

L2 (AQUACULTURE ACTIVITIES)

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When any industry such as aquaculture develops, the functions or activities performed to produce the product become identified in groups. Often, these become separate industries

In aquaculture
five main activities are performed

2- Grow-out

1- Hatchery

4- Marketing

3- Harvesting

5- Processing

1- Hatchery

Hatcheries produce the seed or young fish used to stock growing facilities. Seed are obtained by capturing wild seed or raising from broodstock— adults kept for reproduction (Artificial- Semi-Artificial- Natural under control)



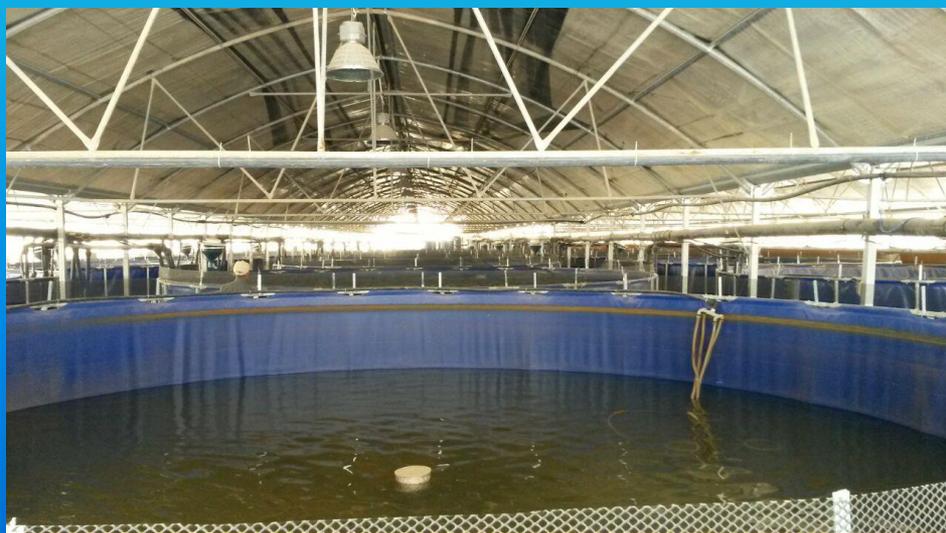
2- Grow-out

Facilities produce crops (fish) from the seed. Like any Agriculture venture, these can be Extensive, Semi-intensive, Intensive, Highly intensive

Extensive systems involve lower populations and less stringent management

Intensive systems involve a very dense population of fish in relatively small spaces and require careful management

Grow-out facilities may be land-based, such as ponds, tanks, and runways. Or, they may be water based, such as pens, cages, and coastal enclosures



3- Harvesting

involves the gathering or capturing of fish for marketing and processing. Aquaculture harvesting is typically topping (partial) or total harvesting

4- Marketing connects producers with consumers. The purpose of marketing is to provide a consumer with desired products and to provide the producer with price to cover production and make a profit



Five markets, depending on the reason for production, are associated with fish

1- Food for human consumption

2- Bait for sport fishing

3- Pets or ornamentals for home or office aquaria

4- Sport fish for release into lakes and streams

5- Fish for feed ingredients

5- Processing

Processing changes the form of the product into something more desirable to consumers

Processing occurs in three forms: minimal, medium, and value-added

THE FUTURE OF AQUACULTURE

At present, the FAO estimates that world aquacultural production represents about 50 percent of the world aquatic food production by fisheries. For food fish, 50 percent of the total world supply is derived from aquaculture

Worldwide, aquacultural production in the 43 countries that have such industries produces more than 110 million tons of fish and fish products

Exclusive of the aquaculture of sport, bait, ornamental organisms, and pearls, this production includes more than 152 species, including finfish, species of shrimp and prawns, crawfish, diverse marine plants, oysters, clams, and other mollusks

According to the FAO, world aquatic plant production by aquaculture was 15.1 million tons in 2006

The culture of aquatic plants has increased consistently, with an average annual growth rate of 8 percent since 1970

In 2006, aquaculture contributed 93 percent of the world's total supply of aquatic plants. Some 72 percent originated in China, at 10.9 million tons

Virtually all of the remaining production also come from Asia. Japan is the second-most important aquatic plant producing country in terms of value, owing to its high-priced

Japanese kelp (*Laminaria japonica*) showed the highest production, followed by Wakame (*Undaria pinnatifida*) and Nori (*Porphyra tenera*)

Aquaculture throughout the world exists at different levels of development, for a variety of reasons. Levels of development include commercial aquaculture, infant industries, pilot scale or partially developed technology, and major lack of technology

Commercial aquaculture represents enterprises with established production facilities, profitable markets, and continuity of sales. Research needs are similar to those that support established agricultural enterprises. These include product improvement, increased production efficiency, and effective marketing.

Infant industries may require research on several aspects of production, marketing, and creation of an acceptable institutional framework.

Pilot scale includes promising organisms for which proof of concept is established and basic breakthroughs in production technology have been achieved. Pilot scale aquaculture requires refinements to solve scale-up problems and ensure reasonable prospects for making money

Major lack of technology represents those species of high market potential for which many major problems (such as reproduction, larval survival, domestication, strain selection, nutrition, and production systems) must still be solved

Aquaculture is now considered a significant part of U.S. Agricultural food production. Several factors suggest that the role of aquaculture will continue to grow: increased demand, new marketing and processing, and the culture of new species. Continual research on the problems facing aquaculture will ensure its future

Demand

Aquaculture is the only known mode for increasing domestic fish production. The world's capture fisheries—wild-caught fish—are harvested at close to the maximum sustainable level

The demand in the United States and other countries for fish increases. A more health-conscious public consumes more fish each year.

Recent marketing breakthroughs in several national fast food and restaurant businesses have extended sales of the southern tradition, catfish, into nontraditional regions.

Demand for fish will be increased even the ratio of consuming fish was stable
Why ??????????

Marketing and Processing

The success of aquaculture depends on how the product meets the demands of the market—different products for different markets

The Food service, retailers, and food processors market fish

The trend is toward more value added, fresh-refrigerated products, including bone fillets, seasoned and marinated products, smoked products, and vacuum-packed prepared fresh products that are ready to bake or broil

Techniques and Technology

New techniques and technology continue to improve the profitability of aquaculture. Feeding represents 40 to 50 percent of the costs associated with aquaculture production. New feeding techniques and technology will improve feed conversion

Biotechnology, genetic engineering, genetics, and selective breeding will increase aquaculture production.

New rearing methods such as cage culture and closed systems will open the door for more people to try aquaculture

New Species

Scientists recognize about 21,000 kinds of fish, but only a few of these are widely used as food.
In the United States, aquaculture is dominated by catfish production

This will continue, but the culture, technology, and marketing for many other species are being developed.
Some of these species include carp, tilapia, hybrid striped bass, alligators, buffalofish, red drum and shrimp, prawns, and some aquatic plants

Research and Problems

Although aquaculture is generally successful, it needs to improve at many sectors such as

1- Life history and biology

2- Genetics and reproduction

3- Nutrition and diet

4- Environmental requirements

5- Effluent (waste) control and water availability

6- Control of diseases and parasites

7- Predation and competition

8- Transportation

9- Introduction of nonnative species

10- Harvesting, processing, and distribution

11- Safe handling of fish and seafood

12- Drug and chemical registration

13- Educating the public

14- Production of rare seed stocks