

FISHERIES DEVELOPMENT AND PLANNING IN THE INDO-PACIFIC REGION
- ITS OBJECTIVES AND CONSTRAINTS

by

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Summary

This paper analyses the results of a questionnaire circulated to IPFC/IOFC Member Countries concerning the objectives of, and constraints to, fisheries development. Answers from 20 of the 25 countries circulated indicate that the principal objectives of fisheries development policy are (a) to meet domestic food requirements and (b) to earn foreign exchange, and that the main constraint to meeting these objectives were identified as the lack of skilled manpower and the risk in investment in fisheries. The impact of fisheries development on the employment situation, believed by many respondents to be favourable, is discussed in detail, both from the point of view of its social effects in rural areas as well as its more general effect on the economy as a whole. The conflicting nature of certain objectives is also considered. The fishing industry in most countries is relatively small in comparison with other sectors, and development objectives in fisheries have therefore to conform to the wider objectives for the economy as a whole, although the constraints placed on fisheries by resource considerations and the activities of other fishing nations are noted.

1. INTRODUCTION

This paper attempts to identify the important problem areas inhibiting growth and development of fisheries in the Indo-Pacific region and to consider the methodology and effectiveness of fisheries development planning in relation to stated national objectives. It is based on an analysis of the answers to questionnaires sent out by FAO to 25 countries in the region, from which 20 replies were received.

Questions were asked first about the Government's main objectives in developing fisheries and respondents were asked to list these in order of priority, secondly about impediments to the attainment of the stated objectives and thirdly the influence of the fishing industry on the employment situation. In addition questions were asked about the planning of fisheries development at the national level and respondents were asked to identify research problems. A copy of the questionnaire is appended as Annex I. The questions were asked in very broad general, open-ended terms, allowing respondents scope for enlargement.

Replies were very varied, some expansive, others perfunctory, and this is partly explained by the substantial disparities in the resource endowment of countries as well as by differences in the degree of involvement of the state in fisheries programmes. Some countries have a developed, centralized planning organization, notably India, Pakistan, Tanzania and Ceylon, but about half the remaining countries are less involved in economic planning and work toward a national fisheries development objective based on limited statistical data, whilst the rest, particularly some of the smaller and less developed states, have minimum state participation and planning in economic development. Under such varied conditions one would expect government involvement in the fishing industry to be very different between countries, and this basically explains the great disparities in the response to this questionnaire. It is mainly in this framework that answers should be evaluated.

2. REPLIES TO THE QUESTIONNAIRE

The answers to questions 1 and 2 were given most fully. Question 1 requested the main objectives of Government in developing fisheries, giving order of priority.

2.1 Question 1

The answers to question 1 are analysed below:

<u>Stated Objectives</u>	<u>No. of Countries Stating This</u>
To produce enough fish for domestic requirements	13
To develop exports	13
To improve the socio-economic conditions of fishermen	6
To promote general all-round expansion of fisheries	5
To develop fish farming, aquaculture and brackish water fisheries	5
To introduce modern equipment and develop distant water fisheries	4
To create employment (not necessarily of fishermen)	3
To develop cooperatives or fishermen's associations	3
To prepare development projects	2
To evaluate fish potential	2

Individual countries also stated the following - to train fishermen, to provide supporting services (marketing and infrastructure), to promote international cooperation, to conserve stocks and to increase the rate of discovery of new species.

The most frequent first priority was to produce enough fish for domestic requirements which was stated by 13 countries, and the second most frequent priority was the general all-round development of fisheries - stated by five countries. Nine countries gave "to develop exports" as either a first or second priority, and ten countries gave both "to develop exports" and to "to produce enough for domestic requirements" as objectives.

2.2 Question 2

This asked specifically about certain impediments to the attainment of objectives given in question 1. The answers given to question 2 were more expansive than indicated in the question itself and it was evident that many countries were far more aware of the constraints and impediments to fisheries growth than they were, for example, of the need for planning. This view is confirmed by the answers to question 4, which inquired about planning methods but which was answered less specifically. This, however, does not necessarily indicate that countries are not conscious of the need to plan fisheries development, but more likely that the necessary manpower, statistics and resource information are not available on which to plan development more accurately. The answers to question 2 are analysed below:

<u>Constraints and Impediments to Fisheries Development</u>	<u>No. of Countries Stating This</u>
Insufficient well-trained manpower, especially for developing modern fleets and deep sea fisheries	17
Lack of entrepreneurs or efficient management	10
Resources not known or not available for existing fleet	10
Not attractive to capital resources as there are other more profitable outlets for investment	9
Inadequate marketing and transport facilities	6
Lack of proper harbour facilities	4
Better gear needed	4
Demand deficient	3
Shortage of processing and storage facilities	2

Individual countries gave the following additional reasons - lack of diversity in fishing effort, inland waters not fully utilized, lack of fisheries biologists, lack of extension service, lack of foreign exchange (to purchase foreign inputs) and lack of adequate bank credit.

Many countries are aware of labour constraints to fisheries development, 17 stating lack of skilled manpower was a constraint. Some, notably those countries with a predominant artisanal sector, specifically stated that much more time needed to be spent on extension work and in training extension workers. Ten countries stated that there was lack of entrepreneurial or management ability which operated as a constraint on fisheries development, though of these, four also said that investment in fisheries was not very attractive as there were more profitable investment opportunities in other sectors of the economy for capital resources. If one accepts that the risk of capital is linked with entrepreneurship, then a total of 16 countries stated that a serious constraint to further development was either that investment in fisheries was too risky or, what amounts to the same thing, not enough people were willing to risk their capital in it.

2.3 Question 3

Answers to the question "In what way do you see the fishing industry influencing the employment situation?" were generally brief and are summarized below.

<u>Stated Influence on Employment</u>	<u>No. of Countries Stating This</u>
1. A favourable influence	10
e.g. specifically stated were the following:	
(a) increased diversity in employment such as boatbuilding, marketing, processing, distribution	5
(b) to discourage movement to urban areas	1

Stated Influence on Employment

No. of Countries
Stating This

2. An important influence, details not given	2
3. Minor influence	3
4. No influence or no answer given	6

Though ten countries indicated that fisheries development would favourably influence employment, a few countries recognized that its effects would depend on new resources of fish becoming available for exploitation, and two stated there would be a significant impact on employment only if distant water operations were developed.

In discussing the general employment effect of fisheries development some of the answers to questions 1 and 2 should also be considered. Three countries specifically gave as one of their Government's main objectives in pursuing fisheries development the creation of employment opportunities, though in no country was this objective given first priority. Six countries gave as an objective the improvement of socio-economic conditions for their fisheries but in all these countries artisanal fisheries predominate.

2.4 Question 4

This asked "Does your country plan fisheries development? Describe the method used in setting target catches. What sectors are taken into account in setting targets? How far ahead do you plan?" Many answers were very general and, in some cases, it is difficult to differentiate between the degree of planning which was currently being pursued and that which it was intended to introduce at some future date. Seven countries stated that they made some sort of plans, eight that they did not plan and the remainder either made, or intended to make, varying degrees of plans, some admitting that they were not effective, others that plans covered only a section of the industry or that they followed indicative planning or simple coordinated fisheries management.

There were many different concepts of planning, varying from the colonial type of short range list planning in which Government departments compete for treasury funds following some partially specified concept of future development, to more definite target plans in which the fisheries department attempted to set itself targets for growth. There were very few illustrations of comprehensive planning. Insofar as most targets were based on inadequate knowledge of the potential of fish resources, it is difficult to know on what these targets were based except by some extrapolation of growth which had taken place over the recent past. In all countries the strategy appeared to be to decide first upon a suitable target and then to consider means of achieving the target by, for example, establishing ports, processing plants and developing a larger fleet, etc.

Other countries, in the minority, appeared to start building their plans by looking at potential resources, past growth rates and the constraints which might arise in expanding fishing activities, and to base targets more realistically on a set of assumptions which included growth of disposable income, elasticities of demand and population increase. Only one country related production targets not only to the availability of resources, but also to training capacity, and the level of technology and technical expertise available and the availability of financial resources. In no instance was there evidence that fisheries plans had been coordinated with Government plans for infrastructure investment.

2.5 Question 5

This asked "Do you undertake fisheries research? Why? And what are the important research problems as you see them?" The first part of this question was not fully comprehended by all respondents and consequently it is difficult to make a simple classification of the replies. However, from 16 replies it is apparent that the major research problem was the concern for biological work on resources - four countries specifically mentioned aquaculture research. A few countries mentioned the difficulties for getting research staff.

Apart from biological research, however, only six mentioned the need for research into processing, preservation or handling and only one country mentioned the need for feasibility studies.

In comment it could be mentioned that there are probably compelling reasons for coordinated biological research in the region. First are the economies of scale which arise from coordinated scientific research, owing partly to the high capital cost of marine research and partly to the shortage of scientists (one country mentioned this). Secondly, without coordination, research could well be duplicated. This indeed, judging from the replies to questionnaires, seems likely as a number of countries expressed interest in doing similar research, e.g., into aquaculture, new techniques for cultivating crustaceans, deep sea resources, etc. A regional research project operates at a much lower cost than a series of independent projects, some of which may be competing for international technical research skills and funding. However, biological research is a lengthy process and the urgent need to conserve and manage stocks in the region could well arise long before research results became available. It seems expedient, therefore, that countries in the region, at least those that are exploiting the same resource, should agree on arrangements for cooperation and coordination of development plans before this time.

3. ECONOMIC CHARACTERISTICS OF COUNTRIES IN THE REGION

A simple analysis of replies would be of little use in evaluating objectives and constraints to fishery development without taking into account the very varied size and relative importance of the fishing industry in each country. Between countries fisheries are extremely diverse, not only in respect of size of fleet, quantity landed, methods of fishing, numbers employed, economic status of the fishing communities, etc., but also because individual countries are at different levels of economic development and demonstrate considerable variations in per caput income and wealth. To examine answers to questionnaires without taking such differences into account so as to give appropriate weight to replies might result in meaningless generalizations. It is thus important to look a little deeper into replies and consider them in relation to the factors mentioned in the previous paragraphs.

In an attempt to find common ground on which to assess the importance of fisheries planning in individual countries in the region, and on which to identify some association with fisheries growth, a study was made of the published statistics relating to production, consumption, utilization of fish and the organization of fisheries in each country. Data were taken from FAO Fishery Country Profiles, most of which refer to 1970, and from the Yearbook of Fishery Statistics, 1972. This material is given in Table I. The data does not cover all countries in the region but is based on information available at the time of writing. Countries have been grouped geographically, but even within geographical areas there are very considerable differences between the characteristics of the fishing industry of neighbouring countries.

4. DISCUSSION OF OBJECTIVES

The main objectives stated by countries need to be considered in relation to the resources which are available for achieving these objectives, the constraints and impediments to growth and the availability of both the export and domestic markets to absorb increased supplies. The main objectives are discussed below.

4.1 To Increase Domestic Consumption

Thirteen countries stated that one of the objectives of their government's policies in the development of fisheries was "to produce enough for domestic requirements". Of these, ten countries (i.e., nearly half the respondents) gave this first priority.

Table 1 The Fisheries of the Indo-Pacific

Country	Production				Fish Imports				Fish Exports				Total Supply		Per Caput Supply kg/year	Gross Value U.S.\$ million	Estimated Employment	Structure of Industry Mainly Artisanal	Source of Fish from land		Utilization % Domestic port	GDP at Market Prices U.S.\$ million	PCE Per Caput U.S.\$
	For Food	For Non-Food	For use in Food	For use in Non-Food	For Food	For Non-Food	For Food	For Non-Food	For Food	For Non-Food	In-land	Marine											
	'000 tons	'000 tons	'000 tons	'000 tons	'000 tons	'000 tons	'000 tons	'000 tons	'000 tons	'000 tons	%	%											
Algeria	8.5	5.0	0.6	-	6.8	5.0	2.3	-	0.1	0.6	3,700	X	4	96	15	85	1,794	33					
Algeria	33.6	-	2.2	7.0	1.6	-	34.2	7.0	3.2	4.0	25,000	X	66	34	95	5	1,618	89					
Algeria	193.7	-	5.1	-	25.4	-	173.4	-	13.1	15.7	40,000	X	85	15	87	13	1,200	55					
Algeria	45.1	-	0.8	1.5	4.6	-	41.5	1.5	6.1	7.7	6,000	some	75	25	90	10	899	81					
Algeria	4.0	-	3.0	0.5	0.4	-	6.6	0.5	8.0	...	3,600	X	100	100	90	10	188	164					
Algeria	18.0	-	2.7	-	7.2	-	13.5	-	18.4	5.0	6,000	40%	89	100	60	40	3,035	1,503					
Algeria	19.0	-	0.2	-	2.1	-	17.1	-	1.8	...	4,200	X	10	11	90	10	3,139	183					
Algeria	102.8	66.5	0.0	-	54.2	66.5	48.6	-	0.8	40.0	164,000	50%	10	90	33	67	11,829	129					
Algeria	141.2	-	113.2	-	0.4	-	254.0	-	20.3	40.0	65,000	80%	5	95	100	5	1,774	129					
Algeria	1,617.3	128.6	-	-	70.2	-	1,547.1	128.6	2.8	341.3	400,000	X	40	60	95	5	48,574	75					
Algeria	317.3	54.8	68.2	85.5	119.1	4.5	266.4	135.8	25.2	93.0	80,000	X	1	99	67	33	3,209	214					
Algeria	1,233.0	16.0	3.3	-	10.0	-	1,220.3	16.0	10.2	...	883,000	small	33	77	99	1	9,824	107					
Algeria	989.8	-	125.5	62.0	2.0	-	1,113.3	62.0	30.7	434.0	688,000	some	10	90	100	100	13,903	160					
Algeria	120.2	3.3	82.7	14.5	13.3	2.0	189.6	15.8	48.1	51.0	45,000	some	2	98	90	10	...	573					
Algeria	432.4	-	5.4	-	0.0	-	437.8	-	15.9	87.5	142,000	X	30	70	100	5	2,040	61					
Algeria	917.7	677.4	15.2	-	41.0	-	891.9	677.4	24.9	286.2	75,000	some	10	90	95	5	5,695	116					
Algeria	170.0	...	-	-	7.5	-	162.5	-	24.4	44.0	40,000	X	75	25	96	4	737	109					
Algeria	317.0	...	4.3	57.0	96.5	-	725.1	-	22.4	211.0	367,000	60%	2	98	87	13	8,237	173					
Algeria	6,844.1	1,943.2	254.8	450.7	805.7	116.6	6,293.2	2,277.3	60.7	2,713.3	570,000	most	100	100	90	10	198,948	1,032					
Algeria	101.6	1.0	62.3	133.0	24.8	-	139.1	134.0	11.2	70.0	18,000	most	1	99	76	24	36,463	1,600					
Algeria	63.4	0.3	7.2	-	22.8	-	47.8	0.3	16.7	23.5	4,400	most	2	98	65	35	6,605	1,424					

FAO Fishery Country Profiles - data relates mainly to 1970

Six of these were substantial importers of fish, each importing more than 60 000 tons per annum, though the importance of these imports to total fish supply varies substantially. Thus, for example, Japan, the biggest importer in the region, imported in live weight equivalent 254 000 tons, equal to only 4 percent of the total supplies for human consumption compared with Australia which imported only 62 000 tons, but which equalled nearly one half of its total fish supply for human consumption. However, many of the countries for which data are given in Table I are not significant importers of fish, ten countries importing less than around 5 000 tons per annum in 1970. Although this might be taken to indicate that in these countries domestic supplies were meeting the market requirements, it need not necessarily be the case since it is likely that, especially in the less developed countries, imports may be restricted by import controls or tariffs.

The objective of increased consumption should be considered together with the answers to question 2.2 - "Is demand deficient; is it difficult to dispose of increased catches?". Many countries found this a difficult question to answer and many answers were rather vague. Only three countries positively stated that there was a deficiency of demand. All these were predominantly meat producing, consuming and exporting countries.

It can, nevertheless, be assumed that demand conditions in the region as a whole are such that there is a great latent potential for absorbing an increased supply of fish, but in many countries certain preconditions for a growth in effective demand must first be satisfied. The most important of these is the provision of an adequate infrastructure and improved marketing systems and nine countries gave the lack of these as a constraint to achieving the objective of increased fish consumption. Three countries specifically stated that a constraint to achieving a higher level of consumption was lack of internal transport, four stated that lack of marketing facilities was a constraint and two that lack of processing and storage facilities to handle increased landings would be a constraint. Thus, altogether eleven countries considered that either demand was deficient or that the expansion of consumption was constrained by economic conditions which had nothing to do with the actual operation of fish production but was dependent upon other factors.

Even one of the most economically advanced countries in the region, indicating some future demand deficiency, stated "It is not known with certainty how much this lower demand owes to traditional dietary patterns or to distribution and marketing factors". In addition some countries specifically stated that the market was saturated for certain species, others that demand needed to be stimulated for unpopular species which were in plentiful supply, thus indicating the need for suitable processing and packaging to make the product more acceptable to the consumer.

In considering the national importance of fish in the diet, average per caput consumption is in some respects a misleading statistic, since it may conceal what in some countries may be very divergent dietary habits. In India, for example, which in 1970 had a level of consumption averaging 2.8 kg per caput/year, a large proportion of the population is not fish-eating but is vegetarian, and the low average for the country conceals the great importance of fish as a source of protein for people living in coastal areas.

Furthermore, the per caput supply data given in Table I excludes fish not immediately used for human consumption, i.e., it excludes fish used for fish meal or for fish oil production. In certain countries, e.g., Malaysia and Thailand, a large proportion of fish meal is used for the production of poultry which is also important as a source of animal protein. Table I shows that in Malaysia 135 000 tons of fish, equal to one third of total fish supply per annum (domestic product plus net imports) are used for non-human purposes, although much of it is used indirectly for human consumption via fish meal. The importance of fish meal as the original constituent of other animal protein must be taken into account in evaluating fish as a component either directly or indirectly in the human diet. Taking a suitable conversion rate into account, the indirect use of fish through fish meal could greatly enhance the stated per caput consumption of fish in Malaysia, Pakistan, India, Thailand, Japan and Australia, and the demand elasticities for fish meal products should be taken into account in considering demand potential.

The general conclusion is that in the region as a whole there is no deficiency of demand but it is not possible on the evidence available to relate potential demand to any measure or identifiable characteristic of the countries responding. Demand for fish is principally culturally determined and the growth of demand depends not only on supplies being available but on the state of the infrastructure, on transport and marketing facilities and where fish marketing is tightly controlled by fish traders/financiers on their attitude toward any change in supply.

4.3 To Increase Export Earnings

This objective was stated by no less than 13 countries, of which nine regarded it as either the main or second policy consideration. Although within the fisheries sector the earning of foreign exchange may be an important consideration, it is also important to see foreign exchange earnings from fisheries in the context of the economy as a whole. It is necessary to realize that although a country may play an important part in total world fisheries trade, fisheries in the context of the national economy may be of relatively minor significance. For example for Japan, which is the largest fish exporter in the world, the value of exports represents less than 0.2 percent of its GNP. An indication of the relative importance of fish in foreign exchange earning in the countries of the Indo-Pacific region can be gauged from Table II.

However, while for a few countries fish may be important as an earner of foreign exchange, to other countries local fish production may represent a saving of foreign exchange through its contribution to the economy as an import substitute industry. Thirteen countries, for instance, stated that one of their objectives was to achieve self-sufficiency in fish, in order to reduce dependence on fish imports. Eleven of these also cited that they wanted to increase fish exports. These are not conflicting aims, since the type of fishing and the fish landed are usually quite different in the export and domestic sectors. Nearly all countries in the region carry on import and export trade in fish simultaneously, exporting high value fish which is not consumed domestically and which is fished usually by a highly commercialized operation - notably shrimp, lobster and other crustaceans, and also tuna - at the same time importing fish which is of lower quality and price.

In this context and in view of the increasing competition in the Indo-Pacific for tuna, new entrants to this type of fishery, which rate foreign exchange considerations highly, might consider whether from a national point of view it would be better to invest in fish which produce the lower quality of fish for the domestic market. By its import substitute effects this strategy could lead to a foreign exchange saving^{1/}. A further saving may be effected because the cost of equipping a fleet for the more highly capital intensive fishery of tuna and tuna-like species may involve greater foreign exchange inputs than a more modest fishing fleet which catch lower valued fish for the domestic market.

^{1/} A further consideration is the possible employment factor which, as the next section indicates, is an important consideration in many countries. It has usually been considered that a strategy of promoting import substitute industries in less developed countries has tended to substitute capital for labour whilst export oriented growth has tended to be biased toward labour. Clement (1971) has expanded on this argument in relation to the Indian Ocean countries. However, in fisheries development the contrary may well be the case. It is fishery development which is export-oriented which tends to be the most capital intensive and to substitute capital for labour, and the inshore fishery which supplies the domestic market in what may be seen to be an import-substitute industry, to be more labour intensive.

Table II

Gross Domestic Product, Values of Landings and Trade in Fisheries Products
as Proportion of GDP and Net Foreign Exchange Earnings as Proportion of GDP (1968)

	1	2	3	4	5
	GDP in U.S.\$ million	Value of Landings As % of GDP	Fish Imports As % of GDP	Fish Exports As % of GDP	Net Foreign Exchange Earnings As % of GDP Col.4 less Col.3
Ethiopia	1 395	0.04	0.02	0.03	0.01
Kenya	1 206	0.28	0.03	0.02	
Malagasy Rep.	691	1.08	0.08	0.17	0.09
Mauritius	174	0.16	0.62	0.01	
Mozambique	462	0.25	0.63	0.06	
Réunion	193	1.40	0.99	0.14	
Somalia	152	0.61	0.06	0.16	0.10
Tanzania	822	1.67	0.09	0.10	0.01
Iran	8 053	0.06	0.01	0.07	0.06
Bahrain	2 403	0.16	0.00	0.03	0.03
Sri Lanka	1 676	3.83	0.70	0.02	
India	40 653	0.45	0.00	0.07	0.07
Pakistan	14 203	1.21	0.00	0.11	0.11
Indonesia	10 509	2.26	0.00	0.01	0.01
Malaysia	2 721	2.84	0.64	0.77	0.13
Thailand	5 051	3.84	0.06	0.30	0.24
Australia	27 233	0.22	0.13	0.14	0.01
Khmer Rep.	800	4.79	0.00	0.02	0.02
Philippines	10 127	3.64	0.20	0.01	
Korea Rep.	5 262	3.26	0.01	0.49	0.48
Japan	132 058	1.56	0.13	0.22	0.09
New Zealand	4 582	0.33	0.04	0.27	0.23

a/ Column 4 less Column 3 as percentage of Column 1.

Source: FAO Yearbook of Fishery Statistics 1969; Tussing 1971.

Countries can, however, earn foreign exchange from their fish resources without becoming involved in organizing and financing a large fishing industry which invariably necessitates a great deal of capital investment in terms of harbours, ports, infrastructure, markets, etc. and outlays on vessels, gear and equipment, some of which may be of foreign origin. For example, a coastal state with a relatively unexploited fish resource within its own coastal waters can make concessionary agreements with foreign vessel owners to allow them to fish in its waters on payment of a licence fee, royalty or tax and this could yield the coastal state a high proportion of the economic rent accruing to its fish resource.

There is a whole range of alternative joint enterprises which could be operated involving, for example, the joint operation and financing of processing plants, training schemes and management and operation of vessels to allow specialization between countries and to avoid duplicating investment, especially investment which involves using foreign exchange. An extension of fishing limits enables a variety of international trade-offs to be used in the more rational use and exploitation of fisheries, to the benefit of all participating nations.

The use of fish resources as a net earner of foreign exchange should be viewed in the context of the costs involved to the economy as a whole. To consider only narrowly the objective of fisheries development as being to increase exports is to take a highly sectorial interest in economic development which may, in fact, in retrospect prove not to have been the best interests of the economy.

4.3 To Increase Employment

The numbers employed in the fishing industry are an indication of its importance. Table I shows the numbers directly employed in fishing in each country and this too varies considerably between, at one extreme, 3 600 in Mauritius to nearly 700 000 in the Philippines. Data on employment in the catching of fish alone, however, give little indication of the real importance of the fishing industry to the overall employment situation since in addition to direct employment in fisheries allowance must be made for those involved in ancillary employments which are dependent upon fisheries, e.g., fish processing and manufacturing, fish trading (wholesaling and retailing), boatbuilding, repair docks, etc.

Even then the resulting figures may still not represent the true value of fisheries as a source of employment, since in many countries a high proportion of fisheries are undertaken by artisanal fishermen, some of whom may be part-time fishermen, undertaking fishing and farming continually throughout the year, or employed only seasonally in fisheries. Occasional employment in fisheries is particularly a feature of fishing in riverine water where activity varies with the seasonal flow of water, although it is also common in marine fisheries, particularly those based on migratory species.

The effect of fisheries on employment can in fact be considered from two points of view firstly, the socio-economic effects of maintaining a stable artisanal sector in the rural areas, and secondly the effects on the growth of employment in the economy as a whole.

(i) Artisanal fisheries

Though artisanal fisheries may provide only a low level of income, they may perform very useful functions in the economy as a means of stabilizing rural populations as a countermeasure to rural-urban drift and the adverse socio-political effects which often follow. One African country specifically stated this function as a favourable aspect of fisheries development. One must expect, however, the stabilizing effect to take place largely in the artisanal sector of the industry. Large-scale commercialized fishing, which is normally centred in urbanized ports, may well tend to attract more people from the rural areas and any adverse sociological effect arising indirectly from increased fishing activity is probably more likely to occur in urban ports, notably round the docks associated with servicing and processing employments where a pool of underemployed casual labour is likely to congregate in the hopes of obtaining some unskilled work.

It is, nevertheless, to be expected that with economic growth the employment situation will change and labour resources perhaps become more fully utilized, both in rural and urban areas, so that the need to take active measures to retain people in the rural areas may not continue indefinitely. In cost-benefit terms the economic planner has to balance the costs of preventing social and political disruption, caused by urban unemployment in the large towns and cities, against the cost of inducing people to remain in the rural areas. Obviously these costs will change over time. In making decisions about employment objectives in fisheries, the planner needs to consider fishing occupations within a national framework of labour demand and social welfare costs. A fisheries policy designed to stabilize artisanal fisheries as a means of retaining people in the rural areas, may in fact add to the level of underemployment and there is, of course, a real cost to the economy in keeping large numbers of people underemployed. But this, at a certain stage of economic development, may be better than having large numbers of underemployed footloose in the urban centres.

(ii) Growth of employment in the economy as a whole

The effect which fisheries growth will have in increasing employment in the country can be considered twofold. Firstly is the effect it has on fishing occupations and secondly its effect in creating employment in ancillary and related occupations, known in economic terms as its multiplier effect.

The most direct effect, that on employment in the fishing industry itself, depends on whether it is government policy to stabilize the artisanal sector or to expand the modern commercial sector. Some of the economic costs of making a choice between these two are considered later. However, it could be argued that in many countries the artisanal sector, because of the seasonal nature of much of the employment as well as the constraints of its traditional social structure, already contains much underemployment and to attempt to increase employment without effectively introducing a new technology is simply to increase the level of underemployment. On the other hand, if technology is improved and a modern commercial sector emerges, sooner or later the number of fishermen will decrease, due both to the finite nature of the resource as well as to the economies of scale in modern fishing operations. Thus, for most of the less developed countries the objective of increasing employment in fisheries can be considered merely as a transitional policy.

If the increase in fish production is to have an effect in stimulating ancillary industries, e.g., boatbuilding, processing and also occupations involved in marketing and fish transport, then many of these occupations will sooner or later develop their own economies of scale. In the less developed economies, fish marketing is usually a highly labour intensive occupation, the distribution chain is long, consumers highly dispersed and difficult to reach and typically they require fish in very small quantities. With an increase in the scale of fish landings, however, marketing becomes more capital intensive and fewer people are employed.

In other ancillary employments, e.g., in boatbuilding and processing, the direct advantages to the country of these industries will be small if the country has to import most of the capital equipment to establish them and the skill to manage them, i.e., the multiplier effect will be exported instead of helping the country. Of course, the most favourable multiplier effect arises when a country already has skills and some degree of industrialization from which its own fishing ancillary industries can be supplied, so that the backward and forward linkage effects are internal to the country.

However, in considering the growth of a commercialized sector in fisheries, it must be noted that 17 countries stated that this was constrained by the lack of skilled manpower. The serious intent with which governments will tackle the problem of training both in fishing skills and in extension work, obviously depends on the degree of importance that it gives to fisheries as a source of employment, foreign exchange, income, and socio-economic stability in the country. However, opinions on the value of training schemes are varied. One of the most successful such schemes for both deep sea and inshore fisheries is in Korea, where fishery training centres have played a very significant role in the development of its fishing industry. In 1961 there were fewer than 100 deep sea fishermen in Korea, but as a result of successful training, numbers increased to more than 9 000 by 1971 (Koh, Yoon Ho, 1973) and in terms of the value of exports Korea has become the third largest fish exporting country in the world.

However, in contrast to the Korean experience, the Thai trawl fishery has developed to a level where catches now exceed the point of maximum sustainable yield and this has been achieved without any sophisticated training programme. Tiens (1973) has warned that ".... at least some of the training programmes to which so much attention is being paid in many developing countries may be unnecessary. In many cases costly training courses produce experts in excess of any real need". Fisheries training schemes are frequently expensive to equip and staff and in many countries the immediate need is usually for an initial period of training for a large number of recruits, but the need declines over the years to a small continuing stream, leaving unused capacity in the training schools.

5. OBJECTIVES IN CONFLICT

Many of the objectives stated by individual countries were in conflict, demonstrating some extent a lack of appreciation of the economic issues at stake. For example, some of the objectives listed below contain a degree of incompatibility:

1. Increased employment
2. Maximized profitability in the industry
3. Increased quantity landed for domestic consumption
4. Increased value of fish for export
5. Increased value of fish landed in order to provide higher incomes for fishermen.

Nearly all countries listed more than one of the above amongst its objectives of fisheries policy and in many cases conflicting aims can be distinguished. For example, countries which aim to increase employment are generally those which have a predominant artisanal fishery. However, those countries which, as well as having this objective, also want to develop a modern commercialized fishery using large mechanized craft and possibly exploiting deep sea resources, will find that the latter fishery needs much less labour per unit of catch than the artisanal fishery and, if it subsequently replaces the artisanal sector, then aggregate employment in the fishing industry will fall.

A modernized industry with its attendant requirements for port and harbour facilities and its larger fish landings will generate employment in other sectors of the economy, for instance in boatbuilding and repairs, in processing and packaging, in ice plants, net manufacture, marketing and transport, and these in turn may have a further effect in multiplying employment in a wider range of occupations. Most of these, however, will be urban employment and the government will want to compare such developments with the alternative of increased rural employment which would follow a policy of encouraging artisanal fisheries. It must also recognize the social consequences of such alternative policies.

If, however, the government's aim is to have a modern and artisanal fishery coexist then it must be realized that there is a considerable cost difference between an efficient modern fishery and a traditional artisanal fishery. If both are landing fish simultaneously for the domestic market, the cost of landed fish will be lower from the modern vessels than from the artisanal craft. If market prices are uncontrolled, then fish prices will either fall to near that of the costs of the modern sector (depending on the degree of competition between vessel owners) which will cause the artisanal fishermen to have even lower earnings than previously, or if fish prices are at a higher level, corresponding to the higher costs of the artisanal sector, then those in the modern sector will make excessive profits.

The adverse effects of either of the situations mentioned above could be reduced by, in the case of the former, giving some government subsidy to the artisanal sector, or in the case of the latter, taxing the excess profits of the modern sector. Neither of these, however, can be done easily, largely because of administrative difficulties and costs and the repercussions which either policy might have on other sectors of the economy. Of course, it is possible to maintain a modern and artisanal sector simultaneously provided that either they sell in different markets, for example if the modern sector sells in an export market while the artisanal sector sells in the domestic market, or if they land fish at different seasons of the year, so that their operations are complementary and not competitive.

If the government finds it has to take special measures to support the artisanal sector because it wants to retain employment in the rural areas then it must realize the real cost of this policy. Certain obvious and measurable costs will be involved. For example, if support takes the form of providing subsidies through the primary inputs, e.g., outboard engines, engine oil, or cheap ice, etc., these can be easily costed. The costs of improved marketing facilities will be more difficult to estimate. However, there is an additional real cost which is often overlooked because it is difficult to evaluate, which is the cost to the economy of making it less attractive for private enterprise to invest in modern fisheries or in economic terms, the cost of the opportunity foregone. This is one type of cost which

Other conflicting objectives arise where the aim of government policy is to increase the nutritional value of fisheries as a means of improving the diet and, at the same time, increase the incomes of fishermen. For example where large quantities of nutritional fish of low commercial value exist, e.g. the trash fish of tropical trawl fisheries, a government intending to promote fish as a means of improving dietary standards must consider the real costs of this policy. To make fish presentable to consumers may involve a new method of processing and fishermen may need to be induced to land such fish if it is not otherwise very profitable to them. The costs involved should be compared to the economic benefits of raising protein levels in the diet by increased fish consumption and to the costs of doing this by other means.

One example of policy conflict was reported by Gerhardsen (1969) in reference to fisheries development in the Fourth Development Plan of India, 1969-74. One of the aims of the fourth five-year plan was to increase the supply of animal protein to the lower income groups in the form of low-priced varieties of fish. However, both processing and fish trade were in the private sector and found it more profitable to handle prime species which militated against the supply of low-priced species. Private traders thus resisted Government attempts to introduce new species to the market.

Finally, one other source of conflict should be mentioned. In the questionnaires a frequently stated objective is to "maximize profitability in fisheries". This involves maximizing the difference between costs involved (labour, fixed and working capital, etc.) and the value of fish landed. This, however, does not necessarily mean landing the largest quantity of fish possible. In fact, the point of maximum profitability usually occurs at some quantity well below maximum catch. A conflict between objectives may thus arise where the government wishes both to operate at maximum efficiency and to obtain the highest level of receipts from sales. Such a policy may arise from the government's need to use fisheries as a means of increasing its export earnings. It is quite likely that at the point of maximum export earnings, the industry may be making a loss. If the Government, nevertheless, wishes to pursue a policy by which it obtains maximum export receipts, then it must be prepared to subsidize the industry to cover its losses.

The real costs of such conflicting aims may be more easily identified when the industry is entirely organized by private enterprise since, generally, the private sector (within the limits of its knowledge) produces only if its operations are profitable. However, when an industry is largely or even partially operated under state ownership, or even under cooperative organization if that is subsidized, or with any form of state assistance, it is much more difficult to identify the real costs of what may be basically political or social decisions since the effect of state interference with the market mechanism is to distort the free market use and pricing of resources.

A fisheries department involved in planning future development could make a far more plausible and convincing case to its government for funds if it could present a well argued policy based on proper assessment of real costs and benefits. Though some countries in the region will not have a sufficient statistical base nor especially detailed costings of fisheries operations to be able to provide data for adequate cost-benefit studies, an exchange of information and research experience between countries would provide the basis for much better policy decisions.

6. CONCLUSIONS

Because countries in the region are at such different levels of economic development, and because fisheries plays such a different role in each economy, it is not surprising that there are many differing views on fisheries development and planning. Each country has different resource endowments at different market values. Furthermore, without more detailed information of the economics of individual countries the information given in Table I is of limited use in making comparisons between countries of the relative importance of the fish industry to each country. Data on fisheries need to be related to data on other sectors of

the economy, in order to provide a realistic basis for planning fisheries development. Ultimately it is the importance which each individual country places on its own fishing industry in comparison with other industries and other investment opportunities which determines how seriously its government will consider fisheries development and planning.

With the realistic appreciation of the fact that to some, and probably many countries in the region, fisheries play a very minor role in the respective economies, it should be reasonable to expect that not all countries will take an equally serious view of the need to plan its fisheries development. Not only are many countries short of the managerial and skilled government manpower to undertake a high level of planning, but in many countries where fisheries play a minor role in the economy, the fisheries department is likely to be a small, underequipped department - the Cinderella of government administration, receiving only a small budget and probably also suffering continual changes in non-technical staff as well as being ignored by politicians and the civil service in general, even when important decisions have to be made which may affect the fishing industry. (The author found many examples of this when in a recent study it was found that few fisheries departments had been consulted on matters relating to the (then) forthcoming Law of the Sea Conference. (Crutchfield and Lawson, 1974.)

Fisheries development, as shown already, is largely dependent upon what the development plans are in a broad spectrum of other sectors of the economy, for example on plans for infrastructure investment, for road and port construction, for improvements in marketing and landing facilities, in banking and credit policies, and without consultation with a wide number of government departments, including perhaps most important of all the controllers of foreign exchange and budgetary policy, integrated fisheries planning cannot be achieved. Furthermore, scope for independent planning is limited and fishing has to fit into the overall plan using labour, capital, entrepreneurial and management resources in accordance with national endowments and requirements.

It has been said that planning is of little use unless it is based on sound economic statistical data. If this were the case, then it would be many years before some of the countries in the region could expect to produce sound fisheries development plans. However, though it may be difficult to achieve effective planning, it is at least possible to attain some improvement in the level of coordination between the various organizations concerned with fisheries. Beever (1965) gave strong arguments for the planning and coordination of fisheries development programmes, which will not be repeated here. Indeed, it is likely that in many countries the coordination of plans for investment and operation is frustrated by lack of cooperation between different government departments (one country actually mentioned this) and lack of consultation with various sectors involved in fisheries, e.g., the private fish sector, private boatbuilders and importers of gear, engines, etc., the cooperative sector, the state fishing corporation and state marketing organization, where such exist. This lack of communication is very common and stems from a number of causes, some political, some historical and some purely personal between senior officers.

Ideally, one would expect the logical strategy of planning to proceed first by the development of a sound statistical and economic base, covering not only information relating to relevant sectors of the domestic economy, but also on data on fish resources and production for all types of fishing including inshore, inland and deep sea fisheries. Very many countries responding to the questionnaire showed they were well aware of the need to build up such scientific statistical information. From this basic data, cost-benefit studies of various alternative development strategies would be undertaken to indicate the most worthwhile investments from the point of view of the economy as a whole. Following this, a planning machinery or commission would establish the strategy to be followed, based on regular consultation with other government departments, and the relevant private sector interests and dependent on availability of funds, foreign exchange and technical skills, etc. To develop a planning machinery to this level, however, takes time and skill.

However, the pressure of increased international competition on diminishing fish resources is already demanding, at a regional level, a degree of planning effort which will transcend planning at a national level. It does not seem likely that, given the drive for conservation of stocks in the framework of increased international fishing effort, that there will be sufficient time to develop planning at a national level in the manner described above before international issues of conservation and management become urgent.

An over expansion of fisheries investment in the region would be very unfavourable for the fishing industries of individual countries. Without planning and managing the use of fish resources on a regional scale, it is probably inevitable that most fisheries will over-expand and be overcapitalized to the ultimate detriment of all involved.

IPFC SYMPOSIUM ON THE ECONOMIC AND SOCIAL ASPECTS OF
NATIONAL FISHERIES PLANNING AND DEVELOPMENT

Questionnaire on Fishery Development: Objectives and Constraints

1. What are the Government's main objectives in developing fisheries in your country? Since some policy objectives are conflicting, e.g., production for export versus domestic consumption, please discuss objectives in order of priority.
2. Specify to what extent you see the following factors as impeding the attainment of these objectives:
 - (i) Resource constraints (shortage of stocks having unharvested potential)
 - (ii) Is demand deficient; is it difficult to dispose of increased catches?
 - (iii) The relative unattractiveness of the fisheries sector to risk capital vis-à-vis other sectors of the economy
 - (iv) Lack of entrepreneurial ability
 - (v) Lack of skilled manpower
 - (vi) Other.

To the extent that the above factors are identified as constraints, some indication of what should be done to improve the situation would be helpful.

3. In what way do you see the fishing industry influencing the employment situation?
4. Does your country plan fisheries development? Please describe the method used in setting target catches. What factors are taken into account in setting targets? How far ahead do you plan?
5. Do you undertake fisheries research? Why? And what are the important research problems as you see them?

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