Supply, Demand and Price Determination

Prepared by
Dr. Sharon Hutchinson,
Dr. Ögmundur Knútsson,
and
Dr. Dadi Kristofersson

Training Workshop on Value Chain Approach to Fisheries

Suriname, July 18th-22nd, 2016

Overview

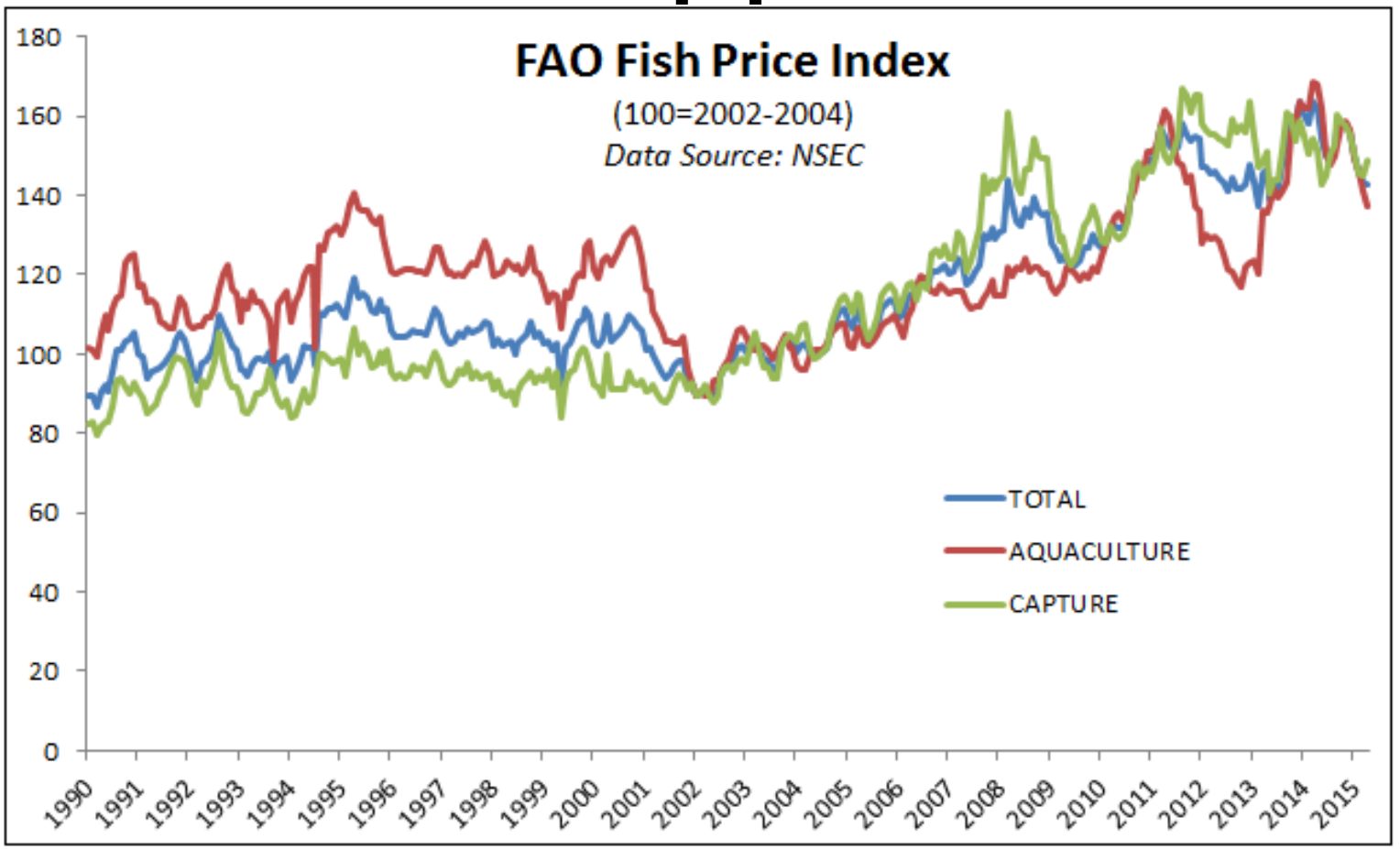
- Global Fish Price Trends
- Identifying the market
- Factors that influence fish demand
- Factors that influence fish supply
- The role of fish attributes

WORLD FISH MARKET AT A GLANCE

	2013	2014 estim.	2015 fcast.	Change: 2015 over 2014
		million tonnes		%
WORLD BALANCE				
Production	**162.8**	**164.3**	**168.6**	**2.6**
Capture fisheries	92.6	90.0	90.6	0.7
Aquaculture	70.2	74.3	78.0	5.0
Trade value (exports USD billion)	**136.2**	**144.3**	**130.9**	**-9.3**
Trade volume (live weight)	**58.8**	**59.5**	**59.8**	**0.5**
Total utilization	**162.8**	**164.3**	**168.6**	**2.6**
Food	141.0	144.6	147.5	2.0
Feed	16.8	15.0	16.4	9.7
Other uses	5.0	4.8	4.7	-2.1
SUPPLY AND DEMAND INDICATORS				
Per caput food consumption				
Food fish (kg/year)	19.7	20.0	20.1	0.9
From capture fisheries (kg/year)	9.9	9.7	9.5	-2.2
From aquaculture (kg/year)	9.8	10.3	10.6	3.8

Totals may not match due to rounding.

FAO Fish Price Index - July 2015



Source: http://www.fao.org/in-action/globefish/fishery-information/resource-detail/en/c/338601/

FAO Fish Price Index

- Overall, the FPI shows less volatility and fewer price spikes than other food price indices including oils, cereals, and dairy.
- Splitting FPI into capture fisheries and aquaculture suggests increased scarcity of capture fishery resources in recent years, but also growth in aquaculture that is keeping pace with demand.
- Regionally, seafood price volatility varies, and some prices are negatively correlated.
- Patterns hint that regional supply shocks are consequential for seafood prices in spite of the high degree of seafood tradability.

What is the Market?

- Who are the consumers?
- End markets are **people**, not a location.
- They determine the characteristics—including price, quality, quantity and timing

How are Consumers Segmented?

- Geographic
  - Region : country, state, neighbourhood
  - Size of metropolitan area
  - Population density: urban, rural, sub-urban
  - climate

How are Consumers Segmented?

- Demographic
  - Age
  - Gender
  - Family size
  - Family lifecycle
  - Generation: Generation X etc
  - Income
  - Occupation
  - Education
  - Ethnicity
  - Nationality
  - Religion
  - Social class

How are Consumers Segmented?

- Lifestyle (psychographic)
  - Values
  - Attitudes
  - Opinions
  - Interests
  - Activities

How are Consumers Segmented?

- Behaviouralistic
  - Usage rate
  - Benefits sought
  - Brand loyalty
  - Readiness to buy
  - User status: periodic, regular etc
  - Occasions that prompt purchase

Reviewing Markets – What Happens to Landed Fish?

- Consumption at home?
- Gifts to friends and family?
- Distributed for free?
- Sold (formal/informal arrangements)
- Community/local/foreign buyers?
- Where is fish sold?
- When is fish sold?
- What is the form of fish sold?

Different Markets for Different Kinds of Fish!

- Fish for locals, fish for tourists…
- Fish for urban vs rural residents
- Whole fish, frozen fish, fillets….
- Smoked fish, salted fish, ready-to-eat…

DEMAND FACTORS

Key Factors Affecting Fish Demand

- Price of fish

Key Factors Affecting Fish Demand

- Price of substitutes (chicken, red meat)

Key Factors Affecting Fish Demand

- Household income
- Income Distribution
- Tastes (cultural attitudes)
- Fashion
- Advertising
- Expectations of the consumers

Key Factors Affecting Fish Demand

- Health concerns - **2015 USA Dietary Guidelines moves toward seafood consumption**
    - The report addresses to the role of seafood consumption into the dietary patterns as an important source of key macro- and micronutrients and to the relation between dietary patterns and sustainability

Key Factors Affecting Fish Demand

- Ethnicity and race
- Geographic distribution
- Family Size
- Age
- Age of children (0-10 yrs)
- Marital status
- Occupation type

Consumer Preferences

- Aquaculture/ Capture
- Variety and nutritional content
- Safety
- Greenness
- Fair trade

Consumer Preferences

- Increased demand for product differentiation
  - Ethnic food,
  - Convenient food
  - Healthy food etc.
- Less time allocated to purchasing and preparation of meals
  - Increased concentration of different food items
  - Increased processing of food
- Increased awareness of safety and health issues associated with food intake
  - Increased the demand for documentation of raw material and productions processes

Influencing Factors on Consumers

- Environmental groups
- NGO´s
- Activists
- Third party certifiers
  - For example MSC
- Celebrities
  - TV chef's
  - Movie stars
  - etc...

Ragnar Tveteras and Olav Kvaloy " Primary industries facing global markets: The supply chains and markets for Norwegian food" Frank Asche (ed).

Retailers demands to suppliers

1	Price	a) Price level, b) linkage to market price, c) quantity discounts
2	Volume and Timing	a) Total volume, b) regularity of deliveries, c) flexibility in deliveries, e.g. In relation to "normal" volumes and time delivery
3	Raw material attributions	a) Size distribution, e.g. Fillets, b) quality attributes, e.g. Collour, fat, texture, taste, c) fresh vs. Frozen, d) uniform quality, e) shelf life
4	Product range and differentations	a) Fish species, b) Product varieties, e.g. Easy-to-cook, ethnic foods, healthy foods, c) private labels / brands, d) consumers advertising
5	Production process	a) Raw material in feed, b) environmental effects of production, c) animal welfare, d) third party certification, e.g. ISO, HACCP e) traceability
6	Transaction cost	a) Negotiation, b) planning, c) control an enforcement, d) transportation e) storage

SUPPLY FACTORS

- Raw material (the fish)
- Cutting/dressing
- Additives (sauce, breading etc)

- Preservation method
- Packaging
- Presentation

What is being sold? Attributes of fish

- Quality?
- Freshness
- Size
- Timing
- Accessibility
- Stability
- Reliability
- Packaging

What is being sold? Attributes of fish

- Colour of flesh
- Appearance of fish
- Fat/ nutrient content
- Presence of bones
- Price

Factors Affecting Fish Supply

- Nature
- Product/ Market conditions
  - Huge post-harvest losses and poor infrastructure contributes to the inferior quality of fish and its export earnings.
  - Most fish suppliers in developing countries act as raw material suppliers of industrial nations, which allow them to earn little profit from their valuable natural resources.

Factors Affecting Fish Supply

- Procurement practices
  - Factor prices and availability for production and shipping
    - Gear, ice, bait, fuel
    - Expansion or improvement in quality of infrastructure services lowers marginal costs, raising the minimum efficient scale of production, transportation, or marketing (Brooks, 2008)
    - Lower costs and greater economies of scale raise the potential for increased or new sales in export and domestic markets (Brooks, 2008).

Factors Affecting Fish Supply

- Producer preference
  - 75 percent (approximated) of fish species with commercial value have been overexploited and some are close to extinction.
  - 52 percent of commercial stocks are fully exploited, i.e. they are at or near their maximum sustainability production levels.
    - 25 percent are in very bad condition,
    - 17 percent are overexploited and
    - 7 percent are depleted.
    - 1 percent is recovering from depletion.

Factors Affecting Fish Supply

- Technology
  - Post-harvest fisheries technology involves processing, preservation, handling, harvesting, marketing etc.
  - Developing countries, where tropical weather and under developed infrastructure contribute to the problem, losses are sometimes in staggering proportions.
  - Losses occur in all operations from harvesting through handling, storage, processing and marketing.
  - Many developing country producers were marginalized from global supply chains due to their poor maintenance of quality standards.
  - In general, low-tech developing country suppliers earn less for their resources;
  - Industrial nations earn extra premiums, by marketing information systems, supply chain management, quality assurance regimes, transport, handling, post-harvest and production technologies.
- Regulatory change

Factors Affecting Fish Supply

- Climate Change
  - GLOBEFISH: *'The current world phenomena of climate change affects directly and indirectly fisheries resources and consequently coastal fishing communities. Low-lying coastal areas are particularly vulnerable and entire communities may become "climate refugees'.*
  - Sea-level rise
  - Flooding
  - Ground water contamination

Factors Affecting Fish Supply

- Climate Change
  - Increased water temperature changes fish body size
  - Changes fish distribution and the productivity of marine and freshwater species (including mariculture)
  - Increased acidity makes it more difficult for marine organisms such as shrimps, oysters, or corals to form their shells
  - Impacts of community livelihoods and sustainability
  - Changing rainfall patterns can negatively affect inland (freshwater) fisheries and aquaculture

Supply of Fish Attributes

- Fish is heterogeneous with a number of attributes
- Consumers have preferences for attributes and the value of fish is to a large extent determined by its attributes.
- Valuable attributes are directly related to the concept of quality.
  - A product that has many valuable attributes is a quality product.

Optimal supply of attributes

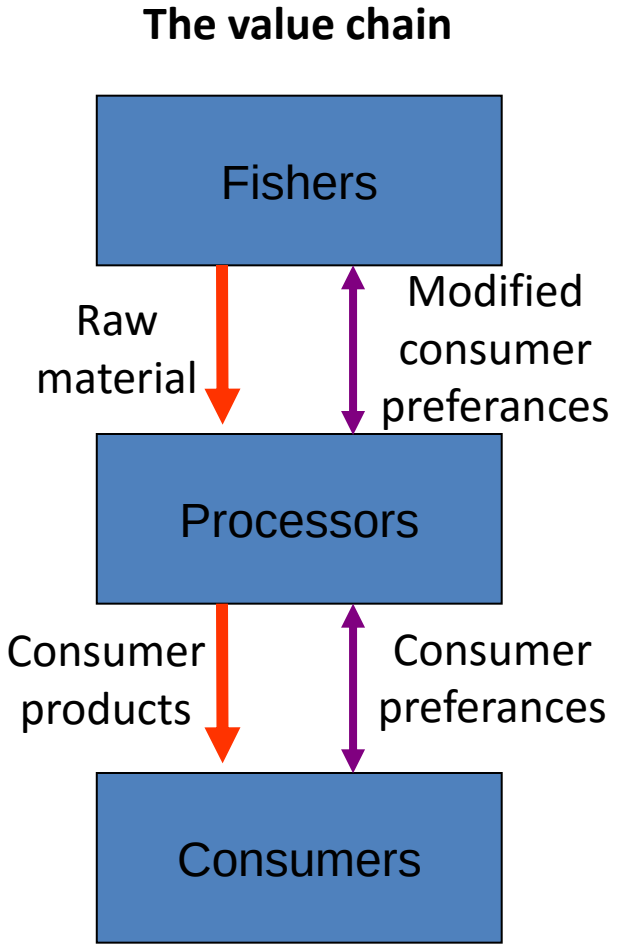
- Improving quality is costly and producers of heterogeneous goods must consider both revenue and cost when maximizing their profits.
- Optimal supply of quality is reached when the marginal cost of improving quality equals the marginal value of quality.

Optimal supply of attributes

- Optimal supply presupposes
  - An effective way of passing on information on attributes and attribute preferences in the form of incentives
  - The flexibility in the production to respond to incentives.
- Both factors are affected by regulation

The value chain

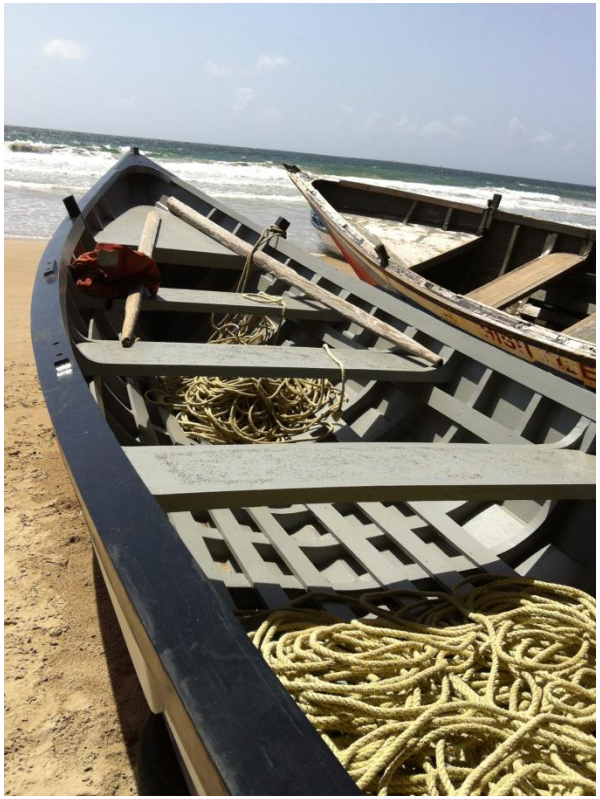
- In theory the market pricing mechanism should pass on information up the value chain from consumers, trough processors to primary producers.



Special issues regarding fisheries

Tragedy of the commons

- Fishers have no incentive to conserve in open access fisheries
- Leads to loss of resource rent (profit)
- Encourages governments to regulate harvest
- Supply of fish determined by regulation
  - Fixed or inflexible supply

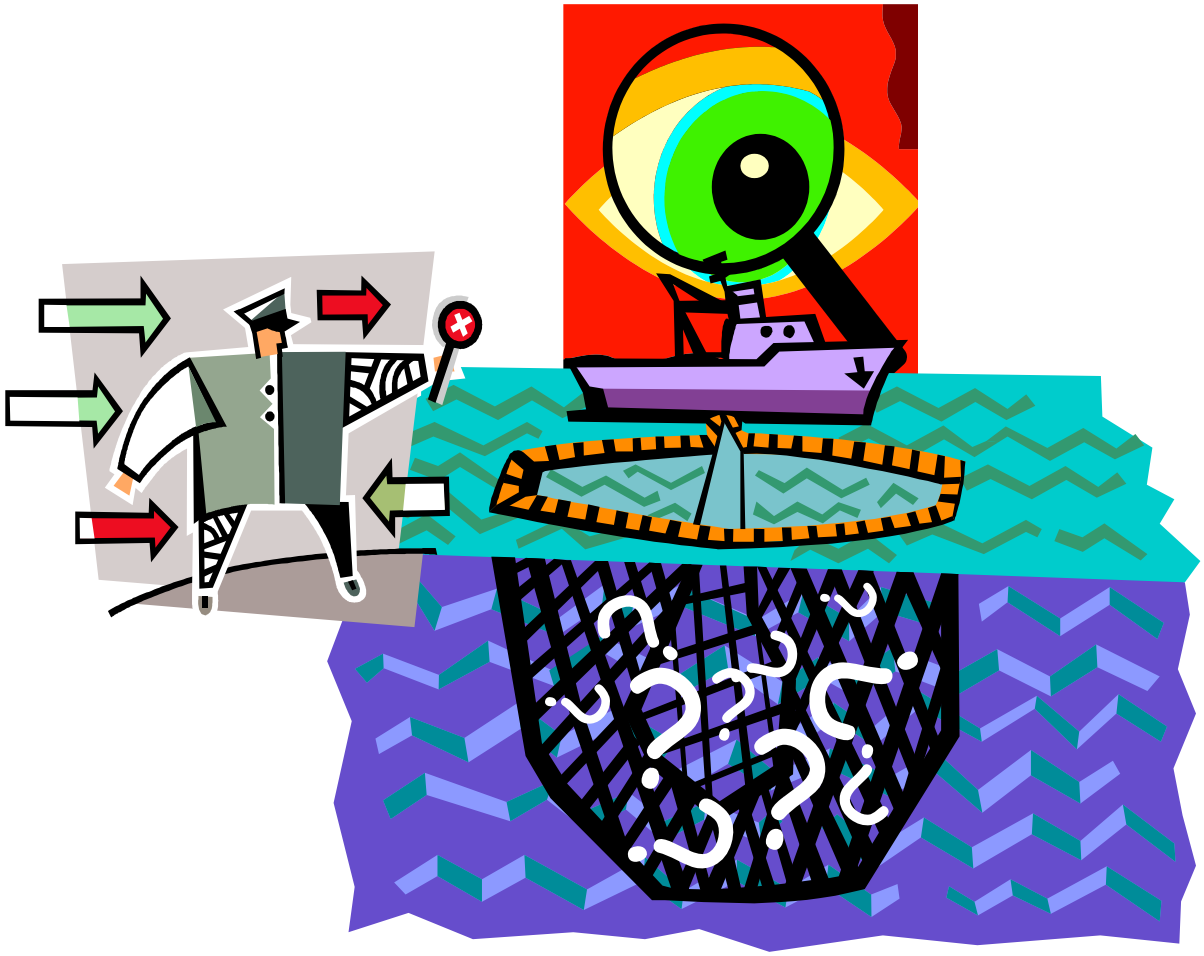


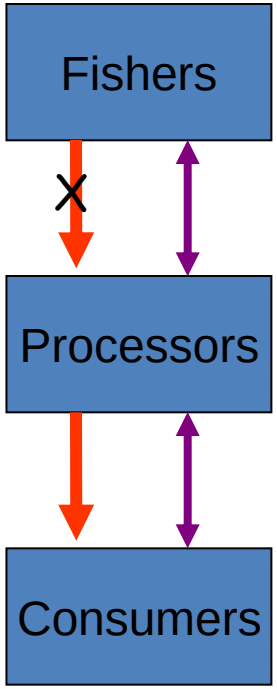
Special issues regarding fisheries

Limited output control

- Fishers have limited control over some of the attributes of their catch.
- The fisher is able to influence his expected catch by choice of gear, fishing ground and time.
- He can improve his control with investment.
- It is however up to chance what he actually catches.
- This lack of control has made the industry historically more supply than demand driven.

Fisheries regulations and the supply of attributes





Conclusion - Managment Regulation

- Management regulation effects the supply of attributes trough output control
- Regulation must allow the fishers to respond to incentives
- Restricting responsiveness to incentives reduces the surplus generated by trade
- This should be taken into account when regulating fisheries

Information asymmetry

- Inaccurate description of attributes lead to an information asymmetry in the market.
  - The fisher knows more about the attributes of the fish than the buyer
- Major theoretical contribution by Akerlof
  - Showed that information asymmetry increases the quantity of low-quality goods sold at the expense of high quality goods.
  - Low quality producers are able to take advantage of lower production cost

Information asymmetry

- Information asymmetry leads to market failure!
- A high quality good could be driven from the market and all the surplus generated in the high quality market could be lost

Price Determination

- Supply interacts with demand to determine price
- Fall in supply increases prices, all else being equal
- Increasing demand increases prices

Thank you!

Supply, Demand and Price Determination

Prepared by
Dr. Sharon Hutchinson,
Dr. Ögmundur Knútsson,
and
Dr. Dadi Kristofersson

Training Workshop on Value Chain Approach to Fisheries

Suriname, July 18th-22nd, 2016