

# Economic value of Fisheries for Development

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## Abstract

Fisheries play an important role in developing countries' socio-economic growth. This economic operation is going to be a partner of Farming in populous nations, such as India. Fishes are one of the most important group of vertebrates serving as food for human. They possess a great economic, nutritional, medicinal, industrial, aesthetic and religious values as well as providing employment for millions of people in the world. They contribute to food security in many regions of the world, providing a valuable supplement for diversified and nutritious diets. Consumption of fish has several health, nutritional, environmental and social advantages over other terrestrial animal meat. Inland fisheries offer opportunities to enable people to meet and provide for their dependents with their own physical and psychological needs. This position is especially important for marginalised communities in poverty reduction, including minorities, rural poor and women. Author examined the economic value of fish and role of fisheries in development in present article.

Key words: fisheries, Farming, economic, employment, development

## Introduction

Fisheries play an important role in developing countries' socio-economic growth. This economic operation is going to be a partner of Farming in populous nations, such as India. Fishing is not only a source of revenue, but also a source of our body's essential nutrients. In addition, fisheries impact the local and national economies, create scopes of participation for rural women and disadvantaged farmers, and alleviate poverty by generating jobs. India is recognised as a developing country for its inland fishing opportunities, with a rich diversity of indigenous fisheries. The rural population depends on these species for their livelihoods and food security. The fishing sector in India now accounts for 60 percent of the country's fish production, providing jobs for about 23 lakh households in the country. It makes providing food security and creating jobs for landless, small and marginal farmers more productive and sustainable.

Inland fisheries offer opportunities to enable people to meet and provide for their dependents with their own physical and psychological needs. This position is especially important for marginalised communities in poverty reduction, including minorities, rural poor and women (Weeratunge et al. 2014). Inland fisheries empower them with low livelihood and subsistence investment opportunities. Women, as another example, in developing countries usually have low empowerment. However, they make up 20 % of the world's inland fishermen and complete about 90% of post-harvest processing (FAO 2014b)

## Economic importance of fisheries.

Fishing is an undertaking for the production or harvesting of fish and other aquatic life. Commercial fisheries, both in freshwater (about 10% of all catches) and in the oceans (about 90%), include wild fisheries and fish farms. Worldwide, about 500 million people are economically dependent on fishing.

Fish are marine, cold-blooded and cranial vertebrates belonging to the super class of Pisces within Phylum Chordata, Fisheries is a type of industry concerned with fish, shellfish (molluscs, each with a shell in two halves, used for food, e.g., meat, oysters, etc and crustaceans being caught, processed or sold.

## Fish as Economic Importance:

Fish as food:

Fish flesh is an excellent source of protein, has very little fat, is rich in iodine and carries a good quantity of minerals and vitamins A and D. Above all, men can easily digest it.

(ii) Fish for disease control:

It is possible to control diseases like malaria, yellow fever and other dreadful diseases that are spread by mosquitoes. Larvivorous fish eat mosquito larvae. Gambusia, Panchax, Haplochitus, Trichogaster, etc are the major larvivorous fish.

(iii) Quality aesthetic:

In aquariums, a significant number of fish are bred for their beauty and graceful movements. Macropodus, Trichogaster, Carassinus (gold fish) and Pterophyllum (angel fish) are important aquarium fishes.

#### **Fisheries are of economic importance, as follows:**

1. It offers many individuals good opportunities for work and self-employment.
2. The food source for nutritious foods is fish.
3. Fishes generate a number of commercially valuable by-products. Fish oil, fish meat, fertiliser, fish glue and so on are these by-products.
4. In paintings, soaps, oils and medicines, these by-products are widely used.
5. Prawns and lobsters all over the world have high market value.

Fishes form one of the most important group of vertebrates for man, influencing his life in various ways. Millions of human beings suffer due to hunger and malnutrition, and fishes form a rich source of food and provide a means to tide over the nutritional difficulties of man. In addition to serving as an important item of food, fishes provide several by products to us. Fish have considerable economic importance are useful as well as harmful to man.

## **Importance of Fish**

### **1. Fish as Human Food:**

Fish have formed an important item of human diet. Nearly all fish freshwater and marine are edible and have been an important source of protein, fat and vitamins A and D since time immemorial. In most fishes, the flesh is white, contains about 13 to 20% of protein and has a food value of 300 to 1600 calories per pound.

According to Pottinger and Baldwin, fish meat contains at least 5 of the essential amino acids. Besides this, it contains vitamin A and D together with large amount of phosphorus present in it. Important marine fishes include salmon, cod, halibut, herring, eels, tuna, mackerel, and sardines. Important freshwater food fishes are cat fish, trout, bass, perch and mullet. Even eggs of certain fishes, such as Russian sturgeon are eaten as cavier.

The major food fishes of India include Labeo, Catla, Cirrhina, Mystus Wallago, Notopterus, Ophiocepholus, etc. The cartilaginous sharks, skates and rays are also used as human food in several countries. They are eaten by poorer classes of people living along the sea coasts of India and Sri Lanka. The canned meat of sharks is sold commercially under the name of gray fish. In south-east Asian countries, shark fins are dried and boiled to get a gelatinous material used as soups.

Fresh fish meat is usually cooked for human consumption. However, large quantities are refrigerated, salted, smoked, canned or pickled. Today, fisheries of the world carry on business worth several hundred thousand rupees annually and also provide employment to thousands of people.

A) Fish serves as an important food for human. Edible tissues of fish are appreciably greater than that in chicken, pig and sheep/goat. For example, approximately 65% of the raw weight of finfish is eaten, compared with 50% of chicken and pigs, and 40% of sheep/goat; fish are supported by water, but terrestrial animals and birds require comparatively strong bones so they spend their substantial energy into the growth of the bones, which cannot be consumed as food. The total estimated fish production of the world in 2012 was 158 million metric tons with a per caput consumption around 19.2 kg. Similarly, the total estimated fish production of Nepal in 2013/14 was 64,900 metric tons with a per caput consumption of 2.3 kg.

### **B) Nutritive value**

Fish is highly nutritious. It provides tasty, low calorie meal but is a good source of high quality protein. Fish is an almost zero-carbohydrate food, good for diabetes and other such patients. The protein content in fishes varies from 15-30% on wet weight basis and 60-80% on dry weight basis. The protein of fish is highly digestible and with well-balanced amino acids. Fish are low in fat and cholesterol. Fish is a good source of Vitamins- A, B and D and also offers a good source of calcium, iodine, fluorine, magnesium and zinc. Fish are rich in poly-unsaturated fatty acids containing Omega-3. Two poly-unsaturated fatty acids present in fish,

eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), collectively known as Omega-3, are essential fatty acids. They cannot be produced in human body, but are essential in the diet. These poly-unsaturated fatty acids can help to reduce the cholesterol level in the blood, thus minimize the risk of heart attack.

### C) Medicinal value

Fish is low in fat, high in protein and an excellent source of Omega-3 fatty acids. Regular consumption of fish can reduce the risk of various diseases and disorders. Some research findings indicate the following:

**Asthma:** Children who eat fish are less likely to develop asthma.

**Brain and eyes:** Fish rich in Omega-3 fatty acids can contribute to the health of brain tissue and the retina of the eye. The IQ level of children whose mother consumed about 340 g fish per week during pregnancy was found higher than non-fish eaters. Similarly, breastfed babies whose mothers eat fish have better eyesight, perhaps due to the Omega-3 fatty acids transmitted in breast milk.

**Cancer:** The Omega-3 fatty acids in fish reduce the risk of many types of cancers by 30 to 50 percent, especially of the oral cavity, oesophagus, colon, breast, ovary and prostate.

**Cardiovascular disease:** Eating fish every week reduces the risk of heart disease and stroke by reducing blood clots and inflammation, improving blood vessel elasticity, lowering blood pressure, lowering blood fats and boosting good cholesterol.

**Dementia:** Elderly people who eat fish or seafood at least once a week may have a lower risk of developing dementia, including Alzheimer's disease.

**Depression:** People who regularly eat fish have a lower incidence of depression. Depression is linked to low levels of Omega-3 fatty acids in the brain.

**Diabetes:** Fish may help people with diabetes to manage their blood sugar levels.

**Prematurity:** Eating fish during pregnancy may help reduce the risk of delivering a premature baby.

### 2. Fish as Food of Cattle:

The scrap from canneries, as well as entire fishes that are not relished by man, are dried and ground in mill. This is called fish meal and is used as artificial food for poultry, pig and cattle. Fish meal is produced in several states like Maharashtra, Andhra Pradesh, Tamil Nadu, Bengal and Kerala chiefly from sardines, meckerels, ribbon fish, etc. The fish is first cooked in large pots containing sufficient quantity of water, on fire or on steam.

The cooked material is then pressed to remove moisture and dried in the sun on suitable platforms. The resultant product is then stored, and if preserved in airtight containers after sterilisation retains its nutritive value for a long time.

The fish meal contains about 60% protein and high percentage of calcium phosphate so that it is very valuable for cattle and poultry. The manufacture of fish meal can be undertaken as a cottage industry requiring little expenditure.

### 3. Fish Manure:

Fish that are unfit for human consumption are used to prepare fish manure for the fields. During peak season, when there is a large supply of fish, or they are landed in spoiled condition, they are sun dried on the beach. The dried fish is ground and converted to manure, which contains a high percentage of nitrogen and phosphate.

Mostly sardines are used for preparing fish meal and the waste material forms the fish guano. It contains 8.9% nitrogen and phosphate, and when mixed with soil, forms a rich fertiliser for plants. It is several times richer than ordinary cattle manure.

### 4. Fish Oils:

The most important fishery by-product is that of the fish oil, which is of two kinds- body oil and liver oil. The oil extracted from the whole body of the fish is called fish body oil, while that obtained from liver of certain fish is called the fish liver oil. Liver oil contains vitamin A and D, while the body oil contains them in traces.

The refined oil from the liver of fishes has a medicinal use, being the source of vitamin A and D. The body oil from fish has many uses, such as in painting, varnishing, soap, candle, leather and steel industries. For preparing body oil, fish are boiled in large quantity of water. Oil is removed quickly and washed in boiling salt water.

Liver oil is prepared from the liver of several species, including sharks and rays. Oil is extracted from the liver soon after the fish are caught to avoid action of enzymes. Liver is cut into small pieces and boiled in sufficient quantity of water. Oil is skimmed from the surface of water and sent for purification. Liver oil contains 55-75% fat, 5-10% protein and the rest water. It is of considerable medicinal value.

#### 5. Fish Skin and Leather:

The skin of several fishes like the sharks and rays are used for making polishing and smoothing material. Shark skin leather is of some commercial importance in the manufacture of many useful articles such as shoes and hand bags, etc. In Japan, lantern are prepared from the skin of puffer fishes (e.g., Tetrodon). Some tribal people used skins of puffer and porcupine fishes (e.g., Diodon) for war helmets.

Crude skins of sharks and rays are used by carpenters and metal workers. Shark skin tanned with placoid scales on it is called shagreen. It has been used as an abrasive for polishing wood and ivory and also for covering jewel boxes, fine books and sword handles.

#### 6. Fish Glue:

Liquid glues are prepared from skin, head and other trimmings of certain fishes. This glue has an adhesiveness of great power for paper, wood, leather and glass.

#### 7. Isinglass:

It is a gelatinous product obtained from the air-bladders of certain fishes such as sturgeons, carps, perches, salmons, cat fishes, cods, etc. The isinglass is a shining powder and is used for clearing wine, beer, making edible jelly and in the preparation of adhesive material.

The air-bladder is removed from fish, washed in cold water and flattened by beating it on a piece of wood. The bladder is then dried in the sun, and is exported for the preparation of isinglass. The finest quality of isinglass is obtained from Russia.

#### 8. Fish Fin:

The fins of sharks are exported to China where they are used for preparing soup.

#### 9. Medicines and Disease Control:

The refined oils extracted from livers of cods and sharks are rich in vitamins A and D. Pituitary glands yield important extracts for medicines. Fishes like top minnows (*Gambusia affinis*), *Trichogaster*, *Chela*, *Puntius*, *Barilius*, *Danio*, *Colisa*, *Rasbora*, *Esomus*, *Ambassis*, *Aplocheilus*, *Barbus*, *Panchax*, etc., feed voraciously on mosquito larvae.

These larvicidal fishes are propagated and distributed widely into ponds, lakes and tanks to destroy mosquito that transmit malaria, yellow fever and other dreadful diseases of tropical countries. Certain fishes and their by-products contribute to useful Ayurvedic and Unani medicines for treatment of duodenal ulcers, skin diseases, night blindness, general weakness, loss of appetite, colds, coughs, bronchitis, asthma, tuberculosis, etc.

#### 10. Sports and Recreation:

Sport fishing by individuals and fishing parties is a popular recreation of million of people, as well as a source of food, all over the world. The most commonly hunted fishes are the freshwater perch and trout and the marine tarpon. However, some of the best game fish is most famous for sport that it provides, but its flesh is not palatable.

Many people's hobby is to cultivate certain tropical fishes as pets. Both native as well as foreign fishes are displayed in home aquaria for their beauty and graceful movements. Common aquarium fishes are gold fish (*Carassius auratus*), angel fish (*Pterophyllum*), sword tail guppy (*Xiphophorus*), minnow (*Gambusia affinis*), siamese fighter (*Betta splendens*), paradise fish (*Macropodus*), *Hemigrammus*, *Aphyocharax*, loach (*Botid*), *Trichogaster*, *Tilapia*, etc. Goldfish cultured and not found in nature and the Japanese have produced their several curious artificial varieties. Pet shops now-a-days stock many kinds of fishes for hobbyists and scientists.

#### 11. Fancy Articles:

Scales of garpike (*Lepidosteus*) are used for jewelry and novelties. From scales of some fish is secured a pigment whose water suspension is known as pearl essence. It is used in the manufacture of artificial pearl in Europe, especially in France.

#### 12. Scientific Study:

Fishes have considerable use as experimental animals, especially in the fields of Genetics, Embryology, Animal Behaviour and Pharmacology. Certain fishes such as *Latimeria* and dipnoans have anatomical features of great zoological interest. Fishes like dogfish (*Scoliodori*), perch (*Perca*) and carp (*Labeo*), etc., are dissected for anatomical study in zoological laboratories. Researches in ichthyology are conducted for the benefit of fisheries and mankind.

#### 13. Industries:

As the fish forms a rich source of food, millions of people are engaged in fishing industry and depends on fisheries for their livelihood in various ways. Besides those who directly catch the fish for marketing, there are equally large number of people engaged in subsidiary industries like refrigeration, preservation, canning, and in the manufacture of fish products and by-products.

## Employment opportunity

Fisheries and aquaculture sector provide, either directly or indirectly, a great employment opportunity for millions of people around the world. In 2012, about 500 million people were directly engaged in the world, part time or full time, in production of fish, either by fishing or in aquaculture. Fisheries and aquaculture sector in Nepal is relatively small, which provides employment to about

Economic importance of fisheries is as follows: 1. Fish is a nutritious food and thus is a source of many vitamins, minerals and nutrients. 2. Commercial products such as fish oil, fish meal and fertilizers, fish guano, fish glue, isinglass are prepared from fish. 3. These by-products are used in paints, soaps, oils and medicines. 4. Some organisms like prawns and lobsters have high export value and market price. 5. Fish farming and other fishery trades provide job opportunity and self employment 6. Productivity and national economy is improved through fishery practices.

## Conclusion

Therefore, it can be clearly inferred from the aforementioned evidence that inland fish farming can also play an important role, together with agriculture, in the socio-economic improvement of a developing country. In a country as populous as India, in particular, inland fishing has tremendous potential as a means of livelihood that can provide society with nutritional elements at the same time. Different obstacles, such as illiteracy, lack of knowledge of scientific fish farming, the participation of marginal farmers in this area only during the rainy season, serve as obstacles to the overall flourishing of inland fish farming. Therefore, in order to effectively introduce the 'Blue Revolution,' not only should the consciousness of the farmers concerned be strengthened, but also the entrepreneurship of the local government, state and central government must be increased. Consumption of Fish play important role in health and nutrition and fisheries sector also playing significant role for the development of the country by providing employment and other business opportunities.

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