The Challenge of Climate Change in Guatemala's Coastal Zone

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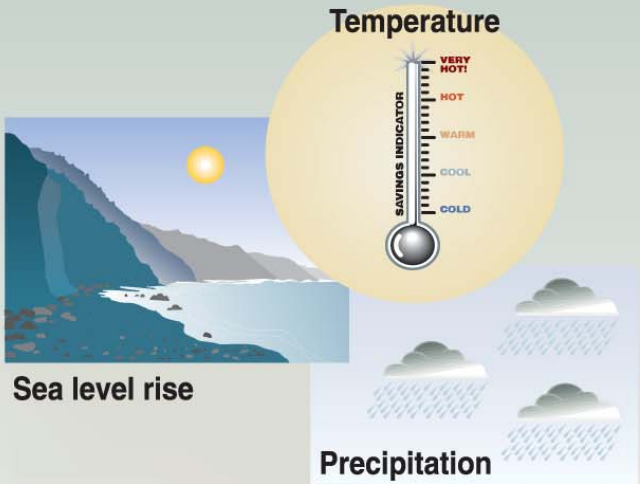
Guatemala is prone to natural disasters

The 2009 Global Assessment Report on Disaster Risk Reduction: Guatemala top **10** countries vulnerable to natural disasters

Potential climate changes impact



Impacts on...

Health

Weather-related mortality

Infectious diseases

Air-quality respiratory illnesses

Agriculture

Crop yields

Irrigation demands

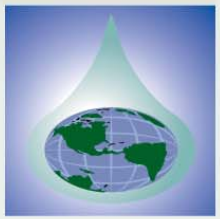
Forest

Forest composition

Geographic range of forest

Forest health and productivity

Water resources



Water supply

Water quality

Competition for water

coastal areas

Erosion of beaches

Inundation of coastal lands

additional costs to protect coastal communities

Species and natural areas

Loss of habitat and species

Cryosphere: diminishing glaciers

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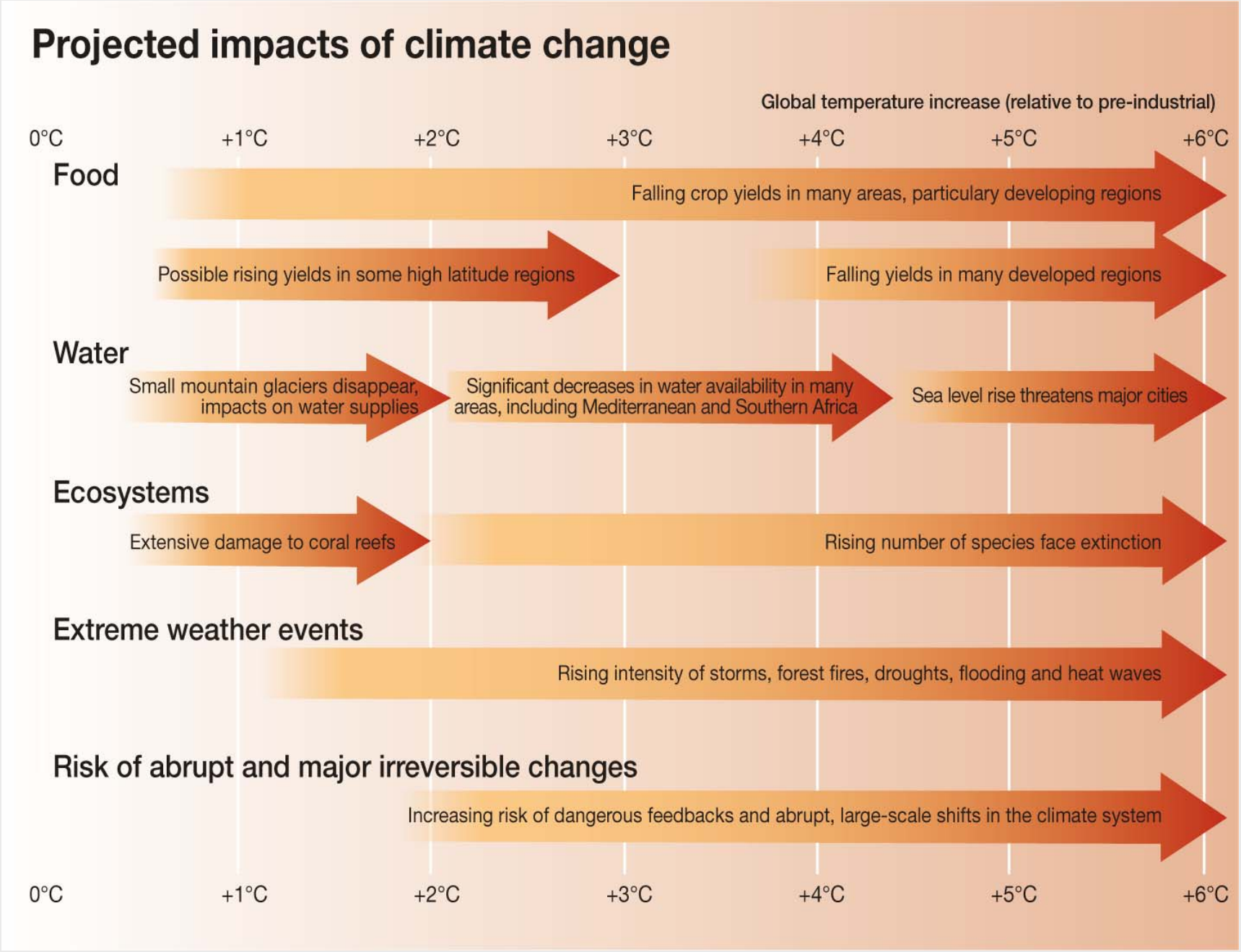
GRAPHIC DESIGN : PHILIPPE REKACEWICZ

Source: United States environmental protection agency (EPA).



Source: Stern Review, 2008

Rains leave scores dead in Central America

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“Authorities say there have been at least 29 deaths, almost **30,000** people forced from their homes and more than **147,000** affected by the rains in Guatemala, declared Sunday to be in a "state of disaster" by President Alvaro Colom.

Central America is one of the areas most vulnerable to natural disasters in the world, and environmental experts have said that the 11 most recent extreme events attributable to climate change have produced losses worth some **US$13.6 billion**.”

Prensa Libre:

34 dead, 7 missing, 175,355 affected and 10,863 evacuated

The effects of climate change:

- Loss of human lives
- The reduction of the availability and exhaustion of the water sources
- The impact and changes in the geographic distribution and plague season, depredators and diseases
- The space modifications in the life zones and in the normal climate conditions
- The alterations and block in the trofic chain (food chain) in the land and marine-cost systems
- Harvest loss and production capacity

Some <u>impacts</u> of climate change:

- Increase of forest fires
- Destruction of infrastructure (floods – landslides)
- Increase of alimentation insecurity
- Loss of natural spaces and habitats
- Environmental social and economic impacts (agricultural, stockbreeding and fishing sectors)

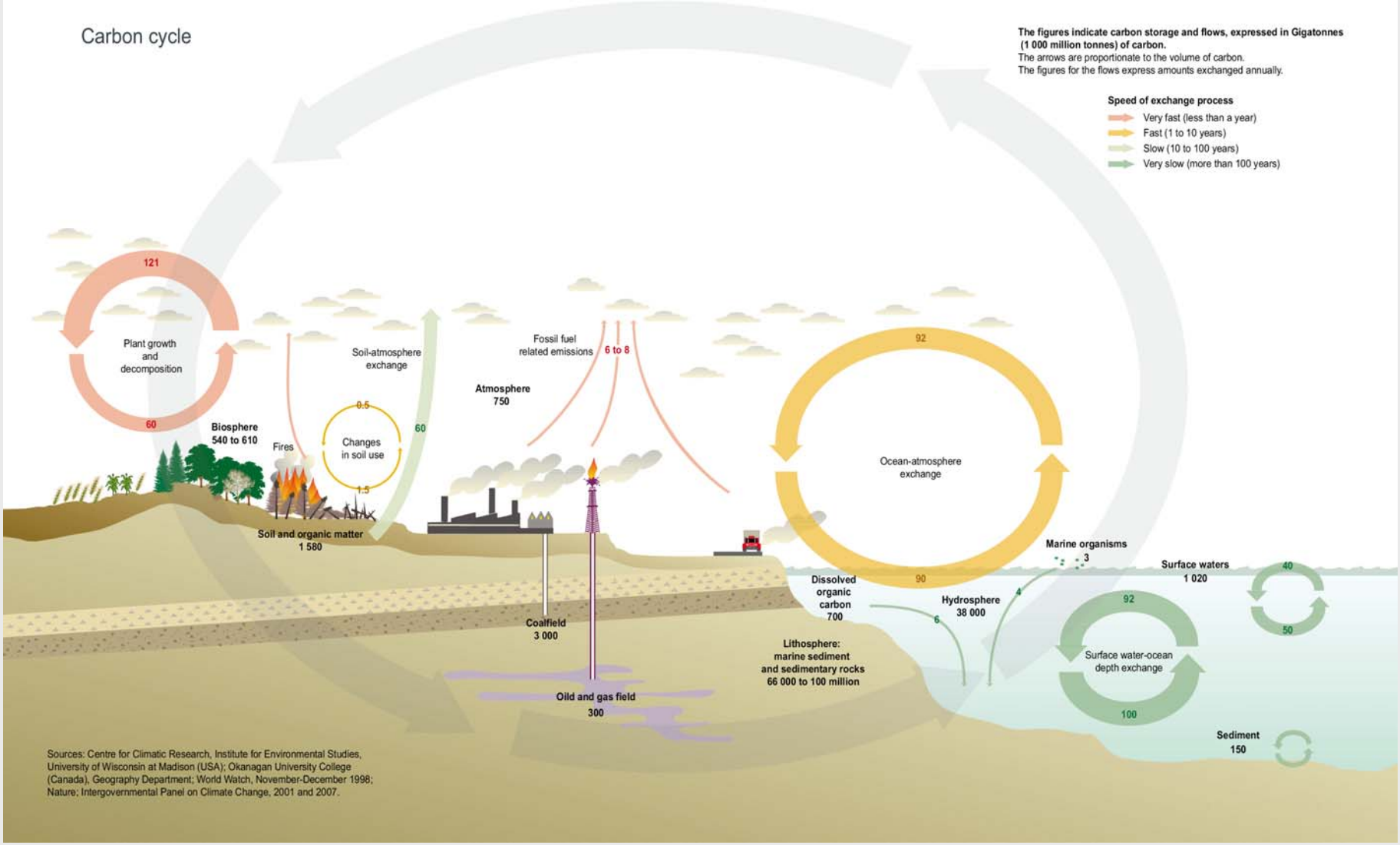
The droughts mainly represent:

- Harvest loss (corncob)
- Food crisis

Impacts of climate change in the Oceans

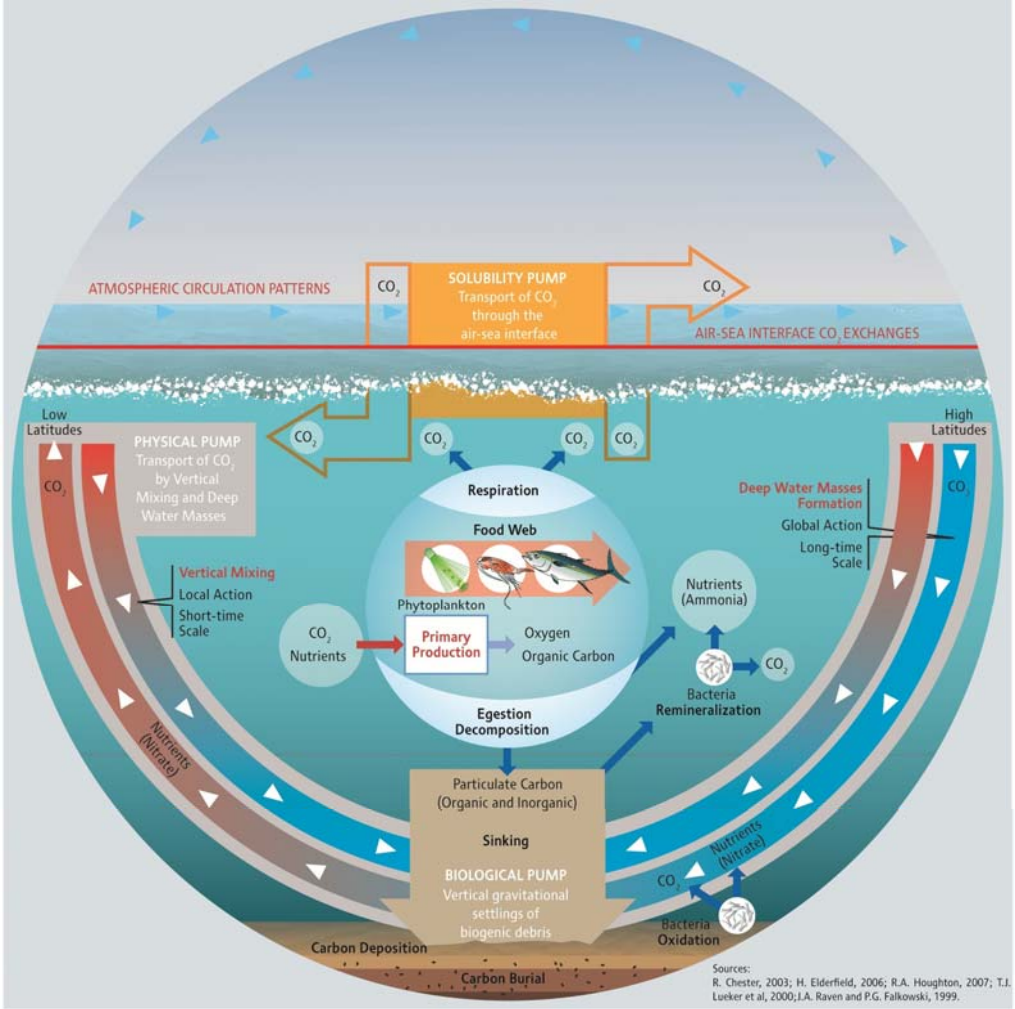
The oceans play a crucial role in the global climate system:

- They generate oxygen and absorb carbon dioxide (CO2) from the atmosphere
- They provide essential goods and services for sustaining life on Earth



The oceans are crucial in the global carbon cycle: they capture over half of all the green carbon (carbon bound by living organisms through photosynthesis)

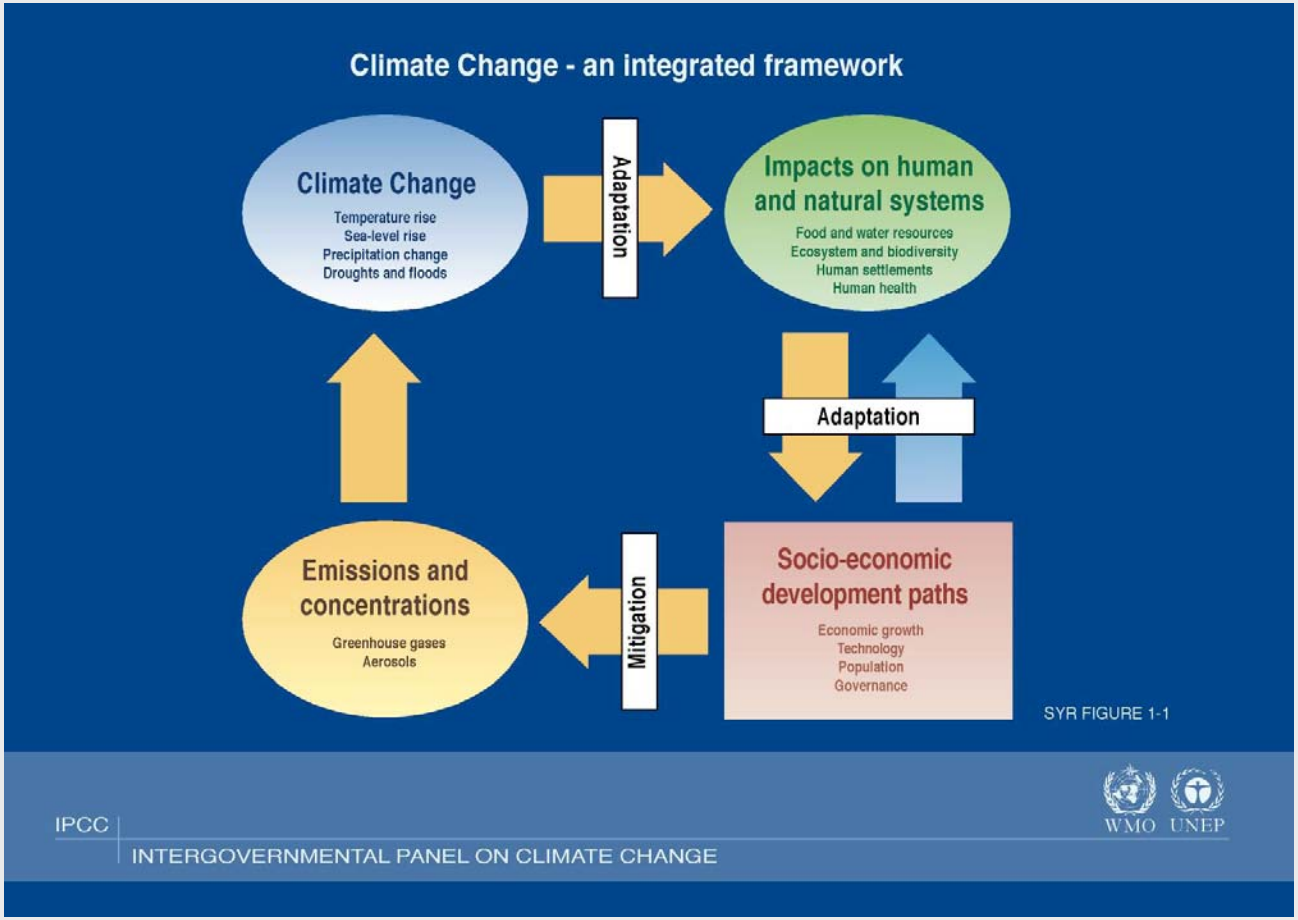
The Carbon Cycle in the World's Oceans: Atmospheric Circulation Patterns



Climate Change Adaptation & Mitigation

Adaptation = Coping with climate change

Mitigation = Emissions reductions



Instruments which facilitate Adaptation and Mitigation

National efforts: reduce the vulnerability and the adaptation to the negative impacts of the climate change:

Force Adaptation and Obligatory Mitigation Climate Change Guatemalan Law

The initiative has been considered as a national emergency a matter of national security

Climate Change Legislation

The Climate Change National Policy

The Scope of the Policy includes the vulnerability reduction to extreme events, the reinforcement of the adaptation capacity, the contribution to the reduction of the GHG and the use of the carbon markets

The Integrated Management of Marine Coastal Zones National Policy

The General Object is that the marine and coastal ecosystems and its hydrographic basins are protected, managed and well used to guaranty the stay and equitable development of the people in the coastal zone

Recommendations for Further Action and Capacity Building

Addressing the Actual Guatemalan Marine Coastal Zone Situation

Approximately 1,012 species of fauna in the Pacific coast exist along with sandy and muddy beaches

Other ecosystems include estuaries and coastal lagoons, as well as herbaceous wetlands, which serve as areas for feeding, refuge, and reproduction for many marine species and as resting areas for migratory birds

The marine coastal area of the Guatemalan Caribbean forms part of the Mesoamerican Barrier Reef Ecoregion, and in addition to coral reefs, it contains mangroves, coastal estuaries and lagoons, and sandy beaches that originate from coral

The population in the coastal region of Guatemala consists of approximately **300,000** people living in 17 municipalities

Guatemalan coastline spreads around 402 km (254 km of Pacific coastline and 148 km of Caribbean coastline), and the Exclusive Economic and Territorial Sea Zone has an area of **120,221.6 km2**

The importance of the country's marine coastal zone is evidenced by the goods and services that it offers, including aquaculture, fishing, sailing, tourism and recreation, commercial services, habitat for biodiversity, and the protection of the coastline

It is estimated that all of those goods and services currently provide the country with between **US $216 million** and **US $314 million** annual revenue

Pinpointing the Problem

Because conservation and sustainable use strategies for natural systems in Guatemala have traditionally been focused on the terrestrial protected areas and the establishment of the marine coastal marine protected areas has fallen well behind, many marine costal species and ecosystems have been put at risk

The most significant threats to marine coastal biodiversity, particularly in the Pacific: contamination caused by unplanned coastal development, unregulated marine transportation, overexploitation of marine coastal resources and loss of habitat and natural cover

Since 1950, mangroves have lost 70% of their original cover (serious implications: reduction of their potential use as breeding areas for fish, mitigation of impacts from climate change, and reduction of impacts from storms and hurricanes)

The size of the marine area currently under protection is inadequate for the conservation of the representative marine coastal ecosystem

The current situation is that there is little capacity for environmental officials to effectively manage the marine coastal ecosystems, particularly within the municipalities

No inter institutional and inter sectoral coordination in developing national and local policies and programs for the protection and sustainable use of marine coastal ecosystems

Lack of protection for marine coastal biodiversity and the loss and degradation of marine coastal ecosystems

The current marine protected areas also have deficiency in proper management and are underfunded

<u>The long term solution</u> to the multiple threats, including climate change, facing the marine coastal biodiversity of Guatemala depends on its effective protection through marine protected areas and the promotion of their sustainable use supported by a strengthened legal and institutional framework, improved skills of environmental officials to monitor and mitigate threats to biodiversity, improved marine protected areas management effectiveness, and collaborative efforts between key government and non government stakeholders

Specific Proposals:

- A conservation strategy will permit the establishment new marine protected areas in the Pacific region to increase marine ecosystem representativeness and push forward the establishment of a network of marine protected areas

- The development of an integrated Guatemalan marine coastal management program is vital, which will be central for a strengthened institutional and regulatory framework for the conservation and sustainable use of marine coastal biodiversity and effective marine protected area management

- The reinforcement of existing legislation on fishing, coastal land use and development and energy and mines is essential including the Regulation of Mangroves

- It is important to facilitate institutional reform

- The conservation of of mangroves on the Pacific Coast is also imperative

- A development of a coast wide program for the prevention, reduction, and control of land based contamination of marine and coastal ecosystems jointly with municipalities, local communities, and key private sector groups

- The definition of climate change guidelines for strengthening the resilience of marine coastal ecosystems to the impacts of climate change are necessary

- The development and implementation of conservation and sustainable use plans for key marine species considering traditional use practices by local communities

- Stable catches and sizes of selected fisheries species in areas of the Pacific region can be achieved by updating fishing management plans for species of commercial importance to include conservation criteria

- A skills building program will strengthen the capacities of local and national stakeholders.

- The program could include the training of government officials, representatives from the private sector and local communities in marine coastal planning, environmental monitoring, financial planning and the effects of climate change on marine coastal ecosystems, also the training of members of fishing federations and traditional and commercial fishermen in sustainable and biodiversity friendly fishing practices; and the training of state officials and non government co-administrators of the SIGAP (Guatemalan System of Protected Areas) to improve their skills in marine protected area management and the development of business plans

- A much needed awareness program will allow leaders of coastal communities and productive sectors (fishing, tourism, energy, agro-industry, marine transportation, urban development, and maritime industry) to become familiar with and monitor compliance of environmental policies, rules, and legislation regarding the marine coastal zone and marine protected areas

<u>The financial sustainability</u> of marine protected areas could be achieved through the development of business plans for each of the new marine protected areas and for the existing marine protected areas in the Pacific region; with the implementation of an action plan for public-private dialogue to encourage voluntary financial contributions from the private sector to marine protected areas and by adjusting the coastal land lease rates established through the Guatemalan National Bureau of Land Reserves, therefore a percentage is redirected to support marine protected area management

The Expected Results

- This actions combined will result in a new institutional structure for marine protective areas management and the conservation and sustainable use of marine coastal biodiversity with more clearly defined goals, roles, and responsibilities, as well as improved coordination, participation, and financing mechanisms

- The proposed actions will enhance the institutional and individual capacities for effective marine protected area management and the conservation and sustainable use of marine coastal biodiversity

- The establishment of most needed Marine Units within the MARN and CONAP (Guatemalan National Council of Protected Areas) will be a way to strengthen their skills to promote marine coastal biodiversity conservation

- Through the establishment of new marine protected areas and the expansion of the existing ones, connectivity between marine-coastal ecosystems will be established, providing movement of species between different habitats and thereby serving as temporary refuge in the face of potential climate change events

- The protection of the mangroves will help to mitigate the impacts from storms and hurricanes associated with climate change, through the reduction of their intensity and the prevention of erosion in different coastal zones, with benefits for marine-coastal species populations as well as the human populations settled in areas surrounding the mangroves

- Finally, national and municipal level authorities have to be trained in the resilience of ecosystems to climate change to adopt conservation and management strategies to mitigate at the minimum the inevitable climate change effects

Thank you so much for your attention!

Oceans and Law of the Sea

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