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July 25, 2012

Fishing for the Future: The Why and How of Nature's Abundant Protein Source

Speakers

Bryan Gillooly, *USAID*

Richard Volk, *USAID*

Robert Bertram, *USAID (Introduction)*

Facilitator

Zachary Baquet, *USAID Bureau for Food Security*

Upcoming Ag Sector Councils

- September | EAT Project and Commodity Exchanges
- October | MEAS Project: Impact of Climate Change on Extension and Advisory Services

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Fishing for the Future:

The Why and How of Nature's Most Abundant Protein Source

July 25, 2012
Bryan Gillooly

Definitions

- **Aquaculture: the cultivation of aquatic animals and plants (fish, shellfish, and seaweed/algae) in natural or controlled marine or freshwater environments; "*underwater agriculture*"**

- **Fisheries: the collective enterprise of harvesting fish. A fishery is usually defined by the species caught, the gear and/or fishing methods used, and the area of operation; includes both inland and marine zones**

Photo Credit: AquaFish CRSP

USAID & Fisheries/Aquaculture

- **FTF Countries: Bangladesh, Senegal, Ghana & Cambodia**

- **Non-FTF Countries: Philippines, Indonesia, CTI Program, & MAREA (Central America & Caribbean)**

AQUAFISH
COLLABORATIVE RESEARCH SUPPORT PROGRAM

- **AquaFish: Bangladesh, Ghana, Tanzania, Cambodia, Mali, Vietnam**

Why Fisheries?

Economic Growth

- **Direct source of employment for 200 million people; over half a billion people employed when one includes dependents, aquaculture and related industries**
- **95 percent of them in developing countries**
- **Net export value of fish products = $17.4 million USD (greater than combined net export value of coffee, rice, sugar and tea)**

Sunken Billions

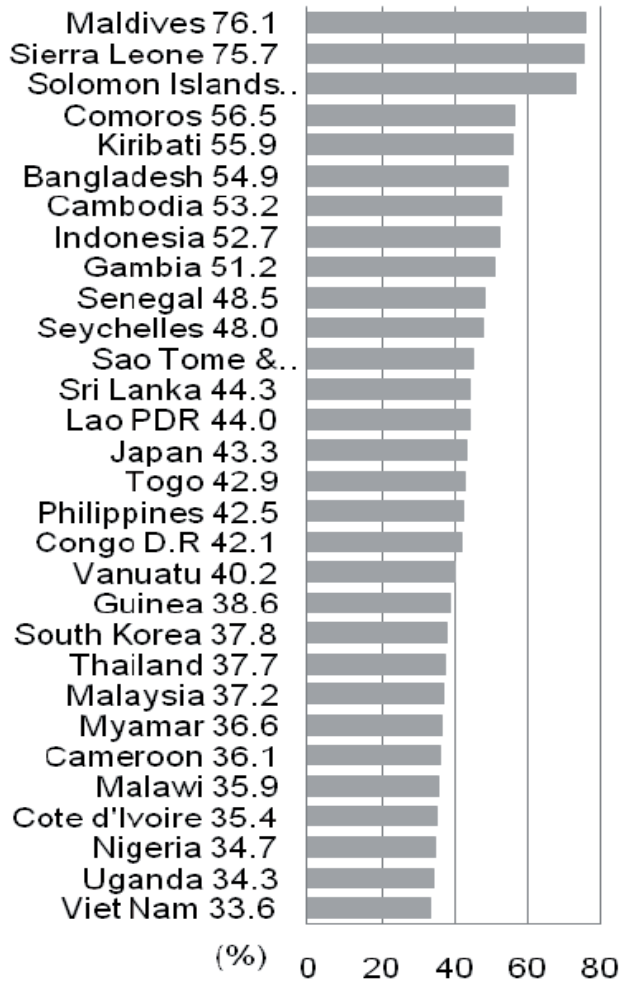
- **"Sunken Billions" = $50 billion per year – equivalent to more than half the value of the global seafood trade**
- **The cumulative economic loss to the global economy over the last three decades is estimated at two trillion dollars**

Estimates of the Economic Losses from Global Marine Fisheries

Source	Estimate of losses
FAO 1993	$54 aggregate loss, or approximately 75 percent of the gross revenue
Garcia and Newton 1997	$46 billion deficit
Sanchirico and Wilen 2002	$90 billion (future projection)
Wilen 2005	$80 billion
World Bank (this study)	$51 billion

Protein Source

Figure 4a: Fish protein as a percent of animal protein consumption (%)



- **1/3 of planet relies on seafood for more than 20% of animal protein, more than 75% in some countries**

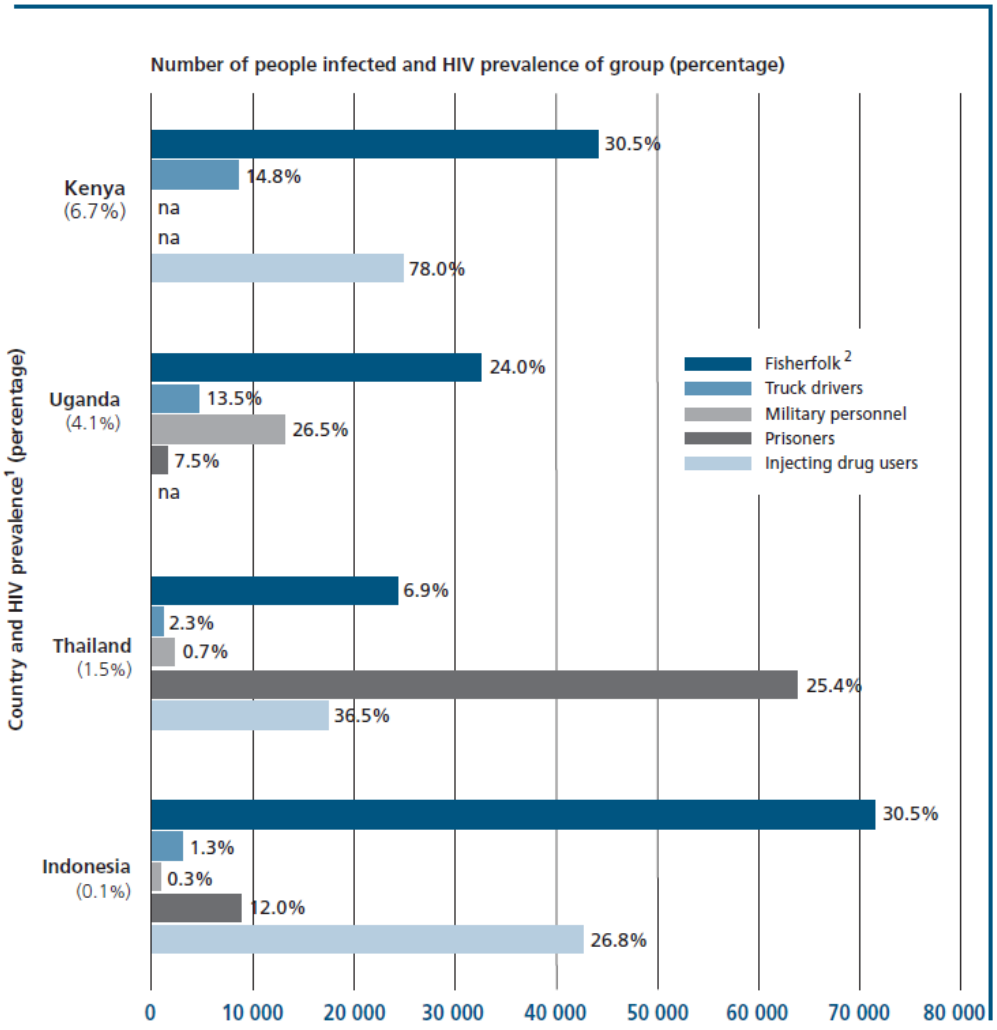
- **In Africa, only source of protein for 1 in 5 people**

Health & Nutrition

- **More than two billion people in the world are undernourished**
- **Fish is the primary source of omega-3 fatty acids in human diet, also important source of vitamin A, iron, zinc and calcium**
- **Fish provides critical nutrients for normal brain and eye development of infants**
- **Preventive role in a number of human illness**
- **Important at key stages of human life (pregnancy, breastfeeding, and childhood)**

Public Health and HIV

Estimated HIV prevalence and number of people infected among subpopulations considered at higher than average risk for HIV in two African and two Asian countries

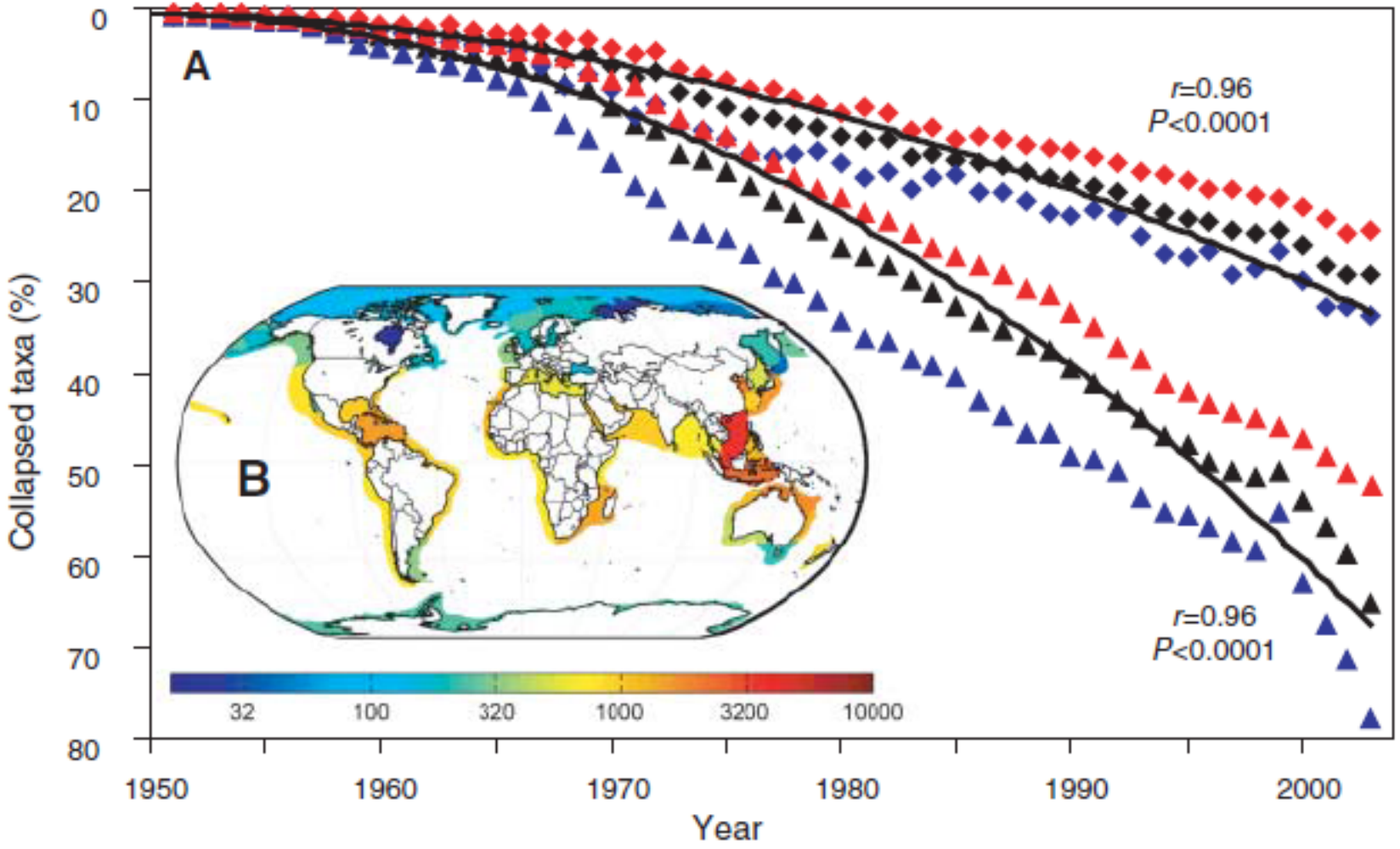


- **HIV prevalence rates in fishing communities are between 4 and 14 times higher than the national average**

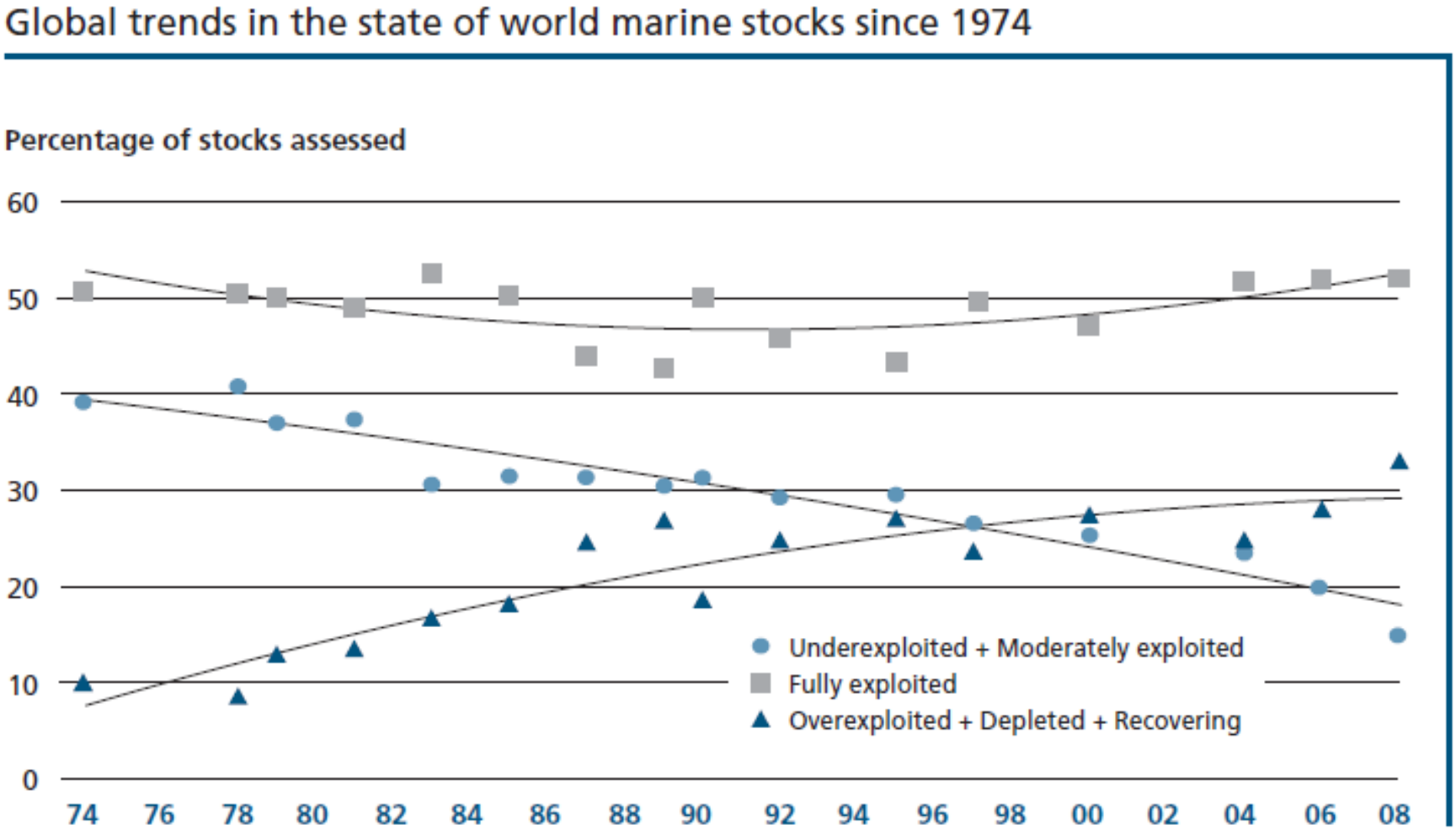
- **Fisherfolk are one of the groups most at risk of HIV**

Current State of Global Fisheries

Tragedy of the Commons

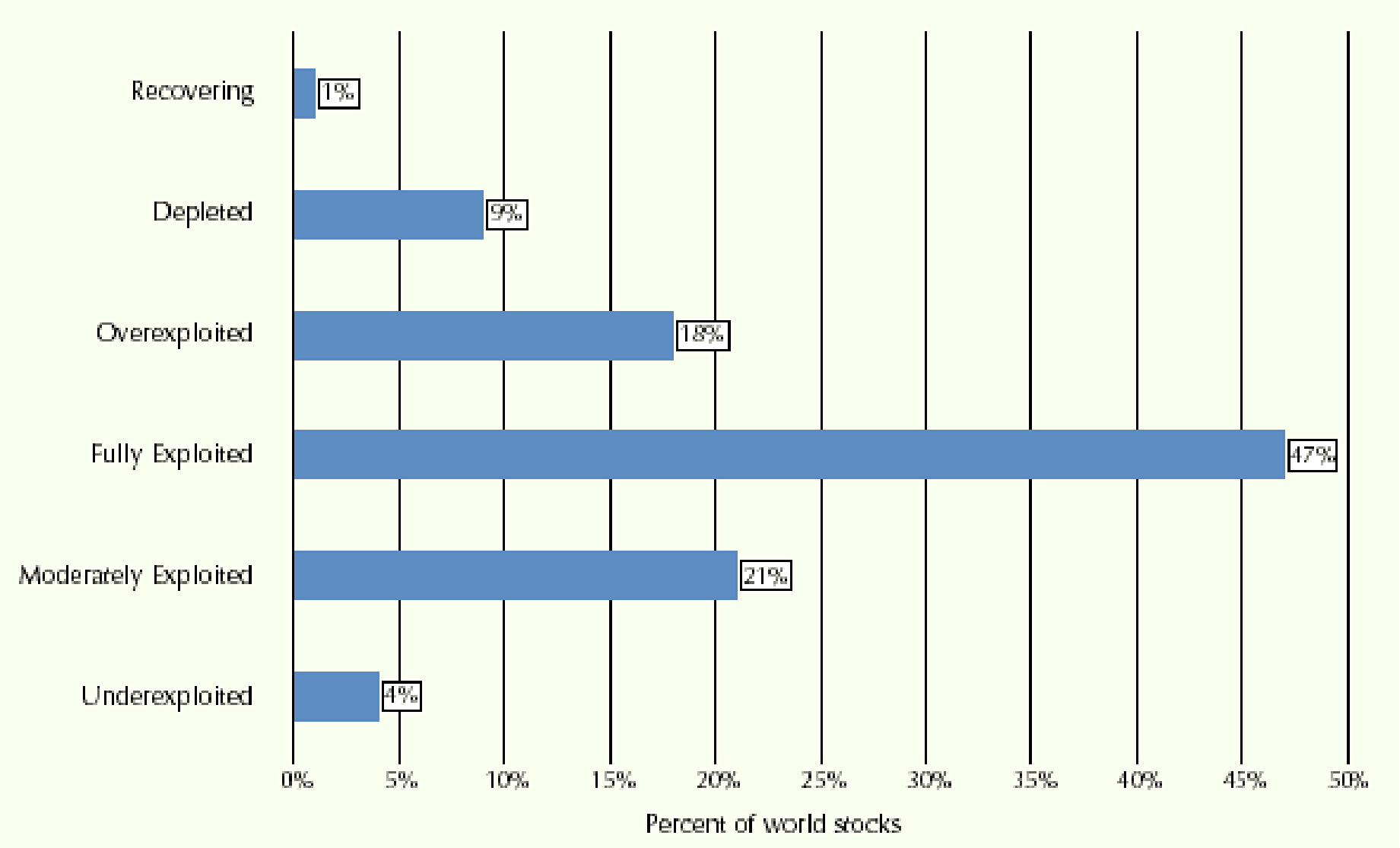


Current State of Global Fisheries



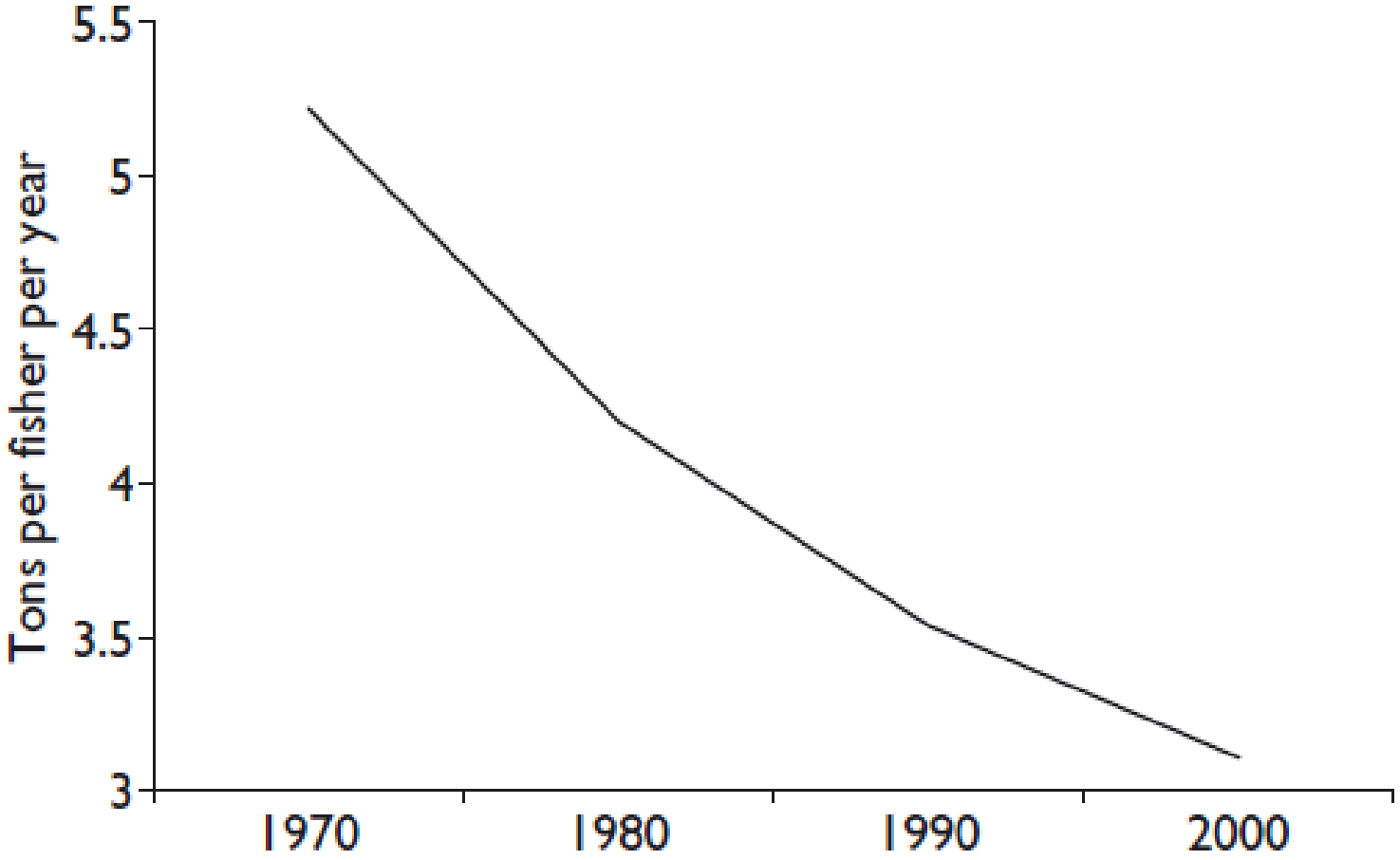
(FAO, 2010)

Current State of Global Fisheries



Current State of Global Fisheries

Annual Catch (Marine and Inland) per Capture Fisher, 1970–2000



Global Threats to Fisheries

- **Overfishing**
- **Global Climate Change/Ocean Acidification**
- **Marine Pollution**
- **Subsidies**
- **Unsustainable Feed for Aquaculture**

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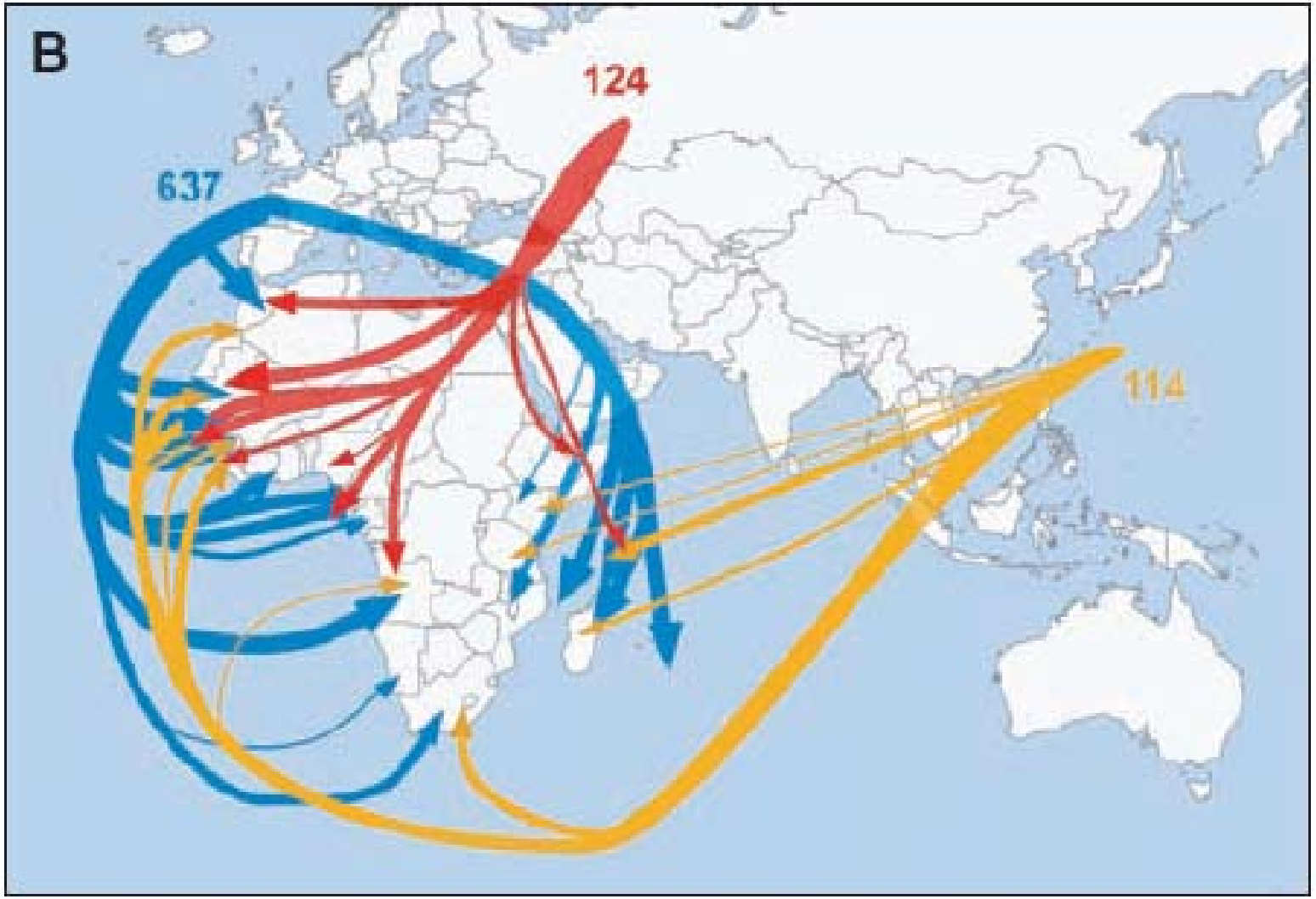
Investing in the reform of marine capture fisheries

July 25, 2012

Richard Volk

Displacement of Industrial Fishing Capacity from Developed Nations to Africa



Worm et al. 2009 ***Science***

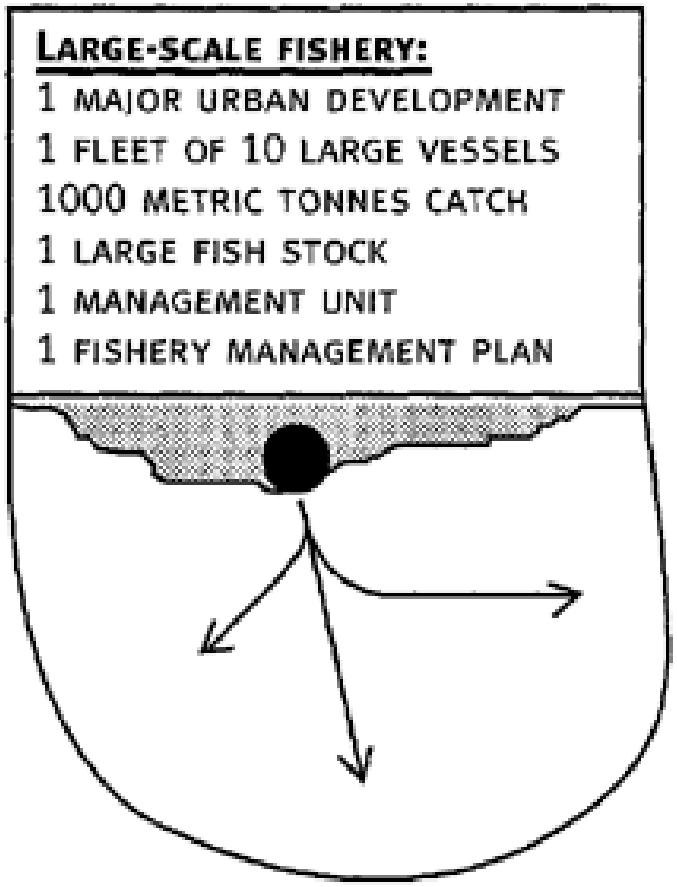
Some context

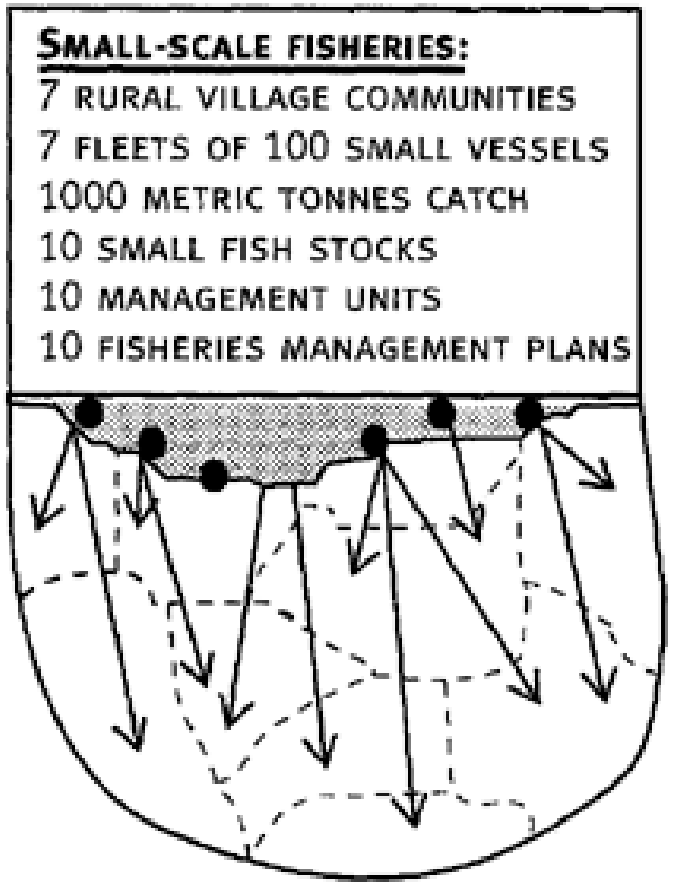
- Nearly 80 percent of traded fish is sourced in developing countries
- 3/4 of trade destined for EU, Japan, and North America
- Demand outstrips supply; 98 percent of stocks in West Africa either fully or over-exploited
- Social safety net for the world's poorest
- Essential fatty acids, micro-nutrients, early childhood development
- Developing vs. developed world: how will the scales tip?

Why focus on small-scale fisheries?

- Responsible for ~50 percent of total global catch consumed
- Employs 96 percent of all fishers
- Employment diversity: men, women, elderly, and youth
- Estimated 50 million fishers

Small-scale fisheries are complex





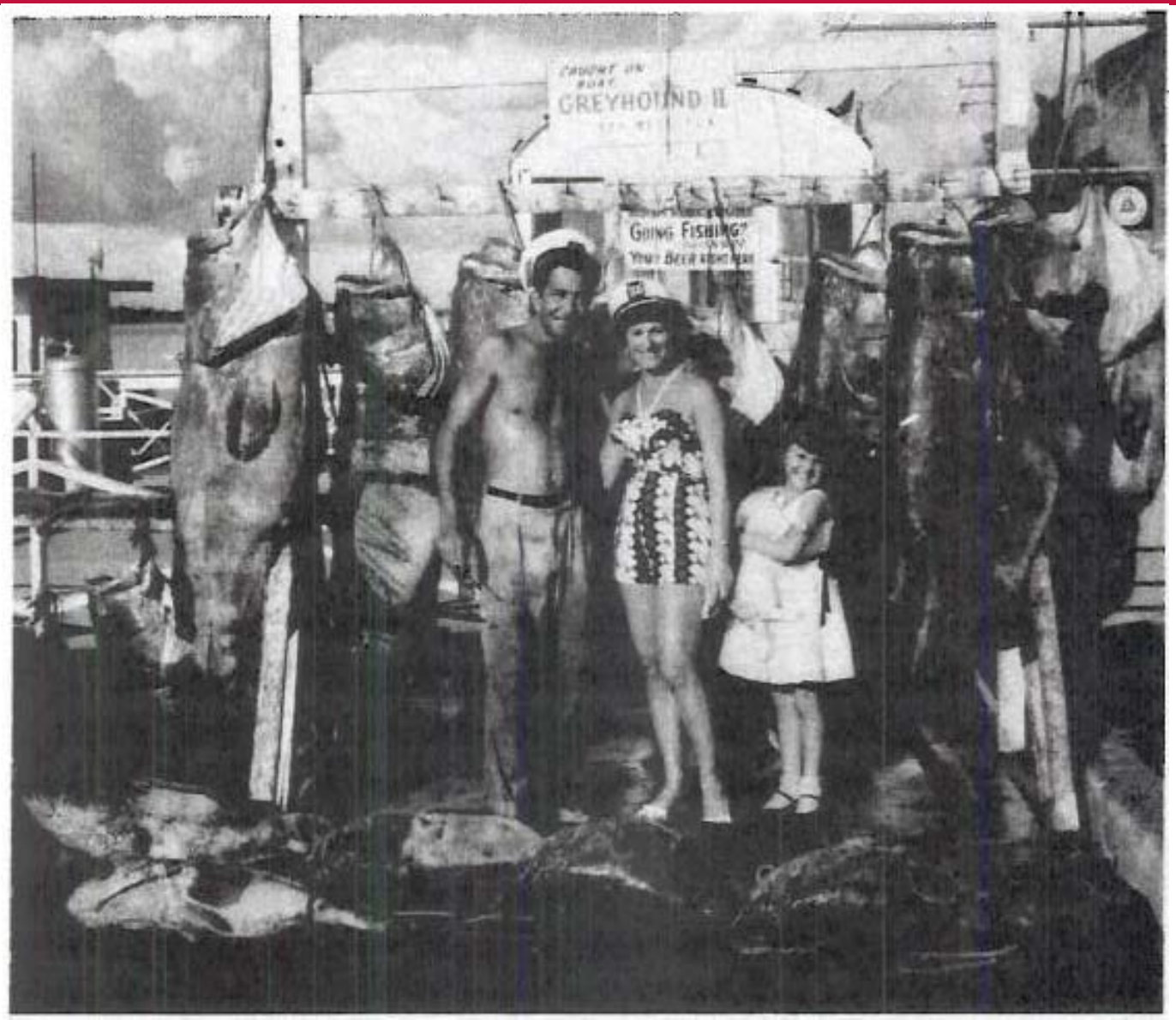
SOURCE: Berkes, F. et al. 2001. Managing Small-Scale Fisheries: Alternative Directions and Methods. IDRC. 308p

Why are small-scale fisheries failing?

- Weak governance
- Open access
- Government subsidies
- Overfishing
- Poor monitoring of catch and fishing effort
- Destructive and illegal fishing (Illegal, Unreported, and Unregulated, *IUU*)
- Degrading ecosystems
- Conflict with other sectors (including industrial fisheries)
- Use of non-selective gear and increasingly efficient gear
- Failure to instill incentives and harness power of market place

Shifting baseline

1958

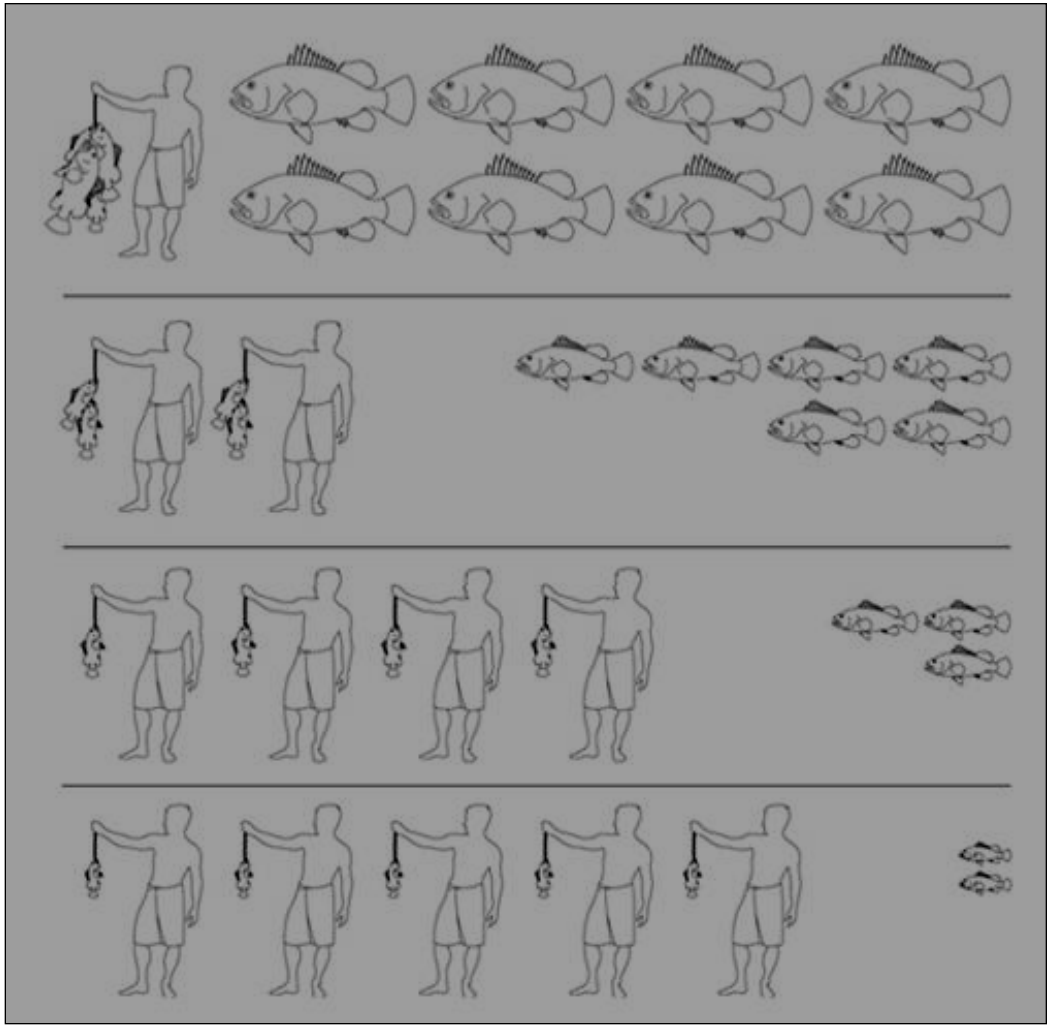


1983

2007

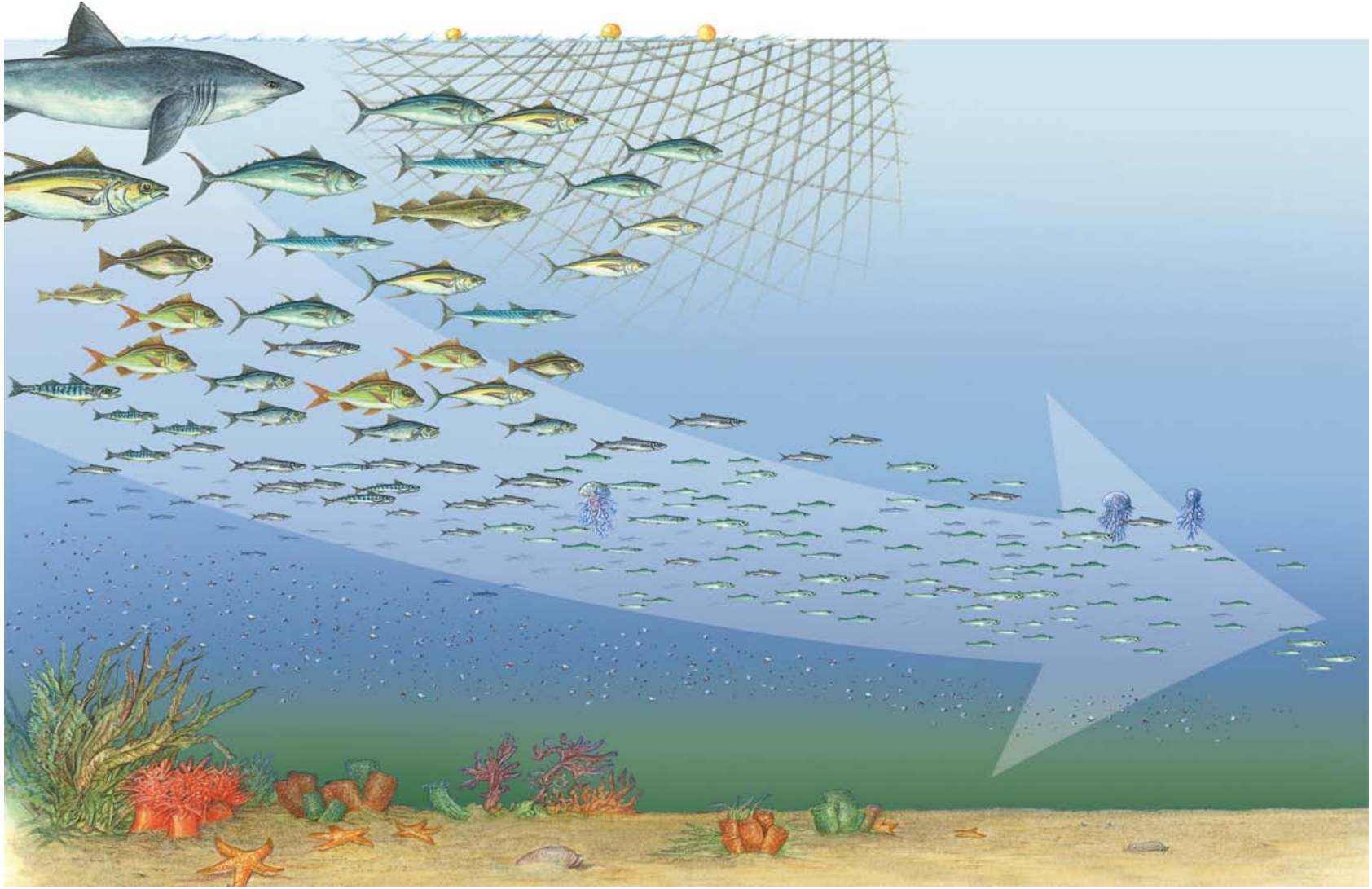
LEAVES 11 AM
RETURNS 4 PM
Capt. John's
GREYHOUND V
PH. 296·5139 or 296·5923

The Basic Problem of Overfishing



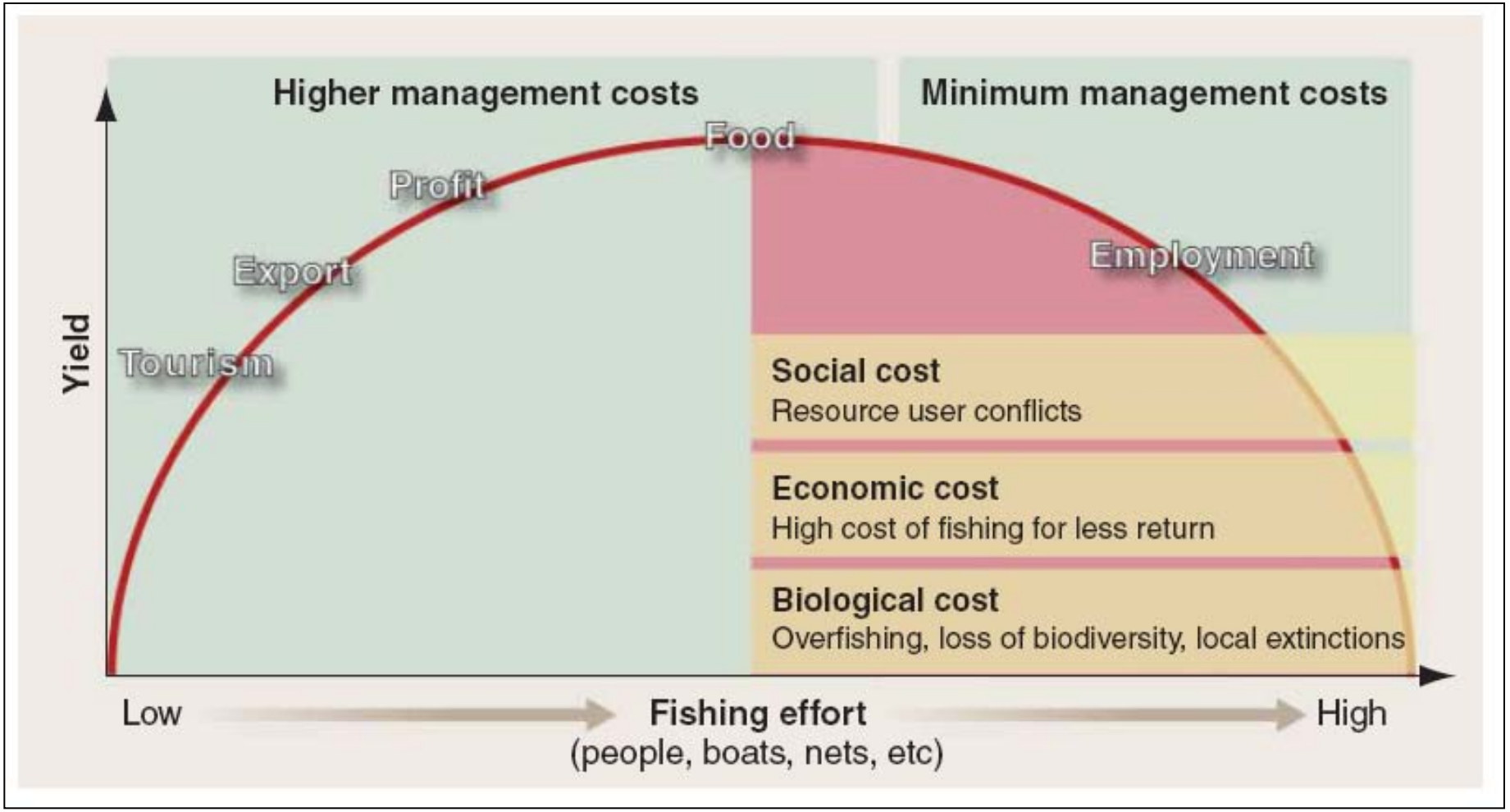
Too many fishermen chasing too few fish

Fishing Down the Food Chain



Pauly et al, 1998 *Science*

Goal setting in fisheries management



Beddington et al. 2007

Tools

- De-centralization
- Co-management
- Ecosystem-based management
- Input and output controls
- Use rights

What works in a developed country industrial fisheries may not apply in small-scale tropical fisheries

Input Controls

- Gear restrictions
- Licensing
- Area closures
- Time closures

Output Controls

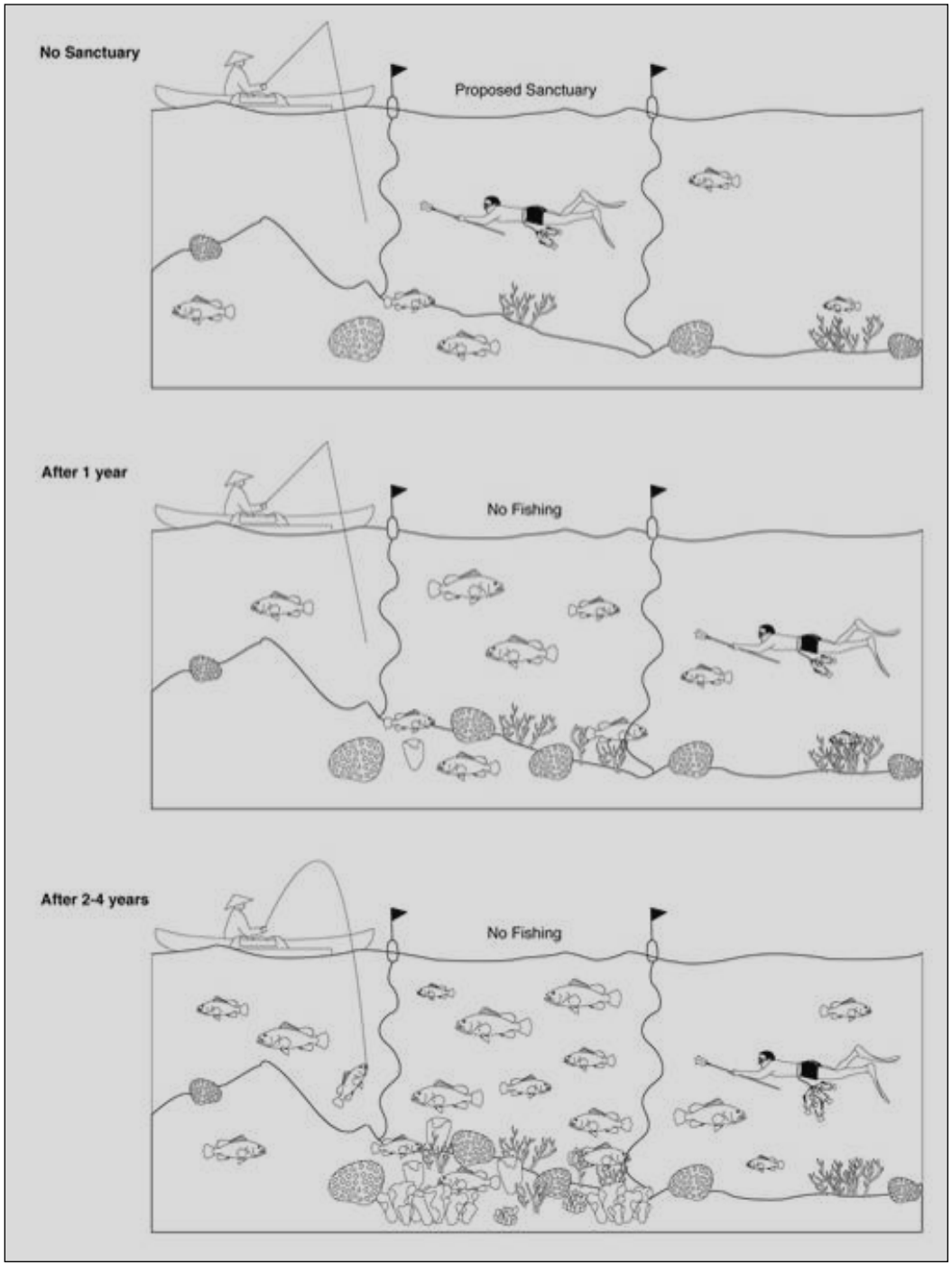
- Size limits
- Prohibitions/bans on certain species
- Total Allowable Catch

Use Rights

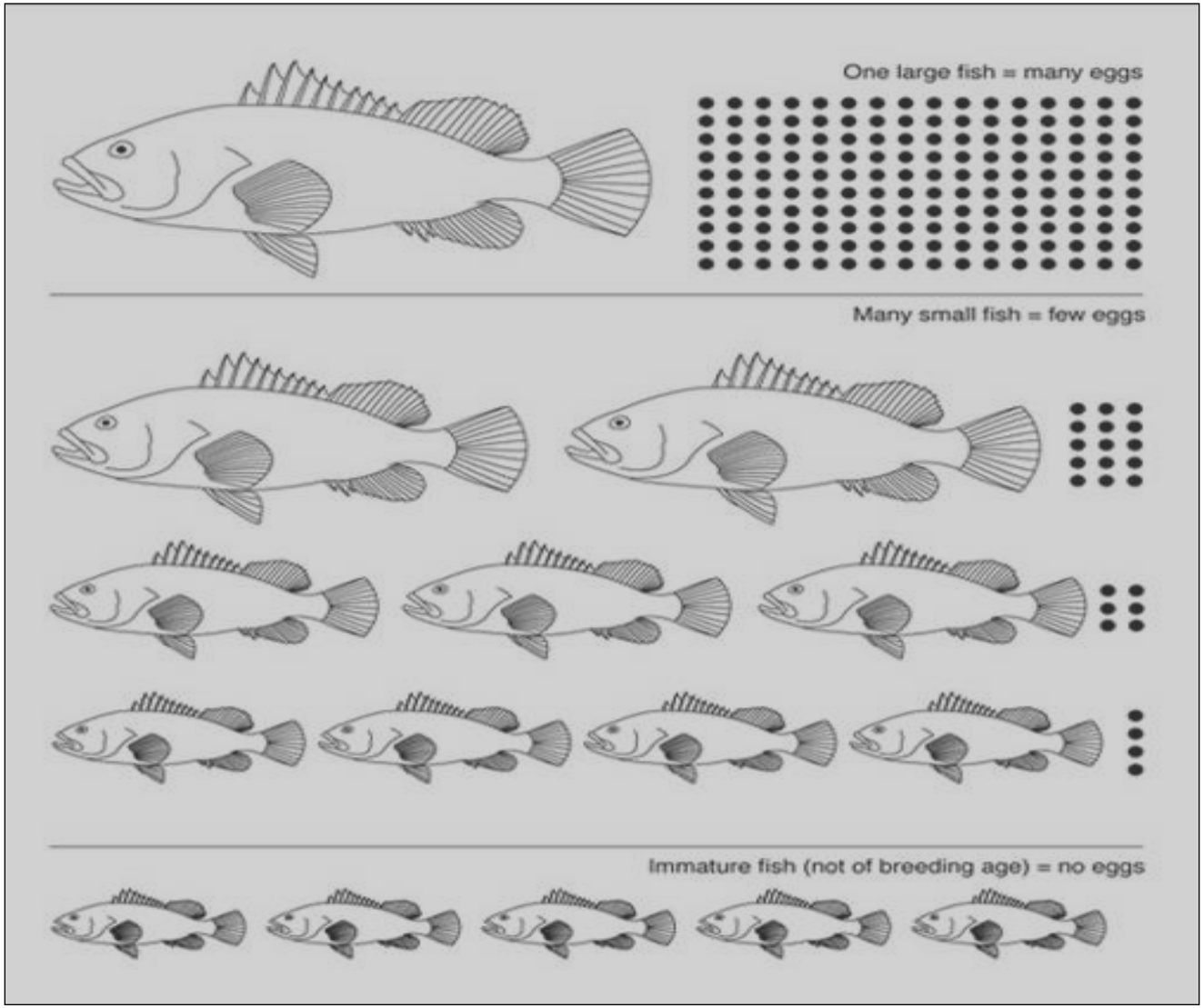
- Limited entry – licensing/registration
- Territorial Use Rights in Fisheries (TURFS)
- Catch shares
- Collectives / sector allocations

Marine Reserves (no-take zones)

- Refuge for overfished stocks
- Restore community structure
- Biodiversity conservation
- Protect critical habitat & spawning sites
- Increase resilience
- Spillover effect to adjacent areas



Why worry about the presence of big fish?



Ecosystem approach to fisheries management

	Conventional Fisheries Management	Ecosystem Approach to Fisheries Management
Management objectives	Fisheries sector	Multiple fisheries, ecosystem and socioeconomic
Species considered	Target species	All species in the ecosystem, particularly those impacted by fishing
Scale	Stock/fishery	Broader ecosystem (spatial and temporal)
Assessment method	Stock assessment	Multispecies and ecosystem assessment and indicators
Data	Scientific	Scientific and traditional knowledge
Governance/ management	Top-down; fishery specific	Participatory, co-management, adaptive management
Management intervention	Mainly control of fishing	Broad based incentives (including MPAs, livelihoods)

(FAO 2009)

Putting it all together ….

- Strengthen institutional, regulatory, and judicial framework
- Introduce co-management systems
- Introduce property and use rights
- Adopt EAFM
- Instill positive incentives (including market approaches)

➢ **Increased value & profit**
➢ **Increased compliance**

Stewardship

So how do we get there?

- Sequencing and timing is critical
  - Develop shared vision among key stakeholders
  - Carry out broad public outreach to support vision
  - Strengthen enabling context (policy, legal, and regulatory reforms)
  - Build capacity (institutional, community, and individual)
  - Strengthen local committees and co-management responsibilities
  - Incorporate input/output controls
  - Register fishers and license fishing vessels
  - Stabilize number of licenses
  - Organize value-chain
  - Develop and implement a 'learning agenda'
- Instill ethic – <u>With privileges come responsibilities</u>

Hɛn Mpoano

Our Coast Our Future

USAID FROM THE AMERICAN PEOPLE

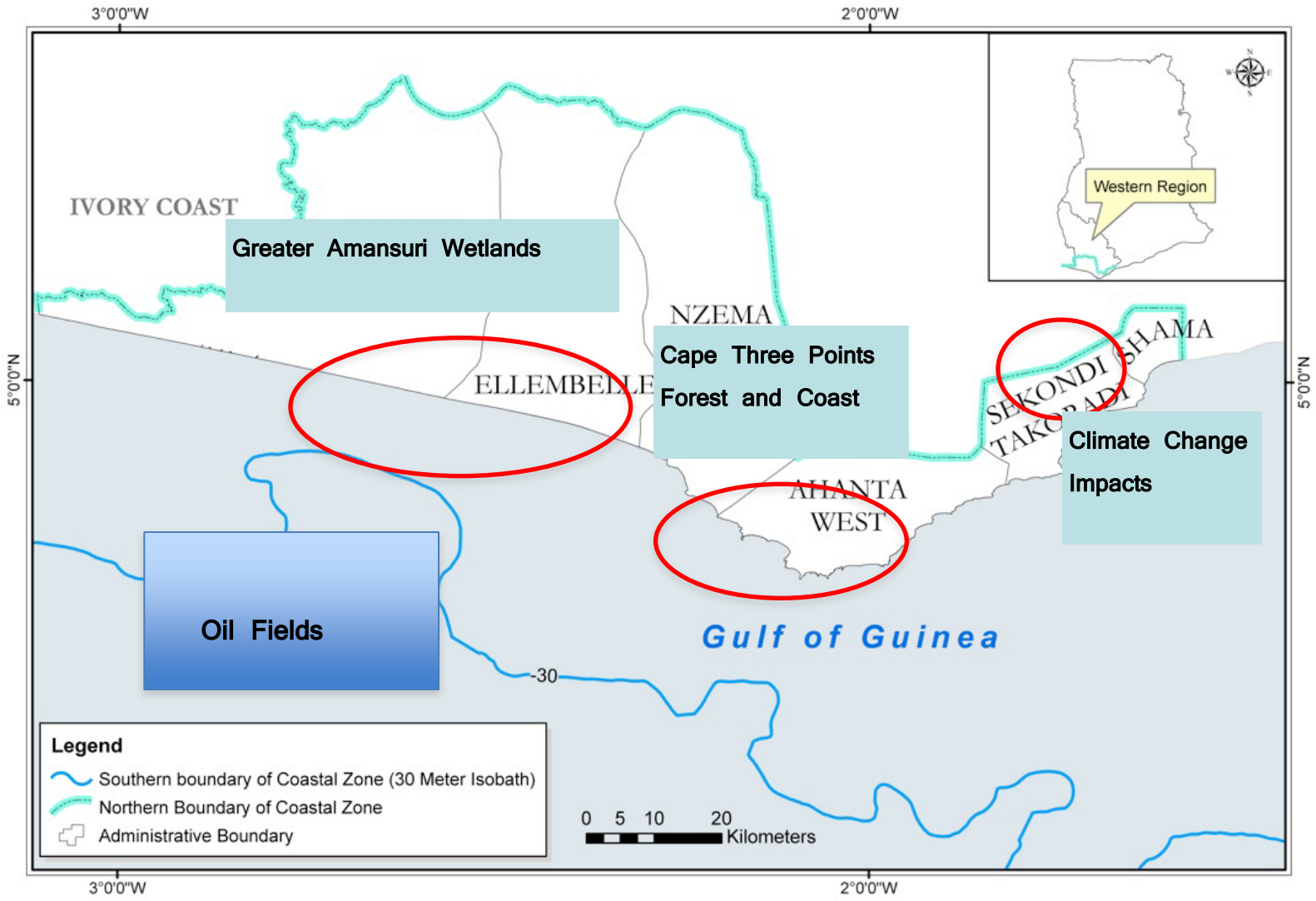
Coastal Resources Center Ghana

DO THE RIGHT THING
Friends of the Nation

WorldFish Center

sustainaMetrix

3 Focal Areas for Hen Mpoano



Ghana – food security

- Average seafood consumption = 27kg/person
- Comprises 60 percent of animal protein consumed in the country
- 135,000 directly employed in marine sector
- 27,000 full-time jobs for women
- 2.2M reliant on fisheries and aquaculture for livelihood
- 36 percent of marine landings are in Western Province
- 1/3 destined for regional trade

The marine fishery in Ghana

Canoes

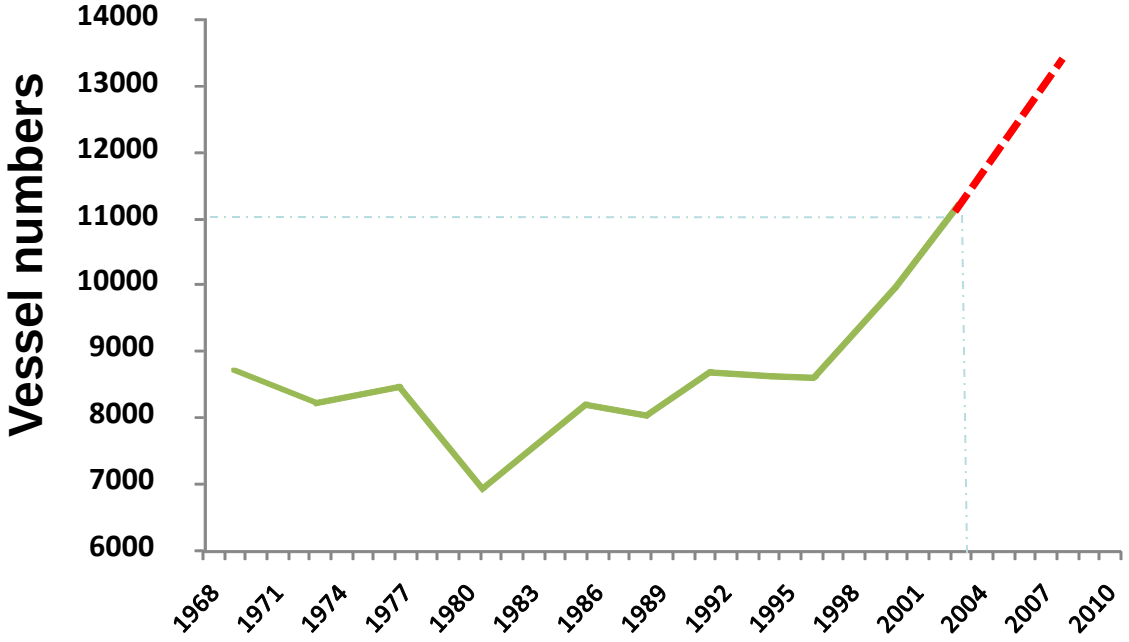
Inshore

Industrial

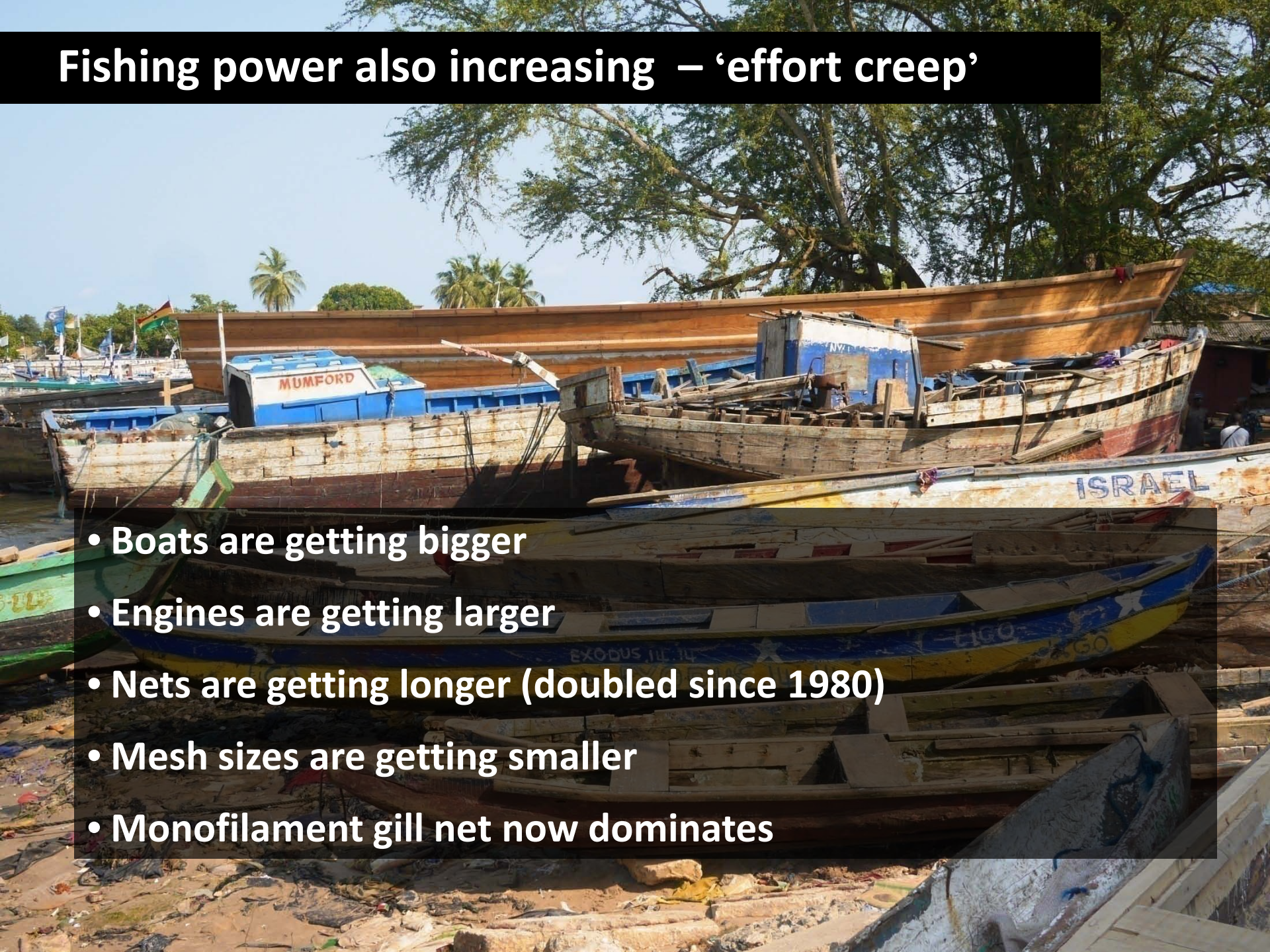
- 310 fish landing sites
- 189 coastal fishing villages
- 90 coastal lagoons

Canoes -- more than 20 gear types

Canoes Inshore Industrial



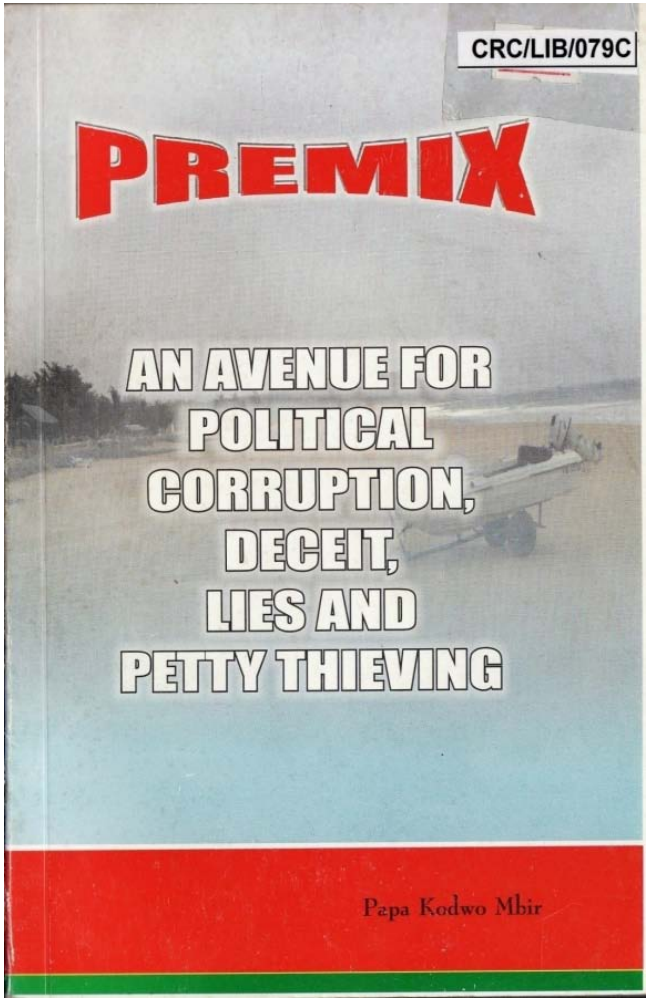
Fishing power also increasing – 'effort creep'



- Boats are getting bigger
- Engines are getting larger
- Nets are getting longer (doubled since 1980)
- Mesh sizes are getting smaller
- Monofilament gill net now dominates

Ghana – factors in over-fishing

- Access to **high-demand** markets
- **Seafood dependency**
- **Globalized trade** demand
- Political interference
- **Lack of control** within the fishery
- Continuing profit potential made possible by government **subsidy**



Ghana – additional challenges

Cause

- Rubber
- Palm Oil
- Mining (bauxite, manganese, and gold)
- Cocoa
- Timber
- Oil and gas
- Sand mining
- Climate change

Effect

- Loss of agricultural lands
- Encroachment on estuaries, lagoons, and wetlands
- Competition for shorefront access
- Marine spatial conflicts
- Coastal erosion and increased flooding of low-lying communities

Key challenges for the sector

- **Open access** with weak, **centralized governance**, and **low capacity**
- **Top-down regulations**, but with **minimal enforcement**
- Absence of effective **co-management**
- **Few incentives** for self-initiated stewardship
- Increasingly **ineffective monitoring**
- **Political interference**

Ghana – USAID

Assemble the preconditions for a Coastal and Fisheries Governance structure that can serve as a national model

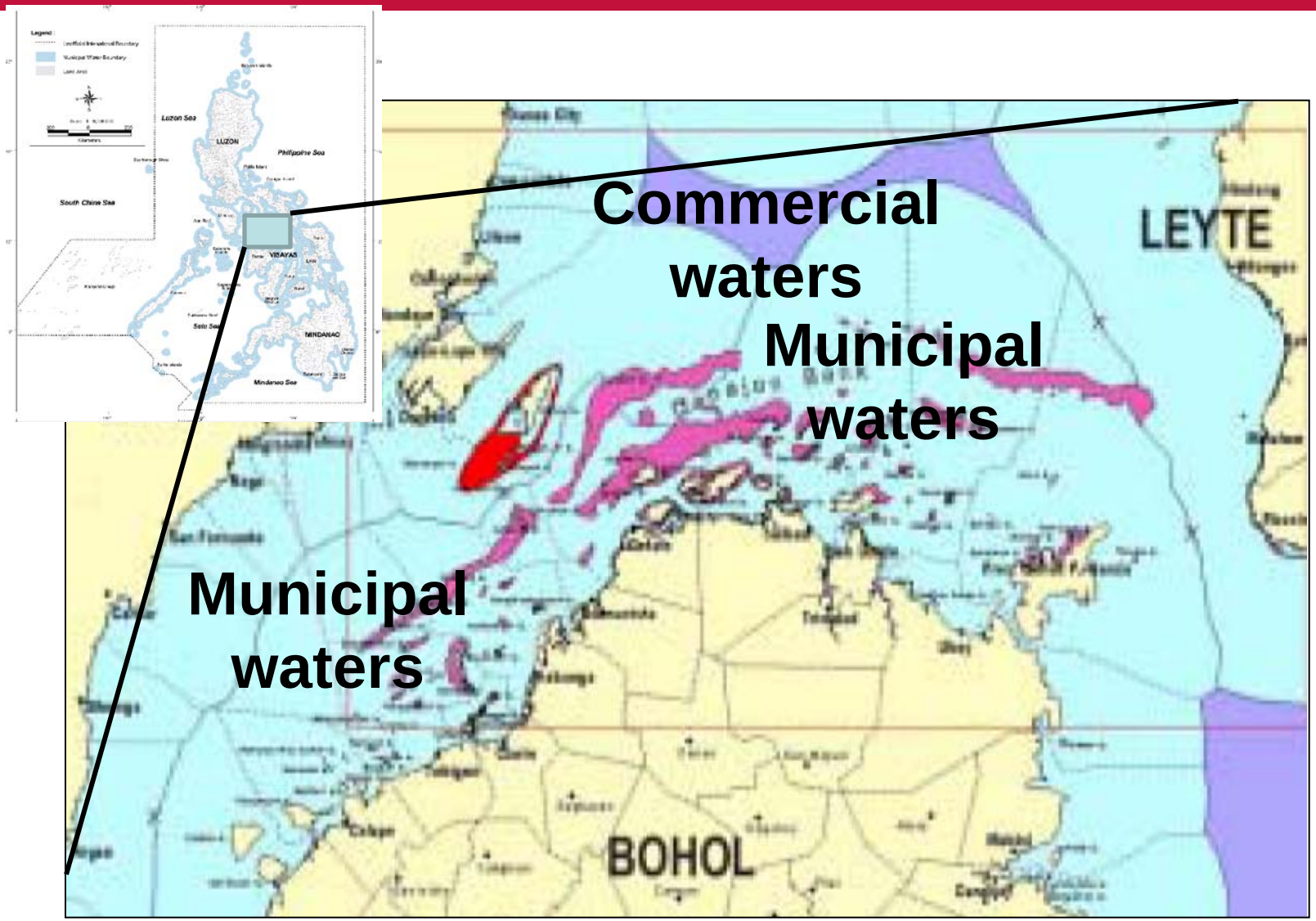
Phase 1: Consultation, gather info, and prepare baselines

Phase 2: Build capacity for decentralized governance & co-management

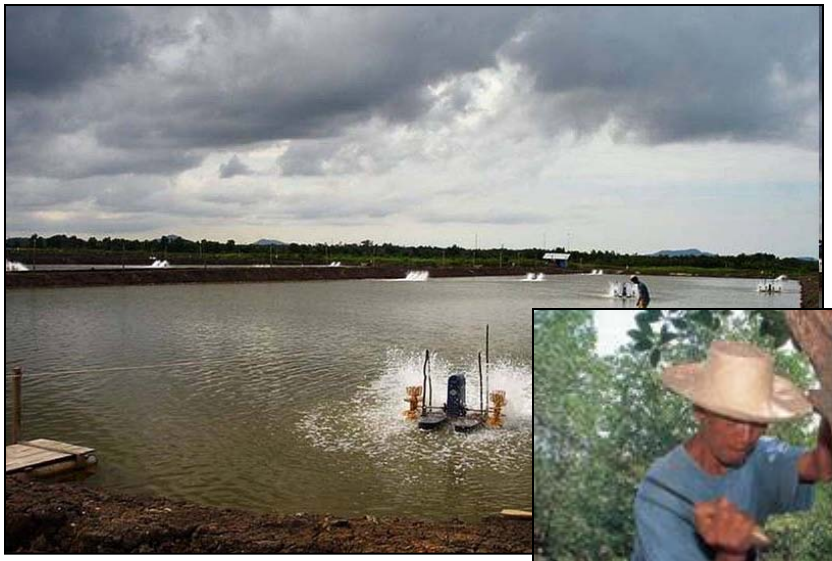
Phase 3: Gain commitment and formalize a fisheries governance program that can be scaled up to nation as a whole

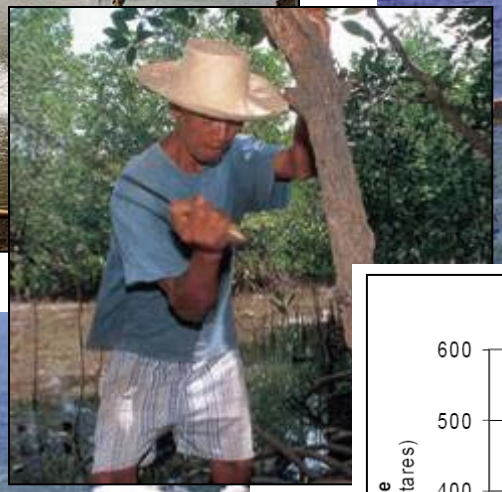
- **Clearly defined Goals**
- **An informed Constituency that supports the goals**
- **Government Commitment**
- **Institutional Capacity to sustain the initiative**

The Philippines – FISH



Threats





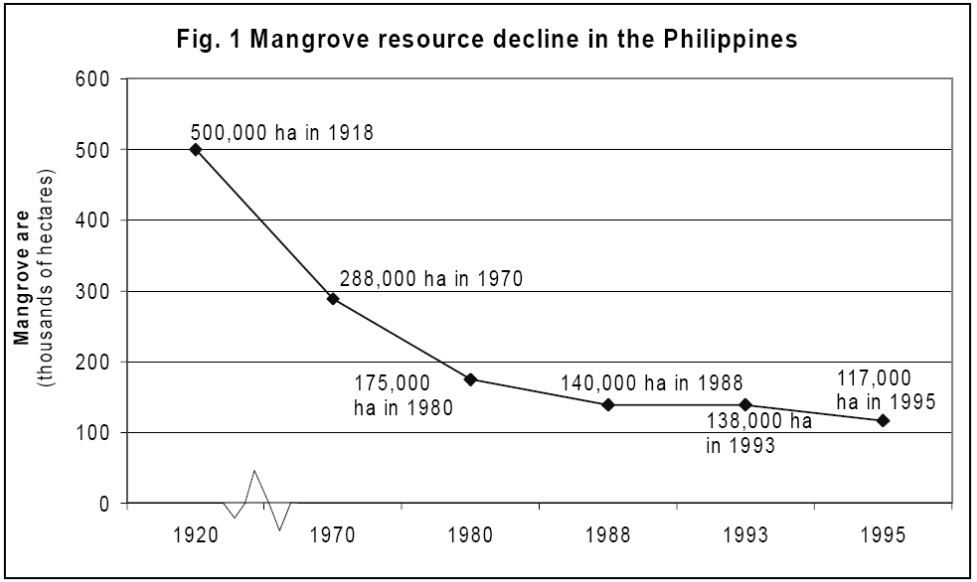


Fig. 1 Mangrove resource decline in the Philippines
Mangrove are
(thousands of hectares)
600
500
400
300
200
100
0
500,000 ha in 1918
288,000 ha in 1970
175,000
ha in 1980
140,000 ha in 1988
138,000 ha
in 1993
117,000
ha in 1995
1920
1970
1980
1988
1993
1995

Strong governance framework

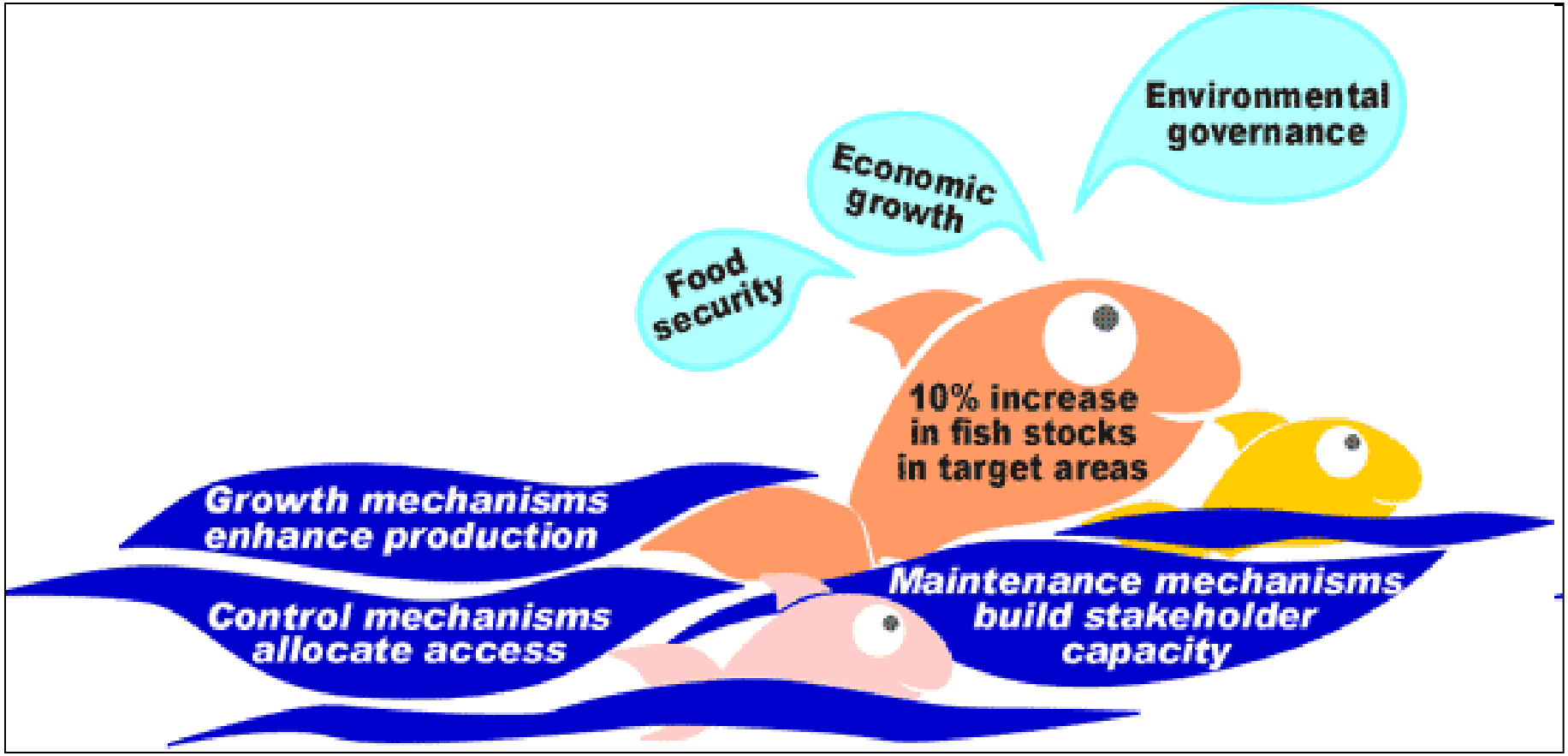
Local Government Code of 1991

- Authority delegated to municipalities to manage fisheries
- Jurisdiction to 15km from shoreline
- Provinces have no fisheries jurisdiction/authority

Fisheries Act of 1998

- Bureau of Fisheries (BFAR) responsible for fisheries management, **except** municipal waters
- Mandates & **funds** Fisheries Management Councils (FARMCs) by "Local Government Units" (LGU)
- Establishes National Fisheries Management Council (NFARMC)
- BFAR may coordinate and assist LGUs and FARMCs
- Allows integrated management across municipal boundaries

FISH Conceptual Framework



FISH Project's approach

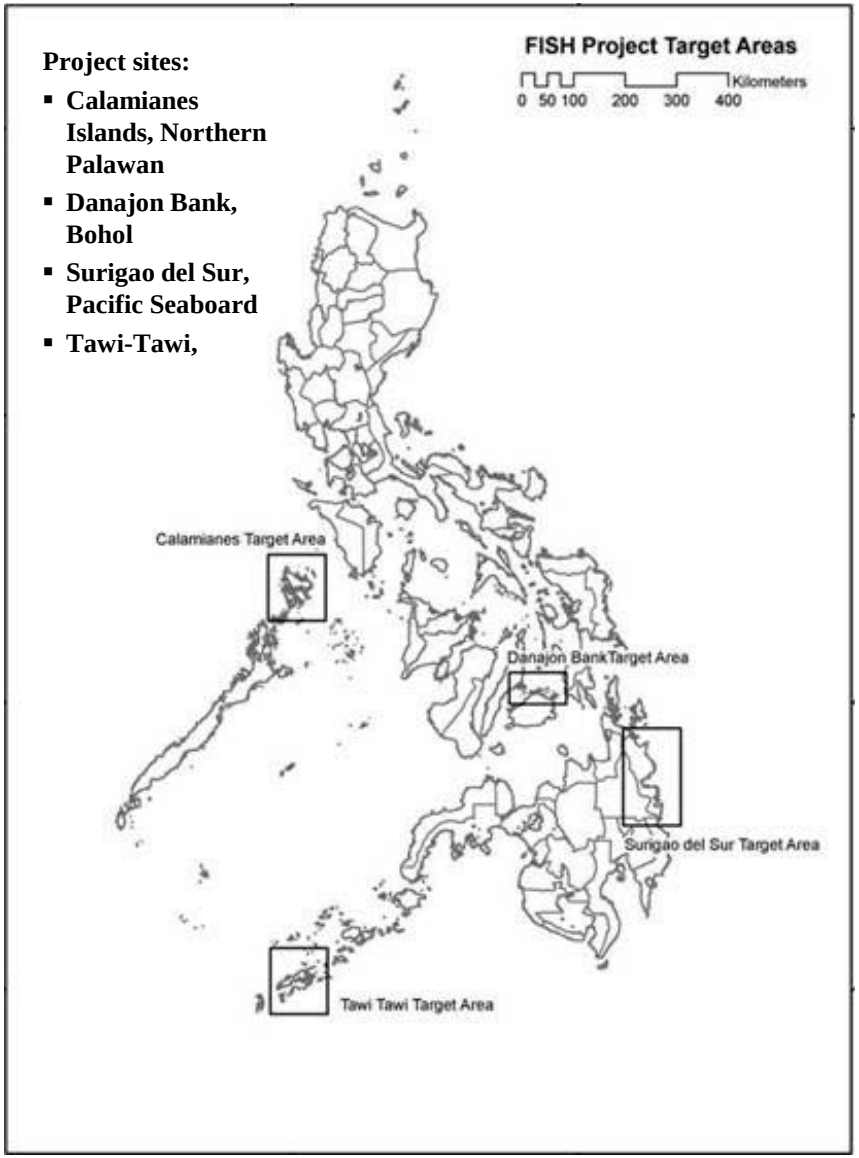
Fisheries Management Mechanisms → **Change in exploitation pattern** → **Increase in fish stocks by 10%**

Modes of delivery

- Capacity-building
- Constituency-building
- Policy improvement
- Co-management
- EAFM
- MPA networks
- Fisheries Management Units

Project sites:

- **Calamianes Islands, Northern Palawan**
- **Danajon Bank, Bohol**
- **Surigao del Sur, Pacific Seaboard**
- **Tawi-Tawi,**



Showing the gains

Volume and value of catch

Annual landed catch (tons) in 4 municipalities in Danajon Bank			
	2004	2006	2008
Talibon	3,666	4,940	4,644
Bien Unido	1,968	2,626	4,426
Ubay	989	1,729	1,428
C.P. Garcia	413	1,571	1,873
TOTAL	7,037	10,867	12,370

- **7,037 mt (2004) – 12,370 mt (2008): landed catch increased by 76%**
- **690 (2004)- 1,600 (2008) kg/fisher/yr**
- **Equivalent to an increase of 19% per annum kg/fisher/year**

Estimated annual landings (tons) of most often used fishing gears			
	2004	2006	2008
Winners:			
Drift gillnet	522	992	2,070
Hook and line	536	2,357	1,297
Danish seine*	634	1,496	1,271
Fish corral*	261	267	302
Stationary liftnet*	8	79	253
Round haul seine*	145	128	218
Losers:			
Multiple handline	185	381	15
Trawl*	173	83	29
Beach seine*	349	38	24
Crab pot	137	150	64
Bottom-set longline	288	502	125
Bottom-set gillnet	726	546	484
* Active and fine-meshed fishing gears			

Showing the gains

Financial analysis and resource valuation

FINANCIAL ANALYSIS: Example forUbay, Bohol, Philippines			
	Actual	Unpaid	TOTAL
Annual Expenses (2008)	1,542,314	819,901	2,362,215
Potential Revenues			3,740,245

ECONOMIC BENEFIT: Example for Ubay, Bohol, Philippine	Value
Increased municipal fish catch, legal methods	**10,261,156**
Damages avoided from blast fishing	20,475,000
Damages avoided from illegal fishing methods	4,008,643
Increased coral cover from MPAs	56,700,925
Damages avoided from commercial fishing encroachment	6,670,800
TOTAL	**98,116,524**

Final thoughts …

- 1/3 of planet relies on seafood for >20% of animal protein
- Protein, but also valuable EFAs and micro-nutrients
- Nearly 80% of seafood is sourced in developing world
- 75% of fish stocks are fully or over-exploited, or collapsed
- In developing world, 90-95% of total catch feeds people
- >30% of catch (globally) is lost through post-harvest
- Significant productivity gains can be made

Will we assist to make those reforms?

Thank you!!

Thank you for joining us!

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MEAS Project: Impact of Climate Change on Extension & Advisory Services

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