Impacts of increased international demand on fisheries on local populations, with particular attention to local economic status and health

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INCREASED GLOBAL DEMAND FOR FISH AND FISH PRODUCTS

- Food (protein) for humans
- Omega fatty acids for human health
- Fish meal for aquaculture, ultimately as food for humans
- Pet food



ANTHROPOCENTRICISM We can question whether this is the **best** or even a morally justifiable principle on which to order the world.

Causes of Increased Demand

- Human population increase
- Fish and fish products are healthier for humans than red meat
- Increasing human concerns about terrestrial animal welfare

MAIN SOURCE OF GLOBAL DATA

DELGADO, Christopher L. et al. Fish to 2020: Supply and **Demand in Changing Global** Markets. World Fish Centre & International Food Policy Research Institute.

Increasing Global Fish Consumption

- Global consumption of fish has doubled since 1973.
- 90% of this growth in the developing world.
 - Saturation of diets in developed countries, coupled with low rates of population and urban growth
 - In developing countries, population growth and ~75% increase in per capita consumption
 - Per capita consumption still higher in developed countries
- According to the FAO, fish consumption is growing in developing countries, but growth has tapered off in developed countries.

Total consumption of food fish, 1973-97

	Total consumption (million metric tons)			Annual growth rate (percent)
Region	1973	1985	1997	1985–97
China	4.9	8.7	33.2	11.8
Southeast Asia	5.4	7.9	11.3	3.1
India	1.8	2.8	4.5	4.3
Other South Asia	1.1	1.3	2.0	3.3 📈
Latin America	2.1	3.6	3.8	0.6 <
West Asia and North Africa	0.6	1.6	2.1	2.4
Sub-Saharan Africa	2.6	3.7	3.7	0.0
United States	2.9	4.5	5.4	1.5
Japan	7.6	7.4	7.9	0.5
European Union 15	6.3	7.3	8.8	1.6
Eastern Europe and former Soviet Union	7.3	9.0	4.4	-5.8
Other developed countries	0.9	1.2	1.6	2.3
Developing world	20.4	32.5	63.2	5.7
Developing world excluding China	15.4	23.8	30.1	2.0
Developed world	25.0	29.4	28.1	-0.4
World	45.4	61.9	91.3	3.3

GLOBAL PER CAPITA DEMAND FOR FISH



	Total consumption (kg/capita/year)			Annual growth rate (percent)
Region	1973	1985	1997	1985–97
China	5.5	8.1	26.5	10.4
Southeast Asia	17.6	19.8	23.0	1.3
India	3.1	3.6	4.7	2.3
Other South Asia	6.2	5.4	6.0	0.9
Latin America	7.0	9.0	7.8	-1.2
West Asia and North Africa	3.4	6.2	6.2	0.0
Sub-Saharan Africa	9.0	9.2	6.7	-2.6
United States	13.5	18.5	19.7	0.5
Japan	70.2	61.5	62.6	0.2
European Union 15	18.2	20.3	23.6	1.3
Eastern Europe and former Soviet Union	20.3	22.7	10.6	-6.1
Other developed countries	11.2	13.4	14.7	0.8
Developing world	7.3	9.0	14.0	3.8
Developing world excluding China	8.1	9.4	9.2	-0.1
Developed world	22.6	24.3	21.7	-1.0
World	11.6	12.8	15.7	1.7

Total per capita consumption of food fish, 1973-97

Regional Differences

- Increases throughout Asia, but largest increase in China
- Decline in per capita consumption in Sub-Saharan Africa since mid-1980's
- Jamaica more similar to SSA in consumption patterns

NOW ON TO JAMAICA

144 miles long

44 miles wide

3rd largest

Area: Population:

10,990.5 km² or 4,440 miles² 2,641,600 (2003)

FIGHERIES PROFILE

No industrial fleet About 16,000 artisanal fishers Using mostly open fiberglass canoes + 40 hp outboard engine Some use of dugout canoes + oars Many spearfishers operate from the shore (no boats)

COMMON GEAR: FISH TRAPS

THE ANTILLEAN "Z" TRAP

There is no legal or illegal mesh size.

From 1" to 1¹/₂ "

Catches juveniles

COMMON GEAR: FISH TRAPS



COMMON GEAR: TRAMMEL NETS



COMMON GEAR: BEACH SEINES



COMMON GEAR: BEACH SEINES

- Not illegal
- Drag along the seafloor, uprooting coral and seagrass

COMMON GEAR: FREE DIVING



COMMON GEAR: FREE DIVING

- Diving for fish is not illegal, even with SCUBA and Hooka
- The fish do not have a chance, especially at night
- The reef is damaged by the spears
- Sometimes divers use chisels to get at lobsters

ILLEGAL/COMMON GEAR: DYNAMITE



Fishing Grounds

- North Shelf (narrow)
- South Shelf (wider)
- Inshore Banks (Day trips)
- Offshore Banks (some stay for months)

FISHING GROUNDS: JAMAICA



Clear Caribbean Waters Good for tourism, but poor in plankton • Fisheries are related poor to begin

Local Demand for Fish

- Local demand for fish is much greater than the capture fishery can supply.
- The demand and good price has led fishers to fish harder, and therefore to overfishing.

THE HISTORY OF OVERFISHING A = Overfishing during Pre-mechanization



THE HISTORY OF OVERFISHING B = Yield increases during Mechanization



THE HISTORY OF OVERFISHING C = Overfishing during Mechanization



THE HISTORY OF OVERFISHING D = Increase, plateau with new grounds



MORE HISTORY



CARICOM COUNTRIES COMPARED



Fishing Pressure (and therefore Cost of Production \$) \rightarrow





Fishing Pressure (and therefore Cost of Production \Rightarrow) \rightarrow

MUTUAL CAUSATION POVERTY CAUSES OVERFISHING and **OVERFISHING CAUSES POVERTY**

Causes of Overfishing

- Jamaica's weak economy very few other livelihood options for people with little capital and education, and few skills
- Perverse subsidies on fuel and fishing gear
- Increased world demand

Diver Fishers

- Catching for conch and lobster export; earn more in one day than others earn in one month
- High risk
 - No training in SCUB or hooka diving
 - ~6 divers per year are permanently paralyzed
 - No certificatoin required by law
- And so in the name of "economic development" and "fisheries development" Jamaican fishers die and are crippled every year, just so Jamaica can earn foreign exchange from conch and lobster exports.
- In addition, these divers base themselves on small cays at the offshore banks, in quite squalid conditions.

Diver Fishers

- The government needs to step in to protect these desperately poor and mostly illiterate fishers from exploiting themselves, and being exploited by the processors and exporters.
- There is the need for the developed countries who purchase these products to require that they be harvested in conditions where the fishers are not exploited.





Aquaculture

- The decline in marine capture fisheries led to the expansion of (freshwater) aquaculture in the 1980s based on tilapia.
- This has used up all Jamaica's freshwater resources, and has created local water shortages.
- Most of this production is exported, to earn foreign currency. Jamaicans have not yet developed a strong taste for freshwater fish.
- The sanitary waste from the tilapia is causing environmental water quality problems.
- Because tilapia is herbivorous no fish meal is required. We don't have to catch fish to feed fish. However we become more dependent on imported grain.

FISH PRODUCTION, IMPORTS, AGGREGATE



PROPORTION OF FISH CONSUMPTION THAT IS IMPORTED



YEAR

Local Demand for Fish

- Local demand for fish is twice the yield from the capture fishery and farmed fishery combined
- Jamaica is a net fish importer
- Thus, Jamaica is part of the increasing international demand for fish

FISH IS AN IMPORTANT SOURCE OF PROTEIN IN JAMAICA

FISH vs TOTAL ANIMAL PROTEIN



PROPORTION OF FISH IN PROTEIN DIET



YEAR

SOURCES OF FISH PROTEIN

- Fresh fish
- Frozen fish (e.g. bangamary)
- Dried salted fish (e.g. cod)
- Pickled fish (e.g. herring, mackerel)
- Tinned fish (e.g. sardines, mackerel, herring)

Fresh Fish Not Consumed by Poor

- Even if Jamaica could supply fresh all its fish protein needs, there would still be demand for other forms
- No refrigeration among the poor means fresh fish and frozen fish can not be stored
 Tinned, salted, and pickled fish remain important
- An important strategy employed by the poor is to buy food in small quantities, meal by meal
 - Thus, they would not choose to store food

Conclusions

- Jamaica is integrated into the global market for fish and fish products, both as buyer and producer.
- Jamaica is affected by the increased global demand for fish & fish products, both positively and negatively.
- It is within Jamaica's power to regulate her fishing industry to improve natural resource management as well as working conditions.

Conclusions

- There is political and social space for government, NGOs and the private sector to each play an important part.
- At the same time the international community can set standards below which no country in good standing would be allowed to fall.