

# **The impact of environmental factors on fish food security in West Africa**

Project Scoping Meeting on Securing the Foundations for Fish Food Security in a Changing Ocean in West and Central Africa

Abidjan, Côte d'Ivoire, 15-17 July 2014

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# Introduction

- 400 million Africans rely on fish as major source of animal protein
- Marine fisheries on the Atlantic coasts generate 5-6 million tonnes annually
- 5-10 million fishers
- Need for additional 2.6 million tons by 2030
- Threats: variability in ocean processes, habitat degradation, land-based pollution, offshore oil and gas industry, unsustainable fisheries practices

# Fisheries in the region: main characteristics

## Industrial fisheries



# Fisheries in the region: main characteristics

## Industrial fisheries

- Largest proportion of fish landing (e.g. 70 % of catch in Canary Current LME)
- National and foreign fleets
- Largely pelagic, > 6 nautical miles
- Pelagic: Clupeids, Mackerel, Anchovy, Tuna, Squid
- Demersal: e.g. shrimp
- Overexploitation and IUU major issues

# Fisheries in the region: main characteristics

Local, commercial and traditional fisheries



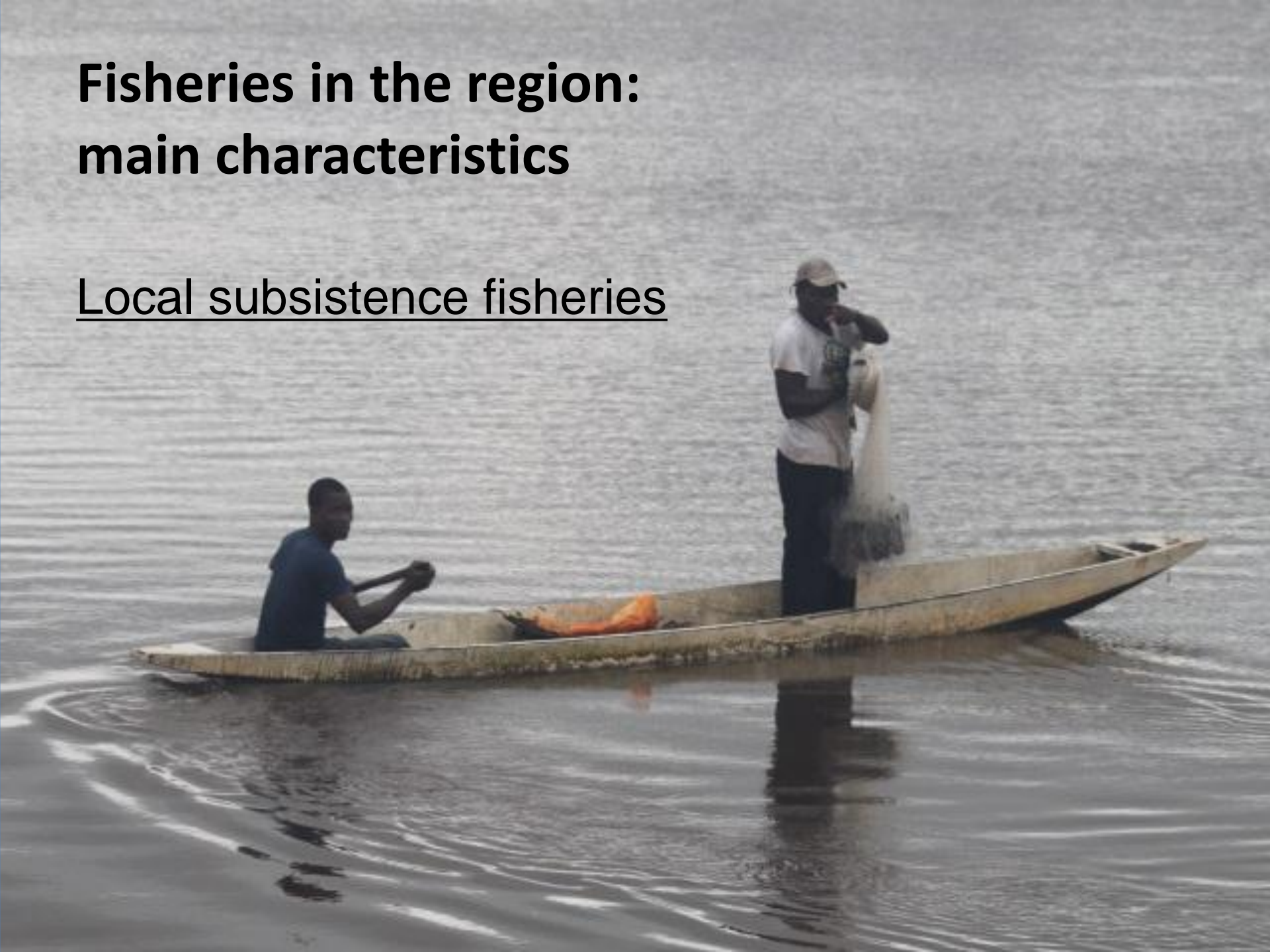
# Fisheries in the region: main characteristics

## Local, commercial and traditional fisheries

- Mostly national fleets, some regionally operating fleets (e.g. Senegal, Mauritania)
- With large boats or pirogues
- < 6 nautical miles
- Pelagic and demersal fisheries, mainly local markets

# Fisheries in the region: main characteristics

## Local subsistence fisheries



# Fisheries in the region: main characteristics

## Local subsistence fisheries

- Non-market fisheries for local consumption
- In proximity to coasts
- In coastal habitats (estuaries, mangroves, lagoons, bays)
- Fisheries on pelagics and demersal species





# Environmental factors affecting Fish Food Security

Variability of oceanographic processes



# Environmental factors affecting Fish Food Security

Apr 2006

## Variability of oceanographic processes

- Variability of position, extent and timing of upwelling and nutrient rich currents, leading to inter-annual changes in fish production
- Extreme events leading to massive fish mortality: harmful algal blooms leading to deoxygenation (BC), sulphide eruptions (BC)
- Strongest impact on offshore fisheries

# Environmental factors affecting Fish Food Security

Modification and destruction of habitats



# Environmental factors affecting Fish Food Security

## Modification and destruction of habitats

### Mangroves

- Reproduction and feeding area for fish, shellfish
- Fishing grounds for traditional and subsistence fisheries
- Large scale destruction of mangroves in the region, potential impact on offshore fish stocks

# Environmental factors affecting Fish Food Security

## Modification and destruction of habitats

### Estuaries

- Reproduction and feeding area for e.g. marine shrimp species in Gabon and Sierra Leone
- Modification by urbanization, pollution, siltation, salinization
- Fishing grounds for traditional and subsistence fisheries

# Environmental factors affecting Fish Food Security

Modification and destruction of habitats



# Environmental factors affecting Fish Food Security

## Modification and destruction of habitats

### Coastal benthic habitats

- Siltation, eutrophication, pollution
- Fishing grounds for traditional and subsistence fisheries

### Offshore benthic habitats – marine

- Effects of trawling on benthic habitats
- Demersal fish species

# Environmental factors affecting Fish Food Security

Impact of offshore oil industry

Exploration phase





# Environmental factors affecting Fish Food Security

## Impact of offshore oil industry

### Exploration phase

- Seismic studies
- Effects of drilling fluids on benthic habitats

### Exploitation phase

# Environmental factors affecting Fish Food Security

## Impact of offshore oil industry

### Exploitation phase

- Effects of drilling fluids on benthic habitats
- Chronic exposure to (hydrocarbons) may impact reproduction of pelagics
- Accidental oil pollution caused by disasters, leaks, blowouts, etc., with impacts on coastal habitats
- Safety zones around oil infrastructure: impact on fisheries villages and traditional fishing grounds

# Environmental factors affecting Fish Food Security

Land-based pollution



# Environmental factors affecting Fish Food Security

## Land-based pollution

- Impacts of sewage, agricultural run-off, dumping, industrial waste, etc
- Health issues may arise from bioaccumulation of pesticides, herbicides etc
- Eutrophication can lead to toxic algal blooms and anoxic events leading to fish kills.
- Plastics may be ingested by marine species

# Impact of fisheries on marine ecosystems

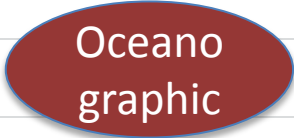




## Destructive fishing methods

- Benthic trawling expands in areas and depth
- Small-sized meshes in trawlers, purse and beach seine have excessive bycatch, e.g. of juvenile fish
- Explosives and chemicals: e.g. Sierra Leone
- Turtle and seabird bycatch in several types of fisheries (e.g. gill nets, longline fisheries).
- IUU fisheries

# Summary: environmental issues vs fisheries

**Cross-table: Environmental issues that are could possible affect fisheries and fish food security in Western Africa (the region of the CCLME, GCLME and BCLME)**

**DRAFT FOR DISCUSSION**

Issues <i>Environmental issues that have a (potential) impact on fisheries</i>	Sub-issues <i>Break down of the issue into sub-issues.</i>	Near shore		Offshore		
		Coastal <small>habitats (mangroves, lagoons, estuaries)</small>	Near shore <small>Demersal fisheries Pelagic fisheries</small>	Offshore <small>Demersal fisheries Pelagic fisheries</small>	Offshore <small>Demersal fisheries Pelagic fisheries</small>	
		Type: Subsistence fisheries, Small scale commercial and traditional			Type: offshore commercial fisheries, industrial	
 Issue: variability of oceanographic processes	Inter-annual changes of extent, intensity and position of nutrient rich currents and upwellings, El Nino/la Nina-like effects)	0	0/+	+	 Most impact on offshore pelagic fisheries	
	Sulphide hydrogen eruptions	0	0/-	+		
	Deoxygenation after die off of massive algal blooms offshore (HAB)	0	0/-	+		
 Issue: impact of offshore oil and gas industry	Chronic hydrocarbon pollution and oil spills (small to large scale)			+	0/+	0/+
	Impact of drilling fluids on benthic habitats			0	++	0
	Closure of fishing grounds			+	+++	+
 Issue: habitat destruction/modification	Shallow water areas (bays)			0	+	0
	Lagoons/mangroves			0	0	0
 Issue: land-based pollution	Domestic and industrial sewage, fertilizers			+	0	0
	Pesticide residues			+	0	0
	Marine litter			?	?	?

**More impact on near-shore and coastal fisheries**

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# Possible responses

## Spatial Management

- Marine Protected Areas, spatial fisheries measures, Marine Spatial Planning

## Sectoral regulation

- Pollution control
- Fisheries regulation



# Governance Bodies Summary

- Some overlap in mandates and geographies
- Lack of regional management mandate with regards to fishing (advisory vs regulatory)
- Recognition of need for stronger cooperation and integration
- Common themes of sustainability and cooperation, as well as science and knowledge sharing, capacity building
- Fish populations, spatial management and pollution control themes



**Thank you!**



# Discussion Questions

- Which issues are most relevant from a fish food security perspective?
- Which are the leverage points?
- Which are the low hanging fruits?

