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WORLD MARITIME UNIVERSITY
MALMO, SWEDEN

ANALYSIS OF THE FISHING
DEVELOPMENT IN SEYCHELLES AND
THE NEED FOR UPGRADING TRAINING

by
YVON LOUIS MARIE
SEYCHELLES

A paper submitted to the Faculty of the WORLD MARITIME
UNIVERSITY in partial satisfaction of the requirements for
the award of a

MASTER OF SCIENCE DEGREE
in
MARITIME EDUCATION AND TRAINING
(Marine Engineering)

The contents of this paper reflect my own personal views
and are not necessarily endorsed by the UNIVERSITY

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ABSTRACT

ANALYSIS OF THE FISHING DEVELOPMENT IN SEYCHELLES AND THE NEED FOR UPGRADING TRAINING

This paper analyzes the present situation of fishing development in Seychelles, and focuses on the relevant necessities for development in the future.

The paper concentrates mainly on the training component, although some proposals which will accelerate the development are put forward.

It has been found through the study that the present training available at the School of Maritime Studies does not cater in any way to the requirements of the fisheries development in Seychelles. Many problems identified have been elaborated upon and solutions have been proposed. It is concluded that the earliest attention should be given to the proposed training scheme in a way that development will not stagnate in the future. Furthermore some recommendations are proposed, such as the establishment of a maritime forum, setting up a committee to evaluate the school's curriculum, and having the Seychelles Fishing Authority give its fullest attention to the Guidelines for the Training of Fishermen as drafted by the United Nations' Agencies (Food and Agriculture Organization, International Labour Organization, and International Maritime Organization).

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INTRODUCTION

As an island country, Seychelles has a long tradition in fishing. The people of the country have traditionally had two basic staple foods , rice and fish. It is thus clear-cut that fish is an important source of protein in the Seychellois' diet. It is essential that everyone eat some fish everyday. Even the fishermen who have been engaged in fishing as a source of income have given priority to supplying the local market for home consumption.

In addition to the local utilization the export of the product has grown to become the nation's second most important source of foreign exchange earnings. However, the fisheries sector has been confronted with various problems and constraints which have resulted in a declining volume of fish landings, and the population has turned to imported meat and tinned foodstuff to supplement the animal protein in the absence of enough fish.

The above problem caught the attention of the government during the preparation of its second National Development Plan for the five year period 1984 to 1989. Through the National Development Plan Committee the government sought to devise measures

to find solutions to this situation and these are elaborated in a document entitled "FISHERY

MANAGEMENT AND DEVELOPMENT STRATEGY".

The principal goal of this strategy is the judicious exploitation of the fishery resources, which forms a part of the main national objectives of diversification of the country's economy, creation of employment opportunities, and enlargement of the basis of sustainable social and economic development.

The scope of this report attempts to cover mainly the issue of the training component for the fisheries sector in order to provide a trained and experienced human resource as a vital component of the Fishery Management and Development Strategy. It also analyzes the constraints affecting the artisanal and industrial fisheries.

Although at present the Seychelles Fishing Authority has clear-cut objectives for the development of the fisheries sector, many constraints presently exist in the development of both these fisheries.

Some of the issues which will engage the attention of this study include:

1. The ageing manpower base.

2. Fish scarcities during the southeast monsoon affecting domestic market.
3. The difficult working conditions.
4. The poor accommodation facilities.
5. Inadequate safety at sea.
6. Lack of adequate port and shore infrastructures, and
7. Environmental disturbances on the fisheries sector.

The above mentioned issues will be formulated in the following recommendations and proposals .

1. Recommendation of well defined objectives for the development of the fisheries .
2. Recommendation on strategies to meet these objectives.
3. A proposed training scheme for fishermen.
4. Programs to implement such recommendations and proposals.

THE APPROACH

In compiling this document a number of ministries, parastatal bodies, international agencies (FAO, OSTRON) were visited during the winter break from the World Maritime University, from the 12th December 1986 to 6th February 1987. Most of these agencies are directly concerned with fishery resources development in some way or another.

Through interviews many issues on the subject were unveiled thereby giving the author a clearer picture of the problems and constraints facing the fisheries sector. It, therefore, became easier to make an assessment of what may be needed for the future development of the fishery resources in the Seychelles with reference to the present fisheries policy.

It is the hope that the investigation would have a positive impact on the National Development five year plan in the future. The economy of the country will also have a leading part to play in boosting increased revenue through future development of the fishery resources. Most important in this venture will be a trained manpower to bring this process to reality.

CHAPTER I

THE FISHERIES RESOURCES OF SEYCHELLES

1.1. BACKGROUND : THE SEYCHELLES

1.1.1. GEOGRAPHY

The Republic of Seychelles is an archipelago comprising more than 100 islands widely scattered over the Western Indian Ocean, demarcated by latitude 3 Degrees and 11 Degrees South and longitude 46 Degrees and 56 Degrees East.

Although it is composed of forty central, mountainous, granitic islands of the Mahe group and some sixty outer, flat, coralline islands spread over an area of approximately forty-five thousand square kilometers, only four hundred and forty-four square kilometers of this vast area is land.

The granitic islands of the Seychelles bank are considered to be fragments of the ancient Gondwanaland. The Seychelles and St Helena in the Atlantic, are the only granitic oceanic islands in

the world.

The islands of the Mahe group with Mahe as the largest in the group (one hundred and fifty-two square kilometers.) rise from a large, shallow (average depth of less than twenty metres and a maximum depth of no more than hundred metres), crescent-shaped submarine plateau to nine hundred metres above sea level in the Morne Seychellois on Mahe. Only two islands on this plateau, Bird and Denis, are non-granitic sand cays.

The second group of islands spreads westwards and southwards from the Mahe group towards the coast of Africa and Madagascar. This group is composed of numerous flat, low lying coralline islands or atolls in several clusters.

Each is located on top of volcanic structures of various sizes and has the characteristic steep outer slopes of true oceanic atolls. The classification of those islands is made according to the different coral island types.

Mahe is located one thousand three hundred and thirty kilometers due east of Mombasa, one thousand eight hundred kilometers northwest of Madagascar and three thousand three hundred kilometers southwest of Bombay (India). The other neighbouring states are Comoros, Mauritius, Maldives, Mozambique, Reunion(France), Somalia, and Tanzania.

The climate is tropical with seasonal variations in temperature and rainfall. Strange to note that

even though the islands lie very close to the equator the climate is very pleasant.

Two monsoons blow over the Seychelles archipelago. the southeast (Vent Suette) from May to November and the northwest (Vent d'Nord) from November to May.

The average air temperature ranges from twenty-seven degrees celcius maximum and twenty-four to twenty-five degrees celcius minimum throughout the year. During the northwest monsoon the air is quite humid and sometimes very enervating, whereas during the southeast monsoon the air is quite pleasant with the presence of light showers of rain being very frequent during the months of May to July. The average annual rainfall is two thousand three hundred and sixty millimeters.

The southern islands lie in the west-flowing South Equatorial Current, while the northern islands are in the path of the east-flowing Equatorial Counter Current.

The northern islands lying nearer the equator are generally less exposed than the southern islands. which are relatively more exposed and thus more affected by the southeast tradewinds. The wind speed varies from eight knots from early November to March, to twelve knots from June to September.

The monsoon seasons are leading actors which hamper the development of the fishery resources. They have

an important role to play in the scarcity of fish affecting the Seychelles islands during the southeast monsoon.

The granitic islands of the Mahe group are well protected from the cyclone belt and hurricanes. They have great catastrophic effects on the two neighbouring island states of Mauritius and Madagascar.

Recently in May 1986, the port of Toamasina in Madagascar was the victim of a severe hurricane. The port was extensively damaged, requiring repair. This repair is being undertaken by the Danish Research Institute. The island of Mauritius also suffers from frequent cyclones which cause considerable and often irreparable damage.

Among the southern and eastern edges of the Mahe plateau, upwelling has been shown to be consistent due to the presence of the cold sub-surface water and the abundance of phytoplankton in the area.

1.1.2. HISTORY

The Seychelles may have been known and visited by the Arab traders sailing to and from the East African coast during the Middle Ages.

The Amirantes group was sighted by the Portuguese explorer, Vasco da Gama, in 1502. However, he did not make a stopover. It was only in 1742 that the

French first explored the islands. They claimed possession in 1756.

Nonetheless The islands were left uninhabited for some years. In 1794 the French garrison surrendered to a British naval force.

However, the French administration went on until the year 1810. A few years later in 1814 by the Treaty of Paris, possession by the British of the Seychelles and Mauritius Islands was confirmed. Administration of the two colonies as a single unit went on until 1872. In 1903 the Seychelles became a Crown Colony of the British Government.

Although in 1948 The Seychelles Taxpayers and Producers Association represented the landed class in a general election, it was not until the beginning of 1960 that the Seychellois people really awoke to the era of politics.

Several political parties were formed at that time. However, in 1963 two prominent political parties were formed by two law graduates, both having studied in England. James Mancham formed the Seychelles Democratic Party (S.D.P.) and France Albert Rene the Seychelles People United Party (S.P.U.P.).

Both had as their aim to upgrade the poor class of the society. In 1967 they demanded that a new constitution be promulgated for the establishment of a Governing Council.

A majority of members was elected from the two parties. However, the outcome was not backed by either party. A constitutional conference was held in London in 1970. It ended with a ministerial system of government being established.

However, at a general election in November 1970, the S.D.P. won ten seats in the legislative assembly, whereas the S.P.U.P. gained only five. Mancham was appointed Chief Minister.

From that time onwards the two parties were in bitter conflict. Although further elections were held at different intervals during the middle of 1970, the results of the other elections still created controversy. This was because even though the S.D.P. won only fifty two percent of the polls, they got thirteen seats, while the S.P.U.P., having won forty eight percent of the polls, got only two seats.

However, the two parties were united on one issue, that of independence. The Seychelles achieved independence on the 29th of June 1976. It became a sovereign republic within the Commonwealth.

A coalition government was formed with Mancham as President and Rene as Prime Minister. It was at that time that the United Kingdom returned to the Seychelles the islands of Aldabra, Farquar, and Desroches. They had been detached in 1965 to form part of the British Indian Ocean Territory.(B.I.O.T.). They had been subsequently on lease to the United States.

On the 4th/5th of June 1977 some supporters of the S.P.U.P. staged an armed coup while Mancham was in London for the Commonwealth conference. Many reasons were given for the staged coup. Albert Rene was sworn in as President.

Several attempts of counter coup have been tried since Albert Rene became President. None of them have been successful. In September 1986 there was a big reshuffling in the present government.

The present government achieved ten years of ruling time on the 5th of June 1987.

1.1.3. ECONOMY

The area of cultivated land is very limited. About one thousand hectares of a total area of fourteen thousand hectares on Mahe is cultivated. The soil is generally poor. New land is being opened up for farming on some outlying islands. The islands are managed by the Islands' Development Company.

The most important cash crop is coconut, the source of copra. It accounted for 43% of the domestic export earnings in 1982. In 1982 it increased to 45%. However, due to the world's recession, export of this commodity has since gone down.

The second important cash crop is cinnamon. It also suffered a serious decline in export. The production of green leaf tea rose from one hundred

and sixty-seven tons in 1980 to one hundred and eighty tons in 1985.

Small quantities of sweet potatoes, yams, sugar cane and bananas are grown for local consumption. The government is trying to increase output of bananas, mangoes and avocados. It is also trying to make the country more self-sufficient in fruits, vegetables, meat, and milk. There is a fruit and vegetable canning plant and an integrated poultry unit. The islands can supply sufficient amounts of poultry for the local demand.

Another major contributor to the economy of the Seychelles is tourism. In 1983 the number of visitors was fifty-five thousand five hundred and eighty-seven. In 1986 the number of visitors increased to sixty-seven thousand eight hundred and seventy-nine.

In order to diversify the economy away from tourism, the fishing industry is being modernized and expanded. Presently the government issues licences for foreign fishing vessels to fish in its Exclusive Economic Zone.

Seychelles has signed a petroleum exploration agreement. It covers an offshore concession area of 16,000 square kilometers. Up to now no definite results have been given. India is collaborating in surveys of polymetallic nodules in the EEZ. Some of the other islands contain large amounts of guano (fertilizer).

It should be noted that the Seychelles benefits from a great deal of foreign aid. The Gross Domestic Product is U.S. Dollars 2,590 per capita.

However Seychelles is heavily dependent on imported foodstuffs. This item constitutes 20% of the total imports. The population of Seychelles is sixty five thousand people.

1.2. THE SEYCHELLES EXCLUSIVE ECONOMIC ZONE

In December 1982 the new United Nation Convention on the Law of the Sea was signed by 119 countries including Seychelles. The signature brought to a close almost a decade and a half of discussions. The Convention now recognises several coastal state rights to establish a 12 mile territorial sea and beyond that an Exclusive Economic Zone (EEZ) extending up to 200 miles from the low water mark or base line. The coastal states have sovereignty over the territorial sea, subject to the right of innocent passage in the EEZ (sovereignty rights for the purpose of exploring and exploiting, conserving and managing the industrial resources) as well as certain other rights subject to the rights of other states of which the most important for fisheries are freedom of navigation and under certain conditions access to fisheries.

In 1977 the Maritime Zones Act extended the limits of the territorial waters to Seychelles up to a distance of 12 nautical miles from the nearest point of the base line. Such limits may be amended by order when the President considers it necessary to do so taking

into account international and state regulations. Seychelles exercises its sovereignty over these waters, the seabed and underlying subsoil and the airspace above. Except in certain circumstances (connected with public safety, public order, defence and security) foreign ships enjoy the right of innocent passage through the territorial waters.

1.3. SPECIES AND LIFE HISTORIES

The Seychelles Exclusive Economic Zone contains a rich variety of fish species. Nearly nine hundred species have been recorded from demersal and pelagic catches at different period of time. Table I shows the species composition in the traditional fisheries which is carried out by handlining, traps and gill netting. However, the record is purely from catches brought ashore, whereas there are many trash fish which are unaccounted for statistically because of the unavailability of consumer demand for them. Table II shows the species composition in the industrial fisheries caught by foreign vessels in the Seychelles EEZ.

However, both the demersal species and the pelagic species are caught by small scale fishermen when carrying out their fishing activities at sea.

Most of the demersal species grow to large sizes and have a very low mortality rate. The potential in the unexploited stock is about ten percent of the initial biomass. Their maturity ages are from four to seventeen years, with fork lengths ranging from twenty five centimeters for the small demersal

ANNEX I

MOST IMPORTANT COMMERCIAL SPECIES LANDED BY THE ARTISANAL FISHERY

<u>Gear</u>	<u>Local Name</u>	<u>English Name</u>	<u>Scientific Name</u>
Hand-line	Bourgeois	Emperor Red Snapper	Lutjanus sabae
	Bordeaux	Humphead Snapper	Lutjanus coccineus
	Vieille Maconde	Brownspotted Grouper	Epinephelichlorostigma
	Vieille Platte	White Blotched Grouper	Epinephelus aultionatus
	Croissant	Moontail Seabass	Variola louti
	Vara Vara	Two-spot Red Snapper	Lutjanus bohar
	Job Gris	Green Jobfish	Aprion virescens
	Job Jaune		Aphereus rutilans
	Batrican	Bluespotted Jobfish	Pristipomoides filamentosus
	Carangue Balo	Bulldger	Carangoides gymnotethus
	Carangue Platte	Yellow Spotted Travally	Carangoides fulvoguttatus
	Thon Jaune	Yellowfin Tuna	Thunnus albacares
	Bonite	Bonito	Euthynnus affinis
	Kingfish	Kingfish	Acanthocybium solandri
	Diable La Voile	Sailfish	Istiophorus platypterus
	Espadron	Marlin	Makaira sp.
	Monsieur Hangard	Tomato Hind	Cephalopholis sonnerati
	Capitaine Blanc	Blue-lined large-eye Bream	Gyanocranius robinsoni
	Capitaine Rouge	Spangled Emperor	Lethrinus nebulosus
	Babonne	Spotted Coral-Trout	Plectropomus maculatus
Becune	Pickhandle Barracuda	Sphyræna jello	
Buele Longue	Longface Emperor	Lethrinus elongatus	
Trap	Cordonnier Blanc	Shoemaker Spinefoot	Siganus sutor
	Cordonnier soule- femme	Streamlined Spinefoot	Siganus argenteus
	Cacatoï Blanc	Yellowscale Parrot	Scarus ghobban
	Cacatoï Bruno		Scarus sp.
	Chirurgien	Bleeker's Surgeonfish	Acanthurus bleekeri
	Rouget Local		Parupeneus seychellensis
Rouget tache	Dash-and-dot Boatfish	Parupeneus barberinus	
Net	Macquereaux Doux	Indian Mackerel	Rastralliy.: kanagurta
	Macquereaux Gros Yeux (teka)	Big-eye Scad	Belar crumenophthalmus

Sources: Seychelles Fishing Authority Report for
1986

Jan/84	14	13	2.9	19.39	4100	(79)	1094	(21)	5217	5217
Feb	17	16	2.6	16.17	3666	(107)	790	(10)	4464	4823
Mar	22	21	4.75	17.50	6601	(80)	1678	(70)	1279	1770
Apr	27	26	4.99	10.67	2569	(40)	2719	(51)	5323	2375
May	32	31	7.95	8.09	4407	(69)	1933	(30)	6433	2706
Jun	32	31	6.31	5.15	2723	(84)	458	(15)	3247	3247
Jul	27	26	5.19	8.00	3359	(81)	708	(17)	4154	3217
Aug	29	28	6.18	8.79	3015	(56)	2416	(44)	5431	4741
Sep	37	36	7.56	15.55	3336	(28)	8413	(72)	11759	5420
Oct	41	40	7.44	19.93	4251	(29)	10465	(70)	14827	6713
Nov	46	46	10.35	19.39	10254	(52)	9696	(40)	20066	17200
Dec	49	49	10.52	8.41	6231	(70)	2608	(29)	8044	9014
Total			76.67	12.79	54613	(56)	42785	(44)	93044	

Jan/85	49	49	11.05	14.50	11370	(71)	4740	(29)	16111	16111
Feb	49	48	9.00	6.10	4071	(66)	2052	(34)	6123	2223
Mar	46	45	11.20	11.75	10335	(78)	2709	(21)	13145	3529
Apr	45	43	9.25	7.76	7109	(10)	4449	(44)	4931	4229
May	35	34	8.53	9.50	5674	(69)	2389	(29)	8169	5045
Jun	34	32	7.24	11.65	6418	(76)	1828	(22)	8437	5925
Jul	28	28	5.18	12.92	4507	(69)	2104	(31)	6671	6506
Aug	30	30	5.67	12.41	2229	(32)	4805	(40)	7034	7210
Sep	33	33	6.59	25.19	3306	(20)	13212	(80)	16597	8920
Oct	36	36	7.58	26.02	3017	(15)	16588	(84)	19646	10255
Nov	37	37	8.41	12.45	2289	(22)	7922	(76)	10470	11923
Dec	30	30	10.30	9.35	4257	(42)	5409	(56)	9702	12406
Total			100.15	12.08	59020	(46)	68527	(53)	129025	

Jan/86	30	30	9.44	16.79	12683	(80)	3072	(19)	15652	15652
Feb	38	37	7.90	16.63	8978	(68)	3839	(29)	13137	2679
Mar	36	32	7.31	12.61	4912	(53)	4225	(46)	9137	3976
Apr	35	21	4.52	13.51	1946	(32)	4149	(68)	6105	4423
May	35	19	3.35	13.17	507	(13)	2994	(87)	4411	4342
Jun	31	5	2.7	19.70	16	(17)	405	(84)	471	1713
Total			37.99	18.96	29192	(59)	15144	(130)	49162	

Sources : Seychelles Fishing Authority Report for

1986

species to seventy centimeters for the large predatory species.

In the case of the pelagic species exploited in the industrial fisheries such as tuna, their ages of maturity are from five years to twelve years attaining fork length between sixty five centimeters to one hundred and twenty five centimeters. However, as the ocean environment is variable, there can be dramatic changes from year to year in individual fish stocks. It should be pointed out that interaction between species is complicated by their feeding habits and the food chain.

1.4. DISTRIBUTION

It is apparent that over the whole area of the Seychelles EEZ, varied quantities of fish are found. According to the surveys conducted, it is possible that there are relatively low densities of demersal fish on the Mahe Plateau. The biomass of demersal fish was estimated at forty-seven thousand tons on the coralline ground and about fifty thousand tons on the sandy ground.

On the other bank areas within the Seychelles EEZ there are probably ten thousand tons of demersal fish. However, there are biomass estimate difficulties because of possible migration of stocks between coralline and sandy grounds. From the recent survey by "Coriolis" in November 1979, the estimated biomass for the pelagic fish was one hundred and fifty thousand tons.

In addition to the fish species, a deep water shrimp resource has recently been discovered on the edge of the Mahe Plateau. The Mahe Plateau is cited as being a nursery ground for both the demersal and pelagic species. It is probable that this can be misleading in stock assessment.

Recently the Seychelles EEZ has been divided into different fishing zones. Table III (a, b, c, d) shows the different zones and respective geographical positions.

MAHE ISLAND SEYCHELLES BANK

ZONE 1

1.	5Degrees	22.0 'S	57 degrees	23.0'E
2.	3 " "	40.0 'S	56 " "	06.9'E
3.	3 " "	30.0 'S	55 " "	11.0'E
4.	3 " "	55.0 'S	54 " "	23.0'E
5.	4 " "	44.0 'S	53 " "	47.0'E
6.	5 " "	38.0 'S	56 " "	08.0'E
7.	6 " "	34.0 'S	56 " "	02.0'E
8.	6 " "	34.0 'S	56 " "	23.0'E

PLATTE ISLAND

ZONE 2

1.	6Degrees	06.3 'S	55Degrees	35.6'E
2.	5 " "	39.0 'S	55 " "	35.6'E
3.	5 " "	39.0 'S	55 " "	10.0'E
4.	6 " "	06.3 'S	55 " "	10.0'E

COETIVY ISLAND

ZONE 3

1.	7Degrees	23.0 'S	56 Degrees	25.0'E
2.	6 " "	53.0 'S	56 " "	35.0'E
3.	6 " "	53.0 'S	56 " "	06.0'E
4.	7 " "	23.0 'S	55 " "	56.0'E

Sources Seychelles Fishing Authority.

FORTUNE BANK

ZONE 4

1. 7Degrees	35.0'S	57Degrees	13.0'E.
2. 7 " "	01.0'S	56 " "	51.0'E
3. 7 " "	01.0'S	56 " "	45.0'E
4. 7 " "	16.0'S	56 " "	40.0'E
5. 7 " "	35.0'S	56 " "	49.0'E

AMIRANTES ISLAND

ZONE 5

1. 5Degrees	45.0'S	53Degrees	55.0'E
2. 4 " "	41.0'S	53 " "	35.6'E
3. 4 " "	41.0'S	53 " "	13.0'E
4. 6 " "	09.0'S	52 " "	36.0'E
5. 6 " "	33.0'S	53 " "	06.0'E

ALPHONSE ISLAND

ZONE 6

1. 7Degrees	21.5'S	52Degrees	56.5'E
2. 6 " "	48.0'S	52 " "	56.5'E
3. 6 " "	48.0'S	52 " "	32.0'E
4. 7 " "	21.5'S	52 " "	32.0'E

PROVIDENCE IS, FARQUHAR, AND ST PIERRE

ZONE 7

1. 10Degrees	20.0'S	51Degrees	29.0'E
2. 8 " "	38.0'S	51 " "	15.0'E
3. 9 " "	04.0'S	50 " "	28.0'E

Sources Seychelles Fishing Authority.

COSMOLEDO AND ASTOVE ISLANDS

ZONE 8

1. 10 Degrees	18.0'S	48Degrees	02.0'E
2. 9 " "	34.0'S	47 " "	49.0'E
3. 9 " "	23.0'S	47 " "	34.0'E
4. 9 " "	39.0'S	47 " "	14.0'E
5. 10 " "	18.0'S	47 " "	36.0'E

ALDABRA AND ASSUMPTION

ZONE 9

1. 9Degrees	54.0'S	46Degrees	44.0'E
2. 9 " "	10.0'S	46 " "	44.0'E
3. 9 " "	10.0'S	46 " "	01.0'E
4. 9 " "	59.0'S	46 " "	01.0'E

TABLE III (d)

Sources : Seychelles Fishing Authority.

CHAPTER II
FISHERIES EXPLOITATION
AND DEVELOPMENT
IN SEYCHELLES

2.1. HISTORY OF EXPLOITATION AND DEVELOPMENT

It has been recorded that as early as 1903 fishing activities on a commercial basis had started in the Seychelles. However, those activities were being carried out solely by the colonial power at that era.

Furthermore in the year 1921, James Hornell, the Director of Fisheries in Madras wrote to the Under-Secretary of State in London, stating that there was a large quantity of pelagic fish in the Seychelles that could be exploited on the grounds of establishing a commercially viable fishing industry. However, not much was done towards developing the fishing industry to its full potential at that time.

Nonetheless, after the first survey of 1948 by Wheeler and Ommaney a commercial fishing industry was initiated in the Seychelles. This was undertaken by the Colonial Development Corporation. It operated mainly on the northern part of the Saya de Malha Bank, and the Mahe Plateau. However, it rapidly failed. This was because of

inadequate marketing facilities, improper fish handling at sea, and a lack of proper shore infrastructures.

Between the years 1950 and 1960, a large percentage of the people of Seychelles were engaged in various fishing activities. They were mainly using the primitive fishing technology available at that time. Those fishing activities were essentially being carried out for local consumption.

During that era, the coastline around the Mahe and other islands forming part of the Seychelles EEZ had an abundance of estuaries. Fishing activities were mostly being undertaken close to the coast because the abundance of the demersal species which were in great demand on the local market were available around the reefs close to the estuaries. At that time the population of Seychelles was around thirty thousand. The only available processing was curing by salting of the surplus catch.

By the middle of 1960, exploitation of the demersal species was mainly being undertaken by private entrepreneurs. Larger whale boats were being built and the introduction of inboard and outboard engines for propulsion purposes gave the small group of experienced fishermen more confidence to proceed farther out to the Mahe Plateau to carry out their fishing activities. However, those fishermen were not at that time deriving great benefits from the exploitation.

Most of the benefits went to the middle men who were owners of the fishing vessels.

Late in 1960, an embryonic Department of Fisheries was established under the auspices of the Department of Agriculture. The Department of Fisheries dealt mainly with administrative matters concerning the fisheries sector.

Land reclamation which was undertaken for the East Coast Project in 1970 (construction of the airport and the commercial port) jeopardized to a very great extent the small-scale fishing activities. The main factors affecting these activities were firstly that most of the estuaries on the east coast of Mahe were either badly damaged or completely paralysed and secondly that because manpower was badly in demand by the construction companies carrying out the project, most of the experienced fishermen left their fishing activities to work in the construction sector mainly because they could earn a better living.

It is quite evident that during the contingency planning for the development of the East Coast Project the fisheries sector had been overlooked. Emphasis of the development had been more geared towards the development of the tourism industry and the commercial port.

However, later in the mid 70's, the artisanal fisheries took new impetus. Artisanal fishery was then divided into two broad categories: the inshore and offshore fisheries. This new venture

induced more revenue for the private entrepreneurs. Some more local fishing companies emerged. Two of the most successful of those companies were " Le Bon Poisson " and " Larue's Fishing Company ". Development of the artisanal fishery was mainly in the areas of :

1. Introduction of new fishing gear (trolling),
2. Fish preservation at sea (ice), and
3. Use of longlining for bottom fishing.

It was only after achieving power in middle of 1977 that the present government took an active role in the fishery resources exploitation. Even the Seychelles Exclusive Economic Zone became the focal point of interest for several resource surveys which were to be undertaken by foreign agencies.

Demersal trawl surveys carried out by research fishing vessels such as the R/V Prof. Metsyatsev (1976 to 1977) Nauka (1979) and R/V Coriolis (1980 to 1981) gave stock estimates of the demersal species using the swept area method. However, those surveys were generally carried out only during shorter periods of the year. As most of the fish species show great seasonal variation, direct comparison of the results from the different surveys may therefore have been difficult.

Trawlable grounds had been located mainly on the Mahe Plateau and very few trawls had been made in

other areas. However, in 1981 after a joint Seychellois / German demersal trawl survey was carried out over a one-year period on the Seychelles Plateau, it was concluded that demersal trawling in Seychelles could not be practiced on a commercial scale due to the lack of vast areas of trawlable grounds and the possible harmful effects on the ecology of the sea bed and the coralline species.

The untrawlable grounds carrying fish stock available to handline or traps have encouraged commercial operations on and around the Seychelles banks. In 1981 a state-owned parastatal fishing company was established with the aim of mainly exploiting the artisanal fishery.

It was believed that this would create more employment opportunities and that distribution for marketing purposes would be more effective. Furthermore a new development was the orientation towards the export market of the surplus catch. However, after two years of operation, the project collapsed. This was entirely due to mismanagement, poor motivation of the crew, and the mistake made in employing fishermen on monthly salary structures.

Despite the fact that several resource surveys have been carried out in Seychelles waters no consensus has yet been reached on the total biomass or the Maximum Sustainable Yield available for the demersal fishery.

The total biomass on the Mahe Plateau was established at 42,000 tons by Berkett (1979), 75,000 tons by Orstom (1981), 80,000 tons by Tarbit (1980), and 50,000 tons by Kunzel et al (1983). However, present indications from the catch rates are that stocks on some parts of the plateau have reached their optimum level of exploitation and that therefore any increase in the fishing must be undertaken with caution.

Regarding the industrial fisheries exploitation, early development of the industrial tuna fishery around the Seychelles can be traced back to the mid-1970's. Before this time longliners from the Far East (mainly Japanese and South Korean) were known to have been fishing for deep swimming tuna in and around Seychelles waters.

The year 1977 marked the starting point of the industrial tuna fishery in Seychelles. In August of that year the Maritime Zone Act (1977) came into force and was implemented in February 1978 by the Exclusive Economic Zone Order. The Act extends the limits of the territorial waters of Seychelles up to a distance of 12 nautical miles from the nearest point of the base line. The Act also establishes an Exclusive Economic Zone of 200 nautical miles from the baseline. Seychelles exercises its sovereignty over these waters, the sea bed and sub soil underlying and air space over.

In 1979, the government was approached by the South Korean Deep Sea Association and soon after a

fishing agreement was signed granting fishing licences to South Korean longliners fishing in the Seychelles EEZ. In 1982 a Seychelles longliner, the Seykor, a 350 GRT (Gross Registered Tonnage) vessel joined the industrial tuna fishery. This venture, however, did not prove to be profitable due to high operating costs, poor catch rates and the sharp drop in the price of sashimi on the Japanese market. The failure may also be attributed to both shipboard and shorebase poor management.

Another joint venture agreement with France in particular left Seychelles with its first industrial fishing capability in the form of four modern pole and line vessels. This venture also collapsed after a year due to the lack of shore-based infrastructures, poor motivation and a lack of expertise of the crew. The shortage of live bait was also a major constraint.

Between August 1981 and April 1982, two Spanish pole and line fishing vessels carried out pole and line fishing trials in Seychelles waters. Although the fishing results were reasonably good, the shortage of live bait was also identified as a constraint that could hamper the development of a large commercial pole and line fishery.

Exploratory purse seine fishing in and within the Seychelles EEZ began in December 1980 with the arrival of the "Isle de Sein" a forty-eight-metre purse seiner with a capacity of three hundred and twenty tons.

During the period December 1980 to March 1981, results of the "Isle de Sein" showed that purse seine operation from the Seychelles Port of Victoria could be feasible.

The potential of the tuna purse seining in the Seychelles EEZ was conclusively demonstrated between November 1981 and June 1982 by the French purse seiner "Yves de Kerquelen" a sixty-nine-metre vessel with a capacity of 800 tons.

Thus by late 1983 considerable interest had been generated in the prospects of the purse seine tuna fishery in the Seychelles and the government had by then decided that any future fisheries agreement would be on a purely commercial basis. In November 1983, fishing licence agreements were negotiated with the Spanish government for fifteen purse seiners and in January 1984 with the European Economic Community for eighteen French purse seiners.

Early in 1984, a certain amount of French and Spanish had already moved from the Atlantic to the Indian Ocean because catch rates in the eastern Atlantic had dropped considerably. By the end of 1984 at the peak of purse seining activity, there were forty nine vessels fishing in and around the Seychelles EEZ.

2.2. STATISTICAL DATA

Up to 1984 statistical data was available from the

government's Statistic Department. However, at the beginning of 1984 the Seychelles Fishing Authority decided to take over the collection of statistical data concerned with the fishery resources. Thus the statistics for the assessment of the fishing industry's impact on the national economy are mainly to be found on an aggregated level.

2.2.1. CATCHES ANNUALLY

Fish landing increased up to 1978 but have decreased since then from 5,400 tonnes to 3,900 tonnes in 1980. However, total landings by the artisanal fishery by 1984 has been around 4,000 tonnes and has remained stable for the years 1984 to 1985. In 1986 a total of 4,630 tonnes of fish was landed on Mahe, Praslin, and La Dique.

This figure represents a 14% increase over the 1985 landings. The whalers and schooners caught approximately 48% of the total landings; the rest was by the smaller boats which operate in the inshore fisheries. In addition approximately 80,000 tonnes of tuna has been transhipped at the Seychelles Port of Victoria. Tables IV and V show statistical data of annual catches for the year 1986.

2.2.2. TRANSFORMATION (PROCESSING)

Fish is marketed in fresh condition, frozen, smoked, salted/dried or as ready to cook products,

TOTAL CATCH(1) LANDED BY LOCAL BOATS ON HANE DURING 1986

BOAT TYPE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL	%
Fishermen on foot	4.0	2.0	5.0	6.0	4.0	4.0	2.0	3.0	2.0	7.0	3.0	2.0	44.0	1.1
Pirogues	29.0	47.0	26.0	14.0	24.0	24.0	18.0	12.0	12.0	19.0	37.0	26.0	288.0	7.0
Outboards	86.0	134.0	106.0	118.0	100.0	108.0	84.0	44.0	54.0	105.0	87.0	85.0	1111.0	27.2
Whalers	174.0	195.0	97.0	143.0	321.0	245.0	90.0	39.0	104.0	255.0	305.0	150.0	2118.0	51.6
Schooner	24.0	43.0	51.0	41.0	27.0	29.0	50.0	25.0	46.0	59.0	72.0	45.0	512.0	12.5
Sport Fishing	0.7	0.7	1.0	1.0	1.0	0.3	2.0	2.0	1.0	2.0	4.0	1.0	16.7	0.4
TOTAL	317.7	421.7	286.0	323.0	477.0	410.3	246.0	125.0	219.0	447.0	508.0	309.0	4089.7	100.0

Species Composition

Carangues	165.0	76.0	25.0	99.0	270.0	269.0	121.0	21.0	31.0	82.0	68.0	25.0	1252.0	30.6
Maquereau doux	0.5	5.0	1.0	13.0	2.0	0.5	0.1	2.0	1.0	1.0	3.0	2.0	31.1	0.8
Other Maquereau	15.0	8.0	8.0	0.2	17.0	5.0	0.3	1.0	1.0	0.1	16.0	2.0	73.6	1.8
Bonite	23.0	16.0	12.0	26.0	43.0	50.0	22.0	9.0	14.0	28.0	27.0	28.0	296.0	7.3
Other Pelagic	4.0	7.0	12.0	12.0	24.0	13.0	9.0	14.0	12.0	58.0	20.0	30.0	215.0	5.3
Berone	3.0	48.0	30.0	11.0	5.0	1.0	1.0	1.0	5.0	7.0	18.0	16.0	146.0	3.6
Cordonnier	8.0	21.0	17.0	16.0	17.0	15.0	17.0	9.0	11.0	23.0	21.0	23.0	196.0	4.8
Other trap fish	14.0	17.0	23.0	20.0	20.0	18.0	21.0	13.0	17.0	20.0	18.0	20.0	221.0	5.4
Red Snapper	10.0	71.0	52.0	47.0	21.0	1.0	2.0	3.0	37.0	102.0	129.0	47.0	522.0	12.8
Vara vara	0.5	2.0	5.0	0.6	3.0	3.0	4.0	3.0	6.0	10.0	22.0	7.0	66.1	1.6
Job	10.0	51.0	23.0	15.0	13.0	6.0	12.0	10.0	13.0	20.0	16.0	39.0	228.0	5.6
Maconde	7.0	16.0	19.0	15.0	5.0	1.0	2.0	2.0	13.0	30.0	51.0	12.0	173.0	4.2
Other Vielle	5.0	13.0	13.0	18.0	14.0	1.0	2.0	3.0	13.0	15.0	40.0	15.0	152.0	3.7
Capitaine	26.0	33.0	34.0	22.0	14.0	11.0	17.0	23.0	33.0	38.0	47.0	38.0	336.0	8.2
Sharks - Rays	9.0	3.0	3.0	0.3	4.0	3.0	6.0	3.0	5.0	3.0	2.0	1.0	42.3	1.0
Octopus	11.0	7.0	9.0	7.0	5.0	5.0	2.0	3.0	2.0	8.0	6.0	3.0	68.0	1.7
Other	6.0	28.0	1.0	1.0	0.5	7.0	5.0	5.0	5.0	3.0	6.0	2.0	69.5	1.7
TOTAL	317.0	422.0	287.0	323.1	477.5	409.5	243.4	125.0	219.0	448.1	510.0	310.0	4091.6	100.0

TABLE IV (Annual catch 1986)

Sources : Seychelles Marketing Board (Fish Division)

Species	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL	%
Bourgeois	4.0	10.0	23.4	10.0	7.3	0.6	0.5	1.3	10.7	24.0	26.0	20.5	155.9	30.3
Bordenar	0.3	2.1	3.7	2.4	3.0	0.2	0.2	0.1	0.2	2.4	4.7	1.9	21.2	4.1
Vava vava	0.4	0.3	0.7	0.6	0.7	2.7	3.0	2.9	3.2	3.3	3.0	0.9	23.3	4.5
Job Gris	5.1	7.0	0.3	6.9	4.5	3.2	5.0	2.4	3.0	3.1	6.7	4.5	60.5	11.0
Job Jaune	0.2	1.5	0.9	1.1	1.7	0.0	0.2	0.0	2.1	0.7	4.7	3.0	16.9	3.3
Balrican	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	.0
V. Macode	0.4	0.5	1.4	1.3	0.4	0.0	1.3	1.3	6.2	5.5	5.3	3.4	27.0	5.4
V. Platte	3.0	6.5	4.2	4.9	2.0	0.5	0.4	0.0	4.7	4.9	4.6	3.6	43.7	8.5
Tioffe	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.2	0.9	0.0	0.0	0.5	4.2	0.8
Croissant	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.2	0.0	0.7	0.7	0.4	3.0	0.7
Other Vieilles	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.2	1.0	0.9	0.0	0.5	4.4	0.9
Capitaine Blanc	0.3	2.2	1.0	1.1	0.5	0.1	0.1	0.1	0.0	1.2	2.1	1.3	11.6	2.3
Gevule Longue	1.7	0.7	0.1	0.2	0.3	0.0	0.0	0.2	0.0	0.3	0.5	0.6	4.4	0.9
Lascar	2.1	0.2	0.2	0.1	1.1	1.9	5.0	5.9	2.7	3.1	1.5	0.3	24.1	4.7
Bone Heri	0.2	0.0	0.0	0.0	0.1	0.3	0.3	0.2	0.0	0.0	0.0	0.0	1.9	0.4
Capitaine Rouge	1.6	0.7	1.0	0.5	0.3	0.5	0.3	0.3	1.4	1.5	2.1	0.9	11.1	2.2
Bacou	0.2	0.0	0.0	0.0	0.1	0.6	0.0	3.7	0.5	0.1	0.1	0.1	5.4	1.1
Caranque	1.9	1.0	0.2	0.7	2.3	14.6	20.3	2.4	5.5	3.7	1.4	0.2	63.0	12.3
Saucon	0	0	0	0	0	0	0	0	0	0	0	0	1.3	0.3
Saillfish	0.1	0.1	0	0.1	0	0.1	0.1	0	0	0.1	0.1	0.0	0.7	0.1
Kingfish	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.3	0.4	0.2	1.9	0.4
Yellowfin	0.3	0.5	0.5	0.4	0.3	0.3	0.2	0.5	0.9	1.5	0.7	0.3	6.4	1.2
Bonite	0.1	0	0	0.1	0.1	0.2	0	0.2	0	0	0.1	0.1	0.9	0.2
Dog Tooth	0.1	0	0	0	0	0.2	0.3	0.2	0.3	0.1	0.1	0.1	1.4	0.3
Dorade	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0.1	0.3	0.2	1.3	0.3
Tazar	0.1	0.1	0	0	0.1	0.1	0	0	0.1	0.1	0.1	0.1	0.7	0.1
Becone	0.7	0.7	2	0.9	0.5	0.7	0.7	0.7	0.2	0.2	2.4	0.3	10.0	1.9
Requin	0.1	0	0.1	0.2	0.1	0.5	0.7	0.2	0.1	0.1	0	0.0	2.1	0.4
Others	0.1	0.1	0.1	0	0.1	0.5	0.4	1.2	0.4	0.3	0.5	0.1	3.0	0.7
TOTAL	24.2	43.5	51.6	41.1	26.9	29.1	49.7	25.3	45.7	59.1	72.6	45.2	514	100

EFFORT

No of boats in operation	14	24	26	22	17	16	19	22	21	24	25	21	209.9
No of trips	26	46	54	37	24	31	50	42	52	57	59	40	510
Total day fishing	116	192	231	174	103	130	215	155	212	270	204	179	2261
Total no of men	110	193	272	105	108	140	264	226	293	319	327	206	2643
Total men/days	482	802	1178	888	469	583	1136	834	1195	1511	1574	922	11574.3

DAILY EFFORT

Mean crew	4.2	4.2	5	5	4.5	4.5	5.3	5.4	5.6	5.6	5.5	5.2	5.1
Mean days/fish	4.5	4.2	4.3	4.7	4.3	4.2	4.3	3.7	4.1	4.7	4.0	4.4	4.4

CATCH RATES

Kg/boat trip	934	940	951	1112	1107	936	997	604	803	1038	1227	1134	992.0
Kg/man x day	72	63	46	52	60	52	46	31	40	41	46	49.2	44.4

HD: # Mean boats per Month

Sources : Seychelles Marketing Board (Fish Division)

animal feed and bait. The present fish processing takes place either at the Fish Division of the Seychelles Marketing Board fish processing plants on Long Pier, at the Indian Ocean Smokeries Ltd., at the Fishermen's Co-operative salt fish processing plant on Praslin, at units belonging to Island Development Company Ltd., or at the various market places.

Although traditionally the artisanal catch was consumed fresh, in recent years a major proportion of the catch is also frozen to be marketed later. Of a maximum throughput of 4,800 tonnes wet weight, 1200 tonnes are for fresh fish production, 2800 tonnes for freezing, 350 tonnes for salting and 450 tonnes for smoking.

2.2.3. EXPORTS

Export of fresh and frozen demersal fish started in the mid-70's after the opening of the international airport. Fish for export is usually graded in premium, first grade and second grade species. Premium grade is usually exported fresh on ice to Europe and Reunion whilst second grade is frozen and exported to various other foreign markets. The figure on the next page shows the value of fish exports indicating the following development in the years 1981 to 1985. Table VI shows Export figures for the year 1986 and Table VII shows Export figures for the beginning of the year 1987.

SALES BY CUSTOMER GROUP NOVEMBER/DECEMBER 1986

NOVEMBER -----	FRESH KG	% OF TOTAL	FROZEN KG.	% OF TOTAL
INSTITUTIONS	17,640	33.6%	51,046	51.8%
HOTELS	10,363	19.7%	13,777	14.0%
RETAIL	8,057	15.3%	5,152	5.2%
EXPORT	16,480	31.4%	28,500	28.9%
TOTAL	52,540		98,475	

DECEMBER -----	FRESH KG	% OF TOTAL	FROZEN KG.	% OF TOTAL
INSTITUTIONS	23,381	51.1%	65,076	76.7%
HOTELS	5,345	11.7%	6,648	7.8%
RETAIL	2,440	5.3%	3,146	3.7%
EXPORT	14,562	31.8%	9,920	11.7%
TOTAL	45,728		84,790	

TOTAL -----	FRESH KG.	% OF TOTAL	FROZEN KG.	% OF TOTAL
INSTIT	41,021	41.7%	116,122	63.4%
HOTELS	15,708	16.0%	20,425	11.1%
RETAIL	10,497	10.7%	8,298	4.5%
EXPORT	31,042	31.6%	38,420	21.0%
TOTAL	98,268		183,265	

TABLE VI (Export figures for the year 1986)

Sources : Seychelles Marketing Board (Export Div.)

EXPORTS COMPARISON OF SALES 1985/1986
C.I.F. VALUES

	1985	1986	
JAN/FEB	969,722	1,072,231	
MAR/APR	1,410,322	1,248,709	
MAY/JUN	934,266	958,451	
JUL/AUG	260,840	173,416	
SEP/OCT	798,803	1,415,268	
NOV/DEC	490,382	1,663,339	
TOTAL	4,864,355	6,531,414	34.27%

TABLE VII (Export figures for beginning of 1985-1986)

Sources : Seychelles Marketing Board (Export Div.)

	1981	1982	1983	1984	1985
Fish Landings(MT)	4,444	3,897	3,750	4,021	4,350
Fish Expt.(R'000)	4,443	7,347	9,460	10,210	7,900
Domestic Exp(")	27,471	20,297	25,200	21,400	19500
Fish Export as % of Domestic Exp.	16.2	36.2	37.5	47.7	40.5

As will be seen from the above table fish exports showed an encouraging development in the period 1981 to 1985 both in terms of current value (expressed in million of rupees R'000) (local currency). For the year 1986/1987 there has been a greater increase and the Fish Division of the Seychelles Marketing Board is looking into other potential foreign markets.

2.2.4. IMPORTS

The imports to Seychelles of fish, crustaceans, and molluscs and preparation thereof has slowly decreased over the years. Between the year 1977 to 1983 the percentage of total import of fish has gone down from 0.25% to 0.09% and in the case of import as a percentage of fish and marine products export it has gone down from 28.2% to 3.9% over the same period. However, the importation of fish is still limited to canned pilchards and anchovies from South Africa, and crustaceans (crabs and lobsters) from Thailand. This has been mainly due

to the large demand from the tourism industry. However, according to officials of the Seychelles Marketing Board the import of fish is estimated at around 2% of the fish export.

2.2.5. FISHING VESSELS AND GEARS

Inshore fishing is carried out by small open boats ranging from 5 to 8 metres, mostly equipped with outboard engines and open whalers of 7 to 9 metres powered by inboard engines. These fish within a radius of 10 to 30 nautical miles of the main islands on the rough coralline substrate found on the Mahe Plateau.

The offshore fishery is practised by larger decked boats ranging from 9 to 12 metres equipped with 27 to 35 horse power diesel engines and known locally as schooners. The table below shows figures of the various types of boats utilised by the artisanal fishery.

YEAR	SMALL BOATS			OTHERS		
	WOOD	FIBERGLASS	TOTAL	WHALER	SCHOONER	TOTAL
1977	273	-	273	48	27	348
1982	175	97	272	48	40	360
1985	53	157	210	38	38	280

The most common inshore gears used are handlines which makes up 60% of the total gears in use, traps make up about 35%, and the rest are gillnets

and beach seines. As for the offshore fishery the sole fishing method used is handlining. The navigation equipment on board the schooners is limited to a compass and a few vessels have recently had echo sounders installed on board. Two vessels contain electric reels on board.

2.2.6. EMPLOYMENT

It is difficult to establish a general criterium for measuring the use of labour in the fishing fleet and shore workers. Whether a fisherman is occupied part-time or full-time in fishing is not easy to determine. As their counterparts in many other countries, fishermen in the Seychelles combine fishing with other occupations, especially when it is a bad season for fishing. In the case of shore workers, apart from the office staff of approximately one hundred, shore workers are mostly casual labour.

2.2.6. (a) FISHERMEN

According to official statistics the number of the working population engaged in fishing activities has changed over the years. However, these figures are just rough estimates because of the fact that when the survey was conducted those part-time fishermen may have been engaged in other shore-based activities. In February 1982 the total number of part-time and full-time fishermen was estimated at about 1350 of which small boats counted 68%, medium-sized vessels 17%, and schooners 15%. In 1986 the total number of

fishermen was estimated to be about 1800.

2.2.6. (b) SHORE WORKERS

The amount of shore workers was estimated at about 2500 for the year 1986. Most of those shore workers were engaged in the transshipment of tuna from the foreign fishing vessels to the mother ships. However, it must be noted that a small number of shore workers were engaged in the construction of the canning factory.

2.2.7. PER CAPITA CONSUMPTION (preferred species)

In 1980 when a statistical survey was carried out it was found that the annual per capita fish consumption in the Seychelles was 80 kilograms. However, in 1986 according to government officials the per capita consumption of fish went down to 50 kilograms. This potential conflict arises because the demersal varieties most appreciated by the local population are generally those that have the largest demand on the export market. Thus the population prefers imported foodstuffs to replace the fish which they cannot obtain on the market.

CHAPTER III

ADMINISTRATION OF FISHERIES

IN SEYCHELLES

3.1. POLICIES

Although there was a Department of Fisheries during the colonial era and after independence, there were no policies whatsoever established to enhance the development of the fishing resources during that time.

It was only in 1980 when the National Development Committee was set up under the auspices of the Ministry of National Development that the government through the first National Development Plan (1981 to 1985) established policies for the fisheries sector with the following objectives :

1. The improvement of the material conditions of all Seychellois in terms of a higher level of per capita income, nutrition, education and social development,
2. The achievement of a high degree of self-sufficiency in food production,
3. The creation of a more equitable society,

4. The achievement of full employment, and
5. The optimum use of available human and physical resources.

However, in 1984 upon reviewing the National Development Plan for the years 1981 to 1985, the government established a second five-year development plan for the years from 1985 to 1989. Through this five-year plan, the government fully recognizing the value of its ocean resources, especially the fishery resources and in particular the tuna stocks, saw that their judicious exploitation would be a very significant opportunity to diversify the country's economy so as to create employment and enhance the basis for sustainable social and economic development.

The main objective of the resource management of the fisheries sector is to maximize the benefits from this sector and to increase its contribution to national economic and nutritional goals. Thus the development of the fishing industry will assist in the implementation of the national objective of a more equitable distribution of income.

By generating additional economic activity and thus broadening the country's economic base, it will further enhance the government's ability to finance its development program.

The six specific objectives of the fisheries sector are :

1. To create the maximum amount of work opportunities,
2. To maximize foreign exchange earnings,
3. To create optimum linkages with other sectors of the economy,
4. To ensure the stable development of the industry,
5. To conserve the marine resources in order to ensure the long-term viability of the industry, and
6. To establish Mahe as an important tuna center of the southwestern Indian Ocean.

The Government of Seychelles also pursues a licencing policy which ensures that the objectives set out above are achieved. On their expiry, existing licensing arrangements are revised. Separate licences are issued for different types of fishing vessels and/or fisheries-related activities (for example, tuna purse seining, long liners, gill netters, factory ships, etc).

In the case of foreign fishing vessels the issue of licences is dictated mainly by considerations of maximizing revenue from the resource while

recognizing the need to conserve that resource and protect the marine environment.

In the case of domestic vessels the main consideration is in the management and control of the fishery rather than the raising of revenue.

After some years of experimenting on the effectiveness of state participation in small scale fisheries in parallel with privately-owned fishing enterprises. It was concluded that it is desirable that small-scale fishing operations should be left in private hands, with the provision that fishing boats should be owned by the operators or by group of fishermen organization

However, the government will continue to participate actively in large-scale fishing operations and fishery-related enterprises requiring substantial capital outlays likely to lie beyond the means of local investors.

Private investment on a joint basis will be encouraged in enterprises requiring substantial capitalization and expertise not available locally. With the view to promoting investments in the establishment of a fishing industry, the government will give considerations on a case by case basis to the offer of investment incentives under one or more of the following forms:

1. Complete or partial exemption from payment of trade tax on machinery, equipment, spare parts

- and raw materials,
2. A corporate tax holiday on terms to be negotiated,
 3. Free repatriation of capital and remittance abroad of profits and dividends,
 4. Electric power at preferential rates,
 5. Availability of sites and, if necessary, buildings with nearby services, and
 6. Exemption from payment of registration fees on land and buildings purchased by new enterprises in the fishery sector.

Because of the insufficient number of young people joining the industry, the government is also trying to establish a MANPOWER DEVELOPMENT POLICY, with the aim of looking into measures of redressing this trend.

3.2. LEGAL FRAMEWORK

The Fisheries Act (1942) which was being applied until 1986 mostly to the Mahe Plateau, except those regulations relating to spear guns which applied to all the other islands of the Seychelles, was rather vague.

The regulations were as follows:

1. Control of the mesh sizes for fish traps and gill nets,
2. Regular inspection of the catch from fish traps to ascertain if the fishermen were taking undersized fish, and
3. Regular inspection at the main market branch to ascertain if fish were sold according to price controls.

Apart from the above regulations, other fishing and marine hunting activities were regulated by the following acts:

1. The National Park and Nature Conservancy Act (CAP 159),
2. The Protection of Sea Shells Act (CAP 138),
3. The Whaling and Sealing Legislation, including the Whale and other Fishing Act (1976) and the Seal Fisheries Order³ Council (1913).
4. Licence regulations for the use of nets for fishing, and
5. The Numbering and Registration regulation of all fishing boats.

The existing fisheries legislation has been produced at different times and individual elements do not always take account of each other. A new law has been promulgated to update, revise and

consolidate the existing fishing laws. The old Fisheries Acts of 1942 have been repealed and a new Fisheries Act 1986 has been enacted.

INSTITUTIONAL AGREEMENTS

In the past the Department of Fisheries was under the umbrella of the Ministry of Agriculture as mentioned earlier. However, the fishing activities were so limited that there was only one fisheries officer working. In 1978, the government decided to take over control of the exploitation of the fishery resources. The Ministry of National Development became responsible for government policies formulation on fishing. The Fishing Development Company which was established at that time was working in liaison with the above ministry.

The Fishing Development company had sole responsibility for the development and management of the small-scale fisheries. However, in August 1984 at a review of the first National Development Plan by the Seychelles Fishing Authority (Establishment) Act, The Seychelles Fishing Authority (S.F.A.) was incorporated.

This body was formed in view of the need to develop the fishing industry to its fullest potential. It is a parastatal organization with autonomous legal and financial status, supervised by a board of directors appointed by the President.

It is the executive arm of the government in all fisheries related matters. As such it has a wide range of responsibilities including :

1. Assessment and management of the fishing resources,
2. Management of some state-owned fishing and fishing related enterprises,
3. Co-ordination and support of fishing activities by owner/operators,
4. Management of the fishing port,
5. Development of gear technology,
6. Co-ordination of manpower training in the fishery sector,
7. Negotiations with the representatives of foreign vessels and monitoring of foreign fishing fleets activities,
8. Fishery surveillance operations in conjunction with the Department of Defense and with any regional fishery surveillance organization to which Seychelles may be a party.

The Seychelles Fishing Authority is organized into the following divisions:

1. The Resource Management Division,
2. The Research Division,
3. The Fishing Port Division,
4. The Schooner Fleet Operation Division, and
5. The Surveillance and Enforcement Division.

The other institutional agreements are with the following sectors:

The Department of Defense:

The department with portfolio responsibility for defense carries out surveillance of fishing activities.

Ministry of Education, Information, and Youth:

This ministry in conjunction with the Seychelles Fishing Authority, ensures that the appropriate training is provided to satisfy the needs of the fishing industry. Furthermore it helps to project an image of the fishing industry which is compatible with its social and economic importance to the country.

Department of Planning and External Relations

The department is responsible for mobilizing financial and technical assistance not available locally to meet the needs of the industry.

The Development Bank of Seychelles

The development bank of Seychelles is responsible for the provision of funds to Seychelles fishermen or fishermen's organization, acting in consultation with the Ministry of National Development and the Seychelles Fishing Authority.

The Seychelles Marketing Board (S.M.B.)

The S.M.B. is responsible for the commercialization of fish and fish products.

RESEARCH

Research of the marine fishery resources is carried out presently by the Research Division of the Seychelles Fishing Authority in collaboration with the French Ocean Scientific Research Center in Seychelles and the Food and Agriculture Organization. Research is being carried out in the following areas:

1. Development and introduction of more productive and more efficient techniques in an effort to increase the earning power of local fishermen.

2. Promotion of more efficient fishing techniques that are more suited to the requirements of the Seychelles commercial fishing industry.

Impetus is also being given to the possibility of diversifying artisanal fishery activities from their concentration on fishing for demersal species to a balanced exploitation of both demersal and pelagic fish. Apart from the obvious advantages which this diversification would have from a stock conservation point of view, the new approach will increase the catch rates of local fishermen and render traditional fishing techniques more viable.

Research work is also directed towards the development of new types of fishing boats. These should be capable of coping with the seasonal weather conditions prevailing in Seychelles waters while having relatively long distances between their shore bases and the fishing grounds. Other factors which are critical to any fishing activities are also considered.

Other research is being conducted in the field of aquaculture, mariculture and the exploitation of sea weeds.

3.5. EXTENSION

The present extension service being provided by the Fishing Authority is in the following fields

1. Trials of the prototype fishing boats with fishermen taking an active role,
2. The use of electric reels for fishing, and
3. The use of Fish Aggregating devices.

3.6. ENFORCEMENT

The Department of Defense carries out the enforcement of fishing legislation through the Navy. Surveillance is carried out by the Defense Force aircraft and patrol boats. The Police Department deals with the identification and arrest of illegal offenders of the fishing legislation. There is presently an observers programme being undertaken, however this has not yet been proved viable.

3.7. INTERNATIONAL AGREEMENTS

Seychelles has been party to the United Nations Law of the Sea Convention since 1978. It is also a member of the Indian Ocean Fishing Commission, and has various agreements with the Food and Agriculture Organization, the United Nations Environmental Programme, the United Nations Development Programme, and has signed agreements with the European Economic Community concerning fishing licences issued to foreign fishing vessels carrying out fishing activities in the Seychelles EEZ.

CHAPTER IV
OTHER MARINE AND FISHERIES
RELATED ACTIVITIES
IN SEYCHELLES

4.1. TRANSPORT AND PORTS

All marine related activities in Seychelles are under the responsibility of the Ministry of Transport. The Department of Transport (Port and Harbour) administers all the main activities and is the unique body dealing with all maritime affairs. The Department has very close links with the Seychelles Fishing Authority.

The maritime administration in Seychelles is undertaken by the Department of Transport which is headed by a Secretary of State. The Department deals with the following activities :

1. Harbour regulations,
2. Shipping affairs administration,
3. Shipping Acts,
4. International Maritime Organization Conventions,
5. Examinations and issuance of Certificates of Competency for masters and mates,

6. Surveys, and

7. All other shipping related matters including pollution control.

However, it should be mentioned that the Department of Transport has delegated to the Seychelles Fishing Authority dispensation on the issuance of Seamen Record Books to local fishermen engaged on foreign fishing vessels operating in Seychelles waters.

In the field of maritime development, presently the East Coast Project dominates all other development activities. This project is mainly concerned with extension to both the commercial and fishing ports. Emphasis is also laid on the development of inter-island traffic on the one hand and trade within the Indian Ocean coastal states on the other hand.

Development of the fishing industry plays a major role in present and future maritime development plans which are constantly kept under review by the Department of Transport. A new quay of ninety meters is being constructed in the fishing port. A bunker pipeline is presently being installed to cater for fuel to all fishing vessels operating in Seychelles waters.

The extension to the commercial port will enable the smooth progression of certain fishing activities such as the transshipment of tuna, food catering business for the fishing vessels and other inter-related activities by providing adequate facilities at the new quay.

The present fleet comprises the "Cinq Juin" a landing

craft cargo transporter, "Pecheur Breton" a reefer vessel which operates mainly in the carriage of tuna from the Seychelles to the Far East and Europe, and certain number of inter-island schooners which operate in the carriage of fish and vegetables from the outer islands to the capital of Seychelles, Victoria.

Most of the fishing vessels which operate in the Seychelles waters are from foreign countries apart from a few belonging to local private owners. It should be mentioned that earlier, from 1980 to 1984, Seychelles Fishing Development Company did own some pole and lines fishing boats and a long liner, however, due to mismanagement and the unavailability of the necessary skilled manpower the vessels had to be sold out.

4.2. COMMUNICATIONS

As the Seychelles is fully dependent on imported food stuff apart from fish, the link between the Seychelles and foreign countries continues to be of a very important nature where the shipping industry is concerned. Most of the foreign ships calling at Port Victoria are engaged in tramp shipping and their calls are made mainly for the unloading of textiles, foodstuff, and building materials for industries and the reloading of cinnamon and copra for export.

There is presently also a large amount of reefer vessels from France, Spain, and Japan paying regular weekly calls mainly because of the extensive industrial fishing activities regarding purse seining going on. These reefer vessels transport tuna to France, Italy, United States,

Thailand, and Australia.

4.3. TOURISM AND RECREATION

Tourism is one of the main actors in the field of social and economic development in Seychelles. It contributes extensively in the earning of hard currency for the country. Most of the large hotels are located copiously around the beaches of the Seychelles islands. And marine recreational activities are becoming increasingly important to the tourist market.

Many local owners of hire crafts operate all round the Amirantes where big game fishing is undertaken. They also occasionally go as far south as the Aldabra groups where there is a Marine Fauna Conservation park. Trips are also made on a regular basis to the bird protection areas on many of the outlying islands where large varieties of sea gulls and other sea birds are found.

The hire crafts are chartered by tourists mainly for big game fishing purposes. In 1986 about fifty tons of fish were registered as having been caught in the sport fishing activities at the Marine Charter.

Other marine recreational activities for the tourists in Seychelles are scuba diving, wind surfing, paragliding, water-skiing and marine fauna sightseeing tours around the marine parks. The government is envisaging to undertake a program for recreational deep sea fishing in collaboration with the tourism private sector which presently operates hire crafts to the outer islands.

The recreational fishing activities are not in conflict with the small scale fisheries, because they operate mainly in areas where the local fishermen do not carry out their daily fishing activities. However, it should be mentioned that the new reclamation project undertaken has had a negative impact on the marine parks around Ste Anne island.

Heavy siltation has occurred and the marine fauna has been badly affected. Most of the fishes found around the marine parks which were one of tourists' main attractions have moved elsewhere in the hope of finding better habitats.

The marine parks are used extensively by glass bottom boats which take tourists on guided tours around the natural marine faunas which are well protected by park rangers who constantly keep surveillance around the park for illegal fishermen who try to fish around them.

CHAPTER V
ANALYSIS OF FISHERIES
DEVELOPMENT TO DATE
IN SEYCHELLES

5.1. INTRODUCTION

Several changes have taken place since the initial stage of fisheries development in the Seychelles. Many projects undertaken have been on a trial and error basis. However, these projects has enable the authority concerned with fisheries development to gather information and highlight the experiences gained from these projects so that constantly varied changes have been adapted in effort to increase the efficiency and effectiveness of the fisheries development.

Experiences gained have been in various areas of fisheries exploitation involving both the artisanal and industrial fisheries. Needless to say the experiences gained has had a positive impact on the socio-economic benefits such as increased catches and higher incomes for the fishermen. However, although good experiences have accelerated fisheries development, there are still many problems which hamper the future of the fisheries development. The problems which have been identified through this study are elaborated upon and explained later on in this chapter. It

must be borne in mind that this paper is actually concentrating on the pre-requisite means of training because of the unavailability of skilled manpower which is badly needed to substantiate the fisheries development in future.

5.2. EXPERIENCES GAINED

In view of the fact that the artisanal and industrial fisheries are quite distinct, each exploiting a different resource, the experiences gained are presented separately in this paper. However, the paper is concentrating more on the artisanal fisheries rather than the industrial fisheries exploitation.

As for the artisanal fisheries, experiences have been gained in the following areas of fisheries development.

- (a) fishing boats, gears and methods,
- (b) electronic equipment,
- (c) fisheries loan schemes,
- (d) shore infrastructures, and
- (e) training.

(a) fishing boats, gears and methods

The boat types in the artisanal fisheries have changed at different stages of the fisheries development. Essentially two aspects are characteristic of this development. First of all a deep sea fishing fleet consisting of schooners, boats built specifically for fishing or originally for island trading and now utilized for fishing purposes, have been developed. These boats are decked and reasonably well suited for operation on fishing grounds up to 130 nautical miles from the fishing harbour or other shore bases. Seen in relation to the enforcement of the Exclusive Economic Zone of 200 nautical miles this has been the first attempt to exploit resources in remote areas of the EEZ.

Furthermore, the traditional small wooden boats (pirogues, catiols, and canots) have gradually been replaced by boats built of fiberglass. The construction of fiberglass hulls for small boats is very simple and the method used is "laminating" instead of the more complicated carvel "sandwich" method, so this has been adapted and been proven a success. The boats are constructed with a double bottom hull and a small fore deck. These small boats are reasonably well suited for the conditions under which they are operating.

The whalers which operate on a sort of daily basis have been fitted with ice boxes so that the catch reaches the market in a fresh condition. The schooners have proved that they are well suited

for the type of fishing they are performing. They are good sailers and fuel is saved on voyages to and from the fishing grounds. They have also proved to be seaworthy boats. The idle periods for repair have been constantly reduced due to the availability of spare parts locally. Furthermore, to save energy the conditions for operating the sails have been improved and the rig, mast, boom and needles have also been strengthened to withstand the bad weather very often encountered while carrying out fishing activities at sea.

The seasons for the different methods of fishing vary with the trade winds, the operation base of the fishing methods and the migration of the fish. During the southeast monsoon the fishing effort decreases according to the bad weather conditions. The strength of the wind is on an average of Force 4, however, Force 5 and 6 are often observed.

Thus due to the seasonal fluctuation, the different types of fishing boats have recently had to combine different gears on the same trip as it has been proved more profitable. Presently the combination of different gears being used is handlines, traps, troll lines, and longlining for fishing boats which are propelled mechanically, while boats without engines are using a combination of handlines, traps, and beach seine nets. Larger pirogues, however, are still being used for beach seining of the Indian mackerel because environmental disturbances such as noise from the outboard engines can possibly scare the fish away from the net before it has been properly

closed.

As for the use of handlines for fishing, it has been proved that replacement of the previously used handline with nylon handlines has improved the catch rate by 10%. The use of other types of hooks, the use of artificial baits when available locally to compensate for the occasional lack of fresh baits, and the use of hand reels and regular cleansing of the fishing gears have all contributed to the improvement of the catch rate.

Even the traditional fishing traps have been given due attention in an effort to improve their effectiveness. The use of wire meshes have been adapted to increase the flexibility of the traps in such ways that the predator species (sharks) cannot destroy the traps and feed on the catch as they used to do before. The experiences gained in the case of fishing gears in use in the artisanal fisheries has greatly improved the efficiency of the fishermen in carrying out their fishing activities.

However, although good experiences have been gained in the area of fishing boats, gears, and methods, there are still many improvements which should be undertaken to ensure a prosperous future for the fisheries. Details of the areas of the improvements to be undertaken are explained later on in this chapter.

(b) Electronic Equipment

The long distances from the fishing harbour to the fishing grounds to which the schooners proceed so that the fishermen can carry out their fishing activities has made the introduction of certain electronic equipment onboard the fishing boats viable as it enables turn around time to be greatly reduced. Presently a couple of vessels have radios installed onboard which they can use for communication purposes with the port authority in case of accidents, such as someone falling sick at sea, engine failures or other mishaps.

However, it should be noted that not all the fishing vessels operate in the same areas and it is quite possible that those owners who cannot afford to buy such equipment are still faced with the problem of safety at sea.

The use of electric reels for bottom longline fishing is also having a positive impact on fisheries development, whereas increase in catch rates has resulted with the introduction of echo-sounders. However, there is still room for improvement in this area of electronic equipment.

(c) Fisheries Loan Schemes

To date approximately 35 fishing loan applications have been recommended and approved by the Ministry of National Development. These loans are granted by the Seychelles Development Bank to artisanal fishermen. It has been found that many hardworking fishermen who did not have their own fishing boats and made use of this loan scheme, are now

potential fishing boat owners/operators. They are doing successfully in their fishing activities and earning substantially very good income. Thus the operating and maintenance costs are less stringent for the fishermen. The fishing activities has also been greatly improved because the owners spend less idle time ashore as they have the responsibility of paying back the loan.

(d) Shore Infrastructures

Work is still being undertaken on extending the fishing port. Improvements to the fishing port have been made mainly to cater to industrial fishing activities such as bunkering, transshipment of tuna from the purse seiners, and other services. In addition a canning factory has been set up under a joint venture agreement with a French company. This will provide more employment for shore workers and Seychelles will be able to gain some foreign exchange from the exportation of canned fish.

The setting up of the Fish Division of the Seychelles Marketing Board in 1984 has again provided new experience to the artisanal fisheries based at the fishing port. The Fish Division ensures that a constant and regular supply of fish is available for the local market. There are fish collecting centers all over Mahe, Praslin, and La Digue. Fish inspection and grading are carried out at the collection centers and the central unit.

There is also a refrigeration and cooling system

for the maintenance unit available now. This unit plays an important role in keeping the stored fish safe and hygienic. The Fish Division also runs a fish shop at the Victoria market. Local consumers can buy a wide variety of fresh and frozen fish at steady prices. Fishermen are also provided with essential services such as bait, fuel, and ice.

(e) Training

The School of Maritime Studies which was established with French financial and operational support in connection with the Tuna Fisheries Project in the 1980's, has been involved in providing training for both the artisanal and industrial fisheries.

A new training scheme for young fishermen has now been going on for a three-month period with lapses of one month between each three-month training programme. Although some of the young trainees have shown keen interest and most have considerably improved their fishing skills, the high turnover rate has been a disappointment.

As for the industrial fisheries, Seychelles does not at the present time make optimum utilization of the pelagic species found in its Exclusive Economic Zone. This is primarily due to the fact that at this stage the Seychelles lacks the financial and technological know-how to exploit these resources. It has therefore opted for a

policy of granting access to the surplus of allowable catch to foreign partners on the condition that this will also contribute to the development of the country. Although presently Seychelles issues licences to foreign partners, it is envisaged that future agreements will more often take the form of joint ventures. Permanent settlements on most of the outer islands have been of vital importance in terms of defence and keeping sovereignty of the waters of the Seychelles EEZ.

Seychelles has built up an extremely effective control and surveillance system involving aerial spotting and co-ordinated marine inspection and enforcement. The cost of the surveillance aircraft is shared with other activities among which are search and rescue, pollution monitoring, and servicing remote islands. The revenue from licencing substantially exceeds the costs of surveillance in the Seychelles. In addition, considerable fishery information has been obtained through this system.

The authority concerned with fisheries development is looking into the possibility of establishing a regional surveillance and enforcement system with the other neighbouring states of the southwest Indian Ocean. A study is presently being carried out on matters such as harmonization of relevant licencing conditions, reporting procedures, and the marking of vessels.

5.3. PROBLEMS IDENTIFIED

There are several constraints that presently hamper the development of the local artisanal fisheries. Some of the problems identified through this study are stated below :

1. the ageing manpower base,
2. fish scarcities during the southeast monsoon affecting domestic market,
3. the difficult working conditions,
4. the poor accomodation facilities,
5. inadequate safety at sea.
6. lack of adequate port and shore infrastructures,
7. environmental disturbances on the fisheries sector, and
8. problems relating to maritime training.

5.3.1. The ageing manpower base

A recent survey indicated that only 30% of those engaged in fishing are younger than thirty years. There is no doubt that the fishermen in the Seychelles are portrayed by the media as being constant drunkards who squander their money away. This sort of negative reputation of the fishermen can only be eradicated by educating the public at

large of the importance of fishing, and to what extent it contributes to the country's economy. It may encourage parents whose children are considering taking up a career in fishing to view the fishing vocation as an important aspect geared towards the country's economical development. It is also a fact that the working population in the fishing industry represent a substantial higher portion with less education than the total working population.

One of the drawback is that most of the fishermen working as skippers on the fishing boats (schooners) are 45 years of age and their average experience in fishing is about 27 years. One third of the fishermen have relatives on board the boat, and other fishermen had a father who was a fisherman before.

Another drawback is that all the fishermen know other crew members before coming onboardt, and that the most usual way in which a fisherman is recruited is that he is asked to join the crew by the skipper. Most of the time a younger man will have difficulties joining a crew because of his lack of necessary fishing experience.

With the relatively high-aged fishermen population and an increasing youth unemployment any answer to the question of how to solve the problem of recruitment is of great value. It can be assured that the unemployed youth might themselves provide clues to their own interest.

Through some interviews with the unemployed youths of whether they would be interested in employment in connection with fisheries activities, it was found that a large percentage of the youths are interested in being involved in some kind of pure education and training if an organization is willing to recruit them and offer the necessary training for a career in the fishing industry. Thus it is quite clear that the majority of unemployed youths are quite keen to take up employment and training for the fisheries sector.

However, the idea that there is little money to be earned in fishing activities persist. With proper motivation and education Seychelles's youths may develop positive feelings towards joining the fishing industry.

5.3.2. Fish scarcities affecting the domestic market during the southeast monsoon.

During the southeast monsoon (May to October) fish scarcity can be particularly acute leading to sharp price increases. Coastal areas around major fish landing sites enjoy a reasonably good supply of fish, while there are areas which suffer periodic shortages even during the good fishing seasons.

During the southeast monsoon the weather conditions in Seychelles waters are so devastating that even the experienced fishermen cannot proceed out to sea for fishing. Another serious problem arises because

most of those experienced fishermen in Sevchelles are not familiar with navigational instruments for fish finding during the southeast monsoon. A lack of knowledge about the connection between weather routing equipemnt and fishing efficiency has also been observed. Formal training in the field of navigation, gear handling, fish handling, and engine maintenance, is scarce among the fishermen.

Furthemore the fishermen have no knowledge of navigational aid instruments, except for the compass and plumb line. Equipment for fish detection is not available on all vessels and charts are not used by the fishermen.

Navigation and fish detection are based on traditional methods like visible direction finding when the islands are seen, the use of plumb lines for depth soundings, the sighting of seagulls, pieces of floating timber on the surface of the sea, and knowledge of the marine environment. Fishing activities often start with some prediction that the boats are on a fishing bank after the colour of the water has been observed or seaweed has been found in the vicinity.

Another serious problem is that the fishermen are so individualistic that they never operate in groups when they are fishing. Even to form themselves into a fishermen organization they would always think of having different organizations in the different fishing communities. It will only be through a special educational program that this attitude may be overcome in the future.

However, both the traditional navigation and fish detection techniques adopted by the fishermen are quite efficient during the northeast monsoon. The fishermen are keen sailors and they have good experience in the techniques of using sails. However, because of their inadequate theoretical knowledge of navigation and lack of formal education they are unable to operate efficiently during the southeast monsoon. Furthermore they cannot proceed to the banks where the unexploited species can be captured and cannot take advantage of the very good possibility of increasing their catch rates.

5.3.3. The Difficult working conditions

This is partly due to poor accommodation facilities especially on the present generation of fishing boats with inadequate life saving appliances and rudimentary fishing gear. Most of the fishing vessels use anchor stones, ropes, and thwarts for securing the boats on the fishing ground. All the operations concerned with laying and lifting the anchor from the sea bed are done manually. It is a very tiring process because sometimes the depth of the sea bed can be 30 to 40 metres, and the rope has to be pulled up by hand after a hard day of fishing with temperatures ranging between 28 and 30 degrees celcius.

Fishermen often have to leave home as early as one o'clock in the morning and carry his own food for the day because there are no available cooking

utensils on the small boats to permit them to have a hot meal. Thus usually the fisherman will carry some dry food consisting of dry biscuits, pieces of fried fish and a bottle of water. On the small open boats there are no shelters to protect them from the rain or the hot tropical sun. Their odd working hours sometime force them to go without food for a whole day because it is quite likely that on certain occasions the fishing might possibly start late in the afternoon if they have had the misfortune of losing the visible direction finding to know their position on that particular fishing ground.

They do not carry any sort of first aid kit onboard because there is no regulation which makes it compulsory. It is probable that if somebody gets injured at sea involving a deep cut for example, there is a high risk of the wound becoming septic.

Sleeping conditions onboard are not a matter of priority and fishermen sometimes go for one or two days without sleep if they find that the fish are biting constantly. This is due to the fact that the fishermen is at that time more interested in his catch than anything else.

5.3.4. Poor accomodation facilities

Many times when the fishermen have to return ashore with the traps for repair, it is very difficult for them to manoever their boats conveniently because there is limited space for them to sit in the boats. They do of course at times carry more than

the small boats can take. On the whalers with inboard engines there are no propeller guards to protect the fishermen in case they accidentally fall overboard while the engine is still running. On the large schooners, the accommodation is very bad. The crew sleep on the floor under deck forward. A small hatch in the deck is the only entry. There are no skylights or ventilation systems.

Half a drum on deck is used for grilling and cooking food and in the event of rain the crew cannot cook any food and they have to make do with whatever dry food they might have on board. Many times fishermen have had to eat raw rice because they could not cook due to bad weather.

The sleeping accommodations (the bunks) are very low and very uncomfortable. They do not have any fixed or permanent arrangements for sleeping purposes. Sometimes the sleeping area is used to store surplus fish which have been cured by salting.

There are no proper fresh water tanks available and the schooners are not properly equipped for such facilities. Drinking water onboard those fishing vessels can be a very high health hazard.

5.3.5. Inadequate safety at sea

Concerning safety at sea for the small boats, the fiberglass boats do not have any sort of bulkhead separation to keep the boat afloat in case of an accident of hitting a reef. There are now rescue

lines mounted along the outside of the boats. They do not carry any life jackets or any survival kits in case of capsizing. They do not have any sort of communication equipment on board which will allow them to communicate with the port authority in an emergency situation of being lost at sea.

As for the whalers, they are also not equipped with life buoys, life jackets, and rescue lines. In the case of whalers staying up to 4 or 5 days at sea, they do not have any sort of life rafts. There is no bulkhead to keep the boat afloat in case of collision with a bigger vessel. However, they do not carry any navigational lights which are very useful in case of an ocean liner having not detected their presence. It is scientific fact that as those boats are constructed entirely from wood it is not always possible to have their presence visible on the radar screen of ocean-going liners.

Concerning the schooners, they also do not carry any life rafts and are not properly equipped with water sealed hatch covers and other closures. They do not contain any bulkhead separation and capsizing is always one of the very high risks on board. There are no navigation lights and nor any pieces of distress signal equipment. They do not carry any first aid equipment, and there is no emergency transmitter to contact a shore base. They do not carry any survival kit and no dry food consignment in case they get lost at sea. There are no walkie talkie sets onboard which could provide communication between boats in case of injury to a crew member and the need to transport him ashore

for medical attention. No life jackets are made available and not even a single fire extinguisher in case of a fire breakout onboard.

5.3.6. Lack of adequate port and shore infrastructures

There is presently a lack of support facilities for the demersal fleet such as the supply of fuel and unloading facilities. The extension service is very limited and it is not available to all fishermen at large. There are no fishermen's service centers throughout the fishing communities providing such services as gear outfitting stores and gear workshops.

The boatyard is not sufficiently equipped and there is not a very high standard of safety procedures being kept there. There are no proper engine maintenance and repair workshops available in the different fishing communities. No docking facilities are presently available for the fishing vessels of the demersal fleets. The skilled manpower needed such as service engineers, fisheries extension officers, workshop managers, and others are presently insufficient for the fishing industry.

5.3.7. Environmental disturbances on the fisheries sector

The different reclamation programs undertaken previously have had catastrophic effects on the marine habitat and eco-system around the coastline of Mahe and the other inner islands. Many reefs

have been destroyed and fish scarcities in areas where they were known to have been in abundance abundance have been reported both by fishermen and consultants carrying out surveys in those areas. The extensive amount of estuaries on the eastern coastline of Mahe have been particularly reduced as a result of the port development activities involving reclamation.

The Indian mackerels which were found in abundance around the Beau Vallon bay and round Port Victoria are now very scarce due to those development programs being undertaken. The waters are no more clear around the Port of Victoria as a result of the transshipment activities going on there.

5.3.8. Problems relating to maritime training

The problems relating to maritime training have been identified as follows:

(a) the status of the fishermen in society

The work is hard and involves considerable personal sacrifice. Compensation levels do not appear to be attractive to persons considering a career,

(b) the recruitment of students

The number of students expressing an interest in fishing is relatively well below the 100 requirement, (c) selection of student

No selection currently exists for identifying non

suitable students early in the program,

(d) lack of boats for on-sea training

There is one boat at present dedicated to training at the Polytechnic and which is now operational, costs are prohibitive for acquiring more boats. However, at least one third of the training time should occur at sea.

(e) Multi career orientation

There appears to be a need to emphasize training for small scale fishing operation on schooners and whalers rather than for the merchant navy or other more technologically advance careers at sea,

(f) lack of public relationship

There is no one responsible at the school of maritime studies to promote public relationship with the fishing industry. ,

CHAPTER VI
RE-EVALUATION
OF SEYCHELLES
FISHERIES DEVELOPMENT POLICY

6.1. RE-EVALUATION OF THE FISHERIES DEVELOPMENT POLICY

Fishing development cannot progress effectively unless the core is given the utmost attention. This core manpower is unmistakably of priority and needs the attention of the management body of the fisheries sector when planning fisheries development for the near future. This is because small scale fisheries development is highly labour intensive and unless the required skilled manpower is provided the development cannot be viable.

It is quite certain that education and training for the fisheries sector needs to be given overall priority in the development of the fishing industry in Seychelles. Through the problems identified, for example fish scarcities during the southeast monsoon and inadequate safety at sea. Those fishermen who operate without the proper training presently, will have to be provided with the necessary training. It is important that the fishermen have a basic knowledge of the engine mechanism in order to carry out simple engine repair in case of engine failure at sea. This will prevent excessive operational and maintenance cost for them.

Furthermore, it will save them the unnecessary towing costs which they will have to face in case they have not got any basic engineering knowledge. It is essential that as the fisherman's income is quite low, the cost of motor repair should be kept as low as possible.

Past experiences have shown that neglect of the training factor in fisheries development has been detrimental to many developing countries, sometimes resulting in the collapse of the project undertaken.

For example, in the case of one Southeast Asia's nation, having more than 30 shipyards, the vessels could not be readily serviced, and the repair of boats or maintenance of deck machinery and electronic equipment could not be performed because the country did not have the necessary skilled labour to carry out those works. This was because of the fact that education and training had been overlooked at the initial stage of the fishing industry's development

When commercial fisheries development started in Seychelles, the training component had not been given the necessary attention. This was because the foreign aid donors did not consider training of crucial importance at the initial stage of fisheries development as they were providing the necessary expertise. However, this is not presently the case, thus the importance of training will have to be taken into consideration at the time of any future projects planning.

Little emphasis has been laid by the Seychelles

Fishing Authority on developing manpower training to its full potential for the small scale fisheries. This is because the authority has been concentrating more of its attention on administrative matters involving capital-intensive fishing development such as the canning factory, purse seining activities, and research mostly geared towards the industrial fisheries rather than the small scale fisheries.

It is thus evident that on reviewing and evaluating the present training system at the School of Maritime studies in Seychelles, little progress has been made in catering skilled manpower, the most critical need to accelerate the development of the small scale fisheries

In recent years there has been a great decline in the availability of a younger skilled labour force to serve the small scale fisheries. Most of the present generation of experienced fishermen are slowly fading out because of their old age and retirement from fishing.

The fishermen normally have to obtain their provisions of gear and equipment from retailers outside their home districts. Service centres should preferably be established in the fishing communities containing gear outfitting stores and gear workshops. It is considered best to have all services of this type rendered by one organization with the skilled labour force specialized for this purpose.

Fisheries development should be viewed within the overall development of the economy both at the

national and regional levels. Thus it is important that a sound knowledge of the resource both from the technical and economical view points is known, so as to make a choice between conflicting options. It is quite vital that regional co-operation be established in an effort to control the migratory species, because these species do not consider any man-made boundary lines when they have to migrate.

At the initial stage of discussion for the establishment of the canning factory, an adequate labour skill before the factory became operational should have been considered. This is quite important because canning is a capital-intensive operation and its economics of production require careful analysis. It would have been possible to look into areas of obtaining the finance necessary to train the required labour force for this industry.

Certain parastatal organizations in Seychelles involved with fisheries development have their bureaucratic system based on the civil service system and working hours. Thus they do not provide the necessary flexibility to fit into the unscheduled and sometimes unpredictable activities of fishing, which in addition is highly seasonal.

Many times fishermen arriving ashore on Saturday find that they have to wait until Monday to unload their catch because the main cold storage centers are not open on Saturday for business purposes. This results in large amounts of fish spoiling and subsequent wastage.

Furthermore certain staff members employed are not commercially orientated or may lack the incentive to take quick commercial decisions. There are also managers and chief executives who do not have the necessary expertise in the fishing industry. It is envisaged that in the future in-service training will be provided at the School of Maritime Studies for those members of staff lacking the necessary expertise.

Necessary steps should be taken to have a set of regulations formulated which will deal with aspects of Health and Safety at Sea for the small scale fisheries sector. This can be on the line of encouraging the younger generation to take up a career with the fisheries sector.

It is the aim of this paper to propose objectives which will encourage more young people to take up a career in the fisheries sector through the School of Maritime Studies in the future. However, the present pathway of the training component is conspicuously littered with numerous pitfalls in such way that the proposed training system will need constant review and evaluation after the initial stage of implementation of the project.

6.2. OBJECTIVES OF FISHERIES DEVELOPMENT

The proposed objectives are more geared towards providing the necessary tools in order to make

fishing an attractive vocation. It is envisaged that the integration of the proposed objectives stated below alongside the existing objectives of the fisheries policy of the Government of Seychelles will further have concerted action to the management and development of the fisheries sector. The proposed objectives are as follows :

1. to increase small scale fisheries,

2. to introduce modern equipment and develop distant water fisheries,

3. to develop co-operative or fishermen's association, and

4. to improve the present nutritional standard through increased fish consumption.

6.3. STRATEGIES TO MEET OBJECTIVES

Given the size of its territorial waters, Seychelles

is well poised for expansion in this sector of its economy. Some forward planning is useful at this point if Seychelles is to realize its goal of establishing fishing as a priority in national development.

There is in no doubt that when methods of fisheries management for small scale fisheries are based on the assumption that control and implementation would be under the direction of government officers, this may not always provide the most effective channel.

For example, if the fishery is highly localized inshore, then it may be more effective to allow local fishermen themselves to control and manage access to the resource they fish.

Management measures implemented by such fishermen is probably much more effective than when implemented by government officers, since fishermen have their own interests at heart and may have their own sanction to deal with offenders.

It is in this respect that the proposed strategies are geared towards providing the fishermen with such services so that they have more incentives to manage their own fisheries from which they earn their living.

Strategies to meet the above mentioned objectives are as follows:

For the first three objectives, the strategies proposed are:

- (a) to establish an intensive training scheme for indigenous personnel at all levels in the fisheries sector, and
- (b) to provide incentive programs to small scale fishermen.

For the fourth objective, the strategies proposed are:

- (a) to carry out a preliminary survey on the demand for fish on the local markets,
- (b) to encourage the development of market strategies to increase consumption of a wider variety of species including tropical trash fish, and
- (c) to promote advertising campaigns to overcome the built in prejudices against iced and frozen fish.

6.4. PROGRAMS TO IMPLEMENT STRATEGIES

The programs to implement the strategies will be phased out over the next 15 years starting from the year 1988. It will be necessary to carry out feasibility studies at various stages of development of the projects. It is quite essential that throughout the development programs evaluation of the

projects is undertaken so that future changes can be adapted to improve the effectiveness of the projects which will benefit the fishermen at large as well as the country's economy.

The programs to implement the strategies for the first three objectives will be as follows:

1. An immediate evaluation of the current training programme at the School of Maritime Studies and proposal of a training scheme for fishermen.
2. Provision for subsidies and assistance to fishermen

As for the fourth objective the program to implement the strategies are:

1. For strategies (a) and (b), the recruitment and training of a certain number of Fisheries Extension Officers will be required to carry out the task of informing the population on the essential nature of the programmed strategies.
2. For strategy (c) liaison with foreign donors to provide the necessary fund for development of the project will be needed.

6.5. PHASED OUT DEVELOPMENT PLAN TO MEET DESIRED OUTCOME AT VARIOUS HORIZONS OF TIME

In addition to the broad national objectives and the

proposed objectives, the aims of the fisheries development plan will be:

- (a) to ensure appropriate fleet, processing and storing capacities and necessary infrastructures, and
- (b) to enhance and maintain professional skills at all levels and in every sector of the industry.

The plan is divided into separate but interdependent phases which enables due attention to be paid to physical facilities, manpower resources and organizational priorities. The plan is divided into three five year phases.

The main features of the various phases as training, fleet structures and operations are as follows:

PHASE 1

1. Evaluation of the present training program.

The curriculum of the School of Maritime studies covers the following main subjects taught over six terms of three months each.

1. French and English language,
2. arithmetic/mathematics,
3. basic navigation,
4. construction, stability and handling of boats,

5. hygiene,
6. fishing techniques, gear handling,
7. oceanography,
8. ropework, net repairs, and gear maintenance.

At the Department of Engineering 2 year training covering courses in the following subjects:

1. general engineering (basic)
2. refrigeration for marine plants,
3. marine engineering, and
4. electrical installation for small boats.

The present situation of the School of Maritime Studies reflects :

- (a) a low academic level of the pupils entering the school compared with the curriculum and subjects taught,
- (b) varying interest among the students in acquiring the knowledge and experience,
- (c) limited familiarity with the educational system,
- (d) difficulties in the adaptation to the residential school system,

- (e) difficulties arising from the teaching in French language and from the writing in both French and English.
- (f) little experience among the students in the fishing sector,,
- (g) difficulties in assessment of the short and long term priorities of the fishing industry and of the individuals already engaged in it.

There are no set time tables, and sometimes the students finish school before having acquired the necessary skills which would have been required of him on joining a fishing boat.

There is nobody responsible for public relations from the school, and furthermore there is no link between the school and Seychelles Fishing Authority.

PHASE 1

2. Proposed training scheme

The training programme must be modified to:

1. ensure the effective selection of students,
2. concentrate on small scale fishing boats,
3. balance sea practical training with course work,
4. provide 100 trained fishermen per annum,

5. provide more training (one additional year) for those few who can qualify for specialized maritime training.

The following training programme is proposed

Intake

During the five year period of Phase 1, the minimum intake of 120 students per annum is proposed. This intake should be given priority to the college leavers but if unfilled places are available, it should be open to anyone who wishes to follow a career in fishing and who meets departmental requirements for admission.

All students would spend at least one week at sea during the first three months of term and following this, a selection would be made of students judged suitable for employment at sea.

Essential equipment

In order to provide a minimum of one-third of the training time at sea, it is necessary to have boats sufficient to provide 9438 student days at sea. (Each student would spend a minimum of 66 days at sea.)

It is estimated that boats could be at sea (including weekends and holidays) approximately 230 days per year.

Each boat will have to accommodate 10 students per trip or 2300 student days at sea during an entire

year, then five boats would appear to be adequate to provide the required training.

The boats to be used for training should be identified by the Seychelles Fishing Authority and provided to the school.

The cost of maintenance of five boats is estimated at Seychelles Rupees 442,000 per annum.

Staffing

At present the Department has 3.5 teaching staff including the Head of Department. In order to accommodate an intake of 120, the following new staff are required.

5 skipper/trainers

2.5 trainers on land (shore based staff)

The staff/student ratio will be 1:15. It is expected that the additional staffing requirement can be met locally. The additional cost of 7.5 trainers will be approximately Seychelles Rupees 200,000 per annum.

Program Content

All students will have to follow a common first year foundation course of practical training in fishing including :

practical preparation of fishing lines (baiting)

practical fishing techniques.

practical use of nets and traps,

practical fish handling and net repair, and

practical seamanship (basic navigation).

All training will be carried out on the trainin boats at sea which usually will operate for one whole week. The practical courses should as much as possible be taught in the national language which is Creole.

At the end of this first year program students will be certified as fishermen by the Seychelles Polytechnic and qualified to work in a fishing fleet.

Students of high potential for advanced study (no more tha 15) will continue into the second year which will provide specialization in:

navigation

fishing techniques, and

marine engineering.

A special training programme will be initiated for existing fishermen . Similarly there will be a need for advice and practical training for all personnel dealing with fish handling ,processing and preservation.

The training of existing fishermen will be carried out in their own districts and it will be planned in a way so as not to involve too much of their time and be made interesting so as to be attractive to them.

The training programme for the existing fishermen will have to include

basic navigation (both theoretical and practical)

safety of fishing vessels,

fish handling and processing at sea,

use of modern electronic equipment, and

hygiene and first aid at sea.

A mobile training bus could be made available for that purpose.

The Fisheries Extension Officers will be trained in the following :

helping all fishermen in improving their fishing methods and the handling of their catch,

providing advice and practical courses for the managers and workers in the industry in all aspects of fish handling, including the establishment of technically suitable working procedures;

providing feedback to the various bodies responsible for rural and fisheries development throughout the

country about the necessary future steps to be taken.

The training proposed for the middle managers who have no background knowledge of the fishing industry will be more concentrated on fishing technology which will contain such subjects as:

fisheries Biology,

fishing gear technology,

fishing nets and handling techniques,

management of small scale fisheries, and

public Relation.

PHASE 1

3. Incentive program: Subsidies and Assistance to Fishermen

The incentive program will be aimed at encouraging persons to become involved in the fishing industry. It will surely encourage more investment in the fishing industry thereby stimulating production and the availability of fish and fish products to the population at large. The facilities will involve rebates on tax and duties and grants will include:

(a) duty free concessions

These concessions will be provided to boat owners/operators who will have to be registered

with the Fisheries Division, and at the same time undergo training for existing fishermen. The concessions will be given on engine, boats, goods and equipment, which are imported especially for use in the fishing industry. Spare parts for fishing vessel and special equipment for fishing vessels such as echo sounders, radars, radio, telephones, electric fishing reels and compasses will also be eligible for duty free concessions.

(b) purchase tax concession

These will be in respect to the purchase of boats, engines, equipment, and vehicles which will be used entirely for fishing activities.

(c) subsidies

A cash subsidy will be given for new artisanal boats over 8 metres in length.

(d) fuel rebate and subsidised fuel

A rebate on fuel and lubricating oil used in fishing operations will be given to fishermen involved in fishing activities in the small scale fisheries. The rebate will be paid to owners based on a quota system determined by the horse power rating of the engine used. The quota and subsidy pay can be set after negotiations with the fishermen and other people involved in the fishing industry.

CHAPTER VII
CONCLUSION
AND
RECOMMENDATIONS

7.1. CONCLUSION

7.1.1. TRAINING

The current training at the School of Maritime Studies does not presently cater to the fishing industry. Most of the youths who finish their studies at the school find themselves without employment. It is clear from this present trend that the lack of a link between the Seychelles Fishing Authority and the School of Maritime Studies must have contributed to this problem.

The school should have established at its opening a curriculum committee consisting of:

1. a representative from the Seychelles Fishing Authority working in a high management position at the Department,
2. one representative from the private sector of the small scale fisheries who is an owner/operator of a fishing boat and who has had a very long experience in vessel operation,
3. a staff member from the National Union Office who

deals with matters relevant to the fishing industry (small scale fisheries),

4. a representative of the Public Health Department having extensive experience in dealing with fishing casualties or accidents,
5. an officer from the Ministry of Education engaged in pedagogical research mainly in the field of maritime education and training in relation to the training of fishermen,
6. a representative of the Fish Division of the Seychelles Marketing Board dealing with the development of marketing strategies, and
7. a Fisheries Extension officer for small scale fisheries.

The appointment of a public relations officer to the school will possibly ease this critical problem of unemployment in the future, because it will be his task to see to placement of the youths onboard fishing vessels while they are in their initial training.

In the future the Head of Department must have the incentive of not having the bureaucratic type attitude of adhering to the office working hours of 8 to 4, and carry out some research in finding out why there is this trend of unemployment of the youths after they have been initially trained at the school and obtained

a certificate of qualification as fisherman. It will be appropriate to have a Deputy Head.

An incentive program will have to be initiated as earlier as possible so as to reap success. Most of the owners/operators benefitting from the incentive program will be asked to have one or two of the students embarked on their fishing vessels.

Those students will be some good elements to promote the campaign for adequate safety at sea, hygiene, use of survival kits and first aid equipment. Their action onboard those fishing vessels will influence the old fishermen to adapt themselves to be more conscious of safety and hygienic conditions which are generally neglected.

Thus it is concluded that the earliest possible attention be given to changing the present training system at the school and looking into adopting the proposed training at the school in the immediate future.

The staff at the school will have to be kept informed of the trial period of the proposed training scheme. Their criticism should be invited if changes will have to be adopted. It will be of great value if regular meetings are held and different areas are investigated, making the training scheme benefit the small scale fisheries in the future.

The students' viewpoints will also be of great value to help evaluate the proposed training. Even the students

who are already in the working field can contribute to the evaluation of the proposed training scheme.

The incentive program will also contribute its part. Although the paper has looked at some of the other objectives which are of value to the development of the small scale fisheries, to elaborate on all the proposed objectives will be beyond the scope of this paper. Therefore emphasis has been laid more on the training component. It would have been quite interesting to elaborate on the other objectives. However, there is a time constraint which does not permit this.

7.2. RECOMMENDATIONS

It is recommended that a Maritime forum be formed as soon as possible to look into the curriculum of the School of Maritime Studies.

Furthermore, it is recommended that the committee, mentioned earlier in the conclusion paragraph be formed. That at the earliest possibility this committee look at the DRAFT DOCUMENT FOR GUIDANCE ON FISHERMEN'S TRAINING AND CERTIFICATION prepared by the Food and Agriculture Organization, the International Labour Organization and the International Maritime Organization. The committee will consider if any changes have to be made to the proposed training scheme with regard to that Draft Document.

It is also recommended that a Legal Committee be set up to draft a set of regulations which will deal with the questions of poor accommodation facilities and

inadequate safety of the vessels when at sea.

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