

Introduction to Aquaculture

By

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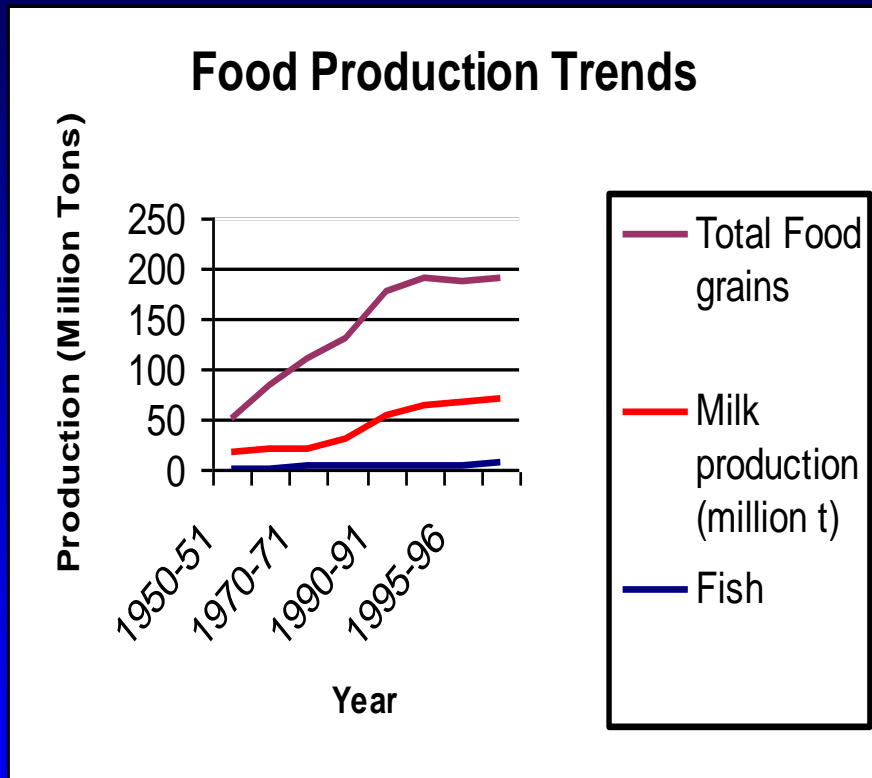
Aquaculture

- Also called Aqua farming
- Aqua=Water, culture=To grow
- It is practiced from more than 2500 year in China, Egypt and India.
- 10% of world's total fish harvest is derived from aquaculture.
- Blue revolution- Aquatic counterpart to the agriculture.
- CIFRI- Central Inland Fisheries Research Institute West Bengal
- CMFRI- Central Marine fisheries Research Institute- Cochin.

Aquaculture Defined

- The art of cultivating the natural produce of water.
- Farming of aquatic organisms in natural or controlled marine or freshwater environments
- Rearing of aquatic organisms under controlled or semi-controlled conditions.
- Husbandry of organisms in an aquatic ecosystem
- Rearing of aquatic organisms under controlled or semi-controlled conditions
- Mariculture - (old name) marine or brackish water

Reasons for Study to Aquaculture



- Over the last two decades, the annual growth rates of Gross Domestic Product (GDP) for agriculture and allied sectors have declined from 5.7% during 1980-85 to 3.0% during the 1992-98 periods.
- Agriculture has come under increasing competition from other water-users.

Reasons for Study to Aquaculture

- Between 1991 and 2003, food grain production rose only 30%, while aquaculture (fish and shell-fish) output rose 102%.
- Yet, performance lags well behind potential. India's global share is under 10% against China's 57%.

Emerging Issues

- Market-trends have put pressure on the government and the industry to expand aquaculture production in India
- Need for public policies to promote production, develop infrastructures for efficient marketing and distribution, promote growth in exports, and contribute to food security and nutritional demand

Study Perspectives

- Commercial Perspective
- Environmental Perspective
- Social Perspective

Aquaculture Classified

- Extensive Aquaculture: Minimal control, lower density, ponds, third world



Intensive Aquaculture: Highly controlled, high density, raceways, confined (industrialized)

World Aquaculture



Commonly Cultured Fish

Foodfish

Many species

Ornamental fish

Aquaria

Backyard ponds

Bait fish

Minnows

Goldfish (carp)

Natural stock
enhancement

Salmon

Trout

Black sea bass

Many others...

Commonly Cultured Crustaceans

- Marine (Penaeid) shrimp
- Freshwater shrimp (prawns)
- Crabs
- Crayfish
- Lobsters
- Brine Shrimp

Commonly Cultured Molluscs

Clams
Oysters
Mussels
Abalone
Urchins



California Red Abalone



R. Birenheide

Additional Cultured Organisms

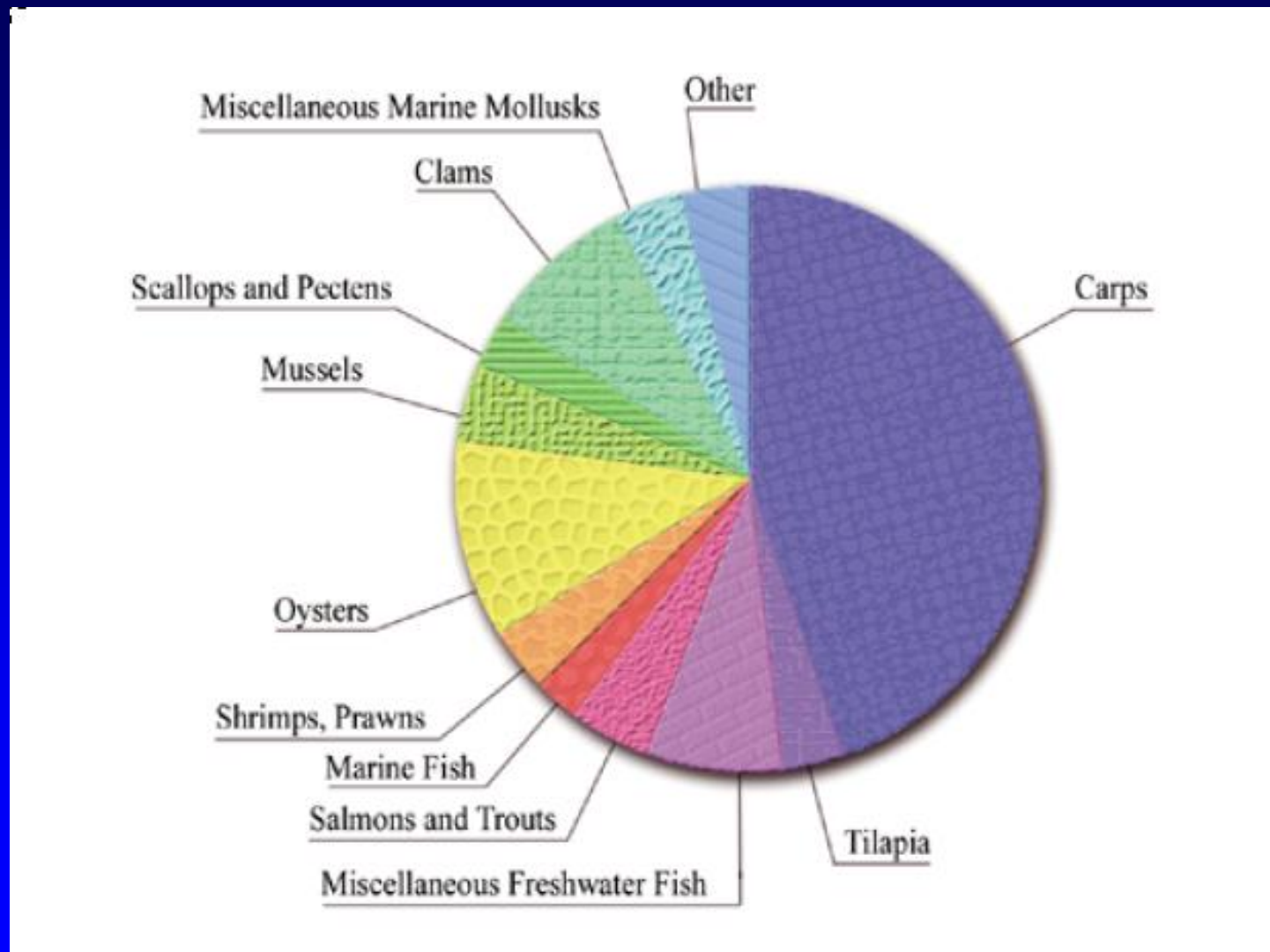
Seaweed
Food for Abalone
Extraction of nutrients
for vitamins
Corals / Sponges / Sea
Fans
Extraction of
medicines
Aquarium trade
Live rock
Aquarium trade



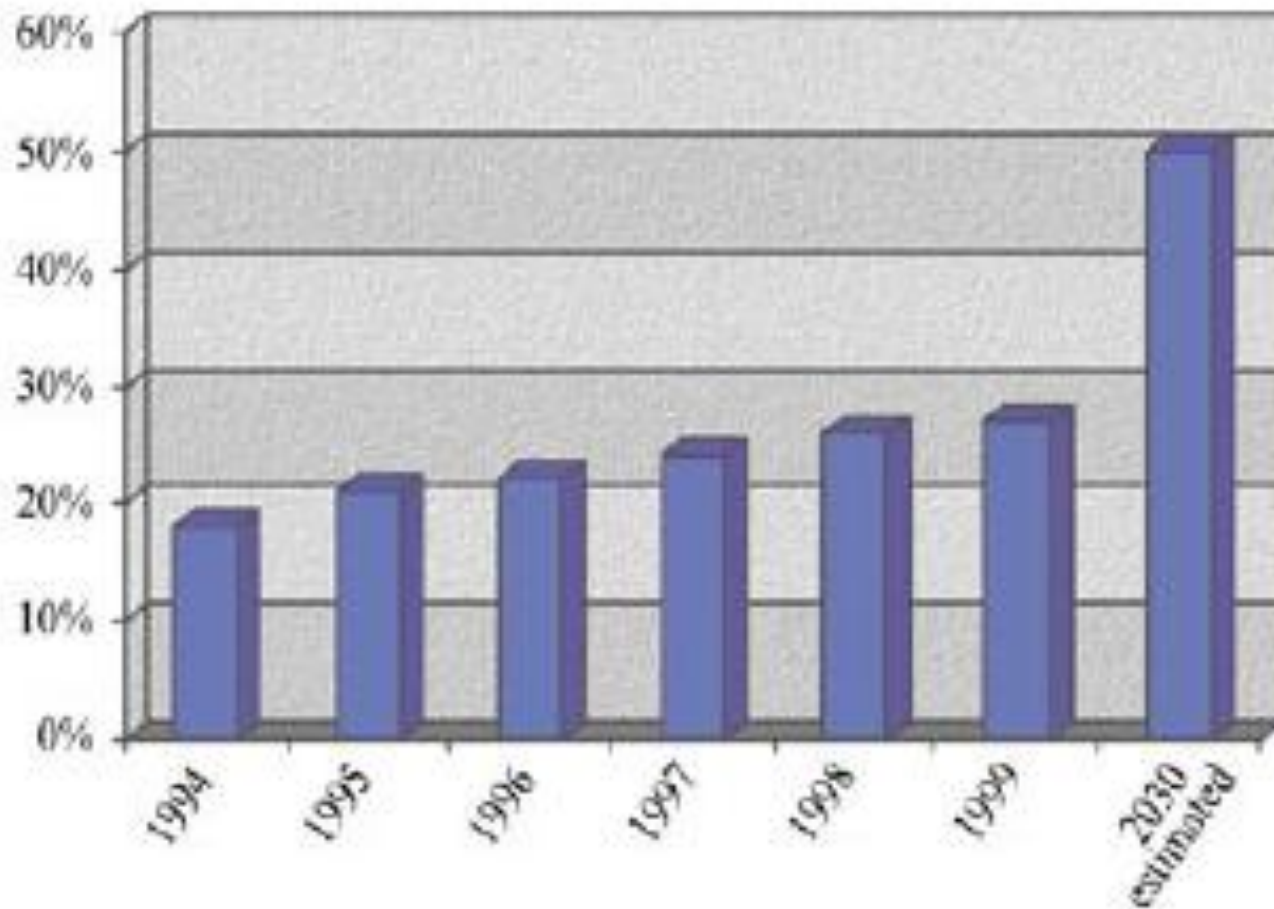
World Aquaculture Production

- In 2000 45.51 million metric tons by weight of aquaculture products
- Equal to US \$56.47 billion
- China is the largest aquaculture producing country in the world

Proportion of Total Aquaculture Production for Different Taxonomic Groups



Percent of Total Food Fish Supplied by Aquaculture



Why Aquaculture Products?

- locally grown (Exclusive Economic Zones)
- **Control:** Food fed, Density, Quality of product
- Sustainable in the face of Finite Resources—overfishing and habitat destruction antagonists
- Diversify farm income
- Proximity—Farms may be closer to local markets.

Why Aquaculture Products?

- **Health Consciousness (protein, FA's, micronutrients)**
 - 2 fish meals/week decreases mortality from heart problems
50%
 - Omega-3 fatty acids decreases occurrence of heart disease
(oily marine fish - Salmon)
- **American Cancer Association**
 - Regular fish consumption decreases chances of colon cancer
50%
- **Efficiency of growth**

A close-up photograph of a large quantity of cooked shrimp, likely pink shrimp, piled together. The shrimp are a vibrant pinkish-orange color, indicating they are cooked. They are arranged in a dense, overlapping manner, filling the entire frame. The texture of the shrimp shells is visible, showing some detail like the legs and antennae. The lighting is even, highlighting the natural color of the seafood.

Trade Deficit—\$8 billion imported seafood!

Aquaculture is a Diverse Field

Biology
Ecology
Nutrition
Handling and hauling
Water quality
Disease
Marketing
Culture techniques

Employment Opportunities

Fisheries biology
Public aquariums
Research positions
Education
Laboratories
Genetic studies
Nutritional studies
Disease studies
Water quality

State hatcheries
Technicians
Biologists
Private operations
Biologist
Assistant manager
Manager
Open your own operation