



***The role of the academic and research institutions in undertaking research and developing management strategies to address the climate change impacts on fisheries and associated coastal resources:  
Examples of some initiatives in the Philippines***

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# Outline

1. **Context of fisheries management in the Philippines**
2. Research undertakings of academic institutions in Region 8
3. Tandem of academic/research institutions with government agencies
4. Initiatives of Palawan State University
5. Management implications

# Fisheries Management in the Philippines



- Local government units (LGUs)
  - Municipal fisheries
  - Within 15 km

- Department of Agriculture-Bureau of Fisheries and Aquatic Resources
  - Commercial fisheries
  - Aquaculture
  - Outside 15 km (national waters)



# Exacerbating Challenge with Climate Change!

Logging

**Versus**

Tourism



Fisheries





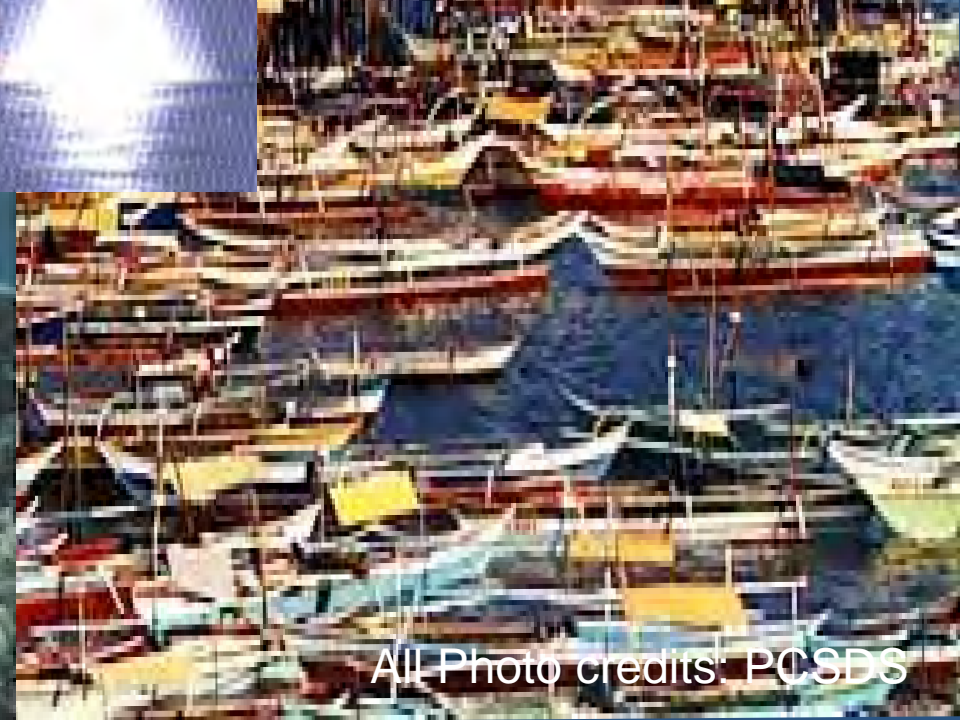
# Critical Fisheries Habitats

1. Mangroves
2. Seagrasses
3. algal beds
4. coral reefs





# Threats to Fisheries and Coastal Resources



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Local government  
units

National  
government  
agencies

Fishing  
associations

Local  
communities

Fisheries  
Stakeholders

Civil society  
groups

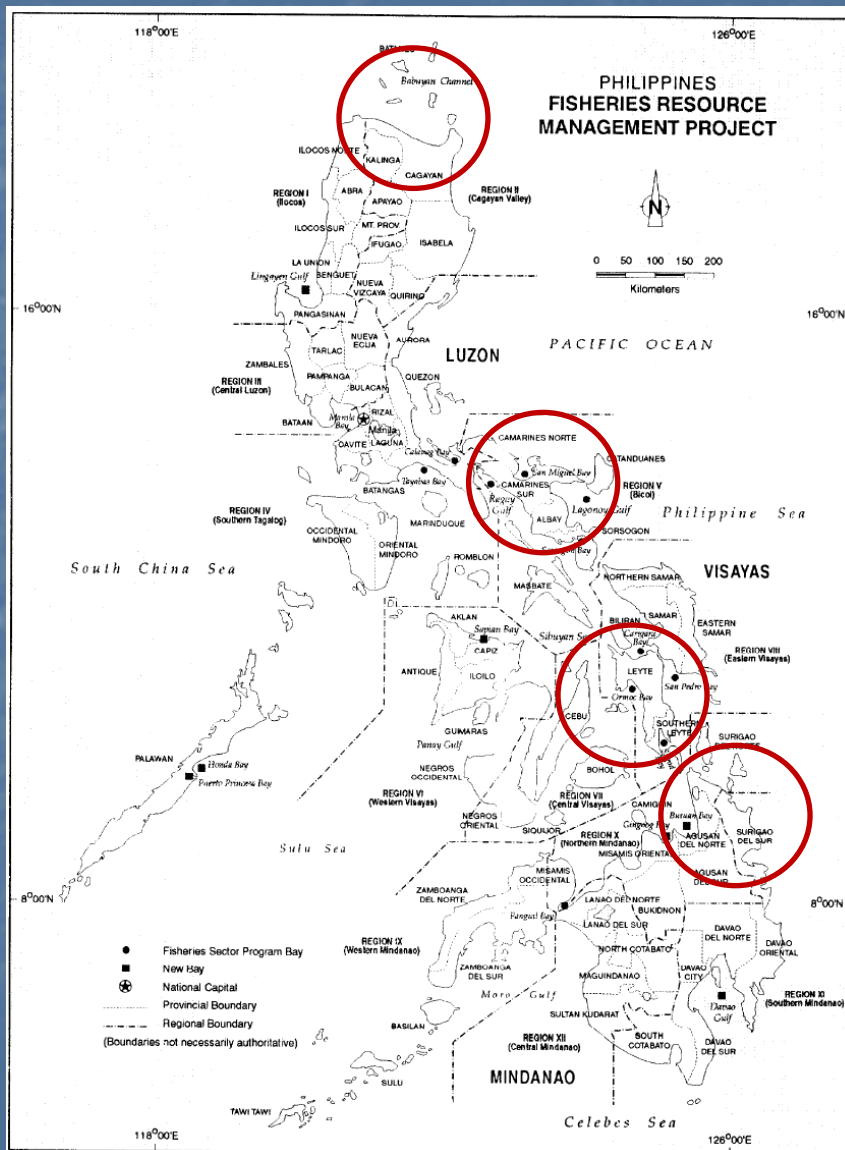
Academe /  
research  
organizations

Consumers

Vicarious users



# Study Sites



**Region 2 (Babuyan Channel) - ICRMP**

**Region 5 (San Miguel Bay) – FSP/FRMP**

**Region 8 (Sogod Bay) - FRMP**

**CARAGA (Lanuza Bay) - FISH**

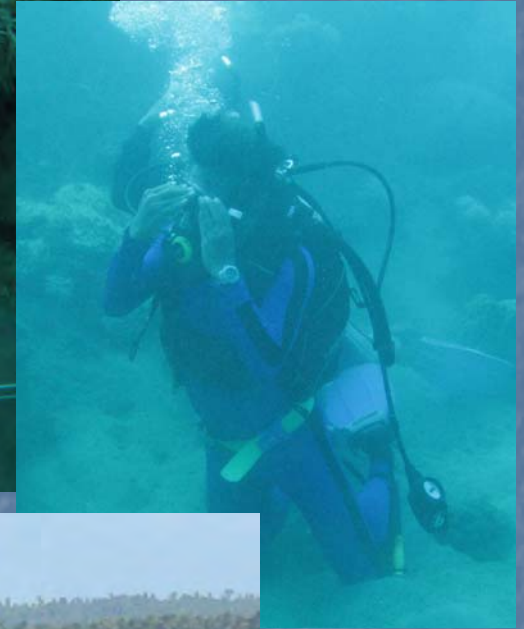


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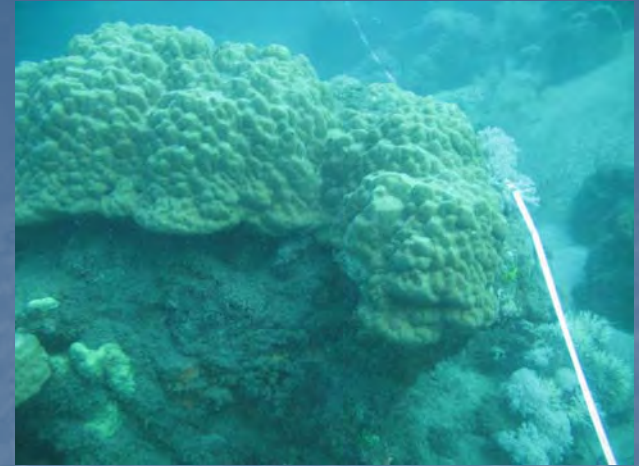
# Documentation of coastal issues/ strategies about climate change





# Climate variabilities in coastal areas

- unusual heavy rains
- typhoon direction shift
- increase in ocean temperature
- sea level rise
- Flooding
- Vulnerability of fisheries



## ■ Fisheries Impacts

- > frequency of harmful algal blooms
- coral bleaching resulted in decrease in fish catch from 30 tons/year to 26 tons/year.





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# Participatory Methods

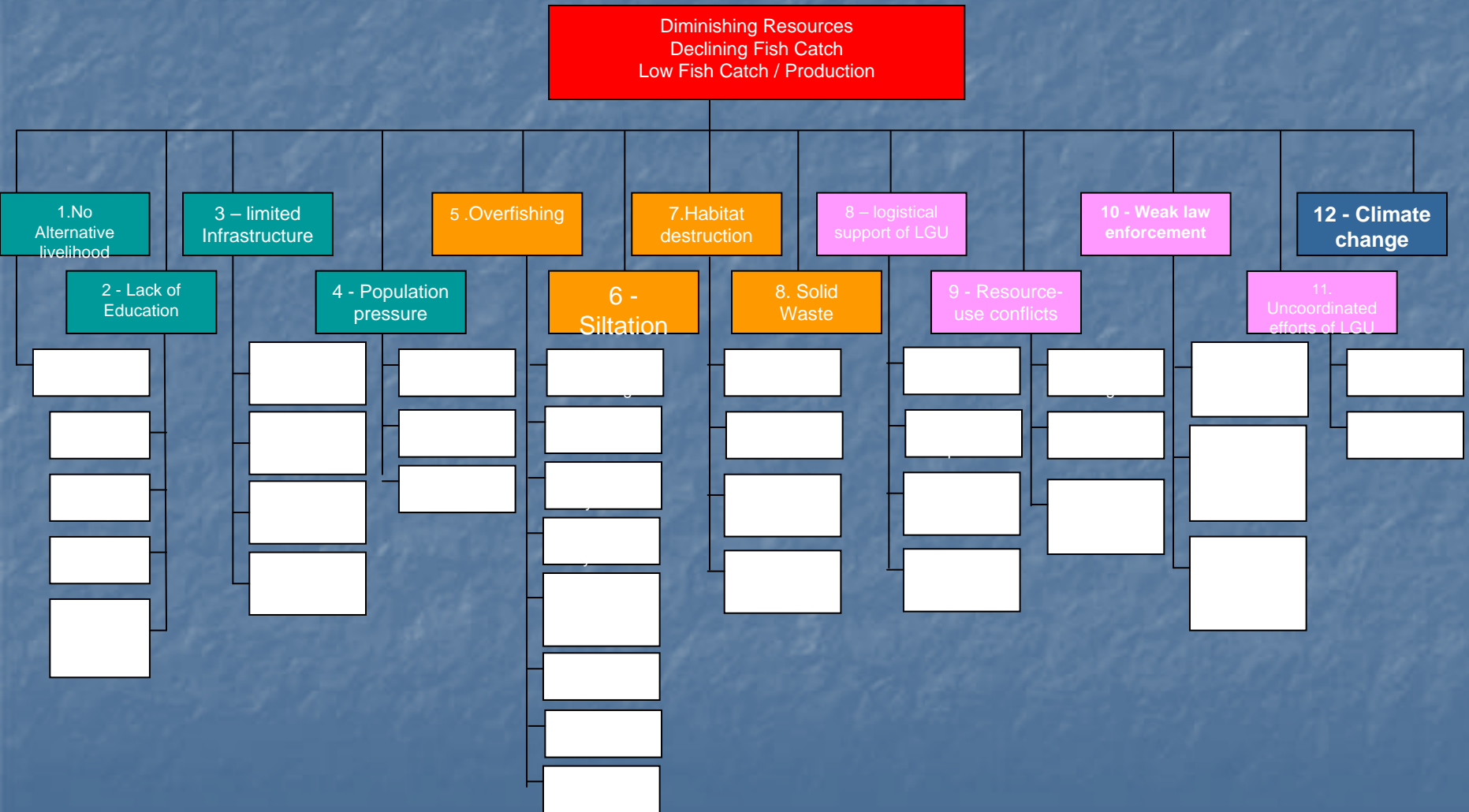




# Fisheries Issues Identified

Issues	Region 2 – Babuyan Channel	Region 5 – San Miguel Bay	Region 8 – Sogod Bay	Region 13 – Lanuza Bay
Climate change	√	√	√	√
Overfishing	√	√	√	√
Land-based pollution	√	√	√	
Habitat degradation	√	√	√	√

# Problem Tree for San Miguel Bay Fisheries





# Participatory Systems Appraisal Quadrant

## **SYMPTOM**

- Element greatly influenced by other elements

## **CRITICAL**

- Accelerator or catalyst

## **BUFFER**

- Development activities expected to have little impact

## **MOTOR/LEVER**

- active element with predictable impacts

# Risk Analysis Template

		Consequence Level			
		Minor	Moderate	Major	Extreme
		1	2	3	4
Likelihood					
Remote	1	1	2	3	4
Unlikely	2	2	4	6	8
Possible	3	3	6	9	12
Likely	4	4	8	12	16



# Where to intervene?

High priority issue	Region 2 – Babuyan Channel	Region 5 – San Miguel Bay	Region 8 – Sogod Bay	Region 13 – Lanuza Bay
<b>Climate change</b>		√		
Governance constraint	√			
Population pressure		√	√	
Weak Policy			√	
Weak Enforcement			√	
Limited local government support				√

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# Integration of climate change into curriculum

- Bachelor degrees
- Graduate program
- Basic education
- Outreach programs



# Habitat protection





# bio-fencing



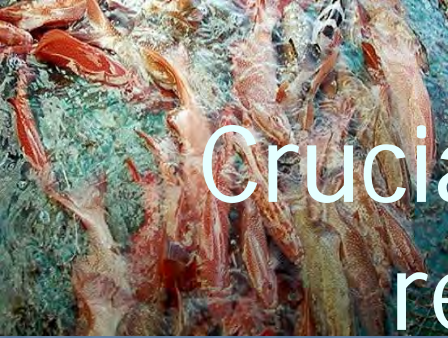
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# Crucial role of academic and research institutions

1. Information dissemination - climate change as important cross-cutting issue
2. generate information about the relationship of climate change and fisheries/coastal management
3. provide science-based recommendations for local government units
4. Develop/undertake relevant measures



# Seeing the Bigger Picture



## Coastal Ecosystem Goods and Services

- Erosion control
- Aesthetic beauty
- Coastal protection
- Fishery habitats
- Biodiversity
- Food

## Threats

- pollution
- Erosion/sedimentation
- Habitat destruction or conversion
- Over-harvesting of resources
- Climate change
- Sea level rise
- Uncontrolled development

## Negative impacts

- Greater poverty and hunger
- Loss of biodiversity
- Loss of use, non-use and option values
- Negative effects on employment and income
- More use conflicts



# Linkage among climate change fisheries management and sustainable livelihoods





# Partnerships with Policy Makers and Politicians!

