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Global Preparatory Meeting
for the First Consultation
on the Fisheries Industry

Mexico City, Mexico, 26-29 January 1987

POSSIBLE ISSUES TO BE SUBMITTED TO THE FIRST CONSULTATION ON THE FISHERIES INDUSTRY*

Prepared by the
UNIDO Secretariat

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* This document has been produced without formal editing.

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INTRODUCTION

1. The Industrial Development Board of UNIDO, at its nineteenth session held in May 1985, decided to include the First Consultation on the Fisheries Industry in the programme of Consultation meetings for the biennium 1986-1987. In accordance with that decision, the First Consultation on the Fisheries Industry will be held in Gdansk, Poland, from 1 to 5 June 1987, and will be co-sponsored with the United Nations Food and Agriculture Organization (FAO).

2. During 1986 preparatory meetings were held in Africa and Latin America to prepare for the Consultation. These meetings examined the state of the fisheries industry in the corresponding region, identified constraints on the development of the sector and determined priority issues for the region for discussion at the Global Preparatory Meeting.

3. The Global Preparatory Meeting will be held in Mexico City, Mexico from 26-29 January 1987. It will be organized in close co-operation with FAO and will be hosted by the Government of Mexico. The purpose of the Meeting is to advise the UNIDO secretariat on the selection of the issues that might be considered at the Consultation.

4. This discussion document attempts to clarify the present situation of the fisheries industry in the developing countries with special emphasis on the main constraints which hamper the development of the sector and on the possible issues to be submitted to the Consultation. It draws on the conclusions and recommendations of the regional preparatory meetings and on the regional studies prepared by UNIDO for this purpose. 1/

I. IMPORTANCE OF THE FISHERIES INDUSTRY

5. In several developing countries which have expanded their activities in the sector, the fisheries industry accounts for a considerable part of GDP. Whilst it is difficult to determine the precise value added in respect of fisheries activities, because of a lack of statistical information, the experience of a number of developed countries and also developing countries shows that growth in the fisheries sector stimulates the development of a whole range of other sectors. These include transport, shipbuilding, repair and maintenance, manufacture of ice, chilling and deep freezing, production of animal feeds, packaging, etc. As a result of these sectoral relationships, the impact of the sector is much greater than is suggested by the figures for catches and processing.

6. The importance of the sector as a creator of jobs has been pointed out on a number of occasions. According to estimates prepared by the United Nations Food and Agriculture Organization 2/, direct employment could be as much as 16 million people and the total number of people dependent on fishing for their livelihood would be in the region of 100 million, mostly in communities in developing countries engaged in artisanal fisheries.

7. Fish is an important source of animal protein and in fact provides 16 per cent of the world supply of such protein. Its importance is particularly significant in countries which have difficulty in increasing the supply of proteins from other sources. In the developing world, the levels of consumption vary significantly from one country to another, and in the same region. High per capita consumption can be found for example in Asia, in Malaysia, the Philippines and Thailand, as well as low consumption in China and India. In Africa, Senegal, Ghana and Liberia are among the top consumers whereas Morocco and other coastal states show a low consumption. In Latin America as a whole the consumption of fish is not a deep-rooted habit and consumption levels are relatively low, even in countries with an important fisheries sector like Ecuador or Argentina.

II. INTRODUCTION OF THE EXCLUSIVE ECONOMIC ZONE (EEZ) AND ITS IMPACT ON THE SECTOR

8. Under the old law of the sea, fishing could be undertaken by anyone, up to a distance of six to twelve miles from the coast. There was virtual free competition for a common resource. Latin America and in particular Chile, Ecuador and Peru were the pioneers in adopting the idea of a 200 mile strip as an Exclusive Economic Zone, when they extended their sovereignty over this area by the Santiago Declaration, of 18 August 1952. From then on, conferences on the law of the sea treated this as their basic topic, until in the third, the concepts were definitively stated, establishing that the coastal State possesses "sovereign rights for the purpose of exploring and exploiting, conserving and managing the natural resources" in respect of its Exclusive Economic Zone. The new law of the sea, which codifies the Exclusive Economic Zone, was adopted in 1982, with the signature of 15 countries and now has the status of de facto international legislation. 3/

9. Up to 1974-1976, when the proposed new law of the sea was generally accepted, foreign fishing fleets were regularly exploiting the waters of coastal countries. This coincided with rapid development of fishing technology (e.g. sonar equipment for detecting fish, filleting machinery, etc.) and the development of long-distance fleets by countries such as Japan, the Soviet Union, Poland, Spain, Portugal, the United Kingdom and the Federal Republic of Germany.

10. The new legal situation has changed the structure of international fisheries to the extent that coastal countries have a direct interest in exploiting a resource over which they now have rights. But many of the developing countries which have obtained jurisdiction over new resources do not have the capacity to take advantage of the new situation. Consequently, many of them have concluded agreements with other countries, permitting them access to their fishing zones, through joint enterprises or in exchange for a variety of economic benefits such as commercial premiums or privileges. 4/ In the long term, it is possible to consider that the majority of coastal countries will apply policies aimed at replacing foreign fleets with national fleets.

11. To assess the impact of the extension of the EEZ in developing countries it has to be borne in mind that already in the early 1960's developing countries accounted for 46 per cent of the world catch, out of a total of 39.5 million MT in 1960. This share increased during the following 10 years to reach 50 per cent during the period of the Peruvian anchoveta boom. After the collapse of the anchoveta, the share dropped to 43 per cent and has since then been slowly recovering to reach again almost 50 per cent in 1985, out of a total of 84 million MT.

12. It was expected that, with the extension of the EEZ, those countries which had previously large foreign fleets inside their territorial waters would benefit most. This applied in the South-West Atlantic to Argentina, in the South-East Atlantic to Angola and Namibia and in the Eastern Central Atlantic to Morocco and Mauritania. In the North-East Pacific and the North-West Atlantic both USA and Canada would benefit from the new situation. However, countries with major distant-fishing fleets not only maintained their catches but some increased them considerably. Japan has maintained its position as the major fishing nation of the world and has succeeded, in spite of an initial negative impact of the enforcement of the EEZ, to expand its catch from 9.7 million in 1976 to 12.1 million in 1985. The USSR increased its catch from 9.3 million in 1980 to 10.3 million in 1985, the Republic of Korea from 2 million to 2.6 million and only Spain suffered a drop from 1.45 million in 1976 to 1.2 in 1985.

13. For developed countries with extended EEZ the situation improved clearly. In the case of Canada, Iceland, Norway and the United States, the new situation eliminated foreign competition for resources within their EEZ and brought about an increase in catches. The US fish production, after being stable from 1960 to 1975 has expanded significantly over the past ten years. This might be a result of the enforcement of the EEZ since during the past few years the policy of the USA has been to reduce increasingly the foreign fleet catch in domestic waters, first through joint ventures and ther through a greater exploitation of the resources by US vessels. The result has been an increase in catches from 2.7 million MT in 1972 to 4.99 million MT in 1985.

14. Developing countries have experienced a considerable growth in catches in the last years. Between 1980 and 1985 these have increased by 8.4 million MT (25 per cent) against a 4.2 million increase by developed countries (11 per cent). This growth is spread unevenly. Some countries, like Chile, Argentina, Ecuador, Mexico, Morocco, Mauritania, Indonesia augmented their catches considerably and many small island states in the Southwest Pacific have had significant gains. Other countries with considerable fishing potential have not made significant improvements due to the lack of an adequate fishing fleet, industrial infrastructure and marketing channels.

Table 1

Fish catch by economic groups
(Million MT)

	1960	1965	1970	1975	1980	1985
Developed	21.2	27.8	32.8	37.0	38.2	42.4
Developing	18.3	24.9	32.3	28.5	33.6	42.0
Total	39.5	52.7	65.1	65.5	71.8	84.4

Source: FAO.

15. It has been estimated that by the year 2000, global demand for fish, on the basis of existing trends in relative prices and population growth, would reach around 114 million MT. According to these projections, demand in developing countries would increase more rapidly than in developed countries to a total of 60 million MT, whereas demand in developed countries would reach 54 million MT. 5/ Estimates about possible catches change. According to one source 6/ total fish catches could be increased to 120 million tons by improving the management of over-exploited resources and increased fishing of stocks which are currently under-exploited. To this should be added that an increase in the real price of fish due to increased demand might increase the consumption of less preferred species or it might shift the use of some species away from non-food use since presently about 30 per cent of world production is converted into fish meal.

III. INDUSTRIAL AND SMALL-SCALE FISHERIES

16. As a result of the extended jurisdiction of developing countries over their fish resources the role of small-scale (or artisanal and semi-industrial fisheries) has once again come under discussion. In many countries small-scale fisheries supply an important part of the fish production. This is particularly the case in Africa and in some Asian countries and to a lesser extent in Latin America. As will be pointed out in later parts of this document, 68 per cent of the national marine catches unloaded are accounted for by small-scale fishing units in West Africa, in the CECAF region, with the exception of Morocco and Nigeria. In Indonesia, the fisheries sector, which is basically artisanal and small-scale, is a major source of employment, engaging a total of 3 million persons, or 5 per cent of the national labour force. In India 1.8 million people depend on the fishing industry as a vital means of livelihood; and in the Philippines about 450,000 people depend on fishing as their main source of income.

17. What is meant by industrial and small-scale fisheries? Industrial fisheries are generally understood to mean large-scale fisheries, whose production is aimed entirely at the market and whose scale enables them to fish in deep water. Small-scale fisheries are defined as meaning fishing with small boats, using little mechanization, with or without engines, and fishing in coastal waters. The produce of small-scale fisheries is largely marketed for direct human consumption although there are cases, in Senegal for example, where small-scale units supply processing plants aimed at the foreign market. This distinction between industrial and small-scale fisheries is obviously a simplification since the dividing lines are not clear cut. Industrial fishing may also occur in coastal zones which could be covered by small-scale fisheries.

18. It is, in any case, clear that the type of problems involved in the development of each are different. Industrial fisheries require considerable expenditure of capital (a modern 80 metre long tuna purse-seiner costs up to $US 10 million plus running costs of up to $US 2 million a year), and they have high energy costs and require highly skilled labour, in terms of crew, technicians and managers. They also require support services which are scarce in developing countries, such as port infrastructure, ship repair installations, etc. Nevertheless, the economies of scale can be very significant when there are sufficient resources.

19. As far as resources are concerned, the main problem for industrial fisheries appears to be that they require constant and abundant fish stocks; as species migrate in an unpredictable fashion, this introduces a significant risk factor. Since large boats have to cover long distances and must preserve catches for considerable periods, factory ships containing sophisticated preservation and processing equipment have been designed.

20. Artisanal and semi-industrial fisheries include a great variety of boats, from sailing boats to small ships. In 1980 they were providing employment for 8 million fishermen, compared with 450,000 engaged in industrial fisheries and their total volume of catches was similar to that of industrial fisheries. 7/

21. In the case of coastal fishing, leaving aside social considerations, the economic calculation appears to favour small-scale fisheries since their boats are more adaptable to changes in the composition of resources. Moreover, the lower maintenance costs and the smaller amount of fuel used make them more economic. Studies have been carried out which show that for every calorie of fish extracted, small-scale fisheries use only a fifth of the fuel used by industrial ocean fisheries.

22. In addition, the building and servicing of boats and equipment can be carried out locally, with a minimum outlay of foreign exchange. Moreover, the training required to adapt new technology to improve the efficiency of small-scale fisheries is less costly and less intensive than that needed for industrial fisheries. For many countries this appears to be the alternative that should be promoted.

23. The lack of an adequate infrastructure for landing, handling, conservation and distribution has been identified as one of the principal problems facing artisanal fisheries. This is due to the lack of credits for small-scale fishermen on terms and conditions in keeping with their weak economic position. 8/

24. In the past, conflicts between the two sectors were smaller and isolated. This was due to the fact that the oceans were relatively under-exploited and large boats could fish near the coasts of foreign countries. The large increase in the size of fishing fleets in the last three decades and the extension of the Exclusive Economic Zone have completely changed the position. Now the ocean fleets and the coastal fleets come into conflict more frequently.

25. In summary, a large part of the fisheries potential of the developing countries occurs in the coastal fishing zone, where the best option appears to be artisanal or small-scale fisheries. In any event, ocean fishing cannot be undertaken by artisanal fisheries. It is in the interest of Governments to avoid overlapping between the two. The new law of the sea, which gives the Governments of coastal countries jurisdiction over resources and their exploitation, affords the opportunity for rational management of those resources.

IV. THE MAIN PROBLEMS CONFRONTING THE FISHERIES INDUSTRY IN THE DEVELOPING COUNTRIES

A. Fisheries management

26. According to scenarios prepared by FAO, the demand for fish could lie between 113 and 125 million tons by the year 2000. In order to meet this demand it would be necessary to increase the exploitation of marine and inland fisheries above the current level of 85 million metric tons. 9/ In that connection it is stated that "management is an essential basis for the sound, sustained development of fisheries" and that "even where catches can be increased, there is a risk that poorly planned development can lead to over-exploitation". 10/ The FAO World Conference on Fisheries Management and Development approved a series of principles and guidelines for the rational management and optimum use of fish resources. 11/

B. Fishing fleet

Africa

27. A striking feature of the fishing fleet in Africa is the importance of foreign deep-sea fleets, which in 1981 accounted for 58 per cent of the total catches from Gibraltar to Congo. The main countries involved in deep-sea fishing off the African coast are the USSR and Spain, followed by the German Democratic Republic, the Republic of Korea, Poland, Rumania, France, Bulgaria and a numer of other countries with lesser hauls. Many fleets operate under joint-venture agreements, which are of a very diverse nature.

28. For the entire Atlantic coast, local and deep-sea catches have evolved as follows:

Table 2

Deep-sea and local catches on the Atlantic coast

	1970-74	1975-79	1980	1981	1982	1983
Catches in the Eastern Central Atlantic						
(1,000 tons)	3,079	3,377	3,432	3,238	3,026	2,812
Deep-sea (%)	62.8	62.4	62.6	57.3	56.2	51.1
Local (%)	37.2	37.6	37.4	47.2	43.8	48.9
Catches in the South-Eastern Atlantic						
(1,000 tons)	2,750	2,750	2,170	2,029	2,359	2,348
Deep-sea (%)	37.8	55.9	57.3	58.9	60.9	55.8
Local (%)	62.2	44.1	42.7	41.1	39.1	44.2

Source: FAO.

29. The total catches remain more or less stable over time, while the long-range deep-sea fleets have substantially reduced the level of their activities off the African coast as a result of the general increase in production costs. The fall in the price of crude oil could reinvigorate these activities.

30. The national fleets accounted for 42 per cent of the catches in 1981 on the West-African coast. The importance of "semi-industrial", "industrial" and small-scale vessels varies from one country to the other. It is interesting to note that in the CECAF region, with the exception of Morocco and Nigeria, 68 per cent of the national marine catches unloaded are accounted for by "traditional" fishing units, under which we can understand small-scale or artisanal vessels. According to the available information, the participation of the small-scale sector is even higher in the rest of the continent than in the CECAF zone.

31. Information on the national industrial and semi-industrial fleets is incomplete. There appear to be a minimum of 1,550 trawlers, 110 tuna boats, 1,650 small trawlers, 420 sardine boats and 630 "miscellaneous" vessels. Generally speaking, the industrial and semi-industrial units are old - from 15 to more than 25 years - and originate in large, but unquantifiable measure from the second-hand market in the European countries. The fishing techniques employed are diverse and have come to involve the use of synthetic fibres and large draw-nets. Less than 200 national vessels are equipped with on-board freezing facilities; some trawlers are able to produce ice, while the remainder, i.e. two-thirds, take on their ice.

32. Experience in Africa has shown that in many places small-scale units, like pirogues and smaller boats attain high levels of productivity and are capable of incorporating improvements which enhance their productivity, like motors, on-board preservation facilities, improved fishing gear, etc. This last factor seems to be a common denominator of most of the small-scale fisheries where the lack of cold storage facilities both on board and for transportation to the markets is one of the bottlenecks of the production and marketing chain.

Asia

33. In most Asian countries traditional fishing grounds seem to be over-fished. Evidence of over-fishing in coastal areas can be found in China and Thailand, which have a larger size fishing fleet, as well as in India, Indonesia, the Philippines and other countries where small-scale and artisanal fisheries account for a large part of annual catches. As a result of this, Governments are encouraging the modernization of the fishing fleet in order to diversify the source of landings and ease the strains of over-fishing in heavily exploited coastal areas.

34. The importance of small-scale fisheries differs from one country to another. In Indonesia the fishing fleet is basically small-scale and accounts for almost 98 per cent of total marine catches. In 1984 the number of fishing boats amounted to 313,640 and although the number of motorized vessels has increased more than proportionally, sail powered fishing vessels remain the major component of the fishing fleet. Only 18 per cent of the country's fishing boats are powered. A similar situation can be found in the Philippines where 60 per cent of the marine fish production is attributable to fishing vessels of less than 3 gross tons. In India, in spite of an important increase in mechanized craft which amounts to 19,000, there exist 140,000 non-mechanized craft of which 40,000 are merely plank built boats, 26,400 dugout canoes and 73,400 catamarans.

35. In view of the social importance of small-scale fisheries many Governments have opted for a modernization of the fishing fleet by the mechanization of fishing craft, the improvement of fishing gear and handling methods in the small-scale sector. The adaptation of out-board engines to dugout canoes in India, for example, has been successful. Also efforts are being made to develop cheaper and sturdier fishing craft, using wood or introducing ferro-cement and fibreglass.

36. Boat-building capacity for larger fishing vessels is very unevenly distributed throughout the region. China, for example, has 100 state-owned fishing boat shipyards with an annual production of 100 steel trawlers averaging 300 GRT capable of producing engines and associated stern gears as well as winches, windlasses and electronic, fishing and navigational aids. Thailand on its side has only one yard which builds steel fishing vessels. For larger vessels the region relies on Japanese, Korean or outside sources.

37. Fish-handling techniques seem to be poor in most countries. Only a few of the larger vessels are equipped with insulated and refrigerated fish holds. Because of the high cost of ice it is only used for high commercial value species which are generally sorted and box-iced on board before landing. Considerable efforts are needed in order to improve the use of ice boxes.

Latin America

38. It is not possible, with the available information, to draw up a general picture of the position of fishing fleets in the region. Nevertheless, it can be said that a number of Latin American countries considerably increased their industrial fishing fleets during the 1970s. Chile, for example, invested significant sums in its industrial fleet, whose tonnage rose from 25,984 GRT

in 1970 to 73,601 GRT in 1981. It currently comprises 350 ships, including 11 factory ships. The fleet has an average age of between 10 and 12 years, but it is currently being thoroughly overhauled and provided with modern equipment. The Peruvian industrial fleet grew significantly during the early 1970s, from 13,000 GRT hold capacity in 1970 to 73,000 GRT in 1973, but with the change in the composition of its fish resources the fleet had to be changed and reduced to 61,700 GRT in 1980 and 35,916 GRT in 1981.

39. In many cases, climate and significant variations according to the seasons (very differenciated dried to rainy seasons) determined the stagnation of certain productions. Entire fishery communities have to engage in completely different activities during part of the year when fishing and/or processing are made impossible by the means at their disposal. This becomes eventually a discouraging factor for the improvement of the means of production and the handling techniques.

40. Investment in fishing boats has also been considerable in Argentina. The fishing fleet currently comprises 486 boats with a nominal fishing capacity of 1.4 million tons, although in reality it allows catches of the order of 830,000 metric tons per year. The average age of the fleet is 20 years, 19 for the 122 ships of the conventional "fresh fish", which supplies the refrigerator ships, 13 for the freezer and factory ships and 30 for the coastal fleet. The latter includes the short-range fleet consisting of 68 vessels, most of which were built between 1947 and 1960. The great age of the fleet seems to be a significant obstacle to the development of the Argentine fisheries industry.

41. Other countries have also considerably increased their fisheries capacity. Between 1975 and 1983, Brazil doubled its fleet, from 50,474 GRT to 99,595 GRT. The increase for Uruguay was from 3,401 GRT in 1970 to 16,830 GRT in 1981. Mexico appears to have the largest industrial fleet in the region, with 324,032 GRT. 12/

42. The development of the fishing fleet has been based only partly on local construction. Some boats have been built in the region, but practically all of the ocean fleet is composed of imported boats. In recent years some countries have built, or are planning to build in the future, installations for shipbuilding and ship-repair. In some cases, such as that of Brazil, there has been major investment, as a result of which shipbuilding has become a significant export activity.

43. In this context it is interesting to recall the conclusions and recommendations of the Expert Group Meeting on Small-Scale Shipbuilding and Ship-repair Development for Latin American and Caribbean Countries which took place in Havana, between 9 and 12 November 1982. 13/ The experts concluded that the state of the shipbuilding and ship-repair industry in countries in the region not only showed great differences in the methods of development, but also in the levels achieved. The experts also indicated obstacles to the development of the shipbuilding and ship-repair industry in the region, which included:

- The low level of development of ancillary industry;
- Insufficient well-trained planners, technicians and managers and the inadequate utilization of those available in some countries of the region;

- Insufficient equipment in most existing shipyards:

- The lack of maintenance programmes for ships in operation:

- The little use being made of standardization of equipment, computation methods, etc.

44. The participants recommended to the Governments of the Latin American and Caribbean countries that, with the support of regional and international organizations, they needed to establish a Latin American co-operation programme for the construction and repair of small boats, particularly fishing boats. The proposed co-operation programme could include, inter alia, the following activities:

- Identification of specific mechanisms for co-operation between countries of the region:

- The obtaining and distribution of scientific and technical information on the current development of shipbuilding and ship-repair world-wide.

C. Port and handling infrastructure

45. The scant attention so far paid by Governments in Latin America to the fisheries activity is evidenced by the lack of adequate mechanisms in the port infrastructure and in marketing at the primary sale stage. Moreover, in cases where major investments have been made for this purpose, there has been no co-ordination with those intended to use the installations, who have therefore not taken proper advantage of the facilities afforded, as happens for example in the big fishing terminals built in Peru and the unloading wharfs for the artisanal fisheries in Brazilian Amazonia.

46. In Africa the lack of sufficient port capacity is a common feature to most countries. Fisheries activities are usually concentrated in one major port and, at the best, in one or two secondary ports, whereas all along the coast adequate locations for simple wharfs can be found which could provide the basis for a network of landing points to serve small-scale fishing units. This does not exclude the existence of over-sized refrigeration facilities or unused ports.

47. Full development of fisheries activities requires installations on the coast for preparing the ships and fishing equipment and for receiving the fish which is then to be processed. Industrial fisheries require larger and more complex installations, but these can be shared between artisanal and semi-industrial fisheries. The installations required include: equipment for hauling up boats for repair and inspection in the case of small boats, docks and repair installations for larger boats, workshops for maintenance and repair of boats and fishing equipment, refrigerated warehouses for the storage of fresh fish, ice-making machines and ice-storage areas, packaging installations, refrigerated transport to take the fish to consumption centres or factories, etc.

48. The lack of adequate infrastructure ashore has been recognized by various international bodies as one of the constraints to the development of artisanal fisheries. 14/ It has been said that the fact that artisanal fisheries maintain primitive technology for handling and processing results in

significant losses of catches and that if the quality of land installations were improved, together with the marketing procedures for artisanal and semi-industrial fisheries, these would have clear advantages over industrial fisheries in coastal fishing. For this reason it has been suggested that the capital investment necessary to improve handling and distribution systems should form part of artisanal and semi-industrial fisheries development projects.

D. Processing

Africa

49. In general terms, the industrial-scale production, which is essentially export-oriented, is involved in freezing, canning and the manufacture of fish meal and oil. Small-scale processing predominates in the production of dried, salted and smoked products and because of the poor road systems for long distances from the fishing site to consumption centres, dried and smoked fish will probably be the mainstay of fish trade for the years to come in Africa. 15/

Table 3

	Total production of developing African countries MT 1983
Fish, fresh, chilled and frozen	93,166
Fish, dried, salted and smoked	242,806
Crustacean and molluscs	62,174
Fish products and preparations	105,040
Crustacean and mollusc products and preparations	-
Oils and fats	11,519
Fish meal	70,493

Source: FAO Yearbook of Fishery Statistics. Vol. 57. Rome 1984.

50. Small-scale processing exists in most West African countries. In Senegal it accounts for 80,000 tons, distributed between braising, fermentation and drying, with a small smoking component. In Ghana, Sierra Leone and Côte d'Ivoire, smoking is the most important of the processing forms. Everywhere else in Africa, drying and smoking are the dominant modes of processing. There exists a broad spectrum of products, ranging from sun-dried whole fish to those prepared by a combination of sun and heat-drying over fires for various drying times and different temperatures. Sun-drying is more practical in the dry areas from Sahel to Central Africa in the dry season while heat-drying (grilling) is practised in the wet area of coastal to sub-Sahel West Africa in the rainy season.

51. Smoking poses a problem with regard to energy because of the major consumption of wood that it entails. Over the years efforts to improve production methods have been made. For example, several types of improved heat-drying smoking kilns have been tried in tropical Africa with various degrees of success.

52. Attempts were made in the 1960's and 1970's to introduce brine-salting. The experimental brine-salted product won local acceptance because of its better taste and longer shelf-life. Unfortunately, promotion of this method was interrupted in the 1970's by salt shortages caused by the deteriorating situation in Central and East Africa. Other delays in the changeover from traditional products to improved ones have been caused by the traditional marketing and pricing system. Without sustained extension work on the new methods, the traditional products, with all their defects, will continue unchanged for years to come.

53. Some West African countries like Senegal, Côte d'Ivoire and Ghana, have installed in recent years high-capacity canneries particularly for tuna, sardine and horse mackerel. This has been partly due to the closing down of a number of canneries in France which were moved to Senegal and Côte d'Ivoire. Since their exports can enter the European market duty-free under the Lomé Convention and their products are marketed under well-known brands and in a presentation adapted to the consumers' preference (notably in France) these experiences have been rather successful, although the future depends on the availability of raw material.

54. In small canneries geared to the local market, high product losses occur through swelling of cans as a result of poor workmanship. It is extremely difficult to control the container quality at scattered and small-scale outfits. Until the supply problem of empty cans with reliable quality is solved, further growth of this industry, still at its very initial stage of development in the region, will certainly be restricted. It has been proposed to set up a regional centralized can-making factory to supply ready-made or crushed empties to smaller canneries. Much of the canned product is unsophisticated and could only be consumed locally or exported at low prices as institutional packs. Diversification of products to those such as smoked or ready to serve, adapted for local taste preferences, will be essential to this sector of the fish industry.

55. Cold storage chains now exist in Ghana, Liberia, Nigeria, Côte d'Ivoire and Senegal. Local catches, mainly of tuna and small pelagics from national fleets and from joint ventures are kept in cold storage at landing centres. The shore facilities are, however, primarily geared to the export of frozen tuna, hake sardinella and cephalopods, not only to developed countries but also to other African countries. Shrimps are normally frozen on the fishing vessels and delivered to cold rooms ashore for trans-shipment to developed countries.

56. In most African countries maintenance and repair of refrigeration units is a serious problem, due to the shortage of spare parts and qualified mechanics. Because of this, for example, the Government of Mozambique intends to cut its expansion and promote less sophisticated processing methods such as salting and sun-drying. On the other hand, there has been over-investment in cold storage capacity in some West African countries.

57. Although for the export market quality standards of importing countries should be fully complied with, excessive emphasis on quality of products could endanger the smooth development of the industry. Quality control of traditional products should aim more at protecting consumers by improving the hygiene and wholesomeness of the products and less at improving the aesthetics.

58. Governments also need to promote improved methods and up-grading of the fish technology in the small-scale fishery sector. In this respect, the major obstacle is lack of trained personnel, especially extension workers able to transmit knowledge to the fishermen without incurring the resentment of the rural community. An effective training programme is the obvious answer.

59. The distribution of fresh and processed products poses a number of simple technological problems that can be solved by making modifications in the facilities used. Fresh products are rarely transported in refrigerator trucks. At the markets, these products are most often stored in old refrigerators unconnected to the electrical system and used as ice boxes. These problems can be solved more easily by easing the conditions for the granting of loans with which to purchase equipment than through technological progress. In the area of inland fishing, an original solution that has been observed in the Congo might perhaps be applicable elsewhere: away from their bases, at the fishing camps, the fishermen have at their disposal petroleum-fuelled freezers in which to store the fish before it is sent to the city by river.

Asia

Table 4

	Total production of Asian developing countries MT 1983
Fish, fresh, chilled or frozen	1,298,912
Fish, dried, salted and smoked	2,432,384
Crustaceans and molluscs	341,281
Fish products and preparations	329,209
Crustacean and mollusc products and preparations	159,588
Oils and fats	3,132
Fish meal	446,875

Source: FAO.

60. Except in countries whose industry is basically export-oriented - like Thailand - dried, salted and smoked fish accounts for a large percentage of fish utilization.

61. In China about 50 per cent of the total marine catch is still dried and dried/salted. These products are still processed in the traditional way either by air or sun drying or both. Artificial drying through heated chambers or tunnels is also undertaken in major fish producing plants.

62. In Indonesia, fish processing for the domestic market is done largely on a cottage-industry level. Traditional processing units process 46 per cent of the domestically marketed fish and 50 per cent of the processor handle salted and dried fish. Due to poor process technology and hygiene practices observed, cured fish deteriorate rapidly. In general it can be said that for simple processing methods there is a need in the region to improve techniques, upgrade facilities and diversify products.

63. Freezing and cold storage facilities exist in China along the coast and in the key inland fishery districts. In other Asian countries, like Indonesia, the Philippines and India, the majority of the freezing plants are used for shrimp and fish that are destined for export. In Thailand, on the other hand, the freezing industry and cold storage facilities seem to be well spread over the country.

64. Canning is concentrated in Thailand, the Republic of Korea, the Philippines and Burma. These four countries account for 87 per cent of the production in the region of canned fish, crustaceans and molluscs. Thailand has emerged in the last few years as a major exporter of canned products, in particular of canned tuna - whose raw material it imported to 65 per cent in 1985. Indonesia has been developing its canning industry in the last few years, but canning has not been able to develop quickly because of the absence of cans, a problem which it is hoped will be overcome with the construction of a tin-plate factory. Also, local factories complain about an insufficient supply of raw material as Indonesian producers prefer to export frozen tuna to canneries abroad. In China the canning industry suffers from outdated equipment and technology and an insufficient number of economically-viable product lines. The major constraints for canned exports include the limited variety of products offered, the packaging quality and the quality of printing on the can.

65. The main producer of fish meal in the region is Thailand, followed by China. About 800,000 MT of trash fish are annually converted in Thailand into 200,000 MT of fish meal, of which 50 per cent is exported. The meal has a low protein content and its sand content is normally over 20 per cent and sometimes as high as 30 per cent, which explains why Thai meal has not been exported to Europe or to Japan in any significant quantity.

Latin America

66. As far as processing capacity is concerned, it can be said that at the present time the majority of countries in the region with significant industrially usable resources have a processing capacity corresponding to the volume of available resources and, in some cases, over-capacity. Those countries which up to now have not developed their fisheries industry owing to the economic difficulties they are encountering and the burden of a negative fisheries trade balance have reached the point where they are now attempting to achieve import-substitution as far as possible, but still on the basis of imported raw materials.

67. Taking the region as a whole, the fisheries industry continues to be mainly concerned with reduction, due to the strong external demand and the possibility of profitable operation of fish meal production. It should be borne in mind that the share of Latin America in the world total of fish meal exports was 43 per cent in 1983. Production for direct human consumption has shown an increase, but not one which is commensurate with food requirements of the region. This is due to the fact that fisheries activity has been based primarily on exports and furthermore because very often sea products are not easily accessible to people who in the main have a low purchasing power.

Table 5

	Total production of Latin American countries MT 1983
Fish, fresh, chilled or frozen	526,329
Fish, dried, salted and smoked	74,116
Crustaceans and molluscs	225,529
Fish products and preparations	272,791
Crustacean and mollusc products and preparations	6,759
Oils and fats	79,732
Fish meal	1,202,750

Source: FAO.

68. The case of Peru deserves particular attention because its fisheries industry has suffered the impact of the change in the biological composition of the Peruvian sea under the effects of the "El Niño" phenomenon. While the anchovy was present, production of fish meal and fish oil steadily increased until Peru became the leading exporter of fish products in the world. With the decline of the anchovy and the appearance of large volumes of commercial species such as the sardine, jack and mackerel, it has become necessary to redirect the industry towards products for direct human consumption. The fish meal and fish oil industry entered a crisis after 1976 as a result of a drastic decline in anchovy catches. The present position is that productive capacity is being restructured, reducing the number of production units. On the other hand, the canning industry has grown extremely rapidly since 1976, as a result of the greater availability of sardines, which has led to excessive installed capacity in terms of the permitted catch.

69. The frozen fish industry presents problems similar to those of the canning industry. Its growth was based on exploitation of the hake. When the stocks of this species declined, there was a significant decrease in the utilization of installed capacity. Over-capacity in part of the fisheries industry owing to changes in the composition of catches has made it necessary for the Peruvian fisheries industry to readapt towards a type of production largely aimed at direct human consumption, both domestic and export.

70. In recent years, Latin American Governments have shown some interest in developing technologies aimed at finding alternative methods of production for human consumption, making better use of the species available in large volumes and in turn obtaining products affording the possibility of large-scale consumption because of their low cost. Cuba, Mexico and Peru, followed by Ecuador, El Salvador, Nicaragua and Venezuela have made significant advances in this area.

71. Those countries developing the reduction industry (Peru and Chile), the refrigeration industry (Argentina and Uruguay) and the canning industry (Ecuador, Peru and Chile), in order to enter foreign markets with their products have had to incorporate technologies allowing them to compete

internationally. Hence the various stages in the productive cycle have had to be optimized. Notable in this connection are the high yield of fishing boats engaged in ocean fishing in Chile, and the efficiency displayed in the processing of these resources to obtain fish meal.

72. In the area of frozen white fish production in Argentina and Uruguay, there have been levels of yield notable for the utilization of labour, machinery and equipment available in the market. Argentina in particular has managed to produce nearly all its machinery and equipment locally with the exception of filleting machines and certain high-technology elements in refrigeration equipment. It is a fact that in Argentina a whole fisheries supply industry has developed, which has been able to export turnkey plants in the refrigeration branch. In this area in particular, and in canning, Brazil too has achieved a large measure of technological self-sufficiency.

E. Domestic marketing

73. Although figures on production in developing countries should be handled with care, the relation of exports to production of the seven main fishery commodity groups illustrates the importance of the different groups in domestic consumption. Nearly three-quarters of fresh, chilled or frozen fish as well as practically all crustaceans and molluscs, nearly half of the canned fish and two-thirds of the fish meal produced in developing countries are destined for export. On the other hand, practically all dried, salted or smoked fish are consumed locally and (one may assume) all fresh fish which does not appear in the production statistics. This leaves us with the very simple conclusion that most of the local consumption of fish is in a fresh fish and in a traditionally manufactured form.

74. There is a lot to be done to improve local marketing systems. In many developing countries, fish are often dumped on sandy beaches or foul ground for sorting and marketing and only people close to the landing points enjoy good quality fresh fish because they get the fish soon after its capture. Further away there are serious quality problems. The utilization of solid fibreboard fish boxes for the transport of fish from the boat to the fish market as well as other types of containers to improve handling should be promoted. Some developing countries, however, have succeeded in creating refrigeration and marketing chains, but this seems to be limited to some major urban centres. The extension of cold chains should be a major policy in those countries which envisage an increase in consumption of fish products.

F. International trade

75. Prior to the application of the new law of the sea about a third of world production of fishery products were marketed internationally. Since the application of the new system, which is estimated to have redistributed 14 million tons or approximately 20 per cent of the annual world catch, some countries have gone from being major exporters of fish and sea products to being net importers. Spain, for example, which lost its access to fishing zones outside its Exclusive Economic Zone, has gone from being a net exporter in the 1970's to being a net importer at the present time. The case of Japan is similar, although this trend was already beginning in the mid-1970's.

76. In 1984 the volume of international trade in fishery products was 11,9 million tons and the value of imports reached $US 17,381 million. Developing countries accounted for 12 per cent of these imports and the United States, Japan and Western Europe for 81 per cent. The USA and Western Europe have been the main importers in recent years, but Japan has emerged only recently as the major fish importer.

77. The share of developing countries in international trade of fishery products has changed remarkably in the last 25 years. Whereas in 1961 developing countries contributed 35,5 per cent of the volume but participated only with 20 per cent in the value of exports, in 1984 they provided 37,7 per cent of the volume and 44,6 per cent of the value. This change reflects the diversification of exports from developing countries away from low priced species (like anchoveta) towards "expensive" fish. Presently around 84 per cent of shrimp exports, two thirds of frozen tuna, one third of canned fish and almost half of the canned crustaceans originate in developing countries.

Table 6

Exports of fish and fishery products

	1961	1965	1970	1975	1980	1984
Volume (in 1,000 MT)						
Total	4,471	6,265	7,433	7,677	10,143	11,923
Developed	2,884	4,047	4,513	5,127	6,318	7,423
Developing	1,587	2,218	2,920	2,550	3,825	4,500
Value (in million $US)						
Total	1,283	1,938	2,945	6,361	15,233	15,955
Developed	1,028	1,471	2,004	4,126	9,198	8,836
Developing	255	467	941	2,235	6,035	7,119

Source: FAO.

78. In spite of the emergence of a number of new exporting countries in the developing world, exports of fish products remain restricted to a few countries. Five of them /Chile, the Republic of Korea, Mexico, Taiwan (China), Thailand/ accounted in 1984 for 41 per cent and the 19 major exporters represent 80 per cent of exports from developing countries.

79. Market penetration by developing countries is limited by three main types of constraints. Two of them, tariff and non-tariff barriers, are created by governments. The other constraint is commercial, relating to market characteristics, quality and distribution channels.

80. During the latest series of multilateral trade negotiations, the Tokyo Round, most-favoured-nation (MFN) tariffs on fishing products were reduced from 6.5 per cent on average to 4.1 per cent, a reduction of more than a third. The next table shows that MFN tariff rates, which were higher for

processed products than for unprocessed fish have also been reduced less. It should be noted that the average rate of tariff, which is weighted according to import values, tends to understate the degree of protection. Tariff rates escalate with the degree of processing in a higher proportion than shown in the table. MFN import duties on canned tuna and canned bonito, for example, are of 24 and 25 per cent respectively in the EEC. 16/

Table 7

Tariff averages of industrialized countries*

Products	Pre-Tokyo Round %	Post-Tokyo Round %	Reduction %
Fishery Products	6.5	4.1	37
Unprocessed	6.3	4.0	37
Processed	9.2	6.3	31

* Average of all tariff items (i.e. duty-free as well as dutiable items) weighted by total 1977 imports. Included are Austria, Canada, EEC, Finland, Japan, Norway and the United States.

81. Another significant problem to the market penetration are the preferential agreements. For example, under the Lomé Convention between the EEC and the ACP countries all fishery products are duty exempt if they originate in any of the ACP States. It is under such agreements that 39 per cent of EEC imports enter, while Japanese and North American imports under these arrangements attain only 12 and 2 per cent respectively.

82. The use of tariff quotas, which provide lower tariffs for a given quantity of imported fish, is widespread as it provides the importer with a flexible tool for responding to changes in domestic demand and supply. Thus, for example, the import of canned tuna in the United States is subject to a preferential tariff for a quota of 20 per cent of the previous year's domestic consumption and more than doubles for above quota imports.

83. Non-tariff barriers of a great variety have a negative impact on trade. They include, among others, licencing, foreign exchange constraints, prior deposits, surcharges, and standards. Standards include health regulations, sanitary or product specifications, packaging requirements, etc., and are widely used in the fish trade. They are thought to play a significant role in creating obstacles to trade. Insofar as they are applied differently to different suppliers and/or are difficult to adhere to they could also give rise to administrative problems and hence inhibit the free flow of goods.

84. It is difficult for developing countries to enter the market of developed countries with a new product or brand. This is due to the fact that consumer markets in these countries are dominated by a few, well-known brand products. The penetration of new markets requires at the same time a number of additional costs which act as disincentives for the exporter from a developing country who therefore prefers to enter the market in joint ventures.

85. One of the most important constraints to the import of fish products, specially those with high value added is quality assurance and service. Major brand companies will only import those products which meet their high quality requirements. To this should be added the fact that for certain processed products the producing company in developing countries has to obtain recognition from appropriate authorities to produce and export such products to a certain market.

86. There are a number of distribution channels for processed products to enter new markets. They include sales through importers and distributors under exporters' own label; selling to own-label buyers; and co-packing.

87. Co-packing agreements or joint ventures offer the advantage of producing under well-established brand names and marketing the products through a national distribution system, thus ensuring significant market share and large-volume sales. At the same time the developing country would be able to take advantage of advanced technologies and management practices.

Notes

1/ Report of the Regional Meeting for Latin America and the Caribbean in preparation of the First Consultation on the Fisheries Industry, Lima (Peru) 27-30 May 1986, UNIDO/PC.148: Report of the Regional Meeting for Africa in preparation of the First Consultation on the Fisheries Industry, Dakar (Senegal) 16-19 September 1986, IPCT.3; Oscar do Porto, Informe Regional sobre la Industria Pesquera en Latinoamerica, 8 April 1986, UNIDO/PC.135; J. Weber and H. Durand, The Fisheries Sector in the countries of Africa, 15 October 1986, UNIDO/IPCT.2; INFOFISH, The Fisheries Industry in selected Asian countries, December 1986, UNIDO/IPCT...

2/ Agriculture towards 2000, FAO, Rome, 1981, p. 82.

3/ The United Nations Convention on the Law of the Sea was closed for signature on 9 December 1984, after being signed by 159 countries. The Convention will enter into force 12 months after the date of deposit of the sixtieth instrument of accession. At 19 November 1985, 25 of these instruments had been deposited with the Secretary-General.

4/ For a list of selected bilateral fishing agreements, the following FAO publication can be consulted: Fisheries Report No. 293. Expert Consultation on the Conditions of Access to the Fish Resources of the EEZ, Rome 1983.

5/ FAO, Agriculture towards 2000.

6/ World Bank, Fishery, Sector Policy Paper, Washington, 1982.

7/ David Thomson, "Conflict within the fishing industry", ICLARM, Newsletter, July 1980.

8/ FAO, Report of the FAO World Conference on Fisheries Management and Development, Rome, 1984, p. 22.

9/ FAO, Agriculture towards 2000, 1981.

10/ FAO, Report of the World Conference on Fisheries Management and Development, Rome, 1984, p. 36.

11/ FAO, op.cit., p. 17.

12/ FAO, Fishery Statistics, 1985.

13/ Final report of the Expert Group Meeting on Small-Scale Shipbuilding and Shiprepair Development for Latin American and Caribbean Countries, Havana, 9-12 November 1982, ID/WG.375/43, UNIDO, Vienna.

14/ World Bank, op. cit.: and FAO, op. cit.

15/ Fish handling and processing in tropical Africa. INFOFISH. No. 5/85, p. 33.

16/ Taken from Carl-Christian Schmidt. Trade in Fish: Problems arising from the New Regime of the Sea. OECD Observer No. 137, November 1985.

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POSSIBLE ISSUES TO BE SUBMITTED TO THE FIRST CONSULTATION ON THE FISHERIES INDUSTRY

Corrigendum

Page 4, paragraph 8, penultimate line

For 15 countries read 117 countries

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