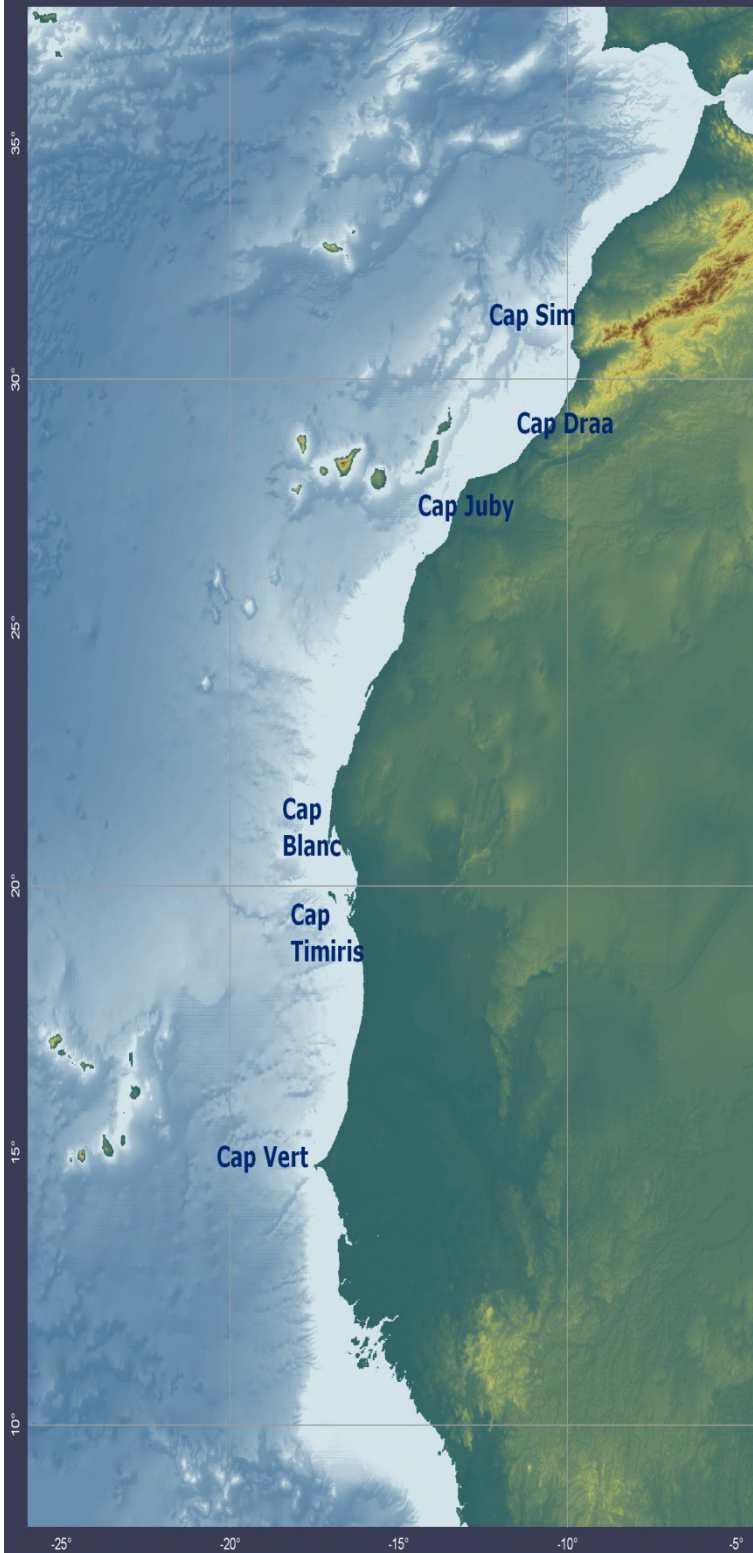


Knowledge base and institutional arrangements for an ecosystem approach to fisheries management of migratory small pelagic fish off northwest Africa the example of sardinella

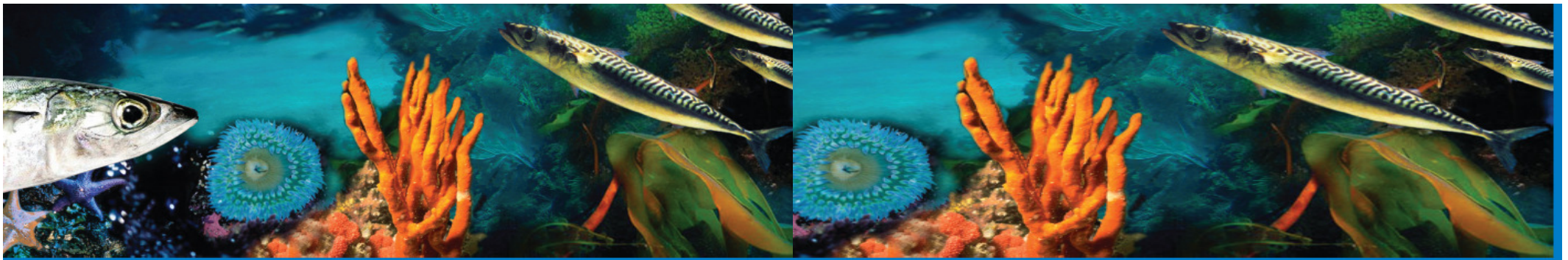
by

A. Mendy, B. Samb, E. Ould M. Mahmoud, S. Benchrifi; M. Tandstad, A. Caramelo & P. de Barros



Objective

To review the main characteristics of the sardinella stock and its fisheries, and analyse the feasibility of the application of EAF.



NW Africa *Sardinella* spp

- ❖ Planktivorous
 - ❖ Intermediate level in food chain
 - ❖ Variable food supply
- ❖ Large biomass
- ❖ Significant inter-annual fluctuations in abundance



NW Africa *Sardinella* spp

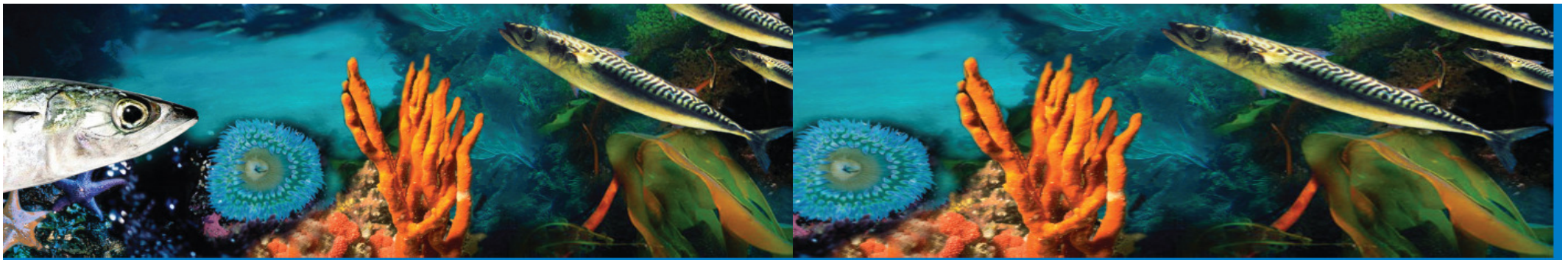
- ❖ Extensive migrations – Massive transport of biomass across the region
- ❖ Spawning and nursery areas separated from feeding areas



North West Africa

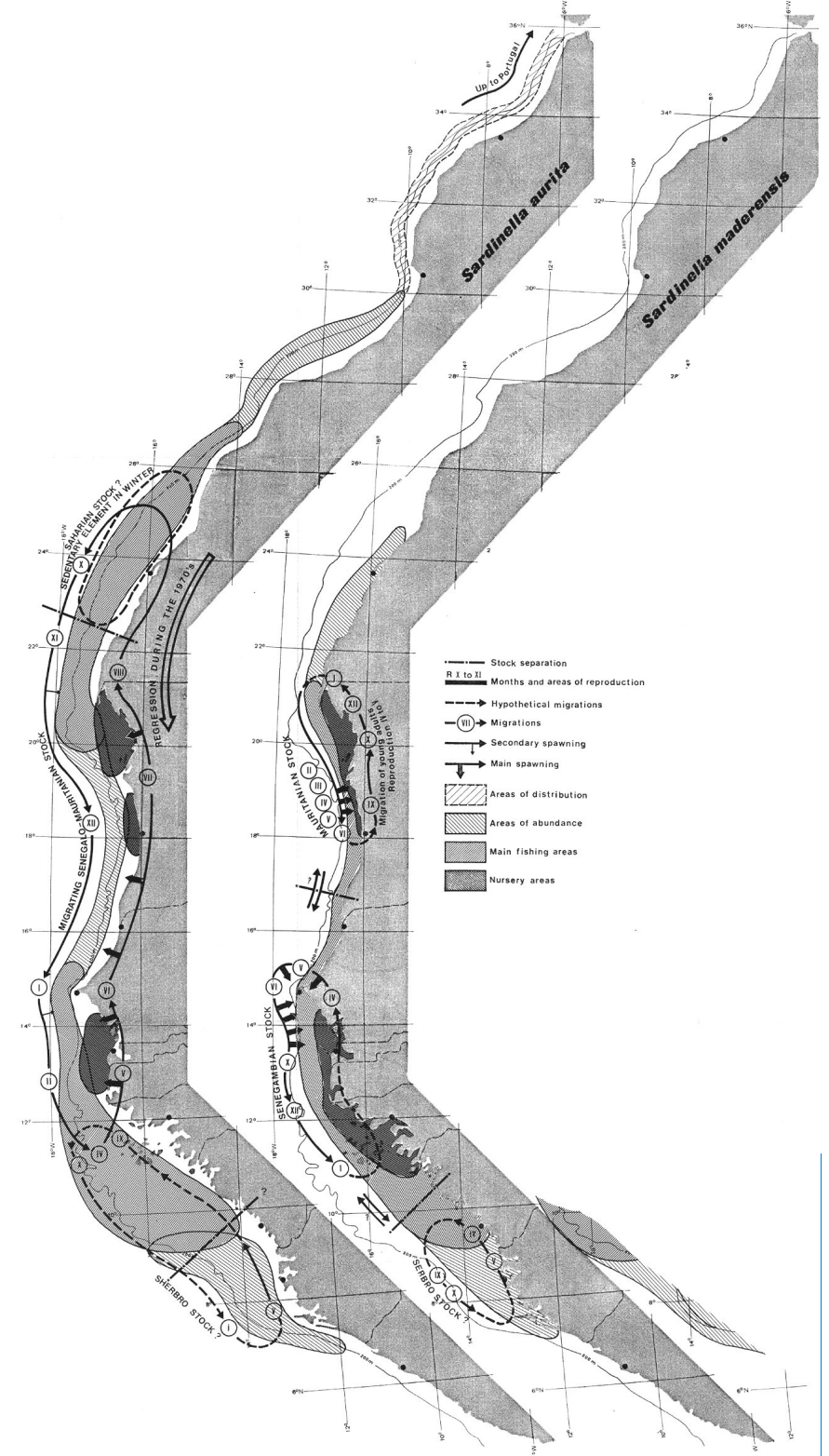
Environmental conditions

- **Highly productive system**
- **Variable productivity**
 - **Seasonal**
 - **Inter-annual**
 - **Spatial**

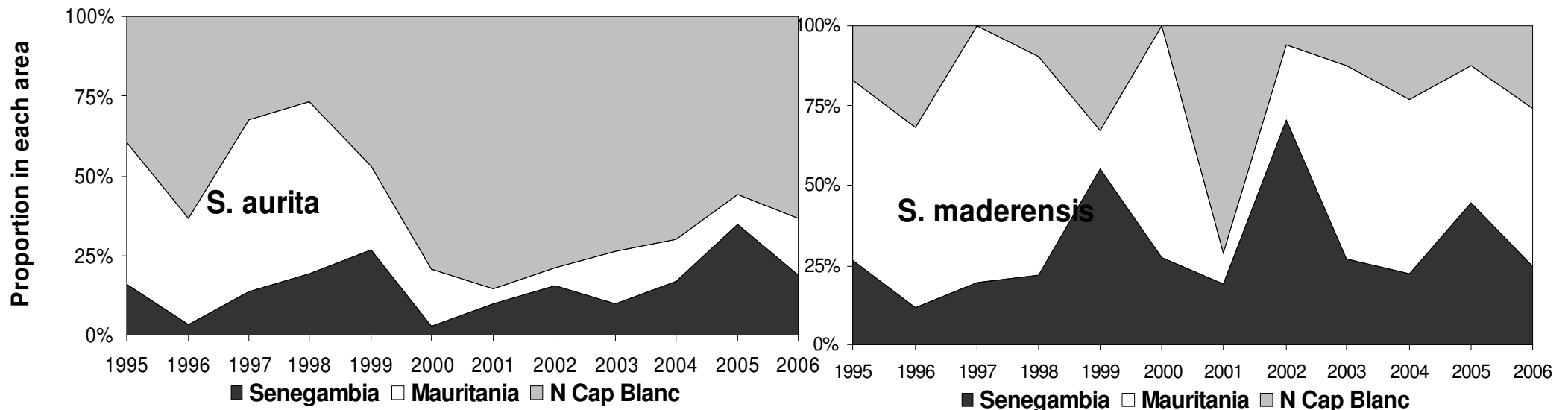


Regional stock

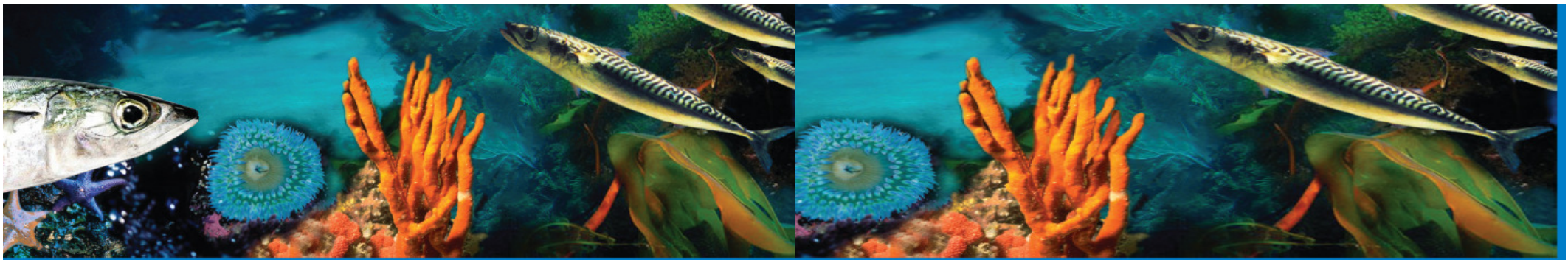
The stock migrates '000's Km



Highly fluctuating abundance and distribution

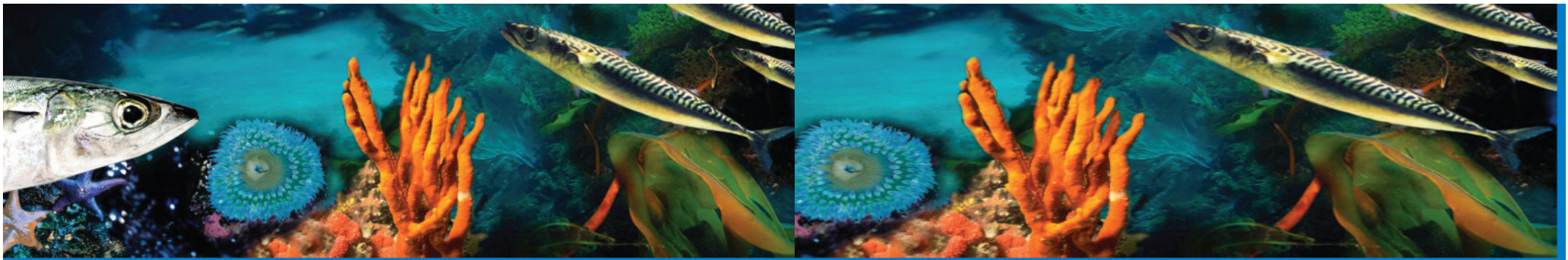
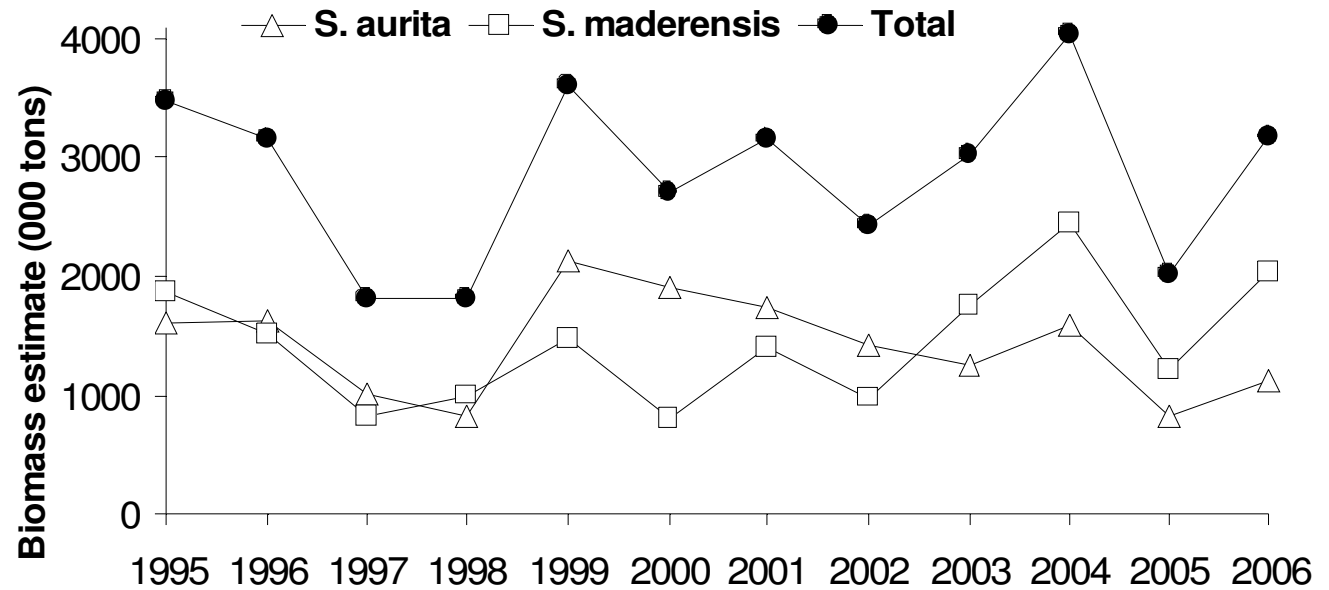


Geographical distribution – Biomass, Nov-Dec



Highly fluctuating abundance and distribution

Total Biomass
(Nov-Dec)



• Fishery – area differences

• The Gambia

- Small-scale/Artisanal fishery (purse seines, surrounding gillnets)
- Mostly foreign fishers (Senegal)
- Benefits for community – Major source of food supply, employment, etc

• Senegal

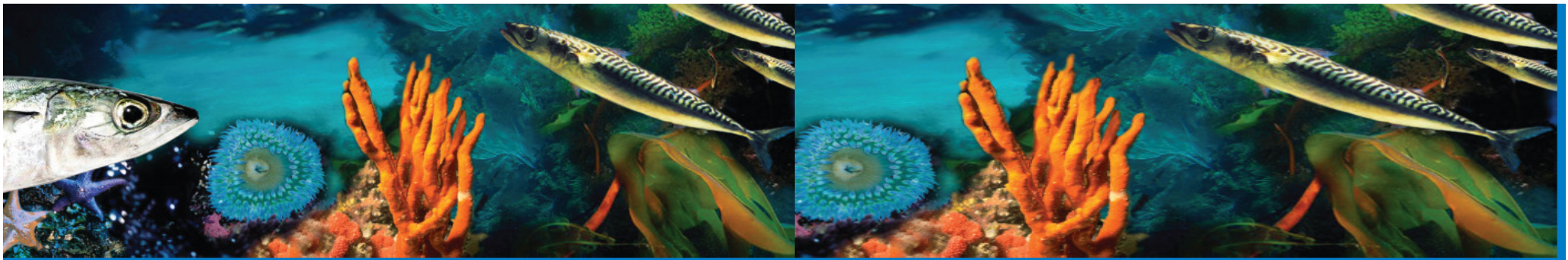
- Small-scale/Artisanal fishery (purse seines, surrounding gillnets)
- Local fishers
- Major source of employment and revenue for local fishing communities



- Fishery – area differences

- Mauritania

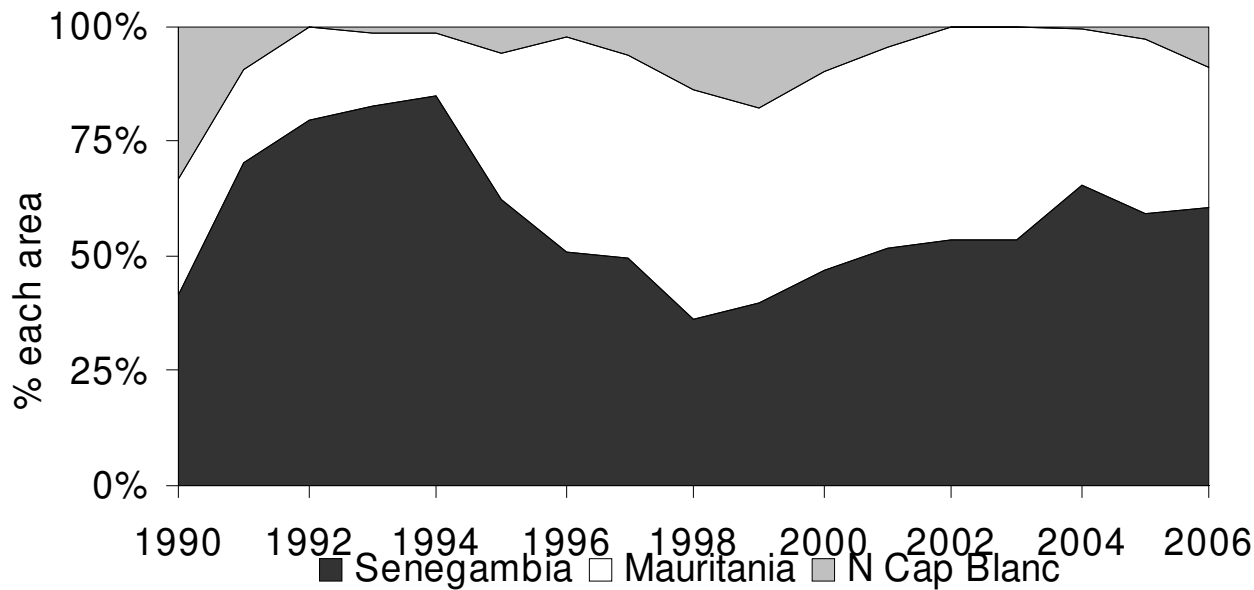
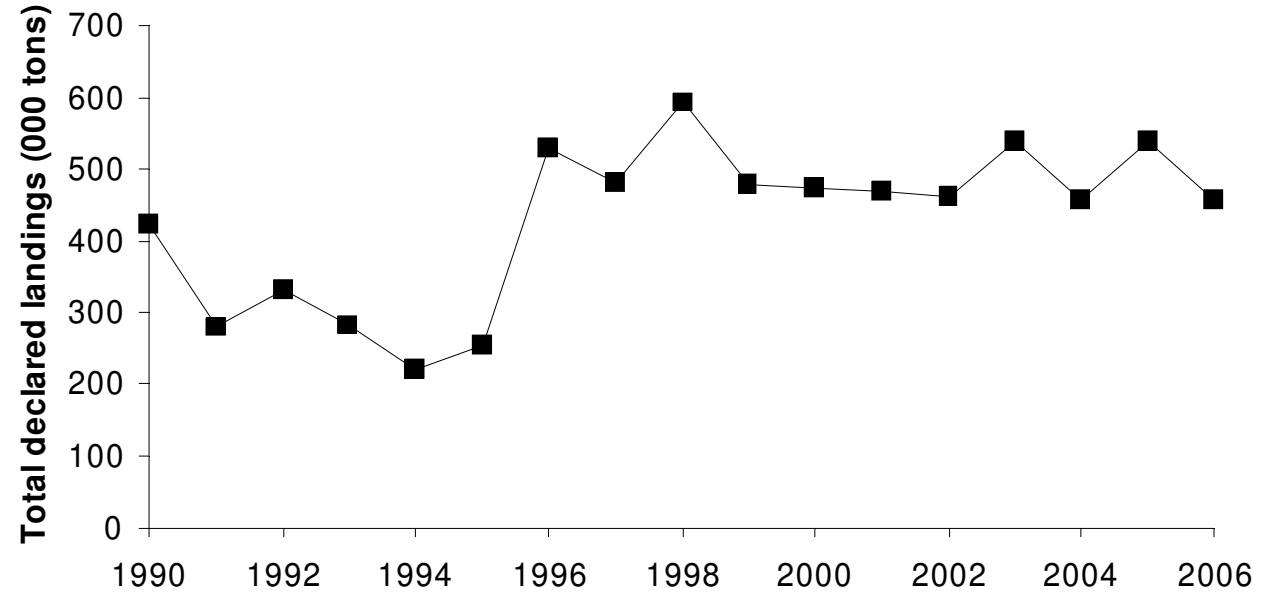
- Licensed foreign Industrial fleet (Pelagic Trawlers)
- Revenue comes mostly from fishing licenses and economic compensation from fishing agreements (mostly EU)



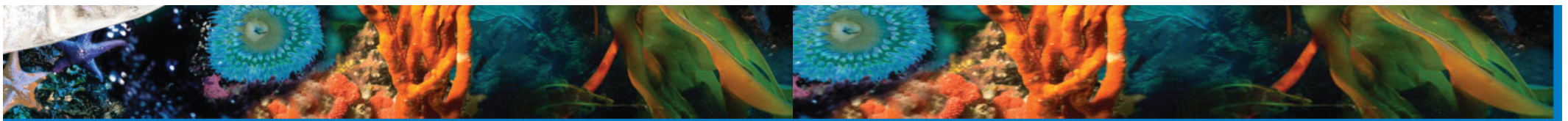
Variable and moving fishery

Total declared landings

Both species



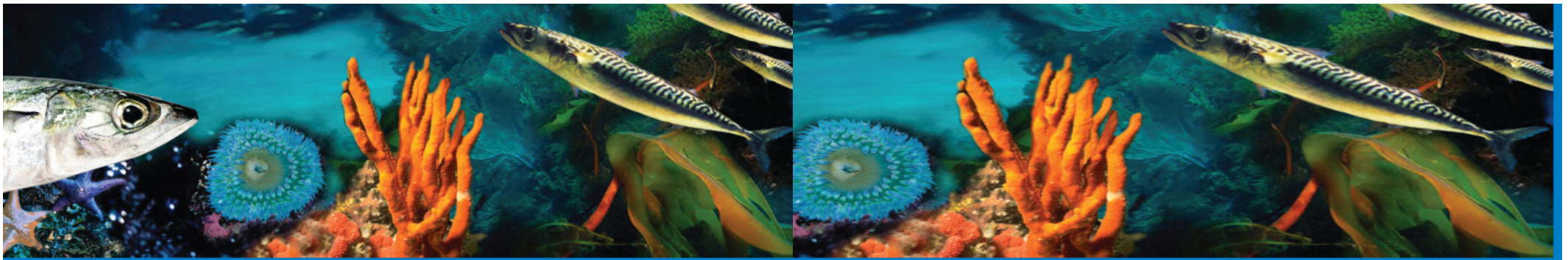
Geographical distribution –
Declared Landings
Both species





Importance

- Sardinellas represent a major food source for many people in African
- Socio-Economic Importance depends on the country
 - Senegal: Employment
 - Fishers
 - Transformation
 - Trade
 - Mauritania: Hard currency
 - Fishing licenses
 - EU compensation

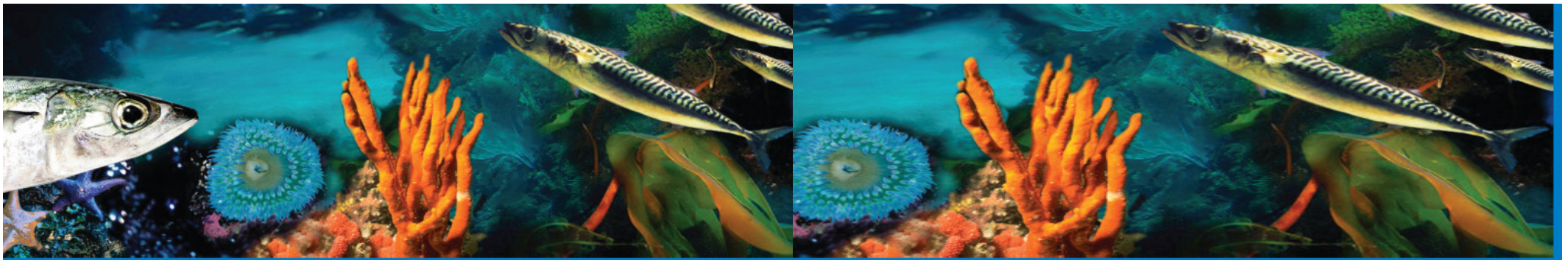


- The above highlights the importance of insuring cooperative arrangements for the management of this fishery. Furthermore the complexity described could benefit from taking an EAF.



Current Management

- Regional cooperation on research
- Single-species assessment leading to an overall catch limit/effort level
- It is up to individual countries to implement the scientific advice.
- Trophic interactions not considered
- Effects of environment not considered
- Etc.



SWOT Analysis - EAF

Beneficial

Harmful

Internal

Strengths

- Regional approach to stock assessment and management (CECAF) already in place
- Joint or coordinated acoustic surveys are carried out along the region

Weaknesses

- Lack of knowledge on dynamics of system;
- Not enough exchange at the management level;
- Insufficient MCS capacity
- Lack of sufficient human capacity

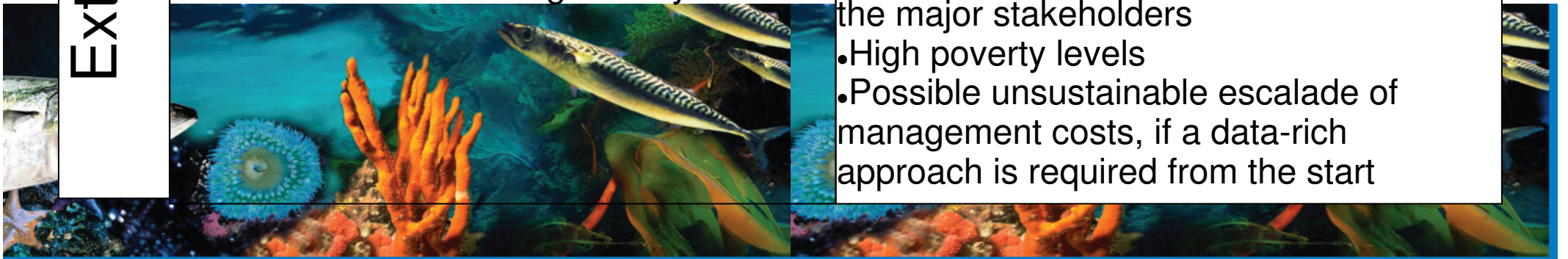
External

Opportunities

- International context is favourable to the introduction of EAF
- Possible to introduce gradually

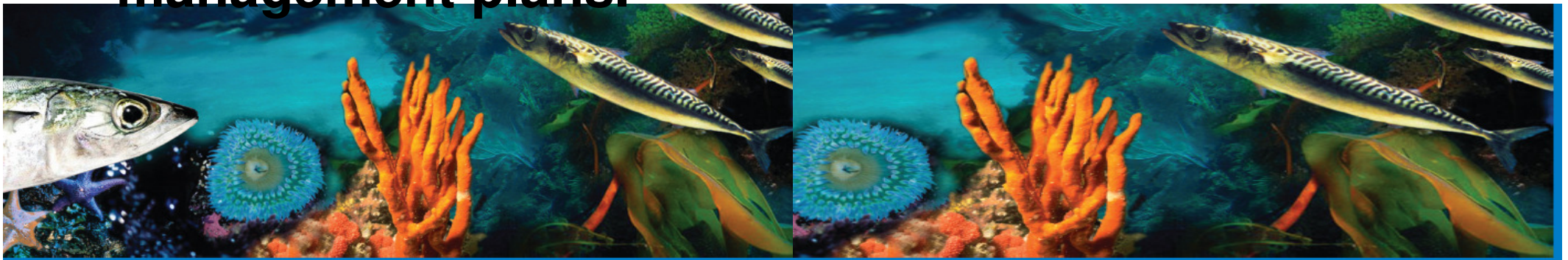
Threats

- The decline in stock abundance may lower political will to take necessary management measures;
- Lack of capacity to ensure participation of the major stakeholders
- High poverty levels
- Possible unsustainable escalation of management costs, if a data-rich approach is required from the start



Issues Identification

- **Three major categories**
 - **Ecological**
 - **Social**
 - **Governance issues, but also drivers external to the fisheries systems**
- **identify and prioritise issues that need to be addressed for implementation of EAF and to develop appropriate management responses.**
- **The results contribute to the development of fisheries management plans.**



Research requirements - Biology

- Trophic interactions of sardinella
 - For incorporating multispecies management
- Migration patterns
 - Extent, seasonality and life-stages
- Effect of environmental changes on dynamics of sardinella
 - e.g. ZEE



Research requirements

- Socio-Economic -

- Alternative uses of fish stock (other economic uses?)
- Employment linked to fishery
- Alternative employment in alternative industry
- Actual importance for food security
 - Are adequate replacements easily available?
- Influential actors/enforcement capacity
 - Who may play a leading role in persuading fishers and other players to preserve resources
- Relation between market and behaviour of fishers



Institutions involved in Management

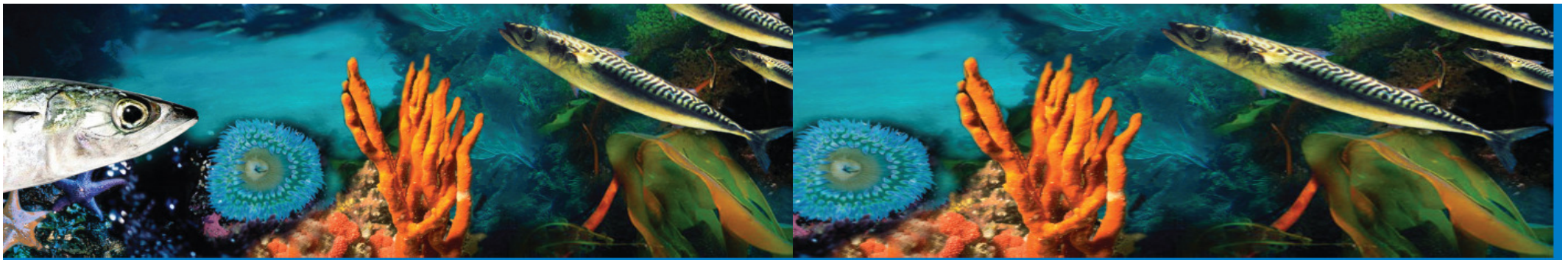
- National Fisheries Research Institutes
 - INRH
 - IMROP
 - CRODT
 - FD
- National Fisheries Management Agencies
- Regional Fisheries Organizations
 - SRFC
 - CECAF
 - COMAFHAT
- FAO



Role of Institutions involved

- National Research Institutes -

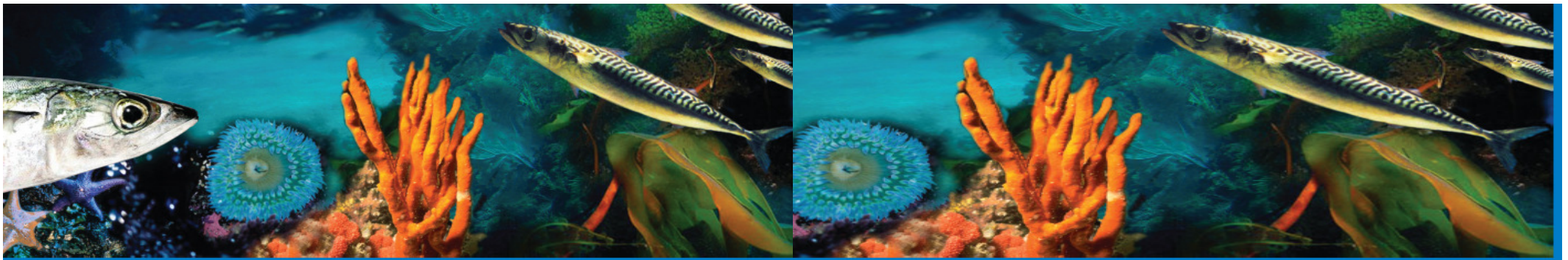
- Participate in the definition of regionally-accepted indicators
 - Fishery
 - Stock
 - Relevant Ecosystem elements
- Regular Monitoring of the fishery, the stock and associated ecosystem elements



Role of Institutions involved

- National Research Institutes -

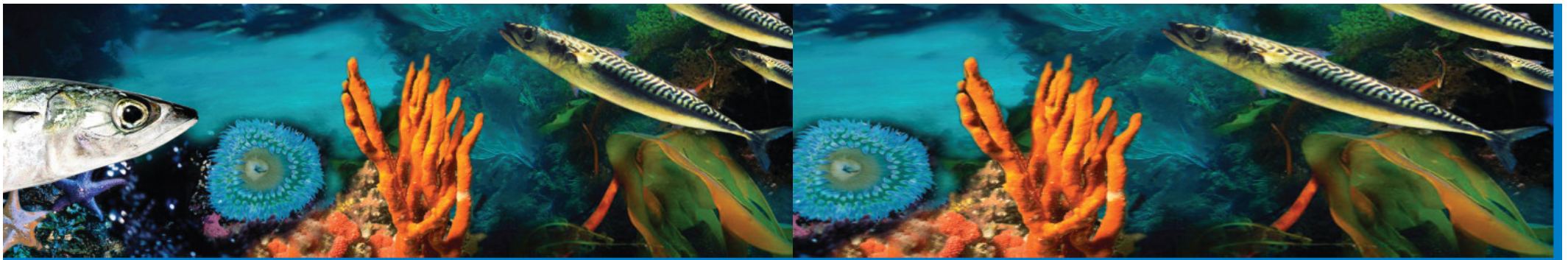
- Carry out research on country-specific or specialised elements
- Execution and coordination of regional joint or coordinated research programmes
- Actively participate in Regional Fish Stock Assessment Working Groups



Role of Institutions involved

- Regional Fisheries Organizations -

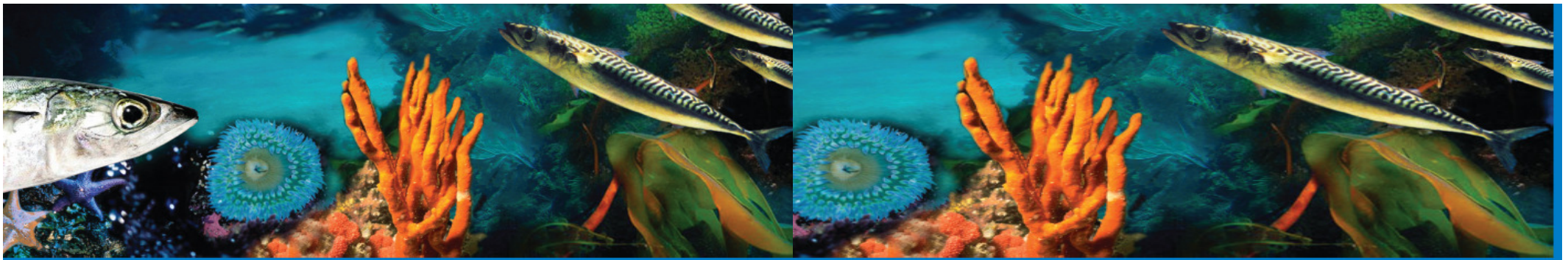
- Negotiate and agree on arrangements
- Forum for negotiation
- Promotion of common research and management
- Actively participate in Regional Fish Stock Assessment Working Groups



Role of Institutions involved

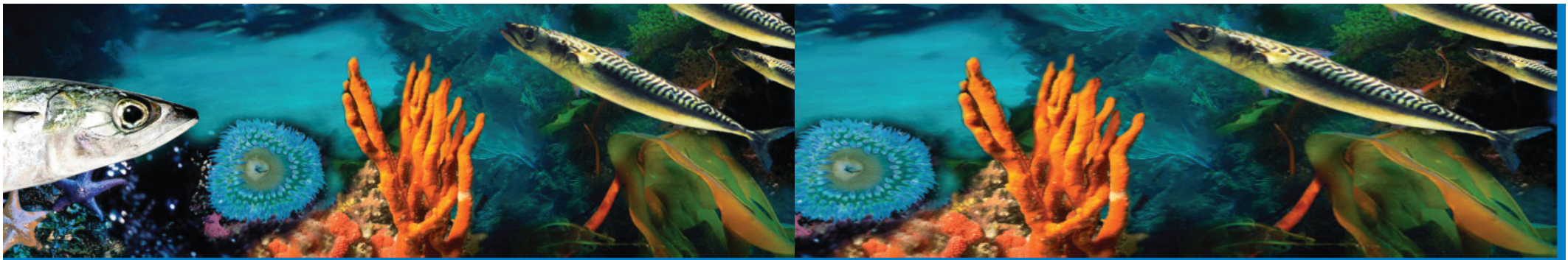
- Possible role of FAO -

- Facilitate the co-ordination of research and management
- Organize and coordinate regional-level fish stock assessment
- Provide technical and institutional support



Way Forward

- Towards Effective Implementation of EAF -
 - Recognition of inherent variable nature of the ecosystem, and implementation of management measures that take this into account
 - Development and acceptance of adequate indicators for management guidance
 - Coordination of actual management measures among countries



Thank you

