

## **Preliminary Study on Economic Aspects for Fisheries Planning in the Developing Country**

—A Case Study for the Bangladesh Fisheries Development Project—

Shigero IWAKIRI\*

### **Abstract**

Until recent years, it has been observed that the planning for Fisheries Development in the Developing Countries has been approached, in most cases, technically. These approaches are directed to develop the standard of engineering facilities, infra-structural facilities like communication network, managerial and supervisory services etc., object of which is, of course, profit oriented. On the other hand, practically little emphasis has been placed on the sociological aspects in order to improve the fishermen's social position and help them to enjoy better standard of living.

The present study on the economic aspects of the Fisheries development of Bangladesh is directed to analyse the present situation of Bangladesh Fisheries and to find out the basic philosophy for development planning with respect to the present condition of Bangladesh which will place emphasis not only upon the technical aspects but also upon the socio-economic aspects of fisheries regions for the betterment of millions of fishermen which will also help to implement technological methods of production in the fishing industry.

This study was carried out as a result of fact finding in Bangladesh in January, 1977.

### **An Economic Outline of Bangladesh**

With particular reference to the first five year plan for the development to Bangladesh and the recent "Bangladesh Economic Survey" together with our own investigation, we propose to pinpoint the position of the fishing industry within the Bangladesh economy and to predict and suggest directions for the development thereof.

The following overall economic situation and tendency within Bangladesh is acknowledged.

The economy has much recovered from the period in Bangladesh history marked by civil war, major flood disaster and subsequent economical difficulties which led the nation to the verge of starvation. Agriculture and industry have slowly but surely improved and, as the present situation continues to improve, the nation's economy is taking off.

We understand that economic recovery within Bangladesh is the result of a successful change in government policy and social organization from a phase typified by rigid socialistic economic policy to a more flexible, liberal approach.

---

\* Laboratory of Fisheries Economics, Faculty of Fisheries, Kagoshima University.

In particular we mention the recognition given to the importance of private capital and the development of a policy which relieves distribution channels from established economic controls.

Even though there is a possibility of inflation with the apparently successful policy of the government, a necessary influx of capital from foreign governments and international financial organizations is, in our opinion, significantly helping to improve the economic situation within Bangladesh.

Under these circumstances, the planning fisheries development projects represents a timely opportunity to not only increase the degree of food self sufficiency of the country, but also to improve the balance of foreign trade.

We predict that the economic character of Bangladesh will not be changed dramatically over a short time however. Agriculture in Bangladesh, occupying as it does the greatest share of the gross national product, the largest percentage of the nations labour force, and further accounting for the greatest part of foreign trade, will continue as the primary feature of the economy in the years to come. The Bangladesh economy can be therefore typified as a "mono-cultural economic structure".

The above situation accounts for the shortage of employment. In the agricultural areas of the country latent unemployment and semi-unemployment is considerable. On the other hand, this also means that wages to workers in industry are low.

We presume that there is an observable tendency for possession of land to be concentrated into the hands of wealthy farmers with the poorer farmers becoming tenants or farm laborers due to the population increases in the agricultural areas. This can be said to contribute to increased structural difficulties within the country.

These structural difficulties, multiplied by the insufficiency of the industrial infrastructure and the lack of adequate transportation facilities encourage only antiquated merchandising activities while discouraging private investment in the production sector.

The government of Bangladesh recognizing the enormous fisheries potential of the country, is eager to undertake fisheries development projects as a way of breaking through the above problems.

### **The Purpose and Effects of a Fishery Development Plan for Bangladesh**

#### **1. Significance of Fishery Development**

It has come to be recognized that it is neither desirable nor adequate for a developing country to give first priority to the development of its own heavy chemical industry or increase production of advanced merchandise as a means of improving its economy.

Increase in costs caused by the limited domestic market and inability to compete in the world market result in loss to and weakness within the national economy.

The theory for development of primary industries such as agriculture, fishery and

forestry and certain sectors of secondary industry which bear close association with primary industry is most important for developing nations as they have ready access to these resources. According to this theory we shall refer to the significance of fishery development as it relates to the status-quo in Bangladesh.

A). Acquisition of food and the elevation of Nourishment

In spite of intensive farming and the diligence of the people of Bangladesh, a constant and adequate supply of food for all people has not been achieved.

Obstacles such as natural disasters have not yet been entirely overcome. It is vital that the country become food self sufficient and cease to rely on other countries since land is now becoming less fertile due to irregular climatic changes and the excessive use of chemical fertilizers. Grain consumption per person in Bangladesh is said to be very high in comparison with developed nations but we know from studying the Japanese case that the development of fishery resources will contribute significantly to the decrease in grain consumption.

The development of fishery resources will therefore be directly related to the rise in proteolytic intake of the people the ratio of which is quite low in comparison with other developing countries, despite the fondness for fish throughout Bangladesh. UNICEF, recognizing the importance of proteolytic intake in child welfare, therefore places great priority on assistance to fishery development.

B). Independent economy and the acquisition of foreign exchange

The health of a nation's economy is very much dependent upon the rate of food self-sufficiency. When food self-sufficiency decreases the national economy is at stake, while an increase points to its vigour. Thailand, for example, even though it lacks mineral and other strategic resources, maintains a healthy economy by means of exports of agricultural products.

The development of fishery resources in Bangladesh, as mentioned, will play a very important role in contributing towards the establishment of an independent economy through food acquisition.

Furthermore, not only the resulting decrease in grain imports but also the export of aquatic products will be a major purpose in the promotion and development of industry and the economy.

Particularly, with the world wide shortage of fishery resources the increased inflow of currency from fishery exports and the reduction in outflow of foreign currency resulting from reduced grain imports will aid the economy greatly.

C). Promotion of sub-regional development

As Bangladesh is crossed by many rivers, regionally there is much room for potential fishery development on a large scale.

Generally speaking the land is under fairly heavy cultivation except for some rural areas but the inland and coastal fisheries have great potential for development.

Establishing special fishery bases in some projected areas, modernizing the methods and equipment, motorization of fishing boats, etc., will promote development of the surrounding areas, improve the quality of life and contribute to regional development.

D). Employment opportunities and the development of allied industries

New opportunities for employment are limited at present due to the absence of demand in the agricultural and industrial fields. Simple basic job opportunities must be created.

We can expect that the development of fishery resources will not only create job opportunities within the fishery industry itself, but will also create opportunity in related industries such as ship-building, internal combustion engine and electrical equipment manufacture and distribution, transportation and processing industries, etc. As fishery production is the concentration of much modern industrial technology, it will effect a beginning for various industrial developments.

E). Improvement of technological Know-how

As the general level of education is relatively low in Bangladesh, through fishery development the technological know-how and practical techniques of a significant number of people can be improved.

As well, because fishery development will promote the people's interest, management, planning and the ability to accomplish the task will be aided. In the development of fisheries, we can expect that people, when they are given a purpose, will endeavour to overcome their limitations and develop the ability to recognize and define the tasks they face and accomplish them.

We can expect them to learn not only natural science, technical maintenance techniques and engineering skills, but also social sciences such as planning, management, organization and systemization.

F). Modernization of the economy

The planned development of fishery resources in Bangladesh will contribute significantly to a sound, modern, socialized society in which all citizens and not only a privileged class will benefit from higher income and improved living standards brought about by the prosperity of industry.

### **The Present Situation and Improvement of the Social and Economic Aspects of Fisheries**

1. Social circumstances relating to fisheries

A) The limitation of effective demand for fish products

A population distribution chart of Bangladesh will show that approximately two-thirds of population fall within the rural agricultural sector. These sector is charac-

terized primarily by jute production as the main source of monetary income.

Almost 70% of their rice production is for home consumption. In this respect we can consider that Bangladesh is generally self-sufficient. Fish products, the main source of protein in Bangladesh, are dependent upon fresh water fish taken from rivers, lakes, canals, ponds and tanks, etc. The annual consumption of fish products is estimated at between 10 and 12 kilograms per person but consumption is variable and depends on such factors as weather (monsoon season or dry season) and the seasonal cash income of the people. Consumption differs widely from income level to income level.

Particular importance should be given to the supply of fish products to poor people in the farming areas at prices which they can afford and in steady supply regardless of the season if at all possible. To accomplish this, planning of fishery development to incorporate mass production, long term preservation methods and cultivation of inexpensive fish products is of vital importance to improvement of the food life of people in the country and as preparation for the increase in the urban industrial population.

#### B) Relative industrial developments related to fishery development

The modernization of the fishing industry is dependant upon the development of relative industries, especially shipbuilding, machinery and electronic production and refrigeration. Well developed facilities for a modern fish development base, distribution and marketing centers, all the machinery, equipment and facilities that go with these cannot be expected to function well without sufficient maintenance, repair and replacement support. Neither can the overall goals of the project nor its expansion be accomplished without this support. It is therefore necessary that the planning of fishery development in Bangladesh be carried out in conjunction with the development of other relative industries. These industries should be encouraged to cooperate and assist each other, taking into consideration not only the needs of the fishery industry but also the present situation of the industries themselves.

## 2. Specific Structural Character of Fishery Production

### A) Small unit production structure

Fishing is presently typified by extremely small units, usually a single fisherman's household. There is little or no fishing carried out by private enterprise.

Inland fishing in the rivers, lakes and marshes is carried out by fisherman who combine this activity with farming. Coastal fishing is carried out by migrant fishermen who live on their row boats. As a result, equipment and boats are of extremely small scale. Naturally therefore, the fish production level is low: the annual haul per fisherman (both inland and marine) can be simply reckoned at about one ton and little more. The fisherman's household is a poor one.

Apart from the production of valuable fishery products such as prawns and shrimp, the introduction of larger scale fishing units for such popular fish as Hilsa and Carp

is pointed out as necessary.

#### B) Antiquated Production System

The fishing industry is obligated to adapt itself to natural conditions such as the monsoon and dry seasons. Consequently fishermen, particularly in the Sundarban area, are migrant because of seasonal changes and their activities are controlled by the Barhardar or village boss.

In this system the fisherman receive advanced payments from the Barhardar who in turn receives advances from dry-fish brokers in the city.

This traditional system tends to obstruct the establishment of a fair price for the products and reasonable wages for labour cannot be obtained.

Likewise, in inland areas where ponds and tanks represent the principal source of fish supply in the villages, the introduction of modern fish farming is limited by traditions of ownership by landowners and merchants and the complex family relations which result in one pond or tank being owned jointly by a large number of people.

Improvement of the production system by establishment of an annual work plan for fisherman, haul control and distribution of fishery materials and equipment must be carried out.

#### C) The economic role of Fisherman's Cooperative Societies

For fishery development, voluntary activities by fisherman's cooperative societies receiving the guidance and assistance of government agencies must be encouraged.

The cooperative movement is well established in Bangladesh at the present time however, lacking in economic power and capital, cooperatives function only in the subcontracting fish product collection field of middlemen and fish brokers.

Although the upbringing of leaders is needed in the development of the cooperative movement, the present calls for government plans to increase the economic strength of the fishermen.

Plans involve the gradual strengthening of business activities by cooperative societies, e. g. effective procurement and competent distribution of fishing materials to fishermen.

In particular, the BFDC should act positively to bring government aid in the form of capital and materials to fishermen and to reorganize the operations of the cooperative society substructures.

### 3. The relation between marketing and the cost of fish production

#### A) Complicated distribution channels in Bangladesh

The complexity of distribution systems between production areas and the consumer has been commented upon in many previous publications. There are for example channels for:

1. Fresh marine fish
2. Dried or salted marine fish

3. Fresh water fish from rivers, canals, lakes, etc.
4. Prawns and shrimp for export

These are transported from the production areas to consumer areas through the various intermediate distribution channels to the farm villages and cities and to ports for export shipment.

Methods of transport are also complicated, varied and uneconomical both in terms of cost and time. These methods range from fish cargo boats, railroads, and trucks to the roofs of busses and on cattle wagons. Where distances between production and consumption are short the distribution and transportation systems operate comparatively well. For longer distances however, the quality of the product, particularly if it is fresh fish, deteriorates, often to the point of inedibility. The distribution and transportation of fresh fish over long distances in Bangladesh can be compared to a very long and narrow pipe.

An important matter to be dealt with regarding the distribution and transportation aspects of the development of the fishing industry is therefore to increase the speed of delivery, increase the volume per delivery and to establish a sound bridge between the increased deliveries and the distribution channels while minimizing the prime distribution costs.

#### B) Backwardness of Marketing Organization

Marketing of fish products in Bangladesh is based entirely on functions related to the existing traditional merchant finance structure throughout the production and consumption areas. Neither the BFDC nor any cooperative society control or directly market fish products.

Distribution of the fish product to the final retail outlet by the wholesaler in the consumption area is via a channel through a middleman at the production area and a concentration broker. The advanced payments for products flow along the same channel in reverse with each party involved securing their intermediate commission, profit, etc..

Processed fish, in particular, is presently being distributed without auction between brokers who have especially long relations with each other.

The marketing organization described above is not a beneficial one for either the consumer or the fisherman.

With the exception of direct retail sales by farmers cum fishermen at the public markets in the villages, fresh fish is being sold in wholesale markets in the cities by auction but the marketing facilities are insufficient except in a few cities.

The consignment system which is necessary for modern wholesale transactions is not well established.

Even in the metropolis of Dacca, wholesale market organization and facilities are inadequate to handle a large volume of fish products and this prevents an increase in fish consumption.

As a general rule, coordinated sales by cooperative organizations and the manage-

ment of market facilities by an organization such as the BFDC should be established as soon as possible.

#### C) Market Price Problems

As the middlemen and brokers of fish products collect the product as compensation for advanced payments they have made to the fishermen, the market price and distribution system is in effect actually controlled by these middlemen and brokers. The final retail price of the product is determined by the wholesalers in the consumption area.

As a result, there is no way to reflect the requirements of the fishermen or to stabilize the retail price in the consumption area at a reasonable level.

This is one factor which restricts expansion of fish product consumption.

Further, the final price of a product in the consumption area is often as much as several times that in the production area, depending upon the season and kind of product.

These price differences are partly caused by the increase in costs which result from poor distribution transactions but the intermediate margins mentioned above are the main reason.

The shortage of freezing and cold storage facilities is also pointed out as a major factor in price instability, particularly the very low prices during times of good harvest.

All of the above problems can only be solved by the establishment of all advanced distribution administration and this is the most important concern in the development of the project.

#### D) Price effects on different income groups

1. When studying the problem of establishing fish prices we observe that, by income classification, approximately 30–40% of the population, particularly in rural areas, has no regular income. There are a great number of non monetary income families which live primarily by incidental spot grain earnings per day. Because the purchasing power of these families is extremely low, a social policy is needed but price formation would have no effect upon them.
2. Two-thirds of the population is agricultural. Apart from the above mentioned group, these people are almost entirely self-sufficient economically, catching fish from the rivers, lakes, artificial ponds, etc. in the villages.
3. The remaining urban labor population is relatively small. Their incomes are said to be a very low level, from 200–300 Taka (U.S. \$. 13–20) per month.

As the labor population is expected to increase in the future, it is necessary to systemize distribution systems and to develop preservation methods for fish so as to maintain a price within the reach of these people.

Time losses as well as losses due to small scale inefficiency and corruption should be eliminated.



### E) Expansion and Reorganization of the Fish product export business

Both fresh and salted hilsa as well as a few other fish products have been exported from Bangladesh to Calcutta for a considerable number of years.

This is part of the activities of the BFDC at present.

The actual quantity of exported products cannot be estimated as a considerable amount of smuggling has been reported.

As common fish such as hilsa are also distributed for domestic consumption, total fisheries administration is necessary to establish a balance home consumption and export, taking into consideration domestic market prices. Recently the export of frozen shrimp and froglegs from Bangladesh to the U. S., Japan and Europe has begun increasing and it should be mentioned in particular that the frozen shrimp produced in Bangladesh are suitable for the foreign market in terms of size and appearance.

At present individual harvests by a large number scattered over a wide area are the rule and the quality of the product deteriorates during collection from these individual sources.

The establishment of an organization for providing exporters with education, advice and assistance in negotiating the quality price and processing of products is also to be considered on the technical assistance grant basis.

As a general increase in the trading of fish products throughout the world is expected, it is necessary to further study the development of other fish products suitable for export.

### Fish Product Processing and Relative Facilities

#### 1. Fish Product Processing

For the most part inland fish are sold fresh, particularly Hilsa and Carp. The quality is high during the dry season but during the monsoons when harvests are best the quality falls considerably because the fish are salted by individual household labour and the quality of salt is inferior. Generally the greater part of the marine products, hairtail, Spanish Mackerel, etc., which are dried or salted, in the Chittagong and Cox's Bazar areas is of high quality. Small dried shrimp are of sufficient quality to be used as secondary processing materials.

Nevertheless, the hilsa as a marine product salted on Dubra Island and in other places by migrant fishermen can be said to be particularly inferior in quality owing to rough heavy salting only to achieve long term preservation.

Considering an increase in fish hauls during the monsoon season, the development of new fish product processing technology is needed, including the introduction of small artificial drying machines.

Such technology would not include canning (which would require a great deal of can materials) and fish meal processing (which would produce only fish meal which is nonconsumable). Fish paste processing and smoking of fish, which could be carried out by small factories, is advisable.

There is a potential for exporting these new processed fish products to neighbour-

ing Asian countries.

## 2. Relative facilities

Ice making equipment and cold storage facilities are especially important in consideration of developments in distribution and marketing.

Present conditions in Bangladesh are marked by 1) a lack of capacity which results in difficulty in preserving the quality of the fish both in the material and finished product stages, 2) the concentration of facilities in only a small number of cities or special project areas and a lack of a distribution system which can maintain constant low temperatures.

Reasonable allocation planning of relative facilities is needed to prevent deterioration and waste of fishery products in future. In addition, a system for dealing with mechanical breakdowns and supply of spare parts should be developed.

### **Supplement**

#### A) Necessity of the enactment of various laws

The various social and economic limitations and faults of fisheries mentioned above should be remedied in conjunction with the systematic arrangement and legislation of the Fishery Act, The Conservation of Resources Act, the Cooperative Association Act and other acts, restrictions and administrative guidances.

In our proposal we do not discuss legislation in particular but we suggest that there is a necessity for prompt enactment.

#### B) The Problem of Pollution

The problem of pollution effects upon fisheries is gaining growing attention in Bangladesh. We should pay attention to the effects upon fisheries of manure and agricultural chemicals, etc. used to kill weeds in farming areas. Necessary legal restrictions may have to be carried out if study shows a threat is present.

#### C) The Problem of Technological Assistance

Since the development of new species of fish, fishing and culturing methods, methods of processing and training in administration are not commercially practical, these should be regarded as falling under the definition of technological cooperation.

##### 1. Development of New Fish

In the development of new fish species, cuttle fish and cultured eels are worth considering, mainly for export but for domestic consumption as well, depending upon the method of processing.

Additionally, pearl culturing might be considered.

##### 2. Culturing of New Species

With regard to the culturing of new species in fresh water ponds, this should be carried out over certain continuous periods, sometimes as a demonstration, with the

full agreement of all people concerned with the particular ponds and consideration should be given to the improvement of existing fish, the effects of introduction of new species, new methods, etc..

### 3. New Processing Method

When considering the development of new processing methods, smoking, salting, drying and paste processing especially should be studied in order to develop quality products which have a taste satisfactory to the domestic consumers, or if for export, the target market.

### 4. Provision of Equipment

As technical assistance, zinc sheets, polyurethane corning caskds, etc. should be made available to the farming villages and cooperative unions to promote and assist them in carrying out traditional processing and preservation activities of drying and salting fish, particularly during the harvest seasons.

### 5. Training

In order to develop management people, select staff of the BFDC, cooperative unions, etc. should be given training in the natural and social sciences. During their training, family assistance, salaries, etc. should be provided. After training they can return to their former jobs and bring to bear the new techniques and knowledge they have learned.

## Conclusion

### 1. Summery of Characteristics

Rearranging characteristically the understandings of the present technology and socio-economics discussed until now, we can suggest the following realizable projects.

#### A) Inland Fisheries

Inland fisheries, representing as they do a large portion of the total fish production of the country, are essentially subsistent fisheries. Hauls are a source of food for the farmers cum fishermen themselves. The primary cooperative societies should undertake the following functions: systemization of the people to develop inland fisheries for merchandising, preparation for the anticipated increase in domestic consumption of fish and preparation for the intensive management of fish breeding.

#### B) Marine Fisheries

Although marine fishing is still limited to coastal fishing and is subject to climatic conditions such as the monsoons, there are many fish species which represent promising resources for exploitation in future. Through proper planning of comparatively large scale enterprises, these resources can be developed for the export market.

### C) Processing

At present, there are a considerable number of inefficient and unreasonable foods being produced. Granted that traditional methods and products are to be continued, we would like to see the private sector take a major role in the fish preservation and processing industries. Present processing and supply costs should serve as the standard for large scale activities but, as the purchasing power of the consumer increases in line with economic expansion within the country, large scale processing and preservation would become economically more attractive. Newly developed processed food products will both have influence and be influenced by the improving food life of the people.

### D) Distribution and Marketing

With regard to the distribution and marketing of fishing products, it is characteristic that conventional functions, such as the Barhardar System, and the modernized function, such as the export of freezing shrimp, not only coexist but are united strongly. Distribution by long and narrow channels is acceptable for minor production but is inappropriate on a mass production basis. The important basic guideline for fishermen and consumers is therefore that the cooperative societies get rid of the existing dealer force gradually and establish independent marketing organizations. We expect the establishment of such marketing organizations to be accompanied by financial measures.

## 2. Principle Preconditions

Although the above mentioned views are our basic guidelines for the development project, some principle preconditions must be established for practical planning.

A) Plans should not be carried out only in the interest of scientific or technological possibility or strong social demand. The project must be both beneficial and profitable in terms of the nation's economy.

B) Based on trends in the international fishery movement, three individual fields, i. e. inland fishery, marine fishery and the breeding industry should be harmoniously developed in line with the natural conditions present in Bangladesh.

C) Planning should be characterized by total organization unifying production, distribution and consumption.

D) It is important that traditional methods, i. e. catching, processing, breeding, cooking, etc., be given due consideration within the project.