Promoting Sustainable Coastal Rehabilitation: Lessons Learned from Community-Based Mangrove Management Practices in the Philippines

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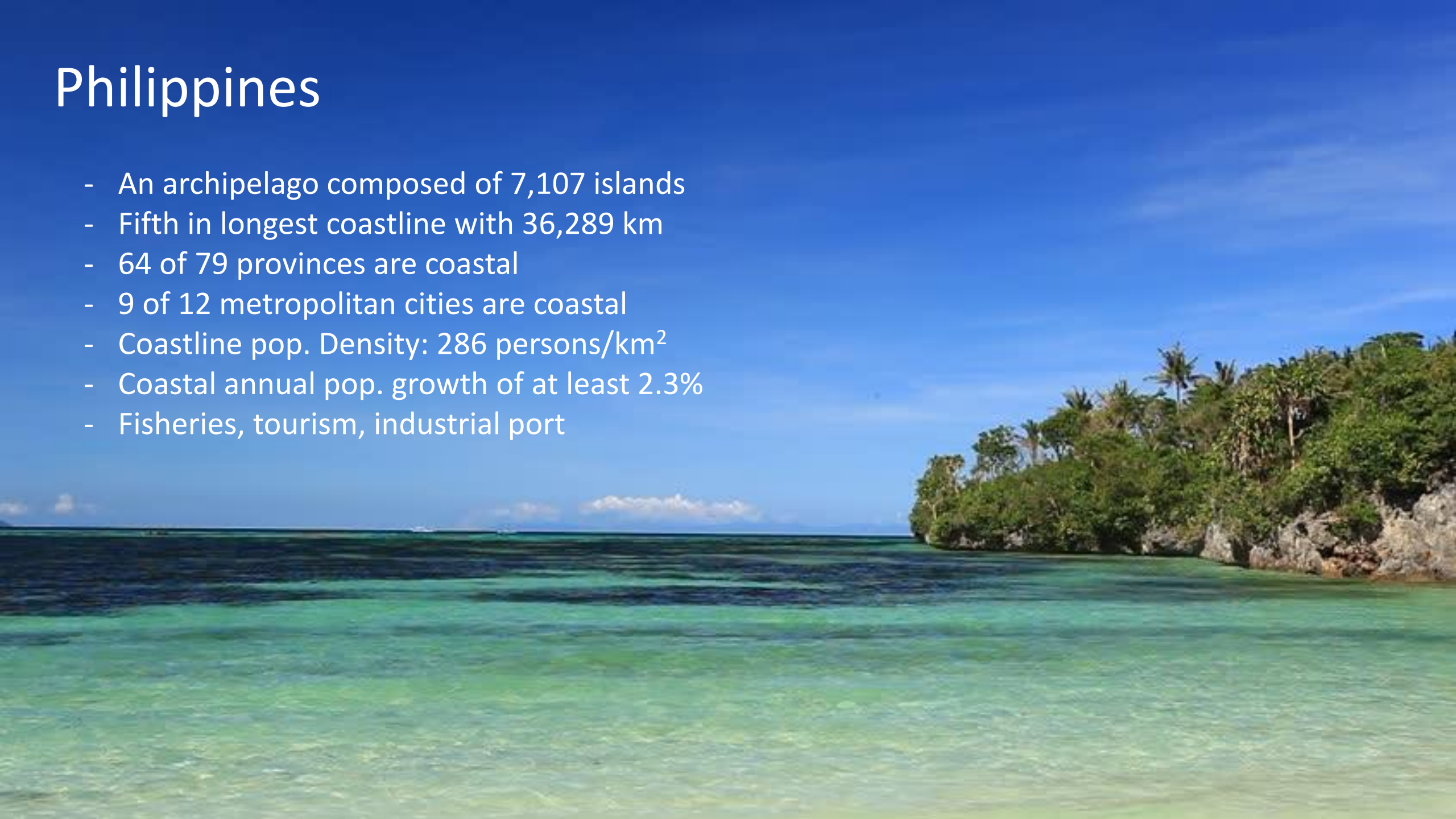
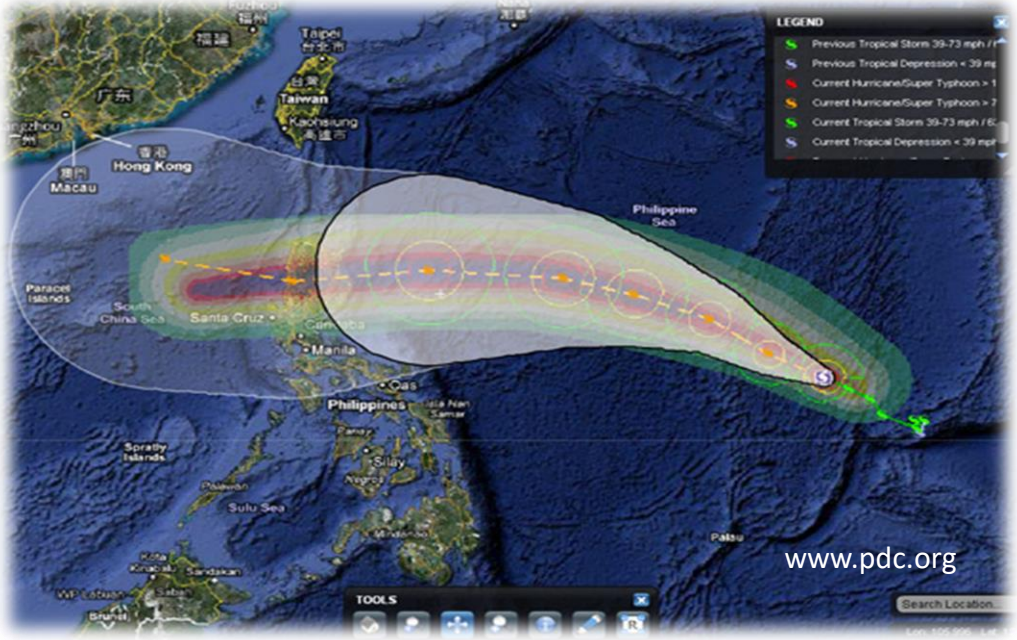
Philippines

- An archipelago composed of 7,107 islands
- Fifth in longest coastline with 36,289 km
- 64 of 79 provinces are coastal
- 9 of 12 metropolitan cities are coastal
- Coastline pop. Density: 286 persons/km^2
- Coastal annual pop. growth of at least 2.3%
- Fisheries, tourism, industrial port



In the context of Climate Change

- *Philippines* tops the 2015 Global Climate Risk Index
- Annual average number of typhoons is 19 to 20
- El Niño and La Niña become more severe and frequent



www.pdc.org

www.wheninmanila.com

Date: Nov 8, 2013

Type: Category 5

Wind speed: 230 km/h (145 mph)

Storm surge: 5.2m (17ft)

Fatalities: 6,241 confirmed;
1,785 missing

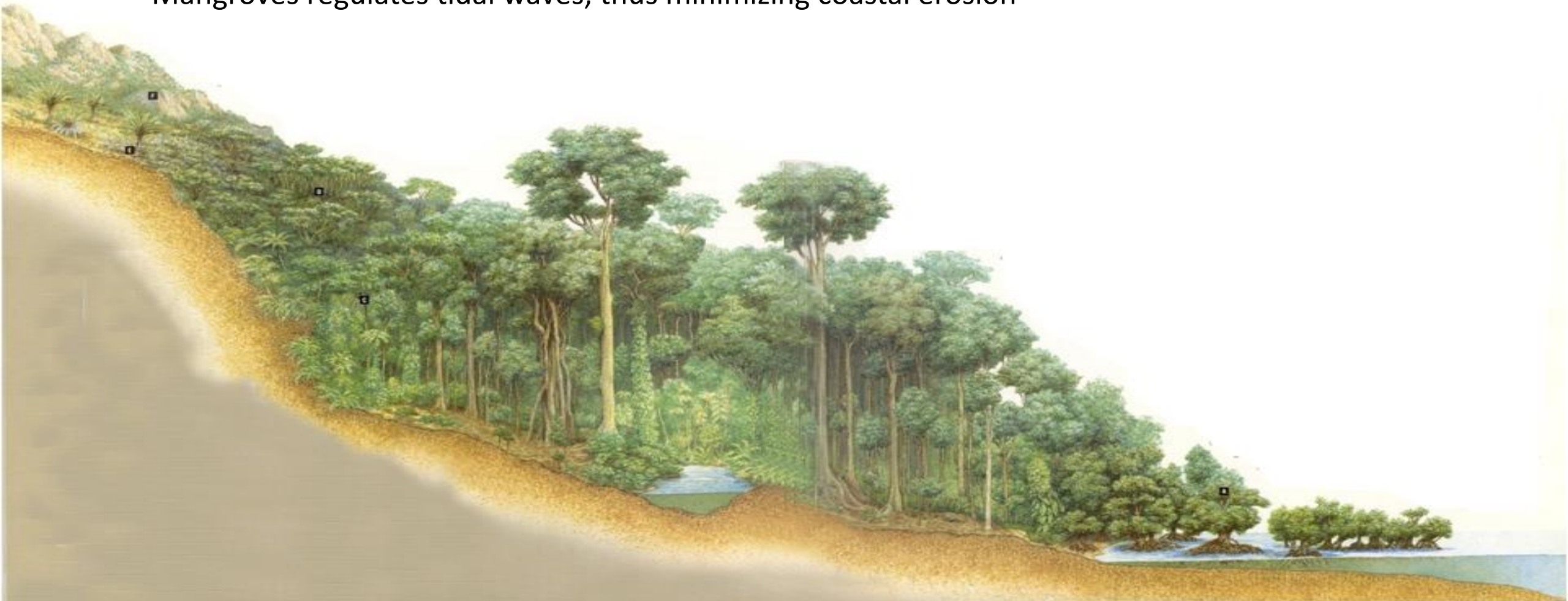
Damage: $1.5 billion

Typhoon Haiyan

Source: NASA

Tropical Watershed Landscape

- Upland forests capture rainwater, recharge ground water
- Good upland cover keeps soil from eroding
- Eroded sediment are trapped and filtered by mangroves thus protecting coral reefs
- Mangroves regulates tidal waves, thus minimizing coastal erosion



Mangrove

- **Forest ecosystem** along coastal sediment and brackish river habitats exclusive in tropic and subtropic regions (latitudes 25° N and 25° S)

- **Landuse** between terrestrial and marine communities, which receive a daily input of water from the ocean (tides) and freshwater, sediments, nutrients and silt deposits from upland rivers

- Halophytic or **salt tolerant plants** in 12 genera, eight (8) families and 110 species





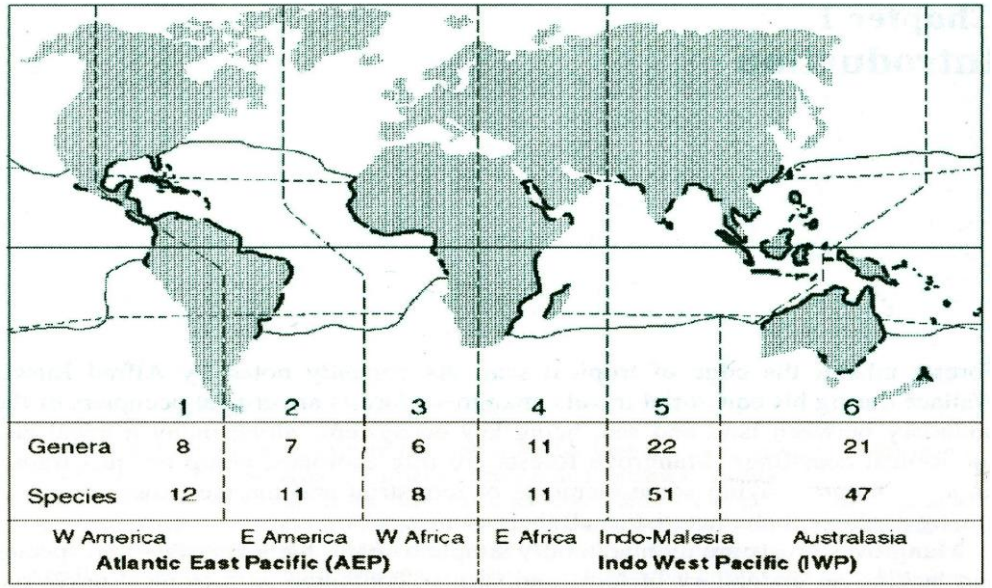
Source: AKECOP-UPLB

Importance of Mangrove

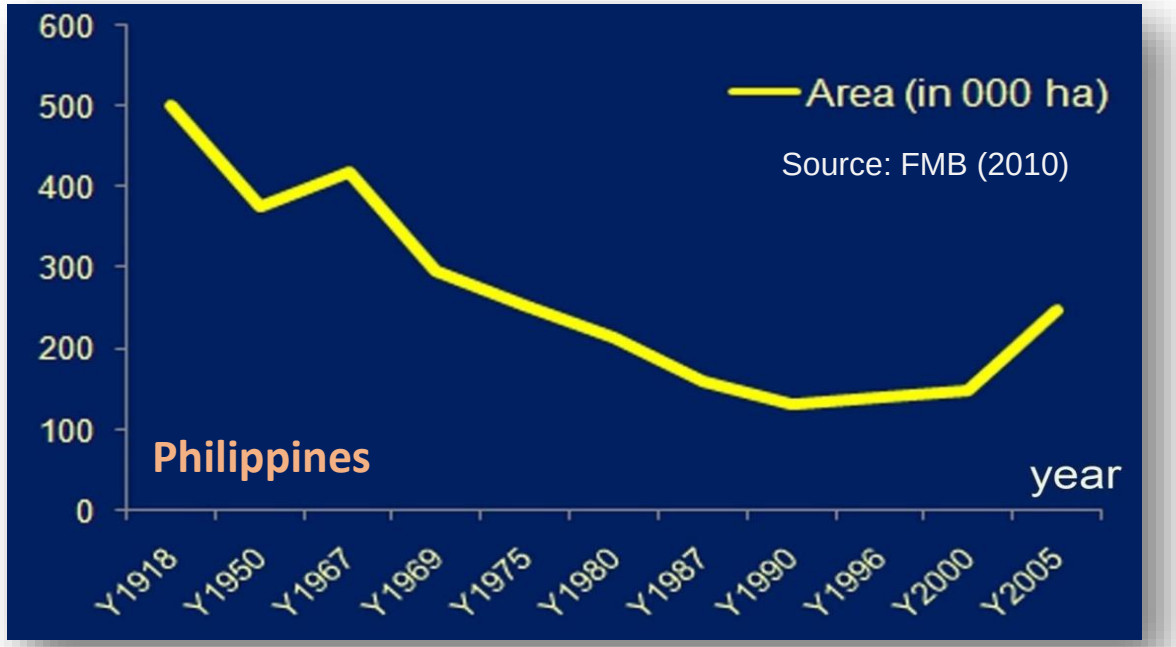
- Habitats, spawning grounds, nurseries and nutrients for a number of marine fauna.
- Timber and non-timber products (medicine, tannins, alcohol, etc)
- Food and income: fish and shellfish of about 90 kg to 225 kg per hectare (FAO, 1994)
- Ecotourism with potentially valuable and sustainable source of local livelihood
- Prevent and reduce coastal erosion
- Protection against harsh effects of wind, waves and water currents
- Global worth of US$ 180.9 billion; US$ 10,000 ha^{-1} yr^{-1} (FAO 2007; Mithapala 2008)
- Carbon storage and sequestration



Global Status



(Source: Spalding *et al.* 1997, Duke *et al.* 1998; Alongi 2010)

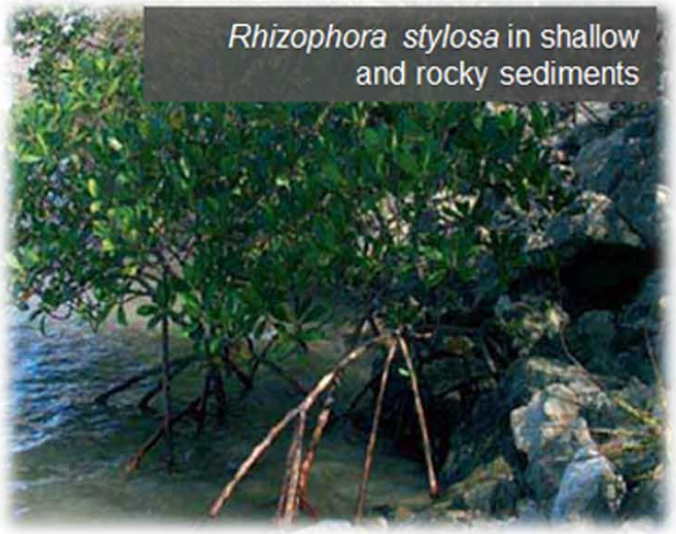


- Currently about 15.2 million ha
- About 18.8 million hectares in 1980
- Most extensive yet greatest loss in Asia
- Annual loss (102,000 ha) is still disturbingly high.

FAO (2007)

- Seventy percent loss (500,000 ha down to 153,577 ha) mainly due to aquaculture.
- Trends are improving in the decade due to recognition of biodiversity and other ecological values.

Common mangrove stand types in the Philippines



Key Mangrove Policies

Commercial cutting is not allowed in all mangrove areas of the Philippines

National Policy:

- **Presidential Proclamation No. 2151 of 1981** whereas mangrove forests are declared as wilderness area.
- **Republic Act 7586** or *National Integrated Protected Areas System Act* (NIPAS of 1992) whereas, all wilderness areas became protected areas.
- **Republic Act 7161** or *Act of Incorporating Certain Sections of the National Revenue Code* in 1991 whereas cutting and selling of mangrove wood is banned;

Department / Ministry policy:

DAO 10 (1998): Guidelines on the establishment and management of Community-based Forest Management (CBFM) Project within mangrove areas whereas **Section 3 allows cutting on planted mangroves.**

Rationale

- Over the past 2 decades, there had been significant interests and efforts in rehabilitating denuded mangrove areas in the Philippines.

- Survival rate of planted mangroves among mangrove rehabilitation initiatives was generally low (10-30%) due to use of inappropriate species & poor site selection, despite heavy budgets allocated for massive rehabilitation projects.

- Challenges in mangrove rehabilitation:
  - Inadequate local stakeholders' participation
  - Limited awareness on ecological preferences in mangrove planting
  - Low awareness on the potential benefits of conserving mangroves
  - Lack of political enforcement of laws related to mangrove initiatives
  - Conflicting policies on mangrove conservation and utilization

- There is an urgent need to understand how mangrove rehabilitation and conservation can be sustained.

Objectives

- Elicit relevant issues and challenges that face mangrove rehabilitation and management
- Describe the best community-based practices in coastal conservation; and
- Recommend strategies to achieve sustainable mangrove rehabilitation that equitably benefit stakeholders.

Location of the Study

- Iloilo, a province located in the center of the Philippine archipelago which was called the “Queen City of the South”.
- The capital city of Iloilo is the City of Iloilo, which is also one of the major urban centers in the Philippines and nicknamed “the Heart of the Philippines”.
- The province comprises the southeastern part of Panay Island with island-province of Guimaras just across its coast.

Source: ArcGIS Online and Google Earth Data
SIO, NOAA, U.S. Navy, NGA, GEBCO
Image © 2019 TerraMetrics

Study Site 1: Barotac Nuevo

Local Community in Partnership with Academe

- Originally consisted of mangroves containing species such as *bakhaw (Rhizophora spp)*, *bungalon (Avicennia marina)*, *pagatpat (Sonneratia alba)*, and *lapis-lapis*. (*Ceriops decandra)*

- Mangroves were destroyed and converted to fishponds

Study Site 2: Katunggan Park

Local Community in Partnership with Local Government Unit

- Conversion to fishponds, damage from typhoons, and the cutting of mangroves due to the lack of people's awareness of its ecological value

- Initiative to rehabilitate began with the initiative of an environmental NGO to find a site of abandoned and damaged fishponds within the municipality for its planned mangrove rehabilitation project

Before and after rehabilitation

Unrehabilitated area outside of the park

Study Site 3: Taklong Island National Marine Reserve (TINMAR), Guimaras

Local Community in Partnership with the Department of Environment & Natural Resources

- TINMAR is comprised of coral reef (fringing) mangroves, seagrass, algal bed and deep water.

- TINMAR failed to meet the criteria of being a “National Marine Reserve” due to illegal activities such as blast fishing, and construction of fish corral.

Participatory Mangrove Rehabilitation

STEP 1

Local Site Coordination

STEP 2

Comprehensive Site Assessment

STEP 3

Participatory Mangrove Rehabilitation Planning

STEP 4

Participatory Project Implementation

STEP 5

Participatory Monitoring and Evaluation

People's Organizations (POs) and Key Informants

Case Study Site	People's Organizations that participated in the FGD
Katunngan Ecopark, Leganes, Iloilo	Community Based Mangrove Seedlings Growers Association
Taklong Island Marine Reserve	San Roque Coastal Environment Program Association, Inc. (SARCEPA)
Jalaud, Barotac Nuevo, Iloilo	Jalaud Fisherfolk's Association

Key Findings

Biophysical and socio-institutional factors contributing to mangrove rehabilitation challenges

Bio-physical

- No scientific basis for species and site selection, planting protocol
- Planting of exotic species
- Polluted coastal areas and illegal mangrove cutting

Socio-institutional

- Target-driven projects
- Planting guidelines are not usually followed
- Delayed release of funds
- Conflict of goals and interests
- Lack of institutional model for mangrove rehabilitation

Key Findings

- Sufficient conditions or best practices towards sustainable mangrove rehabilitation

Taklong Island National Marine Reserve (TINMAR)

- Practice of bayanihan system or volunteerism
- Regular monitoring system and meetings
- Strong support from LGU and national government agencies
- Increasing awareness on the importance of mangroves
- Inculcating a sense of ownership

Katunggan Ecopark

- Establishment of T-fence
- Species selection
- PO formation and capacity building
- LGU as champion in mangrove rehabilitation
- Science-based rehabilitation training
- Long-term survival instead of “just survival”

Jalaud, Barotac Nuevo

- Technical/science-based planting
- Planting methods are open for innovation from the community
- Active local participation from planning to project implementation
- Venue for learning mangrove rehabilitation

Conclusions and Recommendations

- Current policies underscore that mangrove protection and rehabilitation are of paramount interest as far as coastal resource management is concerned.

- The case studies in the Philippines provide insights on how a deforested mangrove area can be reverted back to forests.

Conclusions and Recommendations

Factors contributing to successful reversion of mangrove cover:

1) strong commitment among stakeholders
2) leadership to initiate, manage, and politically support the ground-level efforts
3) cooperation through mutual understanding of goals and project outcomes
4) interdisciplinary research assessment team,
5) strict implementation of a science-based planting scheme
6) enabling policies and its enforcement
7) strong networks among key stakeholders

Acknowledgements

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Thank you for Listening

References

- Andersson, K., Benavides, J., & Leon, R. (2014). Institutional diversity and local forest governance. *Environmental Science & Policy*, 61-72. doi:10.1016/j.envisci.2013.07.009
- Barnuevo, A. P. and Sadaba, R.B. 2014. Recovery of mangrove deforested areas from M/T Solar oil spill in Guimaras, Philippines. 2014 INTERNATIONAL OIL SPILL CONFERENCE
- Garcia, K., Malabrigo, P., & Gevana, D. (2014). Philippines' Mangrove Ecosystem: Status, Threats, and Conservation. In *Mangove Ecosystems of Asia: Status, Challenges and Management Strategies* (pp. 81-94). New York: Springer Science
- Melana, D., Melana, E., & Mapalo, A. (2005). Mangrove Management and Development in the Philippines. *Paper presented during the meeting on "Mangrove and Aquaculture Management".* Kasetsart Unive. Campus, Bangkok, Thailand
- Primavera, J., & Esteban, J. (2008). A review of mangrove rehabilitation in the Philippines: successes, failures and future prospects. *Wetlands Ecol Manag, 16*(3), 173-253
- Pulhin, J., & Inoue, M. (2007). Three decades of community-based forest management in the Philippines: emerging lessons for sustainable and equitable forest management. *International Forestry Review, 9*(4), 865-883. doi:10.1505/ifor.9.4.865