Trends in aquaculture production and outlook

IFFO Conference

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Increasing number of chronically undernourished people: 815 million (11%)
Prevalence of undernourishment highest in Africa, but highest number in Asia
Food security and nutrition status

Millions of children suffering nutrition deficiency

- **Vitamin A deficiency**
  - Causes blindness.
  - 250 million preschool children affected.

- **Iron deficiency**
  - Anaemia contributes to 20% of all maternal deaths.
  - 40% of preschool children anaemic in developing countries.

- **Iodine deficiency**
  - Impairing cognitive development in children
  - 54 countries still iodine-deficient

Billions of obese or overweight people

- **Trend**
  - Worldwide **obesity** has nearly doubled since 1980.

- **Adults (aged 20 or older)**
  - More than 1.4 billion (35% of total) **overweight** in 2008
  - Over 200 million men and nearly 300 million women (11% of total) **obese** in 2008.

- **Children (under the age of 5)**
  - More than 40 million children **overweight or obese** in 2012.

*Source: WHO*
Fish and Nutrition

Fish: Nature’s superfood

- Vitamin D
- Iron
- Zinc
- Iodine
- Vitamin B12
- Protein
- Selenium
- Calcium
- Omega-3 fatty acids
- Vitamin A
Fish provides many valuable nutrients

- protein
- long-chain omega-3 fatty acids (Eicosapentaenoic acid (EPA) and Docosahexaenoic acid (DHA))
- fat-soluble vitamins
- minerals like iron, calcium, iodine, zinc & selenium

With numerous health benefits

- *(known)* reduced risk of cardiac death, aids neurodevelopment in unborn infants
  - A daily intake of 250 mg of EPA and DHA per adult gives optimal protection against coronary heart disease related. At least eat fish twice a week!
- *(probable)* reduced risk of stroke, *(possible)* reduced risk of depression

Which are important in developing countries

- fish provides nutrients where they are most needed
- cheap small pelagics growing component of developing country diets
Fish food supply

Average per capita fish supply (in live weight equivalent):
- 0–2 kg/year
- 2–5 kg/year
- 5–10 kg/year
- 10–20 kg/year
- 20–30 kg/year
- 30–60 kg/year
- > 60 kg/year
Fish contribution to human nutrition

- Per capita fish consumption (kg)
- Share of fish in total animal proteins (%)

Regions:
- Latin America & the Caribbean
- Northern America
- Oceania
- Europe
- Africa
- Asia
- LIFDCs
- World

Graph showing the comparison of per capita fish consumption and share of fish in total animal proteins for different regions.
Aquaculture & capture fisheries production

Excluding aquatic plants.
Fish production & utilization

Fish production
(million tonnes live weight)

Per capita fish supply (kg)

Excluding aquatic plants. 2016/2017: estimate/forecast
Aquaculture and capture

Million tonnes

Aquatic animals


Aquatic animals and plants

Aquaculture Capture
Aquaculture production by continent/region

1980
- Asia: 75%
- Europe: 19%
- North America: 4%
- Oceania: 0%
- Africa: 1%

2015
- Asia: 89%
- Europe: 19%
- Latin America & Caribbean: 4%
- North America: 2%
- Africa: 1%
- Oceania: 0%
Aquaculture production 2015


Excluding aquatic plants.
Aquaculture by ISSCAAP groups

million tonnes live weight

- Freshwater fishes
- Molluscs
- Crustaceans
- Diadromous fishes
- Marine fishes
- Miscellaneous aquatic animals
Aquaculture by ISSCAAP divisions

1980:
- Freshwater fishes: 45%
- Molluscs: 39%
- Crustaceans: 2%
- Diadromous fishes: 10%
- Miscellaneous aquatic animals: 0%

2015:
- Freshwater fishes: 57%
- Molluscs: 21%
- Crustaceans: 10%
- Diadromous fishes: 7%
- Marine fishes: 4%
- Miscellaneous aquatic animals: 1%
Aquaculture by main ISSCAAP groups 2015

**Quantity**
- Carps, barbels and other cyprinids: 38%
- Miscellaneous freshwater fishes: 11%
- Tilapias and other cichlids: 7%
- Clams, cockles, arkshells: 7%
- Shrimps, prawns: 6%
- Oysters: 7%
- Others: 18%

**Value**
- Carps, barbels and other cyprinids: 26%
- Miscellaneous freshwater fishes: 11%
- Tilapias...: 10%
- Freshwater crustaceans: 8%
- Shrimps, prawns: 16%
- Others: 20%
- Salmons, trouts, smelts: 10%
- Clams, cockles, arkshells: 3%
Share of non-fed species in total

Percentage

Quantity

Value

OECD-FAO Agricultural Outlook

• Joint OECD-FAO report (13th)
• Country collaborators
• Aglink-COSIMO, partial equilibrium model
• 10 year horizon
• Major temperate commodities
• Global coverage
• Special theme: Southeast Asia
  http://www.agri-outlook.org/
Aquaculture: lower annual growth rate
Surpass of aquaculture (2013 and 2021)

OECD-FAO Agricultural Outlook 2017-2026 Excluding aquatic plants.
OECD-FAO Agricultural Outlook 2016-2025
Aquaculture growth

+26 million tonnes

Asia 91%
Latin America 3%
Europe 3%
Africa 3%
Oceania 0%
North America 0%

p.a. 0.7 1.8 1.5 3.1 2.3 3.3

North America
Europe
Oceania
Latin America
Asia
Africa

%
Aquaculture by main species

Million tonnes

- Other
- Marine fish
- Salmon, trout
- Shrimp
- Tilapia
- Catfish, pangas, eels, milk fish
- Molluscs
- Carp

Year:
- 1990
- 1993
- 1996
- 1999
- 2002
- 2005
- 2008
- 2011
- 2014
- 2017
- 2020
- 2023
- 2026
Capture fisheries rather stable

- Total capture
- Non-food uses

Million tonnes


El Niño

Million tonnes
More fishmeal produced from residues

Million tonnes

From whole fish  From fish residue

El niño
Fishmeal and fish oil prices
Per capita fish consumption

Kg (lw)

OECD-FAO Agricultural Outlook 2017-2026
Per capita fish consumption

- Aquaculture for human consumption
- Capture for human consumption

2006

2026

OECD-FAO Agricultural Outlook 2017-2026
Uncertainties

- **Aquaculture:**
  - Areas and water
  - Fish seeds and feeds
  - Diseases
  - Technology, financial resources, regulations

- **Capture fisheries:**
  - Natural productivity of fish stocks and ecosystems
  - Climate change, incl. El Niño phenomenon

- **Trade and consumption**
  - Trade policies, market access, trade agreements, food safety and traceability
Sustainability

The sustainability of fisheries and aquaculture production is crucial to the livelihoods, food security and nutrition of billions of people.

Fishery sustainability:

“development that meets the needs of the present without compromising the ability of future generations to meet their own needs”

*World Commission on Environment and Development*
Challenge: 9.7 billion by 2050

We face a major challenge in feeding an expanding world population.

To nourish another 2 billion people in 2050, food production must rise by 60%.
Sustainability

but the way we produce more food cannot be at the expense of the planet
This is the **BLUE** planet

**Water**

72% of the Earth’s surface, with about 97% in oceans

Healthy aquatic ecosystems are vital to human welfare
But…

Marine ecosystem services by Dr. Emmett Duffy (2006)

……………marine ecosystems, and the resources they provide, are increasingly threatened by land-use change, overfishing, climate change, invasion of non-native species, and other impacts of a rapidly growing human population

…………… an environment we need to SAFEGUARD!
Climate change
(Intergovernamental Panel Climate Change)

PROJECTIONS
Ocean warming 2051-60: displaced and reduced fish and invertebrate stocks

CHANGE IN MAXIMUM CATCH POTENTIAL (2051-2060 COMPARED TO 2001-2010, SRES A1B, 2°C warming)

- <50%
- -21 – 50%
- -6 – 20%
- -1 – 5%
- No data
- 0 – 4%
- 5 – 19%
- 20 – 49%
- 50 – 100%
- >100%

WGI, 6-14, SPM.6

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