Experiences, good practices and lessons learned in MPA (Marine Protected Areas) / MPA networking in the Coral Triangle (CT)

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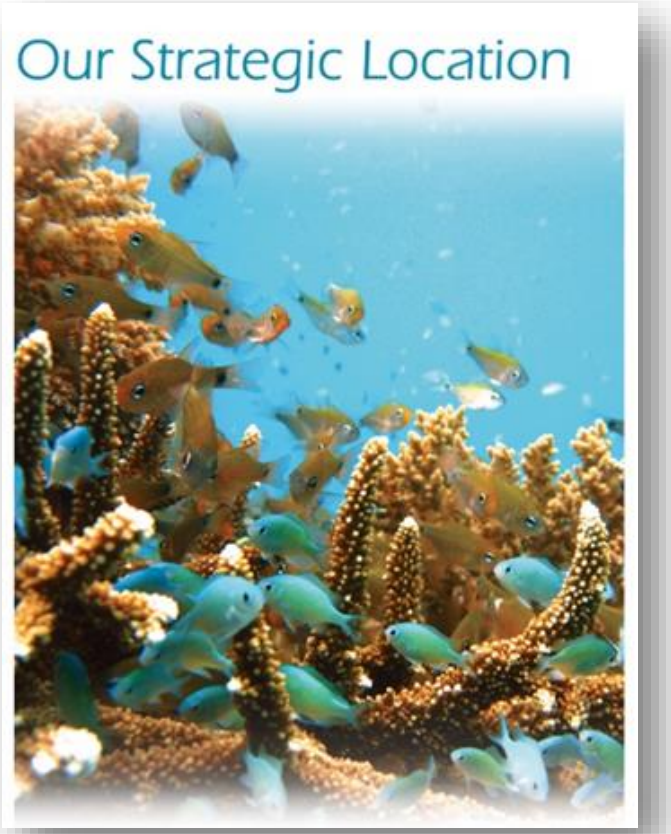
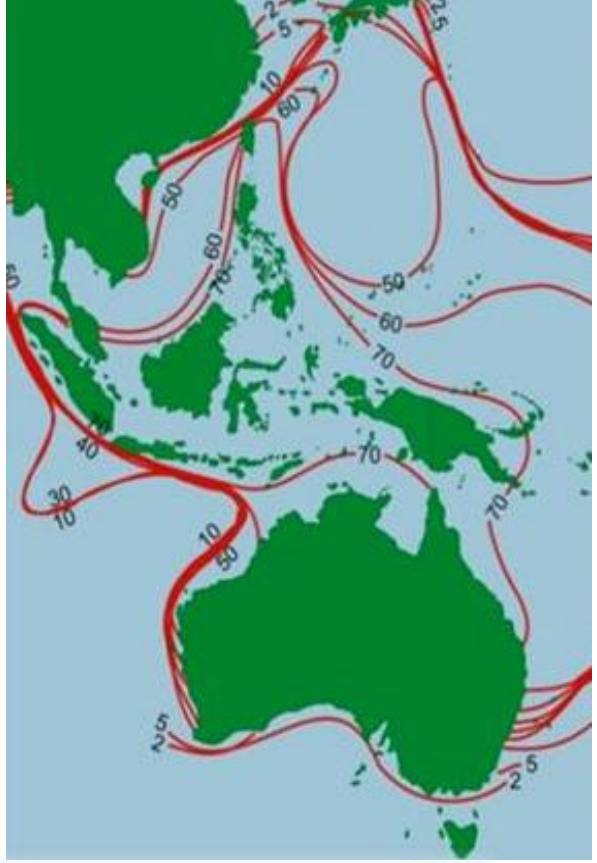




Beyond Quantities and Qualities of Life in the Philippines and in the Coral Triangle

Southeast Asia at the center of world's marine biodiversity

- For Filipinos & Southeast Asians
- Our life, our hope and our future

CORAL TRIANGLE INITIATIVE
ON CORAL REEFS, FISHERIES AND FOOD SECURITY

The Philippines is an archipelagic nation situated within the Coral Triangle. This tiny fraction of the global seas hosts the richest concentration of marine biodiversity on Earth. Thus, the Philippines is a strategic convergence area for generating significant contributions both to marine science and to society at large.

The Philippines as an Archipelagic state

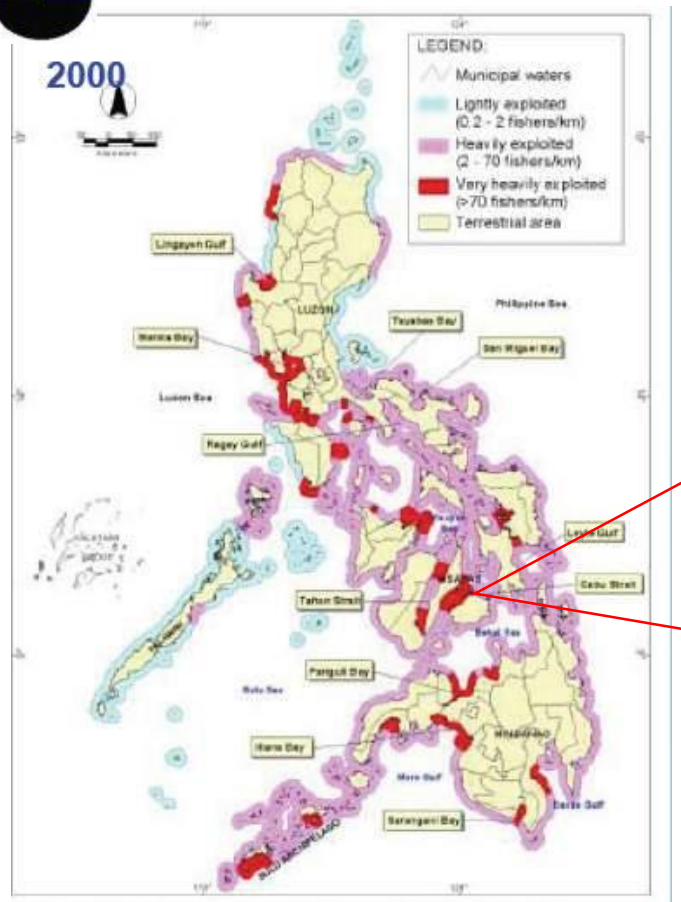


Figure 5. Map of heavily exploited areas in the Philippines.[75]
Source: Green et al. 2003

Philippine Fisheries Decline: How do we address climate change concerns amidst reducing fishing effort, addressing poverty and food security concerns?

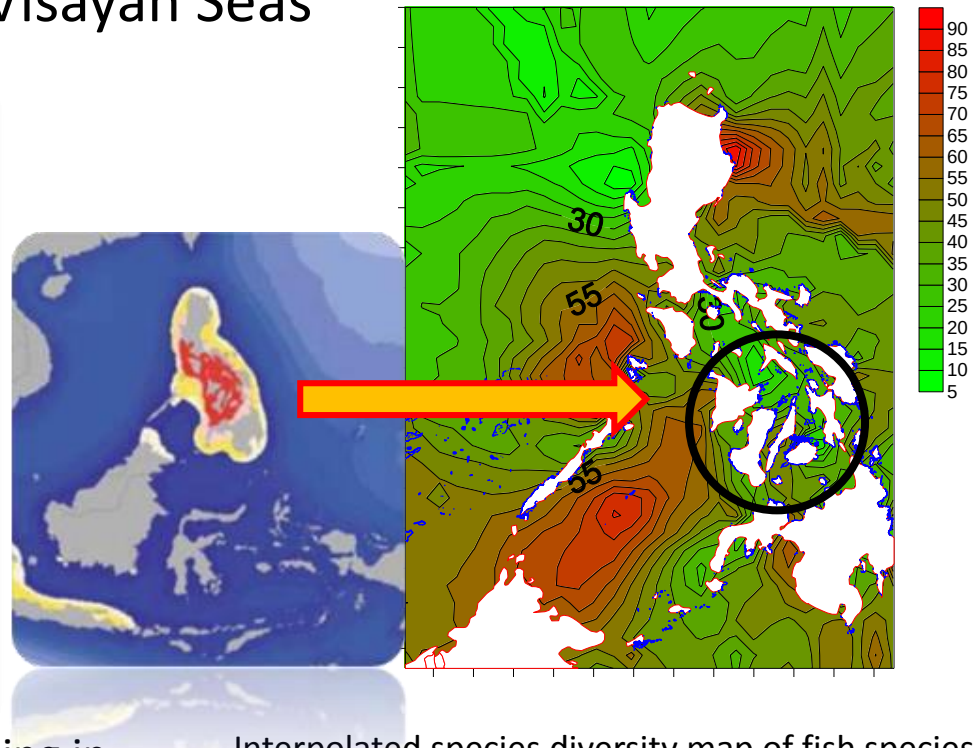
Dealing with the dilemma of increasing demand for food and declining fish yields

This global heritage being at great risk, provided the impetus for the exemplary agreements by the six countries in the Coral Triangle Initiative (CTI) namely: Indonesia, Malaysia, Papua New Guinea, Philippines, Solomons and Timor-Leste.

The Philippines as a rich area of ecosystem goods and services needs to be understood and managed wisely

Fish biodiversity declines in the center of the center, the Philippines → the Visayan Seas

Pattern of species richness based on sampling in early to mid 1900s(Carpenter and Springer 2005)

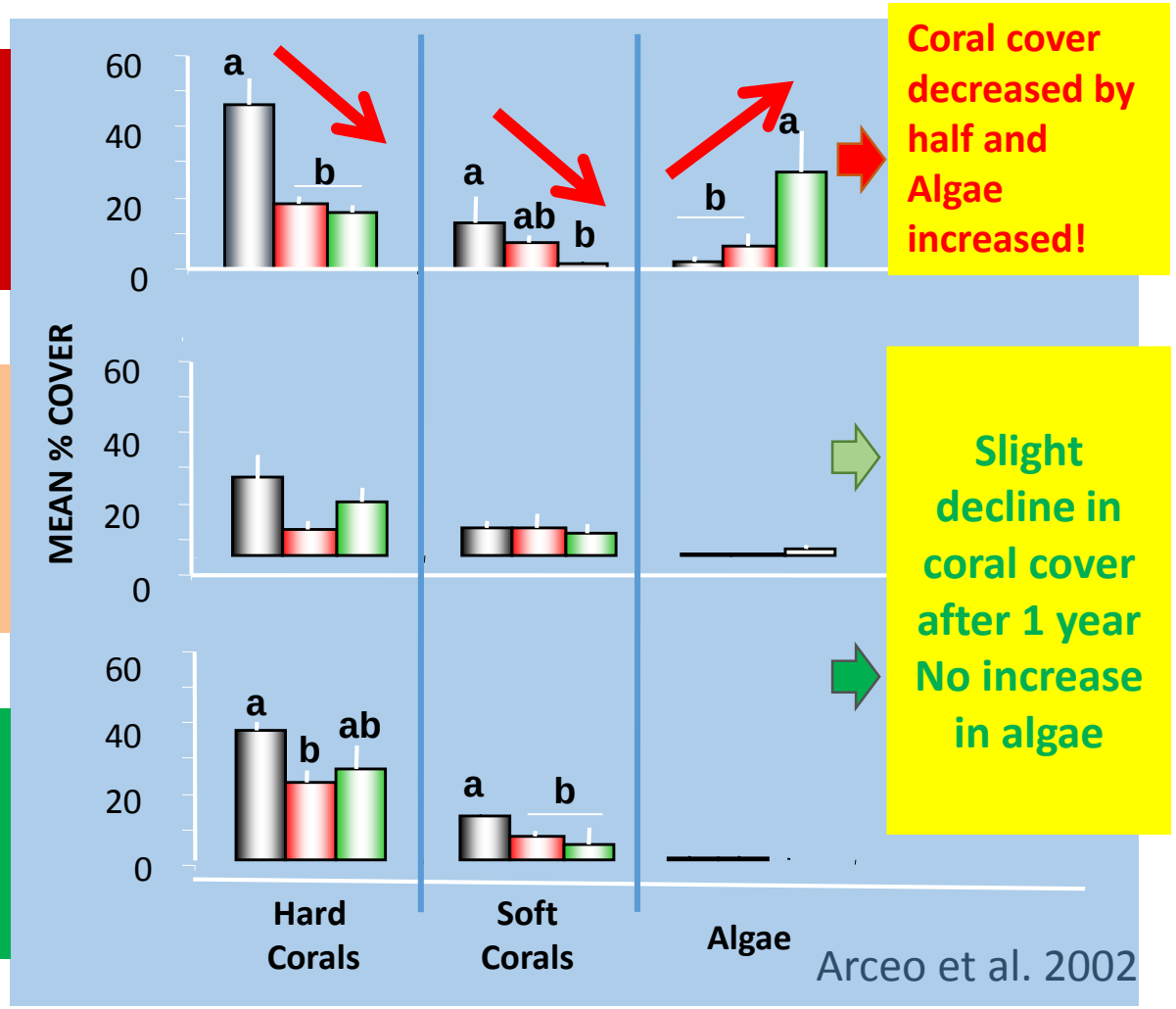


Interpolated species diversity map of fish species in the Philippines from fish visual census data (1990s to 2008) (* Nañola et al, 2010)

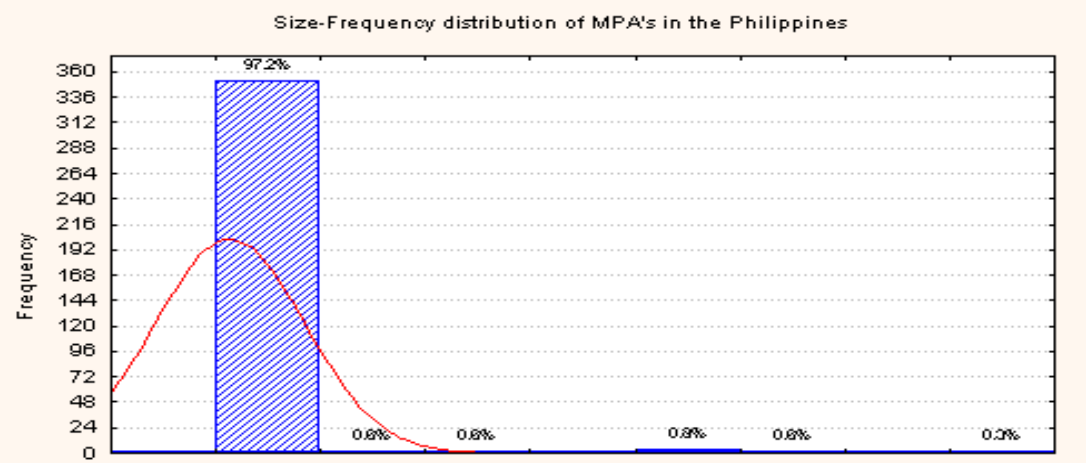
High biodiversity builds resilience to disturbances such as bleaching

	Fishing Pressure	Diversity
Bolinao, Pangasinan	High	Low
Western Palawan	Medium	Medium
Sulu Sea	Low	High

Impacts of the 1998 mass coral bleaching

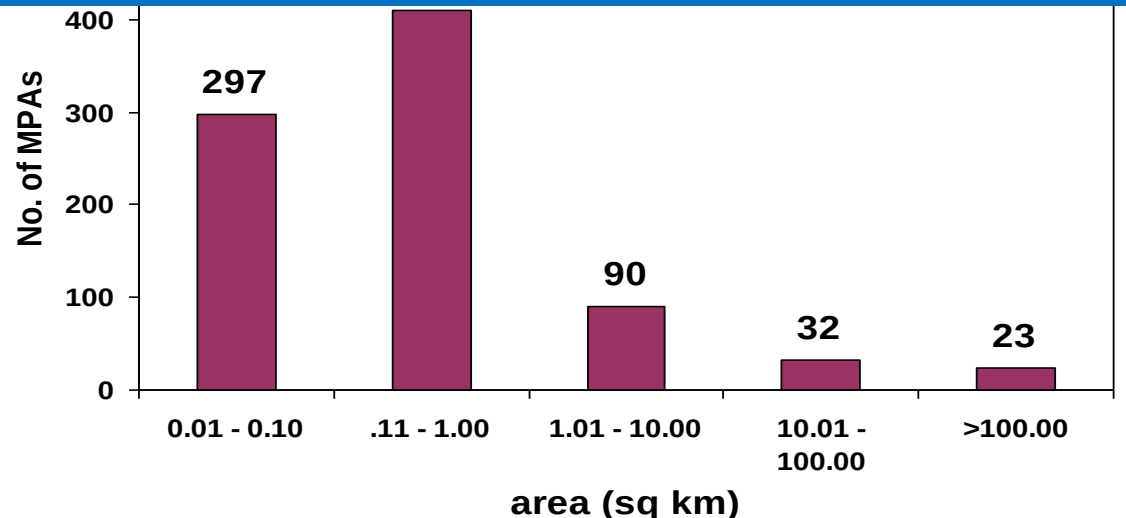


What worked & what didn't?



Of the 311 MPAs with known area, 93% are less than 10 hectares in size (Aliño *et al.* 2000)

Advocating for Bigger Sizes: Ecological and Governance Synergy



Of the 852 MPAs with known area:

- 35% are less than 10 hectares in size
- 48% are within 11-100 hectares

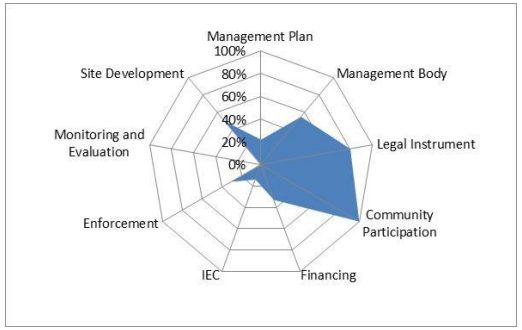
(UPMSI Database 2007)

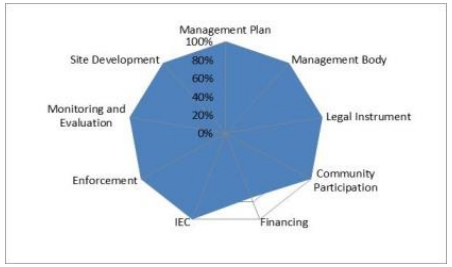
1. Lessons learned especially on MPA effectiveness from the local experience and their global perspective

- SINGLE MPA & MPA NETWORKS
- MPA SUPPORT NETWORK & PAMS

Protecting 10% of the coral reefs in the Philippines would take 100 years: *accelerate* the area covered and *improve its effectiveness*

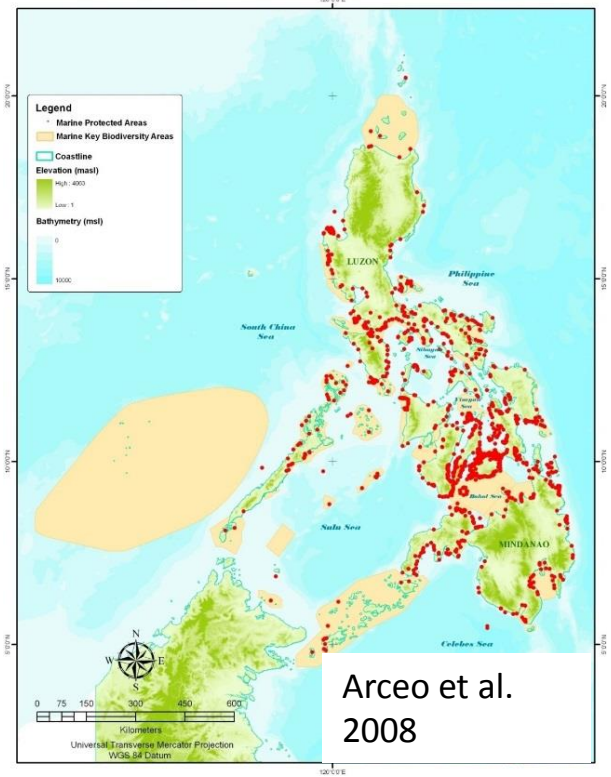
Masinloc & Oyon Bays Marine Reserve (Zambales)



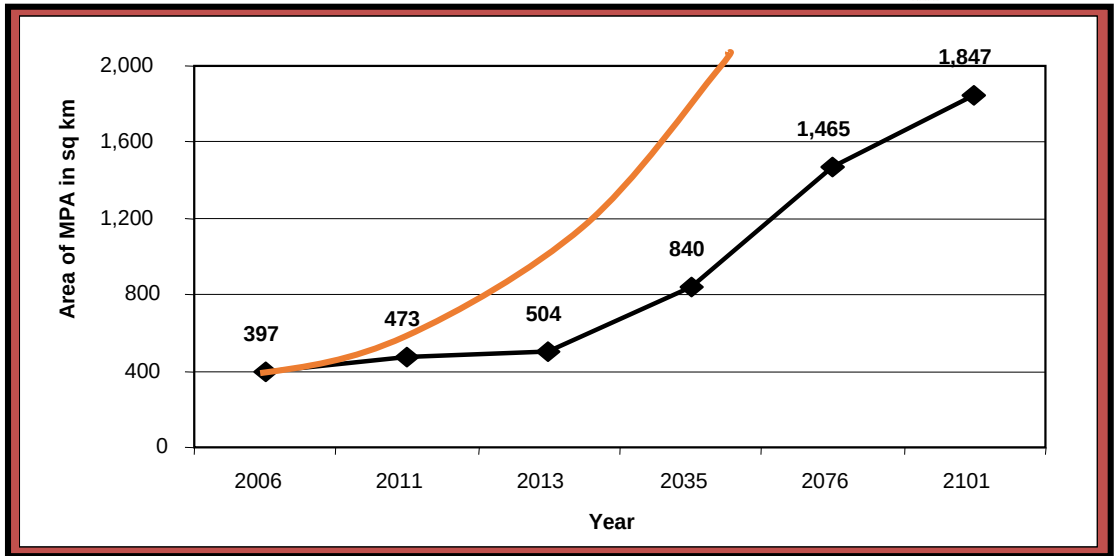


Tubbataha Reefs Natural Park

mKBAs overlaid with MPAs



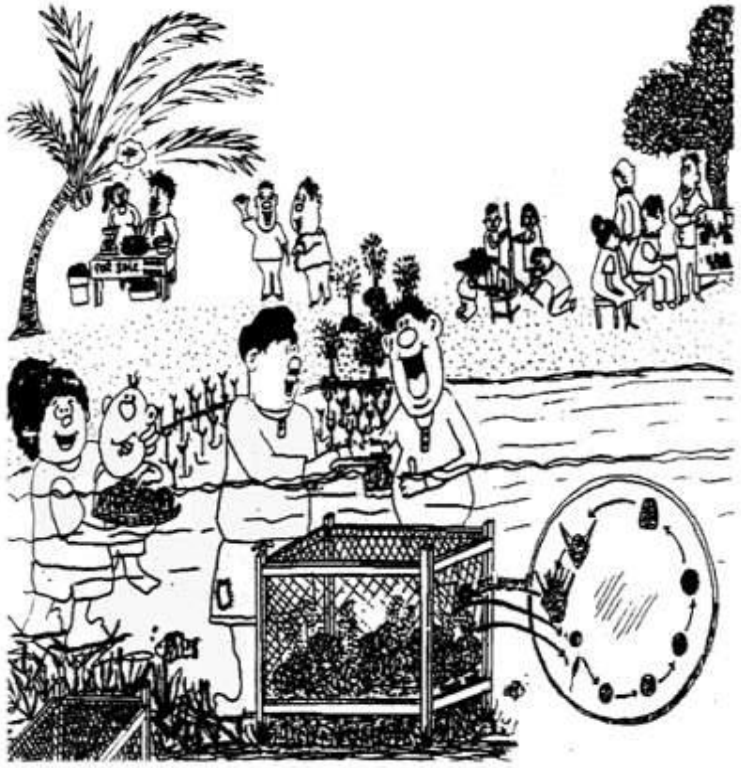
Arceo et al. 2008

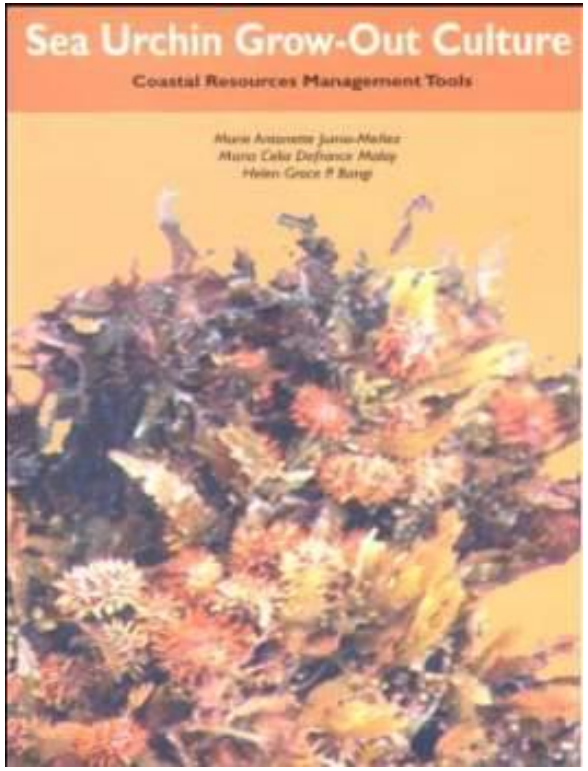


Community-based grow-out culture has additional socio-economic benefits

Incentives for responsible fishery

- **Supplemental source of livelihood for fishers**
- **Heightens local environ-mental awareness**
- **Fosters community participation/ cooperation**
- **Develops local resources management capabilities**



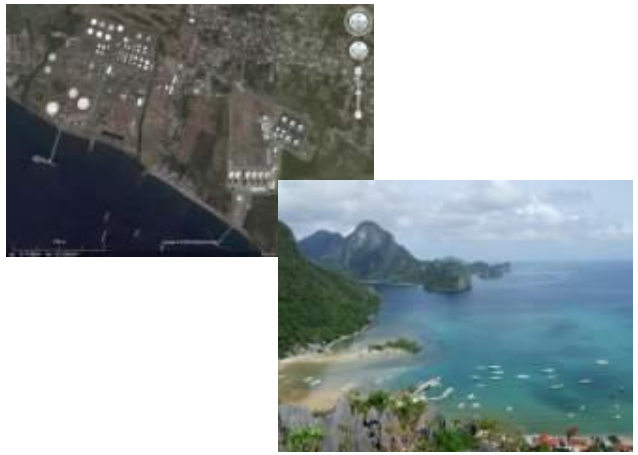


Viable resource management tool together with reseeding of protected areas

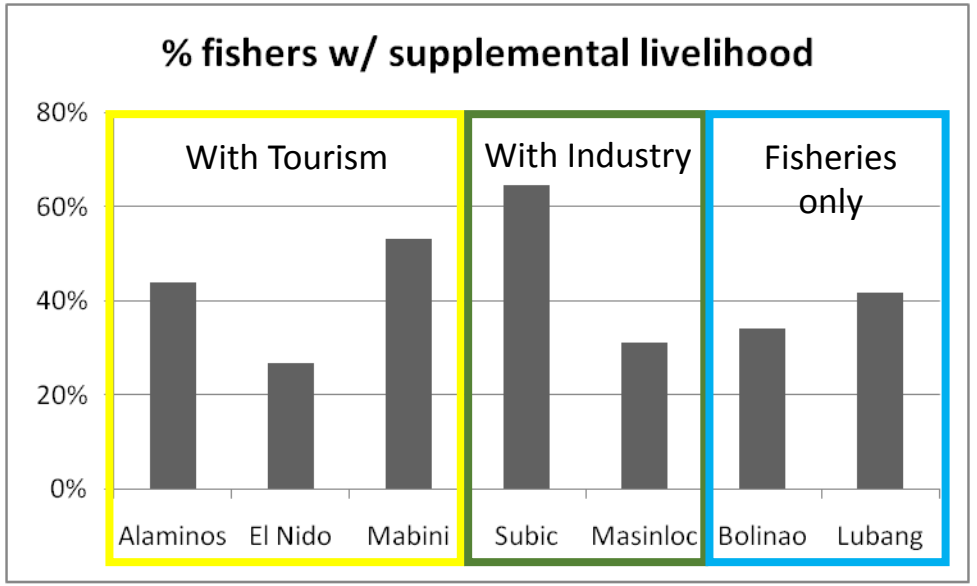
Courtesy of MSI Invertebrates Laboratory

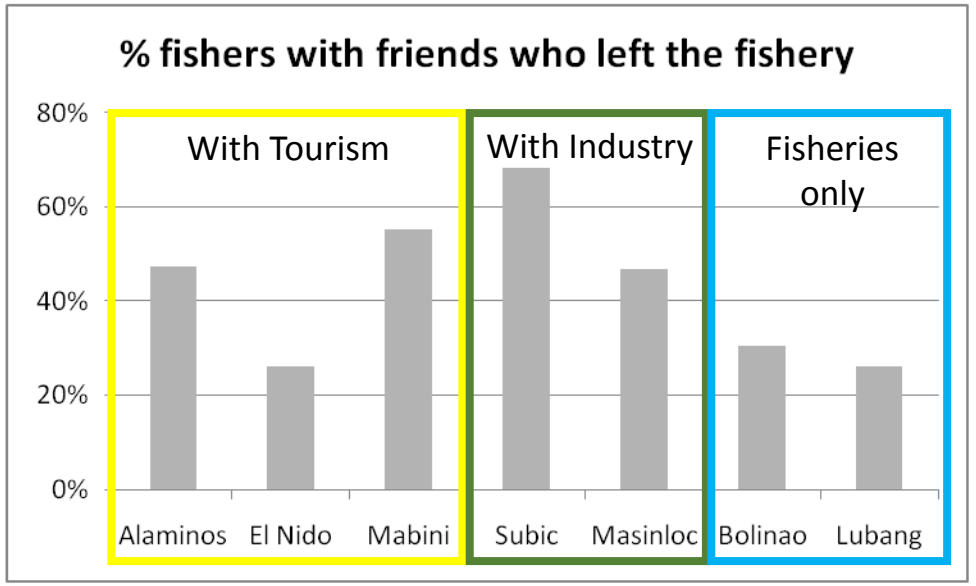
3. Triage approach is insufficient in developing countries

Development can help improve livelihood choices for fishers beyond fisheries

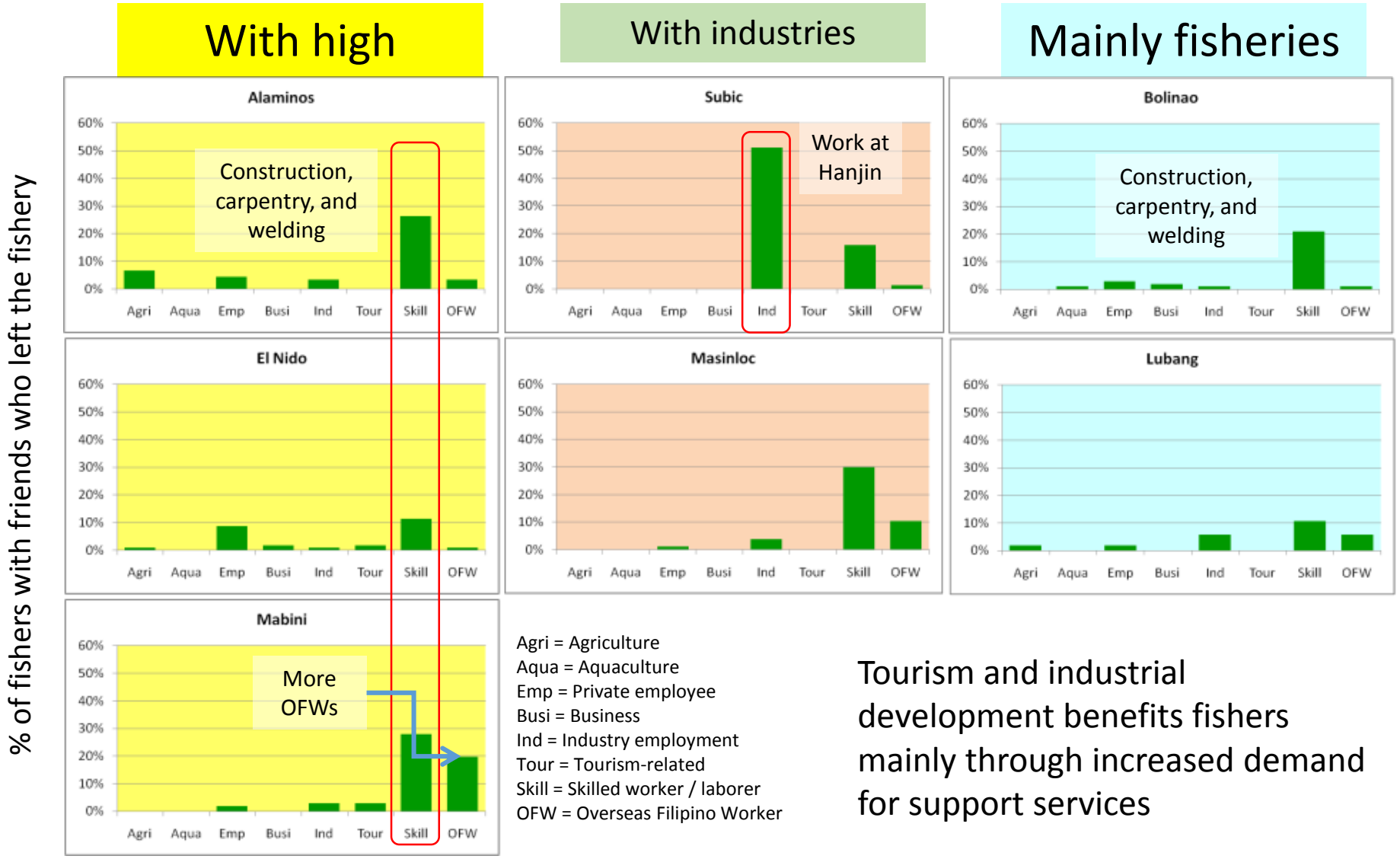


Mualil et al. 2011





Livelihood shifts of fishers



Agri = Agriculture
Aqua = Aquaculture
Emp = Private employee
Busi = Business
Ind = Industry employment
Tour = Tourism-related
Skill = Skilled worker / laborer
OFW = Overseas Filipino Worker

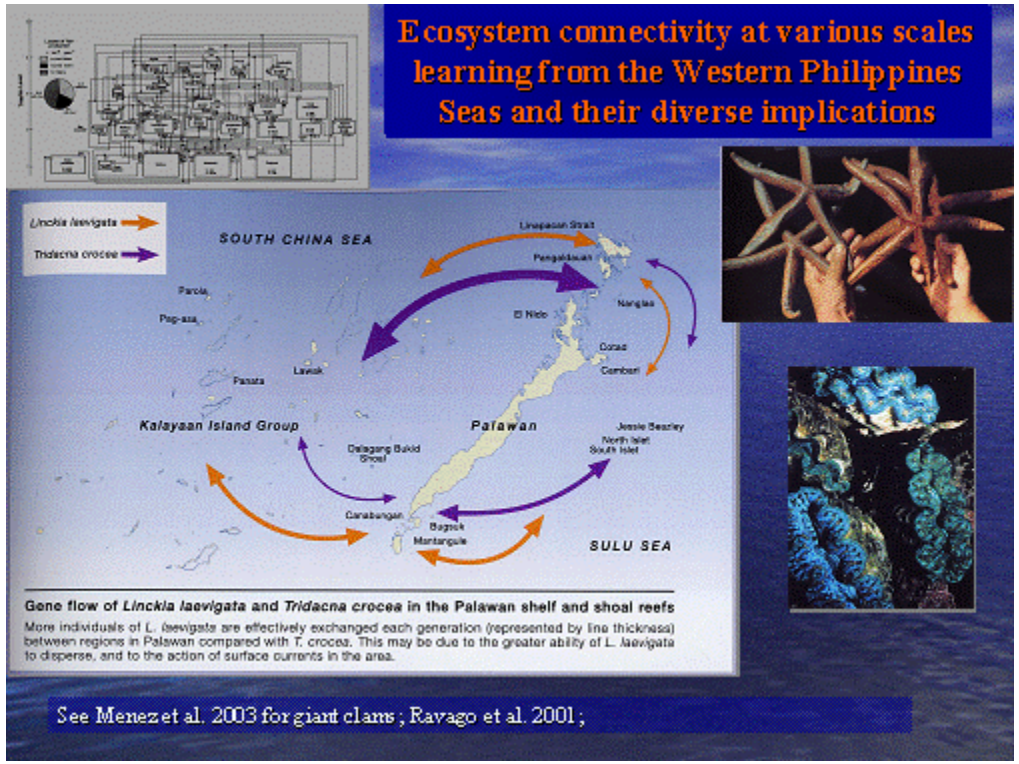
Tourism and industrial development benefits fishers mainly through increased demand for support services

Source: COMECO group, UPMSI

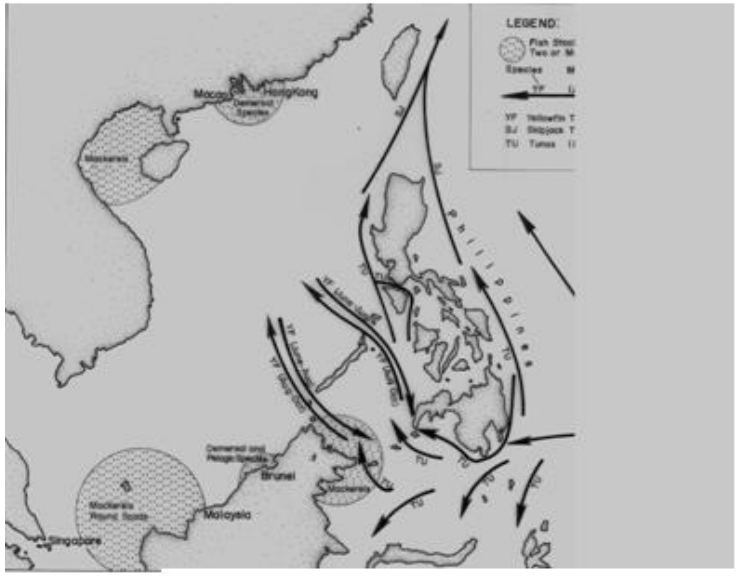
Visit **EBM Tools Project** exhibit area for more information

Why Form MPA Networks?

Existing connectivity among ecosystems at various scales: benefits from natural networks need to be sustained



Inferred migratory route of some tuna species passing through the Philippines



Source: Morgan and Valencia 1983

Single MPAs may not be enough for protection at larger scales.

4. Addressing, achieving multiple objectives thru a systematic approach in MPA planning and implementation is imperative

GSIS

Governance
Socio - economic
Integrated
Systems

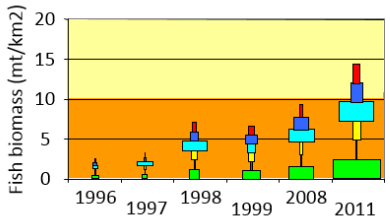
Suitability, **S**ensitivity, **S**usceptibility

Aliño et al. in prep.

Conceptual diagram illustrating the gradient of coral and fish from a degraded reef (left) to a healthy reef (right).

regard ***memes*** as cultural analogues to **genes** in that they self-replicate, mutate, and respond to **selective pressures**

Bolinao (magnified 4x)



Fish biomass (mt/km2)

> 40

21-40

11-20

1-10

Trophic groups

piscivore

ben-invt

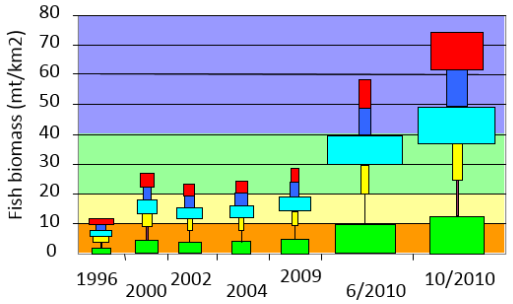
planktivore

omnivore

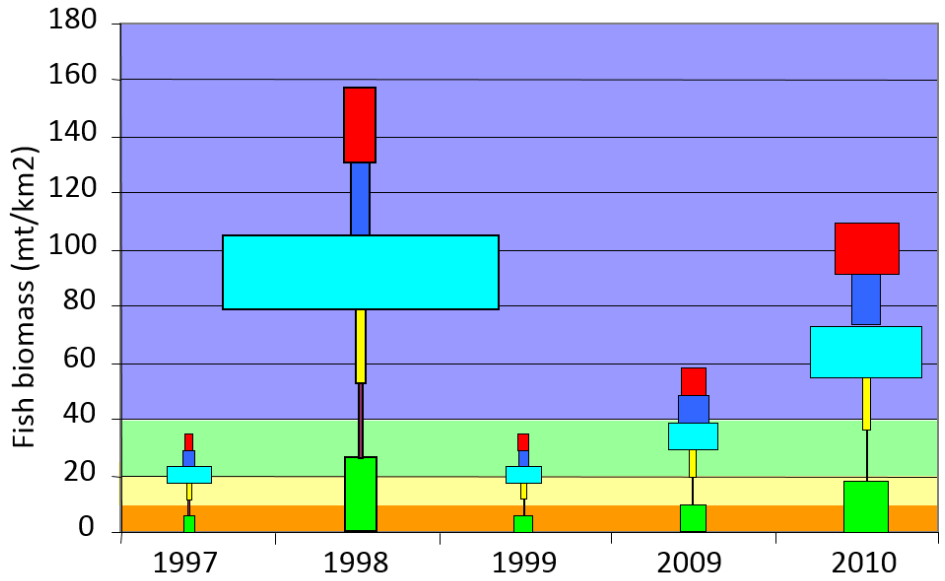
corallivore

herbivores

El Nido

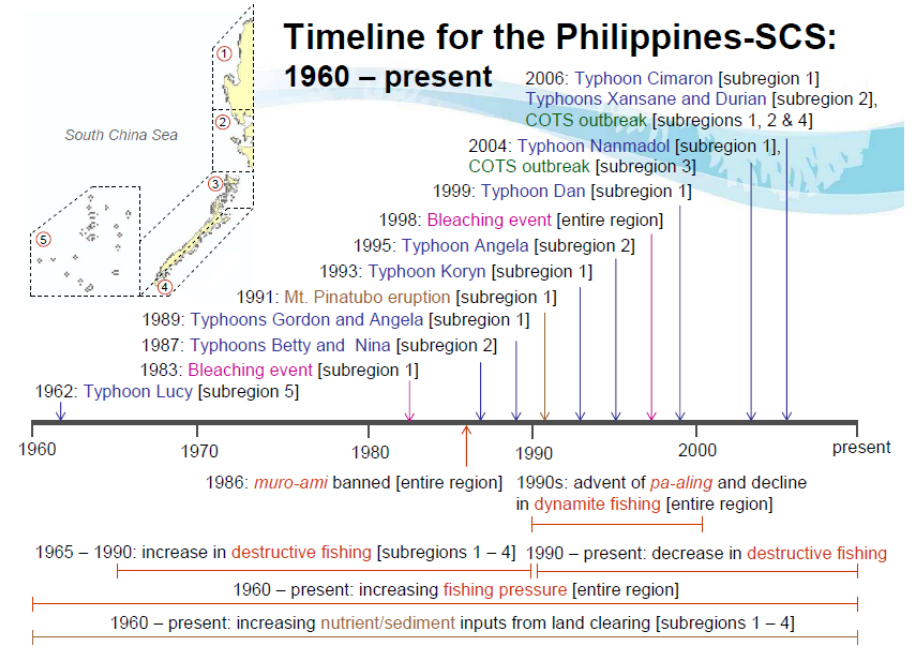


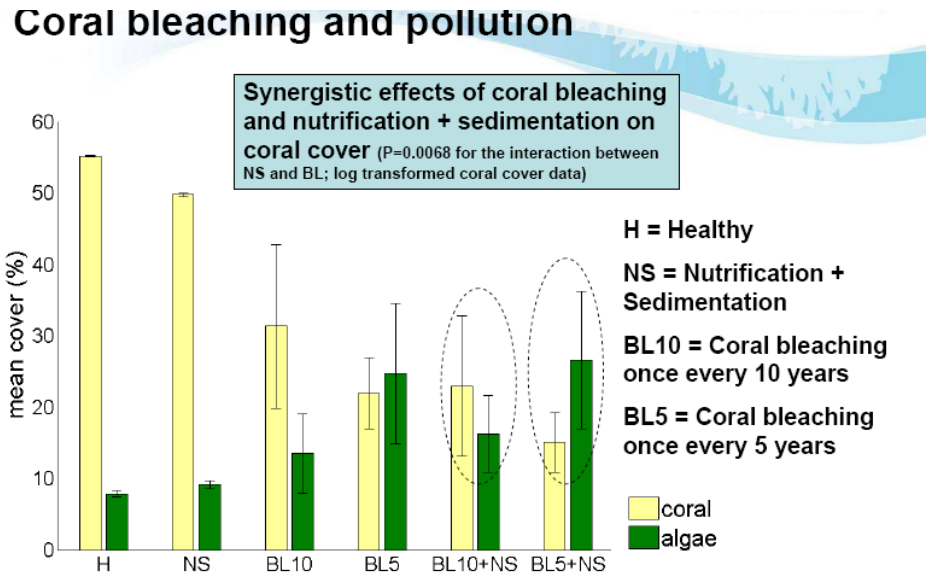
Tubbataha

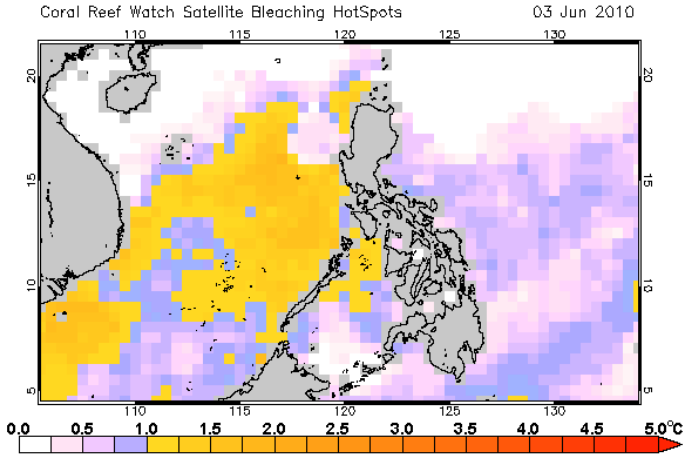


Valuing Biodiversity, Using Wisely and Developing Sustainably

5. Specific lens for specific country e.g. the Philippine context



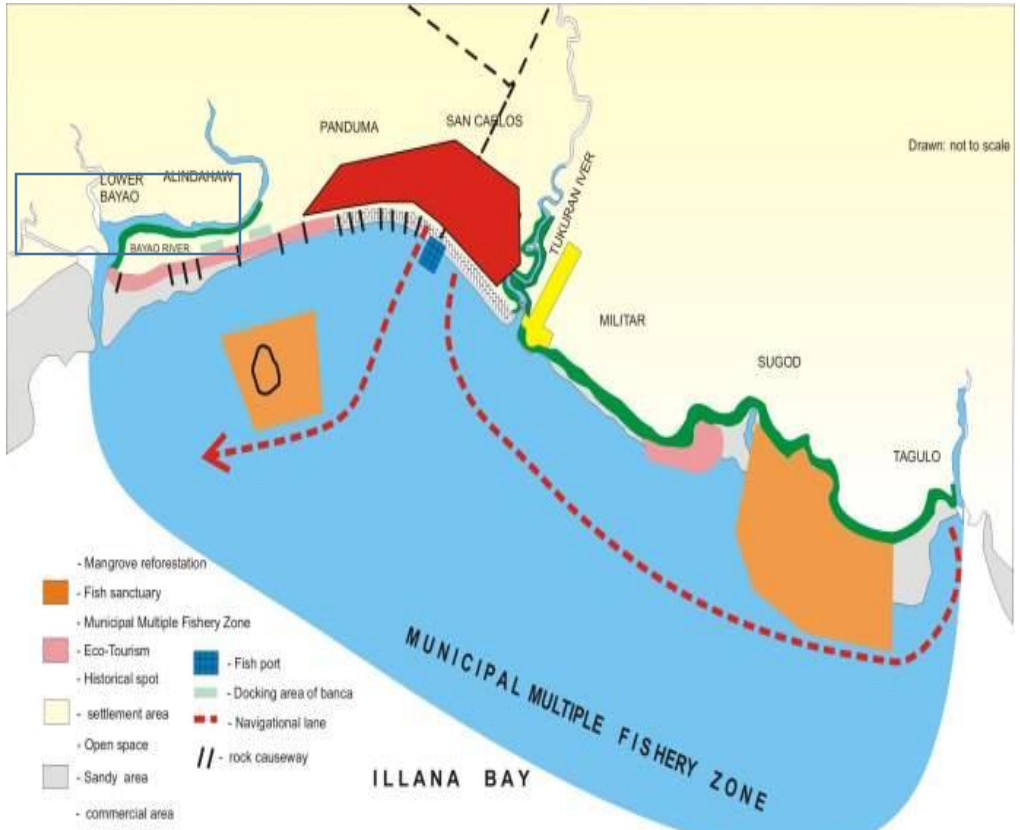


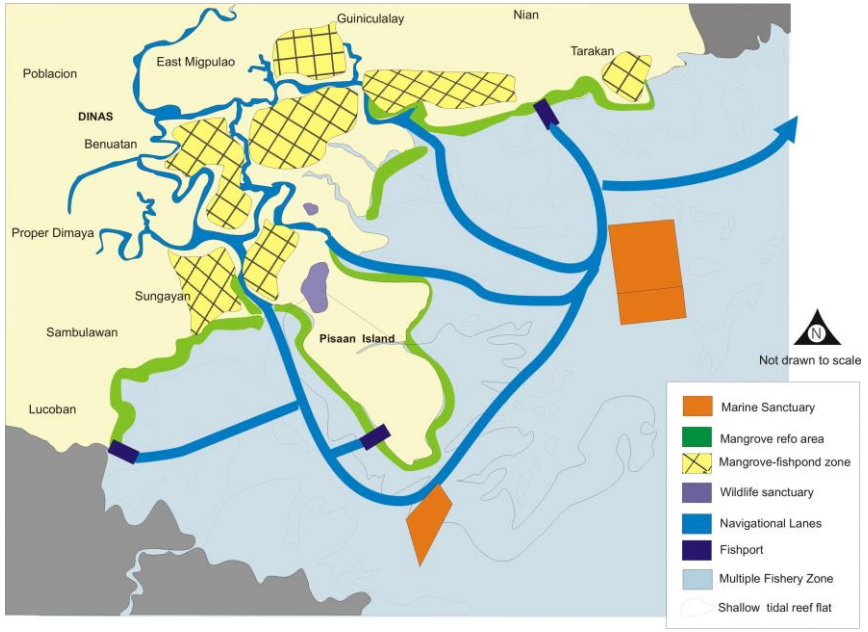


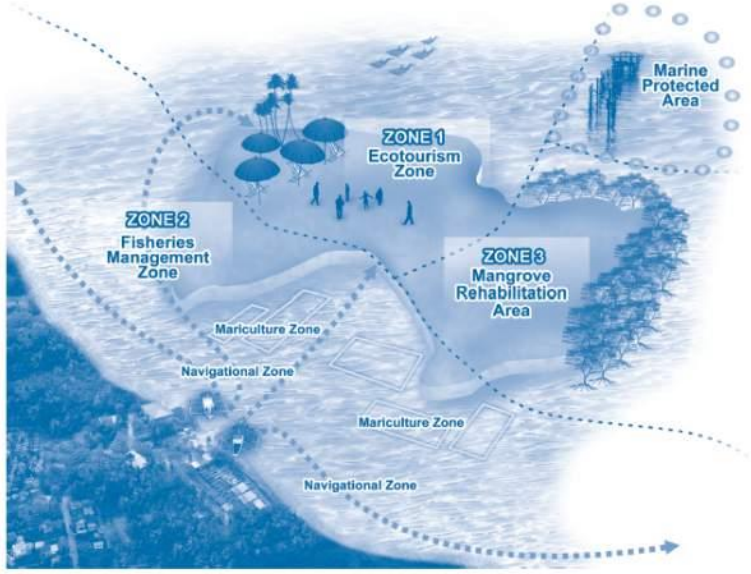
Melbourne-Thomas et al. 2010

6. Integrated synthesis in the theory and practice of MPA

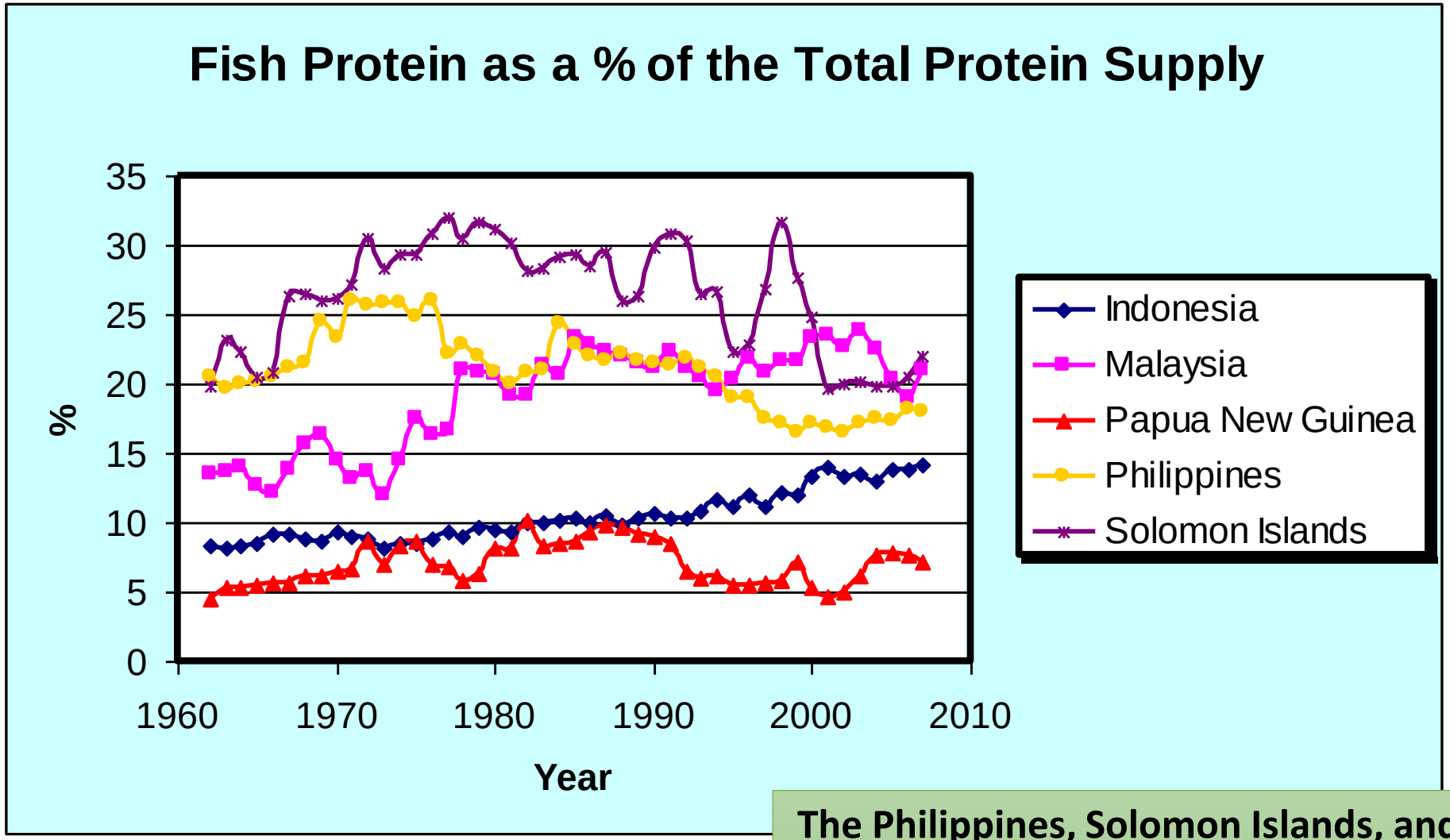
Rationalizing priority use areas through zoning and Marine Spatial Planning





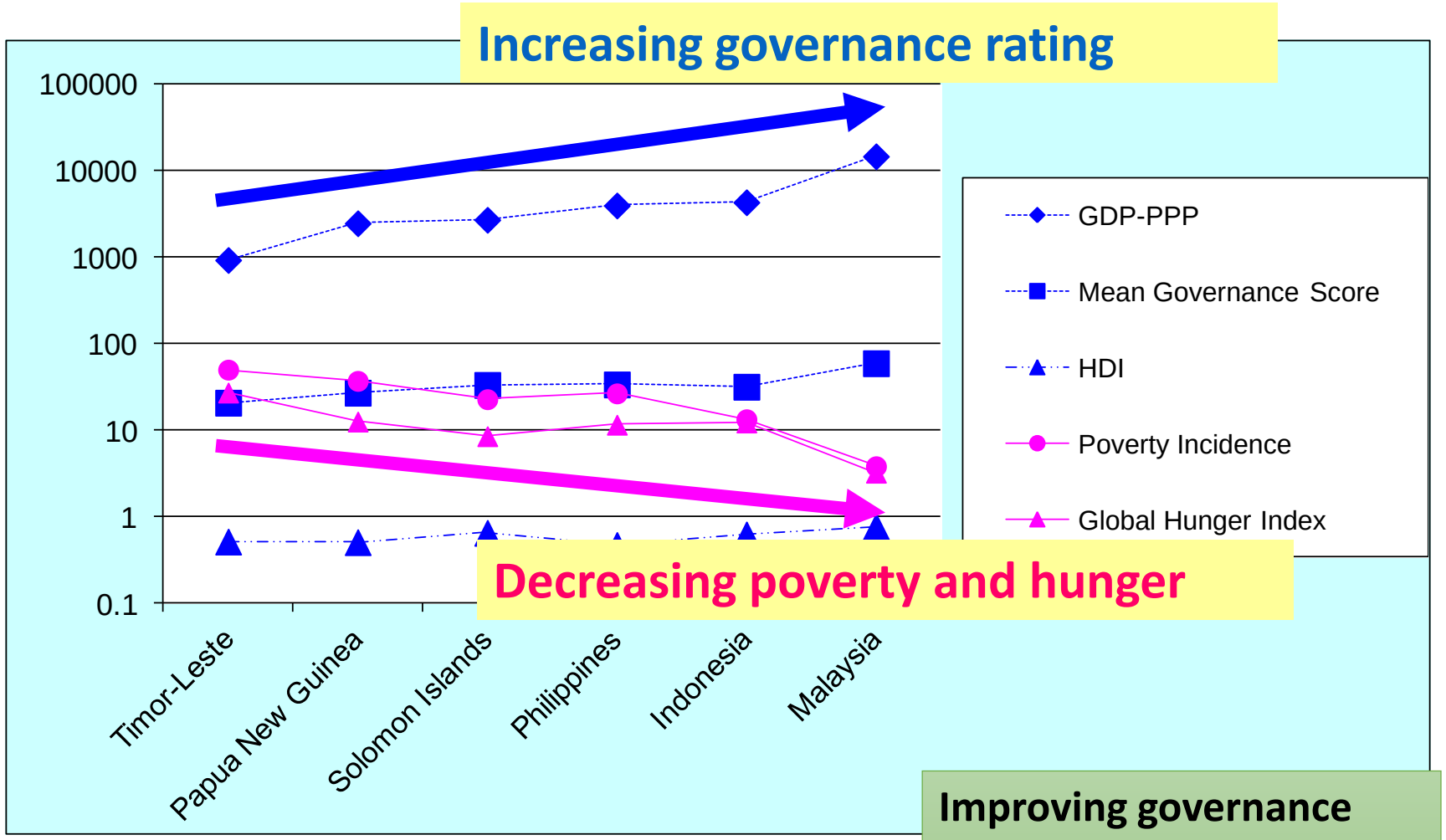


7. Varied manifestations play out in the pursuit of various paths to sustainable development.



The Philippines, Solomon Islands, and Papua New Guinea shows indication of decline in fish protein consumption

8. Explain capacities, threats and their governance, ecological and social-economic states results to outcomes.



Improving governance helps alleviate poverty and hunger

9. MPA analyses of lessons, their local perspectives within each country would vary

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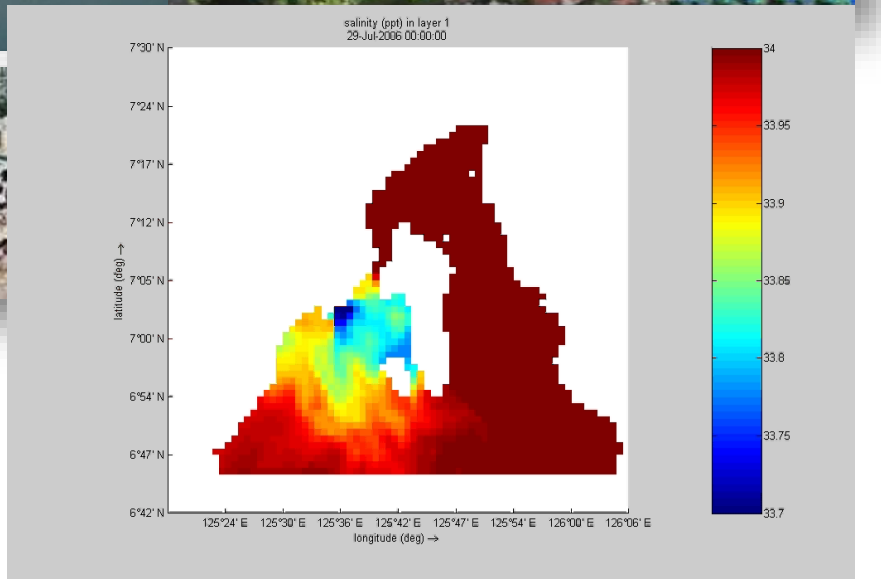
Ridge to Reef & H20

- **Consolidating watershed management with Integrated Coastal Management**
- **Highlands to Oceans (H2O)**



10. Share various MPA tools in assessing how far targets

UNDP, DENR, MERF 2004

Sustainable management

- ❑ Management bodies
- ❑ Management plans and ordinances
- ❑ Budgets allocated for CRM
- ❑ Implementation programs functional & effective

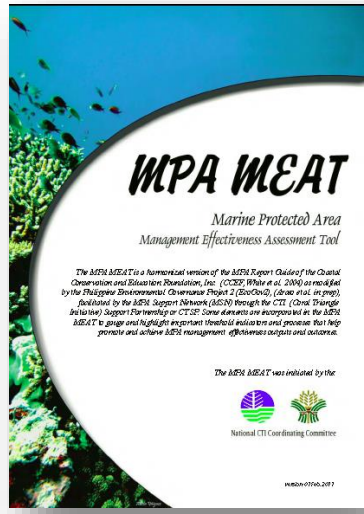
Sustainable Use

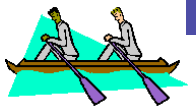
- ❑ Increase fish size, abundance and biomass
- ❑ Adult and larval spillover
- ❑ Improved habitats and ecosystems
- ❑ Regulated use

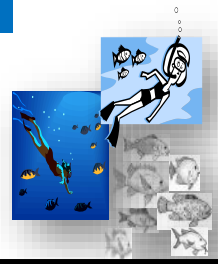
Sustainable Benefits

- ❑ Increased income for beneficiaries
- ❑ Increase in equitable allocation
- ❑ Enhance stewardship arrangements
- ❑ Improved quality of life

Incentives







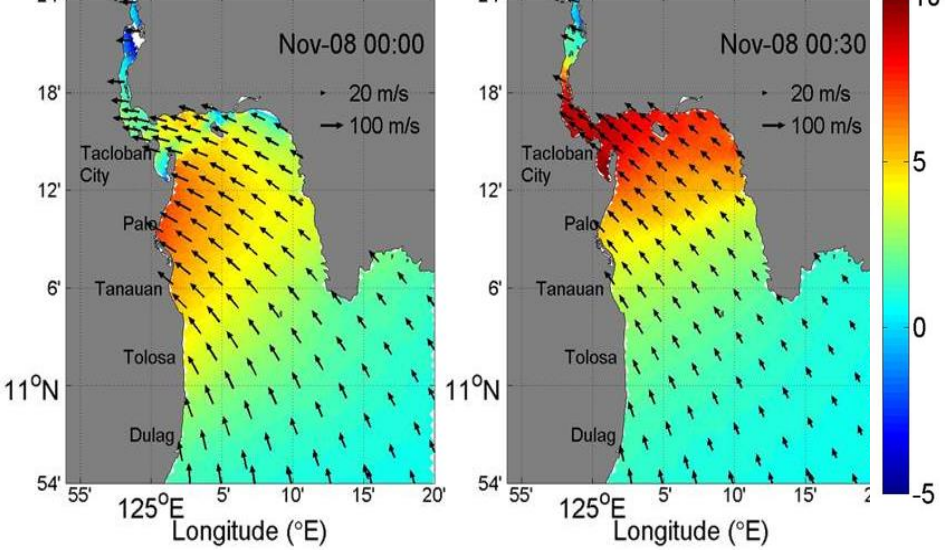
~ 3 – 5 years

~ 5 – 10 yrs

~ > 10 yrs

Sustainable Philippine Archipelagic Development by Improving AIMS Thru Mangrove Ecosystems Management Empowerment

Storm Surge Models and Vulnerability Assessment Tools



Wind vectors (arrows) and sea surface elevation (color contours) from a storm surge model in Tacloban and neighboring towns.

Natural calamities (such as typhoons, storm surges and floods are frequent occurrences in the Philippines. Understanding these events through observations and simulations will help in identifying vulnerable areas and allow careful planning to mitigate impacts on resources and communities

Panoramic shot of storm surge-damaged area in Tacloban City after Typhoon Haiyan(Yolanda)

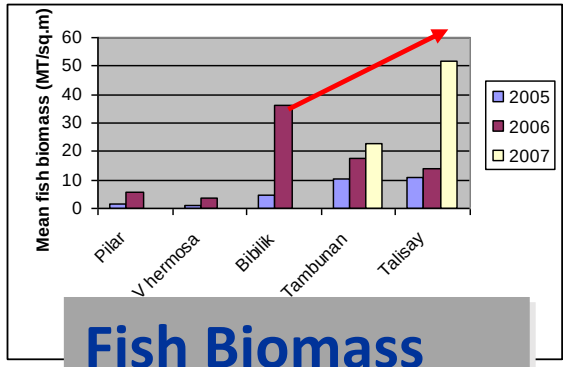
Villanoy et al unpublished

11. Learning from the applications of principles on MPA networks

Sample Benefits Derived from Inter-LGU Collaboration

(Cost for CLE operations per square kilometer of municipal waters)

LGU 1	LGU 2	LGU 3	LGU 4	LGU 5
PhP 528.60	PhP 2,217.68	PhP 879.18	PhP 12,780.53	PhP 293.95

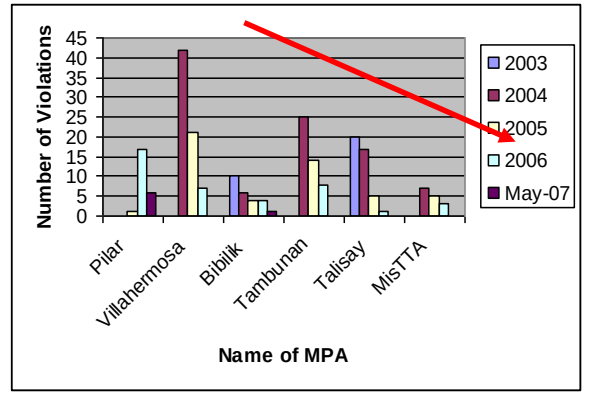


Fish Biomass

Individual LGUs enforcing their respective municipal waters

(effective enforcement up to 5 kilometers)

LGU 1	LGU 2	LGU 3	LGU 4	LGU 5
PhP 467.64	PhP 1,095.14	PhP 418.84	PhP 6,744.44	PhP 242.21



Inter-LGU Coastal Resource Management with joint enforcement

(effective enforcement up to 10 kilometers)

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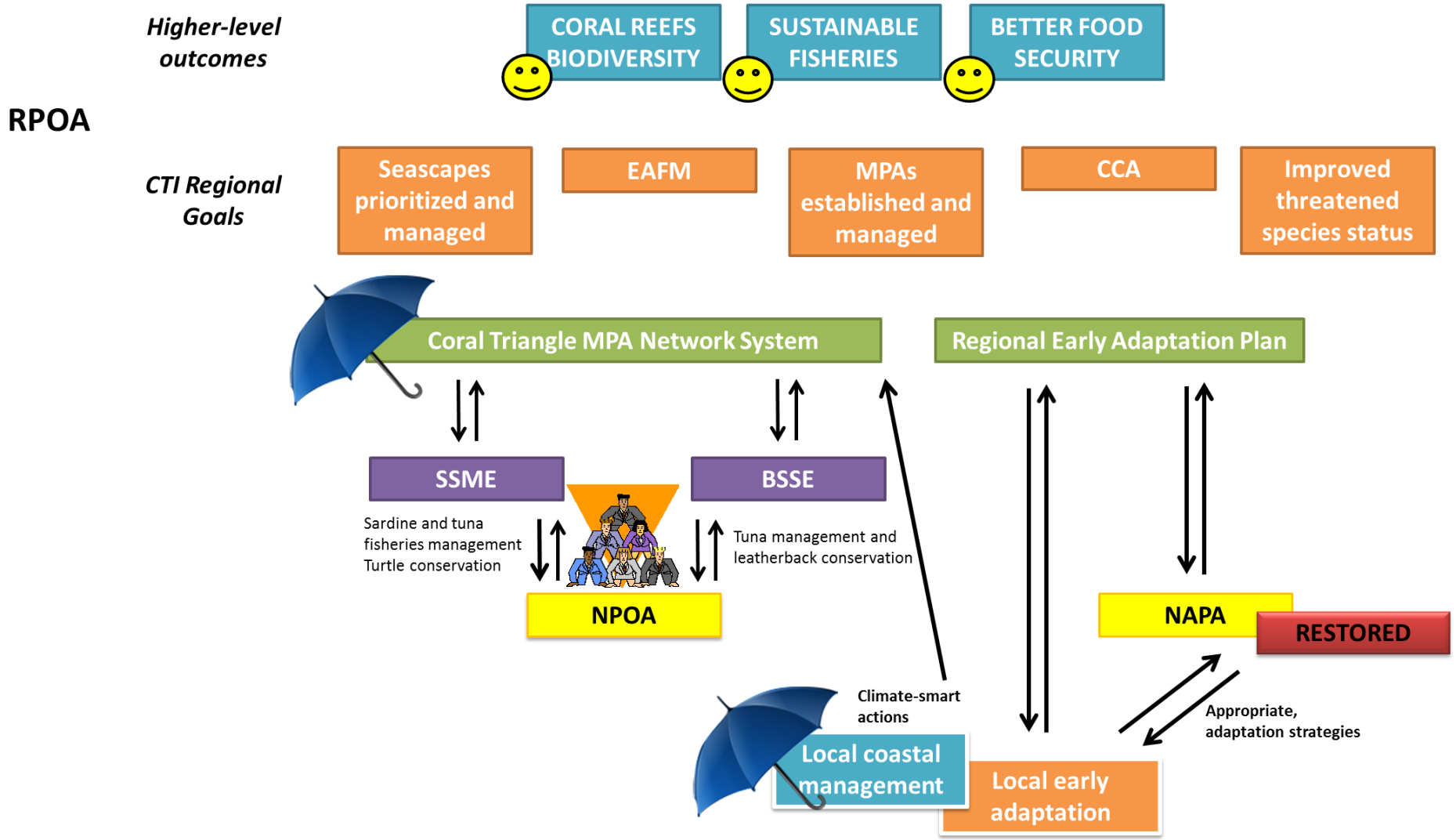
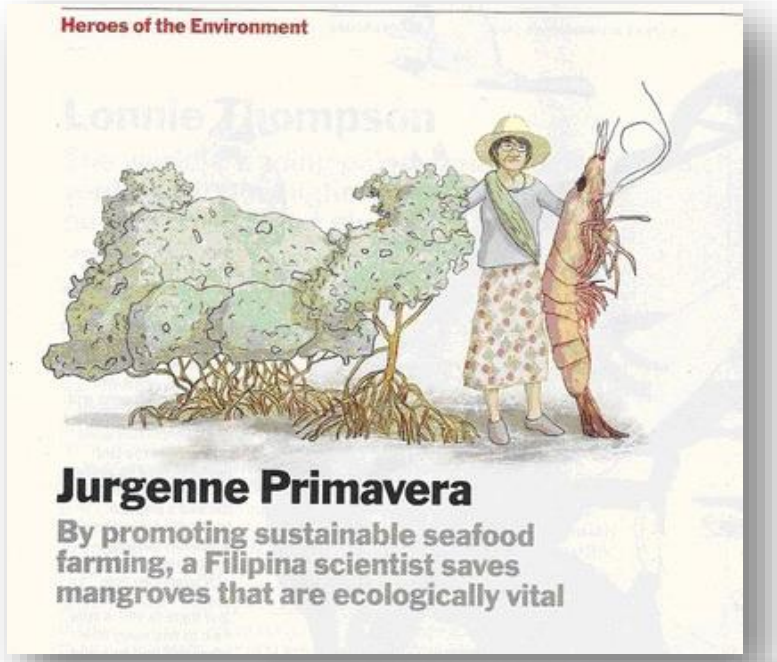
Seascape, MPA networks, CCA, EAFM and Threatened spp.



The Linking of Champions (TLC)

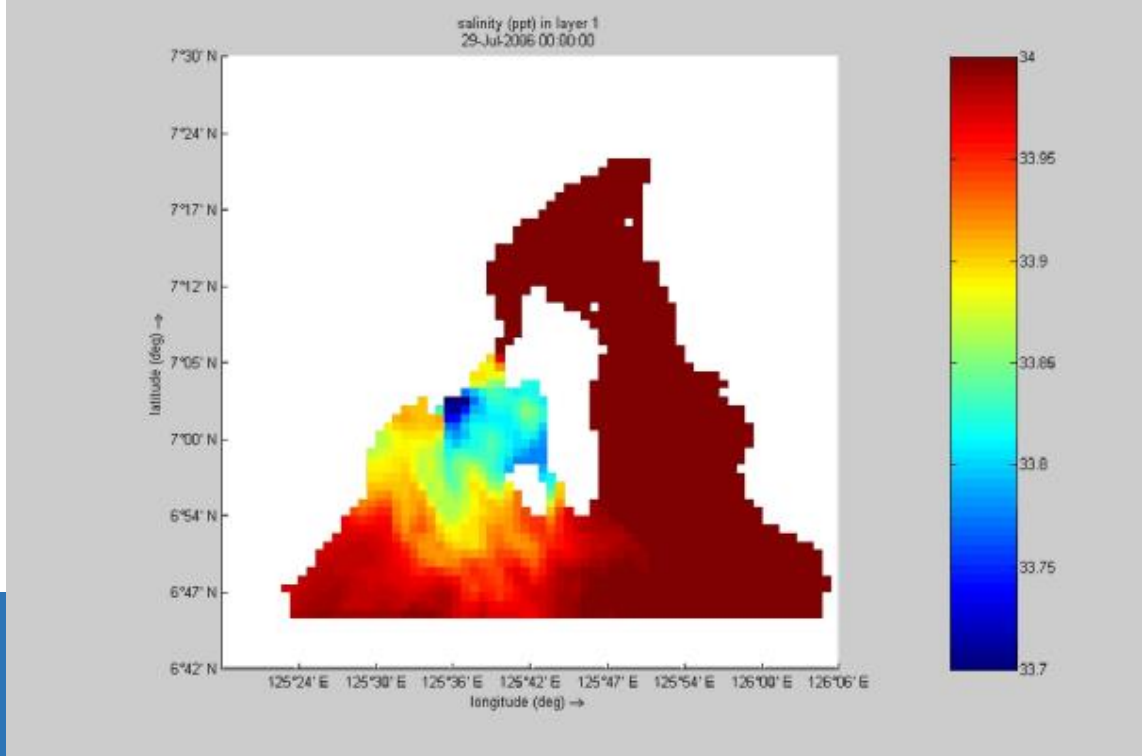


MARINE PROTECTED AREAS SUPPORT NETWORK
MSN

12. MPA/ MPA networks an entry to marine spatial planning

Canaries or Sentinels
(Sentinel Ecosystem of Archipelagic Seas)

- **Many areas under threat from poor land use practices**
- **Siltation, nitrification and pollution profoundly change the habitat**



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Feedback Mechanisms

1. State of the Coasts Report
2. Threat Maps and analysis of threat reduction options
3. Connectivity, value chain maps

MPA Network Design

4. SAP & recommended options & incentives

ACT NOW

STEWARDS (Science & Technology Enhancement for Wise Adaptation & Resiliency Development System)

- **A**ccelerate management effectiveness
- **C**onnectivity complementarity continued
- **T**hreat and disaster risk reduction

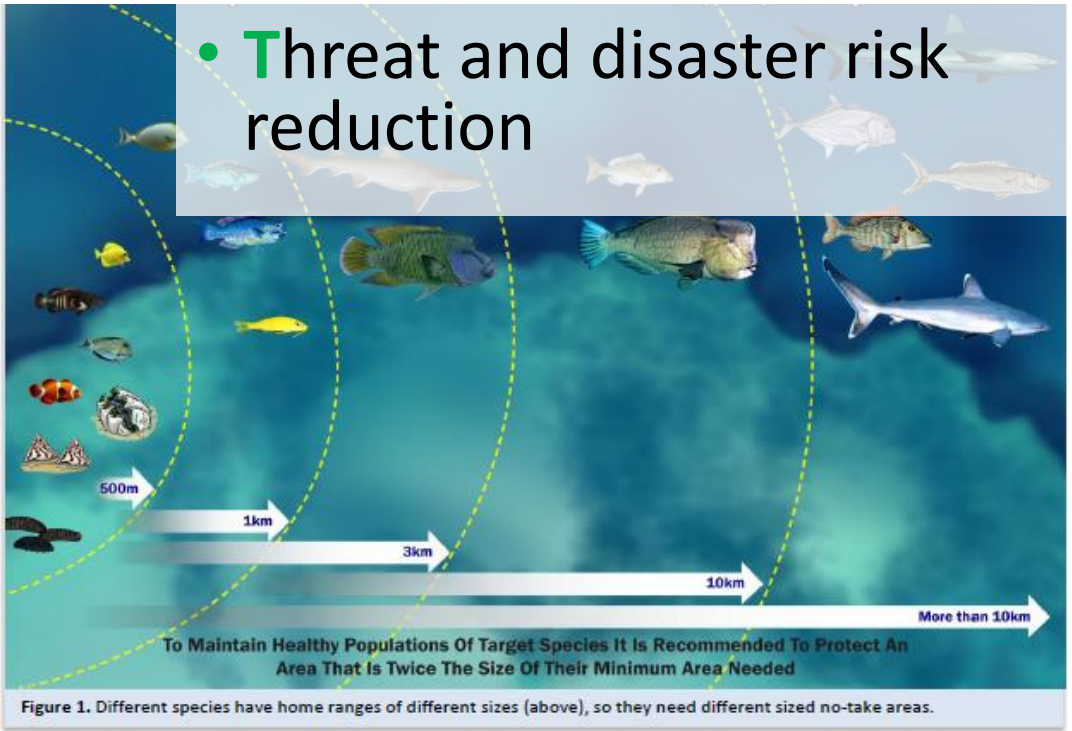
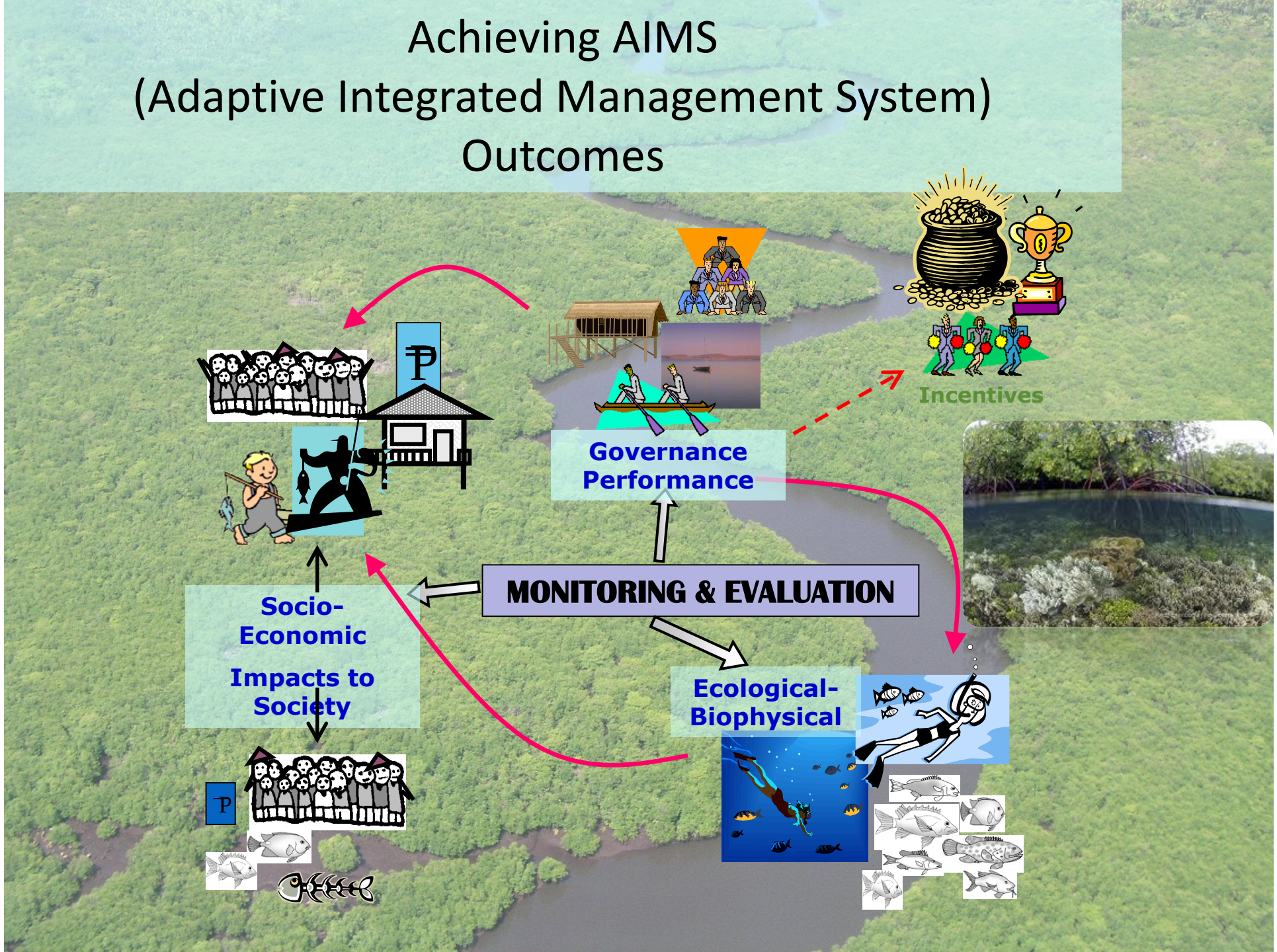


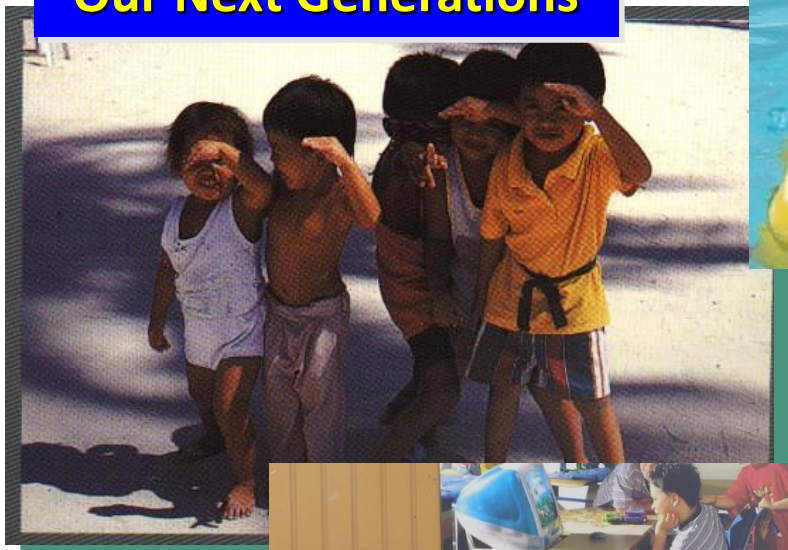
Figure 1. Different species have home ranges of different sizes (above), so they need different sized no-take areas.

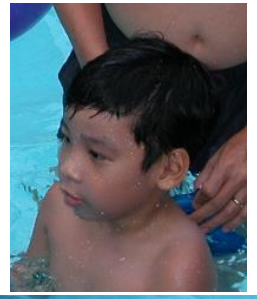
- **N**etworks sustained and institutionalized
- **O**rganizations strengthened and capacitated
- **W**in-win combinations trade offs options for adaptive management

Achieving AIMS
(Adaptive Integrated Management System)
Outcomes



Connectedness for Our Next Generations





Connectedness for Our Next Generations

As in the Indian Proverb:

Remember that we did not inherit this from our fathers we only borrowed it from our children!

THANK YOU

To all our
Friends and Collaborators

Daghang salamat!

Para ka Nemo!
Para sa Lahat

Fish-BE with you...photo by WYLicuanan