Marine and Coastal Ecosytem

scpw
society for the conservation
of Philippine wetlands

Presentation Outline

I. Overview on Coastal Wetland Ecosystems

- A. Corals
- B. Mangroves
- C. Seagrass Beds
- D. Lagoons and estuaries
- E. Beach and Foreshore areas

II. The Role of Coastal Wetlands Roles in Climate Change Mitigation and Adaptation and Disaster Risk Reduction and Management

- A. Food Security
- B. Natural Infrastructure
- C. Source of Livelihood
- E. Habitat for Biodiversity

III. Introduction to Coastal Resource Management

- A. Importance
- B. Participatory Activities

I. Overview on Coastal Wetland Ecosystems

What is Coastal Wetland?

- Area where the land meets the sea or ocean including nearby coastal waters and shoreline ecosystems (Deguit et. al., 2004)

- Ecologically diverse and economically important ecosystem comprising of coral reefs, sea grass beds, beach, mangroves, lagoons and estuaries

A. Corals Reefs

-"Rainforest of the sea"
-Host nearly a million of marine species in wider life forms
-The Philippines coral reefs harbors more than 2,000 species of fish, 5,000 species of clams, snails and other mollusks, 488 species of corals; 981 algae species, thousands of other marine organisms.

Did you know that corals are not plants or rocks? They are actually small animals called polyps , relatives of jellyfishes and anemones!

A. Corals Reefs

Tubbataha Reefs

One (1) square kilometers of healthy coral reefs can produce up to 20 tons of fish per year. When destroyed, it can only generate 4 tons of fish a year (Deguit et al., 2004)

A. Corals Reefs

Threats

- Increase in global temperature
- coral bleaching
- ocean acidification
- Illegal fishing

Surveys in 1980s to 1990s showed that 75% cover of coral reefs in the country were degraded (Deguit et al., 2004)

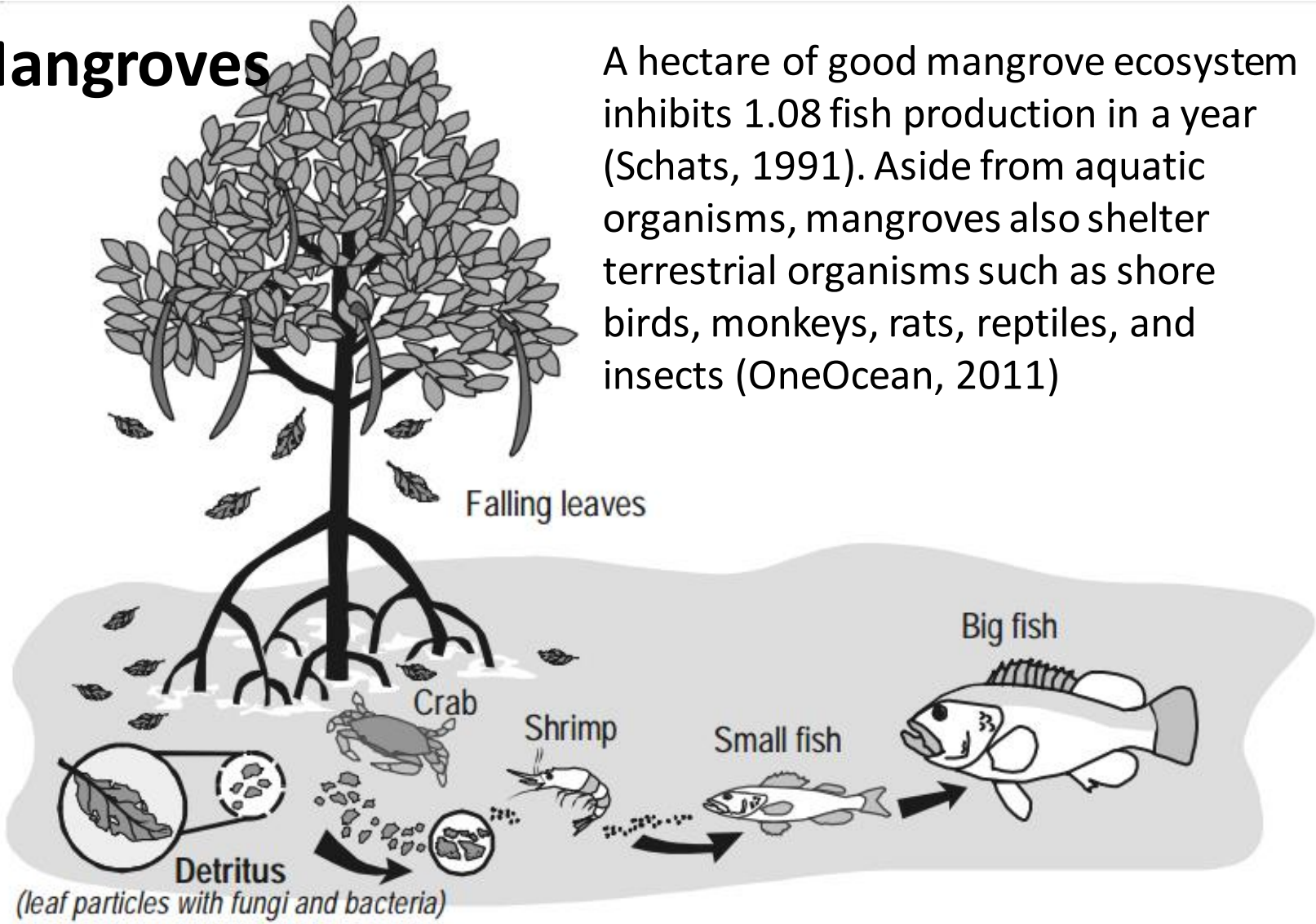
It takes 10-15 years before damaged coral reefs can recover. Sadly, some can't recover at all.

B. Mangroves

Mangroves are home and breeding grounds of huge variety of fishes, crustaceans and other wildlife. About 75% of fish species can be supported by these mangroves serving as habitat and source of food (OneOcean, 2011)

B. Mangroves

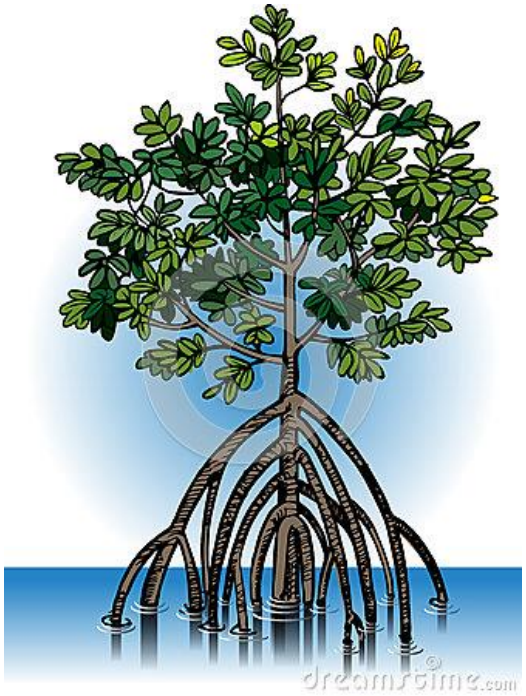
A hectare of good mangrove ecosystem inhibits 1.08 fish production in a year (Schats, 1991). Aside from aquatic organisms, mangroves also shelter terrestrial organisms such as shore birds, monkeys, rats, reptiles, and insects (OneOcean, 2011)



Mangrove Detrital Food Chain

(DENR et al. 2001 as cited by onecean.org, n.d)

B. Mangroves



Rhizophora

Avicennia marina

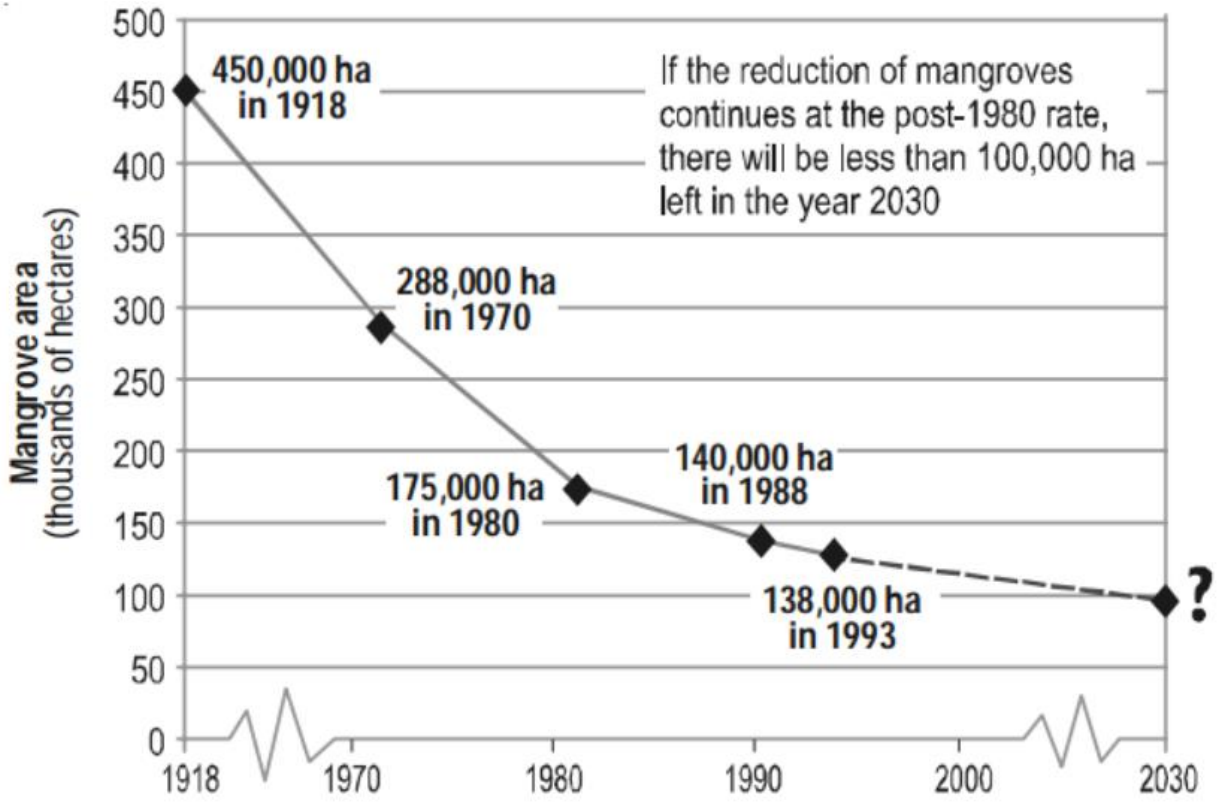
Two Major Mangrove Species

B. Mangroves

Other uses:

- Pollutants absorber
- Natural wastewater filters
- Good source of building materials
- Firewood and charcoal
- Provides tannins for coating and preserving woods

B. Mangroves at risk



Decline of mangrove resource in the Philippines. (DENR 1998; White and de Leon 2004; White and Cruz-Trinidad 1998)

This have been aggravated by continuous expansion of aquaculture, specifically fishponds, firewood and charcoal making, mangrove land conversation into commercial industries, ports, unsustainable tourism, and human settlements (OneOcean, 2011).

C. Seagrass Beds

Seagrasses live in shallow waters where sunlight can easily penetrate for photosynthesis (Teach Ocean Science).

C. Seagrass Beds

Seagrasses support the production of marine organisms of atleast:

- 172 species of fish
- 46 species of invertebrates
- 51 species of seaweeds
- 45 species of algal epiphytes
- 1 species of sea turtle
- 1 species of Dugong

C. Seagrass Beds

Threats:

- *Land use activities (reclamation and improper shoreline development)*
- *Increased human settlements along coastal areas*
- *Use of destructive fishing gears*
- *Sedimentation and siltation from upland areas; and*
- *Introduction of water borne pollutants.* (OneOcean.Org, 2011)

D. Lagoons and Estuaries

Source: geowiki.ucdavis.org

Lagoons are part of the coastal water that are separated and partially enclosed with a barrier (Miththapala, 2013). On the other hand, estuaries are the areas of intersections of freshwater and seawater and like lagoons, it is also semi-close area in the coast (Miththapala, 2013).

D. Lagoons and Estuaries

Source: bestourism.com

These lagoons and estuaries have roles in transportation of organic materials and nutrients and are essential to the lifecycle of the crustaceans and other marine organisms (Deguit et al., 2004). Furthermore, they are a good site for economic activities such as fishing, mariculture, recreation, etc. (Deguit et al., 2004).

D. Lagoons and Estuaries

El Nido, Philippines

Lagoons and estuaries *may rank now among the most heavily impacted aquatic ecosystems on Earth* (Kennish and Paerl, 2010 as cited by Miththapala, 2013).

Human induced activities such as point and non-point pollution, unplanned and uncontrolled development aggravated by overpopulation and worsening the impacts of extreme weather events are degrading this ecosystem (Miththapala, 2013).

E. Beaches and foreshore areas

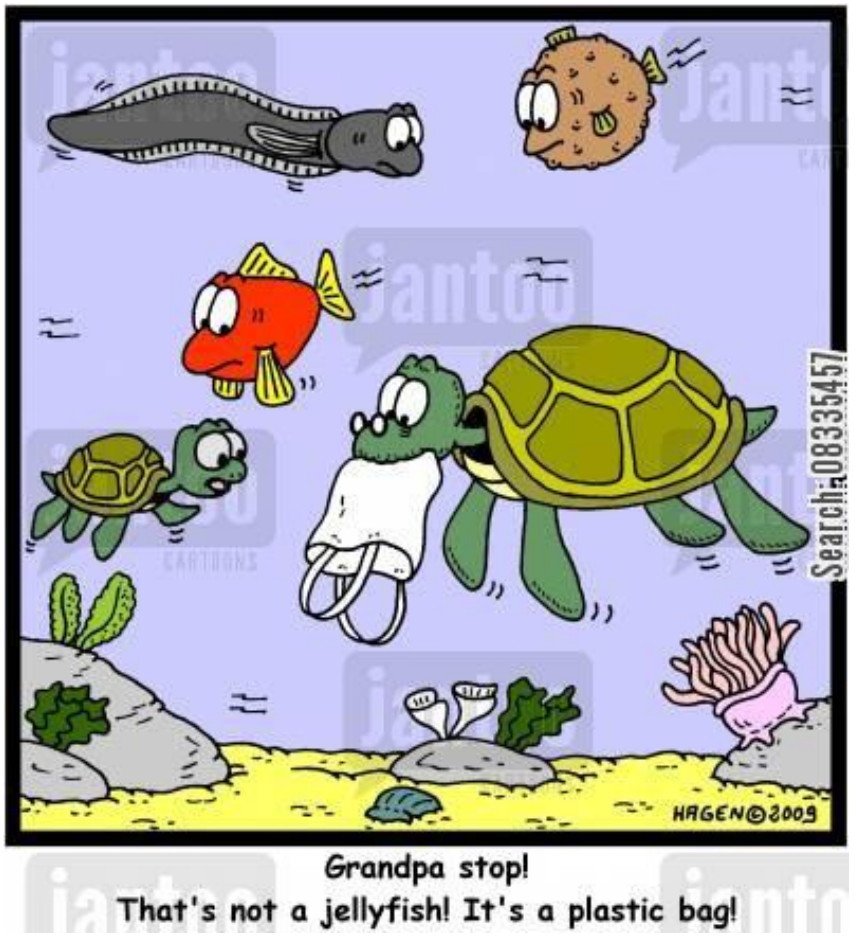
Calaguas Beach

Boracay

Aside from their aesthetic value, these ecosystems are support systems and breeding ground for aquatic and terrestrial organisms like fishes, turtles, and birds; transport sediments, serve as buffering zone against extreme weather disturbances, enables nutrient mineralization and recycling, and maintains the biodiversity and genetic resources of organisms, and many others.

E. Beaches and foreshore areas

Foreshore areas and beaches are just appreciated for physical and recreational functions or tourism opportunities, but their environmental and ecological essence is often underestimated (Cartwright and Wilson, 2016).



One of the major threats to these ecosystems is solid waste pollution.

II. The Role of Coastal Wetlands Roles in Climate Change Mitigation and Adaptation and Disaster Risk Reduction and Management

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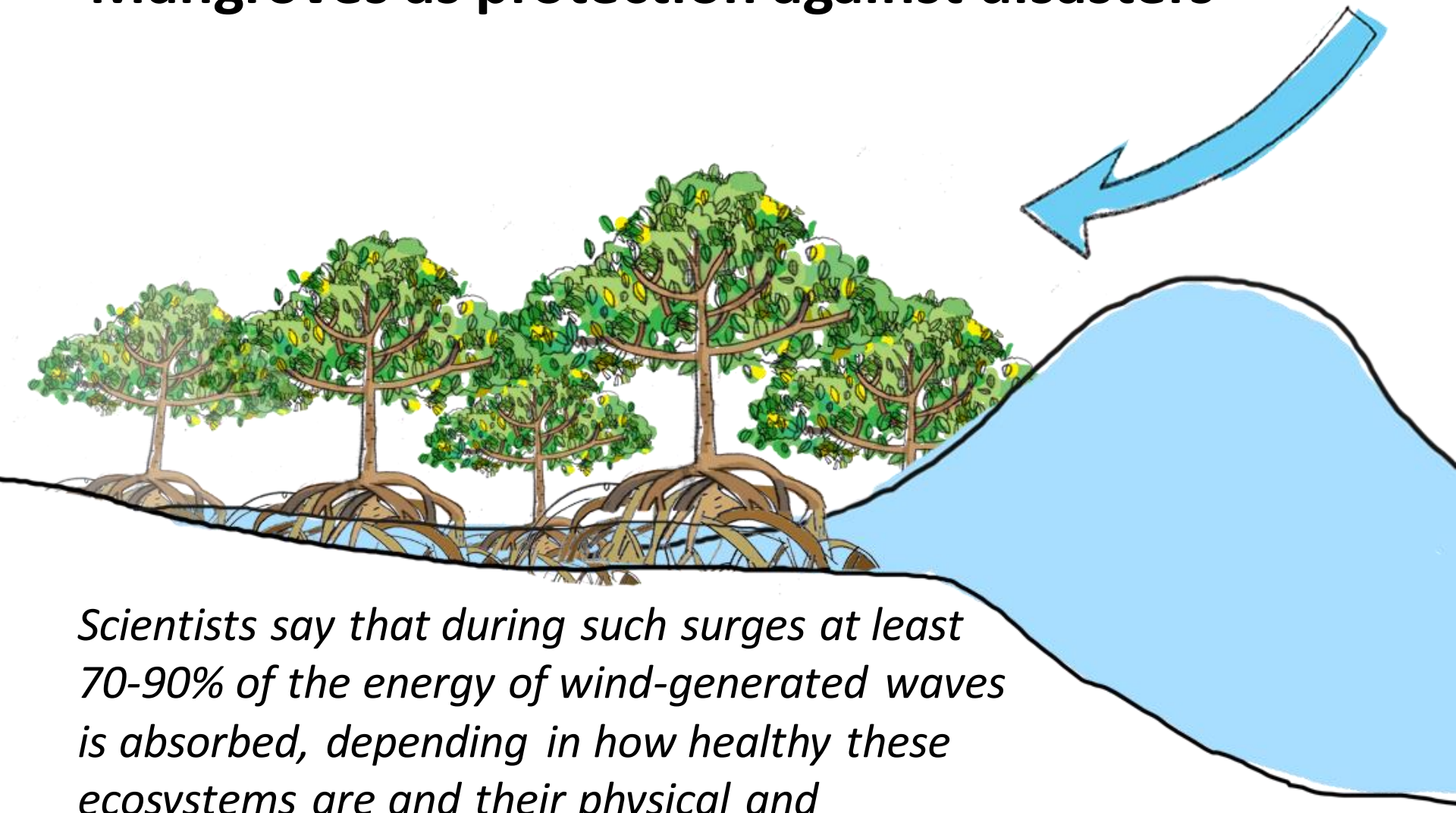
A. Food Security

- Rice, a common wetland plant, is the staple diet for over almost 3 billion people in the world, and accounts 20% of the world's nutritional intake
- There are 19kgs of fish which a human can consume a year.

B. Natural Infrastructure

- Different countries benefited from the coastal ecosystems and saved a lot of their budget for the services that wetlands have provided (WWF,2016):
  - In Carribean, the **coral reefs shoreline protection services** estimated value reached up to **$2.2 billion annually**
  - In the United States, a study of the role of **coastal wetlands in reducing the severity of impacts from hurricanes** showed that there is an estimated value of **US$23.2 billion per year** the coastal wetlands can accommodate on storm protection services (WWF, 2016).

Mangroves as protection against disasters



Scientists say that during such surges at least 70-90% of the energy of wind-generated waves is absorbed, depending in how healthy these ecosystems are and their physical and ecological characteristics (UNEP, 2006).

Image source:mangroveactionproject.org

C. Source of Livelihood

- Wetlands support a vast range of livelihoods - from fishing, farming, tourism and even industries. They provide more than a billion livelihoods in the world (Ramsar, 2016):

  - **660 million** people earn their living from fishing
  - Tourism and travel sectors on the other hand, provide **266 millions of job** composing the **8.9% of the world's employment**
  - Wetlands have also roles on **transportation industry** where **millions of goods and people are being transported** through its water bodies, especially on the coast areas

D. Habitats for Biodiversity

On the marine front, coral reefs are among the most biologically diverse of the land ecosystems. Although they cover only 0.2% of the ocean floor, coral reefs may contain **25% of all marine species**. The biodiversity in wetlands is also valuable as a reservoir of genes and good in researches for medicinal purposes.

III. Introduction to Coastal Resource Management

A. Importance

Coastal Resource Management (CRM) is a holistic approach on intervening the prevalent and interconnected issues and problems affecting coastal environment, through the use of different participatory tools, aiming at slowing down, if not reversing the negative impacts of those problems and issues, and enabling sound decision making for sustainable and wise use of this coastal ecosystems and resources (Deguit et al., 2001).

A. Importance

Listed by Deguit et al., in 2001, below are the key issues addressed by CRM:

- Degradation of coastal habitats
- Open access to fishery resources
- Increased fishing pressure to unsustainable levels
- Destructive/illegal fishing practices
- Coastal law enforcement
- Loss of marine biodiversity
- Inappropriate tourism and coastal/shoreline development practice; and
- Resource use conflicts

B. Participatory Activities

1. Status of Coastal Resources in your Locality

Habitat	Very good	Good	Fair	Poor	Issues and Causes
Coral reefs					
Mangroves					
Seagrasses					
Beaches					
Rivers					

B. Participatory Activities

2. Transect Walk

Habitat Management Parameter	Lowland/ settlement area	Bakawan (mangrove)	Aplaya (beach)	Hunasan (tidal flat)	Damuhan (seagrass bed)	Bahura (reef/ shoal)	Ilalim (deep water)
Mga likas na kayamanan (natural resources)							
Mga uri ng hanapbuhay, mga pagkakataon (types of livelihoods, opportunities)							
Mga suliranin (problems/issues)							

B. Participatory Activities

3. Workshop and group discussion on human impacts/problems in the coastal zone

Activity	Often	Some times	Not happening
Smaller-sized fishes being caught			
Increasing conflicts and discussions between fishing sectors over resource use			
Use of illegal fishing methods/gears			
Fishers traveling longer distances to catch fish			
Cutting of mangroves for firewood, house construction and other domestic uses			
Intrusion of commercial fishing in municipal waters			
Disappearance of once-abundant fish ponds			
Presence of seawalls/coastal construction on foreshore and beach areas			
Siltation			
Domestic wastes in coastal areas			
Agricultural runoffs in coastal areas			
Marine sand mining/quarrying			

THANK YOU!