

PROBLEMS OF FISHERIES DEVELOPMENT IN CEYLON

by

P.A.J.B. Antoninus, O.M.I.

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THE CURRICULUM STUDIORUM

Christian Names: Joachim Benedict Antoninus

Family Name : Punnia Puvirajasinghe

Religious Name: Antoninus

Date of Birth : September 3, 1905

Place of Birth : Jaffna

Country : Ceylon

Place and Date of B.A.: University of Calcutta, India, 1949
B.A. Honours Economics, Second
Class.

Place and Date of M.A.: University of Ottawa, Canada, 1959.

Title of Thesis : Social and Economic Aspects of the
Fishing Industry in Ceylon.

Diplomas: 1. First Class Trained Teacher's Diploma,
Ceylon, 1937.

2. Diploma in Adult Education, St. Francis
Xavier University, Antigonish, N.S., Canada,
1959.

Service in the Priesthood: 28 years, from December 27, 1932.

As Teacher : 24 years, 1934-1958.

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INTRODUCTION

Recent decades have witnessed a growing public and professional interest in the development of fisheries. In the past fisheries in general, the world over, had suffered very great neglect both from economists and technologists as well as from governments of most countries.

Though fishing possesses all the main characteristics of a well defined industry, surprisingly enough, the economists had given scanty attention to this field.

The bulk of the research that has been done in the past on the primary production phase of the fishing industry had been confined mainly to the field of biology. Occasionally it was not uncommon for the biologists to extend the scope of their own thought into the economic sphere and in some cases they have penetrated quite deeply, despite the lack of analytical tools of economic theory.¹

Many others, who have paid no specific attention to the economic aspects of the problem have nevertheless recognized that "the ultimate question is not the ecology of

¹ Robert A. Nesbit, "Fishery Management", U.S. Fish and Wild Life Series, Special Scientific Reports, No. 18, Chicago, 1943. Harden F. Taylor, Survey of Marine Fisheries of North Carolina, Chapel Hill, 1951.

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life in the sea as such, but man's use of these resources for his own (economic) purposes".²

The Russian marine biologist, T.I. Baranoff, referred to his work as 'bionomics' or 'bio-economics', although he made hardly any reference to economic factors.³

There was no doubt a great amount of knowledge about the biology of the various species of fish, but very little about the economic character of the fishing industry. The earliest study undertaken in this field appears to be that of Raymond Firth, Professor of Anthropology, University of London, whose work, "The Malay Fishermen: Their Peasant Economy", which appeared in 1946, contains the fruit of his valuable research among the fishermen of the Malayan peninsula, and is perhaps the most outstanding pioneering contribution on this subject.

In Ceylon hardly any work has been done on the social and economic aspects of the fishing industry. Professor B.B. Das Gupta made some attempt in 1949 in two of his short

² Burkenroad, M.D., Some Principles of Marine Fishery Biology, (Publications of the Institute of Marine Science) University of Texas, Vol.11, No. 1, September 1951, cited by Scott Gordon, Journal of Political Economy, Vol. LXII, No. 2, University of Chicago Press, Chicago, U.S.A., April, 1954, p. 124.

³ Two of Baranoff's most important papers - The Question of the Biological Basis of Fisheries (1918) and On the Question of Dynamics of Fishing Industry (1925) - have been translated by W.E. Ricker of the Fisheries Board of Canada (Nanaimo, B.C.) and issued in mimeographed form.

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publications, "Short Economic Survey of Ceylon" and "The Economic Conditions in Ceylon in 1949", both of which contain very scanty references to the fishing industry.⁴

"The Economy of Ceylon", published in 1951 by Sir Ivor Jennings, then vice chancellor of the University of Ceylon, has just one paragraph about the fishing industry.⁵

Outside Ceylon the International Labour Organization began to show some interest on wages and working conditions of the fishermen and in the 28th (Maritime) Session of the International Labour Conference at Seattle in 1946 adopted a resolution,⁶ requesting the I.L.O. in consultation with the interests concerned:

...to make the necessary studies and preparations with a view to considering the possibility of the adoption of an International Fishermen's Charter setting out, on the lines of the International Seafarers' Charter, minimum standards of wages and working conditions, continuity of employment, social legislation, etc., for the industry.

Earlier in 1919, the First Session of the International Labour Conference at Washington discussed the question

⁴ Das Gupta, Short Economic Survey of Ceylon, 1949, Ceylon Govt. Press, 1949. Economic Conditions of Ceylon in 1949, Ceylon Govt. Press, 1949.

⁵ Ivor Jennings, The Economy of Ceylon, Oxford University Press, October 1951, p. 56.

⁶ Conditions of Work in the Fishing Industry, International Labour Office, Geneva, 1952. Studies and Reports, New Series No. 30, p. 1.

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of hours of work of fishermen and the question was again placed before the Second (Maritime) Session at Genoa in 1920 which adopted a recommendation concerning the limitation of hours of work in the fishing industry to be implemented by means of legislation which should be framed by the Governments in consultation with the employers' and workers' organizations concerned. The International Labour Office undertook an extensive enquiry into all of the working conditions of fishermen as well as their hours of work. The Office sent out a questionnaire to Governments requesting information concerning measures that had been taken or were proposed to give effect to the Genoa Recommendations.

Only in 1952 was the International Labour Office able to issue a Report based on the replies to the questionnaires which were received from 24 governments. Ceylon had failed to send any replies. This Report of the International Labour Office gives a brief account of the types of fishing and species of fish; wages, hours and manning; general conditions of employment and welfare; social security and co-operative societies in the 25 different countries of the world.

In 1953, G.M. Gerhardsen and C. Beever discussed in an article in the Monthly Bulletin of Agricultural Economics and Statistics "Some Aspects of Fisheries Development Economics", giving a brief account of fisheries development in the advanced countries and the need for technical assistance

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to underdeveloped fisheries.⁷

Since the time of Alfred Marshall who had touched briefly on the subject of diminishing returns and costs in fisheries,⁸ Professor Scott Gordon was the first economist to raise within a coherent theoretical framework, the allocation problems posed by the fishery as a type of common-property resource, in an article which appeared in the *Journal of Political Economy* in April, 1954.⁹ He was soon followed by Dr. Anthony Scott, who wrote equally well about the same subject.¹⁰

On the other side of the globe, Professor E.S. Kerby of the University of Hong Kong, in 1955, examined fisheries improvement in East Asia, while Dr. Szczepanik, lecturer in the same University, analysed at length some problems in fishery development.¹¹

⁷ G.M. Gerhardsen and C. Beever, "Some Aspects of Fisheries Development Economics", Monthly Bulletin of Agricultural Economics and Statistics, May 1953, F.A.O., Rome, pp. 1-7.

⁸ Alfred Marshall, Principles of Economics, 8 ed., London, 1936, pp. 369-371.

⁹ H. Scott Gordon, "The Economic Theory of a Common-Property Resource: The Fishery", Journal of Political Economy, Vol. LXII, No. 2, 1954, University of Chicago, Ill., U.S.A., April 1954, pp. 124-142.

¹⁰ Anthony Scott, "The Fishery: Objectives of Sole Ownership", Journal of Political Economy, University of Chicago, Ill., April 1955, pp. 116-124.

¹¹ Kirby, E.S., "Fisheries Improvement in East Asia: Economic and General Aspects", Far Eastern Economic Review,

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The International Economic Association, which was founded under the auspices of UNESCO, in September 1950, held every year a Round Table Conference with papers and discussions centering upon a single major topic. In 1956, the Round Table Conference on the economic problems of fisheries was organized at the request of and in collaboration with the F.A.O. of the United Nations. It was held in Rome where a very representative gathering of economists from Europe, America and Asia had met and discussed for the first time, the economics of fisheries in general and of the underdeveloped countries in particular. The papers read were by no means exhaustive. Nevertheless, they have stimulated further research on this important field. They have been edited by Ralph Turvey and Jack Wiseman, both of the London School of Economics and Political Science,¹²

A technical meeting on costs and earnings of fishing enterprises was convened in London from 8 to 13 September 1958. Lord Waldegrave, Joint Parliamentary Secretary to the Ministry of Agriculture, Fisheries and Food in his opening

No. 16, October 20, 1955, pp. 482-3. Szczepanik, E.F., "Economic Analysis of Fishery in the Far East", Far Eastern Economic Review, Vol. XIX, 1955.

¹² The Economics of Fisheries, Food and Agricultural Organization of the United Nations, Rome, 1957.

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address welcoming the 52 experts from 21 countries, made a pointed remark about the present state of the knowledge about the economics of the fishing industry. He said:¹³

A great deal of effort has been devoted to the scientific aspects of fishing and fish stocks... By contrast the effort which has been put into the study of the economics of fishing is, I think, very much smaller, and the study of applied economics in the fishing industry has not yet developed very far.

Professor Scott Gordon followed up his study with a further discussion on the problem of conservation from the economists point of view, in his article on "Economics and the Conservation Question" which appeared in the Journal of Law and Economics in October, 1958.¹⁴

In 1959, Dr. C.J. Bottemanne of Holland, published his magnum opus, the "Principles of Fisheries Development" in which he has compressed a large amount of comparative material dealing with "the main principles which determine the structure of fisheries and those on which fisheries development should rest".¹⁵

¹³ Report of the Technical Meeting on Costs and Earnings of Fishing Enterprises, London, September 1958, p.6.

¹⁴ Scott Gordon, "Economics and the Conservation Question", The Journal of Law and Economics, October 1958, pp. 110-121.

¹⁵ Bottemanne, C.J., Principles of Fisheries Development, North-Holland Publishing Company, Amsterdam, 1959, p. viii.

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The fishing industry had also suffered relative neglect from technologists. The speed of technological development which has affected ordinary ships has by-passed the fishing boats. Mechanization of fishing boats is a recent development which has simply grown out of the high-speed pleasure launches.

The Fishing Boat Congress organized by the F.A.O. in the latter months of 1953 with full sessions held respectively at Paris and Miami, U.S.A., marked a big step forward in fishing boat design. The knowledge and experience of some 70 recognized authorities on various aspects of fishing boat design, equipment and operation, supplemented by the comments of some 70 others equally concerned with the maintenance and expansion of the fishing industry in most part of the world, have been collected and embodied in a book called the "Fishing Boats of the World", edited by Jan-Olof Traung, Naval Architect, Fisheries Division of F.A.O., Rome, and published in 1955. Though this book marks but a milestone on the way to further progress, yet as A.C. Hardy remarks in the introduction, "much remains to be done before we can say categorically that fishing boat design as a whole, embracing all types and sizes, has reached the same technical level as that for other types of ships".¹⁶

¹⁶ A.C. Hardy, Introduction, Fishing Boats of the World, F.A.O., Arthur J. Heighway Publishing Ltd., London, 1955, p. xix.

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The book also contains valuable information about engines suitable for fishing craft; modern propulsion plants; control devices and factory ships. The paper on "Outlines of a catalogue of fishing boat tank tests", led to a further publication of the Fishing Boat Tank Test (Part 1) in November, 1955, compiled by Jan-Olof Traung of the F.A.O.¹⁷

The problems of fish processing was discussed in another Congress known as the Fish Processing Congress held in 1955.

In October 1957, the International Fishing Gear Congress held in Hamburg, Germany, marked another important step forward in international co-operation in dealing with some of the many problems concerned with the development of fisheries throughout the world. The major part of the 540 participants were from countries in the front rank of fishing nations.¹⁸ Dr. D.B. Finn, Director Fisheries Division, F.A.O. has remarked:¹⁹

Although the profession of gear technology is still in the development stage, and gear research

¹⁷ Fishing Boat Tank Tests, (Part 1), F.A.O., Rome, November 1955, pp. E.A.O. No. 1-150.

¹⁸ Modern Fishing Gear of the World, edited by Hilmar Kristjonsson, Chief Fishing Gear Section, Fisheries Division, F.A.O., Rome, published by Ludgate House, London, 1959.

¹⁹ D.B. Finn, Preface, Modern Fishing Gear of the World, op. cit., p. xxiii.

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facilities are as yet, available only in few countries, much progress has been made towards evolving the methodology and tools of trade. But experimenting with fishing gear is expensive and in view of the economic pressure under which the fishing industry generally works and the need to increase gear efficiency, this is clearly a field for governmental action. If rapid progress is to be made, then Governments must set up and-or support gear research institutes.

The governments of most countries have also greatly neglected the fishing industry. It is only recently that certain governments have turned their attention towards the fisheries.

Soon after the second World War, the International Labour Office in 1945 urged on the governments that "consideration should be given also to the fishing industry, first in its immediate bearing on the feeding and rehabilitation of the countries" and that "attention will have to be given in the period of rehabilitation and reconstruction to the problems of restoring as completely and quickly as possible an industry that is a source of employment as well as an abundant and immediately available source of foods with a high nutritive value".²⁰

In 1955, the F.A.O. organized an International Fish Marketing Training Centre in Hong Kong in which many co-

²⁰ The Co-operative Movement and Present Day Problems, International Labour Office, Montreal, 1945, pp. 47-48.

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operative officers from several underdeveloped countries including Ceylon, participated.²¹

The third F.A.O. Regional Conference for Asia and Far East held in Bandung from 8 to 19 October, 1956, recommended to governments (a) that governments should support the current F.A.O. investigation of the respective functions of middlemen and fishery co-operatives in fish production and trade in some countries within the region; (b) that governments should give special attention to the critical need for trained fishery co-operative leaders.²²

Following the recommendations of the Third F.A.O. Regional Conference, fishery co-operative officials took advantage of the facilities provided by the FAO-ETAP Training Centre in fishery co-operatives and administration from December, 1957, to January, 1958, in Australia where the Training Centre was held.²³

At the Technical Meeting of Fishery Co-operatives sponsored by the F.A.O. and I.L.O. held in Naples, Italy, in 1959, Dr. A.F. Laidlaw presented an interesting paper on "Education and Training for Fishermen's Co-operatives" in

²¹ F.A.O. Report, No. 404, International Fish Marketing Training Centre, Hong Kong, Rome, September, 1955.

²² F.A.O. Fisheries Papers No. 9, June, 1958, p. 6.

²³ Report of the F.A.O. Indo-Pacific Training Centre, Australia, 1958.

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which he dealt on the educational aspect of co-operatives and co-operative aspect of fisheries.²⁴

Thus the increasing interest evinced on fisheries development the world over and the material available concerning the present state of rapid development of fisheries in other parts of the world have inspired this study of examining the social, economic and technical problems facing the development of fisheries in Ceylon, where psychological attitudes and social habits of those engaged in this industry vary considerably from those prevailing in other parts of the world.

Chapter I deals with the general aspect of the economy in Ceylon, briefly reviewing the present situation.

As social returns on the fishing industry are relatively high and as fisheries provide not only food and protein supply for the exploding population of Ceylon, but also offers excellent opportunities for employment in the direct as well as ancillary operations connected with the fisheries, fishery policies and plans should be integrated and co-ordinated with the general development plans of the Government.

Chapter II is devoted to the critical examination of the obstacles to fisheries development in Ceylon. Lack of adequate knowledge about marine resources, poverty and indebtedness, inadequacy of capital and absence of technological

²⁴ Laidlaw, Dr. A. F., Education and Training for Fishermen's Cooperatives, Ottawa, Canada, March 14, 1959, pp. 2-25.

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skill coupled with the dearth of entrepreneurs, Ceylon shares with other underdeveloped countries in varying degree. However, entry into this industry is not restricted by caste as is often erroneously held. The horizontal immobility in fisheries is nevertheless conditioned by other social and economic factors.

Remuneration to factors of fishery production are considered in the third chapter. The share system and wage system in relation to investment, methods of reducing inherent risks in fishery investment and the problem of rent in fishery are all analysed in this chapter.

Chapter IV scrutinizes the problem of fishery finance, the ability in the past to accumulate capital and the potential sources of fishery finance with special emphasis on co-operative finance.

Fishery development and foreign capital, the significance of foreign investment, and the problems connected with public investment and inter-governmental financing are closely examined in Chapter V.

As economic and technological development should go hand in hand, some of the problems associated with modernization of the fisheries in Ceylon are pin-pointed in Chapter VI. The mechanization of the local craft and the problems involved in the use of new gear receive equal attention in this chapter.

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The last chapter defines the role of Government in fisheries development, examines the Ten Year Plan and the Law of the Sea. It stresses not only the necessity of correlating and integrating all fishery plans and projects into the general structure and balance of planning, but also the importance of a balanced programme of development within the fishery industries themselves. In other words, it emphasizes a simultaneous development of fishing, fish handling, processing, marketing, applied fishery research and education. For an integrated plan, the cooperation of the biologists, economists, technologists and Government is indispensable.

CHAPTER I

CEYLON'S PRESENT ECONOMIC POSITION

Ceylon is a tropical island with an area of 25,332 square miles situated just off the south-eastern tip of the Indian sub-continent, separated only by a narrow stretch of 22 miles of water.

The Island is composed of ancient rock and in the south-central area, mountains rise above an upland belt of 1,000 to 2,000 feet to peaks above 8,000 feet in height. Numerous rivers, radiating from the central mountain are navigable only by small boats but provide excellent potential for irrigation and hydro-electric power.

The North East monsoon blowing from November to April, and the South West monsoon from May to October give the Island an annual rainfall varying from 40 inches in the North East to over 200 inches in the South West. The average yearly temperature in the low country is 80 degrees, but the mountain altitudes offer relief from the monotony of lowland warmth and humidity with a temperature ranging from 40 to 60 degrees Fahrenheit.

Population

The population of Ceylon, according to the last census in 1953 was 8,098,637, composed of a heterogenous group

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Sinhalese, Tamils, Muslims, Burghers, Veddhas, Europeans, Indians, Pakistanis and others as shown in Table 1.

Over the last 50 years, Ceylon's population has more than doubled and is continuing to rise at an alarming rate. From ancient times malaria had been the greatest killer. After World War II, the Ceylon Government determined to knock it out by a vigorous national health campaign. The result was spectacular. The death rate fell in only a few years, by more than half, but the birth rate stayed as high as ever, with the result that Ceylon now has annual population increase approaching ^{to} nearly 3 per cent, which is one of the world's highest.

In the Vital Statistics published by the Government of Ceylon, the estimated population at mid-year of 1958 was 9,388,000 and at the end of that year, 9,498,000. The increase in the Island's population during the same year was 2.5 per cent, the same as in the previous two years. The excess of births over deaths (natural increase) amounted to 244,875, while the excess of emigrants over immigrants was 15,323.¹

The space of population growth in Ceylon is high not

¹ Ceylon News Letter, Information Department, Ceylon, July 10, 1959, p. 2. (In forty years man's life expectancy in Ceylon has risen from 32.7 to 60.3 and his wife's from 30.7 to 59.4 years. Cf. Ceylon 1957 Department of State Publication, U.S., June, 1957, p. 1).

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TABLE I
Population of Ceylon by Races

Sinhalese

Low Country Sinhalese..... 3,464,126

Kandyan Sinhalese..... 2,157,206

Tamils

Ceylon Tamils..... 908,705

Indian Tamils..... 984,327

Muslims

Ceylons Moors..... 468,146

Malays..... 38,736

Burghers..... 43,916

Veddhas..... 20,678

Europeans..... 5,886

Pakistanis..... 5,746

Others..... 11,162

Total..... 8,098,637

Source: Census of Ceylon, 1953, p. 5.

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only in comparison with the rates in the West, but also with the rates in the South and South East Asian countries, with the exception of Taiwan, as indicated in Table II.

The population projection for Ceylon from 1956 to 1981 published by the Planning Secretariat in Ceylon forecasts that by 1981, the population of Ceylon will hit the 20 million mark.²

Ceylon's Economic Growth

According to the Annual Report of the Ceylon Central Bank for 1959, the total population in that year was 9.64 million and the gross national income for the same year was Rs.5,698 millions resulting in the per capita income of around Rs.589.³ The rate of growth of real income at 1.3 per cent was slightly lower than in 1958. These trends clearly indicate a very slow rate of progress for an underdeveloped country like Ceylon which is planning economic development.⁴

By Asian standard, Ceylon has thus far been able to maintain a relatively high standard of living with a literacy rate of 70 per cent, with 2,003,044 children in schools in

² Selvaretnam, S., Population Projection for Ceylon, 1956-81, Planning Secretariat, Colombo, 1959, p. 21.

³ The value of one American dollar equals nearly five Rupees.

⁴ Ceylon News Letter, Information Department, Ceylon, June 8, 1960, p. 3.

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TABLE II

Percentage Growth of Population
(1953-1957)

Taiwan	3.6	Pakistan	1.4
Ceylon	2.5	India	1.3
Malaya	2.4	Japan	1.2
Philippines	1.9	Burma	1.0
U.S.A.	1.8	Sweden	0.5
Indonesia	1.7	U.K.	0.4

Source: Statistical Yearbook (United Nations),
1958, p. 3.

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1957, one University at Peradeniya and two other Sinhalese "pirivena" (Buddhist temple) schools raised to university status in 1959,⁵ and a fairly good network of railways and roads.

In the international comparison and especially in comparison with other countries in South and South East Asia, with the exception of Japan, Ceylon's per capita income appears to be relatively high, as indicated in Table III. This is solely due to her plantation economy; about a third of Ceylon's gross national product originates from the three major crops, tea, rubber and coconut. The productivity of other sectors of her economy, in terms of output per man or yield per acre, does not seem to be very much higher than that of other Asian countries.

The pattern of economic development in Ceylon has been markedly uneven. Some sectors have boldly forged ahead, while others have miserably lagged behind. (Vide Table IV). It is these backward sectors of the economy that can give us a more meaningful picture than the aggregate national income of a country. It is this increasing imbalance in the economy that should receive a greater attention in any plan for the economic expansion of the country.

⁵ Vidyodaya University and Vidyalandkara University were inaugurated in March 1959 to provide for the first time in the history of the Island, higher education in the Sinhalese medium.

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TABLE III

Estimates of Per Capita Net National Product
Expressed in U.S. Dollars: Annual Average
1952-1954
(At factor cost)

Western Countries	Per Capita	Asian Countries	Per Capita
United States	1,870	Malaya (1952-53)	310
Canada	1,310	Japan	190
Switzerland	1,010	Philippines	150
New Zealand	1,000	Ceylon	110
Australia	950	Thailand(1952-53)	80
Sweden	950	Korea	70
Belgium	800	Pakistan	70
United Kingdom	780	India	60
Denmark	750	Burma	50
France	740		

Source: United Nations, Per-Capita National Product of 55 countries; 1952-1954, Statistical Paper Series E, No. 4 (New York), 1957.

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TABLE IV

Gross Domestic Product at Factor Cost
1957

	Rs.M	Percentage Distribution of Gross Domestic Product 1957
Tea	1,075	21.6
Rubber	338	6.8
Coconut	342	6.9
Paddy	350	7.0
Other products, animal husbandry	565	11.4
Fisheries	34	.7
Industry	380	7.6
Construction	214	4.3
Electricity	20	.4
Transport and Communication	258	5.2
Housing & Rent	215	4.3
Public Administra- tion	385	7.7
Other Services	799	16.1
Total	4,975	100.00

Source: Ten Year Plan, National Planning Council,
pp. 78, 82.

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About 48 per cent of the total national income originates in the agricultural and fishing sectors and on these two industries about 70 per cent of the population subsists. The national income from industries, including mining has been as low as 15.76 per cent, while the rest comes from trade, transport and other sources.⁶

The most vital and desirable goal of economic planning is the establishment of a stable economic structure. This predominant objective demands an orderly mobilization of forces of production in order to securely increase the wealth of the country and the readjustment of productive processes to the new conditions of demand and consumption.

A country like Ceylon which has to depend on foreign market and conditions beyond its control for so large a portion of its yearly production can enjoy no economic security. Ceylon's dangerous reliance on the few export items to import food and other necessities has subjected her balance-of-payment to wide fluctuations as prices of the world market rise and fall.

Development of Material Resources

The most striking and pressing problem in Ceylon at the moment is the population explosion. "Were it not for the population pressure", observed Professor J.R. Hicks, who visited Ceylon in 1957, "the urge for economic development might not be so very great; for there is not at the moment a

6 Times of Ceylon Supplement, September 13, 1960, p. 2.

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crushing problem of poverty and malnutrition such as there is in the neighbouring countries."⁷

Population explosion brings with it not only the problem of finding food for the expanding population, but also the problem of creating employment opportunities for the annually enlarging labour force. Ceylon's labour force in 1956 was 3,254,000 of which approximately 540,000 were totally unemployed and 386,000 were ^{PARTLY} ~~generally~~ unemployed.⁸

By and large, the long term solution of the twin problems of finding food and employment for the rapidly increasing population must be sought in the maximum utilization and development of the natural resources of the country.

There is at the moment no great a scarcity of natural resources in Ceylon. The problem is how to bring the available resources into productive use.

(a) Agricultural Resources

Of Ceylon's total area of about 16.25 million acres only 6.75 million acres are considered suitable for agriculture of some form. Tea, rubber and coconut occupy 2.25 million acres.

The total production of tea stood at 413 million

⁷ Hicks, J.R., "Reflections on the Economic Problems of Ceylon", Papers by Visiting Economists, National Planning Council, Colombo, Ceylon, p. 9.

⁸ Annual Report 1956, Bank of Ceylon, p. 7.

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pounds in 1958 and the export income at Rs.1,717 millions.⁹ Tea is by far the most important of Ceylon's export crop. Practically the entire output is exported and often accounts for two-thirds of the total value of exports. The tea yield per acre in 1955 was only 672 pounds. Under efficient production practices the average per acre production of tea could be raised according to the Tea Control Department, to 1,200 lbs. over the next two decades.¹⁰ But the extent of new land suitable for tea production in Ceylon is only a little over 20,000 acres, according to the estimation of the Land Commissioner's Department.

Rubber accounted for only 12 per cent of the export earnings in 1949 but soared to 27 per cent with the outbreak of the Korean War.¹¹ In 1958, rubber production stood at 224 million pounds and export at 207.2 million valued at Rs.258 million. Due to the fall in world prices, the value of rubber exported fell by Rs.42.2 million, the lowest since 1949.¹²

⁹ Ceylon News Letter, Information Department, 10 July 1959, p. 2.

¹⁰ First Interim Report, National Planning Council, Colombo, July 4, 1957, pp. 6-8.

¹¹ Ceylon 1957, Department of State Publication, U.S. June, 1957, p. 13.

¹² Ceylon News Letter, Information Department, 10 July 1959, p. 2.

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Coconut plantation covered an acreage of 1,071,942 in 1954, and contributed 10.13 per cent of total export earnings. Production has stayed about 2,000 million nuts a year and it is hoped to increase the output to 3,000 million nuts by 1970.¹³ Most of the trees are old and need replantation. But again it must be stressed that production of coconut is limited by the availability of suitable sandy soil.

Other agricultural products exported are cocoa, cardamoms, cinnamon, quills and chips, citronella oil, coconut fibre brittle and mattress, nutmeg, pepper, betel nut and tobacco the production of which is relatively small, about 5 per cent of the export earnings.

On the non-export agricultural sector, 1,269,892 acres are under paddy cultivation. The yield per acre varies widely from 21 bushels per acre in the Vanny (March 1955-1956) to 51 bushels in Kandy and Polonnaruwa. The present production is 23 million bushels in the Maha and 16 million bushels in the Yala season, totalling 39 million bushels.¹⁴ The greatest obstacles to increasing the output of paddy are lack of irrigation facilities, poor drainage, flooding and silting up of the tanks and channels.

¹³ First Interim Report, National Planning Council, Colombo, 1957, p. 12.

¹⁴ Ibid., p. 37.

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The National Government in Ceylon has also turned its attention to another important resource, namely forestry. A new plan has been drawn up to cover a period of 20 years for the improvement by natural regeneration and by forestation, as a means of stepping up production of timber and fuelwood in the Island, in order to make the country self-sufficient in its requirements of these essential commodities.¹⁵

In the agricultural sector, output rather than expansion of employment should be regarded as the main consideration. For as Professor Hicks had rightly pointed out: "An expansion which is directed towards increasing agricultural employment is likely to be extremely expensive in terms of capital".¹⁶ What Ceylon needs, he says, is a better organization of agriculture, better methods of production and not a lot of capital investment in agriculture.

There are limitations to agricultural output in Ceylon. As observed earlier, the output of tea is approaching its limits; neither is there much land left for further extending rubber plantation, nor is there more suitable land available for production of coconut.

As for paddy, there again are limitations both in the extent of land available and the inherent fertility of the

¹⁵ Sri Lanka, Information Department, October 27, 1959, p. 3.

¹⁶ Papers by Visiting Economists, National Planning Council, Government Press, Seylon, 1959, pp. 13-14.

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soil. Professor Gourou has clearly stated: "Tropical soils are poorer and more fragile than those of temperate regions". The virgin jungle demands scarcely anything from the soil, because organic matter fallen from trees provides its own humus. But "clearing causes unpleasant surprises, for, instead of deep humus, sand is found, and the forest may have greatest difficulty in growing up again, once man's exploitation has exposed the underlying soil".¹⁷ Hence the relatively poor soil is one important factor in the low yield per acre in most of these lands.

Another cause for low yield per acre is the monocultures common in tropical countries. Agricultural crops are subject to plant pests. Under tropical conditions such infections could easily become widespread epidemics with disastrous results. Blights have thus affected the cotton, cacao, rubber and banana industries in the past. The climate of Ceylon also renders pest control work difficult because it induces the growth of many diseases. Then, floods help the spread of animal diseases such as rinderpest and other livestock diseases.

Professor Gourou has also warned that "...the tropics are not eminently favourable to the raising of live-stock. Disease is one factor, difficulty of preserving animal products

¹⁷ Pierre Gourou, The Tropical World: Its Social and Economic Conditions and its Future Status, Paris, 1947: English Translation, New York, 1953, p. 13.

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is another, but most important is the fact that tropical pasturage of average quality is not good food value".¹⁸

(b) Industrial Resources

Ceylon also possesses a variety of mineral resources of considerable value. These include graphite, precious and semi-precious stones, clay suitable for ceramics, mica, magnesite, vanadium, limestone and ilamite sand.

Having little or no coal or oil, Ceylon has small potentialities for heavy industry. The Government has set up one cement factory at Kankasanturai which produced 75,000 tons in 1957. With the establishment of three more cement factories, one in Puttalam and two in the South of Ceylon, it is proposed to increase output to 1 million tons per annum by 1968.¹⁹

Work is also in progress in connection with the exploitation of mineral sand, sugar and textiles. During the coming financial year (1960-1961) it is proposed to start on a rubber tire and tube factory and the iron and steel project, both of which are being undertaken with assistance from U.S.S.R. which has promised Ceylon a 120 million rouble loan repayable in 12 instalments at 2 1-2 per cent.²⁰

¹⁸ Pierre Gourou, op. cit., p. 53.

¹⁹ Sri Lanka, Information Department, June 29, 1959, p. 21.

²⁰ Sri Lanka, Information Department, August 12, 1959, p. 2, and August 17, 1960, p. 3.

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The Government has also set up a glass factory, a ceramic factory, a paper mill and other enterprises such as the manufacture of dry cell batteries and an asbestos cement plant for the manufacture of asbestos cement products and corrugated sheets capable of an output of 24,000 tons per year.

The small scale industries set up in 1958-1959 include production of crown cork, plastics, blades, pins, nibs, clips, brown sugar, surgical cotton and lint, bicycles, hosiery, cigarettes, cycle tires and tubes and tooth brushes.

The basic raw materials for the production of nuclear energy such as minerals and ores containing uranium and thorium are also found in Ceylon, but this field has hardly been exploited.

Of the water resources of Ceylon, the amount of water potential for irrigation in the dry zone is estimated to be 89,000,000 cubic feet.²¹ The National Government has now addressed itself to this problem of conserving water and has launched several multi-purpose river and tank schemes, the chief among which are the Gal-Oya River Vally Scheme and the hydro-electric scheme at Laksapana and the Walawa scheme which are expected to bring tremendous benefits to the country.

²¹ First Interim Report, National Planning Council, Colombo, 1957, p. 40.

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Rural electrification programmes have also been initiated by the Department of Electrical Undertaking to supply electricity to five industrial centres and four villages in the Colombo district.²² Power is a basic requirement to stimulate not only heavy industries in towns but also small scale or cottage industries throughout the Island. Social consequences of the provision of power for even domestic purposes are far reaching.

Of the sea resources the gathering of sun evaporated salt has been a very ancient industry, which remains a government monopoly to this day. Ceylon's present output of salt is 500,000 tons, 15,000 tons of gypsum and 7,000 tons of potash as by-products per year.²³ Ceylon has established a National Salt Corporation in 1957 for the development of a large export salt industry in the Hambantota district. The salt industry is highly labour-intensive. For the production of 500,000 tons of salt and attendant by-products it is estimated that approximately 4 to 5 thousand persons will be required and about the same number will be needed in subsidiary occupations like transport and loading of ships.

As for the industrial sector, diversification of Ceylon's industries may well provide employment opportunities

²² Sri Lanka, Information Department, February 24, 1960, p. 1.

²³ The Ten Year Plan, National Planning Council, Government Press, Seylon, 1959, p. 352.

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for a certain number of the unemployed. But labour intensive industries are very few and therefore merely employing labour without proper equipment will only result in low productivity. Ceylon cannot afford to place too much reliance on industrialization. For there are real and serious limitations for undertaking new industries. First there is the question of capital equipment. In view of the limited resources of the Island for the manufacture of capital equipment, a large proportion of the capital equipment required has to be imported. This will impose a severe burden on the economy.

Secondly, there is the limitation of raw material needed for the expansion of industries in Ceylon. Thirdly, new industries can arise only if there is a market for their products. Fourthly, developing new industries may prove to be very uneconomical for the simple reason that importing those products from those countries which enjoy comparative advantage may be cheaper than producing them locally.

Since hydro-electric power is Ceylon's main indigenous resource, the only possible "power intensive" industries that could be set up, according to Nicholas Kaldor who visited Ceylon in 1958, are: "Artificial fertilizers, cement, rubber processing (tyres) and metal refining. Aluminium making might become economical at a low power cost even though there are no bauxite deposits on the Island".²⁴

²⁴ Papers by Visiting Economists, Planning Secretariat, Colombo, p. 28.

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The development of cottage industries may also provide to some extent further employment opportunities and still Ceylon will be left with a large residue of unemployed. She will therefore have to turn to other resources.

(c) Fishery Resources

Not sufficiently exploited is another resource - the fishery resource in Ceylon. Surrounding the Island is the vast Indian ocean teeming with unlimited marine food. According to Dr. Pearson, there are at present four known types of fishing grounds around the Island, namely: (a) The rock and coral continental shelf which surrounds the greater part of the Island, (b) the small area of mud and sand which lie off the river mouths, (c) the Palk Strait, a large shallow area of mud, carrying a depth of about seven fathoms, and (d) the large flat rock and sand areas known as the Wadge Bank and Pedro Bank, carrying a depth of 20 to 100 fathoms.²⁵

The inshore fishing is carried on the 830 miles of coast line by local fishermen organized into a variety of enterprises ranging in size and varying in form from a single-man operation of the rod and line to the more complex and expensive beach seine fishing. Nearly fifty different varieties of fish are captured by the beach seine nets, the most

²⁵ J. Pearson, Administration Report of the Marine Biologist for the year 1927, Government printers, 1928, p.22.

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common being sardines, herrings, mackerel, king-fish and cavalla locally known as seer, all of which are of considerable economic importance.

The Ceylon lagoons too provide excellent grounds for prawns, shrimps and crabs. The most sheltered lagoons are the Negombo, the Kottiyar, the Jaffna and the Batticalao lagoons. The Balapitiya lagoon alone made of the main Madu Ganga, the Randombe Lake and the River has a total of 1890 acres.²⁶

Dr. Ling, the F.A.P. fish culturist, estimated the annual production of prawns at 50 lbs. an average acre compared to 230 to 830 lbs. of prawns per acre produced in East Java.²⁷

The off-shore fishing carried on by nearly 52 varieties of gill nets, do not extend beyond 20 miles.

The Wadge Bank lying to the West of Ceylon, approximately 100 miles from Colombo has an estimated extent of three to four thousand square miles of which, roughly half falls within the 40 fathoms. The best fishing has been found to be in the 25 to 35 fathoms. The fish population of the Wadge Bank is made of such migrants as cavallas, trevallies or horse mackerel (parawa-S) (parai-T) and non migrant - stock which

²⁶ Progress Report, No. 2, Fisheries Research Station, Government Press, Ceylon, July, 1956, p. 5.

²⁷ Ibid., p. 9.

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are of great commercial importance to trawl fishery.²⁸ At present the Wadge Bank is exploited by two trawlers belonging to the Government-the "Braconglean" and the "Maple Leaf", which together produced 28,956 cwt. in 1957.²⁹

The Pedro Bank lies about 80 miles North East of Trincomalee and is roughly 1,000 square miles in extent. It has so far not been exploited.

As far back as 1923, Dr. Pearson had noted as much as one hundred and fifty different types of fishing appliances used in Ceylon.³⁰

Till very recently all fishing operations were conducted in non-powered primitive craft. In 1957, the Ceylon Fishery Department had registered 1,306 "kattumarams", 6,306 "orus", 2,369 "vallams" and 3,946 "teppams",³¹ and of the total 13,927, only 280 have been fitted with outboard motors.³²

²⁸ Progress Report No. 2, op. cit., p. 2.

²⁹ The Ten Year Plan, op. cit., p. 298.

³⁰ Bulletins of Ceylon Fisheries, Vol. 1.3, Colombo, 1923.

³¹ Kattumaram, literally binding logs together, as a rule 3 to 5 planks are lashed together with coir. Orus are narrow outrigger sailing canoes made in various lengths and widths. Vallams, cavel built sailing boats. Teppams are 4-log rafts used for drift netting.

³² Sri Lanka, March 2, 1960, p. 3.

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The total output of fish in Ceylon in 1957 was 761,301 cwts. of which 28,956 csts. were produced by the two government trawlers. In the same year the quantity of fish imported into the Island was 2,130,420 cwts. valued at Rs.80,216,000, making a total quantity of fish available for consumption of 2,891,721 cwts.

The import of fish and fish preparations rose in 1958 to Rs.92,323,000 worth³³, despite the landings of the two government trawlers and the Japanese boat the "Meegamu maru" whose annual landing is approximately 750 to 850 thousand pounds.³⁴

The amount of annual landing and the species captured in Ceylon from 1948 to 1957 are given in Table V.

Ceylon's relative production of fish in terms of world output was only 38.5 thousand metric tons in 1957 compared to Japan's production of 5,399.0 thousand metric tons, for the same year. Figures for other South East Asian countries are indicated in Table VI.

Among the marine resources may be included the "chank" and pearl fisheries. "Chank" fishing dates back to very ancient times. The shell of this crustacean is carved into bangles and children's feeding spouts. It is also used

³³ Sri Lanka Annual, Progress Report, 1958, Information Department, Ceylon, p. 44.

³⁴ Times of Ceylon, Imperial Visit Supplement, August 18, 1956.

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TABLE V

Catch: Quantities by Groups of Species
(Thousand metric tons)

YEARS Country	1948	1953	1954	1955	1956	1957
SPECIES <u>CEYLON</u>	24.0	25.5	29.7	31.3	40.4	38.5
Herrings, sardines, anchovies, etc.	...	7.1	9.5	11.6	18.3	14.1
Tunas, bonitos mackerels, etc.	...	5.1	6.6	7.0	11.2	13.1
Miscellaneous marine teleos- teans	...	7.1	8.1	8.4	5.2	5.7
Sharks, rays, etc.	...	0.7	3.1	2.5	3.0	3.9
Mixed and un- identified fished	...	2.0	0.8	0.4	0.1	0.1
Crustaceans	...	0.7	1.2	1.0	1.5	1.3
Molluscs	...	2.8	0.4	0.4	0.4	0.3

Source: Year Book of Fishery Statistics, F.A.O.
of the U.N., Rome, 1957, p. b-5.

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TABLE VI

World Catch: by Continents and Regions
(million metric tons)

Continent, regions	1948	1953	1954	1955	1956	1957
World Grand Total	<u>19.09</u>	<u>24.91</u>	<u>26.80</u>	<u>28.12</u>	<u>29.60</u>	<u>29.96</u>
North America	3.62	3.54	3.91	3.89	4.26	3.94
South America	0.45	0.56	0.63	0.77	0.82	0.97
Europe	6.12	7.02	7.51	7.62	8.08	7.64
Africa	0.83	1.60	1.60	1.66	1.77	1.86
Asia	<u>6.49</u>	<u>10.10</u>	<u>10.78</u>	<u>11.57</u>	<u>11.93</u>	<u>12.88</u>
(thousand metric tons)						
India	...	819.0	828.5	839.0	1012.3	1233.0
Japan	2431.4	4521.6	4544.6	4912.8	4762.6	5399.0
Pakistan	...	249.0	259.7	270.9	277.0	282.8
Indonesia	300.0	616.9	628.5	669.8	636.9	660.0
<u>Ceylon</u>	<u>24.0</u>	<u>25.5</u>	<u>29.7</u>	<u>31.3</u>	<u>40.3</u>	<u>38.5</u>

Source: Yearbook of Fishery Statistics, Production,
F.A.O. of the U.N., 1957, Vol. VII, pp.a-3,
a-7.

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as a wind instrument. The sinistral "chank" with the whorls directed anti-clock wise is such a rarity that it fetched fancy prices. In 1937, 1,669,745 "chanks" were exported and Rs. 26,341.93 were collected as royalty. But due to the slump in the "chank" shell market, the export decreased to 781,083 chanks in 1938 and with the outbreak of World War II and with the tightening of immigration laws, the Indian divers who normally carried on the trade, ceased coming and "chank" fishing was abandoned.³⁵

There is no reason why "chank" fishing should not be resumed. Pearl fishing too dates back to prehistoric times. The pearl oyster is found in Tambalagama Bay in Trincomalee, along the coast near Negombo and Chilaw but the most famous area for Ceylon pearls is in the Gulf of Mannar, where the pearl banks or "Paars" lie 20 to 30 miles west of the barren coast between Arippe on the estuary of the Aruvi Aru and Kudramalai, the promontory near the mouth of Moderagam Aru. The last official pearl diving was held in 1925, but in March 1958 two Canadian boats - the "North Star" and the "Canadian" engaged in pearl dredging operations off Karativu and brought up about 15,000 pearl oysters in one hour. Under the old diving system, pearl divers were able to bring up

³⁵ Administration Reports, Marine Biologists, Ceylon, 1927-1938. Ceylon Government Press, 1939. The 'chank' most abundant in Ceylon is the "Turbinella Pyrus Linne" with a yellowish inner lip.

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only about 400 oysters in one day.

Besides marine resources, indigenous fresh water abound in most of the irrigation tanks and channels and provide an important source of food supply, particularly in the more remote districts where salt water fishes are not easily procurable. The tanks of Ceylon are capable of producing 150 to 300 lbs. of fish per acre per annum.³⁶

The fisheries in Ceylon are capable of very considerable expansion, not only providing ample employment opportunities but also as a potential source of food to the growing population. The development of fisheries should receive high priority in any development plan. The importance of the development of fisheries is now increasingly realized not only on social but nutritional and economic grounds.

On social grounds because those engaged in fishing form an important part of our economy. Their importance lies not only in their numerical strength - for they form a considerable section of the Ceylonese population - but also on their contribution to our economic and nutritional system.

Fisheries constitute a potential source of food. It has been pointed out: "A ton of fish delivered in the market for consumption represents the value of 4 or 5 head of cattle

³⁶ Administration Report of the Marine Biologist, 1935. Ceylon Government press, 1936.

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at the slaughter house. But in order to send 4 or 5 head of cattle to the slaughter house, it is necessary to have 35 to 40 animals in pasture, so that every ton of fish caught is equal to the meat production of 35 to 40 head of cattle on the range. A country that has the opportunity of catching 100,000 tons of fish per year as the Belgian Congo presently does, has therefore practically the same wealth as a country having 3 1-2 to 4 million head of cattle on the range".³⁷

Improvement of the fisheries would mean not only more food for hungry people but also an improvement of Ceylon's nutritional system. Nutritionists consider fish as an important item of diet. Fisheries have the promising potential of giving greater nourishment to the people of Ceylon who have been graded as a C-3 Nation by health authorities (Vide Table VII).

The percentage of malnutrition is high particularly among the rural population. There is widespread deficiency caused by insufficiency of protein food. This deficiency can easily be remedied by consumption of more fish. It has been remarked: "Measured by the labour involved, fish is among the least costly of all protein foods. There are no fields to plough and cultivate, no seeds to sow and no

³⁷ Halain, C.P., (Belgian Congo) Remarks, Modern Fishing Gear of the World, F.A.O. Congress, Hamberg, September 1957, Ludgate House, London, 1959, pp. 596-597.

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TABLE VII

Daily per capita Intake of Animal Protein
and Protein from Fish in 1952-1953

Country	Animal Protein	Protein from fish	Percentage of animal protein intake contributed by fish
	(grams per day)		Percentage
Norway	53.0	9.8	18
France	43.0	3.0	7
Chile	26.5	4.7	18
Japan	12.9	9.9	77
Ceylon	10.9	7.9	72
Pakistan	10.3	0.4	4
Philippines	9.6	4.0	42
India	5.6	0.4	7

Source: F.A.O. Problem of Fishery Expansion (Paper No. 55-6-3683), prepared by F.A.O. for Regional consultation of the Selective Expansion of Agricultural Production and Consumption, Ceylon, 20-25 June, 1955.

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cattle to tend in order to reap a bountiful harvest".³⁸

If more protein food could be obtained from the sea, then it could mean that land and other ^{RESOURCES} capital devoted to protein food raising could be shifted to other uses.

Fisheries also constitute a source of raw material for fertilizers and animal food that is so lacking in adequate supplies in many areas in Ceylon.

Fisheries also provide a very high social return on the industry. Expansion in fisheries is not contingent on heavy investment being incurred, of bringing the resource into a position where it can be exploited. This is in contrast with agricultural development, especially in the dry zone where large sums of money have to be spent on irrigation and fertilization before the land can be exploited to yield a flow of output, whereas in fisheries such investment costs are nil.

Fisheries can also be considered as a potential source of national income. Fish production amounts only to a quarter of Ceylon's requirements and her annual import of fish and fish products stood at a staggering Rs.92.3 million in 1958. Fisheries development would result in a considerable saving of foreign exchange.

Another significant economic effect of the develop-

³⁸ Indian Information, No. 239, October 15, 1948, p. 12.

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ment of fisheries is that it would tend to stimulate the growth of many subsidiary and ancillary industries all of which will provide increased employment opportunities.

Fisheries development is also a powerful income generator. For as the development of fisheries widens, more purchasing power will be placed in the income groups whose propensity to consume is very high, which through the cumulative and multiplier effects will tend to increase investment and employment in Ceylon.

Ceylon has yet to realize that it is an island and its resource developments are bound up with the frontier of the sea. The challenge of the future is in the vast ocean that surrounds the Island, an ocean which is estimated to be approximately 1,200,000,000 acres in extent, an ocean forming the third largest body of water on the globe, covering nearly 28,375,000 square miles.

The harvest of the sea will become increasingly important in the years ahead and as George Drew, the Canadian High Commissioner in London, put it at the Geneva Conference: "With the explosion of population now increasing the food demands all over the world, the conservation and protection of food resources of the sea assume rapidly increasing importance."³⁹

³⁹ Conference on the Law of the Sea, Geneva, March 1960, Sri Lanka, Colombo, March 30, 1960, p. 3.

CHAPTER II

OBSTACLES TO FISHERY DEVELOPMENT IN CEYLON

Despite their obvious potentialities, the fisheries have remained the most backward sector in Ceylon's economy. There have been very severe limitations and handicaps for the development of this industry, viz:

(1) Unidentification of resources

Though thousands of fishermen in Ceylon have from ancient times daily observed facts about the occurrence and behaviour of species in their traditional fishing grounds and have gathered a considerable stock of knowledge, which they have handed down from generation to generation, these facts have never been collected and put together in any systematic form. In other more developed countries, it is this body of basic knowledge that has served to develop extensive fisheries.

Fishing in Ceylon has been from time immemorial restricted to an area very near the coast. Only a few of the largest outriggers would go out a distance of 15 to 20 miles from the coast. Inadequate knowledge of the Continental Shelf marked by the 1,000 fathom line, has left some of the most prolific fishing grounds unexploited.

The Government has been equally ignorant of the marine resources and the potentialities of the sea. Under the

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Portuguese and Dutch rule hardly any information regarding the development possibilities of the fishing industry was passed on to the local fishermen. Even under the British, the Ceylon fisheries suffered great neglect for over a century. Except for a few proclamations (vide Appendix I) in 1869, 1907 and 1913, their interest in the Ceylon fisheries was restricted to the pearl-fisheries. Even in that respect, prior to 1902, they had been carried on without any regard to marine biological problems involved.

Professor William Herdman of Liverpool University was brought to Ceylon in 1902 in connection with the failures and irregularity of the pearl-fisheries. He made a thorough examination of the pearl banks and published an exhaustive report dealing with the bionomics of the pearl oysters and the biological conditions of the pearl banks. One of his recommendations was that a marine biologist be appointed to carry out continuous investigation and experiments, to counteract the ill effects of silting and overfishing of pearl oysters.

But not till 1907 did the Government appoint a marine biologist, Dr. A. Willey, who was then the Director of the Colombo Museum and that, too, because of pressure brought by the Ceylon Company of Pearl Fishers, to whom the Government had leased out the pearl fisheries. In 1912, when the Company ceased its operations, the pearl banks reverted to the Ceylon

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Government. The Director of the Colombo Museum was then placed in charge of the scientific operations connected with the pearl banks. Very little was done in the way of carrying out investigations of the food fisheries, mainly owing to the "apathetic attitude of the Government".

Since 1912, Dr. Joseph Pearson made successive attempts to induce the Ceylon Government to take "a practical interest in the food fisheries of the Island".¹

In 1919, the Ceylon Government sanctioned a marine biological survey of the littoral waters of Ceylon, with a view to increasing the knowledge of the food fishes of Ceylon.

In Ceylon Fisheries Sessional Paper 1 of 1922, the Industrial Commission dealt with the fisheries in an exhaustive manner and recommended the immediate establishment of an independent department of fisheries and as Dr. J. Pearson has remarked: "Owing to financial reasons effect had not been given to these recommendations, but it is hoped that within a short time an independent department of fisheries will come into being".² His hope was not realized till two decades later.

In 1922, Dr. Pearson assisted by Mr. A. H. Malpas, the

¹ Bulletin of Ceylon Fisheries, Colombo, January 17, 1923, Vol. 1, p. 1.

² Bulletin of the Ceylon Fisheries, January 17, 1923, Vol. 1, p. 1.

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assistant marine biologist carried on the fisheries investigations and the results of their researches have been published in the Bulletins of the Ceylon Fisheries, Vol. 1, January 17, 1923.

Bulletin No. 1 deals with the Hydrographical investigations of Lake Tamblegam, while Bulletin No. 11 gives the statistics dealing with the growth rate of Plancuna Placenta and Bulletin No. 3 describes one hundred and fifty different types of fishing appliances used in Ceylon at that time. This list is by no means complete, but after Schweitzer (1677), who describes only one appliance namely the beach seine and gives a list of the different fishes in the Ceylon sea, Dr. Pearson's description of the fishing appliances in Ceylon has not been so far surpassed, though his list of the commercial fishes is far from complete. For after Schweitzer (1677), Bennet published in 1828 a description and coloured plate of thirty Ceylon species, many of which had been already included in the well-known Fishes of India by Day (1875-1878). Many contributions appeared in the Ceylon Journal of Science, particularly by Dr. P.E.P. Deraniyagala who has recently published a coloured Atlas, dealing with a portion of the known fish fauna. The latest work published in 1955 is by Ian S.R. Munro of the Fisheries Division of the Commonwealth Scientific and Industrial Research Organization, who had been invited to go to Ceylon under the Colombo Plan in 1951.

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During his stay in Ceylon for a number of months, Mr. Munro made a study of eight hundred and fifty-six different varieties in the ocean around Ceylon and in the local rivers, lagoons, streams and tanks, and has embodied them in his three hundred and fifty page book, "The Marine and Fresh Water Fishes of Ceylon".³

During World War I, the Ceylon Government purchased six trawlers from the Japanese Government for the purpose of mine sweeping. At the conclusion of the war, one of those trawlers, the "Lilla" was handed over to the marine biologist for the survey of the Ceylon waters. The trawler was used in the inspection of the pearl banks, in the marine biological survey and in the periodic hydrographical cruises in the Gulf of Mannar.⁴

The marine biological survey of the littoral waters of Ceylon was conducted by means of trawl, dredge and tow-net "in order to determine the distribution of food fishes and the biological conditions of the littoral area". In 1926, Mr. Malpas published the results of this work in the Ceylon Journal of Science.⁵

³ Munro, Ian S.R., The Marine and Fresh Water Fishes of Ceylon, Halstead Press, Sydney, 1951.

⁴ Pearson, Joseph, Bulletin of the Ceylon Fisheries, January 17, 1923, Vol.1, p. 2.

⁵ Malpas, A. H., "Marine Biological Survey of the Littoral Waters of Ceylon", 1926, Ceylon Journal of Science, 2, pp. 13-165.

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Mr. Malpas in his report divided the littoral waters of Ceylon and of South India into fourteen areas and thirty-five sub-areas ~~(and Pedro banks)~~

The Fifth Report of the Imperial Economic Committee on the subject of marketing and preparing for market of food stuffs produced within the British Empire was published in 1927. This Report contained some very pertinent sections on the tropical fishes and raised some valuable points, the chief among them were:⁶

1. That different opinions are held regarding the abundance of fishes in tropical waters as compared with the colder seas.
2. That fishes appear to move more rapidly in tropical waters than in colder seas.
3. That it is uncertain as to whether the steam trawler of the northern type is the best form of power vessel for use in tropical waters.
4. That both economically and commercially it is important to endeavour to stimulate the utilization of the by-products of the fishing industry; as for example, the preparation of fish manure for Ceylon and Indian plantations and the preparation of fish meal as a food for cattle and poultry.

This was the first indication of the interest evinced by the Imperial Government, which was a great source of encouragement to the Marine Biological Department of Ceylon. A study was already undertaken on the availability of the

⁶ Pearson, Joseph, Administration Report of the Marine Biologist for 1932, p. f.10.

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food fishes of considerable economic value. The biological surveys also revealed that there were large areas for trawling on both the Wadge and Pedro banks.

Another little known fact is that there are good prospects for a whaling industry. In 1928, a Norwegian whaling company was prospecting in Ceylon waters and reported the presence of numerous whales and prospects of whaling industry being very favourable, the Legislative Council passed an Ordinance controlling whale fishing in Ceylon.⁷ (Vide Appendix 1).

Trawler fishing was attempted by the Government trawlers, the 'Lilla', the 'Violet', the 'Nautilus', the 'Reglan Castle', the 'Halpa' and recently by the 'North Star' and the 'Canadian', but they were mostly experimental and confined to the wadge bank.

⁷ Administration Report of the Marine Biologist for 1935, Malpas, A.H., Government Printers, Ceylon, 1936, p.G.8. The first licence under this Ordinance was issued to one Mr. K. Berntzen on behalf of Messrs. Industrial Maritima S.A., for a period of 5 years. But he never began whaling operations, for in September, 1931, the League of Nations adopted a convention for regulating whale fishing designed to prevent the uneconomic exploitation of whales. The State Council agreed to accede to this Convention and passed an Ordinance No. 49 of 1935 amending the Whaling Ordinance No. 30 of 1928, to bring Ceylon legislation into line with the provisions of the International Convention for Whaling and Whaling Industries Act of 1934.

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Apart from these intermittent experiments, no comprehensive work on oceanography has been so far done. Recently Mr. Robert G. Snider, co-ordinator of the International Indian Ocean Expedition visited Ceylon in connection with the work of the oceanographic exploration of the Indian Ocean. The data obtained by this expedition may provide essential information on which decisions can ultimately be reached on the nature of fishery operations, markets and methods of marketing, extent of investment and related development problems.

Meteorological information related to oceanographic knowledge obtained on a synoptic basis may lead to better long range weather forecasting. Charting and sampling the ocean floor through soundings, geophysical measures, dredging and photography may provide information useful for navigation and fisheries and may reveal resources of economic value hitherto unknown.

It has also been established that the oil sardine has been very much underfished in the Indian Ocean. Not long ago, in 1948, British planes flying over the Gulf of Aden, spotted out an 18 mile long shoal of sardines in the Indian Ocean. Samples taken were of unusually good flavour and a new kind of fish, tasting rather like salmon, was also found in the vicinity of the shoal. This was one of the world's biggest source of fish ever located.⁸

⁸ British Information Service, 27 February, 1948, p.8.

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What the fishermen of Ceylon need for their daily and seasonal operations is a direct and clear indication about occurrence and behaviour of the species their gear usually catch or their prospective gears may catch, in order to raise the results of their activities to the highest possible level.

Lack of knowledge about the fishing grounds, their location and quality has been hitherto a serious handicap. Fishing in Ceylon has been generally a sort of blind fishing. Only those who were lucky enough to spot a shoal could effect a reasonable catch.

(2) Poverty and Indebtedness

Despite the fact that the fishery resources of the sea are the richest and the most indestructible known to man, paradoxically enough, the fishermen are generally not wealthy and as Professor Scott Gordon has put it: "By and large, the only fishermen who becomes rich is one who makes a lucky catch."⁹

One of the reasons why the fisherman's income is low, is due to the fact that his opportunity costs are low. His opportunity costs are low because "he is generally unadaptable geographically or industrially".

Professor Gordon adduces two other reasons to explain why fishermen in general earn typically less than most other occupational groups, even in much less hazardous occupations

⁹ H.Scott Gordon, "The Economic Theory of a Common-Property Resource: The Fishery", *Journal of Pol. Ec.*, April 1954, p. 132.

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or in those requiring less skill. (1) The great immobility of fishermen: "Living often in isolated communities, with little knowledge of conditions or opportunities elsewhere; educationally and romantically tied to the sea; and lacking the savings necessary to provide a 'stake', the fisherman is one of the least mobile of occupational groups". (2) "There is in the spirit of every fisherman the hope of the 'lucky catch'. The fishermen are generally gamblers and incurably optimistic. It is this gambling spirit that makes many of them work for less remuneration than they would accept as a weekly wage because there is always the possibility of a good catch and a financial windfall".¹⁰

The fisherman in Ceylon, like many of his counterparts in other parts of the world, is generally caught in the 'vicious circle of poverty' which Professor Nurkse has defined as "the circular constellation of forces tending to act and react upon one another" in such a way as to keep a poor man in a state of poverty.¹¹

A fisherman is poor because his income is low. Because his income is low, his savings are low. Because his savings are low, his investments are low. Because his investments

¹⁰ Ibid., pp. 132-134.

¹¹ Nurkse, Ranger, Problem of Capital Formation in Underdeveloped Countries, Oxford University Press, New York, 1957, p. 4.

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are low, his productivity is low. Because his productivity is low, his income is low and therefore he is poor and so the circle goes on.

Another cause of poverty among fishermen in Ceylon is their ignorance. In some of the fishing villages, the children do not go beyond the primary school because (a) the parents are too poor to afford a higher education, in spite of the existence of a free education scheme from kindergarten to the university stage. The incidental expenses for books, clothing and stationary are a heavy burden on poor parents; (b) for economic reasons the education of the child is terminated early because a boy working or assisting in the hauling of the inshore seine net, is usually entitled to half share, which invariably augments the family income; (c) or, because to enable the boy to get an early training in his father's trade.

The monsoons have also contributed to the poverty of fishermen in Ceylon. During the South West monsoon, those living in the west coast of the Island are almost entirely deprived of their livelihood except for a few fishermen who migrate to the east coast. Those living in the east coast seldom or never migrate during the North East monsoon. Thus during both monsoons a large section of the fishermen are deprived of their main source of income and have to fall on their past savings, or borrow from the middleman.

The fishermen in Ceylon also have a tendency to incur

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expenses of a religious and social nature. They undertake annual pilgrimages to religious places of worship or contribute liberally for the maintenance of their churches or temples. They also spend lavishly on ceremonial occasions like marriages, funerals and puberty ceremonies.

These various factors have driven the fishermen to live above their means and consequently a large portion of the fishing population lives in perpetual debt.

But the occupational indebtedness of the fishermen is a far more serious problem. It is the "sammatties" or entrepreneurs that are heavily indebted to the middlemen. Owing to the uncertainty of the catch and the heavy circulating expenditure needed to maintain the daily fishing operation, the entrepreneurs have often to run to the middleman who advances them money on the condition that the entire catch during any particular season is sold to him at pre-arranged prices. These prices are usually fixed at the lowest anticipated level. His agent is present at the landing point to collect all the fish. The middleman also organizes the packing, transport and disposal of the fish.

The national Government tried to extricate these fishermen from their chronic indebtedness by granting loans through the Department of Fisheries to individual fishermen. But the abuse of the loans compelled Government to stop issuing loans to individual fishermen from August 1948.¹²

¹² Times of Ceylon, August 18, 1948.

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Indebtedness, as a permanent feature is no doubt very detrimental to any prospects of fishery development. It stifles production incentive because the fisherman is haunted by the distressing thought that any increase in his effort will be immediately appropriated by the middlemen, through lowering the prices. The solution of this incentive problem and the problem of the indebtedness of the fishermen which are so intimately connected, are of very great importance in any scheme for the development of fisheries in Ceylon.

(3) Horizontal and vertical immobility of labour

It is not so much the disguised unemployment as the immobility of labour which constitutes a serious obstacle to the development of fisheries in Ceylon. The chief reason for horizontal immobility of labour in general, in Ceylon, is the caste system. Social tradition has labelled certain occupations as 'low'.

A number of occupations in Ceylon are no doubt associated with social castes with certain disabilities attached to them. It is remarkable, however, that agriculture and fishing are perhaps the only two occupations that are being worked by almost all castes in Ceylon. Foreign ^{writers} ~~visitors~~ ignorant of the different communities engaged in fishing have erroneously classified them as "fisher caste" and given them an inferior status, though many of those engaged in fishing in Ceylon belong to the higher castes. At this juncture some

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explanation may be necessary to break this misconception and prejudice. Even a person like Dr. Ivor Jennings, at one time Vice Chancellor of the University of Ceylon, writes thus in his *Economy of Ceylon*.¹³

In many countries with a sea board as long as that of Ceylon and a sea less fruitful than the Indian Ocean, agriculture and fishing go together. When the fisherman is not at sea, he is looking after his crops; when the agriculturalist is not looking after his crops he is at sea. The two would fit very well in Ceylon, when the monsoons restrict the fishing season. Unfortunately, social tradition prohibits this marriage of the two industries. Fishing is by social tradition limited to certain castes and the fishermen generally do not own or cultivate land.

This is evidently a misrepresentation of facts.

There are several places in Ceylon where the fishermen own or cultivate land, for example Mullaitivu, Batticalao, Hambantota, Mantota and Vankalai. If cultivation is not done by the fishermen in other places it is not because "social tradition" prohibits them from cultivating, but due to other reasons: (1) They may be living in towns where land is not available for cultivation; (2) Where there is land available the land may be unfertile and unfit for cultivation; (3) Those who have suitable land may not have the time to engage on cultivation, for instance, in the northern part of the Island where there is fishing right through the year; (4) Those who migrate from the west coast to the east coast during the South West monsoon from May to October cannot hope

¹³ Ivor Jennings, *The Economy of Ceylon*, Oxford University Press, October, 1951, p. 56.

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to cultivate land even if land is available; (5) and those who do not migrate during the monsoon do cultivate land if they own land or do not cultivate because they are too poor to own a cultivable plot of land.

Neither is fishing limited by "social tradition to certain castes". For we find the fishermen of Ceylon belonging to almost every caste. Among them we find the Karawas, the Barathas, the Salagamas, the Goigamas, the Duravas, the Timilas, the Pallivilles, the Mukkuvas, the Kadayars, the Nalavas, the Pallas, and the Parayas who carry on marine fishing while fishing in the inland waters is carried on by a number of other castes.

Even the Kings of Ceylon and the Kshatriyas of old were not averse to fishing. The Sinhalese Kings of the Kavan Tissa's line seem to have retained the "Fish" emblem, for Neville writes: "The inscription (in Henane Gala, Lower Bintenne, Eastern Province) is followed by the arms of Cavanno Tisso's family, cut elaborately and on a large scale... where the fish is clearly drawn with pectoral and dorsal fin, eye and gill".¹⁴ It is also found as the sole emblem on Nissanka Malla's lion throne now preserved in the Colombo Museum.

The Kalvettu or Rock inscription on the Koneswara Temple at Trincomalee has the emblem of a double fish, said

¹⁴ H. Neille, Taprobana, December, 1885, p. 39.

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to have been the emblem of the Tamil King. When the Temple was destroyed by the Portuguese, the slab containing this inscription with the double fish emblem was fixed to the right wall of the entrance to the Trincomalle Fort, and can be seen to this day.

Fr. Gnanaprakasara, the eminent historian and philologist, says: "As for fishing itself, for a matter of that, the ancient Kshattriyas themselves could have had fishing as their usual occupation barring times of war. Fishing like hunting was in ancient times a royal pastime".¹⁵ The Kshattriyas constitute a tribe of warriors and were at one time the exclusive possessors of regal authority.¹⁶

The Brahmans who form a very negligible portion of the population of Ceylon were originally set apart for the priesthood and their functions are summed up in the "Thuravaram" section of the Thirukural. The educated orthodox Hindus have often pointed out that the prohibition of killing and eating flesh meat is found prescribed in the "Thuravaram" which outlines the virtues to be practised by the Brahmans. No such prohibition is imposed on the laity in the section dealing with "Illaram" or domestic virtues to be practised by the laity. The Dasabrahamana Jatika states that the

¹⁵ Jaffna Catholic Guardian, April 30, 1921.

¹⁶ The Castes, Casie Chitty, Colombo, 1860, pp. 27, 28.

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Brahmans had various occupations including fishing and hunting.¹⁷

There is a village in Ceylon, about 15 miles north of Colombo, called Pamunugama. The tradition of the place is that it was once known as Bamunu Gama meaning village of the Brahmans. Today its inhabitants call themselves Goigamas and they carry on an extensive and well-developed inshore fishing. The neighbouring villages like Capungoda and Indurava, are inhabited by the Goigama community, which is likewise engaged in fishing. The major portion of the inshore seine fishing carried on in the fertile fishing grounds off the island of Karativu, is owned and operated by the Goigama people of Pamunugama.

Similarly in the North, there are places in Batticaloa and in the islands off Jaffna where fishing is the chief or part-time occupation of the people of the Vellala Caste.

At Pallimunai in the Mannar Island, there is an entirely distinct ethnic group which goes by the name of Cannadias, and is mainly engaged in fishing.

There is also another misguided notion in the minds of some Westerners that in Buddhist countries from Ceylon Eastwards, fishing is regarded as ignoble, since it involves taking of animal life. In Ceylon, however, most of the

¹⁷ Who are the Kuru-Kulams of Jaffna? Colombo, 1956, p. 1.

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fishermen living in the South are Buddhist. There are also fishermen among the Hindus, Muslims as well as Christians. Therefore, there cannot be any limitation on the entry into this occupation.

Even if there exists any prejudice it should be easy to break down the barriers in this occupation and no other group is capable of expanding in terms of labour supply as in the fishing industry.

The horizontal immobility in fisheries is conditioned by other social and economic factors. One reason for immobility of labour in Ceylon is the deep attachment to the home and village and it is hard to persuade people to seek employment away from their homes.

Fishing as it is, is not remunerative enough to attract surplus labour. Besides, fishing is a hazardous and excessively strenuous occupation and hence man power is necessarily restricted by consideration of its strength and endurance. It involves some form of physical hardship.

Another outstanding obstacle to the recruiting of labour is the high degree of uncertainty attached to the fishing operation. There is first the uncertainty of the quantity and the uncertainty of the price. The total catch of a whole fishery may vary from one season to another or because of the difference in the catch of one boat on successive trips. The quantity of catch may fluctuate from a boat load to an empty net for days on end.

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Fishing operations are also affected by fluctuations in the prices and the risk involved because of the perishability of fresh fish. Fluctuation in the prices of factors of production - the wages for labour, the interest on capital, and the prices of strings, twine and nets can also affect the industry.

Fluctuations in the supply of fish also have a strong impact on the labour situation. The total labour force required to handle peak landings is correspondingly high, while during the lean months, much of the labour has to be kept idle. The quantity landed has repercussions on the labour engaged in packing, transporting and marketing.

A sudden increase in operating cost can have disastrous effects on the various fishing enterprises because of the elastic demand of fish. The fluctuating demand for fish can also have an adverse influence on the labour market.

A shortage of other foodstuffs such as meat or eggs can stimulate an increase in demand for fish.

In general, marketing of fresh fish is characterized by its extreme sensitiveness to various fluctuations which occur not only seasonally, but also daily and even hourly especially in the highly urbanized consuming centres like Colombo. For the Colombo fish market today dominates the fish trade and prices.

Fisheries in Ceylon are also characterized by the

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vertical immobility of labour. Owing to organizational weakness and lack of opportunities for promotions or higher appointment vertical mobility in the fishing industry as it exists today is greatly hampered. The utmost a labourer can hope for, if he is thrifty and provident, is to become a small independent entrepreneur. But the process is painfully slow.

The unattractiveness of the fishing industry has resulted in the present tendency of the younger generation in the fishing villages to migrate to larger towns to take up more lucrative work. Organization of the industry on modern lines and a good scientific fishery education can only stop this exodus.

(4) Inadequacy of Capital

The supply of capital and the demand for capital both revolve in the same vicious circle. The supply of capital is governed by the ability and willingness to save; the demand for capital is governed by the incentive to invest. On the supply side there is the inability on the part of the fishermen in Ceylon to save due to the low level of their real income. This low level of income is the result of low productivity which in its turn is due to lack of capital. The lack of capital is a reflection of the small capacity to save and thus the circle is complete.

On the demand side the inducement to invest in fisheries is low because of the small purchasing power of the fishermen.

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which is due to their low real income, which again is due to low productivity. The low productivity is in turn the result of the small amount of capital used in production, which again may be caused by a lack of inducement to invest in fishery enterprise.

Income is so thinly diluted among the fishermen that there is hardly anything left for saving. Even to muster the little savings of the few, there are no proper facilities or institutions. The banking system in Ceylon is not accessible to the fishermen who are too poor to make themselves credit worthy.

The structure of the capital market in Ceylon is so constituted that it caters only to the rich to make them richer. The fishing industry is undercapitalized partly due to the rigidity of the capital market in Ceylon. It is the only industry that is badly served or not served at all by the credit institutions in Ceylon. Even the cooperative credit unions are practically non existing among the fishermen. The 55 Fishermen's Cooperatives which are members of the Ceylon Co-operative Fish Sales Society are merely fish marketing societies. Efforts to form producers societies among the fishermen have so far proved abortive either because of lack of capital or because of political intrigues. The loans that were given to the fishermen through the societies were more or less direct loans from the Fisheries Department.

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The inefficient utilization of the capital market in Ceylon has been the greatest obstacle to the development of the fishing industry. If this industry is to make any headway more and more capital will be needed to finance development programmes. Capital is the life blood of business and of economic activities. Purchasing power is needed to buy equipment, to build boats, to make or purchase nets and engines to mechanize the industry.

(5) Dearth of Entrepreneurs and Absence of Technological Skill

If Schumpeter's analysis of the economic growth of advanced capitalistic countries is correct, it is the innovating entrepreneur who is the driving force behind all developments. As Kaldor pointed out: "He is a promoter, a speculator, a gambler, the purveyor of economic expansion generally, and not just of the new techniques of production".¹⁸

It is only a creative entrepreneur who can discover the potentialities in a place, create a demand, move factors from unproductive to productive enterprises. In short he is the "functional foreman" who handles the ropes of economic progress. Without him, it is doubtful if the mature countries

¹⁸ Kaldor, N., "Economic Growth and Cyclical Fluctuations", Economic Journal, March, 1954, p. 71.

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could have advanced so fast, even with all the natural resources and capital at their disposal. Entrepreneurship, conceived as risk-bearing, is primarily an art which requires an adventurer's mind.

It has become fashionable among economists to deplore the absence of Schumpeterian entrepreneurs in underdeveloped countries. Many of them have dwelt at length upon political, sociological and historical explanations for this shortage. Although such non economic explanations are not to be despised, it must however be admitted that most underdeveloped countries possess a reasonable number of people with entrepreneurial talents. Take for instance, Ceylon and the fishing communities in particular. The middlemen, the shopkeeper and the money lender in the fishing villages are by no means lacking in entrepreneurial qualities. These men are not devoid of courage and imagination. Though operating on a small scale individually, they have sought out and developed new economic opportunities. The more successful individuals are able to enlarge the extent of their operations; the accumulation of experience and capital from earlier profitable ventures have often helped this process along. These people behave in a subjectively rational fashion when they adopt short economic horizons and avoid long-term commitments in the fishing industry. The following statement of Gunnar Myrdal is illustrative:¹⁹

¹⁹ Myrdal, C., An International Economy, New York, 1956, pp. 202-203.

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It is.... highly characteristic of all the under-developed countries that their business classes are bent upon earning quick profits not by promoting long-term real investment and production but by buying and selling, money lending, and other easier ways of making money, which also escape taxation. Profits tend to be invested in land, or else hoarded or transferred abroad, when they are not dissipated in a costly display of wealth and social status. There is a low propensity to save and to invest productively in new enterprises".

Thus the "business classes" in Ceylon are not necessarily behaving irrationally when they choose to maximize their profits in the shortest possible time. Considering the special circumstances in Ceylon, their decisions may constitute a perfectly rational evaluation of the structure of economic opportunities. It is unlikely that "westernized" entrepreneurs would have behaved differently when confronted with the same "spectrum of alternatives".²⁰

This propensity to engage in short term speculative ventures in Ceylon which represents a behavior pattern can "disappear or significantly decline in importance" only "in the face of a drastic outward shift in the marginal efficiency of capital schedule".²¹

By far the most significant factor is the absence of foreign entrepreneurs among the fishing communities in Ceylon which has been to a great extent responsible for the lack of

²⁰ Rosenberg, N., "Capital Formation in Underdeveloped Countries", The American Economic Review, September, 1960, Wisconsin, U.S.A., p. 714.

²¹ Ibid., p. 715.

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sufficient stimulus for more local entrepreneurship. Fishing villages are some what closed economies, where the presence of foreigners or strangers are not generally tolerated. In other places, foreign entrepreneurs have been largely responsible for bringing many underdeveloped countries progressively more closely in contact with the net work of international commerce, and they have introduced some of the fruits of modern organization, capital, know how and technology, and, in the process, they have provided opportunities for native entrepreneurs.

We have the example of the immigrant Chinese in South East Asia, of Indians in East Africa who have done much to further the growth of the exchange sector of backward economies. They have accumulated capital, provided skills and aptitudes not present or developed among the local people, and have pioneered in the development of trade, transport and industries. Their influence has been more widespread than the activities of the large-scale European mercantile, industrial and planting concerns. The Chinese immigrants have contributed very much to the economic life in Malaya, and their economic superiority over the indigenous Malays is due to their greater industry, ingenuity, thrift and resourcefulness. Similar traits were exhibited by the Indian and Muslim immigrant trades who had in course of time amassed wealth in Ceylon.

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The secret of their success is that initially they are accustomed to a low standard of living, so that they are prepared to accept very low incomes and are able to operate as traders in regions where the turnover is very small. The presence of these traders at the economic frontiers often provided a demand for the output of the local producers and acquainted them with the goods which were hitherto unknown to them.

These immigrants also had a high propensity to save. It is remarkable how these immigrants who entered the country with little or no capital have often contributed greatly to capital formation by spending less than their incomes. We have the classical example of the continuous capital accumulation by the poor immigrants in North America.

The greatest contribution these foreign entrepreneurs can make is that they stimulate and foster local entrepreneurship both directly by providing training and experience to employees who usually pass through a period of apprenticeship and later strike out on their own when they have accumulated sufficient capital.

In Ceylon entrepreneurship is greatly influenced by the type of ownership of the enterprise. In fisheries, the family type of ownership has become the traditional one. From the consideration of family, there is an easy transition to other forms of social organizational units most favourable for the development of the industry. Social clans, racial

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and even religious groups would easily lend themselves for co-operative efforts in the reorganization of the fishing enterprise.

Ceylon fishermen belong to different racial, ethnical and religious groups and each group, therefore, could easily be knit into efficient organization unit. The most enterprising in each group may well provide potential entrepreneurs for the industry.

The absence of technological skill has also greatly contributed to the stagnation of the fishing industry in Ceylon. It is not only quantitative labour but also qualitative labour that is markedly lacking in this industry. Technical skill can only be acquired by sound technical education and training programmes. Hitherto the education system in Ceylon had been lopsided. Emphasis had been on the academic side but the practical training was completely neglected. Some effort is being made now to remedy this situation. Unless there is some drastic change in the curriculum of the schools in the fishing areas giving a fishery bias and until special fishery training schools are opened at least in some of the most suitable centres around the Island to provide a progressive and intensive course of training in fishery science and fishery techniques, there can be no hope for any substantial fishery expansion unless, of course, Ceylon is prepared to import technical skill indefinitely.

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(6) Organizational Weakness

Organizational weakness has hitherto been a hindrance to the improvement of the lot of the fishermen. The efficient organization of the industry, especially on the distribution side has been hindered by the monopolistic position of the local fish dealers and the middlemen. The wholesale marketing system based on middlemen is detrimental to both the fishermen and the consumers. Loans and subsidies to fishermen can be offset by the severely restricted marketing channels and the resultant monopolistic position of the middlemen. Thus the marketing organization poses special problems which have to be overcome in the successful promotion of co-operatives among fishermen which have to compete with the firmly entrenched fish dealers. Fishermen's co-operatives have to engage successfully in commercial operations connected with a fluctuating volume of excessively perishable commodity like fish which must be handled and distributed. The Ceylon Fish Sales Union that was formed in 1952 should be encouraged to expand its activities and enroll as many fishermen's co-operatives as possible, and to provide fish transport facilities to its member societies, and, as in Hong Kong, retain compulsorily a certain percentage of the sales as savings of the fishermen.

At present one of the greatest obstacles encountered by the fishermen is the lack of quick transportation of their

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catch from the fishing grounds to the markets. The introduction of motor boat service in most important fishing centres round the Island will greatly expedite the landing of fish so that it could reach the consuming centres in a fresher and more palatable condition. Besides, additional refrigerated railway vans could be attached to carry the bulk catch, and refrigerated or insulated trucks could also be used as is done in Japan. Fishermen must also be trained in better methods of degutting and packing in ice or in methods of quick freezing. Much of their efforts and toil are lost when fish reaches the market in a putrid state due to imperfection in the packing process. The reorganization of the packing, transportation and marketing system are the only effective means of ensuring adequate returns to the fishermen and reducing excessive distribution costs. The Co-operative Fish Sales Union offers the fishermen an alternative marketing outlet at guaranteed prices.

Public retail fish markets are at present in a deplorable condition. They must be modernized by providing more spacious and airy accommodation for stall holders. The Ceylon Fish Sales Union should open more fish retail stalls in Colombo as well as in other inland towns in Ceylon.

The existing consumer co-operatives should be encouraged to undertake the sale of fish, since its sale to consumers at reasonable prices would increase the consumption of

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fish, and the co-operative selling would also act as a check on profiteering by retailers. At present fish is sold mostly in retail fish stalls in the public retail markets. If plastic wrappers could be imported, the sale of fish in such containers could be undertaken by the various consumer co-operatives throughout Ceylon. With the expansion of population, industrialization and urbanization, there will arise new opportunities for promoting fish consumption arising from the greater convenience of marketing a perishable product like fish in urban centres, and the higher incomes will support heavier purchases of fish products.

The obstacles to fisheries development in Ceylon which we have so far examined are by no means insurmountable. Lack of understanding the fundamental causes underlying these obstacles has been largely responsible for the tardy progress made so far in the development of the fishing industry in Ceylon. There is one more problem that should be closely analysed before we set out to consider the proposals for the improvement of the industry, namely, the problem connected the remuneration to factors of fishery production. This we shall treat in the next chapter.

CHAPTER III

REMUNERATION TO FACTORS OF FISHERY PRODUCTION IN CEYLON

People do not give their labour and energies for economically productive purposes unless they think the reward is worthwhile. The fishermen in Ceylon, however, have in the past carried on an activity that has been not sufficiently rewarding. They contented themselves with receiving a much smaller percentage of the money paid by consumers of fish than is received by producers of other food commodities.

Theodore Morgan of the University of Wisconsin, for a time attached to the Bank of Ceylon, made a study of the distribution and level of income in Ceylon,¹ based on information from a survey administered by Dr. Harry Cullumbine in December 1950, in co-operation with the Department of Medical and Sanitary Services of the Ceylon Ministry of Health and Local Administration. According to Morgan agricultural labour like farmers, peasant cultivators and gardeners earn a median income of Rs. 49 and a mean income of Rs.64 per month, as indicated in Table VIII.

¹ Morgan, T., "Distribution of income in Ceylon, Puerto Rico, United States and United Kingdom", The Economic Journal, December, 1953, Vol. LXIII, pp. 821-834.

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TABLE VIII

Income levels by occupations in Ceylon
1950

Occupations	Percentage of families in sample	Rupees per month	
		Median income	Mean income
1. Higher professions: doctors, lawyers, plan- ters, business men, civil servants, etc.	1	329	359
2. Sedentary work: teachers, clerks, tailors, draughts- men, accountants, post- men, etc.	8	179	200
3. Field Officers of the Govt., public works, poli- cemen, surveyors, rural development officers, village headmen, etc.	3	167	191
4. Factory and office super- visors: storekeepers, factory overseers, foremen, market supervisors, etc.	1	172	192
5. Heavy Labour: all estate workers, harbour workers, mechanics, masons, carpen- ters, road workers, etc.	31	70	85
6. Light labour: domestic ser- vants, salesmen, shop assis- tants, boutique traders, etc.	24	60	82
7. Agricultural labour: farmers, peasant cultivators, garde- ners, etc.	30	49	64
8. Others	2	103	154

Source: T. Morgan, The Economic Journal, Dec. 1953, p. 830.

Morgan had not worked out separate figures for the fishermen in Ceylon. The present writer made a sample study of five fishing villages in North Ceylon, in September 1959 and the daily income and expenditure of 71 "sammatties" or entrepreneurs and 71 labourers by means of a questionnaire.² The average income per month of labourers in the fishing enterprise is only Rs.58.

In Ceylon due to the primitive character of the fishing and its technological backwardness, the total cost of production is generally higher than in technologically advanced fisheries. In other words the input of capital, labour and other factors required to produce an output is fairly high in a primitive fishery.

(1) Remuneration to Labour

In most cases fishermen's earnings depend wholly or largely on the value of the catch and their remuneration falls into the following pattern: (1) Share system, (2) Wage system.

1. The Share System

The share system in its purest form consists in the payment of an agreed fraction of the proceeds from the catch

² Figures for the five fishing villages were obtained through the Secretary of the North Ceylon Maritime Association, September 1959. The figures collected were only for a month. To arrive at some more meaningful averages, figures have to be collected daily and for some years because of the irregularity of the catches.

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to each member of the crew. Under this system the proceeds from the sales of the catch is shared in the following manner; if there are 12 operating the seine net the proceeds from the sale of their catch is divided into 15 parts. One share is earmarked for the capitalist owner or "Sammatti", 2 shares for his boat and net and the rest is equally divided among the 12 who worked. The boys who help get generally half a share.

This form of profit sharing sharply distinguishes the fishing industry from practically all other industries with regard to labour remuneration and cost. In this respect the fishing industry could be considered unique. Under this system there is a heavy reliance on the crew doing the best possible job, and a direct dependence on individual initiative.

In this group of enterprise the crew is often composed of relatives and friends, and labour contracts are rather informal. The decisions as to the timing, place and method of fishing are generally taken jointly.

The share system has definite advantages, namely:

(i) It provides great incentive for better production, since the size of their share is tied to the quantity of the catch, they will be only too willing to increase the hours of operation.

(ii) It also gives incentive for careful handling of catches.

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(iii) It involves a division of risk between the owner and the crew. The important thing about the share system is that labour costs vary with the proceeds of the catch, thereby mitigating to a great extent capitalist owner's risks involved in fluctuations of proceeds due to sharp variations in price and quantity.

(iv) The share system also encourages cost minimization in respect to things charged against the share.

(v) Where capital is scarce, the share system economizes capital for the owner in any risky circumstances.

(vi) The share system makes use of the 'psychology of the big packet' in a way that a fixed wage cannot do.

(vii) A keen crew means a competitive advantage where there is much competition between boats and boat owners.

(viii) Where the auction of fish is prevalent, the sharing system gives the fishermen a clear view of supply and demand conditions and they come to know the ruling prices.

(ix) Another advantage is that a system of 'incentive by share' will be more successful in persuading fishermen to work hard, and as a result of the incentive effects of the system, labour productivity in the industry will be considerably higher than it would otherwise be.³

³ H. Zoetewij and I. Bowen, 'Fishermen's Remuneration, Economics of Fisheries, F.A.O., Rome, 1957, pp. 18-35.

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For the above reasons it will seem clear that the effects of the share system on the allocation of resources and on general economic welfare tend to be favourable.

The Share System and Investment

Much of the difficulties in the fishing industry could be ascribed to lack of investment and innovation. If this industry has lagged behind it is partly due to the lack of capital. The share system may benefit the crew but not necessarily the owner capitalist. There are four reasons why the share system has discouraged investments:

(i) There is no inducement to invest because any increase in proceeds due to new investment will have to be shared automatically with the crew. Hence there is a tendency on the part of the owner capitalist to keep investment low.

(ii) Under the share system, the share going to the crew is relatively high, proportionate to total costs and revenues in the industry. As the system exists in Ceylon, only 3-15th or 20 per cent of the total proceeds goes to the owner and the rest is shared among the crew. In the United States one of the most common agreements is that 40 per cent of the net proceeds, after deducting the joint expenses goes to the vessel and 60 per cent to the crew. In English drifting, 7-16th of the boat's net earnings are shared by the crew, while in Scotland, in steam drifting, one-third of net proceeds goes to the crew, and on board motor drifters three-

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eighths; under Norwegian collective agreements 26 to 32 per cent of the gross value of the catch goes to the crew.⁴

(iii) The share that goes to the owner capitalist in Ceylon represents depreciation, interest and profit income. There is hardly anything left for investment or innovation. The desire to improve the industry remains unsatisfied. The owner capitalist has to bear the cost of the boat over its life. He has also to meet the expenses of the repair of net and boat that are so frequently damaged in the reef girded coast of Ceylon.

(iv) The crew share the profit but do not share the loss in Ceylon. The net may be carried away by currents, the boat may founder on the rocks, the crew do not share in the loss. It is the owner capitalist who has to bear the brunt of any irreparable loss. Loss sharing is prevalent in some countries like the United States "where in the Pacific Coast Fishing, when the 'net stock' (gross proceeds of the catch minus contractual deductions - including the boat owner's share) is negative a portion of the loss is charged to each member of the crew".⁵

⁴ International Labour Office, Conditions of Work in the Fishing Industry, Geneva, 1952, pp. 77 and 71.

⁵ James A. Crutchfield, "Collective Bargaining in the Pacific Coast Fisheries: the Economic Issue", Industrial and Labour Relations Review, July, 1955, p. 542.

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(v) The flexible nature of the share system also greatly adds to the uncertainty of the marginal efficiency of capital in the fishing industry. The entrepreneur here when making investment cannot make his decisions on the basis of finely-calculated comparisons between prospective yields and the rate of interest, but must decide on the basis of a more or less conservative subjective estimate of the order of magnitude of the past yields.

Thus the depressing influence of the share system on investment and innovation has greatly retarded the modernization of the fishing industry which has remained backward compared with other industries where labour cost is fixed per unit of time.

The share system as it exists now reduces capital accumulation, provides less incentive to investment and militates against the development of the fishing industry.

2. The Wage System

The wage system is more widely used in inshore seine fishing than the share system in Ceylon. Generally the share system is confined to smaller groups, while the wage system is prevalent among the larger groups. The labourers are paid a monthly wage plus three meals a day, with a free supply of tobacco, betel and a periodic drink of tea during the working hours.

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In the case of migrant fishermen, the owner capitalist pays an advance and the travelling fare. This involves a greater risk. It is a contractual wage, the owner capitalist has to pay the stipulated amount irrespective of the catch and the prevailing prices. Occasionally, some labourer may decamp with the advance received after a few days work.

The owner capitalist in Ceylon is locally known as "Sammatti" in the North and "Mudalali" in the South. He hires generally 25 to 30 men plus 10 to 20 casual hands. The "Mudalali" erects sheds or "vaadies" on the shore to accommodate his men. He supplies the provisions, and cooking is done in turns among them. He also looks after their health and gives them a day off on Sundays and feast days. The normal wages varied from Rs. 20 for bachelors to Rs.40 to those with a family. They all work like a team.

The "Mudalali" also generally has his icing and packing sheds separately erected and a lorry or van transports his fish to the nearest railway station, or direct to the consuming centres. For that purpose he has a special team of skilled or trained workers.

There is no such thing as "collective bargaining" nor any semblance of trade unionism among the workers. They do not follow the usual pattern of labour-management relations. We cannot expect to find in this sector, trade unions in the sense of organizations promoting the interests of workers

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against those who employ them. But there are other organizations like the Central Fisheries Union, the North Ceylon Fishermen's Welfare Unions and the Jaffna Maritime Association through which the owners and crew jointly defend their common interests.

Even in the case of the wage system there is a very close and intimate relation between the capitalist manager and those who work under him. Both the manager and the wage earners are members of the same welfare unions.

The desire for security compels workers to prefer the fixed wage system to the share system even though the long-run average earnings are higher in the share system.

The wage earners are the poorest among the fishermen. Those working on a share basis are very much better off and some of them are even in a better position than the small independent fishermen.

The Wage System and Investment

Though the wage system has definite advantages over the share system from the point of view of the owner capitalist, yet in Ceylon it has had a depressing effect on investment. The wages are fixed irrespective of the catch. The risk is entirely borne by the owner capitalist.

As long as the labourers are assured of their fixed wages there is no incentive to increase production or lengthen

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the work hours. The owner has to be constantly vigilant to get what work he could get out of them.

The wage earners' heart may not be in the tank if they have to toil on the burning sand or in a stormy and wet weather. Only a perpetual vigilance on the part of the entrepreneur could ensure efficient work. Production may languish for a want of proper supervision, and lack of personal interest.

Seine fishing in Ceylon has been mainly a 'blind fishing', and Professor Scott Gordon's saying "by and large, the only fisherman who becomes rich is one who makes a lucky catch" eminently fits the Ceylon ^M"Mudalai". Beach seining in Ceylon is either "blind seining" or "shoal seining". "Blind seining" is carried out without sighting any fish beforehand. In this method of fishing, the net is set at times and in places where experience has shown where good catches could be realized. In the "shoal seining" method, the nets are set around a surfacing shoal of fish that has been sighted by watchers posted for that purpose either on land or off shore in boats.

Even if a shoal is sighted, the shoal must move sufficiently close to the shore to enable the fishermen to entrap it within the limit of the seine net. There have been cases when successful catches have suddenly enriched the entrepreneur. Such men have reinvested and expanded their

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enterprise and even have gone into processing and marketing. These, however, are exceptions. By and large many an enterprising capitalist has met with ruin due to long periods of unsuccessful fishing.

Even the capitalist who made his money due to good luck, is hesitant to invest in new enterprises, as much of his earnings will be needed to hedge against the unlucky and lean periods.

Investment in modern western fishery must not be based on the hopes of a lucky strike. Scientific knowledge and modernization have considerably reduced uncertainties associated with fisheries. Under a primitive system, the marginal efficiency of capital can only be pure conjectures.

Wages and expenses on food alone absorb a very large slice of the earning of the "Mudalai". There may be long periods during which he has to feed and pay the weekly wages to his workmen. There is high degree of uncertainty attached also to the estimates of the proceeds of the catch. The total catch of the whole fishery may vary from one season to another or from operation to operation, and may fluctuate from a boat load to an empty net for days on end.

Fishing operations are also affected by fluctuations in the prices and the risk involved because of the perishability of fish. Fluctuations in the prices of food, of strings, twines and net can also halt the pace of investment and innovation.

An enterprising "Mudalai" often tries to improve his gear, though he proceeds very cautiously. The multitude of factors and conditions with which he has to work is so varied that, as a rule, he can only advance very slowly if he wants to keep up his catches and avoid a serious loss of fishing hours. This is one of the reasons that accounts for the fact that improvements and gear types have seldom or never developed in Ceylon in the past.

The inshore seine fishing does not lend itself to any kind of modernization. An attempt made on the suggestion of the first Director of Fisheries in 1947 to use power-driven winches or capstans in place of manpower, proved a dismal failure. Beach seining is such a delicate operation that requires careful directing and lifting of the nets which often get entangled in the rocks, that no mechanical device could ever be a substitute.

(2) Remuneration to Capital

The very high rate of interest inhibits fishery development in Ceylon. A low level of indigenous capital has been mainly responsible for the very high rate of interest. Poverty and lack of lending institutions have compelled the fishermen to turn to the local money lender who invariably fixes a monopolistic and arbitrary rate.

Interest is a reward for bearing non insurable risks. The risks connected with fishery financing are comparably very

great and that is the main reason for the high cost of fishery finance, or the high interest rates demanded by the fishery financiers. The only way to improve the flow of capital to fisheries is to reduce the inherent risks.

Kirby and Szczepanik have suggested the following methods for the reduction of inherent risks in fisheries:⁶

(i) Spreading of information obtained by oceanographic, meteorological and biological research, as well as by the study of the methods of fish finding and catching. This substantially contributes to the reduction of fishery risks, but does not entirely eliminate them.

(ii) Combination and compensation of risks, for example, fishing for different species by the same unit; combination of deep-sea fishing with coastal fishing; fishing with different methods by the same enterprise. All these examples point to one common principle, viz. that through the operation of the law of large numbers, unfavourable events may be compensated by favourable events. From the economic point of view, this principle amounts to the establishment of an obvious case in favour of a large fishing enterprise.

(iii) Insurance.

Insurance is not applicable to all kinds of fishery

⁶ E.S. Kirby and E.F. Szczepanik, "Special Problems of Fisheries in Poor Countries", The Economics of Fisheries, F.A.O., Rome, 1957, pp. 96, 97.

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risks. No insurance company will guarantee the price or volume of catches; but craft can be insured, as well as gear and the life of the fishermen. This method, moreover, could be made available not only to large fishing units. Even small fishermen can use it if proper insurance facilities are organized. Japan can be cited as a good example.

(iv) Although price is not subject to insurance, the degree of price fluctuation can also be diminished. One way is to use storing as a sort of buffer stocks policy. Another way is to spread market information. In Japan, for example, fishing units at sea are in radio communication with a number of markets with highest prices, thus levelling the price all over the country at a fairly stable figure.

Of these four methods of reducing fishery risks, the spreading of information, at present is nil; for neither the oceanographic nor meteorological, nor the biological research conducted in Ceylon has advanced far enough to be of any practical use for local fishermen. Experimental fishing carried on in the Wadge Bank and the Pedro Bank has so far not attracted local capital. The information collected by the Ceylonese-Japanese owned trawler may provide a useful guide for other similar ventures.

The method of combination and compensation will no doubt have very beneficial effects, but it involves a very large scale fishing enterprise. If capital could be found,

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there is possibility, however, to combine the present inshore fishing with mechanized deep-sea fishing.

As regards insurance, there is no such thing as insurance for the fishermen in Ceylon. That has been the greatest obstacle for the flow of capital to the fisheries. A scheme of fish boat and net insurance similar to the one introduced in Japan in 1937, may well be adopted in Ceylon. It consists of a system of mutual insurance of boats and fishing gear and is run by the fishing boat insurance associations which are formed by the boat owners themselves. The Government maintains a special fishing boat re-insurance account which re-insures 90 per cent of the total insurance sums. In case where fishing boats are submerged or damaged on account of disaster or accidents, they are insured under the Government re-insurance system in accordance with the Fishing Boat Loss Compensation Law. It is compulsory for similar fishing boats of less than 100 gross tons to be insured under certain conditions and a certain part of the premium is paid by the Government.⁷

Fishermen in Ceylon have suffered serious damage from recurrent cyclones and other natural disasters every year. No statistics are available regarding the annual casualties at sea.

⁷ Japanese Fisheries, Asia, Kyokai, Japan, 1957, p. 185.

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Such casualties are usually the result of sudden squalls which the observatory is generally unable to forecast and hence the fishermen are not forewarned in time.

In times of distress, rescue parties of experienced fishermen go to their comrades' assistance. In some cases, the Catholic priest or a Government officer may represent matters to the Master Attendant in Colombo, who sends out a rescue boat whenever possible.

The local canoes seldom carry even a bamboo to cling to in case of emergency and the mortality would doubtless be heavier except for the fact that the outrigger canoe generally floats even after turning turtle.

That makes it all the more urgent to introduce some form of insurance for the fishermen and his gear, where the Government could ensure loss compensation to banking institutions and a part of interest on loans for repair of damaged craft could be defrayed from the national treasury as is done in Japan.⁸

As regards the fourth method of reducing fishery risks, the risks involved in price fluctuation can now be obviated with the opening of the cold storage plant in Mutwal which will tend to level off the prices of fish.

⁸ Ibid., p. 185.

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The question has also been raised whether a higher rate of interest would encourage investment in fishing in the sense that credit institutions will be induced to release more capital for fishery expansion. But the fishing industry being now in the most depressed state, a lower interest will be more desirable to stimulate investment.

Zoetewij of the International Labour Office has given the following reasons against a higher rate of interest in fishery development:⁹

(i) If much labour is used in any particular type of production, the marginal rate of saving is likely to be low, which would be a serious matter in underdeveloped countries.

(ii) Labour-intensive methods which are in fact used, will encourage increases in population.

(iii) Productivity may increase much more slowly by adopting labour-intensive rather than capital intensive methods.

The inshore seine fishing in Ceylon is highly labour-intensive. Capital is distributed too widely and inefficiently. Rafts have to be replaced every two or three years. Capital-intensive methods will no doubt provide quick return. Larger mechanized boats do give a substantial increase in output and

⁹ H. Zoetewij, Discussion, Economics of Fisheries, F.A.O., Rome, 1957, p. 112.

this could enable the substitution of deep sea for inshore fishing. It must, however, be borne in mind that there is no evidence to show that inshore fishing has reached its limits and that the continental shelf has been overfished. A happy balance may be struck between the labour-intensive inshore fishing and the capital-intensive deep sea fishing.

(3) Remuneration to Land

The problem of rent in fishery has recently engaged the attention of economists. Professor Scott Gordon was the first to raise the question of rent in fishery in his article on the "Economic Theory of a Common Property Resource: The Fishery".¹⁰ He contrasts the fishery with the more familiar private property industry such as farming. The sole owner of a farm will attempt to maximize the rent on his farm. The farmer receives a return that is a mixture of rent, interest, profit and wage, while the return of the fisherman includes a wage, some profit and interest but no rent at all. The reason why the fisherman does not receive rent, according to Professor Gordon is: "In the sea fisheries the natural resource is not private property; hence the rent it may yield is not capable of being appropriated by anyone."¹¹

¹⁰ Gordon Scott Ho., "Theory of a Common-Property Resource: The Fishery", The Journal of Political Economy, Vol. LXII, April 1954, pp. 124-142.

¹¹ Ibid., p. 126.

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Dr. Anthony Scott, of the University of British Columbia, followed up the discussion on the economics of the common-property in two interesting articles¹² in both of which he disagreed with Professor Gordon's contention that the fishermen are poor because they do not collect rent. Dr. Scott believes that fishermen are poor because of their low opportunity costs, and that "the mere fact of sole ownership does not bring about a significant change in the exploitation of the fishery in the short run".¹³

At the Economic Conference held in Rome in 1957, the question of rent in fishery was discussed at length and there was general agreement among the participating economists that the "problem was not that fishermen were poor because they did not obtain rent from the resource, but that society was the poorer because nobody got the rent"¹⁴ and it was suggested that the State could collect the rent in the form of licensing fee for fishing rights.¹⁵

¹² Anthony Scott, "The Fishery: The Objectives of Sole Ownership", The Journal of Political Economy, Vol. LXIII, April, 1955, pp. 120-124. "Optimal Utilization and the Control of Fisheries", The Economics of Fisheries, F.A.O., Rome, 1957, pp. 42-56.

¹³ Anthony Scott, "The Fishery: The Objectives of Sole Ownership", The Journal of Political Economy, Vol. LXIII, April, 1955, p. 120.

¹⁴ The Economics of Fisheries, F.A.O., Rome, 1957, p. 61.

¹⁵ Ibid., p. 63.

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The problem of rent in the fishery has been examined on the main from a theoretical standpoint. By and large the fisheries in Ceylon have been and are operated on a semi-private basis. The predominantly extensive inshore seine fishing is carried on within certain prescribed limits. Each fishing unit operates within what is locally known as a "padu" or area, off a certain allotted coast line. The right to fish within the "padu" has been acquired by tradition, common agreement and often by the decisions made by commissions appointed by Government to settle disputes over fishing rights. The civil courts have upheld these traditional rights which have now acquired the character of prescription.

Here then we have an element of sole ownership. Similarly in the case of fishing in the lagoons and shallow seas, certain areas have been allotted to the fishermen to fix their traps. We may, therefore, infer that normally rents on these "plots" of the sea and the lagoon are not collected in the form of licences by the State but are turned over to the fishermen. However, the fact remains that despite the fishermen appropriating this rent, they are still in a state of poverty. The conclusion that forces on us is that neither common-property nor private sole ownership are sufficient to explain the lower returns in fishing than in other occupations. The reasons, as we have explained above, ought to be sought elsewhere.

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As for the suggestion of imposing a licensing fee on fishing rights, on the grounds of the State appropriating the rent, this will undoubtedly place the fishing industry in Ceylon at a disadvantage relative to other industries. The only merit of licensing lies in the elimination of the inefficient and marginal fishermen. But the remedy may prove worse than the disease.

CHAPTER IV

FISHERY DEVELOPMENT AND DOMESTIC CAPITAL

One of the basic determinants of fishery development is the quantity of real capital available. The term capital refers to "man-made physical instruments of production which normally come into being as a result of net production exceeding physical consumption".¹

Capital employed in fishery consists essentially of three items, namely craft, gear and cash for subsistence. The amount of fixed capital involved is very considerable in terms of local income levels. The craft so far used in Ceylon are not the most efficient units from the point of view of both labour and capital utilization. Experiments have proved that larger and mechanized boats produce better returns. Both enlargement of size and mechanization involve a heavy capital outlay. Similarly, technical progress has revolutionized the type of gear used in modern fishery. Besides, a certain amount of liquid capital will be required for the provision of the means of subsistence for the fishermen.

¹ Kurihara, K.K., The Keynesian Theory of Economic Development, Columbia University Press, New York, 1959, pp. 35,36.

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As a rule, neither long-term finance to modernize craft nor short-term finance to modernize gear is available to fishermen in sufficient amounts. Hence, as Kirby and Szczepanik have observed: "The solution of the problem of financing this process is the basic condition of fishery development".²

Cheap loan capital is a prerequisite of expansion in the fisheries virtually in all stages of production and marketing.

ABILITY IN THE PAST TO ACCUMULATE CAPITAL

The very fact that incomes are so low among the fishermen is itself indicative of capital scarcity. This does not mean that the necessary capital does not exist at all. One has only to visit the maritime villages in Ceylon to see that in almost every village there is a church of incredible size or a temple or mosque elaborately designed and a school belonging to the parish. If the fishermen in the past were able to raise up funds to build such stupendous structures, there is no reason to believe that they are incapable of gathering capital for productive purposes. The problem is to find some appropriate methods to muster their little savings.

2 E. S. Kirby and E.F. Szczepanik, op. cit., p.96.

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The Catholic fishermen generally contribute one tenth of their daily catch to the Church. The system of collecting their contribution is known as the 'Tithe' system or the rent system. On the day of the church festival the fishermen assemble under the presidency of their parish priest. The rent is then publicly auctioned. The highest bidder is given the contract of collecting the rent. He has to deposit on the very day one percent of the total contracted for, and then he pays daily or weekly till he completes the contract before the approach of the next church festival.

The tithe system had been introduced by the Dutch to augment their revenue by taxing one tenth of the catch from each fisherman. The British continued the system up to 1850, and when it was abandoned, the Catholic church took it over and has continued it ever since. Thus with the rents so collected the fishermen were able to put up schools, convents, presbyteries and huge churches. Some of the churches are today worth lakhs of rupees.³ Similarly, the Hindu and Muslim fishermen have built their temples and mosques.

Individually fishermen, however, were not in a position to save anything substantial to improve their capital equipment. They had to turn to the most primitive institutions of credit accessible to them, viz:

³ Lakh or lac is an Anglo-Indian word for 100,000.

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(1) Indigenous money lenders - Pawn Brokers

The commonest method of obtaining a short-term loan was by pawning jewels. There are in every fishing village some pawn-brokers who are prepared to lend money on the security of jewels. Short and urgent loans are generally obtained in this manner. The jewellery worn by men such as gold rings, ear-rings, silver waist chains and gold chains are the first to be pawned. Then if further capital is needed, the jewellery of women and girls - the rings, the bangles, the gold chains, the ear-rings, the necklaces and only in extreme dire necessity, the wedding necklace or "Thali", will find its way to the pawn broker's house.

The amount of loan given is invariably less than the value of the jewel pawned. The loan had to be returned with an interest fixed by the pawn broker. If the loan was not returned within the period fixed, the jewels left as securities were sold and the money realized by the pawn broker.

(2) Middlemen

The pawn brokers had only limited funds available for loans. For the purchase of boat or net, the only credit facility available to the fishermen was the boutique keeper or the merchant middleman who was ever ready to advance the capital on the security of the catch. The fishermen had no proper accounting and the prices of the catch were fixed by the middleman who would keep on giving advances till he

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reduced the fishermen to a state of perpetual bondage from which they had no hope of extricating themselves.

(3) The "Cheetu" System

The "cheetu" system is something unique and had been another source of capital for the fishermen from time immemorial. Under this system ten to twenty families get together and draw lots. The first two numbers are taken by the organizing family, which may exchange its numbers with those of the families in urgent need of money. Each family pays Rs.10 or Rs.20 per month up to the number of months drawn by the whole group. The whole sum of money is collected by the organizer and given to the members according to the number they had drawn. By this means a family is able to raise Rs.200 to Rs.400 at once. Under this system there is no interest to be paid and hence this system has great advantages over all other forms of financing. Some would draw even two numbers to augment their capital. The money thus raised may have been sufficient to meet both fixed and circulating capital in the pre-war days. Today the amount is hardly sufficient to cover the overhead expenses, incurred by the fishermen.

(4) The "Pana Chadangu" System

This system of financing is also very popular among the fishermen in Ceylon. Generally, on the day of the launching of the new boat, the owner holds what is known as a "financial wedding" or "pana chadangu". He invites friends

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and relatives. Each invitee on entering the house, places some money wrapped in betel leaf in the hands of the host. Each person may give Rs.10 to Rs.25. The total amount he receives will depend on the number of visitors and the amount they give. Often the sum realized was sufficient to repay part of his loan incurred in connection with the purchase of his boat. This money he receives is not considered as a gift but as a friendly loan which he would have to repay when the donors held similar "financial weddings".

These so-called "financial weddings" were held also on other occasions such as marriages or functions held in connection with the puberty ceremonies. This was a very profitable and flexible form of capital circulation in the village or town.

(5) The Relief Fund System

Those catholic parishes that have adopted the tithe or rent system, give out money for repair of boat or net, or even for the purchase of new nets in the event of accidental loss of nets at sea. In places like Negombo, part of the rent collected is disimbursed in the following purposes by the unanimous agreement of the church council composed of the representatives of the fishermen and their parish priest:

- (a) Maintenance (extended to the family) when the fisherman is prevented from going to sea, by illness, bad weather, etc.

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- (b) Assistance for medical aid.
- (c) Assistance for the repair of boats, nets, etc.
- (d) Assistance for the education of their children.
- (e) Allowance on occasion of death in the family.

The amount allowed in each case is examined and passed by the above church council.

(6) The Mortgage System

Driven to the wall the fisherman may mortgage his house and property to liquidate his debt or to purchase his boat and tackle. Invariably the interest on the mortgage goes on mounting till the house and property are sold or seized by the money lender.

(7) The Provident Fund System

The Jaffna Diocesan Provident Fund was established about the mid thirties during the great Depression, in the diocese of Jaffna for all Catholics. The fishermen in some parishes have availed themselves of this facility. They contribute Rs.1.00 every month. It is a form of life insurance. If the fisherman dies, his wife is entitled to a month's subscription of all the members of the Provident Fund.

(8) The Marriage Provident Fund

This was started about 20 years ago by a layman, Mr. L.S. Rasanayagam, in the parish of St. James, Jaffna. It is perhaps the only one of its kind in the world. Under this system the parents contribute Rs.1.00 every month on behalf of

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their daughters from the age of seven. On the day of their wedding each daughter is entitled to one month's contribution of all the members. This is the only one of its kind in Ceylon and has functioned very successfully and is even today providing doweries for the girls not only of the parish of St. James, but has now spread to other parishes of farmers as well.

All these institutions can only supply an insignificant fraction of the capital that will be needed to modernize the fishing industry in Ceylon. Other more efficient and dynamic methods of mobilizing domestic as well as foreign capital must be explored.

POTENTIAL SOURCES OF FISHERY FINANCE

All the countries which today are economically advanced began as countries which were as poor as some of the underdeveloped countries are today. Yet domestic capital accumulation took place as part of a process of economic development. However low the income per capita may have been at one time, part of the current income was set aside to create and augment a stock of capital. Similarly most modern developed fisheries had broken the vicious circle of poverty in the past, first through domestic capital formation. Some of the potential sources of domestic capital formation for fisheries development in Ceylon should be thoroughly examined.

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(1) Up by the Bootstraps

It is now being increasingly held that capital formation is only one aspect of economic development. According to Wolf and Suffrin: "Theoretically development could be achieved and sustained without any increase in capital stock by continued changes in technology and productivity. In practice, however, increased capital formation and improved technology are likely to be inter-connected and mutually reinforcing".⁴

Kuznets has also posed a question concerning the causal role traditionally assigned to capital formation in economic development. For he asks: "If certain elements in consumption are strategic in increasing labor's productivity and it is thus possible to secure higher rates of growth by increasing consumption (and reducing capital formation) as a proportion of national product, is it desirable to maintain a distinction between such consumption and capital formation as a means of increasing labor productivity?"⁵

Some recent writers like Buchanan and Ellis have suggested that economic development of underdeveloped areas

⁴ Charles Wolf, Jr. and Sidney C. Suffrin, Capital Formation and Foreign Investment, Syracuse University Press, 1958, p. 4.

⁵ Simon Kuznets, A Survey of Contemporary Economics, Vol. II, B.E. Haley Editor, Holmwood, Illinois, 1952, p. 180.

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may be possible, without substantial sacrifice of current consumption and without foreign capital.⁶ This may be achieved in two ways: (a) By increasing productivity, and (2) By utilizing surplus labour.

(a) By increasing productivity.

It should be possible to devise means of increasing productivity per man-hour which do not require heavy investment of the kind prevalent in advanced countries. In other words, techniques which are more labour-intensive than capital-intensive could be introduced in underdeveloped area. Applying this to the underdeveloped fisheries in Ceylon, in so far as the low incomes of the fishermen have their root cause in the lack of proportion among the productive factors of labour and capital, we may consider three types of change by which output and incomes can be improved.

First, output from existing productive factors could be increased by means of technical changes that make it easier to substitute abundant labour for relatively scarce capital equipment. Greater specialization and division of labour would also tend to raise total output. The precise form of specialization suited to Ceylon conditions is a matter of research. Adopting and applying superior techniques already

⁶ Norman S. Buchanan and Howard S. Ellis, Approaches to Economic Development, The Twentieth Century Fund, New York, 1955, pp. 45-46.

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in use in developed fisheries to meet the special problems facing the Ceylon may be easily undertaken. The only trouble is that new techniques in the developed fisheries tend mainly to save labour. What Ceylon needs is capital-saving innovations because capital is relatively scarce and costly.

A second type by which output and incomes can be improved is to create greater demand for labour-using products as suggested by Buchanan and Ellis. "Any change in the structure of domestic and world demand for final products in favour of those using relatively more labour in their production would tend to raise incomes in countries where labor is abundant".⁷

In other words, if domestic demand and world demand for fish and fish products could rise, then, this would raise the income of the fishermen, who will increase output to meet the increased demand. This is hardly applicable to Ceylon since demand for fish is by no means inadequate. Nearly 2,130,420 cwts. of fish and fish products are imported annually into the Island. The demand is there. Hence the argument of Buchanan and Ellis has no validity for Ceylon.

The third method by which real income of fishermen could be increased is by removing the existing disproportion among the factors of production that is economically responsible

⁷ Norman S. Buchanan and Howard S. Ellis, op. cit., p. 46.

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for the low level of output in the fisheries. There are two possible ways of doing this. One is to increase capital relative to labour; the other is to decrease labour supply relative to existing capital equipment. The first method may not be applicable to a place where capital is scarce. The second method seems more feasible. Good many fishermen in Ceylon are marginal fishermen. There is no doubt overexploitation in a limited area by an overpopulation of fishermen. In other words, there is a surplus labour that could be removed without decreasing output. This brings us to the second way of achieving development without substantial sacrifice of current consumption.

(b) By utilizing surplus labour

As observed above, there appears to be some saving potential in disguised unemployment. That is, a certain amount of surplus labour in the existing fisheries could be moved out without any decrease in fishery output. Such surplus labour could be profitably employed on capital projects like the building of fishery harbours, fishery co-ops, etc.

Rangar Nurkse has suggested in the case of surplus labour on the farm that the farmers who hitherto maintained the surplus labour should continue to do so while such surplus labour is put on capital projects.⁸ Such a course will

⁸ Rangar Nurkse, Problem of Capital Formation in Underdeveloped Countries, Oxford University Press, New York, 1957, p. 33.

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prove impractical if applied to the owner capitalists in fishery in Ceylon. The simplest method is to levy a tax, say 2 percent on their daily catch for the specific purpose of maintaining the surplus labour employed in capital projects elsewhere. Thus productive labour can continue to feed the unproductive surplus labour now put on capital projects. The merit of this scheme is that the use of disguised unemployment for the accumulation of capital could be financed from within the system itself. In other words, capital formation through the use of surplus labour is self-financing.

There is also a heavy seasonal unemployment among the fishermen in Ceylon during the monsoons. Except for the migrant fishermen, the monsoon enforces idleness among a large number. These people could be organized for certain types of capital projects in the village itself or in its immediate vicinity. If they are to be employed far from their homes, it will involve additional transport costs, new housing costs and perhaps serious family and social dislocations as well.

The surplus labour and the seasonally unemployed can be mobilized only for investment projects requiring no special skills or equipment. Under a community project, for example, roads, harbours, schools and buildings to house processing plants may be built. The most that could be expected of such labour-intensive projects is a limited amount of preliminary capital formation. Such surplus labour can only lay the

ground work for the development of the industry. They can hardly be expected to turn out fixed capital in quantities and qualities that are of immediate use for the modernization of the fisheries. It takes machines to make machines. The surplus labour and the seasonally unemployed are no effective substitutes for machines to make machines. Capital will always be needed. Hence further methods must be devised to augment capital.

(2) Dishoarding

A great amount of capital is concealed in hoarded gold and silver jewellery among the fishing population in Ceylon. In some parts of rural Ceylon, silver coins have been buried in pots or earthen vessels for precautionary motives. Evidently, in these areas people consume something less than their whole current output. It is what they have saved that is "invested" in hoards of cash, jewellery and gold.

It was a common practice to attribute this propensity to hoard primarily to fear. As Adam Smith expressed it long ago:⁹

In those unfortunate countries, indeed, where men are continually afraid of the violence of their superiors, they frequently bury and conceal a great part of their stock, in order to have it always at hand to carry with them to some place of safety, in case of their being threatened with any of those disasters to which they consider themselves as at all times exposed.

9 Adam Smith, The Wealth of Nations, Everyman's Library, Vol. 1, Dutton, New York, 1910, p. 250.

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Thus it was believed that a large part of the savings of these people was kept in this idle form, for such objects of wealth are more readily concealed in times of trouble than buildings and equipment; they are portable and can easily be turned into purchasing power.

In Ceylon, it is unlikely that fear alone could have accounted for the propensity to hoard, except in times of war or national disaster. Fishermen in Ceylon have held their savings either in the form of hoarding cash balances or in the form of hoarding physical assets such as jewellery, gold or other durable commodities. The hoarding of cash balances is mainly influenced by transactionary and precautionary motives, whereas the hoarding of physical assets is motivated by other compelling reasons such as added prestige and social status in the community or for the sake of acquiring and holding goods as liquid assets in the absence of adequate financial institutions. Durable assets such as jewellery or gold are regarded as highly liquid and possess the added advantage over cash balances that they constitute excellent stores of value in an environment characterized by political insecurity or inflationary pressures.

The desire to increase the social standing in the community in which the fishermen live, with the display of their wealth in the form of jewellery has perhaps been a more influencing factor.

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The problem will be to persuade the people to part with their hoard of gold, silver and jewellery. One way may be to offer an enhanced price for the gold or their jewellery. The Government could issue promissory notes or bonds in return, and convert the gold into foreign currency which could easily be utilized for importing capital equipment for fishery development.

If an all-out effort were made, substantial capital may be realized. Jewels are hoarded not only in fishing villages, but throughout the whole of Ceylon. If all the hoarded jewels could be mobilized, part of the foreign currency realized by the sale of the jewels, could be placed in the hands of the commercial banks through the Central Bank of Ceylon to increase their cash reserves. This will enable the banks to expand credit for productive investment. The Central Bank can also reduce the bank rate as inducement for potential investors to borrow. Part of foreign currency could be kept for equilibrating the balance of payment.

(3) Levies on Middlemen

Another fruitful source of capital may be a levy imposed on the middlemen who have been hitherto exploiting the fishermen. In the past the middlemen have played an important part in supplying credit to the fishermen at exorbitant rates and are even today reaping enormous profits relative to the other members of the community. For lack of

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proper accounting, many of them have hitherto evaded the payment of income tax.

A capital levy is better than a tax on the middlemen for this simple reason that they may shift the incidence of the tax either to the fishermen or to the consumer.

(4) Taxing the Owner Capitalist¹⁰

Once the surplus labour has been moved out and put on productive projects, the owner capitalist will increase his income. The increased income arises directly from the projects themselves. In the case of improved transport, increased income will arise from the greater specialization that becomes possible. Better and quicker transport will ensure better preservation of fish in fresh condition when it arrives in the market and secure higher prices that will augment the income of the owner capitalist.

Their increased income in turn can be recaptured in the form of a tax, leaving them little better off than before, but permitting the increased output to reach a larger domestic market.

The taxing away of the increased income may also be necessary to prevent any increased productivity from being dissipated on wasteful consumption or ceremonial expenditure or even on increased leisure. Only a modest and temporary

¹⁰ The term owner capitalists denotes here a person who owns a boat and gear, and may be self-employed or have labourers under him to carry on fishing operations.

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sacrifice of present consumption is all that is required.

(5) Savings as a Source of Capital

The other possible internal source of capital formation for fishery development is by reducing consumption to release funds for production of capital equipment.

To encourage voluntary saving, soon after the great depression of the 1930's, the Government of Ceylon established the Ceylon Savings Department. Even school children were trained to save and buy saving stamps that could be cashed in any post office. Through the sale of saving certificates the Department has made a headway in reaching the masses. The Savings Week held annually usually brings in a substantial collection of savings. This method of saving has not penetrated the fishing villages. An effort should be made to popularize this scheme of voluntary saving among this section of the population which is in greater need of capital accumulation.

Facilities too have been provided through the Post Office Savings Department for small and big savings. Post Offices in the fishing areas should, through intense propaganda, attract savings of the inhabitants.

A compulsory scheme of saving could also be introduced among the fishermen. Through the fish marketing organization the fishermen could be compelled to deduct from sales a certain percentage as is done in Hong Kong, where 5 percent

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is deducted by the Fish Marketing Society for savings from the proceeds of each co-operative member's catch sold at the wholesale fish market.¹¹

It is now commonly recognized that the existing marketing system based on middlemen has failed to provide the fishermen with opportunities for saving and investment. The remedy for the inadequacy of opportunities for saving among fishermen lies in radical institutional changes particularly in the field of marketing. Marketing reorganization will no doubt greatly increase the earnings of fishermen and also their savings.

(6) Foreign Trade Capital

Another potential source of capital is the possibility of utilizing the opportunities offered by foreign trade. Ceylon can offer a number of goods in exchange for foreign products. Besides tea, rubber, coconut which are the largest foreign exchange earners for the country as a whole, other lighter goods like pearls, tortoise shell, 'chank' and other marine products could also be exported to pay for the imports of fishery equipments.

(7) Confiscation of Foreign Enterprises

Confiscating foreign enterprises has been proposed

¹¹ J.T. Wakefield, "The Hong Kong Fish Marketing Organization", F.A.O. Report, No. 404.

by Professor Bronfenbrenner who suggests that this method has been carried through with varying degree of success by the Governments of Mexico, Iran, Egypt and Indonesia. He shows that economic growth can be significantly accelerated by expropriation: "...in societies whose income distribution include high property shares which are not ploughed back into economic development".¹²

This method of confiscating foreign properties if adopted would seriously undermine Ceylon's relation with the outside world and would destroy all hopes of obtaining any capital assistance which is so urgently needed at this initial stage of development.

(8) Commercial Banks

The commercial banks of the country should be induced to grant loans for big fishing enterprises as is done in Japan. The equipment fund is financed by two long-term credit banks and the operational capital is supplied by other banks.¹³ These banks also finance small fisheries enterprises which are more or less stabilized. The banks lend them money, solely because it pays to do so. Similar organizations must

¹² Martin Bronfenbrenner, "The appeal of confiscation in economic development", Economic Development and Cultural Change, April, 1955, pp. 201-218.

¹³ Japanese Fisheries, Asia, Kyokai, Tokyo, Japan, 1957, p. 155.

be established in Ceylon to finance modernization of the fishing industry.

(9) Fishery Finance Corporation

In Japan, the Agricultural, Forestry and Fisheries Finance Corporation was established in 1951 to finance the medium-and small-scale fisheries entrepreneurs and organizations operated by them, and to give long-term and low-interest credits to the operators of these industries so that they may increase their productivity.

It should not be difficult in Ceylon to set up a similar Fishery Finance Corporation to inject more credit into the industry.

(10) Development Bank

The Government of Japan also established in 1951 the Japan Development Bank which "aims at expediting reconstruction of economy and promotion of industry by supplying long-term fund, while supplementing and encouraging the financing carried out by the general financing organs."¹⁴

The Japan Development Bank has financed the fisheries in the following fields:¹⁵

1. Whaling-In order to earn foreign currency by export of whale oil, the loan was made to facilitate the construction of factory and catcher boat.

¹⁴ Japanese Fisheries, Asia, Kyokai, Tokyo, Japan, 1957, p. 168.

¹⁵ Ibid., p. 160.

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2. Pelagic tuna fishing -
To facilitate construction of factory for salmon and trout fishing in the Northern sea.
3. Refrigeration and cold storage facilities -
To expand refrigeration and cold storage facilities which are needed for the refrigeration of fish, for export and cold-storing the fish to be canned.

Judging from the variety of purposes for which funds are provided in Japan, it is an institution that might well be established in Ceylon.

(11) Small Fishing Enterprise Financing Association

In Ceylon, it is the small enterprise that encounters most difficulties in raising funds. Because they are small - scale operations, the banks are reluctant to grant them loans. Secondly, since the loans are in small amounts and the number of cases too many, banks do not naturally welcome them. Thirdly, the banks may not have sufficient funds to meet the demand. Japan has solved this problem by the "Small Fishing Enterprises Finance Guarantee Act" (Law No. 346, 1952) by which the small fishing enterprises and the fishermen make an investment in the form of fisheries rights and bonds, and form a fisheries credit fund association in every prefecture. The related public organizations can also become members and participate in the activities of the association. This association gives guarantee to the smaller fishing enterprises loans from the financial organs. The Government re-insures

the guarantee of the association. At the same time the "Special Account for Smaller Fisheries Financing Guarantee Act" was sanctioned for carrying out the insurance business and the fund necessary for it was carried over from the general account now reaching 600 million yen.¹⁶

(12) Co-operative Finance

It was to extricate the peasant from the clutches of the monopolistic village money lender that the co-operative movement came into being. As early as 1912, the first of a series of credit co-operative societies was established. The outbreak of the first world war retarded the growth of this movement. At the early stages these co-operative credit societies fell under the control of the richer peasants and so gave very little aid to those for whom they were intended.

By 1940 there were 1,302 credit societies with a membership of 34,404, and after the second world war the total number of credit societies increased and in 1951 there were 36,553 with a membership of 70,000 and the total assets stood then at Rs.5.3 million.¹⁷

¹⁶ Ibid., p. 168.

¹⁷ Report of a Mission organized by the International Bank for Reconstruction and Development of Ceylon, Ceylon Government Press, September, 1952, p. 9.

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Loans are advanced to members on the basis of character and need, on reasonable terms not exceeding 9 per cent per annum and often at 6 per cent. Each society determined the limit on individual loans which are usually between Rs.200 and Rs.300.

It is clear that the loans granted to individual members by the credit co-operative societies are meagre. In addition to the fund that accumulates by way of shares and deposit of members, these societies are also able to borrow from the Provincial Co-operative Banks that are established in the nine Provinces and the Central Co-operative Bank in Colombo.

Surprisingly enough, there are no credit co-operatives among the fishermen. All early attempts to form co-operatives among the fishermen ended in premature failures, till the Central Fisheries Union, organized in 1937 by some public-spirited men, mostly doctors, lawyers and priests, held frequent meetings in important fishing centres round the Island and opened the eyes of the fishermen and the public to the appalling conditions in which they were living.

By 1938, the Central Fisheries Union had organized the fishermen into 54 fisheries unions,¹⁸ 40 of which later became registered Fishermen's Co-operative Societies.

¹⁸ Seventh Annual Report of the Central Fisheries Union of Ceylon, June, 30, 1944, p. 2.

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During the second world war the Government took action to increase the production of fish, and for this purpose more fishermen's societies were organized, loans were granted and a marketing organization was established. While these organizations were called co-operatives, they were not developed by the fishermen themselves. They were regarded as Government enterprises through which it was possible to procure a loan.

It could not be expected that the fishermen would be interested in or enthusiastic about a movement of which they knew almost nothing. Few understood the function and purpose of such societies and were not interested in whether they survived or not. As a rule Government sponsored schemes are unable to create the enthusiasm and spirit of sacrifice necessary for the success of community projects. This is one of the most distressing feature about the co-operative movement in Ceylon. It was imposed from above and did not spring from grass roots. As in India the co-operative movement in Ceylon is still like "a plant held in position with both hands by the Government since its roots refuse to enter the soil". It lacks popular initiative and depends largely on Government.

As Dr. Laidlaw pointed out for India and the same applies to Ceylon: "...the dominant person in the co-operative movement in India has always been the government official.

He has been the initiator, the organizer, the directing power and the policy-maker behind the co-operatives... As a result, much of the movement of the past existed only on paper; it was elaborately expanded in government documents and enactments, but never got close to the real problems of the people".¹⁹

Official domination is against the spirit of the co-operative movement. The members are the shareholders, owners, proprietors of the societies. The officials are outsiders and have no place within the movement. They have no stake in the organizations they seek to supervise, guide and control. In the earlier stages, the State owes it to itself to assist and guide them through special officers so as to train them for their work. Having done this, the officers should withdraw and allow the members to carry on their business themselves. Trusteeship of beginners one may justify; but perpetual tutelage is entirely foreign to the co-operative ideology and co-operative practice in other countries.

Dr. Laidlaw has listed a few of the evil effects of Government domination over the co-operatives:²⁰

1. The co-operative societies tend to be weighed down by administrative controls and regulations

¹⁹ Alexander Laidlaw, "A Canadian Looks at Co-operatives in India", Canadian Co-operative Digest, Spring, 1959, p. 14.

²⁰ Alexander F. Laidlaw, Report to the Central Committee for Co-operative Training of the Government of India and the Reserve Bank of India, 1958, pp. 31, 32.

in minute details. Granted there must be a certain amount of Government regulation of co-operatives, but it should be kept as simple as possible. Otherwise the control of these societies is bound to pass into the hands of a few bureaucrats who are able to master the great accumulation of laws and regulations.

2. Too many government controls over the movement leads to registering co-operatives before the people are ready for them. Societies are organized in order to meet statistical targets without laying a proper foundation of education.
3. An undue amount of government control leads to rigidity of form, to doctrinaire inflexibility that is not in keeping with the best traditions of the movement.

This does not mean that government should ignore altogether the co-operative movement or take no further interest in it. In a democratic society, under government committed to the welfare of the common people, official policy can never be indifferent to the co-operative movement. The state should help to organize the co-operatives, supply certain kinds of financial assistance and provide the necessary legislation for the development of good co-operatives. Eventually there must be a gradual and phased withdrawal of government and official agencies from their position of control.

The organization of fishermen presents certain problems which are unique and are not generally encountered among other groups. Because of the very nature of their occupation, since they work singly or in small groups, fishermen tend to be individualistic and may not easily take to co-operatives. Also because of the very nature of their work,

requiring special skills, often uncertain, sometimes dangerous, they tend to consider the catching of fish alone to be their sole job and easily relegate the business end of the industry to somebody else.

Certain other features of the fisheries also make the organization of fishermen more difficult than organization of other groups. The long periods away from home, the difficulty of having any educational programme for them, the necessity for frequently landing fish away from their home, and this is more so in the case of migrant fishermen, - these no doubt present special difficulties. It will be necessary to devise special methods and techniques to meet such situations.

The 55 fishermen's co-operatives that have so far been formed and are now members of the Ceylon Co-operative Fish Sales Union are merely marketing societies. Co-operative credit societies are practically non-existent among the fishermen. The loans that were given to the fishermen through these societies were more or less direct loans from the Fisheries Department.

That brings us to another distressing character of the co-operatives among fishermen in Ceylon, namely the dual control. The loans to fishermen were given directly by the Director of Fisheries and the societies were placed under the Registrar of Co-operative Societies. The presence of the Fisheries Inspector and the Co-operative Inspector often made

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things more confusing and not infrequently contradictory advice was given to the fishermen. Conflict of authority can do incalculable harm. For a time there was a transfer of authority and supervision from one department to another. The Fishermen's co-operatives have fallen into a sort of no man's land between the two departments and have consequently suffered.

The Ceylon Government should decide once and for all to which department the supervision of fishermen's co-operatives should belong, the Fisheries Department or the Co-operative Department. There is no doubt that the Department of Fisheries should see to the technical and development side of the industry, while the Co-operative Department should have charge of fishermen's co-operatives and their audit and supervision.

Loans should not be given to fishermen indiscriminately as has been done in the past. Often the loans granted to fishermen were squandered for unproductive purposes such as giving dowry to a daughter or to have an expensive wedding and not infrequently the money was drained down on drinks and useless expenses.

Giving a loan to a fisherman without proper control is like giving him a rope to hang himself. The idea of forming co-operatives among fishermen is to replace the middlemen. Only if the societies could perform the same services

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as rendered by the middlemen, i.e. lending money on the security of the catch and of the boats and tackle, then can there be any hope of developing the fishing industry. If loans were needed for the purchase of boats, engines or nets, instead of handing the money to the fishermen, a co-operative credit society should make the purchases and hold the boat or engine or net in its name till the debt is liquidated.

The marketing organization also poses special problems, which have to be overcome in the successful promotion of co-operatives among fishermen. Fish trade is a complicated, delicate and highly specialized business in which the experience of the established merchant or middlemen is usually much greater than that of the fishermen or co-operative society or of both Fishery and Co-operative Departments.

The middlemen in addition to disposing of catches performs a variety of functions which are essential to the fishermen and to the continuous operation of the fishery. Far too little is known of the precise manner in which those middlemen operate, their turnover, profit-margins and influence on price formation and area of distribution.

At the third F.A.O. Regional Conference for Asia and the Far East, held during October 8 to 19, 1956, at Bandung, attention was drawn to the two possible weaknesses in the co-operative programmes, viz:²¹

²¹ F.A.O., Fisheries Papers No. 9, June, 1958, Rome, p. 3.

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- i) The lack of more precise information on the functions performed by middlemen for fishermen and the changes which occur where middlemen are replaced by co-operatives in some or all of these functions;
- ii) The generally inadequate training and experience of fishery co-operative leaders and government officers concerned with fishery co-operatives, and inadequate arrangements to ensure that the experience of officers concerned respectively with fisheries and with co-operative organization is shared to the best advantage.

With regard to the first weakness, namely lack of more precise information on the functions performed by middlemen for fishermen, the F.A.O. has already promoted an investigation to be conducted in the first instance by the universities of Hong Kong, Bombay and Malaya, in certain selected fishery centres.

It will be far more advantageous to retain the middleman as part of the co-operative organization. He could be drafted as manager and his services may be very valuable at this stage of development.

As regards the second weakness, a training centre in fisheries co-operatives and administration was held in Australia in 1957, under the auspices of the F.A.O. Expanded Technical Assistance Programme. It was felt that one of the problems confronting the development of fisheries in the Indo-Pacific region was the shortage of trained leaders who can "work with skill, imagination and sympathy, among the fishermen themselves".

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The general conclusions drawn from the training course was that ideally "...co-operative endeavour in fisheries should be accompanied by the systematic investigation and clarification of the social, economic and technical problems of the fisheries, especially fishermen's incomes, credit and marketing".²²

The Fishermen's co-operatives should be reorganized in Ceylon on the Antigonish model and the purpose and aims should include (1) the welfare of fishermen, (2) the welfare of the general community so that a co-operative should imply a "group of people organized for the good of all the people", (3) the improvement of the fishing industry, and (4) the interest of the consumer.

We have thus far examined all the possible potential sources of domestic capital. In view of the long-term plan envisaged for the development and modernization of the fisheries in Ceylon, domestic capital is all but inadequate. Particularly at this stage of development, foreign capital becomes indispensable.

²² F.A.O., "Training Centre for Fishery Co-operatives", Report, Australia, 1958, p. 7.

CHAPTER V

FISHERY DEVELOPMENT AND FOREIGN CAPITAL

Even after straining and squeezing all potential sources of domestic capital, there will still remain a need for foreign capital to meet the demands of an expanding modernized fishing industry. With the present rate of population increase and consequent demand for increased protein food, it will be necessary to exploit both sources of capital to the utmost.

Foreign capital has contributed greatly towards the economic development of many countries. Usually foreign capital has been complementary to indigenous domestic capital. In some cases foreign capital has been attracted to those countries in which domestic saving and investment thrive best; but, in many instances, inflow of foreign capital has had a triggering effect on domestic capital formation.

Pattern of Foreign Investment

Foreign capital may be supplied by private or public agencies.

A. Private Foreign Investment

Private foreign investment may take the form of portfolio investment or direct investment which may flow either

to the public sector or private sector of the economy. Both types of foreign investments found their way to Ceylon in the colonial days.

(1) Portfolio Investment

Portfolio investment is mainly concerned with the floating of government and corporation bonds and purchase of securities.

As a result of agitation by the planting community in Ceylon for better roads and railway to transport their products to shipping centres, the Government in the early 80's floated what was known as the 'Ceylon Government Railway Bonds', which brought in a number of foreign subscribers. In the heydays of foreign investment prior to World War I, more than three-quarters of the foreign investment in Ceylon was portfolio investment in the Government bonds or public utility stocks.

Why was there such a small fraction of direct investment relative to portfolio investment? The reason is not far to seek. First there was the difficulty experienced on the part of foreign businessmen in assessing the merit of private enterprise, some thousands of miles away. Secondly, the difficulty of keeping an eye on small plantations or factories so far away deterred prospective investors from buying shares in the London Stock Market. Finally, it was impossible for investors to know what enterprises were worth under-

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taking or to have confidence in their managements.

Hence a good deal of foreign investment had to be done through intermediaries like the Finance Houses. These Finance Houses served as guarantors of the bona fide of the companies under their wing. When one of these companies issued shares, they would be accepted more readily in London because it was known that the company was well sponsored. That is how the Ceylon Government was able to raise funds for the development of the Railways.

Similarly, capital outlays for social overhead like the construction of fishery harbours, ice and cold storage plants and transport could be met by Government bonds. It is possible to place a certain amount of such bonds among the middlemen and fishermen's co-operative societies. Firms providing various types of fishery equipment could also be regarded as potential subscribers. But it seems unlikely that foreign subscribers could be attracted by an unstable national government. One of the chief impediments to the flow of portfolio investment is the fear of default on bonds, and fear of the suspension or delay of interest remittance through moratoria or exchange controls.¹

(2) Direct Investment

An important category of foreign investment is the

¹ Buchanan and Ellis, op. cit., p. 344.

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direct investment, under which a foreign firm invests directly in its own undertaking in the local economy.

It is remarkable that in the past private foreign direct investment had tended to shy away from industries working for the domestic market and had concentrated on primary production like tea and rubber. In other words foreign investment has shown a marked preference for activities connected with export of primary products and an aversion to activities catering to the domestic market of Ceylon. According to Dr. Singer: "Foreign investment in the past was foreign only in a geographical sense. It formed an essential part of the creditor country's economy; it did little or nothing to promote and on occasion, may even have impeded the economic development of the debtor countries".²

Professor Nurkse, however thinks, this may have not been due to any deliberate policy of exploitation but the explanation lies "...on the one hand in the poverty of the local consumers in the underdeveloped countries and on the other in the large and in the 19th century vigorous expanding markets for primary products in the Western industrial centres".³

² Singer, H.W., "The Distribution of Gains between Investing and Borrowing Countries", American Economic Review, May, 1950, quoted by R. Nurkse, op. cit., p. 24.

³ Nurkse, Rangar, op. cit., p. 23.

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The incentive to invest in Ceylon was also created by England's own demand for primary commodities which she required. In other words as Rangar Nurkse explains: "Private investment generally is governed by the pull of the market demand" and "...the weakness of the market incentive for private investment in the domestic economy of the low-income countries can affect domestic as well as foreign capital".⁴

The low level of economic development as reflected in inadequate basic facilities, shortage of trained labour, lack of allied industries and shortage of local venture capital may have also had a deterrent effect on foreign private direct investment. Nevertheless, in recent years, particularly during the post-war period, with the gaining of independence, most of the underdeveloped countries are striving to attract foreign capital for development schemes.

Despite their efforts, foreign capital has tended to be more and more shy, due to the unfavourable climate created witting - or unwittingly in these underdeveloped countries. The unfavourable atmosphere for foreign investment has been created mainly by the uncertainties of international politics, and also by a certain amount of economic nationalism that has driven some of these countries, including Ceylon, to take measures which tend to discourage foreign investment, for

⁴ Nurkse, Rangar, op. cit., p. 25.

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example: (1) Passing of regulations which compel foreign enterprises to admit substantial participations by local capital and personnel; (2) Discriminatory treatment in the allocation of import licences; (3) Foreign exchange controls, and (4) Immigration restrictions.

These restrictions on foreign capital are chiefly due to national sentiments and especially the fear of political domination and exploitation after winning independence.

These restrictions, undoubtedly, have very adverse effects. They not only limit the supply of capital available, but also obstruct the most effective development of the available supply.

The frequent change of government may also have a depressing effect on potential foreign investors. In Ceylon, with the change of government public policy too has changed towards foreign investment. The first national government under the United National Party (U.N.P.) following a policy of mixed economy for Ceylon freely invited foreign private capital.

The "Mahajana Eksath Peramuna", (M.E.P.) government that succeeded the U.N.P. declared itself to be a Socialist government and has followed a "...foreign policy of non-alignment with power block, of neutralism and peaceful co-existence".⁵

⁵ Governor General's Speech from the Throne, Ceylon News Letter, Govt. Information Dept., 2nd July, 1959, p. 1.

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In pursuance of its socialist policy, it has nationalized the transport service and cargo landing. The problem of nationalizing the tea estates was discussed in and out of parliament to such an extent that it had a deleterious influence on foreign capital inflow.

In his last Budget Speech, in July 1959, the Finance Minister reaffirmed the policy of the government as regards foreign investment, in the following terms: "The government welcomes foreign investment in appropriate undertakings, having regard to government's own socialistic policy and the need, therefore, to contain private enterprise within certain spheres of the national economy. Each project will be examined on its own merits, and where it is found desirable in the country's interest, the fullest assistance will be given".⁶ He also stated that there would be a guarantee of the right to repatriate profits in order that dividends might be paid to the investors in their own country.⁷

Despite all these public utterances, there lurks in the minds of potential investors some element of uncertainty that may discourage not only the inflow of foreign capital

⁶ Finance Minister's Budget Speech, Ceylon News Letter, July 10, 1959, p. 3.

⁷ Ibid., p. 3. The Sri Lanka Freedom Party that was voted into power on the 20th July 1960, under the premiership of Mrs. Sirimavo Bandaranaike, the world's first woman Prime Minister, reiterated its policy of welcoming foreign capital in this country. Cf. Sri Lanka, August 17, 1960, p. 3.

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but may even drive the existing foreign capital away.

Pure nationalism should not blind us to the advantages of foreign direct investment, for they are many and Ceylon cannot afford to ignore them particularly at this stage of her economic development.

The Advantages of Direct Foreign Investments

(1) They provide foreign exchange. The import of capital goods into and the export of finished products from Ceylon will promote international trade and maintain the exchange value of our currency.

(2) Foreign investment will raise Ceylon's domestic incomes, because the industries set up by foreigners will pay wages and salaries to local people and buy supplies such as raw material, timber and bricks. These payments will not only increase consumption thereby stimulating local production, but also will make it possible to have larger local savings, with which more schools, medical services and other permanent measures could be effected. Thus national income will correspondingly increase.

(3) Foreign investment will also increase skills. More important than the foreigner's contribution of capital, will be his contribution of skill. Private capital investment brings with it managerial and technical talents. By providing training facilities which are indispensable, particularly in underdeveloped countries like Ceylon, managerial

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investment will act as a catalyst to indigenous entrepreneurial activities and consequently accelerate capital formation.

(4) Another significant contribution is the triggering role of foreign investment. As Wolf and Suffrin have pointed out: "Foreign investment can be a significant marginal factor as a means of triggering indigenous capital formation."⁸

(6) Foreign capital will also open up the country. In Ceylon it was the foreign capital that had in the past greatly aided the clearing of the jungle for plantation agriculture. It was for the benefit of those new industries that roads and railways were constructed, which have undoubtedly benefited the Ceylonese people very substantially.

(7) Another important advantage is that foreign capital has helped Ceylon to develop her natural resources. These natural resources would very likely have remained untapped for centuries, had it not been for the initiative and enterprise of foreign investors. Ceylon without having to spend money can reap the benefit of the research conducted by foreigners for the discovery of hitherto undetected mineral wealth.

Considering all these numerous advantages accruing from foreign private investment, the possibility of attracting

⁸ Wolf and Suffrin, op. cit., p. 56.

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private foreign capital for the development of the fishing industry in Ceylon cannot be ignored. Nevertheless, attracting foreign capital for direct fishing ventures may prove detrimental to the interest of the indigenous fishermen in that foreign companies may over-exploit the fishing grounds and deplete the fishery resource in Ceylon.

Fishing is an industry involving so much of risk and uncertainty that foreign capital is not so easily attracted. One possible alternative seems to be the collaboration between domestic and foreign investment. Partnership has very great advantages, for, the local shareholders will have greater interest in the business and will be able to acquire skill and training. It will enable the Ceylon Government to exercise some measure of control over its economic policy or can keep more of the profits at home, if more capital is supplied from domestic sources.

The foreign partners too stand to gain, because partnership with the local people and government will provide some protection against discrimination or pressure. The tuna fishing company which is the only one of its kind in Ceylon, is owned and operated by the recently formed Ocean Foods and Trades Ltd., a joint Ceylonese-Japanese venture. This company is engaged mainly in exploiting the resources of the upper waters of the deep sea to avoid competition with local fishermen.

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The formation of more of such joint fishing companies may prove very profitable and should be encouraged. But the only trouble is that the tuna fishing boat is an expensive vessel and only a few rich capitalists could have enough funds to work in partnership with the Japanese team. It may not directly benefit the local fishermen at large. Even in Japan, tuna fishing is considered the apex of the pyramid of the fishing industry with the countless small boats in the coastal waters forming the base of the pyramid. Progress in any industry ought to be gradual.

If the risks involved in the fishing industry could be reduced by the methods described in Chapter III, namely by spreading information, by combination and compensation of risks, by insurance and the diminution of price fluctuation, it may be possible to attract foreign private capital from the West, at least for the manufacture of goods that are necessary for fishery development, such as boats, motors, nets, and electronic apparatus. The possibility of attracting foreign capital of this kind should not be neglected. There are examples showing that this method is workable. In the Far East, Japanese private capital is the most active in fishery development. More of it would be forthcoming if the Ceylon Government considered this possibility more seriously. The experience of Burma where political risks are reduced by the organization of Burmese-Japanese fishing enterprises is a

case in point.⁹ There is no reason why other capitalist countries of the West, which have developed industries supplying capital goods for fisheries, should not also follow this method.

B. Public Foreign Investment

As things are, it is very unlikely that private foreign capital could easily be attracted to Ceylon, however powerful the inducements offered may be. We have therefore to rely to a large extent on public foreign investment, which comprises public loans or grants from foreign Governments.

Public foreign investment has certain advantages over private foreign investment, namely: (1) Foreign loans for capital expenditure can be used for domestic development in accordance with Ceylon's overall development programme. (2) Foreign private investment is controlled by the foreign firms for their own profit but a public foreign investment or loan can be controlled by the Ceylon government for the good of the country. (3) Ceylon's post war development programmes involve such large amounts of capital and so many risks that private investment alone will not be sufficient to meet the demand. She must therefore look to other governments for financial assistance.

⁹ F.A.O. Report No. 404, Rome, 1955, p. 48.

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(i) Inter-governmental financing

Before 1929 foreign governments could borrow in the capital markets from private lenders. But the great era of private international lending ended with 1929 and the era of inter-governmental financing began.

(1) The Export-Import Bank established in the United States in 1934, is a government agency to finance transactions and projects that would directly or indirectly promote United States' foreign trade. It operates on a commercial basis and its loans carry a rate of interest 3 1-2 per cent and for periods of one to twenty years. These loans are for specific purposes, generally granted directly to Governments or Government Corporations.

Ceylon has not drawn from this source. Other under-developed countries had greatly benefited by the loans from this institution. It may be possible to obtain loans for fishery development from this source.

(2) During the post-war period the United States Government made direct grants to underdeveloped countries to the amount of \$2.6 billion. Ceylon too had her share for the multi-purpose scheme at Gal-Oya. Nothing was obtained for fishery development. In July 1959, Ceylon obtained three loans totalling Rs.15,372,500 from the United States. These loans formed part of the total of approximately Rs.220,000,000 made available by the United States to the people of Ceylon

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under the Ceylon-American Economic and Technical Co-operation Programme, initiated in April, 1956.¹⁰ So far no allocation has been made from this large loan for the development of fisheries.

(3) The Commonwealth Development Finance Corporation was established in 1953 in England for the purpose of granting loans to members of the British Commonwealth. It has an authorized capital of 15 million pounds and borrowing powers amounting to twice its issued capital. As lender of last resort, it supplements other sources of industrial capital overseas. In the very first year of its operation, it has invested about 5 million pounds in the Union of South Africa and Pakistan.¹¹ But Ceylon, however, has not drawn from this source, for any of her development programmes.

¹⁰ Sri Lanka, July 15, 1959, p. 1. Besides the Government of the United States, two private organizations are assisting Ceylon with gifts and grants. The C.A.R.E. besides transmitting tins of powder milk, gift of the American people, is now contemplating to donate outboard motors to fishermen's credit unions in Ceylon. The Asia Foundation, another non-political, non-profit organization, is rendering private assistance to individuals or groups in Ceylon in the form of grants for the training of leaders for fishery co-operatives or the supply of capital good for fisheries. The assistance provided by the Asia Foundation differs from inter-governmental loans in that the foundation works with non-governmental organizations.

¹¹ Economist, March 12, 1955, p. 908. When Ceylon was a colony, she obtained a grant of Rs.85,000 in 1936 from the Colonial Development Fund that had been created in 1929, in Great Britain, for the erection of the Fishery Research Station in Colombo. Cf. Malpas A.H., Administration Report of the Marine Biologist for 1936, Government Press, Colombo, 1937, p. G.6.

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(4) Japan too has offered aid for setting up of a fisheries training centre in Negombo, Ceylon. The Government of Japan is prepared to spend a sum of 11 million yen on an expert staff and 21,781,000 yen on fishing boats and other equipment for the centre.¹²

The scope of the training centre is to train fishermen in the use of modern gear and in the operation and maintenance of mechanized boats and engines on lines similar to the four centres that have been opened out under the guidance of the F.A.O. in India, where each centre caters to 20 trainees a year.

Ceylon should take advantage of this offer made by the Japanese Government and all that will be required is to provide the necessary buildings for the local staff to be trained under Japanese experts and to continue the training centre after the experts leave. A tentative estimate of Rs.150,000 has been made as expenditure for acquiring a land or land with suitable building, while a further sum of Rs.30,000 is estimated for capital cost of furnishing the building and providing the school with transport.¹³

(5) The Federal Republic of Germany has also made available to Ceylon assistance amounting to 6 million German

¹² Sri Lanka, July 8, 1959, p. 2.

¹³ Sri Lanka, July 8, 1959, p. 2.

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marks (approximately Rs.6,900,000 for flood reconstruction.¹⁴

(6) The Soviet Union provided funds for the establishment of a cotton testing laboratory and ginnery in the Hambantota district under the Soviet technical and economic assistance programme in July, 1959.¹⁵

In August of the same year, Ceylon received a 120 million rouble loan from the Soviet Union for economic development. This loan is repayable in 12 instalments at 2 1-2 per cent interest. This money is to be devoted to the hundred million rupee iron and steel project which is to be developed in three stages.¹⁶

(ii) International Loans and Grants

Whatever may be the merits of intergovernmental loans and grants, there is an understandable fear in the minds of countries that have emerged from colonial status that accepting loans or grants from governments may lead to political domination which may ultimately result, in losing their newly won independence. Countries receiving loans or grants are apt to resent conditions attached to capital transfers.

There is at present the widespread realization that economic development of underdeveloped countries should not be left to the haphazard intergovernmental capital movements,

14 Sri Lanka, July 22, 1959, p. 2.

15 Sri Lanka, July 15, 1959, p. 2.

16 Sri Lanka, August 12, 1959, p. 2.

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but should be deliberately aided by international agencies, whose policy it is, to make long-term development loans at liberal terms. Such planned multinational lending and borrowing have the advantages of inducing capital-rich nations to lend abroad without the epithet of "imperialist" being hurled at them and persuading capital-poor nations to borrow abroad without the traditional fear of "political strings".

There are quite a number of International Agencies, whose attention must be attracted to the needs of fishery development in Ceylon:

(1) The International Bank for Reconstruction and Development was established by international agreement in 1944 at Bretton Woods, in the United States.

The International Bank for Reconstruction and Development is authorized to make or grant loans for development projects, with its own capital funds and through private capital and is provided with a financial structure under which the risks of such investment are shared by all member Governments. The loans made or guaranteed by the Bank are only for productive purposes and for financing the foreign exchange requirements of specific projects. Unlike other financing institutions, this bank does not grant loans unless the merits of all projects financed are carefully studied and arrangements made to assure that the most useful and urgent projects are dealt with first.

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It is the practice of the World Bank to send out a technical mission to countries which need loans with a view to assessing the economic and financial situation and help the country to make out its case for a loan.

A 12-member mission with Sir Sydney Caine as chairman visited Ceylon in September, 1951, stayed ten weeks to study the economic potentialities of the country and recommended a loan from the International Bank for Reconstruction and Development for a development programme the mission had outlined.

Of the 448 pages of the mission's Report hardly three pages are devoted to the subject of the development of the fishing industry in Ceylon. Having briefly examined the present condition of the fishing industry, the Mission concludes:¹⁷

"Under these circumstances the best that can be expected is a very gradual increase in catch, through small successive improvements, and a better economic position for the fishermen to be achieved by improved financing, handling and marketing. Meanwhile ocean research is needed to provide more knowledge of the profitable fishing areas, quantities and types available and seasonal movement... Potentially important as the fishing industry is,.... two main points emerge concerning its expansion:

- a) the catch can be enlarged somewhat at this time by increasing the effective fishing time of present personnel and equipment- using such means as towing the small boats to and from the grounds.

¹⁷ Report of a mission organized by the International Bank for Reconstruction and Development, at the request of the Government of Ceylon, Ceylon Government Press, September, 1952, p. 283.

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- b) for the rest, any substantial increase must await the training of many more seamen and fishermen. Ceylon cannot expect a large catch even by buying new trawlers- until the latter is done. It may take many years."

Up till now Ceylon has received \$19 million from the World Bank, most of which has been devoted to the development of electric power, transport and communication. Only a tiny fraction has been directed to fisheries. High hopes were expressed with the emergence of the World Bank whose increasingly important task was "to make the resources of the world more fully available to all mankind".¹⁸ From the point of view of the fisheries in Ceylon, the World Bank is terribly disappointing. For one thing the World Bank mission that visited Ceylon should have made more specific proposals for the fisheries development in Ceylon and should have implemented its proposals in accordance with Article III, Sec. 9, of its Charter which clearly states that loans be granted "for the purpose of specific projects of construction and developments".¹⁹

(2) The International Finance Corporation, established in 1956 as an affiliate of the International Bank for Reconstruction and Development, for the purpose of lending directly to private industries without the requirement of a government

¹⁸ Keynes's Speech before the House of Lords, May 23, 1944, cited by K.K. Kurihara, op. cit., p. 184.

¹⁹ United Nations, Method of Financing Economic Development in Under-Developed Countries, p. 78.

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guarantee in the receiving country, can invest in private undertaking, in association with private investors and provide not only fixed interest loans but also venture capital, at low interest rates of 3 to 5 per cent and with relative long periods of repayment. This Corporation could very well provide capital for private foreign or local companies for fishery processing and transportation. It is well worth tapping this source.

(3) The establishment of a United Nations Agency to make grants-in-aid or low-cost loans for economic development of the underdeveloped countries was recently proposed. Grants-in-aid are to be granted for specific purposes such as research and education, public health programmes, subsidization of medium- or short-term credit to farmers and fishermen and improvement of rural public works. The Ceylon Government should move to obtain such grants-in-aid to provide easy credit to fishermen.

(4) The Food and Agriculture Organization, commonly known as the F.A.O., is a specialized agency of the United Nations, established in 1943, to help nations obtain more and better products from their farms, forests and fishing waters.

At the end of World War II, the U.N.R.R.A. while working on programmes of relief and rehabilitation in the Philippines and China realized the implication of their activities, advocated in 1945 the establishment of some permanent

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organization of international collaboration in respect of fisheries in this area. Partly as a consequence of this advocacy, the special commissioner in South East Asia convened a fisheries conference in Singapore in January, 1947.

This conference dealt with various aspects of rehabilitation of South East Asia fisheries and recommended that a permanent international organization should be established under the aegis of the F.A.O. This recommendation was accepted by the F.A.O. and regional councils were established.

After a meeting of the Standing Committee of Fisheries which was held in Washington in July, 1948, two regional officers of the Fisheries Division, were appointed, one with his headquarters at Rome and the other for the Far East with his headquarters at Singapore.²⁰

The F.A.O. also advises governments on how to improve their agriculture and fisheries and works to improve the diets of people throughout the world.

Ceylon was one of the first underdeveloped countries to benefit from the assistance rendered by the F.A.O. Fishery Division, which sent Dr. Kestener and Dr. Ling in 1948 and Mr. G.L. Kestevan in 1950 to Ceylon. In their reports they recoded the present status and the prospective development of the fishing industry in Ceylon. It was only in 1953,

²⁰ Indian Information, August 1, 1948, p. 3.

after several experiments that Mr. Kvaran, marine engineer under F.A.O., assisted Mr. Glanville to install a Scandia 10 h.p. marine diesel engine which had been supplied by the F.A.O. in a Jaffna beach seine boat. By 1954, seventeen engines supplied by the F.A.O. were sold to boat owners in the North of Ceylon for half price.

(5) The Colombo Plan is an organization whose foundations were laid at the Commonwealth Foreign Ministers' Conference held in Colombo, Ceylon, in 1950, for the co-operative economic development in South and South East Asia. Valuable assistance in the economic and technical development of the countries of this area has been provided under the Colombo Plan. During the first seven years of the Plan alone, up to the middle of 1958, the external assistance projected to this area has been to the value of about \$5,000 million, of which assistance provided during 1957 alone was of the order of about \$1,000 million.²¹

Of the Colombo Plan countries, Canada alone has contributed substantially for the development of the fisheries in Ceylon. For the construction of the cold storage and freezing plant in Mutuwal, Colombo, Canada has contributed 5 million rupees. This cold storage plant is reputed to be one of the most modern in the world. It consists of a fish

²¹ The Colombo Plan , Colombo, December, 1958, p. 6.

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hoist for unloading the trawlers, a conveyor to carry the fish into the plant, chill tank for short-term storage, a filleting line, freezing chambers operated at a minus 40 degrees capable of freezing up to 15 tons of fish a day, and cold storage rooms with a capacity of 500 tons maintained below zero Fahrenheit. There is also a block ice making machine producing 10 tons of ice a day and a flake ice machine capable of producing 12 tons a day.

In 1955, Canada also gifted 40 engines to the Ceylon Government for sale to fishing boat owners. These marine engines were made available to the fishermen on a down-payment of one-third of the landed cost, the balance being payable in 22 instalments within two years of taking over.²²

Two Canadian boats - the "North Star" and the "Canadian" were also gifted to Ceylon by the Canadian Government for experimental fishing in the Wadge bank. The skippers of these two boats are paid under the Canadian training programme.

By and large, it must be acknowledged that the Colombo Plan stands out as one of the most valuable instruments towards human welfare in the South and South East Asian countries in general and in Ceylon in particular.

²² Sri Lanka, December 30, 1959, p. 3. Canada's Colombo Plan Contribution for 1959 to 60 towards Ceylon's economic development is \$2 million. Of this sum, nothing has been ear-marked for fisheries. Cf. Sri Lanka, June 29, 1960, p. 3.

Future of Foreign Aid

Since World War II, we have witnessed a whole battery of institutions coming into being to help underdeveloped countries with their development programmes. Foreign Aid Programmes are now becoming a regular feature in the Budget of the aiding countries. As such, foreign aid programmes can become a subject of considerable controversy. In the United States, for example, the Government's effort to obtain increased sums of money for economic assistance has in fact encountered rather strong opposition. The whole concept of economic aid has been assailed from some quarters as a "give away program". Even those who sincerely believe that furthering the economic development of underdeveloped countries is necessary for American security, raise doubts about the proper scale and scope of this assistance. They would want to know how much capital do underdeveloped countries really need to a take-off into self-sustained growth. They would like to find out how much these countries can absorb efficiently at present. Is capital their main requirement for growth or are such factors as management, technical skills, labour skills more important? Some even doubt if there is any hope of achieving higher living standards in these countries without fundamental changes in their social institutions and psychological attitudes.

There are others who stoutly maintain that it is not

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the mere opening of the tap and pouring capital into underdeveloped countries that is going to develop automatically the country. There must be the ability to absorb the capital. There is, no doubt, much truth in this assertion. Machinery imported to Ceylon for fishery development may lie idle for lack of trained men to operate men.²³

Even in underdeveloped countries fear is being expressed about interminably accepting aid either from western capitalist countries or from the Sino-Soviet block. Up to what point could they keep on receiving aid without surrendering their sovereignty on the one hand and the loss of spiritual values on the other?

With the lapse of time the emphasis on massive foreign loans and grants is bound to decline. Greater attention may be given to the transfer of techniques, to public health and education. Capital alone cannot produce miracles. Social, economic and political organization conditions its effective use.

Emphasis is now shifting from foreign to domestic finance. The conviction of experts in such international organs as the United Nations and International Bank is that

²³ Not long ago a number of tractors gifted by the Australian Government to Ceylon were idle for months and ruined for lack of trained men.

"the role of foreign finance in economic development can therefore only be of a subordinate character".²⁴

Buchanan and Ellis have remarked: "Unless the habits of consumption and saving, the institutions and legal frame work for accumulation, lending and investing can be adapted to the building and maintenance of capital, foreign aid can bring only transitory benefits..... Unless the chief nurture of growth is indigenous, the society is constantly exposed to retrogression".²⁵

²⁴ United Nations, Methods of Financing Economic Development in Underdeveloped Areas, p. 94.

²⁵ Buchanan and Ellis, op. cit., p. 301.

CHAPTER VI

PROBLEM OF MODERNIZING FISHERIES IN CEYLON

The Industrial Revolution bypassed the fishing industry even in the Western advanced countries. Research and technology progressed with incredible rapidity in all other fields. Even agriculture enjoys a long tradition of research and improvement. Fishery alone has suffered neglect from both governments and scientists. Fishery alone has failed to attract engineers and innovators in the past.

Today the fishing industry is in the middle of an industrial revolution. Mechanization and large-scale production and processing are rapidly taking place in the more advanced countries. Ceylon can no more remain indifferent to the fast-changing and rapidly-evolving industry.

Mechanization of Boats

There are 13,967 fishing vessels, excluding beach seine boats, along the coast of Ceylon, as indicated in Table VIII. They are built by local carpenters and vary in size and design in different parts of the Island, each being made to meet the methods of fishing followed by the local fishermen.

Hitherto all local fishing was conducted in non-powered craft. The "Kattumaran" is the most ancient and primitive

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TABLE VIII

Number of Craft now in use and their
estimated catch, 1957

Type of Craft	Number in existence	Number in actual use	Average Annual Catch per craft (lb)	Total Catch (000 lb)
Kattumarams	1,343	808	5,000	4,040
Orus	6,306	3,784	6,000	22,704
Vallams	2,369	1,421	6,000	8,526
Teppans	3,946	2,368	5,000	11,840
Padavu (Beach Seine (boats)				32,806
Other craft and methods				2,104
Total	13,967	8,381		82,023

Source: Director of Fisheries. Cited in The Ten Year Plan, Planning Secretariat, Colombo, Ceylon, 1959, p. 314.

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craft. Literally it means "binding logs together". As a rule three to five planks or logs are lashed together with coir because lashing stands the ever shifting cross stresses as no nail could. The central plank is longer than the others and shaped to a rough bow at both ends, or a stern piece may be added separately at these ends. The Negombo "Kattumarans" are about ten feet long while those used in Jaffna district reach up to 25 to 30 feet. Many have mast and a triangle like sail. About 1,346 of them were registered in 1957.

The "orus" are narrow outrigger sailing canoes which are made in various lengths and widths to suit different types of operation from rod and line fishing, seining and drift netting near the shore to drift lining, trolling, pole fishing and handling at distances ranging to 25 miles from the shore. The outrigger canoe, used in the South of Colombo, rarely run above 20 feet long by 2 feet beam. Both mast and guff are usually made of bamboo, but the hull is cut out from any tree having the requisite size and strength, but usually of jak or wild breadfruit (*Artocarpus nobilis*). The booms which carry the outrigger is of domba (*Calophyllum inophyllum*) and the outrigger itself is often of lunumidella (*Malia dulia*). The sail is oblong in shape. According to the figures of registration, there were 6,306 orus in operation in 1957. (Vide Table VIII).

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The "vallam", a carvel-built sailing boat of South Indian type is about 20 to 30 feet in length and 2 1-2 to 3 feet in width, and is in regular use in the Northern and Eastern Provinces. There were 2,369 "vallams" registered in 1957. The estimated catch for each vallam is 6,000 lbs. a year.

The "teppams" are 4-log raft which are principally used on the West Coast for drift netting. The larger flat bottomed beach seine boat or "paru" is unutilized for carrying heavier nets in the North East Coast. There were 3,946 "teppams" registered in 1957 of which 2,368 were assumed to be in regular use. Each "teppam" could produce about 5,000 lbs. per year.

The "padavu", a larger sailing boat of 30 to 40 feet in length and 5 feet in width, is used for beach seining in the Northern watern of Ceylon. A medium-sized mast and sail are used to travel to distant fishing grounds.

Almost all these fishing vessels used in Ceylon are of 3 to 10 tons. The fishermen have hitherto contented themselves with these sailing or rowing or pole-propelled craft for their operations. None of these craft was equipped with engine.

Boat building yards are all improvised. The local fishermen themselves are capable shipwrights.

Dr. Joseph Pearson, Marine Biologist, wrote: "The

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next step in the development of the fisheries is to devise ways and means of improving the methods used by the local fishermen in inshore waters" but admitted that one of the most difficult problems to solve would be "the discovering by trial and experiment of a suitable modern boat of moderate size and cost which can be adapted to the requirements of the inshore fishermen".¹

Dr. Pearson had off and on drawn attention in his reports to the stagnation of the local fishing industry owing to the use of craft and gear that have outlived their utility and had pointed out that no development of the industry can take place, until the introduction of modern fishing craft capable of working intensive fishing gear is effected.

Under the Donoughmore Constitution,² the Marine Biologist Department was placed under a dual control-that of the Ministry of Education as a Department of the Museum and that of the Ministry of Local Administration where fisheries were concerned. Mr. Malpas succeeded Dr. Pearson in 1933 in the

¹ Pearson, Joseph, Administration Report for 1927, Ceylon Govt. Printers, 1928, p. f 3.

² The Donoughmore Constitution was drawn up by a commission of three under the chairmanship of Lord Donoughmore, after the commission visited Ceylon in 1927, and investigated the working of the existing constitution. The new Constitution came into force in 1931, granting internal responsible government.

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dual capacity of Director of the Colombo Museum and marine biologist. This duplication of duties inevitably proved disastrous to the successful administration of both Departments, and the local fisheries were left to languish in the same deplorable state.

Since the time the Donoughmore Constitution came into operation, many schemes for the improvement and modernization of agricultural, industrial and other matters of economic importance have been adopted, and trades were fostered and improved by the state, but the fishing industry alone received scant attention from Government.

Even the general public seem to have shown callous indifference towards this depressed industry. The first layman to pinpoint the problem of the Ceylon fisheries was the late Dr. Milanus de Almeida, the Ceylonese chest specialist. His interest on fish began with a hobby that ended in his establishing the first Aquarium in Mount Lavinia. From this he turned his attention to the more vital problem of the vitamin deficiency in the Ceylonese diet that was mainly responsible for the high incidence of tuberculosis and he realized that there was a possible source of vitamin supply available in the abundant marine life that surrounded our Island.

In 1936, Dr. de Almeida delivered a lecture on "The Possibilities of the Fishing Industry", under the auspices of the Annual Conference of Urban Councils held in Jaffna. The

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delegates who had assembled from various parts of the Island, returned to their respective home towns, fired with a new idea that something could be done to this much neglected industry.

The Moratuwa Maha Jana Sabha, a social reform society, set the lead by convening a mass meeting, presided over by the late Dr. K.J.D. Silva and it was at that meeting that a resolution was passed to form a Central Fisheries Union for the purpose of the promoting interest of the fishing industry in Ceylon. Public opinion was aroused throughout the Island, through the press and meetings held in all the important fishing centres.

One of the objects of the Central Fisheries Union (C.F.U.) was to urge upon the Government the establishment of a separate Department of Fisheries and to engage therefore a staff of scientific experts with practical experience to make an exhaustive marine biological survey, firstly in the inshore waters, and secondly deep sea waters; and also to urge upon the Government the appointment of a Fishery Advisory Board comprising of representatives from Fishermen's Welfare Unions and members of the public interested in the industry.

From 1938 onwards, meetings were held in various parts of the Island to inaugurate Fisheries Unions, which were affiliated to the Central Fisheries Union. Fifty-four such organizations were affiliated to the C.F.U.³

³ Seventh Annual Report of the Central Fisheries Union of Ceylon, June 30, 1944, p. 2.

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The Central Fisheries Union submitted a memorandum and followed it up with a deputation to the Minister of Local Administration, protesting against certain proposals of the marine biologist, which were mentioned in the course of the debate in the State Council on Mr. Susanta de Fonseka's motion requesting Rs.2 million be set apart from the Colonial Development Fund for the reorganization of the fishing industry.

The C.F.U. also memorialized His Majesty's Secretary of State for the Colonies, through His Excellency the Governor of Ceylon, on March 10, 1938, and pressed for a fisheries commission to inquire into the advisability of the Government proposals and to examine the general conditions as affecting the fishing industry, particularly with reference to:

1. Living fish and their environment and methods of catching them in large numbers when they congregate in shoals.
2. Improvement of present boats, fishing tackle and fishing technique to bring the local industry in line with modern improvements.
3. Methods of transport, marketing and preservation of fish from the time they are caught till they reach the consumer.⁴

Consequent on public agitation the Ministry of Local Administration appointed a sub-committee.⁵

⁴ Memorial to the Right Honorable W.G.A. Ormsby-Gore, His Majesty's Principal Secretary of State for the Colonies, March 10, 1938, pp. 1-4.

⁵ Malpas, A.H., Administration Report of the Marine Biologist for the Year 1938, Government Press, Colombo, 1939, p. G3.

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This sub-committee visited almost all the important fishing stations and submitted its Report, in which it stated clearly: "The Department of Fisheries should be a self-contained Department embracing all branches of the fishing industry both scientific and economic".⁶

One of the first steps taken by the Ministry was to formulate a fisheries ordinance. The draft ordinance that was released to the public, evoked a storm of protest against certain obnoxious clauses. The C.F.U. submitted another memorandum and sent a deputation to wait on the Minister of Local Administration, and succeeded in securing the deletion of the objectionable clauses and the amendment of others. In 1940, the new fisheries ordinance, Ordinance No. 24 of 1940, was passed in the State Council. In accordance with Article 3 of the Ordinance, the Fisheries Advisory Board consisting of official and unofficial members, was established.

From the time the Fisheries Ordinance was passed, the C.F.U. and the Members of the Fisheries Advisory Board agitated for the appointment of a qualified Director of Fisheries. The post was advertised, There were three applicants: Dr. N.M. Carter from Canada, Dr. Wheeler and a German Jew from Bermudas. Dr. Carter was recommended by the Colonial Office, but owing to the outbreak of the World War II, the post was

⁶ Summary of Report of the Fisheries Sub-committee, 1939, copy sent to C.F.U. Ceylon, pp. 1-2.

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left in abeyance for some time, and Dr. C. Amirthalingam, who was appointed to act in the meantime, was later confirmed as Director of Fisheries.

It was during his time that a formidable array of fishery experts visited Ceylon. First, there was Mr. Hickling, the Colonial Office Fisheries Advisor in 1947, and after him three Danes, Drs. Peterson, Blegrad and Myrup, followed by Drs. Kestener and Ling of the F.A.O. Fisheries Division in 1948, and Dr. C.C. John of Travancore, in 1949. Mr. C.L. Kestevan, Fisheries Representative of the F.A.O., arrived in 1950. All of them made their recommendations in their respective Reports which were released to the public in 1951.⁷

It was only in 1953, after several experiments, that Mr. Kvaran, marine engineer under F.A.O., assisted Mr. Glanville to install a Scandia 10 h.p. marine diesel engine which had been supplied by the F.A.O. in a Jaffna beach seine boat.

The fishermen, generally suspicious of any innovation, were very cautious about adopting mechanization of their boats till the demonstration proved conclusive.

By 1954, seventeen engines supplied by the F.A.O. were sold to boat owners in Jaffna for half-price. In 1955, Canada gifted 40 engines to the Ceylon Government for sale to fishing boat owners. These ten Petter 10 h.p., Coventry

⁷ Ceylon Daily News, April 20, 1951, p. 1.

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Victor 7-9 h.p. and 15 Coventry 5-7 h.p. marine engines were available to fishermen on a down-payment of one third of the landed cost, the balance being payable in 22 instalments within two years of taking over. The cost of the engines was between Rs.2,300 and Rs.3,200. These engines have been fitted in Jaffna, Negombo and Trincomalee. In Jaffna, they have been fitted to a beach seine boat or vallam, and one to a dug-out canoe.⁸

Experiments carried on with mechanizing the outrigger or 'oru' has shown that the Penta outboard motor with bracket attachments could be successfully introduced.⁹

During the early part of September 1959, the Negombo mechanized boats landed very large catches of seer, by trolling, with the result that the price of seer fell to Re.1 per pound. The mechanized boats operating in the Trincomalee area also landed very large catches during the latter part of July, 1959. One of the fishermen from Negombo who originally took up to mechanized fishing in a 26 ft. Taos type boat in March, 1958, launched in August, 1959, a 40 ft. boat powered by a 45 h.p. Yanmar engine. This boat was equipped with a line hauler. The owner expects to operate this boat especially for tuna long line fishing using 500 hooks as compared with

⁸ Progress Report, No. 2, Government Press, Ceylon, July, 1956, p. 34.

⁹ Ibid., p. 25.

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125 hooks used in other mechanized boats which are now engaged in tuna line fishing.¹⁰

One result of mechanization has been to encourage the formation of co-operative societies to obtain loans for mechanized boats and gear. On August 25, 1959, the Minister of Industries and Fisheries issued the following statement:¹¹

"In view of the large number of inquiries that have been made to Government for the grant of loans to individuals for the purchase of mechanized fishing boats, it has become necessary to clarify the position in regard to the issue of these loans.

The Government has decided that all loans for mechanized boats and gear should be channelled through co-operative societies. The Commissioner of Co-operative Development has been requested to launch an intensive campaign for the promotion and formation of Co-operative Fishing Societies and the Director of Fisheries has been directed to instruct all Fisheries Inspectors to assist the Co-operative Department in this direction.

In the past loans were granted to individual fishermen for the purchase of boat and gear. These individuals engaged the services of four to five others to operate the boat and gear. From the catch of these operations the boat owner appropriated 50 per cent of the profits and distributed the other 50 per cent equally among the others.

It is the policy of this Ministry to encourage the growth of the industry on a co-operative basis which would give an equal share to all engaged in the harvesting operations. As such the Ministry has taken steps to issue loans only to co-operative societies. It is open to individuals to obtain their loans on the hypothecation of boat and gear from Commercial Banks and the credit institutions".

¹⁰ Sri Lanka, September 23, 1959, p. 2.

¹¹ Sri Lanka, September 2, 1959, p. 3.

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Under the new scheme of granting loans for mechanized boats, 33 boats were put into operation by the Co-operative Fishing Societies up to the end of January, 1960. One hundred and twenty-seven mechanized boats were put into operation by individual fishermen, thus bringing the total number of mechanized boats now in operation, financed by Government loans as well as by other sources to 280, by March, 1960.¹²

A later figure published on April 27, indicates that the "total number of mechanized boats financed by Government loans is now 207, that is 145 to individual fishermen and 62 to fishermen's co-operatives societies".¹³

It is estimated that a sum of Rs.1,500 will be required on the average, according to the Ten Year Plan, to mechanize a 'kattumaram' and a sum of Rs.3,000 for the purchase of nylon nets. The estimated cost of mechanizing an oru is on the average, Rs.1,500, and the gear which can be used from a mechanized oru has been estimated to cost Rs.1,500. The life of an outboard motor, when used by local fishermen seems to vary from 6 months to 2 years. Considering the uncertain life of the engines in the hands of the local fishermen, the Government has considered it necessary to lay down a period of one year within which the loan should be paid. As for the "vallam", according to the Ten Year Plan: on the average

¹² Sri Lanka, March 2, 1960, p. 3.

¹³ Sri Lanka, April 27, 1960, p. 3.

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Rs. 8,000 will be required to mechanize a vallam and an additional sum of Rs.3,000 for the purchase of new gear.¹⁴

The Ten Year Plan further suggests that the only form of improvement that can be adopted in respect of the "teppam" is to introduce more modern gear, viz, nylon nets. Each "teppam" can use 6 pieces of nylon net and "...the entire cost of supplying these nets will have to be made available through loans by Government and as the life of the gear is estimated at 3 years, repayment will have to be spread over two years."¹⁵

Problems connected with mechanization of boats

(1) Technical difficulties will be encountered in the installation of marine engines because the local vessels are not built for mechanical propulsion. The main difficulty will be in boring the stern post for the stern tube. Innumerable nails are driven usually in local crafts, into the stern post at right angles to the direction in which the stern tube is fitted. Before boring, therefore, it will be necessary to remove all nails and in most cases the craft have been in use for many years, the nails will be difficult to remove. Should a nail break then it will be almost impossible to dislodge the submerged fragments.

¹⁴ Ten Year Plan, National Planning Council, Colombo, 1959, pp. 288-290.

¹⁵ Ibid., p. 291.

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(2) The vibration of the engines not properly installed, may weaken and loosen the planks corroded by the nails. Efforts must be made to impress upon the fishermen that "...fastening of the component parts of the hull should be of copper, clenched up on rooves or washers and used to secure the outside planking to the framing of the hull. Where through-fastening cannot be worked, brass screws of proper gauge should be used".¹⁶ Experience in mechanizing small craft in Bombay should be of great assistance to the Ceylon fishermen. Dr. S.B. Setna has also suggested that it is a good practice in marine installation to have the engine bearers as long as the vessel will permit, which is not realized by the average fishermen, who insist on the engine bearers being just the length of the engine. This, according to Dr. Setna, places unnecessary stress on the hull in the area where the engine is installed.¹⁷

(3) Poor manoeuvrability may be experienced as a result of cutting space in the rudder to allow for the propeller, on installation of an engine. Most craft in Ceylon have the rudder attached to the stern post by means of a rope. Dr. Setna suggests that the best way to fix the propeller is to fit a dummy stern post to the existing stern post and to hand the

¹⁶ Setna, S.B., "Bombay Fishing Boats", Fishing Boats of the World, F.A.O. The Fishing News, Arthur J. Heighway Publications Ltd., London, 1955, p. 18.

¹⁷ Ibid., p. 18.

rudder in the usual manner which gives the vessel good manoeuvring qualities. Fairing of the dummy stern post improves performance, as it allows a smooth flow of the water to the propeller. Dr. Setna states further that the standard propellers supplied by the manufacturers are generally not ideal. Local fishing craft are constructed without plans and it is difficult for a manufacturer abroad to select the ideal propeller not knowing the type of hull.¹⁸

Sooner or later it will become necessary to re-design the boats completely for power propulsion, having modified sterns while retaining the general characteristics of the local sailing boats. The new boats should have greater capacity for nets, fish and ice, and for the engine.

(4) The selection of the proper type of engine to fit the local vessel also presents a problem. Installing a highly powered engine for a lighter vessel may ruin the life of the boat. Experience of other countries should help to overcome this difficulty. For example, it has been established by experience that for a vessel up to 42 ft. overall length, a 22 to 30 h.p. engine at 1,200 r.p.m. with a 2:1 reducing gear is best. It will give a loaded boat approximately 6 knots of speed. For a vessel up to 55 ft. in length, a 35 to 40 h.p. engine at 1,200 r.p.m. is required, giving a speed of approximately 7 knots.

¹⁸ Ibid., p. 18.

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Most of the powered fishing boats in Japan are small-sized wooden ones. The number, average tonnage, and horse power of powered fishing boats vary according to the type of fisheries.

In considering the problem of modernization and mechanization of boats in Ceylon, it is better to think first of mechanizing smaller boats. In the early years of mechanization larger boats cannot be introduced. In the first place there is insufficient experience of mechanized boats among local fishermen and secondly investment of large sums of money necessary may not take place until fishermen are convinced that they can use larger boats profitably. Finally harbours are essential for the use of larger boats and at present landing facilities are extremely insufficient.

The powering of fishing vessels is still an almost unexplored field, even in Canada and the United States where only a small proportion of launches have engines built for marine use, the rest having car engines.

The automobile engines are attractive because they are easy to maintain, parts and maintenance skill are available in any village or town.

(5) Safety problems.

One of the gravest dangers in most fishing launches using oil engines is gasoline explosion caused by leaks in the fuel tank or piping. This has been a very common cause

of loss of both lives and boats. As all the fishing boats are built of wood in Ceylon, they are exposed to the hazard of fire. No fire fighting equipments are carried on the local craft. Neither do they carry any life belts. With the increase in mechanization it will be necessary to educate fishermen in safety requirements.

(6) The Problem of Outboard Motors

The easiest engine to install in primitive craft is undoubtedly the outboard motor. Such engines are commercially available in a range from 1-2 to more than 25 h.p. weighing from 10 to 110 lb. A high-speed 4,000 r.p.m. gasoline engine drives the vertical shaft of the outboard. These engines were primarily designed for pleasure boating, but now provide power for many craft engaged in commercial fishing. The advent of the 25 h.p. outboard motor gave considerable impetus to the adoption of the outboard to fishing boats, which has been rapid in the years since World War II. There are variety of methods whereby outboards can be fitted to small fishing craft. Boats such as the "dory" and "charpie" models are often fitted with wells inboard, in which a large outboard engine of 5 to 10 h.p. is mounted.

The outboard motors now on the market are not designed for long, steady operation, nor for use in heavy boats. The trouble with outboard motors is that the casings of the shaft gearing are of aluminium alloy, subject to corrosion when

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left exposed to salt water. Paul Ziener thinks that there are well-founded reasons for avoiding the use of such motors under severe conditions and though the best makes of them have, in certain circumstances, given good service, yet "...they are high consumption engines and they suffer rapid wear and in tropical waters, extreme corrosion. The result is a high maintenance cost".¹⁹ This should be a sufficient warning to the Ceylonese fishermen who also fish in the tropical waters. However, outboard motors are very little affected by fractures or unforeseen stopsé Ziener thinks that if bronze propellers and bronze underwater parts are used with proper upkeep and minor repairs, outboard engines of Swiss make, may be used for more than 20 years.²⁰

(6) Maintenance of Engines.

Maintenance of the engines is a big problem, the importance of which may not be sufficiently realized by the local fishermen who have been supplied with engines. They may expect that once the engine has been installed, it would operate without any trouble. They are so engrossed in their fishing operations that they may not carry out ordinary repairs. Minor troubles may develop into major defects, with

¹⁹ Paul Ziener, Fishing Boats of the World, edited by Jan-Olof Traung, F.A.O., Arthur J. Heighway Publications Ltd., London, 1955, p. 394.

²⁰ Paul Ziener, Fishing Boats of the World, edited by Jan-Olof Traung, F.A.O., Arthur J. Heighway Publications Ltd., London, 1955, p. 395.

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the result that the cost of repair may rise and they may lose a number of fishing days.

The fishermen owning engines should know their machine well and must be able to do emergency repairs at sea. They should be instructed how to overhaul the engine when the vessel is drawn ashore for the monsoon. They must be made to realize that the life of an engine can be prolonged greatly if, for example, the water cooling passages are flooded with fresh water to remove the salt deposits made by cooling with sea water. This simple action would greatly reduce corrosion during the three or four months the craft is laid up.

It will be also beneficial if the manufacturers be requested to establish a service to supply spares and maintain engines in running condition. In Bombay, for instance, the fishermen are now greatly benefitting from the free services rendered by firms supplying engines. Once the firms withdraw, the fishermen will have to be on their own resources. In Ceylon, in view of the large number of owners and prospective owners of mechanized boats in the Negombo area, three courses in the operation and maintenance of marine diesel engines, were conducted by the F.A.O. Marine Engineering Superintendent, Mr. E.P. Kvaran. The first course had a regular attendance of twenty-seven trainees. Twenty-five trainees attended the second course and the third course was attended by forty trainees in September, 1959.²¹

²¹ Sri Lanka, September 23, 1959, p. 2.

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Technical staff ought to be provided at all fishing centres where vessels have been mechanized on a large scale, to instruct fishermen. Unless fishermen themselves operate the engines and have part in the mechanization programme, prospects of the expansion of the fishing industry are remote. Rapid motorization will need a large number of trained engine drivers. The absence of trained personnel is bound to tell on the efficiency of the engines. If a large number of fishing vessels were tied up on account of engine troubles, it would be a tragedy worse than if the vessels were not mechanized at all, "because they would not be able to operate even as sailing craft on account of the weight of the engines".²²

Sails have not been discarded from mechanized fishing boats in Ceylon, where fuel for gasoline or diesel engines is very expensive and where the monsoon conditions are hard on the machinery. The owners must be advised to use the sail whenever possible. It will be a great saving for them and the life of their engines could thus be prolonged.

As observed earlier, the Government of Ceylon has now ruled that loans for mechanizing boats and for modern gear would be granted only through fishermen's co-operatives. These loans which were free of interest are now subject to a

²² S.B. Setna, Fishing Boats of the World, London, 1955, p. 23.

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charge of 3 per cent interest and repayable within 36 months.²³ According to the Report of the Ten Year Plan, as pointed out earlier: "The life of an outboard engine, however, has been found to be very variable when used by local fishermen, the period varying from 6 months to 2 years".²⁴ If the Government loan has to be repaid within 3 years, and the engine is to last only for a period from 6 months to 2 years, this will obviously leave the fishermen in a worse position of indebtedness. That makes it all the more imperative to see that the fishermen are properly trained to maintain their engines in good repair.

The Problem of Gear

In Ceylon there are about 148 different types of fishing appliances, ranging from the rod and line to the most complex inshore seine fishing net. Almost all the nets are made of natural fibre, namely cotton, hemp and coir. Traps are made of "palmyrah" leaves; "kottus" of dead twigs and branches, and "kattai" of trunks of coconut trees.

Nearly all fish-net twines are made of two strands, three strands or four strands and the mesh varies according to the type of fishing. The construction of the fishing nets from the braiding of the webbing to the assembly of the whole

²³ Sri Lanka, September 23, 1959, p. 2.

²⁴ Ten Year Plan, National Planning Council, Colombo, 1959, p. 289.

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gear is the task of the fishermen themselves. The boat owner is only interested in the cost. In several villages, women prepare pieces and sell them to the boat owner. The cost of the material is very often high in relation to earnings. After World War II, an attempt was made by the Government to sell yarn and sail cloth to fishermen at reasonable price.

Demonstrations made by Japanese fishing team and Canadians under the Colombo Plan have convinced the fishermen of the efficiency of nylon nets. In recent years there has been a remarkable increase in demand for this man-made synthetic fibre.

Two important improvements have been effected in the past few years, namely the introduction of the nylon nets and the long line fishing as a result of the mechanization of the boats.

The performance of the mechanized boats would have been still more remunerative if they had possessed small winches for operating the long lines. At present power is only used for propulsion; it can be also profitably employed to perform work which engages the tedious and exhausting labour of a number of hands. Power vessels using drift nets carry seven to eight men for setting and hauling the nets. Similar work is done by four men in other countries, through the use of winches driven by the same engines. This economy can also be achieved in Ceylon if winches are installed in the mechanized craft for drift netting and long line.

Modern Trends in Fishery Development

Modern fishing has developed through three main technological revolutions: (1) Mechanization began late in the 19th century with the use of steam propulsion in fishing vessels, later followed by steam-driven winches. Semi-diesel and diesel engines began to make their appearance at the turn of the century and have been gaining ground steadily till now steam is almost displaced in the advanced countries except in North Atlantic long distant trawlers.

(2) The use of electronic echo sounding and echo ranging equipment is the second stage of fishery development. Echo sounding had already become standard equipment in big North European distant waters trawlers before 1939, but were used only for depth sounding. The improvement of underwater equipment during World War II paved the way for electronic fish detection and after the war, recording echo sounders were specially adopted in all medium and large fishing vessels in the developed fishing countries.²⁵

This was a great advance. It was like giving a blind man his sight. Fishermen once accustomed to these facilities feel they have been groping in the dark.

²⁵ Hilmar Kristjonsson, "Modern Trends in Fishing", Modern Fishing Gear of the World, F.A.O. Fishery Division, Fishing News (Books) Ltd., Ludgate House, London, April, 1959, p. xxv.

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(3) The third major revolution in modern fishing is the appearance of man-made synthetic fibres. There are several kinds of synthetic fibres, the most important being nylon, perlon, tyrelene, tevicon and krehalon.

Nylon in various forms was the first of the man-made fibres to be widely used in fishing nets. It is now most widely used for gill netting the world over and has given this age-old simple basic form of fish net, a new lease on life. According to Kristjonsson: "The elastic properties of nylon, its flexibility, softness, high tensile strength and other characteristics have so profoundly enhanced the catching power of gill nets that the name itself is hardly appropriate any longer where school fish of a uniform size are truly gilled".²⁶

One attractive feature of the gill net is that it can be used even from the most primitive unpowered craft. The nylon nets are light, and non-rotting, which is of the greatest importance in hot tropical climates. The introduction of nylon net in Ceylon has already met with great success. Nylon nets can be paid out even from the "cattamarams". Those fishermen who have begun to use nylon nets have increased their catches some 5 to 10 times thus raising their income. This will eventually enable them to replace their primitive craft with small mechanized boats.

²⁶ Ibid., p. xxvi.

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Since the introduction of nylon nets, there have been two complaints made by the fishermen. One is that fish begins to rot faster in nylon nets as a result of nylon cutting the fish that struggle in the net. If the fishermen could find it possible to remove the fish as soon as caught, they might avoid this trouble. While the nylon material has the advantage of being longer wearing and rot proof, it also has this disadvantage of cutting the fish more rapidly than the heavy cotton twine. However, the higher fishability of nylon net should offset this disadvantage. Even the powered boats may have the same difficulty if the gillnets are hauled by hand. With a power driven net hauler, costing only about Rs.500, the boat could easily fish twice as many nets and save the fish from rotting, with a smaller crew.

The other complaint is that when the nylon nets get broken, the fishermen are unable to repair them, because they do not know how to keep the knots from slipping. A very simple method is being used at the nylon net manufacturing firm, at Drummondville, Canada, to prevent knots from slipping. They use a solution commonly known as the knot adhesive solution which the firm has patented. The early difficulties of knot slipping has now been largely overcome with bonded twines and-or heat-setting of knots. This has not been fully realized by the fishermen or by their instructors.

A knotless net has been introduced in Japan. This

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method of making nets was invented in 1922 by the Nippon Seimo Co. Ltd., in Japan, and it has become increasingly popular in the fisheries of that country. The knotless net has many advantages: The meshes are not distorted under strain, and because of the absence of knots, less twine is needed with a consequent saving of weight and bulk. It can mean a saving of as much as 50 per cent of the raw material. The resistance of knotless nets in water is very much less. They are smooth and easy to handle with less labour and no wearing away of knots. Besides there will be no damage to the catch. Many fish are damaged in knotted nets by rubbing and friction against meshes. With knotless nets such damages are considerably reduced and the quantity of the catch is increased. Having no knots, these nets are easy to dye and there can be no deposit of dirt and micro-organisms between the interstices of knots, so that these nets are much less liable to fouling and need less washing. There will be no difficulty of mending such nets. Torn parts are mended as easily as in knotted nets.²⁷

Every fishing method has been affected by the development of synthetic fibres. Even handlining has gained new importance in Ceylon through the use of nylon monofilament,

²⁷ The Nippon Seimo Co. Ltd., Tokyo, Japan, "The Knotless Net", Modern Fishing Gear of the World, Edited by Hilmar Kristjonsson, F.A.O., Fishery News (Books) Ltd., London, 1959, pp. 107-108.

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artificial lures and in some cases hand-powered reels. Nylon twine has now been also adopted for longlining and this has tremendously increased the catches of the fishermen.

Perlon, too, has now been introduced into Ceylon. Like nylon, it is a synthetic fibre also manufactured in the United States. The fibre developed by Du Pont is called nylon 66, as opposed to nylon 6 or Perlon, a fibre developed by the former IG-Farben-industrie combine in Germany. In their technological properties perlon and nylon are identical, except for the melting point, in the case of nylon, is approximately 30 degrees centigrade higher.²⁸

Perlon like nylon has rot resisting capacity and displays a high degree of resistance to sun light and weather conditions and is immune to attacks by micro-organisms such as bacteria or fungi.

The terylene fibre is a new synthetic fibre of British manufacture. It was a discovery made by J.R. Whinfield and J.T. Dickson in the laboratories of the Calico Printers' Association Ltd., between 1939 and 1941. This new synthetic fibre has already made a considerable impact on the textile industry, but is comparatively new to the fishing industry.²⁹

²⁸ Perlon-Warenzeichenverband E.V., "The Technological Characteristics of Perlon for Fishing Equipment", Modern Fishing Gear of the World, Edited by Hilmar Kristjonsson, F.A.O., Fishery News (Books) Ltd., London, April 1959, pp.34, 40, 41.

²⁹ Imperial Chemical Industries Ltd., (Fibre Division) Harrogate, U.K., "Terylene Polyester Fibre and its Relation

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The teviron synthetic fibre, first introduced in October, 1956, is the product of the Teikoku Rayon Co. Ltd., Osaka, Japan. The yarn is available both as filament and as a staple fibre. This fibre is suitable for making fishing nets and rope.³⁰

Krehalon is another Japanese synthetic fibre with a higher specific gravity than other synthetic fibres. It is less affected by currents, sinks faster and drains water faster. The pliability of the fibre gives more strength to the knots and resistance to impact and friction. This fibre is particularly suitable for the manufacture of set nets, as fish of any size are unlikely to be injured when trapped, because of the pliability of the fibre.

Krehalon is also used for stick-held dip nets, gillnets, longlines and trawlers. The nets are either knotless or made with English knot. Lines and ropes are also made of krehalon. This fibre is said to be sensitive to heating and should be kept off sandy beaches or cobblestones in mid summer.³¹

to the Fishing Industry", Modern Fishing Gear of the World, Edited by Hilmar Kristjonsson, F.A.O., Fishery News (Books) Ltd., London, April, 1959, p. 43.

³⁰ The Teikoku Rayon Co. Ltd., "Teviron Fishing Nets", Modern Fishing Gear of the World, Edited by Hilmar Kristjonsson, F.A.O., Fishery News (Books) Ltd., London, April, 1959, p. 55.

³¹ Kureha Kasei Co. Ltd., "Krehalon Fishing Nets and Ropes", Modern Fishing Gear of the World, Ed. by Hilmar Kristjonsson, F.A.O., Fishery News (Books) Ltd., London, April, 1959, p. 57.

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Synthetic fibre has been used for fishing gear in Japan since 1932 and today all kinds of nets and gear are made from synthetic material. As a result of improvement in quality, advance in net-making techniques and the reduction in cost by mass production in 1953, the demand for synthetic fibre has considerably increased.³² Ceylon is importing a considerable amount of synthetic fibre from Japan.

The economics of fishing gear depends generally on initial costs, useful life, costs of preparation, maintenance and efficiency. The initial cost for a given weight of nets is higher for synthetic fibre than for cotton, hemp or coir. But the useful life of these synthetic fibres is considerably longer because of the high degree of resistance to rot and friction. While these nets need little or no preservative treatment, nets of cotton, hemp and flax must be continuously treated. The expenditure in money and labour time involved represents a heavy burden.

A teviron net is said to cost less than a net of any other synthetic fibre yarn and costs only 30 per cent more than a cotton net. The Japanese synthetic fibre nets are naturally less expensive than European or American nets of the same fibre, for the simple reason that labour costs are much less in Japan than in the other manufacturing countries.

³² Japan Chemical Fibres Association, Tokyo, Japan, "The Manufacture and Testing of Synthetic Yarns and Fibres used in Japanese Fishing Gear", Modern Fishing Gear of the World, Ed. by H. Kristjonsson, F.A.O., Fishery News (Books) Ltd., London, April, 1959, p. 63.

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Though the cost of synthetic fibre is relatively high, these nets are so light that fewer men are required to operate them in much less time, that in the long run there is bound to be substantial gain.

The use of electric light for attracting fish is another important improvement in fishing methods. Attracting fish by light is of special value where sardine, anchovy, mackerel, and other light seeking species are present, but do not spontaneously form dense schools that are easily located. A great deal of patience is often needed to develop a suitable technique for each species under each set of circumstances.³³

Another recent development is the extension of trawling into deeper waters, even with relatively small boats of modest power. On the U.S. Pacific coast and in the Mediterranean sea, 30 to 80 ton vessels of 150 to 250 h.p. trawl down to 350 fathoms which is as deep as the deepest grounds fished by the biggest trawlers in Northern Europe of over 1,000 h.p. To fish such depths, an echosounder is indispensable on bottom contour lines.³⁴

Hydrographic and biological observations are now helping skippers in locating fish concentrations. Echo sounding

³³ Hilmer Kristjonsson, Modern Fishing Gear of the World, Edited by Hilmar Kristjonsson, F.A.O., Fishery News (Books) Ltd., London, 1959, p. xxxi.

³⁴ Ibid., p. xxx.

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equipment developed for fish detection after the last war has also had a profound effect on most modern methods of fishing. Echo fish detection will enable fishermen to find the fish and its depth. Research is being done to evolve a simple inexpensive device of using an echo sounder.³⁵

Electrical fishing is already in use in fresh water, but serious problems have been met with in applying it to salt water fishing. In course of time electro-fishing in the sea may prove a revolutionary development.

Fish behaviour and net action are now being studied with the aid of television camera and hopes are expressed that in the not too distant future "...fishing skippers will be able to look at a television screen in the pilot house, watch the net and how it operates, and observe the fish and the evasive action they may or may not take."³⁶

Another significant progress has been made in the power handling of one-boat purse seines on the Pacific coast of America. There is a great scope for saving labour and improving efficiency by applying mechanical power to other nets used in Ceylon.

³⁵ Ibid., p. xxxi.

³⁶ Anderson, A.W., Discussion of Future Development, Modern Fishing Gear of the World, Edited by Hilmar Kristjansson, F.A.O., Fishery News (Books) Ltd., London, April, 1959, p. 596.

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The Russians are now using what is known as factory ships. These vessels are built to fish in distant waters, normally more than a thousand miles from their home ports. Most of these factory ships carry very large crews for filleting, freezing and processing the catch.

The Russians are also using the helicopter for locating schools of fish. Trailing the microphone of a depth-sounding instrument in the water 50 feet below, a helicopter leads the boats of Russian fishing fleets all over the world with deadly accuracy. The sound projector, or microphone, is towed at a depth of about 20 feet under a streamlined float. A wire from the float leads to the instrument panel inside the helicopter. The operator communicates with the fishing fleet by radio. The instrument reports the size and shape of the schools of fish, their depth, and even the species of fish found. The boats then set their trawls or seines accordingly.³⁷

In the face of these rapid changes in fishery techniques, education should be of paramount importance to those living underdeveloped areas. Then they must be shown how to apply that knowledge. It is in the application of the education where the manufacturers, scientists and the F.A.O. representatives could be of immense help.

³⁷ Popular Mechanics, April, 1960, Chicago, U.S.A., p. 74.

CHAPTER VII

ROLE OF GOVERNMENT IN FISHERY DEVELOPMENT

With the attainment of independence in 1948, the Government of Ceylon launched a six year programme which was designed to foster economic development through planned capital outlays in the public sector. This plan was not as closely coordinated and controlled as a programme of development should be, but was rather an effort to influence development in specific fields according to certain broad targets set by different Ministries. The target fixed under this programme for the development of new land for agricultural purposes was substantially achieved; but in the case of other sectors, the desired targets were not achieved to the same extent.

The second six year plan was inaugurated after the first meeting of the Colombo Plan in 1951 to run till 1957 and made dependent for its execution on the financial resources that would become available during that period.

In the meantime a mission from the International Bank for Reconstruction and Development visited the Island at the request of the Government of Ceylon and having completely examined the development needs, recommended a development programme based on a definite order of priorities. The

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second six year plan was revised and October 1954 marked the beginning of this programme investment. The principal aims of this programme included development of roads, railways, hydro-electric power, ports and telecommunications; extension of irrigation and land reclamation projects and colonization of new lands; crop diversification and better marketing facilities; rural development and village works; development of tourism; improved health and sanitation facilities; more technical schools, better teacher training; and the development of both administrative and defence sources.

In 1956, the National Planning Council was set up in Ceylon in accordance with the National Planning Council Act No. 40 of 1956. This Council's prior task was to prepare an effective plan for the overall development of the economy.

It published its First Interim Report in 1957¹ and by June 1959 it had drawn up the Ten Year Plan which provides for the first time a comprehensive plan of development for the Ceylon economy covering both the public and private sectors. It presents programmes of development for the different sectors of the economy and attempts to bring them together into a co-ordinated whole.

Fisheries constitute an important sector in the economy of Ceylon and as such to achieve a balanced development

¹ National Planning Council, First Interim Report, Colombo, Ceylon, July 4, 1957, p. 8.

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plans for the development of fisheries should be integrated and co-ordinated with the general development policies and plan of the Government. The National Planning Council has realized the potential fields of expansion of fisheries and admitted that "the programme for fisheries enjoys a position of high priority in the overall plan" and the Programme included in the Ten Year Plan was prepared jointly by the Department of Fisheries and the Planning Secretariat, with an earlier report submitted in August, 1958, by a team of experts from Japan, forming the basis. The programme aims at increasing the production of fish from 761,301 cwts. in 1957 to 3,932,000 cwts. in 1968 to support an estimated projected population of 12,289,000 and to make the island self-sufficient in fish.²

The total investment envisaged over the 10-year period for the development of fisheries is estimated to be Rs.349 million.³

One of the glaring defects of this estimate is that it had been worked out from faulty and incomplete statistics. The planners themselves have admitted that: "The inquiries made for the preparation of this report revealed how little statistical information is available regarding the fisheries

² The Ten Year Plan, National Planning Council, Colombo, 1959, p. 285.

³ Ibid., p. 310.

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of the Island and it was found that what was available was itself not always reliable nor complete enough to enable definite decisions to be taken".⁴

Even the figure for persons directly engaged in catching fish was derived at approximately 79,000, by applying to the number of boats in use in 1957, the number of people required to man these craft.⁵ No one seems to know exactly how many fishermen are actively engaged in fishing in Ceylon. Divergent figures have been supplied by the Fishery Department to the fishery experts who visited Ceylon. In 1948, Dr. H. Blegrad, the Danish expert in his report to the Minister of Industry, Industrial Research and Fisheries stated that there were "...no less than 50,000 full-time fishermen who fish about 38,000 tons of fresh fish annually".⁶

Dr. C.C. John, who visited Ceylon from India at the request of the Ceylon Government in 1949, in his report stated that according to the Director of Fisheries in Ceylon there are "...at present 50,000 fishermen operating 10,000 craft and 1,500 nets and who land about 38,000 tons of fish annually".⁷

Dr. C.L. Kestervan, the Fisheries Representative of the F.A.O., in South East Asia in his Report on the Ceylon

⁴ The Ten Year Plan, National Planning Council, Colombo, 1959, p. 286.

⁵ Ibid., p. 311.

⁶ Ceylon Sessional Paper VI - 1951, p. 18.

⁷ Ibid., p. 111.

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Fishing Industry stated in 1951 the Ceylonese fishery "engages the services of approximately 40,000 men" and he repeats that "production from this section of the industry amounts to approximately 38,000 metric tons per year".⁸

According to the Report of the World Bank Mission that visited Ceylon in 1952: "Fishing occupies some 120,000 persons, distributed about the entire coast but chiefly on the North half of the Island".⁹

As regards the fishing boat and gear, too, there is a discrepancy between the Ten Year Plan figures and the figures given by Dr. Kestevan, the F.A.O., Fisheries Representative, according to whom the number of units of the types of boat and gear used in Ceylon in 1951 were as follows:¹⁰

Boats	.. Catamarans.....	6,000
	Outrigger canoes....	4,350
	Seine boats.....	1,900
Gear	.. Seine nets.....	3,500
	Drift nets.....	5,400

and the estimated total catch was 38,000 metric tons per year.

According to the Ten Year Plan figures:¹¹ there were 1,343 "katumarams" and 6,306 "orus" or outrigger canoes in Ceylon

⁸ Ibid., p. 154.

⁹ Report of the World Bank Mission, Ceylon, 1952, p. 283.

¹⁰ Ceylon Sessional Paper VI, Colombo, 1951, p. 154.

¹¹ Ten Year Plan, National Planning Council, Colombo, 1959, p. 314.

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and the total annual catch in 1957 was 82,023,000 lb. or 36,617.4 tons. Unless records are kept for the daily landings from each craft for a period of several years, it will be hopelessly impossible to arrive at some averages. For the landings are not uniform. There may be days of good fishing followed by weeks of empty nets. Landings may vary from day to day, from month to month and even from year to year.

When you plan on uncertain data, the projected figures for the ten year period may produce something very distorted. That is one reason why, in fishery planning, much shorter period must be considered. The programme for fishery development has to be revised annually if it is to bear good results.

Government Role of Financing Fishery Development

It is an undeniable fact that Government investment has a tremendous influence in stimulating economic growth. Just as a low level of income per capita is considered a criterion for the economically underdeveloped country, Government expenditures per unit of population may be taken as indicative of a country's standard of living. It is said that the United States through its various units of Government spends 168 times as much on its average citizen as does the government of Haiti. The Government of New-Zealand spends over one hundred times as much per capita on economic development as does Haiti.¹² That makes much difference between

¹² Buchanan and Ellis, op. cit., p. 323.

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the 'haves' and 'have-nots', between economically advanced and economically backward countries.

In Ceylon the Government capital expenditure in 1947-1948 was Rs.152.6 million or 26 per cent of the total expenditure; while in 1953-1954 it had increased to Rs.298.3 million or 31.2 per cent of total expenditure and in 1954-1955 to Rs.452.1 million or 42 per cent of the total expenditure inclusive of extra budgetary items.¹³

Compared to the countries in the West, Ceylon spends a very small percentage of her national income on fishery development.

The Budget for 1959-1960 showed that of the total expenditure of Rs.1,405,657,445, only Rs.1,883,535 were earmarked for fisheries, that is .0013 per cent or only one tenth of 1 per cent of the total expenditure. Thus the Government expenditure on fisheries per unit of population is roughly 2 cents, taking the 1956 population figures of 9,375,000.

The Ten Year Plan has envisaged the total investment on fishery development during the 10-year period to amount to Rs.349 million. The money required for this investment programme can hardly be expected to come from the private sector

¹³ Economic and Social Development of Ceylon (A Survey 1926-1954) presented to Parliament by Hon. M.D.H. Jayawarnese, Minister of Finance, Government Press, 1955, p. 40.

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and it will therefore be the responsibility of the Government to bear the major burden. Items like the construction of fishery harbours, refrigeration plants and wholesale markets have necessarily to be carried out by the State. There are other projects like the purchase and operation of trawlers are likely to be implemented only by the Government. However, there are still other items that could be undertaken by the private sector provided the Government supplies easy credit, as for example the purchase of new mechanized boats, engines and gear.

In this respect, it should be instructive to know what is being done by Governments of other countries for the improvement of the fishing industry. The Government of the United Kingdom instituted in 1946 a scheme of financial assistance for fishermen. The Government makes a grant of 25 per cent of the cost of fishing vessel and gear. For example, the Government pays the fishing boat owner 25,000 pounds (\$70,000) if the boat he is building costs 100,000 pounds (\$280,000). In addition to this money the Government also makes loans to owners at a low rate of interest to provide for at least part of the remaining 75,000 pounds (\$210,000).

The U.K. Government gives owners further help by means of a subsidy if a vessel is losing money. The sum does not cover the difference between loss and actual operating

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expenses but it may be 100 to 120 pounds (\$280 to \$340) in a single voyage plus 4 pence a stone (\$0.0033 a lb.) on all fish landed for human consumption.¹⁴

In Canada, since 1947 - superceding ad hoc war time measures for the creation of a modern fleet - the Federal Government has provided a subsidy for the construction of fishing craft of approved types and of such size as may be acquired and operated by individual fishermen and small groups of fishermen. This subsidy is administered in conjunction with Provincial Government schemes for fleet modernization that provide low-interest loans and other aids to new constructors.¹⁵ It is believed that without the Federal subsidy assistance programme, and the programme of assistance through the Provincial Fishermen's Loan Boards, the modernization of the fishing fleet occurring in the last 10 to 15 years in Canada might not have taken place.¹⁶

The Canadian Government also introduced in 1947 a price-support legislation for the primary fishing industry to

¹⁴ Fred Parkes (U.K.), Discussion, Boat Type, Fishing Boats of the World, London, 1955, p. 245.

¹⁵ H.A. Innis and W.C. MacKenzie, Canadiana, 1958, Vol. IV, p. 162.

¹⁶ Eugene Gorman, Problems of the East Coast Fisheries, Paper read at the Third Annual Meeting of the Committee of Technological Investigations, January 9, 1959, p. 3.

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cushion the shock of slumps in the fish prices. The Fisheries Prices Support Board established floor prices for raw fish and, in order to maintain such price levels, may purchase the catch involved or make deficiency payments to its producers.¹⁷

Another assistance rendered by the Government of Canada is the establishment of the Fishermen's Indemnity Fund in 1953 by the Federal Government to provide insurance against partial or total loss of smaller fishing craft for owners to whom commercial insurance facilities are not normally available except at prohibitive rates. In 1955, the Federal Government enacted legislation to facilitate provision - by Chartered Banks and Credit Unions - of intermediate term credit for fishermen. The purpose of this was to assist fishing enterprises to finance improvements to equipment or capital stock.¹⁸

In 1957 unemployment insurance was extended to cover fisherment in Canada. Under this scheme, each registered fisherman contributes 20 to 94 cents a week according to his daily earnings. An equal amount is contributed by the purchaser of fish from him. The Government contributes 20 per

¹⁷ W.C. MacKenzie, "Purpose of Cost and Earnings in Fisheries", Report of the Technical Meeting on Cost and Earnings of Fishing Enterprises, F.A.O., September, 1958, London, p. 11.

¹⁸ Canadiana, Ottawa, 1957, Vol. IV, p. 167.

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cent of the combined contribution of the fisherman and purchaser. It is a fixed scale, five-twelfth is contributed by fisherman, five-twelfth by purchaser and two-twelfth by the Government. All fishermen have to register themselves for insurance which covers from the first week of December to the middle of May. Both fishermen and purchasers have to procure special stamps from the Post Office and affix the amount on the book supplied by the Unemployment Insurance Commission. Each insured fisherman receives 6 dollars to 36 dollars a week depending on his contributions. No insurance benefits are given during summer months.

In Hong Kong, the Government decided first to hold an exhibition of engines by the different manufacturing and importing firms. Then it was decided that the firms should supply the engines for the fishing boats and grant 50 per cent credit, while the other 50 per cent was to be supplied by the Government. The boat owners who obtained the engines on their part undertook to give 10 per cent of their catch to liquidate their debt. This is undoubtedly a very simple scheme involving no hardships for the fishermen. Conditions for repayments should be simple and easy. Where the loan is secured by a mortgage on the boat, lengthy legal process may be involved and if foreclosure is applied, the boat may be ^{left} up for a long period serving no useful purpose and probably deterioration. Under an arrangement where possession only is

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given and legal ownership is contingent on repayment of the loan, it will be possible to exercise more effective supervision. The aim of all loans to fishermen should be on the one hand to protect the investment adequately, while on the other hand to recognize the special circumstances of the fishermen. Therefore there should be some flexibility in the timing and method of repayment. Asking fishermen to repay fixed sums at fixed intervals is most impractical. Reduction of certain percentage on the daily sales of the catch is more feasible. Hence the co-operative marketing will be of immense assistance in recovering the loans.

Role of Government in Fishery Co-operatives

There is considerable divergence of opinions as to the part government can and ought to play in the development of fisheries through the co-operatives. The very nature of a co-operative implies that it is largely based on self-help. Yet the social significance and quasi-public services of a co-operative lay a heavy claim on government authorities for aid and encouragement. In a democratic society, under a government committed to the welfare of the common people, official policy can never be indifferent to the co-operatives in general and fishermen's co-operatives in particular.

Dr. Alexander F. Laidlaw, the Colombo Plan Consultant

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limits government role in co-operatives to five functions:¹⁹

- 1) Helping to create a favourable atmosphere for the growth of voluntary co-operatives.
- 2) Providing the necessary legislation for good co-operative development.
- 3) Providing a minimum amount of supervision, as much as seems necessary in the public interest, and leaving the movement to control its own audit service.
- 4) Supplying certain kinds of financial assistance to co-operatives that give community services in the nature of public utilities (Warehousing and cold storage facilities are examples of such services).
- 5) Publishing accurate and up-to-date statistical information on co-operatives.

It is natural that since the co-operative members, particularly the fishermen cannot be expected to be competent to manage their affairs at the earlier stages, the State owes it to itself to assist and guide them through special officers so as to train them for their work. Having done this, the officers should withdraw and allow them to carry on their business themselves.

There is no doubt a great reluctance on the part of Government to withdraw from its position of paternalism because of the financial assistance rendered to the co-operatives. This is understandable. Governments are anxious to

¹⁹ Alexander F. Laidlaw, Report to the Central Committee for Co-operative Training of the Government of India and the Reserve Bank of India, Ottawa, June 12, 1958, p. 33.

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promote co-operatives as a part of economic development plans and are providing large sums of money to finance co-operatives and hence their desire to have control over the public funds which they are investing, and it is not likely that government will relax its control over the movement in the near future.

State as entrepreneur

There is still a group of economists who are convinced that only a very rapid rate of real capital accumulation is capable of jolting the underdeveloped countries into sustained growth. They argue that almost all underdeveloped countries are bound by tradition, so hampered by outworn cultural institutions, so socially and economically static, and frequently so pressingly overpopulated that only big investment projects and large capital increments can hope to clear the way for economic development, and that full-scale efforts, requiring large capital investment can only be undertaken by the State and hence they consider the State as the ideal entrepreneur and praise the virtues of central economic planning.

The example of the Soviet Union and Communist China has been suggested for a planned development of the fishing industry in underdeveloped countries.²⁰

²⁰ E.S. Kirby and E.F. Szezpanik, The Economics of Fisheries, F.A.O., Rome, 1957, p. 85.

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Everyone will readily concede that a certain amount of planning is absolutely necessary for the development of a backward fishing industry. This does not necessarily imply that the government should completely socialize the industry. The example of Japan should be illustrative.

The economic history of Japan has demonstrated the compatibility of rapid economic change and growth with the preservation of traditional attitudes and social relationships. What Japan did was to re-cast or re-emphasize these to suit the need of a new economic order.

In the nineteenth century Japan, there was no entrepreneurial class at hand with the necessary drive and the investible capital to launch a commercial and industrial revolution. The Government then believed it had to perform entrepreneurial functions, to foster real capital formation and allocate it judiciously in modernizing the economy. The Japanese Government used both direct and indirect means in attacking the problems of entrepreneurship and capital mobilization and allocation. On the one hand, the state acted as entrepreneur and capital supplier, on the other hand, the state encouraged and fostered private enterprise and investment.

By 1880, the Japanese Government owned "3 shipbuilding yards, 51 merchant ships, 5 munition works, 52 other factories, 10 mines, 75 miles of railways and a telegraph system

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which linked all the chief towns".²¹ The manufacturing plants were constructed at government expense to show what was possible. Then following a change in policy in 1880, most of these were turned over to private firms, often at attractive prices. By then industrial progress had picked up enough momentum from the Government's efforts for private firms to carry on, aided if necessary, by the government.²²

A similar policy could profitably be followed in Ceylon for the development of fisheries where the Government could provide capital or undertake fishing operations as is now done by the two Government trawlers. But sooner or later it must hand over the business to the fishermen themselves directly or through their co-operatives.

Concerning Government undertakings in Ceylon, Professor J.R. Hicks has made the following remarks:²³

The public undertakings, which are at present (1957) in existence in Ceylon, are not functioning so smoothly as to suggest that their path is free of obstruction.....

The main obstacles to public enterprise, now existing in Ceylon, seems to me to be two in number..... One is the fact that public enterprise is on a small scale, it is especially difficult to prevent the

²¹ Allen G.C., A Short Economic History of Modern Japan, 1868-1937, Allen and Unwin, London, 1946, p. 30.

²² Norman E.H., Japan's Emergence as a Modern State, Institute of Pacific Relations, New York, 1946, p. 112.

²³ Hicks, J.R., "Reflections on the Economic Problems of Ceylon", Papers by Visiting Economists, Colombo, 1959, pp. 17,18.

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day-to-day management of each concern from being a political issue.....

The second obstacle which needs to be considered is concerned with marketing.....

It is a common experience that public enterprises are not very good at this marketing function.

Another obstacle to public undertakings as pointed out by Dr. N. Keyfitz is that: "Too often Civil Servants are appointed in underdeveloped countries to manage State enterprises. The Civil Servant may be a good administrator but is not necessarily a good entrepreneur".²⁴ This is very true particularly in the case of fishery enterprise in Ceylon.

State and Conservation of Fishery Resources

It is generally agreed that to conserve the natural resources of a country is a domestic responsibility of Government.

Conservation policies have been devoted to establishing regulations for the exploitation of specific resources. In Ceylon there have been several proclamations by Government to prohibit the use of certain types of nets in the sea and some types of fishing appliances like the "katte" in the lagoons. (Vide Appendix 1).

The main purpose of these prohibitions was to conserve the immature fish and fry from being dragged by small meshed

²⁴ Keyfitz, N., Lecture "Need for Capital in Under-developed Countries", Carleton University, Ottawa, October, 1959.

nets. There are, however, no laws declaring any closed season for fishing in Ceylon. The monsoons have imposed a more severe restriction of fishing during those stormy months.

Government and Law of the Sea

In the nineteenth century the three-mile limit for the breadth of the territorial waters was accepted by many but not by all members of the international community of nations.²⁵

A convention on the territorial sea and the contiguous zone drew up a code for the rights and obligations of States in their territorial sea. It contains many articles such as "...those providing for a twelve-mile contiguous zone for customs, fiscal, sanitary and immigration purposes, for a twenty-four mile closing line for bays, and for the application of the straight base-line system for determining, in certain circumstances, the starting point for measuring the territorial sea. In addition, it recognizes and regulates the rights of innocent passage for ships through the territorial sea".²⁶

The Second United Nations Conference on the Law of the Sea was held at Geneva in February-March, 1960, with

²⁵ The traditional 3 mile limit was based on the range of a gun.

²⁶ George Drew, Chairman of the Canadian Delegation, Geneva, March 31, 1959, The Law of the Sea, Queen's Printer, Ottawa, 1959, pp. 5,6.

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delegates from 88 countries. participating. The delegation from Ceylon was led by Sir Claude Corea, permanent Representative of Ceylon to the United Nations. He was assisted by Mr. D.T.E.A. Fonseka, Director of Fisheries.²⁷

A Canadian-American proposal for a 6-mile territorial limit, with bordering countries to have exclusive fishing rights for a further six miles after 1970, was turned down by a vote of 54 to 28 - just one short of the two-third majority needed.

There was no doubt a natural fear among some of the Asian Nations like India, Korea and Ceylon that Japanese fishermen may enter their coastal waters. The Mexicans wanted American shrimping fleets held at a good distance. Some South American States claimed rights as far out as 200 miles where their fishermen catch tuna and whale.

Ceylon also could not have compromised her position. The Canadian-American proposal at the Second Conference on the Law of the Sea, ignored the "traditional" or "historic" fishing rights of several countries. Mr. Drew's argument that "newer nations of the world do not and in the nature of things, cannot possess, "traditional" fishing rights in distant waters", betrays a somewhat surprising ignorance as to the existence of such "traditional" and historic rights.

²⁷ Sri Lanka, March 30, 1960, p. 3.

Ceylon, for example, had traditional and historic rights over the pearl fishery from time immemorial, even beyond the time of Vijaya in the fifth century before the christian era.

The Mahavamsa contains several allusions to pearls and pearl fishing in Ceylon.²⁸ Pliny in the Vith Book of his "History of the World" refers to Taprobane (Ceylon) as "the most productive of pearls of all parts of the world". Ptolemy, Strabo, Athenaus, Aelian and the Author of Periplus of the Erythrean Sea have all recorded the fame of the Ceylon Pearls. The Periplus written about the 2nd century A.D. refers to the use of convict labour in the pearl fishing in Ceylon.²⁹

Most of the pearl banks or "paars" lie well away from the six plus six miles suggested by Canadian-American proposal. These pearl banks lie some 20 to 30 miles west of the coast off Arippe, on the estuary of the Aruvi Aru.

Both experimental and commercial fishing have been carried on in the Wadge bank, which lies approximately 100 miles from Colombo and Pedro bank about 80 miles North East of Trincomalee. Both banks have been discovered over 50 years ago by the Ceylon Marine biologists. The Government of Ceylon has introduced trawl fishing in both banks.

²⁸ W. Geiger, The Mahawamse, translated, Guildford & Esher, 1912, pp. 11,14,16,28,36 and 47.

²⁹ Alfred Edward, "Fishing for Pearls in the Gulf of Mannar", Ceylon Today, November, 1955, pp. 6-11.

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Some considerations should be shown to such historic and traditional rights. A more practical proposal could have been the six miles of territorial sea plus six miles of fishing rights plus recognition of all traditional fishing rights that could be established on historical grounds. A committee could be appointed by the United Nations to study these traditional and historic rights which if established could be incorporated into the international law of the sea under prescriptive rights. Any disputes arising from claims could be decided by an international judicial tribunal. This is a proposal worth considering.

Thus in the last analysis the development of the fishing industry depends on an unhesitating and aggressive initiative taken by the Government of Ceylon to map out a practical, comprehensive and integrated plan and execute it expeditiously, so that the immediate threat of population expansion may be met with increased fish food and with increased job opportunities for the expanding labour force.

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One of the most acute problems facing Ceylon today is the alarming rate of population increase. The national Government of Ceylon has addressed itself to the task of meeting this challenge by a planned programme of production of food to meet the increasing demand on her limited natural resources. No economy can afford to have an unbalanced progress. Priority, however, should be given to food producing sectors of the economy. Agriculture and fisheries merit the highest consideration in a country like Ceylon, faced as it is with the problem of an expanding population.

Opportunities for developing agriculture in Ceylon are conditioned by physical factors and the availability of land. Being an island, surrounded by the vast Indian Ocean, Ceylon should unhesitatingly turn to the resources of the sea to solve her food problem. Hitherto fisheries have suffered neglect from both Government and Scientists. Today there is a growing awareness that fisheries are capable of very considerable expansion and that fisheries development is highly desirable on general economic grounds in view of the potential contribution to national income, on nutritional grounds because of the widespread prevailing shortage of animal protein and on social grounds in view of the relatively large section of the Ceylon population virtually tied

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to fishing as an occupation.

2. Fishing operations in Ceylon have been mainly confined to the narrow coastal fringe of the continental shelf and are prosecuted on a small scale with primitive equipment. Increased production cannot be achieved unless the inefficient fishing boats and gear are improved. There are manifold opportunities for increasing production, not only by the intensification of the existing operations on the basis of improved methods, but also by extending the area of exploitation. At the moment, there is no evidence that the inshore fishing has reached its limits; nor is there proof of any overfishing in the continental shelf. The inshore fishery forms the backbone of the fishing industry and is capable of quick response if properly developed. Any attempt to improve the deep-sea fishing can only be confined to the younger generation. The older men should be helped to continue their traditional methods with improved marketing facilities which would greatly increase their earnings and their savings, and so facilitate the repayment of loans. Inland fisheries too could be substantially increased by systematic management of the resources and the introduction of paddy -cum-fish culture in the expanding agricultural fields.

3. There are, however, no 'primrose paths' to fishery development. There are several obstacles to be

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cleared if the development programme is to bear fruit. Opportunities for development may be obscured by ignorance or exaggerated by optimism about fishery resources. Hence the necessity of identifying resources. In this respect the data obtained by the International Indian Ocean Expedition that is at present engaged in oceanographic exploration of the Indian Ocean, should be widely publicized so that the local fishermen may profit by information thus obtained. Lack of knowledge about the fishing grounds, their location, and quality has been hitherto a serious handicap. Meteorological information related to oceanographic knowledge can aid considerably long range weather forecasting. Charting and sampling the ocean floor will provide useful information for navigation and fisheries and will reveal marine resources of economic value hitherto unknown. What the fishermen of Ceylon need for their daily and seasonal operations is direct and clear indication about the occurrence and behaviour of the fish their gear usually catch or the new gears that are contemplated may catch.

4. The road to fishery development is also paved with vicious circles. Poverty and indebtedness are more pronounced and widespread among the Ceylon fishermen than among other communities of Ceylon. They are usually in a poor bargaining position and lack incentive to improve their efficiency. The provision of credit or subsidy is pre-requisite of techni-

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cal improvements. In order to redeem the fishermen from the clutches of the middlemen, the Government of Ceylon is now granting loans through the fishermen's co-operatives. Fishermen's credit co-operatives based on the agricultural pattern is rarely likely to succeed since the fishermen can provide no basis of security which is comparable with land or even crops. Effective use of credit facilities demands a close understanding of the fishermen and their operations. If the aim of the fishermen's co-operatives is to replace the middlemen, there must first be an understanding of the techniques and function performed by middlemen for fishermen. The fish trade is a complicated, delicate and highly specialized business, in which the experience of the established merchants or middlemen is usually much greater than that of the local fishermen themselves or of the government Departments of Fisheries and Co-operative Development. Neither of these departments is in a position to guide the industry on the business side. The middlemen, in addition to disposing of the catches, perform a variety of functions which are essential to the fishermen for the continuous conduct of the fishery operations and are virtually a condition of entry into the trade. Very little is known of the precise manner in which these middlemen operate, their turnover, profit margins and influence on price formation and the area of distribution.

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At the present time there are two outstanding weaknesses in the co-operatives among the fishermen, viz: (1) The lack of precise information on the functions performed by middlemen for fishermen; (2) Inadequate training and experience of fishery co-operative leaders and government officers concerned with fishery co-operatives.

The fish merchants and the middlemen form such a formidable ring that it will be very difficult either to dislodge them or to compete with them. The only alternative opened is to absorb them in the fishermen's co-operatives. Their experience and technique will be of immeasurable value to the newly formed fishermen's co-operatives. Inducements should be offered to them to accept the post of managers in the fishermen's co-operatives. The Government on their part could subsidize the salaries of such managers from savings made by reducing the services of the numerous co-operative and fishery inspectors.

5. To attract both domestic and foreign investment in fisheries, efforts must be made to minimize risks involved in fishery undertakings. The spreading of information obtained by oceanographic, meteorological and biological research, the combination of deep-sea fishing with coastal fishing, and insurance of boats and gear will substantially contribute to the reduction of fishery risks. At present, there is hardly any incentive to private investment in fisheries because of the high interest rates prevailing due to the

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considerable risks involved. Fisheries development calls for investment capital. An all-out effort must be made to mobilize whatever potential domestic capital is available for fisheries. A start could be made with some sort of moral suasion to persuade the fishermen to part with their hoarded gold and silver jewels that are superfluous and in return the Government could give an attractive offer in terms of Government bonds. Credit Unions should be started in every fishing village to gather the savings of fishermen.

Major capital outlays can be financed only by Government. The construction of fishery harbours and roads leading to the numerous fishing centres should be the main responsibility of the State. Part of the work may be brought under community projects where labour could be supplied by surplus labour or by the inhabitants of the respective villages.

Inducements should be given to attract private foreign investments on secondary industries such as processing, canning, fish-oil extraction, supplying capital goods for the fishing industry such as marine engines, nets and fishing hooks, and transportation, by at least two policy instrumentalities, namely: (1) The use of investment guarantees to insure foreign investors against the risk of expropriation and inconvertibility of capital earnings, (2) An attractive tax policy, which assures a favourable tax treatment to incomes from such foreign investments.

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The magnitude of the task involved in fishery development calls for a great amount of capital which must for some time come from outside sources in the form of international loans and grants. There are several avenues open for the Government of Ceylon to obtain funds for fishery development from international sources. Large foreign aid can only be complementary to domestic capital. Excessive dependence on such foreign aid may lead the country into a ruinous state. Foreign capital whether private or public should stimulate domestic savings to enable Ceylon to accumulate its own capital along with technical knowledge.

6. The supply of capital alone cannot raise the standard of living of the fishermen. Along with capital there must be a supply of qualitative services, of technological knowledge and entrepreneurship. Merely injecting capital into country or supplying it with modern equipment will not ensure economic development. The creative entrepreneur and the "Know How" are absolutely vital. The entrepreneurial scarcity in the fisheries in Ceylon may be overcome by training and education among the young and most enterprising fishermen. Leaders with talents can always be discovered in almost every fishing village.

From a long term point of view, education must begin with the young. The establishment of fishery schools in every Province is a desideratum. Japan for instance has 56

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fishery high schools with a considerable number of courses on fisheries and advanced courses are provided in most of her 228 universities. A similar educational pattern could be introduced in Ceylon. The fishermen will require adequate vocational training and educational facilities. The Government will also require leaders trained in the problems of the fisheries and the most efficient methods of co-operative organization.

7. The Ten Year Plan has envisaged the progressive mechanization of fishing boats and the introduction of new techniques and fishing gear in Ceylon. No mention, however, is made of the possibilities of the establishment either of a co-operative net-making factory or of a canning plant or of the co-operative ownership of big vessels. Cheap loans on the security of the machinery and buildings should be made available to the Fishermen's Co-operative Unions for the setting up of a net-making factory and a fish canning plant. Fish like sardines, tunny, mackerel, seer and shark and also turtles, and prawns are ideal for canning. They are plentiful around the Mannar Sea and Mannar Island is ideally suited for the establishment of a canning plant.

With reference to the mechanization of the local craft as outlined by the Ten Year Plan, an important consideration in the selection of engines should be that they are absolutely reliable and easy to operate, so that they can be

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serviced either by the fishermen or by local mechanics. Neither the fishing industry nor the fishermen can afford to be used as guinea-pigs for experiments with untried engines. Here the engine manufacturers should be made to give a guarantee that the type of engine they are offering has been subject to tests at sea under normal fishing conditions. Certain types of engines may be excellent for the U.S.A. fishing boats, but they may ~~not~~ be totally unfit for Ceylon boats and tropical seas. The initial cost of such engines and the expense involved in maintenance and repairs tend to make them uneconomic from the point of view of the Ceylon fishermen.

Some representatives of the manufacturing firms should take the responsibility for the maintenance and repair of the engines, at least up to the time the loans made to fishermen for purchase of engines are repaid. It is most unfair that the fishermen should be penalized for carrying out experiments for large engineering concerns, without extracting some sort of a guarantee from the manufacturers. The manufacturers also should normally be held responsible for the training of the fishermen in handling and maintaining the engines.

A suggestion that kerosene or petrol engines should be introduced in underdeveloped countries should receive careful consideration. For one thing local mechanics and drivers are familiar with engines used for cars and lorries,

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and there are facilities for repairing and maintaining such engines. Petrol engines are much easier to operate and maintain, although there is a greater fire hazard. The cost of such engines is much lower but in a place like Ceylon the cost of petrol is high due to a high tax on petrol. Should such engines be introduced in Ceylon, the Government should exempt from tax any petrol used in fishing boats because usually the tax on petrol is imposed to provide funds for building and maintaining public roads.

Older local craft should be replaced gradually with better designed new boats that will stand the strains of the monsoon and bad weather. The new boats should be designed to carry both engine and sail. When the wind is favourable, the fishermen must be advised to use the sail which would ensure a great saving on their petrol.

Training in the efficient use of man-made synthetic fibre for net and long line should be given to all fishermen. Even those who cannot afford to install an engine could use nylon nets or long line from their local craft. Younger men should be trained in the latest development in fishery techniques and the use of echo sounders and electrical fishing.

8. The importance of fishery development and its possible impact on the overall development of the economy is very inadequately understood and appreciated. The statement issued by the F.A.O. at the Regional Consultation Conference

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on the selective expansion of agricultural production and consumption, held in Ceylon in June, 1955, should provide a useful warning in tackling the problems of fisheries development in Ceylon:

"With regard to fishery development programmes, piece-meal approaches to special problems can rarely succeed, and one factor alone, namely the extreme perishability of the commodity, dictates a simultaneous approach to related problems in production and marketing, in order that the incentives, as well as the means can be found to increase production. In practice, this will involve a very considerable strengthening of most government services to undertake the work of research, technical training, administration, financial assistance, marketing organization and, in many cases, the creation of specially constituted development agencies".

The conclusion seems inescapable that if our most pressing problem is the problem of finding food and employment opportunities for the rapidly expanding population in Ceylon, a positively vigorous, comprehensive, integrated and long-term planning must be unhesitatingly undertaken by the Government for the development of the resources of the sea which undoubtedly constitute one of the most productive potential wealth of our country.

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APPENDIX I

PROHIBITIONS AND RESTRICTIONS OF

FISHING IMPLEMENTS IN CEYLON

I. Ordinances Nos. 4 and 5 of 1842

Under these ordinances Chank fisheries were controlled. Divers and boats had to be licensed and chank required to be landed at a port named in the licence.

II. Proclamation No. 6 of 1869

prohibited the use of the Vali Valai (drift net) within one league of the shore along the northern coast of the Jaffna Peninsula.

III. Prohibition of the use of Katte in 1872

by Mr. Green, the A.G.A. of Western Province as a result of dispute between the Muneswaram fishermen and Sea Street fishermen.

IV. Ordinance No. 6 of 1890

Sect. 6 licences to be issued to possess salt to persons who are established fish curers. All licences to be endorsed "Fish Curing only".

V. Proclamation of April 12, 1907

prohibited the use of the Araykuddu Valai and Vali Valai in certain parts of the Jaffna Lagoon and of the sea between Jaffna and Mannar.

VI. Prohibition of December 17, 1909

of the use of Kalu Dela or Ren Dela or Ara Dela in panadure, Angulu Eliya and Panadure lagoon and also in the Bolgoda Lake.

VII. Game Protection Ordinance No. 1 of 1909

New rules for the Sanitary Boards as follows:

1. The territorial waters were included
2. Boats were not to be registered, only nets
3. Baru-del and Yoths were to be registered as well as Ma-del.

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- VIII. Proclamation of September 13, 1912
Under Talpe pattu fishing rules, Akulwetiya or Jakottuwa or Kraals were forbidden to be erected in navigable Rivers or Canals within 50 yards of each other.
- IX. Proclamation of November 8, 1912
The use of Baru Dela was forbidden in the Kilonnawa Canal.
- X. Proclamation in Gazette of December 5, 1913
forbids the use of the Suda-dela as no net with mesh of less than 2 ins. is permitted. Prohibits also the use of the Siri-dela or Siru-valai and the Kottu as they were responsible for the destruction of large number of immature fish.
By-law was made which made the Kaddais free to every one for fishing purposes and made it an offence to use any kind of net within the Kaddai areas.
- XI. Ordinance No. 30 of 1928
An Ordinance to control Whale fishing in Ceylon waters was passed in 1928 by the Legislative Council.
- XII. Ordinance No. 9 of 1929
by which the Chank Ordinance of 1890 was amended so as to permit a rule being made by the Governor in Executive Council making it lawful for chank fishing to be carried on at certain seasons of the year.
- XIII. The Rule was made on November 30, 1929
amending the Ordinance of 1928 permetting the area of the Pearl Bank between Mannar and Moderagam Point and Vankalai sea to be opened for chank fishing.
- XIV. Whaling Ordinance of 1930
The Marine Biologist was appointed Whaling Officer under this Ordinance.
- XV. October 27, 1933, Rules passed under section 27 of the Game Protection Ordinance No. I of 1909 regulating fishing in Chilaw District.
- XVI. By-laws regulating sea fishing in 1934
can be framed under
1. The Game Protection Ordinance of 1909
2. The Local Government Ordinance No. II of 1920
3. The Village Committee Ordinance No.24 of 1889.

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XVII. Regulations relating to the use of fishing nets in 1935 were framed under the Game Protection Ordinance of 1909:

1. the use of fishing nets in the waters adjoining Weligama Koral and Wellaboda pattu in the Matara District.
2. Regulations relating to the use of nets and Kraals in the Delara-Bolgoda water system.
3. Regulations relating to the Jaffna Lagoon and Karaveddy Lagoon (under construction).
4. Municipal regulations which prohibit fishing in the Beirai Lake, Colombo.

XVIII. Fisheries Ordinance No. 24 of 1940

An Ordinance to amend and consolidate the law relating to fisheries and to the taking and protection of fish in Ceylon waters, to provide for the registration of fishing boats, for the better regulation of the fishing industry and for purposes incidental to or connected with the matters aforesaid.

By this same Ordinance the first Fishery Advisory Board was formed.

Note: Dr. J. Pearson commenting of the prohibition of the use of some nets remarks "It has been found that when the use of certain named net is prohibited in a district, the fishermen will make some slight modification of the net to justify a new appellation and then proceed to evade the law". Bulletin No. 3, 1922, p. 65.

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THE LAW OF THE SEA

The Canadian Proposal:

1. A state is entitled to fix the breadth of its territorial sea up to a limit of six nautical miles measured from the base-line which may be applicable in conformity with articles 4 and 5.
2. A state has a fishing zone contiguous to its territorial sea extending to a limit twelve nautical miles from the base-line from which the breadth of its territorial sea is measured in which it has the same rights in respect of fishing and the exploitation of the living resources of the sea as it has in its territorial sea.

The United States Proposal:

1. The maximum breadth of territorial sea of any state shall be six miles.
2. The coastal state shall in a zone having a maximum breadth of twelve miles, measured from the applicable baseline, determined as provided in these rules, have the same rights in respect of fishing and the exploitation of the living resources of the sea as it has in its territorial sea; provided that such rights shall be subject to the right of the vessels of any state whose vessels have fished regularly in that portion of the zone having a continuous baseline and located in the same major body of water for the period of five years immediately preceding the signature of this convention, to fish in the outer six miles of that portion of the zone, under obligation to observe therein such conservation regulations as are consistent with the rules on fisheries adopted by this conference and other rules of international law.
3. Any dispute with respect to the interpretation or application of this article at the request of any party to the dispute, be submitted to arbitration unless the parties agree to another method of peaceful solution.

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4. For the purpose of this convention the term 'mile' means a nautical mile (which is 1,852 metres) reckoned at sixty to one degree of latitude.
4. As respects the parties thereto, the provisions of paragraph 2 of this article shall be subject to such bilateral or multilateral arrangements, if any, as may exist or be entered into.

Note: It is proposed that this article be entered into with the express understanding that each party to the convention undertakes to consider sympathetically the request of another party to consult on the question of whether the rights granted by the article are being exercised in such manner as to work an inequity upon one or more of the other parties and, if so, what measures should and can be taken to remedy the situation.

The U.S.S.R. Proposal:

Each State shall determine the breadth of its territorial waters in accordance with established practice within the limits, as a rule, of three to twelve miles, having regard to historic and geographical conditions, economic interests, the interests of the security of the coastal State and the interests of international navigation.

The Eight-Power (Burma, Colombia, Indonesia, Mexico, Morocco, Saudi Arabia, United Arab Republic and Venezuela) Proposal:

1. Every State is entitled to fix the breadth of its territorial sea up to a limit of twelve nautical miles measured from the baseline which may be applicable in conformity with articles 4 and 5.
2. Where the breadth of its territorial sea is less than twelve nautical miles measured as above, a State has a fishing zone contiguous to its territorial sea extending to a limit twelve nautical miles from the baseline from which the breadth of its territorial sea is measured in which it has the same rights in respect of fishing and the exploration of the living resources of the sea as it has in its territorial sea.

Source: The Law of the Sea, The Queen's Printer and Controller of Stationery, Ottawa, 1959, pp. 22-24.