STATUS AND PROSPECTS OF THE FISH PROCESSING INDUSTRY IN THE PHILIPPINES

by

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Abstract

The Philippine Government, through the Bureau of Fisheries and Aquatic Resources and other agencies, launched the Expanded Fish Production Programme in 1970 and this has led to an increase in fish production. The rapidly expanding fishing industry is now supplying annually around 1.6 million t of fish which form the basis of the fish processing industry in the Philippines. About one third of the annual total catch is processed as salted, dried, smoked, fermented, frozen and canned products and as fish meal.

Drying and smoking and other fish processing methods, as practised in most fishing areas, are the traditional methods that have existed for years. There is a lack of modern processing technology and of trained manpower in fish processing.

However, steps are being taken by the Government to counteract these problems. Efforts have been concentrated on the improvement of the traditional methods of fish processing on the development of export products and import substitutes. Attention is also given to the elimination of wastage in processing, marketing and distribution.

INTRODUCTION

The Republic of the Philippines has more than 7 000 islands with an irregular coastline of 18 000 km. In addition, there are about 9 000 km^2 of fresh water and 5 000 km^2 of brackish water and swamp lands. The Philippines has a bountiful supply of fish and the fisheries are of considerable importance in the national economy, both as an industry and as a source of food. Some 2 000 species of fish, molluscs, crustaceans, echinoderms, coelenterates, corals, turtles, seaweeds and other aquatic fauna and flora occur in the Philippines.

Fish has always been an important item in the Philippine diet. It constitutes more than 50 percent of the animal protein intake of the average Filipino. However, fish production has not met the needs of the fast growing population despite the extensive fishery resources. The average *per caput* consumption has been estimated at between 30 and 40 kg, which is relatively high by world standards.

There is an awareness of the necessity to exploit the country's fisheries. The Philippine Government is making efforts toward increased fish production through the Bureau of Fisheries and Aquatic Resources, which is implementing a fisheries development programme including the improvement and development of the fish processing industry.

HISTORICAL BACKGROUND

Traditionally the inhabitants along the coastal areas practice methods of fish processing such as salting, drying, pickling, broiling and smoking. These methods are employed during peak seasons and the products are intended for home consumption. Marketing surpluses are bartered.

Small species of fish, such as anchovy, sardine, goby fry and mackerel, are the raw materials used for salting. Salting of small fish is usually carried out in wooden bancas or concrete tanks, which may either be packed as fish pastes or immediately sold after salting. Smaller species, such as anchovy, are dried without salting while the larger fish, such as groupers and roundscads, are salted before sun-drying. Some are skewered on bamboo sticks and sun-dried. Smoked fish in the Philippines is of Chinese origin; this product differs from smoked fish in temperate countries in that the fish are boiled in brine prior to smoking.

Canning was introduced as early as the 1930s but did not flourish. The slow development of the canning industry can be traced to the lack of technical know-how in the methods of canning. In recent years, the canning industry has remained undeveloped and neglected and millions of pesos are being spent by the Government for the importation of canned products.

Some 20 years ago, fish landings were 1-2 km from the shore. The catch was ferried ashore by amphibious vehicles or by dugouts with motors and outriggers.Ice was bought from private plant operators and was mechanically crushed before loaded into trawlers or fish carriers prior to departure to the fishing grounds. Immediately after capture the fish were packed in 'bañeras', circular galvanized iron containers, in ice, with approximately 3 parts ice to 7 parts fish.

THE PRESENT FISHERY

The pressures of the growing population have placed food production at the top of government priorities. With the campaign to increase food production an intensified national drive to develop the country's fishery resources has been launched. This expanded fish production programme aims at attaining self-sufficiency in fish supplies. The programme also aims at promoting import substitutes and developing an expanded export of fishery products.

For the purposes of fish production, the resources are subdivided as follows:

Marine

(1) Commercial fisheries: covered by fishing vessels 3 GT or larger;

(2) Municipal fisheries: covered by fishing bancas less than 3 GT, using relatively simple gears, operating mostly in shallow coastal areas and primarily used for subsistence fishing.

Inland

(1) Brackish water fisheries
- (a) brackish water fish ponds: for milkfish (*Chanos chanos*) and prawn culture;
- (b) estuaries: for culture of oysters, mussels, etc.

(2) Freshwater fisheries
- (a) freshwater fish ponds: for culture of carps, tilapia and others;
- (b) communal waters: lakes, reservoirs, rivers which, like the municipal fisheries in marine waters, are generally utilized by subsistence fishermen.

Contribution to the economy

As a whole, the fisheries sector contributed 4.25 percent to the GNP in 1974; the fish supply situation is shown in Table 1. The fishing industry directly employed an estimated total of 795 000 fishermen in 1974. Indirectly, the industry provides employment to those engaged in fish marketing and distribution, fish processing, operation of ice plants and cold stores, and to those in allied industries such as net-making, boatbuilding, etc. While normal production reached a 4.6 percent growth rate during the period 1968-72, there has been a signifi-

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1/ P.Ps. 1 = U.S.$ 0.136 (April 1978)

cant increase to 5.2 percent in 1968-74. Total production in 1968 was 937 700 t, valued at P.Ps. 1 362 million[1/], while the corresponding figures for 1974 were 1 268 400 t and P.Ps. 5 570 million. Production projections, based on a 4.6 percent growth rate, are shown in Table 2 (production targets are given in Tables 3 and 4 and Figure 1).

Exports steadily increased from 1 980 t (P.Ps. 4.9 million) in 1968 to 22 867 t (P.Ps. 130 million) in 1974, representing an elevenfold increase or 50 percent growth rate in volume. The major exports in 1974 were frozen fish and shrimp; Japan and the U.S.A. were the main markets. Imports were reduced over the period 1968-74, from 88 291 t (P.Ps. 99 million) to 56 461 t (P.Ps. 233 million). The bulk of the country's imports in 1974 were canned fish (83 percent) and fish meal (16 percent) supplied mostly by Japan and Peru, respectively.

Table 1

Fish supply situation (t), 1974

	Domestic production	Foreign trade		Available supply
		Export	Import	
Fresh fish	1 241 899	12 499	2	1 229 452
Canned fish	–	–	47 108	47 108[a/]
Crustaceans, molluscs	26 469	1 809	–	24 660
Dried, salted, smoked fish	N.A.	343	4	(339)[b/]
Total	1 268 368	14 601	47 114	1 300 881[c/]

a/ Equivalent to 67 297 t fresh fish

b/ Equivalent to 565 t fresh fish

c/ If canned, dried, salted and smoked fish are converted to fresh fish equivalent, total available supply is 1 320 844 t

Note: The net import is 32 513 t; this is equivalent to 52 476 t fresh fish

Table 2

Production projections at 4.6 percent growth rate

Year	t
1974	1 268 400
1975	1 326 700
1976	1 387 800
1977	1 451 600
1978	1 518 400
1979	1 588 200
1980	1 661 300
1981	1 737 700

Table 3

Effective demand and production target (t), 1977-1981

Year	Effective demand (4.2%)	Target production (5.5%)	Annual incremental production
1977	1 495 000	1 489 400	77 600
1978	1 557 700	1 571 300	81 600
1979	1 623 200	1 657 700	86 400
1980	1 691 400	1 748 900	91 200
1981	1 762 400	1 845 100	96 200

Table 4

Production targets by fishery sector (t), 1977-81

Sector	1977	1978	1979	1980	1981	Average growth rate (%)
Inland fisheries	157 400	173 800	191 100	209 300	228 500	10.8
Municipal fisheries	779 600	814 800	851 900	891 100	932 500	4.5
Commercial fisheries	552 400	582 700	614 700	648 500	684 100	5.5
Total	1 489 400	1 571 300	1 657 700	1 748 900	1 845 100	5.5

THE FISH PROCESSING INDUSTRY

The bulk of the country's total catch is consumed in the fresh state. Only about 40 percent of the total annual catch, which is approximately 1.3 million t, is processed in the Philippines.

Domestic production of salted, dried, smoked and fermented products is sufficient in larger national markets. These items are produced through a system of small-scale units as home industries.

Drying

At present, household and commercial drying using solar radiation is still the most common method of preserving fish in the Philippines. Drying is practised in every fishing village and by this method it is possible to utilize fish surpluses.

Drying as a method of fish preservation is still an important industry. It provides a storable product, creates employment and, with its great flexibility, handles a large volume of fish from small widespread units.

The method used is to salt the fish by immersing in brine before sun-drying on bamboo trays for 1-3 days depending on the size of the fish used and the prevailing weather. Since drying in the open is hampered by weather during the rainy season, some processing plants use artificial driers. The product has a moisture content of 30-40 percent of the total weight.

The dried, small fish are usually packed in boxes of 25 kg; larger fish are wrapped in matting, in various sizes, for transport and distribution. For retail distribution, they are packed in plastic bags. The dried products can be stored for 2-6 months and they are distributed to shops and markets throughout the country. Dried fish is a staple product in the Filipino diet; it is accepted and consumed by all income groups and in all localities of the country. Dried fish which are not sold for reasons of poor quality go to the fish meal factories and are converted into feed.

Salting-fermenting

The practice of fish salting has been slow to improve through the years. The fishermen still cling to old methods. Sardines or other small fish are brine-salted, drained overnight and packed in loose salt. The finished products are packed in wooden boxes or boxes lined with mats or plastic film.

Salting with fermentation is also a common way of preserving fish in this country. The products obtained are fish paste (bagoong) and fish sauce (patis). The manufacture of fish paste and sauce is a traditional industry and it plays an important role in utilizing fish surpluses, especially the trash fish. Some of the species used for fish sauce and fish paste manufacture are *Stolephorus* sp., *Sardinella* sp., *Anodentostoma* sp., *Decapterus macrosoma* and a mixture of small fishes.

Fish and salt are mixed, fed into a fermentation tank and allowed to ferment for about one year for patis and 6 months for bagoong. Patis is drawn off as a clear liquid, containing fish protein, salt, etc. It has a particular, agreeable taste and is widely used in the Philippines for salting and seasoning many types of food. The bagoong is used in a similar way.

Production of fish sauce takes place partly at the cottage level but also in well-equipped, medium to large size factories. There are still many small operators producing less than one tonne of fish paste per year and many do not have bottling facilities. They sell either to vendors in public markets or to enterpreneurs who bottle and distribute their product under an established brand name. The fermented products require a long period for production and they can be stowed for long periods.

Smoking

Smoking of fish is carried out in villages, towns, cities or in places where daily transport, of the product, to central markets is possible. The major species used are sardines, milkfish, roundscad, mullet and mackerel. Cleaning in fresh water is followed by removal of gillls and internal organs. The fish are then washed thoroughly and are allowed to drain. For cooking and brining (all species except milkfish) a large tub is filled with water, and salt is added to give a concentrated solution. This is then heated and when the boiling point is reached the fish are cooked for a period of time, depending upon the species and the size of the fish. For milkfish, they are soaked in a brine solution and then cooked. After brine-cooking, the baskets are drained and cooled. Before smoking, some processors sundry the fish or allow them to stand overnight (when cooked in the afternoon) prior to smoking the following day. The mode of smoking depends primarily upon the type of smokehouse. Hot smoking is commonly practised; sawdust or shavings of hardwood are used as fuel. During peak seasons the fish are cooked in bulk, stored in cold storage and smoked during lean months. The products are sold directly in the trays in which they were smoked or are repacked in boxes. The used trays are shipped back to the processors.

Freezing

Fresh fish are generally marketed whole or in the round and occasionally the larger ones are sold as steaks or chunks. At present, most of the supermarkets in the Greater Manila area sell frozen fish (whole or gutted); fillets, packed in plastic bags are also sold. Tuna, milkfish and shrimp constitute the bulk of the frozen marine products for export but frozen scallops and cuttlefish are also exported. The Philippine Fishery Exporters have acquired the necessary experience in preparing the product. They have also learned to trade and arrange shipments. In 1976 the country exported a total of 17 382 t of fish and fish products, valued at U.S.$ 36 million; of this amount, 7 970 t were frozen products, valued at U.S.$ 17 million.

The domestic market for frozen marine products is limited because the Filipino consumer has a prejudice against this type of product. The freezing industry in the Philippines is quite small. Shrimps are frozen at the rate of 1-2 t/day, milkfish 1-10 t/day and lobster no greater than 0.5 t/day. Processing is carried out without sophisticated equipment and technology. Contact plate and blast freezers are the most common types used and a typical processor would have a daily freezing capacity of 4-5 t and a storage capacity of 80 t. There is one government-owned freezing plant in Greater Manila, the Food Terminal Inc., which operates a commercial blast freezer with a capacity of 80 t and a freezer storage capacity of 300 t. The plant is used for freezing marine products for export.

Canning

There are a few canneries in operation and their output is too small to supply the domestic market. The cost of production is great and, as a result, the products are too expensive for most consumers. Canning as an industry is still limited to small quantities of tuna and tuna-like species, mackerel, sardine and occasionally milkfish. The canning industry in the Philippines has not received much attention and has therefore not develop, and it has been necessary to import large quantities of canned products. Given proper incentives, the local canning industry could be fully developed.

Mincing

The manufacture of fish sausage and fish cakes was introduced as early as 1957 by a Filipino fishery technologist who had been trained in Japan. The product has gained acceptance but is not yet produced on a commercial scale. Fish cakes and fish sausage are prepared from shark, tuna, croaker and lizard fish. The success of the fish sausage industry in this country will depend on the availability of raw materials and the cost of production.

Fish meal

In the Philippines, fish meal gained popularity in the early 1950s. It was used as an ingredient in the formulation of feeds for poultry and livestock. The Government now encourages its production on a commercial scale. There has been a considerable increase in fish meal consumption, which has boosted the local industry but local production is still too low to meet the increasing demand.

The raw materials usually consist of assorted fish which are either whole or scrap. The most commonly used are roundscad, sardine, slipmouth, big-eyed scad, anchovy, tuna and fish scraps and waste from the canning factories. The process of fish meal manufacture consists of cooking, pressing, drying and milling fresh fish until a dry meal is obtained. The method used by local producers is a crude, dry rendering method. Raw fish are cooked, dried under the sun, pulverized and packaged in sacks.

PROBLEMS OF THE FISH PROCESSING INDUSTRY

The fish processing industry is not without its problems. Among them are the following.

(1) Shortage of supply and the high cost of raw materials at landings. This is particularly true for canning since acceptable grades of fish are not available in a sufficiently regular supply to justify full capacity operation.

(2) Improper fish handling, icing and sanitation practices.

(3) Need for the improvement in the processing of traditional products and for the development of new products for export and for import substitution. There is a need for more quality control measures to be practised in most processing plants.

(4) Inadequate infrastructure, such as harbours and other facilities. There are not enough cold stores for frozen fish from which the processor can draw his supply of fish at reasonable prices throughout the year.

(5) In canning, the high cost of tin plate is the main problem. As a result there is stiff competition from imported canned products, particularly sardine and mackerel.

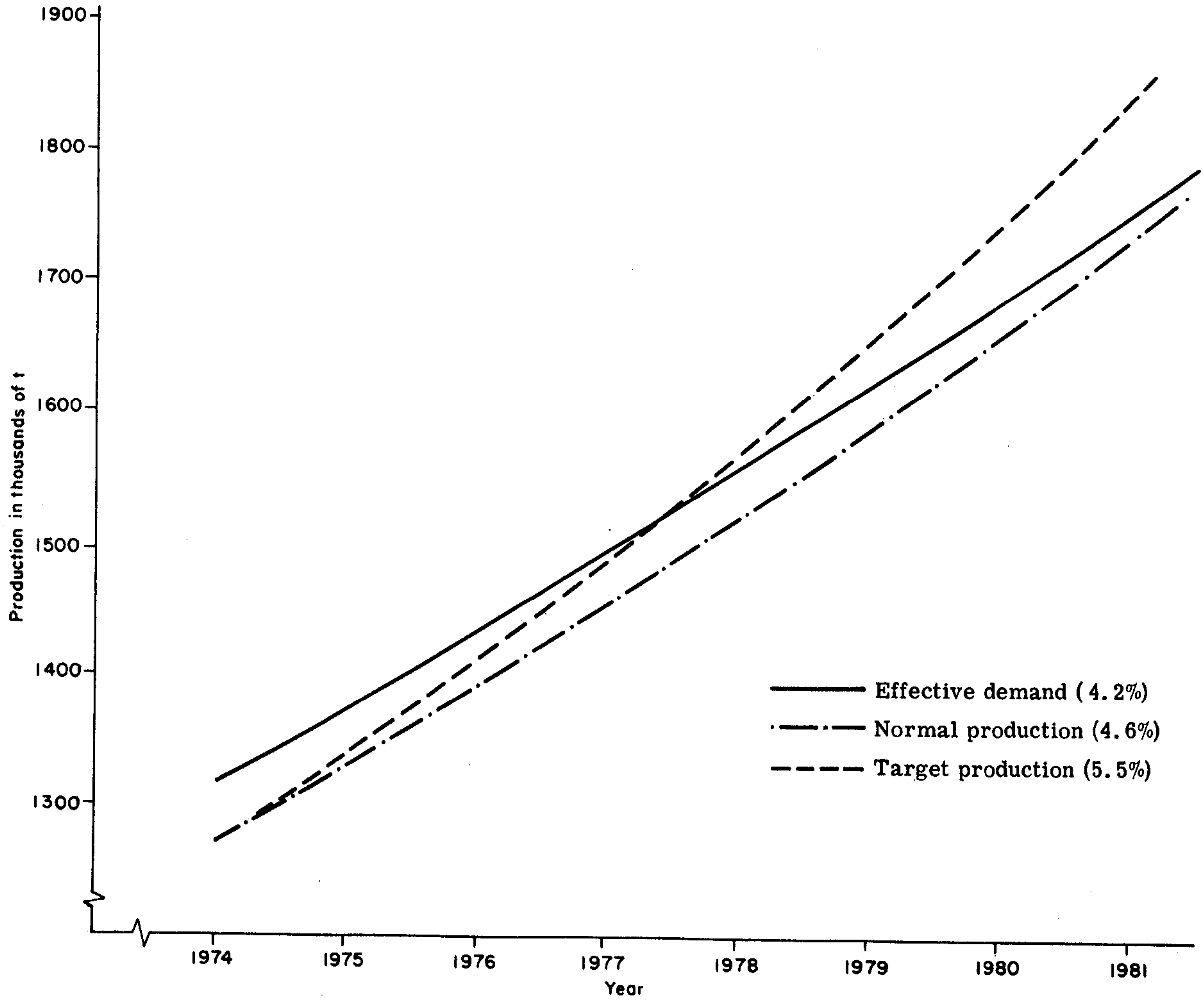

Figure 1 – Effective demand and production target, 1977–1981