

What does...

...UNCLOS stand for?

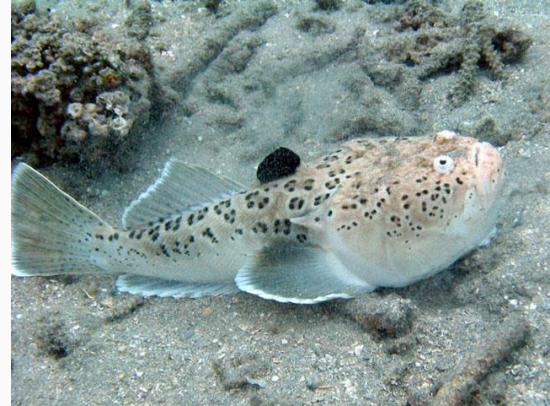
United Nations Convention on the
Law of the Sea

...a spotcheck stargazer do?

Buries itself in sand and
ambushes prey!

...aquaculture mean?

Farming of any aquatic organism.



Aquatic Food Production Systems

ESS 2017



Learning Objectives

Able to outline the problems/issues related to fisheries and aquaculture

Able to describe the threats to specific named species

Able to evaluate strategies for sustainable fishing and aquaculture

As usual, the bad news first...

Could fish stocks really be eradicated by 2048?

<http://video.nationalgeographic.com/video/declining-fish>

Maritime Resources

Review the list of marine species “not to eat” - textbook pg 223

Identify the three **most significant** species in your diet and/or your countries' economies

As a group, identify the three **most significant common** species in your diets

Are there alternatives? Are those alternatives sustainable?

Fisheries & Aquaculture

What's the difference between a fishery and aquaculture?

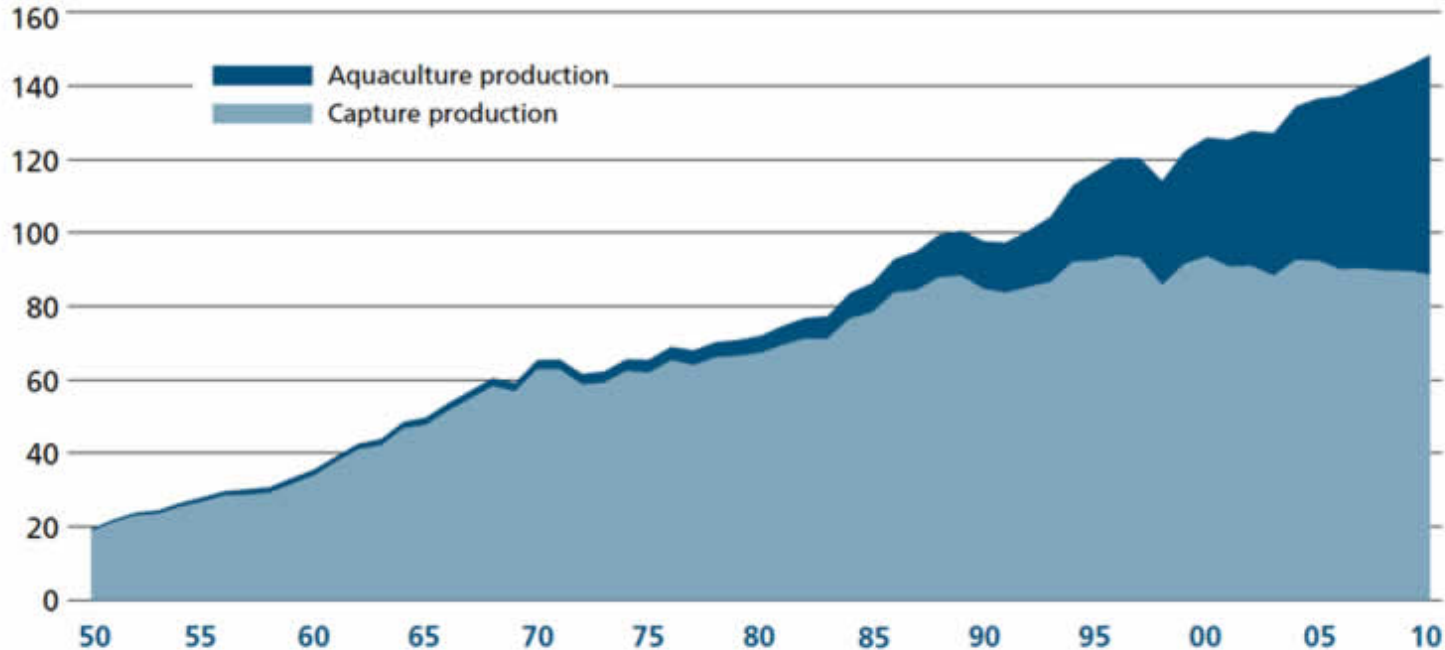
A fishery is used to harvest fish: capture-fishing of wild species and fish farming (salt- or freshwater); a part of aquaculture

Aquaculture is the farming of any aquatic species: control of growth to increase production e.g. hormones, artificial feed, GMO

Fisheries & Aquaculture

World capture fisheries and aquaculture production

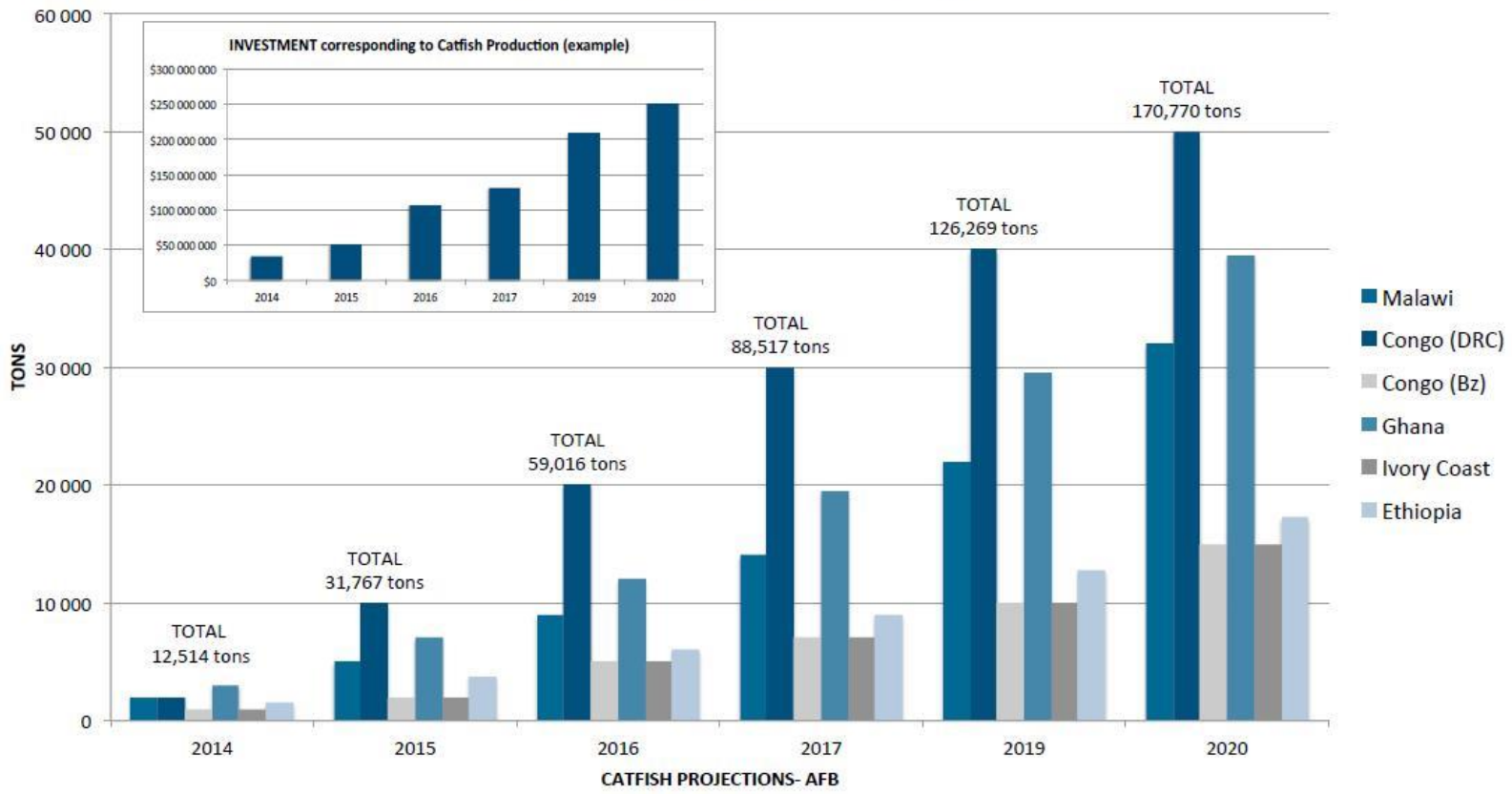
Million tonnes



Credit to: Africa Food Basket,
<http://www.africafoodbasket.com/factsandfigures.html>

Fisheries & Aquaculture

Africa Food Basket project in selected countries



Credit to: Africa Food Basket,
<http://www.africafoodbasket.com/factsandfigures.html>

Fisheries & Aquaculture

“Fish farming” can boost yield and save wild populations

Risks include...

- Loss of habitat
- Pollution from feed and antibiotics
- Diseases spread into wild
- Escape and breeding of GMOs
- Escape and increased competition in wild

Fisheries & Aquaculture

Different species need to be managed in a different way...

Slimehead (**Orange Roughy**) - deep sea Sardine - pelagic



Slow-growing, mature late (30 years to be productive)

Less fish can be caught, less often



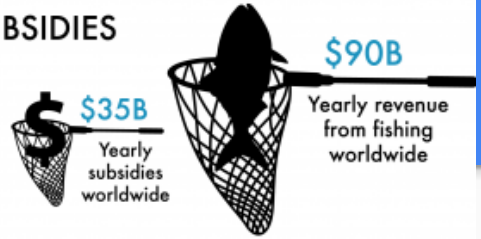
Fast-growing, mature young

More fish can be caught, more often

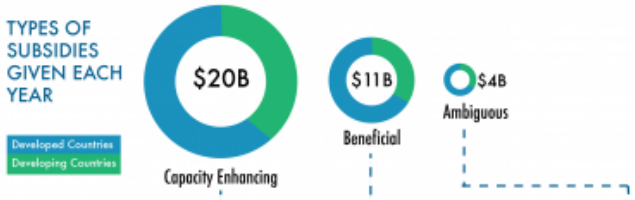
Fisheries & Aquaculture

We're gonna need a bigger boat
GLOBAL FISHERIES SUBSIDIES

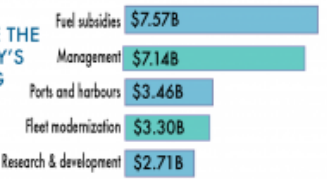
WHAT ARE FISHERIES SUBSIDIES?



TYPES OF SUBSIDIES GIVEN EACH YEAR



WHERE THE MONEY'S GOING



Capacity Enhancing Subsidies
 Help fisheries fish more.

Such as:

- tax breaks on fuel
- bigger boats or engines
- improved gear

Fish stocks ↓

Beneficial Subsidies
 Help create sustainability of the fish stocks

Such as:

- fisheries management
- research & development
- regulation enforcement

Fish stocks ↑

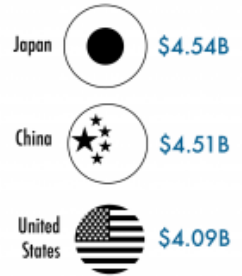
Ambiguous Subsidies
 Help fisheries industry and stock sustainability

Such as:

- fishing license buyback
- unemployment insurance

Fish stocks ?

TOP 3 COUNTRIES



Issues:

Cheaper fuel = more fishing trips
 = more catch = more waste

Payments to catch more =
 fishing during breeding seasons
 = depleted natural capital

Source: Sumaila, Lam, Le Manach, Swartz, & Pauly (2016). Design: Lindsay Lafreniere

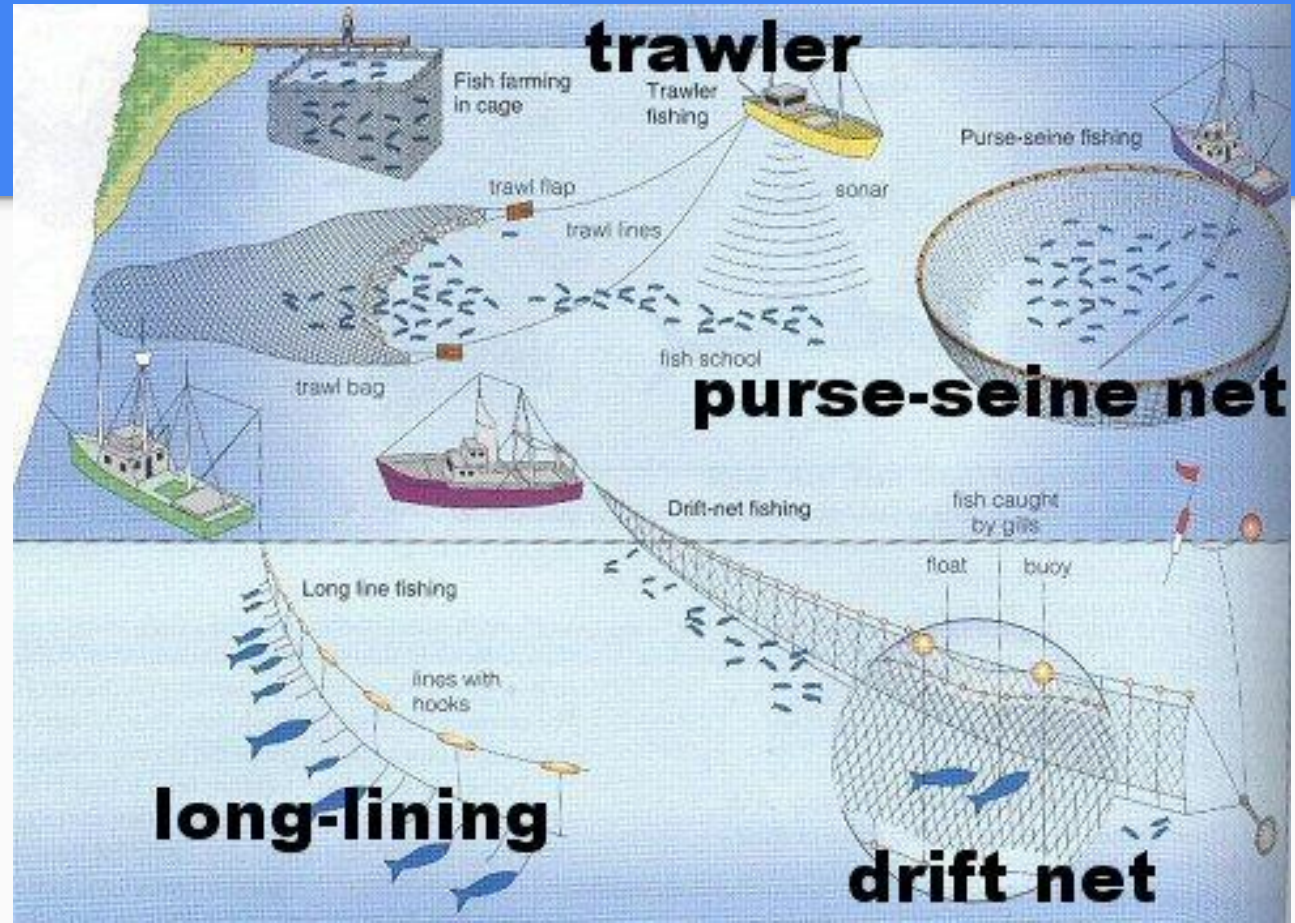


Credit to: University of British Columbia,
<http://www.nereusprogram.org/ask-an-expert-why-is-the-global-fishing-industry-given-35-billion-in-subsidies-each-year/>

Fisheries & Aquaculture

The wild fishing industry is unsustainable because...

Examples of industrial fishing methods



Fisheries & Aquaculture

Tragedy of the Commons

Documentary - “End Of The Line”

Fisheries & Aquaculture

The wild fishing industry is unsustainable because...

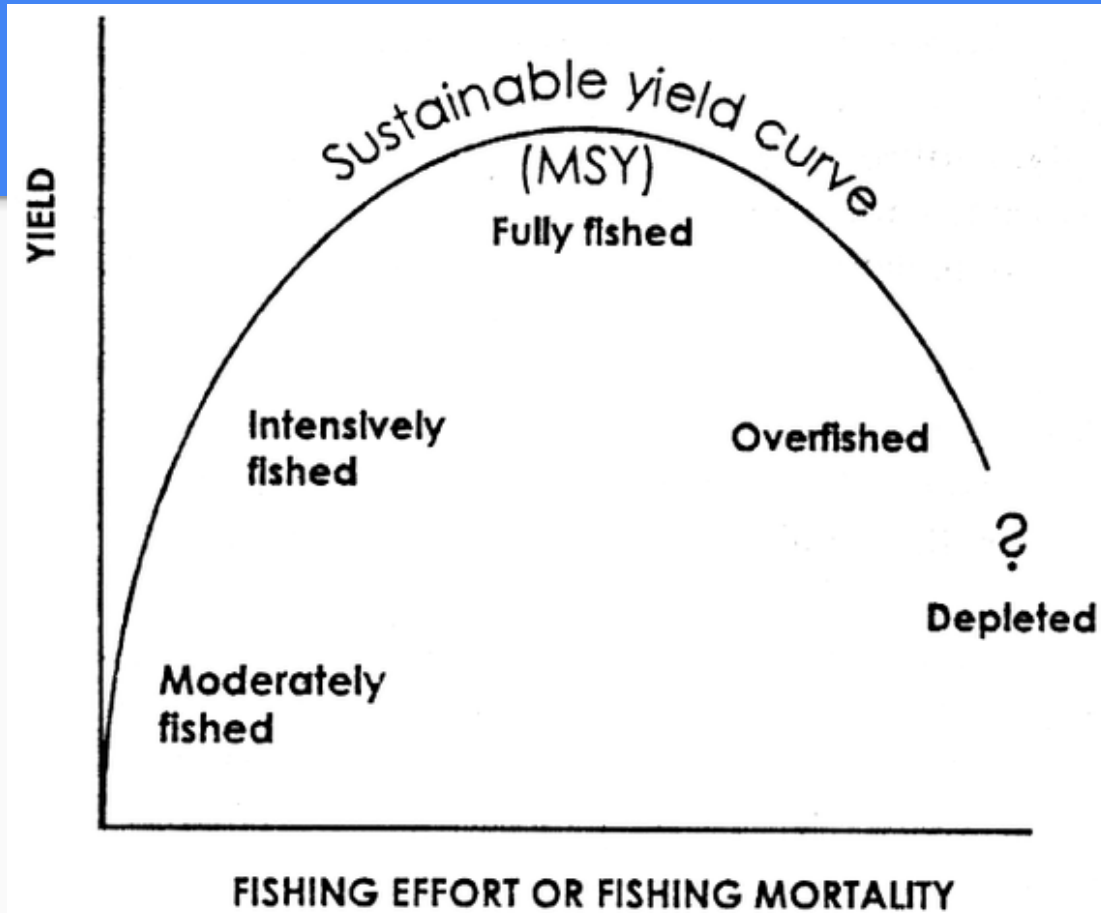
Summarise the main causes and solutions - textbook pg
219-221

Fisheries & Aquaculture

Managing sustainability

- Carrying capacity - community and population
 - Reproduction rate - species and community
 - Life expectancy
 - Natural capital and income
- Sustainable Yield
- Maximum Sustainable Yield (MSY)
- Optimal Sustainable Yield (OSY)

Fisheries & Aquaculture



Fisheries & Aquaculture

Managing sustainability

- Sustainable Yield calculations
 - Sustainable Yield gives us a number value for...
 - Natural Income e.g. alternative fish species

A final thought... The Last Sardine?

<https://www.youtube.com/watch?v=B2kQF7eWkls>