



الهيئة الإقليمية للمحافظة على
بيئة البحر الأحمر وخليج عدن

Regional Indicators Used for Assessment of Marine Environment in the Red Sea and Gulf of Aden

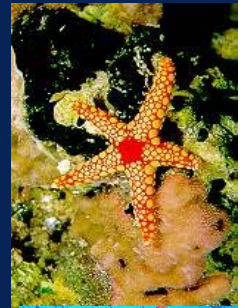
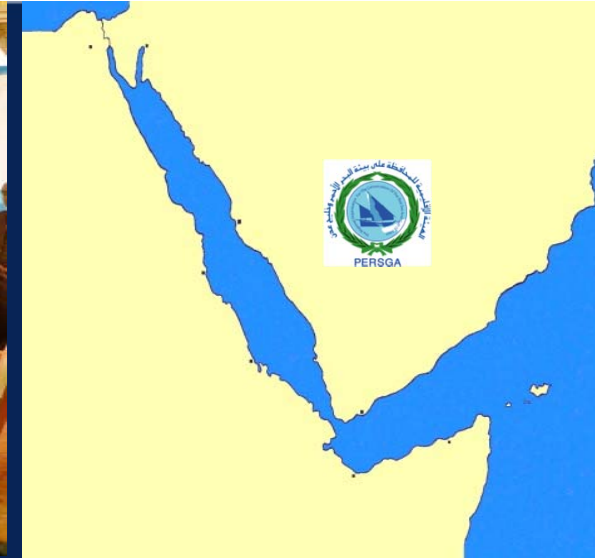
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OUTLINE

- Brief background on PERSGA and Characteristics of the Red Sea and Gulf of Aden Region
- PERSGA Standard Survey Methods for Key Habitats and Species , and Living Marine Resources
- Performance Indicators in Specific RAPs for Conservation of Key Habitats and Species
- Indicators in Other Assessment Guidelines
- Gaps and shortcomings
- Addressing gaps:
 - PERSGA workshop on Regional Indicators (2010)
 - SEM Project Component 3: Regional Environmental and Socioeconomic Monitoring Supporting Ecosystem Based Management (EBM)





PERSGA الهيئة الإقليمية للمحافظة على بيئة البحر الأحمر وخليج عدن

An intergovernmental organization concerned with protection/conservation of marine environment and sustainable development

- Member states are **Djibouti, Jordan, Egypt, Saudi Arabia, Somalia, Sudan and Yemen**
- Head Quarter in Jeddah
- PERSGA has also established a marine Emergency Mutual Aids center for the Red Sea and Gulf of Aden (EMARSGA) in Hurghada
- Legal/mandatory framework: Jeddah Convention (1982) and its attached/ derived Protocols and MoUs
- Regional Action Plan developed in 1982

Regional Action Plan Major Objectives

Assessment of Coastal-Marine environment

Guidelines for Sustainable Resource Management

Legal Base for Cooperative Efforts

Support Institutional Mechanism

PERSGA Program Components

Specialized Programs

- ❑ Living Marine Resources Program
- ❑ Biodiversity-MPAs Program
- ❑ Regional Monitoring Program
- ❑ Land Based Activities Program
- ❑ Marine Pollution (EMARSGA Center)
- ❑ Climate Change Program

Supportive Programs

- ❑ Environmental Education and Awareness
- ❑ Annual Training Program: Capacity Building
- ❑ PERSGA Regional Information System
- ❑ On-ground Activities Program: Demo Projects



Regional Legislation

Regional Action Plan
Protocol on Combating
Pollution by Oil and
Hazardous Chemicals
Jeddah Convention

1982

Protocol on
Protection
from LBAs

Protocol on
Biodiversity
and MPAs
Network

2005

Protocol on
Exchange of
Equipment
and Personnel
During
Emergencies

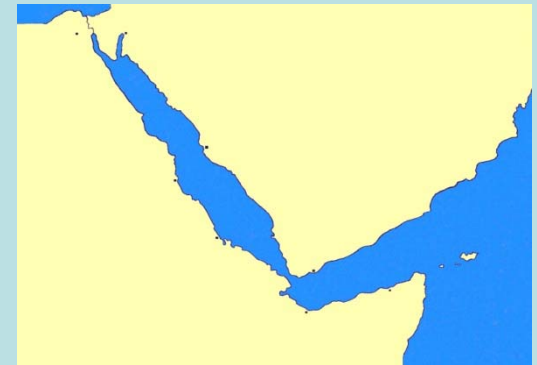
2009

MoU on
Regional
Cooperation
on Port State
Control

2011

MoU on
Regional
Cooperation in
Fishery
Management

2013



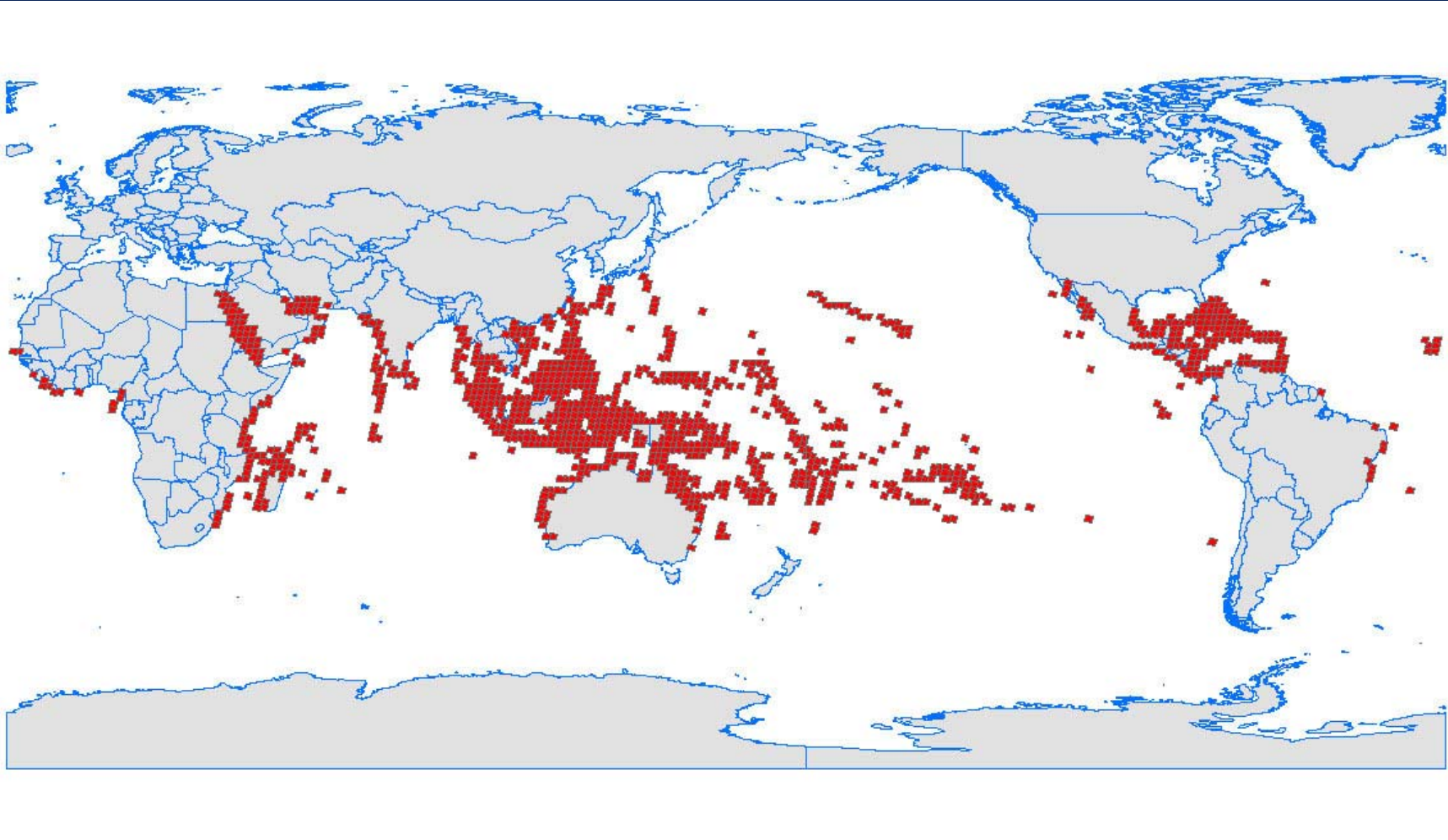
Diverse coastal and marine habitats

Key ecosystems/ the resource base is diverse in the Red Sea and Gulf of Aden



World Coral Reefs Distribution

The Red Sea represents less than 0.2% of the world's ocean, while it supports around 6% of the world's coral reefs



High biodiversity of the Red Sea

Coral reef: \approx 300 species

Echinoderms: \approx 170 species

Decapoda: \approx 130 species

Polychaetes: \approx 567 species

in comparison: *Arabian Sea 141 species*

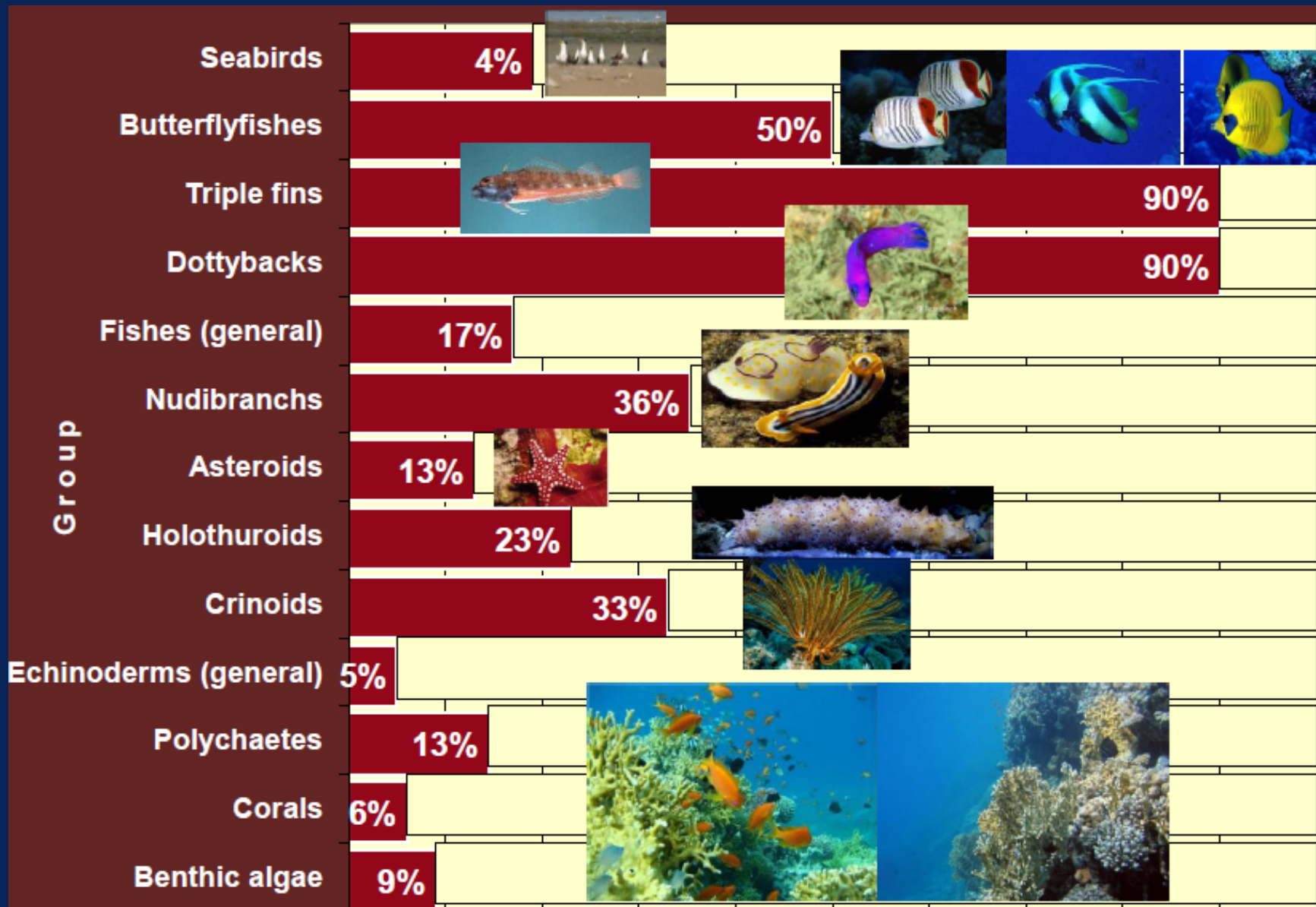
Arabian Gulf 231 species



The Gulf of Aden is an area of oceanic upwelling, resulting in high productivity of fishery resources



High Species Endemism in the Red Sea

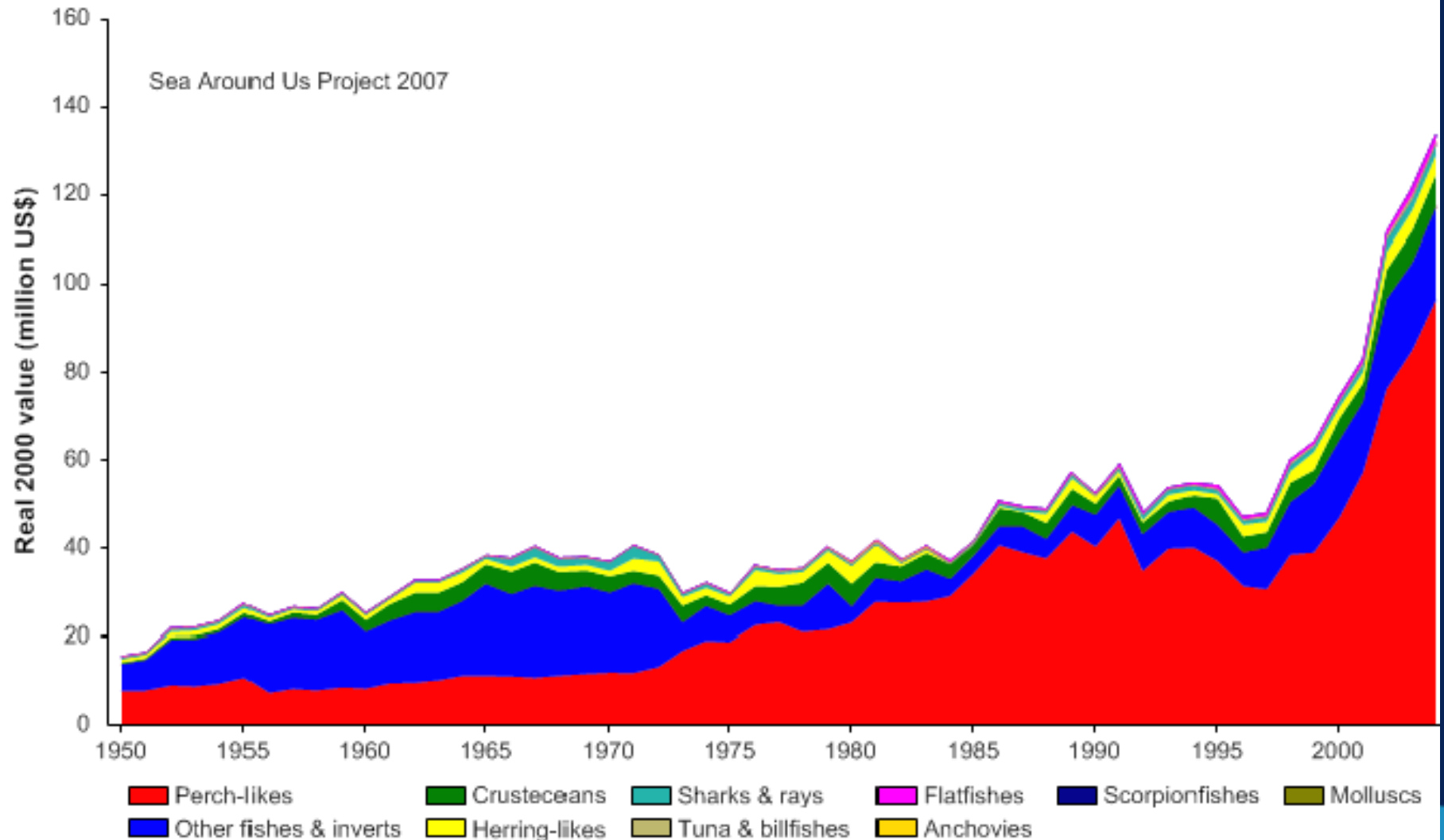


Percentage endemic species in the group (Red Sea)

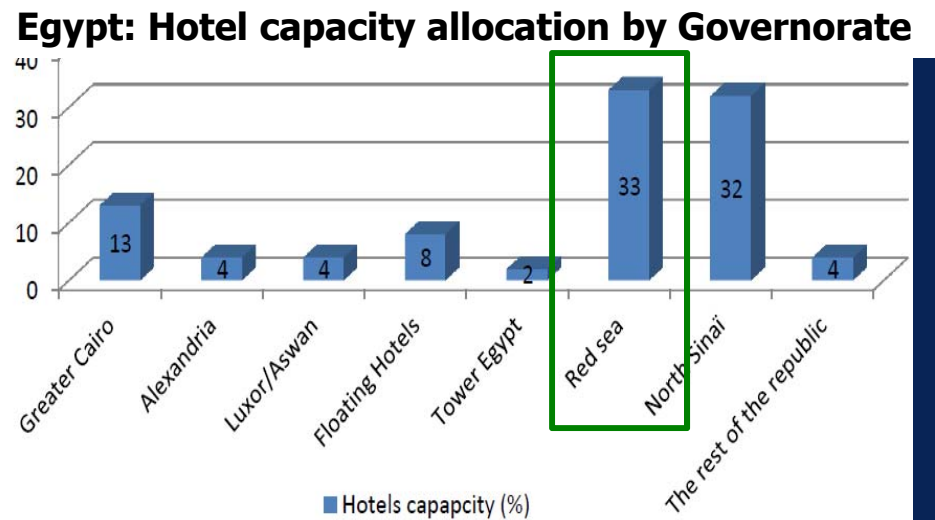
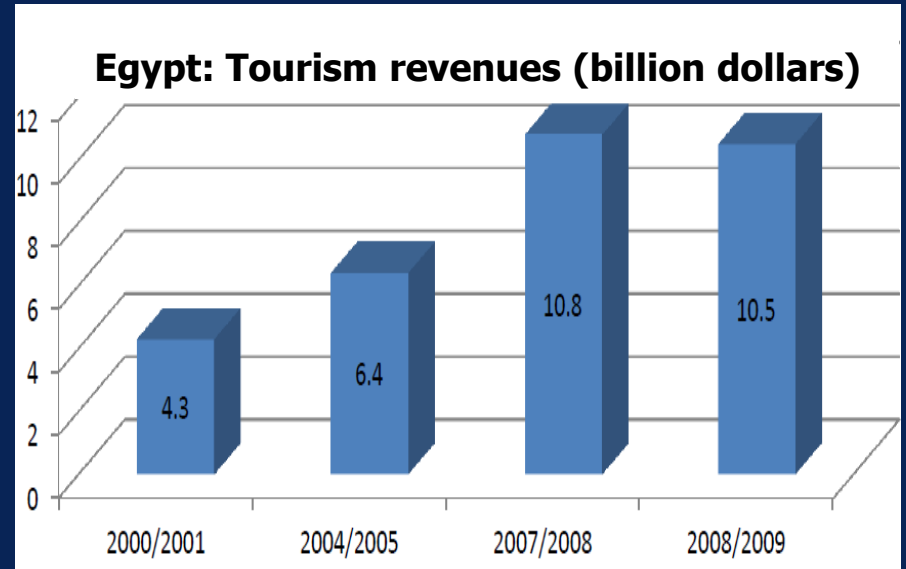


Use and Value of the RSGA Living Marine Resource: Fisheries

Value of reported landings in the Red Sea LME by commercial groups (Sea Around Us 2007).



Coastal and diving tourism

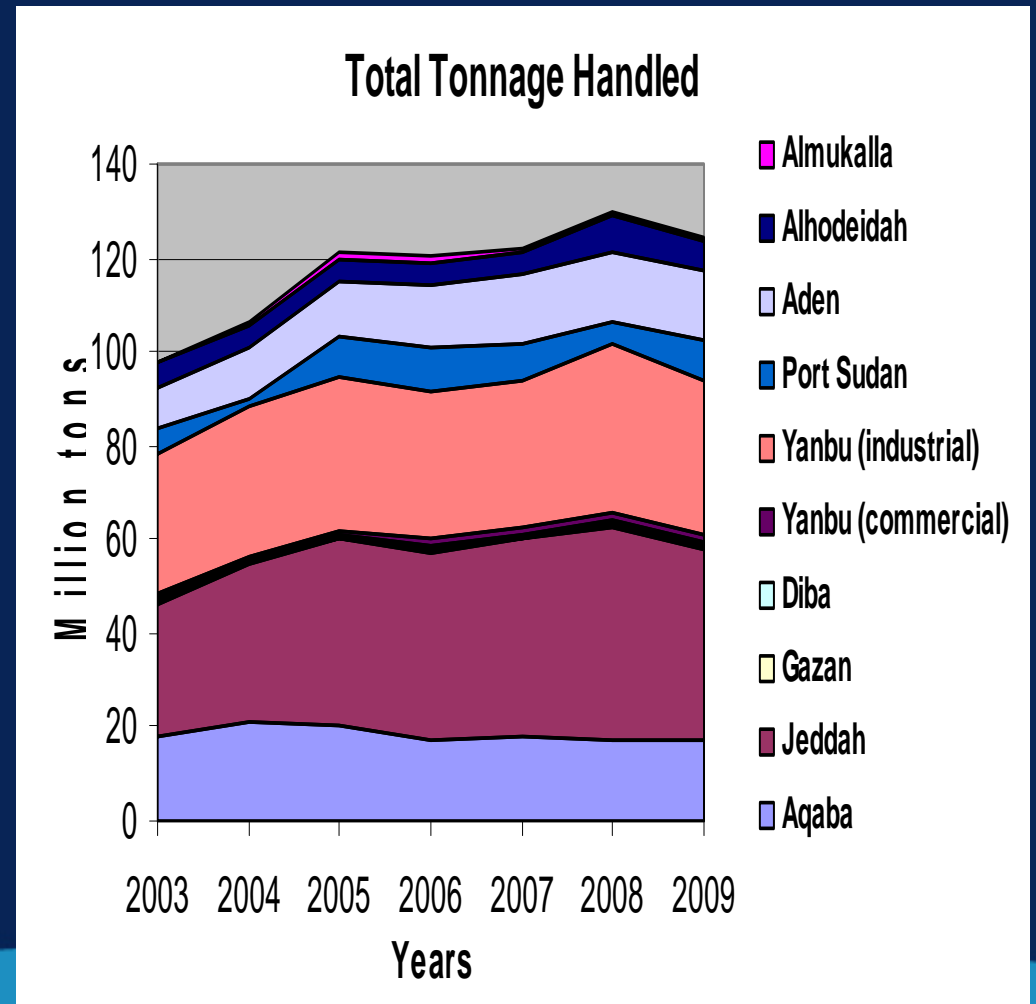
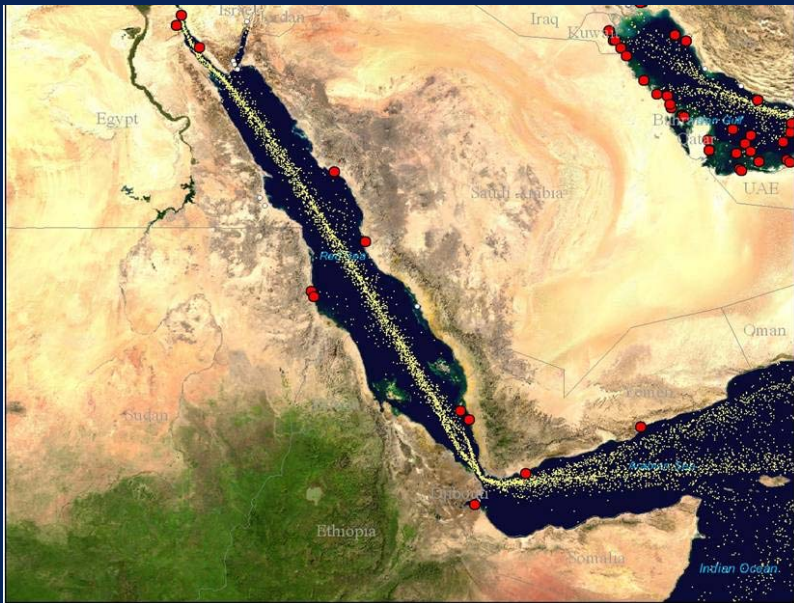


Source: Hilmi et al 2012; Cesar 2003)



Navigation: Protection of Ports

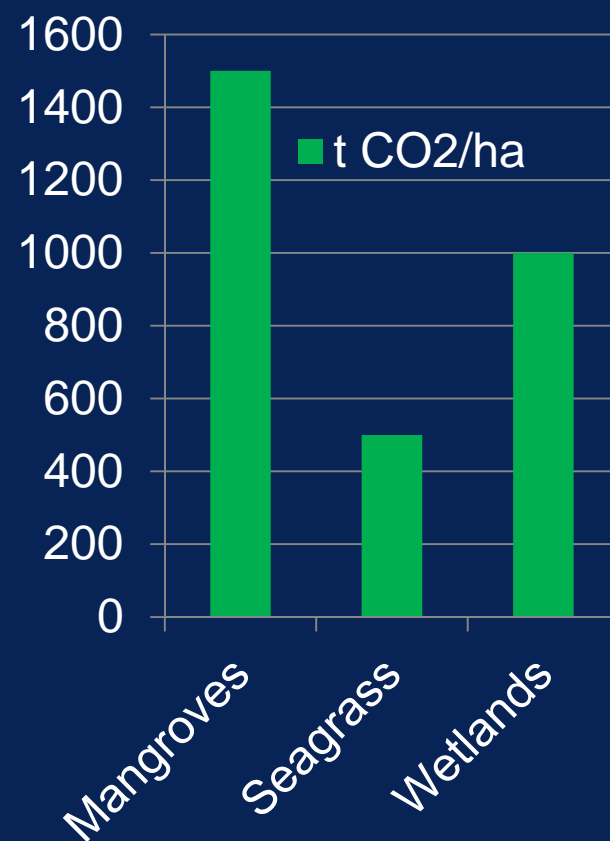
Major route for maritime transport (Suez Canal, Bab-el-Mandeb)
Main Red Sea harbors are naturally protected by coral reefs



Carbon sequestration and storage (Blue Carbon)

Resource Potential in PERSGA Region

- **Mangrove carbon stock**
 - Above-ground 125 t CO₂/ha, below-ground 125, soil >1000
 - Total 1300-1900 t CO₂/ha
- **Seagrass carbon stock**
 - Above-ground 15 t CO₂/ha, below-ground 30, soil >500
 - Total 550 t CO₂/ha
- **Tidal wetland carbon stock**
 - Above-ground 5 t CO₂/ha, below-ground 10, soil >800
 - Total 900-1300 t CO₂/ha
- **Annual increment by mangroves: 5 t CO₂/ha**



The Region has distinct geology and oceanography

Red Sea is the warmest among the world's seas

Arid area; very low precipitation

No permanent freshwater inflow

Limited water exchange with the Indian Ocean

Long water retention time: 200 years

Gulf of Aden is strongly affected by the north east and south west monsoons

semi-permanent thermocline

Vertical mixing is limited



Standard Survey Methods for Key Habitats and Key Species in the Red Sea and Gulf of Aden

- Developed during SAP (1999-2003), published in 2004.
- Purpose: Evaluate the current status of key habitats and species within the region through standard surveys that were comparable in extent, nature, detail and output
- Several authors contributed to the development of the SSMs. A consultation workshop held in 2000
- National specialists were trained to apply the SSMs through a series of regional workshops held at different venues in the region.
- Simple /demonstrate rapid assessment methods



Feature	Detailed assessment/sampling	Rapid assessment
Number of sites examined	Few	Many
Coverage/representativeness of coast	Low	High
Range of factors examined	Limited	Considerable
Detail of information for each factor	High	Low
Precision of data collected	High	Low
Technology/cost	Moderate/high	Low
Type of data generated	Parametric ¹	Non-parametric ²
Statistical analysis possible	Parametric	Non-parametric
Types of statistical analysis possible	Univariate & multivariate	Univariate & multivariate

PERSGA SSMs (2004)



Chapters and key habitats and species groups covered by PERSGA SSMs

1. RAPID COASTAL ENVIRONMENTAL ASSESSMENT

2. INTERTIDAL AND MANGROVE

3. CORALS AND CORAL COMMUNITIES

4. SEAGRASSES AND SEAWEEDS

5. SUBTIDAL HABITATS

6. REEF FISH

7. MARINE TURTLES

8. SEABIRDS

9. MARINE MAMMALS

1



RAPID COASTAL ENVIRONMENTAL ASSESSMENT

2



INTERTIDAL AND MANGROVE

3



CORALS AND CORAL COMMUNITIES

7



MARINE TURTLES



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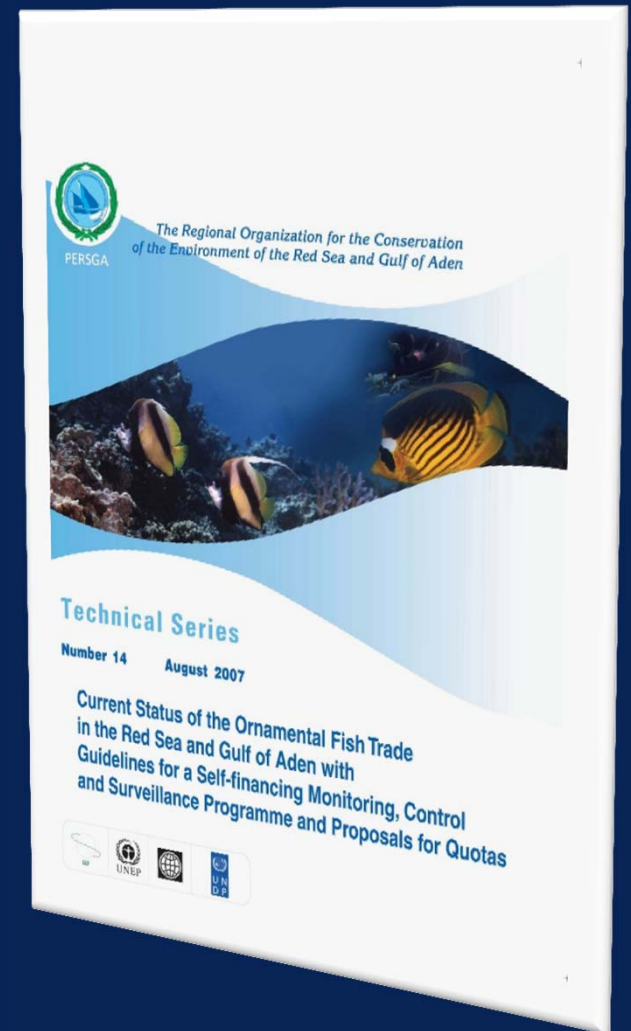
PERSGA regional broad assessments:

- SAP key habitats and species status reports: mangroves, seagrass, coral reefs, seabirds, marine turtles, marine mammals (2002-2004)
- SAP LMR status and management report (published in 2002)
- 2006: SOMER I
- SEM PPG: assessment of LMR, MPAs and monitoring capacities (2011-2012)
- Current: SOMER II



PERSGA other specific assessments/ management guidelines for:

- Elasmobranchs in the RSGA (2002/ 2003, 2009): Catch, bycatch, trade
- Ornamental Fishes in the RSGA (2002-2003): catch, trade
- Blue carbon: 2013
above-, below-ground biomass, soil carbon, status, policies.
- Marine litter in the RSGA: 2014
Categories, abundance, source



Performance Indicators in Specific RAPs for Conservation of Key Habitats and Species

For example: RAP for Conservation of Mangroves in the RSGA region

The *Framework for Actions* is constructed of six key components:

- **Integrated Coastal Zone Management planning for the conservation of mangroves**
- **Education and Awareness**
- **Marine Protected Areas**
- **Ecologically Sustainable Mangrove Utilization**
- **Impact of Shipping and Marine Pollution**
- **Research, Monitoring and Economic Valuation**



For each of the six components, the RAP:

- ✓ **Identifies priority actions;**
- ✓ **Defines expected results, desired outcomes and time-frames;**
- ✓ **Outlines performance indicators and methods of quality assurance.**

e.g. Performance Indicators for component I of the RAP

1. Publication of regional and national guidelines for ICZM, socio-economic and environmental impact assessments
2. Development of policy and enactment of legislative amendments
3. Implementation of ICZM and EIA in decision making



Main gaps and shortcomings for regional indicators/ assessments

- Socioeconomic factors
- Governance and response factors
- Linkage to the Regional Action Plan objectives
- Inadequate capacities
- Incomplete landings' statistics, historical data on habitats, species, pollution loads, etc.
- Financial constraints
- Complexity of ecosystems and regional issues



Regional Workshop on Sustainable Development Indicators for the Red Sea and Gulf of Aden (2010, Jeddah)

Status of ICAM in the PERSGA region
(defining the baseline)

Build capacity for identification and
selection of key regional indicators for the
sustainable development of the region
(using PERSGA Action Plan as framework)

Ecological- Governance – Socioeconomic
factors

Elements of the evaluation framework for
application of regional indicators



PERSGA/ World Bank GEF funded Project: 2014-2017 Strategic Ecosystem Management of the Red Sea and Gulf of Aden (SEM Project)

The project was launched in March 2014. It includes three components:

Component 1: Strengthening the principles of marine managed areas through stakeholder driven MPA implementation

Component 2: Strengthening coastal communities using incentives approach to improve fisheries management and achieve other marine resource benefits

Component 3: Regional Environmental and Socioeconomic Monitoring Supporting Ecosystem Based Management (EBM) and Community Benefits



Component 3 Implementation Milestones

Regional Environmental and Socioeconomic Monitoring Network Supporting Ecosystem Based Management and Community Benefits

Activity	Year 1				Year 2				Year 3				Year 4			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Enhance regional collaboration for data collection from current monitoring activities to enrich regional database of ecosystem variables	█															
Gap analysis of monitoring capacity, review current applied monitoring variables	█	█	█													
Updating a manual of standard environmental and socioeconomic survey methods		█	█	█												
Harmonization workshops for research and monitoring variables /community participation				█	█	█										
Enhance integrated monitoring database: include socio-economic & ecological variables and maintain data supply				█	█	█	█	█	█	█	█	█	█	█	█	█
Identification of threats from land and marine sources and update habitat/ sensitivity mapping					█	█	█	█	█	█	█	█	█	█	█	█
Strengthen monitoring outreach through raising awareness and the profile of stakeholder engagement					█	█	█	█	█	█	█	█	█	█	█	█
Inform Decision Makers by communicating successes and providing guidance through monitoring; Inform broader public and wider community of monitoring results									█	█	█	█	█	█	█	█
Hold an international conference for academia, MPA managers, community leaders in collaboration with international bodies														█		

Annual Work Plan of the First Year

C3. Regional Environmental and Socioeconomic Monitoring Network Supporting Ecosystem Based Management and Community Benefits

Activity	Quarter 1			Quarter 2			Quarter 3			Quarter 4		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Establishing Work Team and Selection of Consultants												
Assessment of data from current monitoring activities; human/institutional capacities and needs												
Interim Assessment and Expert Opinion: Country Reports												
Updating a standard regional format for monitoring results												
Regional Workshop for Discussion of Interim Assessment Country Reports												
Review Standard Survey Methods Considering Socioeconomic Aspects and Community Participation												





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Thank You...

