming allowed*

Instruments used to implement these policies include:

land allocation, low interest loan, infrastructure, provision for training, and distribution of free mangrove tree seedlings.

Some Philippine laws/policies concerning the mangroves

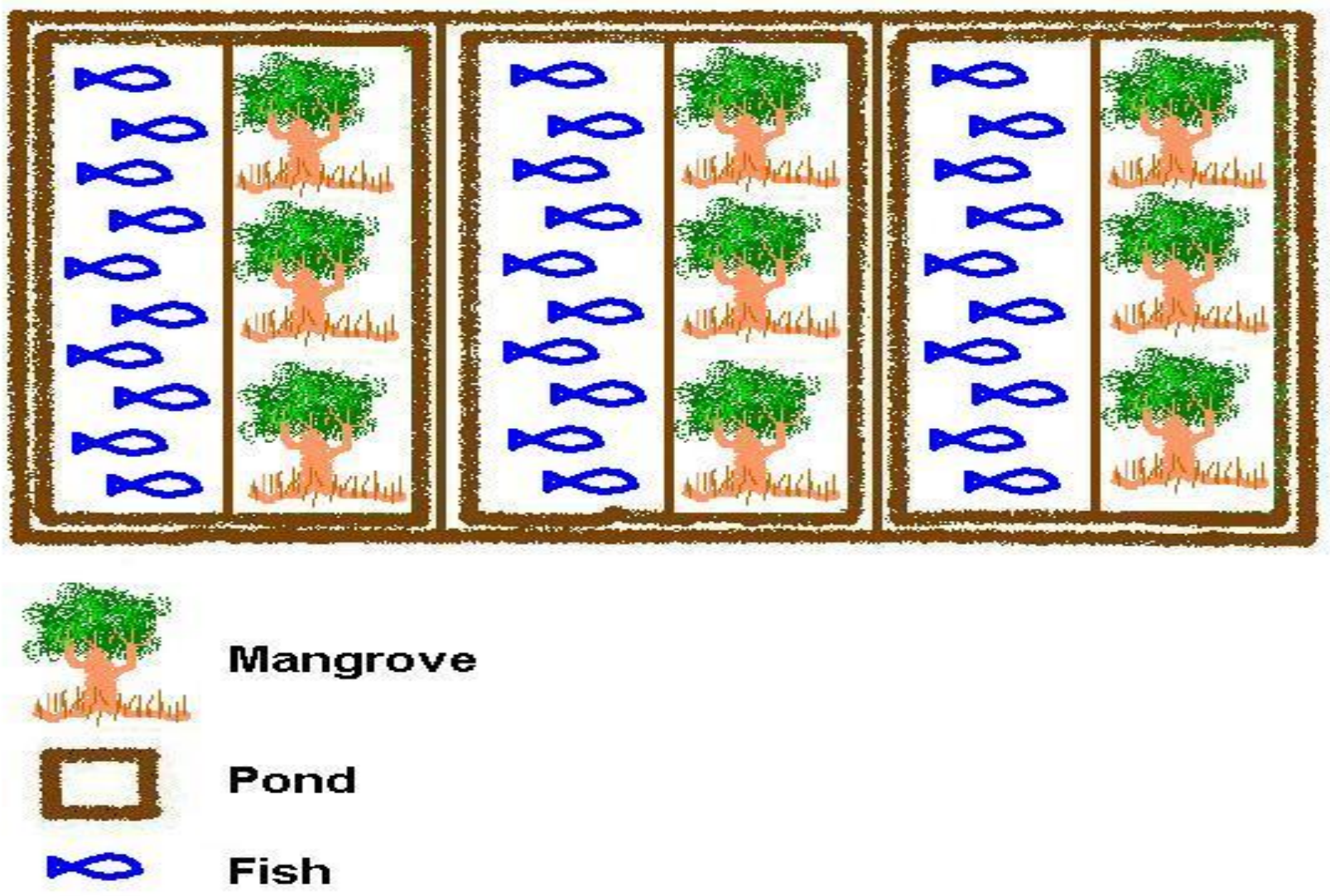
Laws and policies relating to mangrove ecosystem **zoning** (BFD Cir. 95) and **utilization** (PD 705, DENR AO 3/9)

Laws on **protection** (PD 705, PD 1586, DENR AO 76, LOI 917, RA 7161, DENR AO 16)

Laws on **rehabilitation** (DENR AO 77, DENR Memo Cir. 15, DENR AO 15, EO 263, DENR AO 30, RA 8550)

*Implementation now rests on the **strong political will** of the LGUs to enhance sustainable mangrove ecosystem rehabilitation, conservation and management.*

The same **mangrove-friendly aquaculture** (MFA) practiced in Vietnam is also practiced in the Philippines (as initiated by SEAFDEC)



Model for mangrove aquasilviculture
(as proposed by Sinfuego and Buot 2010)

MFA may be applied on two levels (Primavera, 2000)

a) silvofisheries or aquasilviculture where the low-density culture of crabs, shrimp and fish is integrated with mangroves

b) mangrove filters where mangrove forests are used to absorb effluents from high-density culture ponds

There is a need to disseminate these sustainable practices.

UPLB ERTC will indeed be instrumental.

Sustaining biodiversity education and community awareness drive among adults, youths and kids

The best of the laws and policies, the best of the research results and the best of the sustainable plans will only become known to everyone and operational with efficient IEC campaign and advocacy.

Local people deserve the best information about the mangrove forest, its resources and its ecological and economic benefits (Macintosh *et al.* 2002, Chotthong and Aksornkoae 2007).

The Philippine mangrove ecosystem in the years ahead

Coexistence of mangrove forest and sustainable fisheries

Mangrove ecosystem in Pagbilao, Quezon

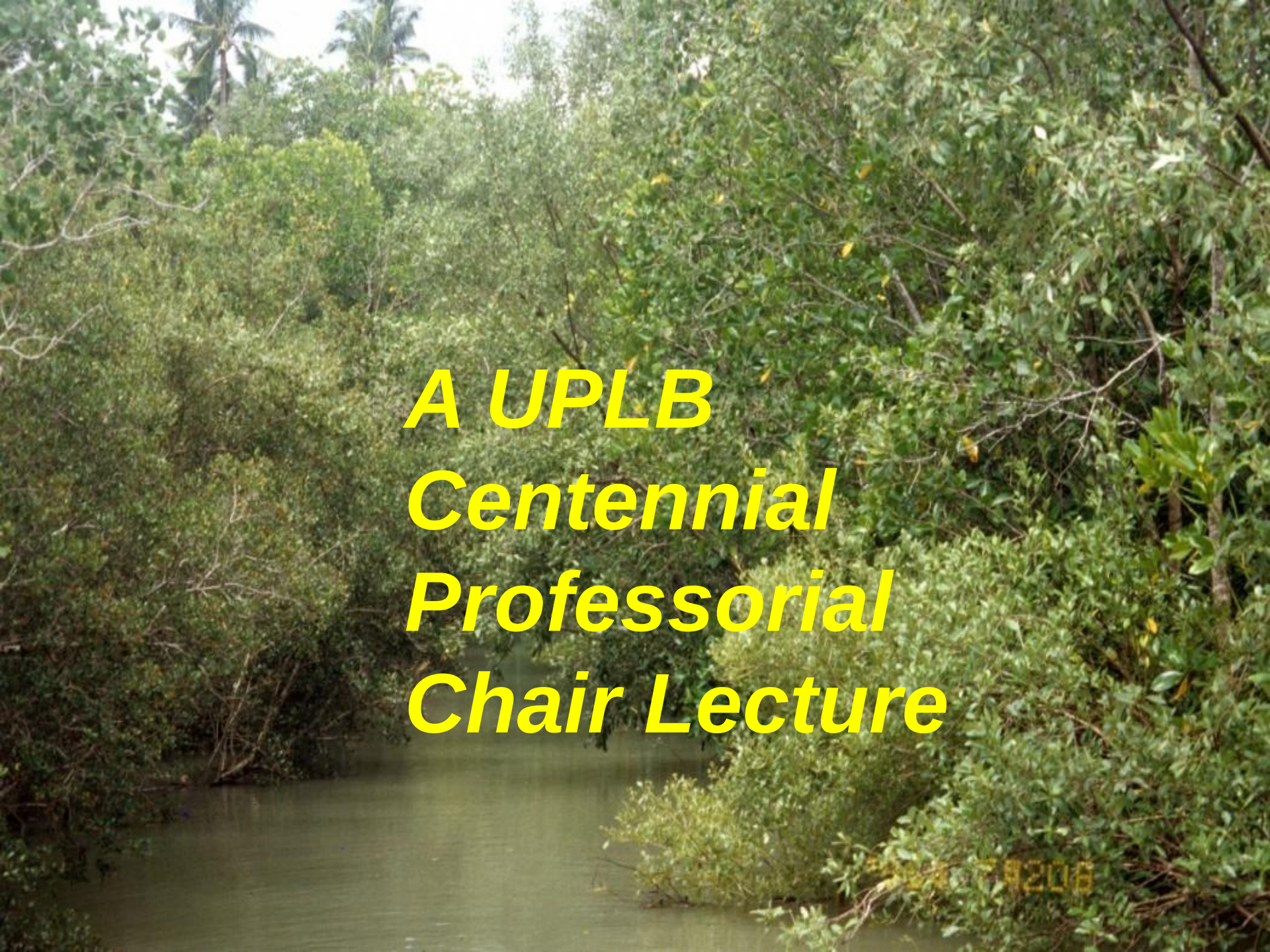
Mangrove ecosystem: an ecotourism village

Sustainable practices learned thus far, rest NOT only on solid grounds of biophysical considerations, BUT sociocultural and politico-economic as well.

Hence, it is imperative for the *UPLB Estuary Research and Training Center* to be a multidisciplinary body doing multidisciplinary and interdisciplinary studies

Sustained provision of mangrove ecosystem services is the ultimate goal of the *UPLB Estuary Research and Training Center*

for a happy and vibrant coastal community…


A UPLB
Centennial
Professorial
Chair Lecture