

Practical Aquaculture 1

By

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The term 'aquaculture'

all forms of culture of aquatic animals and plants in fresh-, brackish- and saltwater

Aquaculture has the same objective as agriculture

- 1 increase the production of food above the level which would be produced naturally
- 2 removal of unwanted plants and animals ,their replacement by desirable species
- 3 improvement of these species by cross-breeding and selection
- 4 improvement of food availability by the use of fertilizers



“integrated fish farming”

Fish farming can be combined with agriculture, animal husbandry and irrigation practices which can lead to a better utilization of local resources and ultimately to higher production and net profits

Advantages of fish farming

- Fish is a high quality animal protein provider for human consumption.
- A farmer can often integrate aquaculture into the existing farm to create additional income and improve water management on the farm.
- Fish growth in ponds can be controlled: the fish species raised are the ones the farmer selected.
- The fish produced in a pond are the owner's property; they are secure and can be harvested at will. Fish in wild waters are free for all and make an individual share in the common catch uncertain.
- Fish in a pond are usually close at hand.
- Effective land use: effective use of marginal land e.g. land that is too poor, or too costly to drain for agriculture can be profitably devoted to fish farming if it is suitably prepared.

Some cultured species in the world



Nile Tilapia

Silver carp



Bighead carp



Atlantic Salmon



Common carp



Grass carp



Pearl Oyster



Aquaculture systems

Raceways



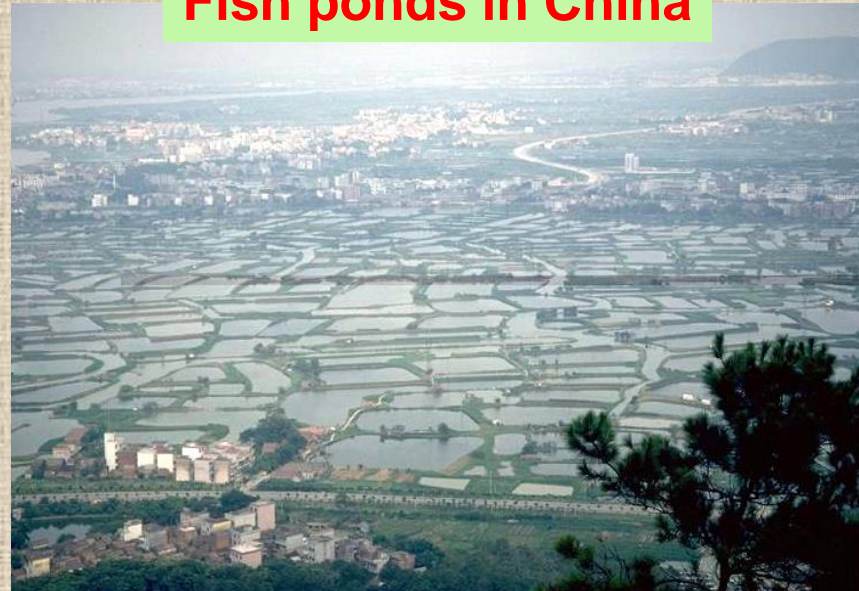
Fish harvest from a cage



Indoors in the U. S.



Fish ponds in China



World production

توسع كبير خلال خمسين سنة الاخيرة

الانتاج العالمي حسب
البيئة

60
مليون
طن
2004

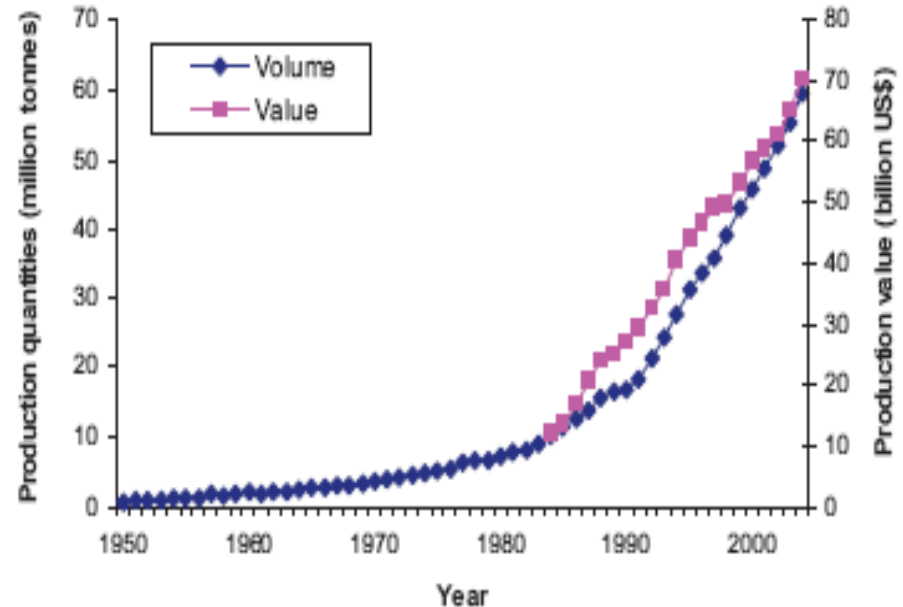
اقل من
مليون طن
1950

معدل
النمو
السنوي
%8.8

الاستزراع
البحري
30 مليون
طن
(%50.1)

US\$70.3
billion

Trend in total world aquaculture production and value
(including plants) between 1950 and 2004



الاستزراع في
المياه العذبة
25.8 مليون
طن
(%43.4)

الاستزراع في
المياه الشروب
3.4 مليون
طن
(%5.7)

الانتاج العالمي

الانتاج العالمي حسب المجاميع في كل بيئة

النواعم تشكل **42.9%** والنباتات
المائية **45.9%** في التربية
المياه البحرية

الروبيان تشكل
63.1% في
التربية في
المياه الشروب

الأسماك تشكل
94% في
التربية في المياه
العذبة

في 2004
سجلت 51 دولة
انتاج الروبيان

2 دولة صنفت الانتاج
جزء استزراع مياه عذبة
وجزاء استزراع مياه
شروب

4 دول صنفت الانتاج جزء
استزراع بحري وجزء
استزراع مياه شروب

23 دولة صنفت
الانتاج استزراع مياه
شروب

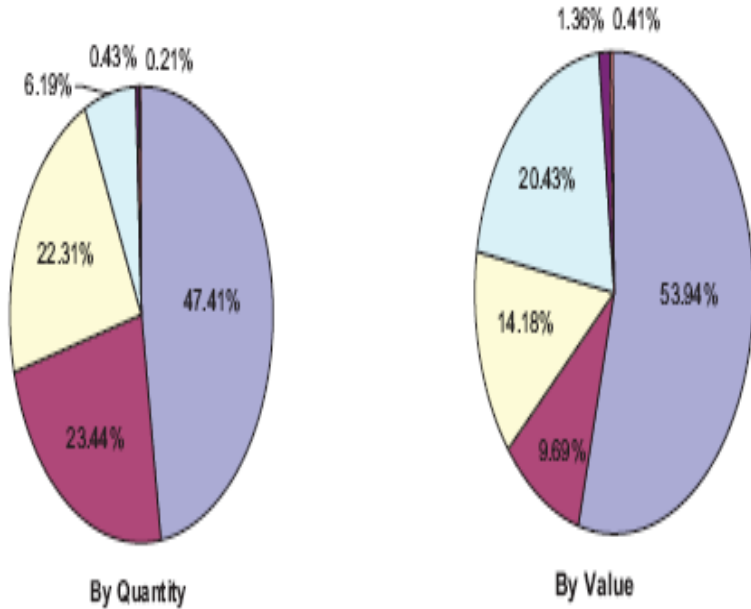
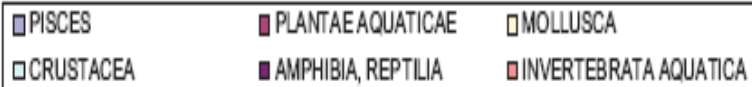
22 دولة صنفت
الانتاج استزراع بحري

Iran classifies shrimp under brackishwater aquaculture and Saudi Arabia under mariculture although both countries operate their grow-out ponds under the same mostly hypersaline conditions (40 ppt or higher).

الانتاج العالمي

الانتاج العالمي حسب الانواع

World aquaculture production by major taxonomic grouping in 2004



الأسماك تشكل
قيمة **53.9%**

1

الأسماك تشكل
كمية **47.4%**

1

النباتات المائية
تشكل **9.7%**
قيمة

4

النباتات المائية
تشكل **23.4%**
كمية

2

القشريات تشكل
قيمة **20.4%**

2

القشريات تشكل
كمية **6.2%**

4

النواعم تشكل
قيمة **14.2%**

3

النواعم تشكل
كمية **22.3%**

3



الانتاج العالمي

442 نوع سجلت كأسماك تربية بين
2004 – 1950

Penaeus vannamei, the species contributing to increase in shrimp production and decrease in unit price, globally.

2004
115 عائلة
336 نوع

معدل الاضافة
السنوي
1.5 عائلة
5 نوع سنويا

1950
34 عائلة
72 نوع

There are more species of fish cultured than other major taxonomic groups. The **cyprinids**, with **18.2 million tones** valued at **US\$16.3 billion**

1960- 1950
0.3 نوع

1980- 1960
1 نوع

1990- 1980
9.5 نوع



الانتاج العالمي

الانتاج العالمي حسب انظمة التربية CULTURE SYSTEMS

احواض ارضية – احواض اسمنتية – قنوات مائية –
اقفاص – حظائر – حبال -----

Earthen ponds, concrete tanks, raceways, pens, cages, stakes, vertical or horizontal lines, -----

Tilapia (*Oreochromis niloticus*) farm in Malaysia. The current production of this introduced species in Asia is much higher than in its native region, Africa.



freshwater fishponds	Cyprinids
in sea cages	salmons
brackishwater or marine ponds	shrimps
raceways or freshwater ponds	catfish
lines, racks and stakes	marine bivalves
lines	seaweeds

African catfish (*Clarias gariepinus*) Nigeria. 12 concrete ponds of the farm are harvested twice annually, the farm should profit over US\$50 000 a year

الاستهلاك العالمي

Fish consumption in kilograms per capita, (grams per day)

	1969-1971	1979-1981	1990-1992	1995-1997	2000-2002
Australia	15.0	15.7	19.3	20.8	22.3
China	4.7	5.1	12.0	22.3	25.5
Japan	62.4	64.6	69.0	69.7	66.8
France	21.2	24.8	31.0	29.6	31.0
Germany	12.4	12.8	15.3	15.0	14.6



Tilapia catch from a reservoir in Myanmar. Tilapias are not only produced by aquaculture, but also a major commodity of culture-based fisheries in many countries, especially in Asia. In some countries like Sri Lanka, tilapias dominate the reservoir fisheries catch.