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MARINE RESOURCES AS A BASE FOR INDUSTRIAL DEVELOPMENT: PROBLEMS AND PROSPECTS IN THE WESTERN INDIAN OCEAN ISLAND STATES*

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Preface

Within the framework of UNIDO regional and country studies, policy-oriented research and analyses are carried out on current economic structures and future development prospects to serve as a basis for long-term industrial strategies, providing national policy-makers with information on relevant international development trends. These studies also support the UNIDO programme of technical assistance at the country, sub-regional and regional levels through the provision of relevant information and analyses.

The present study attempts to draw the attention of policy makers, multilateral and bilateral agencies to the prospects for better utilization of marine resources for industrial development; an area hitherto relatively unexploited. The study analyzes problems and prospects for utilizing marine resources as a base for industrial development in island developing countries with particular reference to the Western Indian Island Ocean States. The study contains a general survey of marine resources, an analysis of the development pattern with a focus on marine resources utilization and prospects in Comoros, Madagascar, Maldives, Mauritius and the Seychelles. The study attempts to specify measures for enhancing prospects for better utilization of marine resources and outlines the scope for national action and regional co-operation in this regard.

With the advent of the United Nations Convention of the Law of the Sea (UNCLOS III), marine resources are opening up new economic opportunities for exploitation. It is hoped that the study will provide inspiration for new avenues of development through better utilization of marine resources in the context of industrial development. The study has been prepared in collaboration with Dr. Donald L. Sparks. It has been undertaken as a desk-study drawing upon available information. Its scope is therefore naturally limited. More detailed field surveys and assistance at the national and regional levels would need to be undertaken in co-operation with national governments, regional and international organizations.

It should be noted that the conclusions and recommendations of the study are not official statements of intention by Governments nor do they represent a comprehensive and in-depth assessment of the industrial development process in the countries concerned.

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Dates divided by a slash (1984/85) indicate a crop year or a financial year. Dates divided by a hyphen (1984-85) indicate the full period, including the beginning and end years.

References to dollars ($) are to United States dollars, unless otherwise stated.

In tables:
Three dots (...) indicate that data are not available or are not separately reported;
A dash (-) indicates that the amount is nil or negligible;
A blank indicates that the item is not applicable;
One dot (.) indicates that there is insufficient data from which to calculate the figure.

Totals may not add precisely because of rounding.

The following abbreviation are used in this document:

CF	Comorian franc
CREDICOM	Société de crédit pour le développment des Comoros
EEZ	Exclusive Economic Zone
EPZ	Export Processing Zone
FAD	fishing aggregating devices
FAO	Food & Agricultural Organization of the United Nations
GDP	gross domestic product
GNP	gross national product
IBIOM	Issued-Based Indian Ocean Network
ICAO	International Civil Aviation Organization
IDA	International Development Association
IFAD	International Fund for Agricultural Development
IMF	International Monetary Fund
IMO	International Maritime Organization
IOFC	Indian Ocean Fishery Commission
LDCs	Least Developed Countries
MSL	Maldives Shipping Ltd
MT	Metric tonne
MW	Megawatt
OPEC	Organization for Petroleum Exporting Countries
OTEC	Ocean Thermal Energy Conservation
RF	Rufiyaa
Rs	Rupees
SDR	Special Drawing Rights
SR	Seychelles Rupees
STO	State Trading Organization (Maldives)
UNCLOS	United Nation Convention of the Law of the Sea
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNIDO	United Nations Industrial Development Organization
UNITAR	United Nations Institute for Training and Research

Executive Summary

Introduction

The island States of the Western Indian Ocean, Comoros, Madagascar, Maldives, Mauritius and Seychelles, share many common problems and potentials. After independence, three of the five (Seychelles, Mauritius and Maldives) began to develop major tourism industries, in an attempt to diversify away from the one or two agricultural commodities that dominated their economies and whose prices fluctuated widely on the world market. Mauritius has in recent years developed its manufacturing sector as well . Madagascar and Comoros have yet to modernize their economies.

As these States plan their individual patterns of economic development, and as they promote industrialization, they could examine more closely the ways in which they can base growth and development on their own natural resources. With the exception of Madagascar, the known natural land resources of the island States are limited. In the case of marine and coastal resources, obviously the most important resources of island countries, the situation could be appreciably better. Both exploration and exploitation are generally at a low level.

With the advent of the United Nations Convention of the Law of the Sea (UNCLOS III) the economic zones of these island States were greatly expanded.[1/] This enhances the importance of their off-shore marine resources. In the short run, a further development of living marine resources, mostly on an independent basis, seems the most likely course of action. In the medium- to long-term the States may be able to use both living and mineral marine resources, to further develop their light- and medium-scale manufacturing

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1/ The Law of the Sea Treaty is not yet international law and will only become so when 60 countries have ratified it. So far only 26 countries have signed the Treaty. Some designated countries have refused to sign the Treaty because of clauses which would force them to share mining technology and which they fear would reduce the role of private mining companies.

industries, if the exploration and exploitation of offshore resources is intensified. In this regard regional co-operation could be very useful. The economic potential of the 200 mile Exclusive Economic Zones claimed by the States in question is still virtually unknown. With an eye to the fragility of the marine environment, the exploitation of resources should proceed carefully using new methods of management and environmental protection.

Comoros

The Federal and Islamic Republic of the Comoros (which consists of three of the four small islands of the Comoros archipelago) is one of the world's least developed and most densely populated States (with a per capita GNP of less than $350). The nation has very few natural resources. Comoros entered a period of political instability and economic disequilibrium following independence, a condition from which it is only gradually emerging.

About 80 per cent of the population are dependent on agriculture. Plantation agriculture (primarily ylang ylang, yielding an aromatic essence) provides about 40 per cent of the country's GDP. About 7,000 persons are employed in fisheries. Fishing is largely artisanal, using low technology and labour-intensive methods. Fish processing is at a very low level and such manufacturing activities as exist are mostly of the small-scale, traditional cottage type.

The Government aims at achieving self-sufficiency in food, and improving health and living standards. One way to help achieve these goals would be to better utilize marine resources. Near-shore fisheries and sources of construction materials (sand, gravel and limestone from coral) offer scope for development without major investments, subject to limitations imposed by the need for environmental protection, and unspoiled beach scenery offers a potential for tourism. Important infrastructural investment would, however, be needed to make the islands more accessible.

Madagascar

Relative to the other four countries in this study, the Democratic Republic of Madagascar is large, both physically and in population terms, and it possesses a variety of natural resources. Nevertheless, by virtually any standard, Madagascar is less developed economically: per capita GDP was well below $350 in 1983. Its major economic sector is agriculture, where over 80 per cent of the population work. The manufacturing sector largely consists of food and textile industries. For a variety of reasons, the Malagasy economy has faced a persistent decline over the past years. Inappropriate pricing mechanisms, inadequate linkages and a shortage of foreign exchange have strongly affected the productive sectors and food consumption per capita has decreased. Madagascar, however, can aspire to halt the decline in per capita income and achieve real growth and development, despite its current balance of payments problems, if external donors and creditors will support domestic efforts to reform the economy.

Of the States under discussion, Madagascar depends the least on its marine resources. The full extent of the country's land resources is unknown. Connections into the interior are inefficient and a large part of the population lives on the coast. There are thus many reasons to make better use of the marine resource potential. Fish and improved seafood processing/distribution could help solve the food problem. Coastal tourism could be stimulated and there is scope for better use of local building materials (marine sands and gravel) and coastal canal transportation improvement and development.

Maldives

Maldives is a small nation, comprising many islands and atolls. It supports a total population of about 150,000, of whom nearly 90 per cent live on the capital island of Male. Although average income is still very low, Maldives has made impressive economic progress since independence, given its lack of natural resources, isolation and low level of social and physical infrastructure development.

The economy is not diversified. Maldives' two major sources of income are tourism (with over 70,000 tourists in 1983) and fisheries. Both are related to the country's marine resources. In recent years, the export-oriented textile industry has appreciably improved the manufacturing sector's share in GDP. The Government's twin objectives of rapid economic growth and a better regional economic development balance among islands will depend on better utilizing the available marine resources, and Maldives is already taking appropriate steps in that direction. Fishing gear and techniques and seafood processing have been improved. There would be scope for further improvements here, and also for boat building and repairing, promoting a local handicraft industry using indigenous marine resources, and more extensive use of marine products as inputs for the manufacturing industry and the construction sector.

Mauritius

Mauritius has a relatively diversified economy. It comprises one major island, plus a few smaller outlying islands. Its population is 1.2 million, and average GDP was around $1,000 in the mid 1980s.

Until quite recently, the Mauritius economy hinged on sugar production. While agriculture in general still remains important, its share of GDP has declined from over 18 per cent of the total to about 13 per cent during the late 1970s and early 1980s. The share of fisheries, once important, has also declined in recent years. Tourism and especially manufacturing have seen their GDP share grow considerably.

Mauritius has a number of marine resources which could be better utilized. The possibilities of a local pharmaceutical industry based on marine plants and increased aquaculture and mariculture could be explored, fish catches and fish processing facilities could be improved. The island could become self-sufficient in salt, and marine resources could also be used in the building materials industry and to raise the presently very low local content level in manufacturing products.

Seychelles

Seychelles has a population of about 65,000 people, of whom 95 per cent live on the main island of Mahe. Only about 200 km^2 of the country's surface are suitable for agriculture. It is the richest country of the five reviewed in this study, with an average per capita income of $1,870 in 1983.

Seychelles' economy and society have been transformed since independence, and increases in tourism have mainly been responsible. Agriculture, which during the 1960s contributed over 75 per cent of GNP, now contributes less than 5 per cent. Fisheries have remained important occupation in Seychelles, and fish processing and good international connections have stimulated exports. Manufacturing only takes place on a very modest scale.

The Seychelles Government has focused on marine resources as part of its national development strategies, recognizing the ecological costs and constraints of development of the coastal zone. Its strategy for developing its 200 mile EEZ is geared toward identification of hydro-carbon potentials, developing a fishing industry based on tuna stocks, and increased seafood processing. Marine resources could also be used in local handicraft production and as building materials. Supporting economic activities which need to be developed are boat building and repair and shipping.

International Co-operation

The international development community can offer much to these island States. The sphere of international co-operation could begin with an attempt to learn about these islands' marine resources, particularly in the vast sea areas of the EEZs. A multilateral and/or bilateral focus on the development of important marine resources as a potential base for further industrialization would include: marine fisheries, mariculture, ocean minerals, energy production, shipping and ports, and coastal tourism.

The study also recommends that specific measures be initiated for enhanced utilization of marine resources as a base for industrial development

in the Western Indian Ocean island States including the holding of a series of regional or subregional workshops, surveys, technical assistance and investment promotion. The key issues at stake are inter alia:

- exploiting the potential for mariculture/aquaculture development;
- improving commercial seafood processing and distribution;
- promoting fishery gear/technology improvement and development;
- strengthening cooperatives for boat building/repair facilities;
- promoting the processing of salt based on seawater reservoirs;
- introducing industrial uses of marine biotechnology for food, pharmaceutical and chemical production (aquaculture, seaweeds, marine pharmaceuticals, marine toxins, and industrial chemicals);
- utilizing fish skin (particularly shark, eel and salmon) for leather industry development as a by-product of fish processing;
- promoting cottage industry production using local materials (such as shell buttons, jewellery, pearls, ornamental use, etc.);
- enhancing coral reef exploitation, management and environmental protection for construction industries (sand, gravel, limestone);
- developing techniques for surveying and assessing marine resources in EEZs;
- developing alternative ocean-based energy sources.

To further enhance the utilization of marine resources for industrial development in the above areas, international co-operation and national action may usefully be supported by surveys, technical assistance and investment co-operation.

The exploration and exploitation of ocean resources depend on marine technology. The island States would need to strengthen their scientific and technological base in marine science to take advantage of the rich potential that the ocean offers for their industrial development process.

1. REGIONAL OVERVIEW OF MARINE RESOURCES AND ISLAND COUNTRY DEVELOPMENT

A. Marine Resources and Development in the Western Indian Ocean Region

The island States of the Western Indian Ocean on which this report focuses[1/] - Comoros, Madagascar, Maldives, Mauritius and Seychelles - share many economic problems. In general they are isolated, open economies and producers of one, or at best a few, primary products whose prices fluctuate widely on the world market. Except for Madagascar, they have small populations (but nevertheless severe density problems), small markets, limited land resources for agriculture, low levels of industrialization, limited communications within the country and with the outside world, poorly developed physical infrastructure, generally insufficient trained manpower, limited natural resource endowments, fragile eco-systems, and unpredictable weather which can severely damage the countries (Table I.1). Three of the five countries have been classified as least developed countries (LDCs) by the UN, and their per capita GDP and Physical Quality of Life Index are among the lowest in the world.[2/] Despite common limitations, their short- and medium-term potentials and current levels of development varies greatly, with Mauritius and Seychelles at the top of the scale, Comoros and Maldives at the lower end, and Madagascar in between.

The smallest of the countries in the region is Maldives, with an area of 298 km^2, followed by Seychelles (444 km^2), Mauritius (1,960 km^2), Comoros (2,170 km^2), and Madagascar (592,000 km^2). Maldives has the highest population density, 520/km^2, with Mauritius next (495), followed by Comoros (165), Seychelles (142), and Madagascar (15). In population terms,

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1/ This study excludes Sri Lanka because of its location (more "central" Indian Ocean), its size (both physical and population) and its level of development; Zanzibar and Pemba because they form an integral unit within the United Republic of Tanzania; and Reunion, being an overseas Department of France. The study also excludes a number of small inhabited and uninhabited islands which are dependencies of foreign powers and are used primarily for non-economic purposes.

2/ This study recognizes that GDP per capita is an inadequate method of measuring a country's level of economic development, as it says nothing about, e.g., equity or distribution issues. Nevertheless, it is useful in placing some rank on the relative wealth of a country. The Physical Quality of Life Index, which measures infant mortality, literacy and crude birth rates, is another way of indicating development levels.

Seychelles is the smallest, with less than 65,000 people, followed by Maldives (155,000), Comoros (358,000), Mauritius (971,000) and Madagascar (with nearly 9 million inhabitants). Further, Mauritius has the lowest population growth rate in the region (and in the developing world) of 1.4 per cent. The highest population growth rate in the region is Maldives' 3 per cent. Seychelles and Mauritius have by far the highest GNP per capita, over $1,500 and around $1,000 respectively, while Madagascar, Comoros and Maldives all have GNP per capita under $350.

Marine resources, which include living resources (e.g. marine animals and plants) and non-living resources such as minerals and non-minerals (e.g. off-shore oil, corals, salt), could play a major role in the economic development process of these States. None of them have fully utilized the near-shore and off-shore marine resources so far, but the United Nations Convention on the Law of the Sea (UNCLOS III, 1982) presents new stimuli to further utilize these resources.[1/] The Law of the Sea Treaty, however, is not yet international law and will only become so when 60 countries have ratified it. So far only 26 countries have signed the Treaty.

As in most other island States there is a general lack of awareness of the potential value of marine resources in the Western Indian Ocean island countries. Ocean resources are not generally identified as resources for development in government planning, and governments do not allocate adequate research and development funding in this area. These resources could both be used to increase exports and to reduce the generally very high dependence on imported raw materials.

Although there is some co-operation now inter alia through the "Commission de l'Ocean Indien", in general there has been little regional or international coordination and sharing of knowledge. Given the scarce resources of the individual States, regional co-operation would help:

- concentrate funds and capacity for the exploitation of marine resources;
- concentrate marine research capacities;

1/ For a summary of the main provisions of UNCLOS III, see Annex I.

Table I.1 Inter-country comparison of selected economic indicators, 1981-85 (selected years)

Indicator	Unit	Year	Comoros	Madagascar	Maldives	Mauritius	Seychelles
Land area	km^2		336,000	9,400,000	160,000	969,000	64,000
Exclusive economic zone	km^2		...	1,300,000	1,200,000	1,040,000	...
Population	thousands	1984	436	9,730	170	900	60
GDP	$ million	selected years	(1984) 126	(1984) 2,000	(1983) 57	(1984) 941	(1983) 120
GDP	$	1983	340	310	350a/	1,150	2,400
Real GDP growth	per cent	1981	5.5	-10.1	11.6	9.9	-7.1
		1982	3.9	0.9	6.5	5.8	-1.6
		1983	3.7	1.0	8.3	6.4	-1.6
		1984	3.3	1.8	...	4.6	...
Share of manufacturing in GDP	per cent	selected years	(1984) 4.0	(1984) 16.0	(1984) 4.7	(1983) 16.2	(1982) 7.8
Share of fisheries in GDP	per cent	selected years	...	...	(1984) 17	(1983) 3.8	(1982) 2.7
Principal exports	$ million	selected years	(1983)	(1984)	(1985)	(1985)	(1984)
			Vanilla (9.2), cloves (3.4)	Coffee (14.2), vanilla (32), cloves (36)	Apparel and clothing (6.3), fresh skipjack (3.9)	Sugar (186), manufactures (212), tea (11.5)	Fish (1.4), copra (1.2)
Principal imports	$ million	selected years	(1983)	(1984)	(1983)	(1985)	(1984)
			Rice (6.7), transport equipment (6.0), non-electrical machinery (5.1)	Raw materials (111), energy products (101) capital goods (85), consumer goods (39)	Consumer goods (23.1), intermediate and capital goods (18.8), petroleum products (9.7)	Textiles (113) food (88), petroleum products (72), machinery and equipment (36)	Fuel (26.4), manufactures (20), food, drink and tobacco (17.0), machinery and transport goods (16.9)
Balance of payments (current account)	$ million	1983	-11.1	-194	...	-49.1	-13.9
Exchange rate	Local currency equivalents to $1		(CFr per $)	(Mg fr per $)	(Mal rufiyaa per $)	(Rs per $)	SRs per $)
		1981	272	272	7.55	8.9	6.2
		1984	437	377	7.85	13.8	7.1
		May 1986	349	687	...	13.2	6.2
Total disbursed debt	$ million	selected years	(1984) 103.8	(1984) 1,636	(1981) 38.9	(1984) 12.7	(1983) 41.7
Debt service	$ million	1984	2.6	53.7	...	58.3	...

Sources: UN, Monthly Bulletin of Statistics, March 1986; IMF, International Financial Statistics, 1985; World Bank, World Debt Tables, 1983; The Economist Intelligence Unit, Country Report: Madagascar, Mauritius, Seychelles, Comoros, No. 2, 1986; Maldives, Ministry of Planning and Development, Statistical Year Book, 1984.

a/ GDP per capita.

- complement knowledge of marine geology in the Indian Ocean which would improve the evaluation of marine resource potential within individual EEZs;

- mutually reinforce and uphold EEZ policies.

Until quite recently there has been little assistance from international development agencies, although during the 1970s the UN Ocean Economics and Technology Office and UNESCO's Man and the Biosphere Programme and its Marine Science Division did make worthwhile contributions to coastal and marine resource development/management issues in developing island States.[1/] Other UN organizations including UNDP, UNIDO, UNEP, UNITAR, IMO, FAO, UNCTAD, and the World Bank have begun to recognize the importance of ocean resources and have instigated independent or joint programmes to address key issues.

Given the fragile ecosystems of the island countries, development must be pursued in a manner which keeps ecological costs to a minimal. The countries under study here have suffered from poorly planned port facility expansion, wastewater discharge, waste disposal installations, cannery discharges, intensive mineral mining ventures, inappropriately located and scaled tourist facilities and inadequately planned urbanization. The long-term cost of inappropriate methods of marine resource exploitation could outweigh the gains. It should also be pointed out that strategies for exploitation, protection and management developed for temperate zones in developed countries are generally inappropriate for these tropical, developing nations, and new methods must be found.

Nevertheless, while coastal and marine zones are highly vulnerable ecologically, and Governments perhaps are not always aware of their value, they present a great potential for growth and development.[2/] Marine

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1/ Towle, E.L.: The Island Microcosm, Washington, DC, Island Resources Foundation, 1984.

2/ For a more detailed and persuasive argument along these lines, see in particular Towle, E.L., ibid.

resources provide important forward and backward linkages and multipliers.[1/] The linkages have been classified as:

- Backward, where growth and development in ocean/coastal industries induce investment and development in other sectors, providing inputs to ocean/coastal industries such as boat and ship building, port facilities, engine repair and other service activity;

- Forward, where ocean/coastal industries exert an influence on industries using "products" from the coastal/marine zone as an input such as fish processing and coral sand and block for construction use;

- Demand, where income generated by marine/coastal related industries stimulates increased demand for consumer goods and services.

Of particular relevance for all the countries in the region would be the potential for increased:

- employment, with the growth of fisheries and tourism in particular;

- nutrition, with fisheries and aquaculture providing the potential to substantially increase the protein levels;

- foreign exchange earnings, with increased revenues from fish, minerals, energy and tourism;

- national development and social equity, as coastal and marine transportation infrastructure is developed and small- and medium-scale industry is stimulated, with benefits spreading out from the major population centers to the more remote areas;

- economic self sufficiency through the increased contribution of domestic resources to national development; and as less imports of food and industrial inputs are needed.

1/ The significance of ocean resources for GDP is sometimes difficult to establish. For the most current methods and models of appropriate analysis, see Pontecorvo, E. et al., "Contribution of the Ocean Sector to the United States Economy", Science, 208:1000-1006, 1980.

The short- and medium-term prospects for the increased industrial exploitation of some marine resources in the five countries appear quite good. For the longer term, the prospects are as yet less clear.[1/]

For the short term, the individual island States will most likely focus their efforts on fisheries (improving processing, marketing, equipment and technology and manpower training). While there could be some areas of regional co-operation, most of these activities are likely to be carried out nationally. For the medium term, the States might consider more concrete moves into small- and medium-scale manufacturing, utilizing more local marine resources as basic components in, e.g., the construction industry and pharmaceuticals. Again, while there will be some potential for collaboration between States, much of these activities will be done nationally. The exploitation of more distant off-shore resources in the EEZs (including energy production from waves, ocean thermal energy conversion and oil exploration, deep sea nodules and other deep sea minerals) will only become feasible in the long run. All of these activities are expensive and dependent on sophisticated technologies, and would require a degree of regional co-operation and support by the international community.

B. Toward Marine Resource-Based Industrial Development

Fisheries

Marine fisheries play an important role in the Western Indian Ocean Island States, excepting Madagascar. Indian Ocean fishing harvests have been about 2.5 million tons in recent years, out of a potential 15 million tons. More than 90 per cent of the fish caught in the region, however, is by the African mainland States. Fish processing in the island States is minimal: more than half of the catch is marketed fresh off the boats, perhaps one third is cured by smoking or drying, another 5 per cent is processed for fishmeal, 5 per cent is frozen and 1 per cent is canned. Stock assessments and research

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1/ For an overview of the marine and coastal potential for the island States of the Western Indian Ocean, see UNEP, Marine and Coastal Area Development in the East African Region, Nairobi: UNEP Regional Seas Reports and Studies Number 6, 1982, paragraphs 145-237.

are being conducted under the FAO Indian Ocean Regional Fisheries Project (based in Seychelles). Additional research is needed, however.

Permanent measures to support the expansion of this industry will have to aim at a balance between the capital-intensive, "modern" commercial/industrial fisheries, and the labour-intensive, "traditional" small-scale fishermen to maximize benefits to the national communities. Increasing the catch of certain species by using "fish aggregating devices" and finding ways to protect breeding habitats is recommended for several countries. Increased extension efforts are needed to help all levels of fishermen develop more appropriate gear and fishing techniques to enable them to harvest underutilized stocks.[1/] Such efforts should also include improving navigation and safety. Emphasis will also have to be placed on research on domestic, regional and world markets, and on storage and processing. As to the latter, the modern fishing fleets operating in the region often retain freezing/processing units outside the jurisdiction of the island States, thus depriving them of value added through processing. Increased attention would also need to be given to the development of leather industry based on fish skin as raw material (particularly shark, eel and salmon). Such products are already commercially available.

Aquaculture and Mariculture

Aquaculture and mariculture are still in their early stages of development worldwide, although several developing countries (e.g. Ecuador) have been successful. The Indian Ocean island climates allow virtually year-round fish farming activity, although land area is limited in every State except Madagascar. Nevertheless, aquaculture could help improve general living and nutrition standards and employment, and could strengthen the economy by increased foreign exchange earnings.[2/] Certain species (e.g. prawns) could be cultivated for the growing demand by tourists.

1/ It is, e.g., estimated that as much as 400,000 tons of sharks could be harvested annually in the western part of the Indian Ocean.

2/ In Mauritius, e.g., the large sugar estates have decided to diversify into aquaculture in an effort to become less dependent on a single crop with a strongly fluctuating market price.

Minerals

Within the 200 mile EEZ of most of the five States, there are a number of important mineral deposits, found primarily in silt sediments (some as much as 100 metres thick), and including ores of chromite, iron, ilmenite, monazite, tin and zircon. Further, guano, phosphite and mineral beach sands and gravel are now exploited in some coastal areas. Other resources include barite, glauconite, magnetite and organic sediments (oil, gas) at relatively shallow depths. Seychelles has tried to identify offshore deposits of limestone. The seawater contains exploitable minerals, and some 14 million tons (or 8 per cent of the world's total) salt production comes from the Indian Ocean. The potential of most of these minerals to serve as bases for industrial processing or refining is probably not high in the short run, as a consequence of the exorbitant costs of off-shore exploration and exploitation. Such offshore materials as manganese nodules[1/] or polymetallic sulfides will also have to wait until the costs of exploration and exploitation become more moderate, or for a successful operation under UNCLOS III a national or private sector deep sea ocean mining venture. This does not appear likely within this decade. Perhaps the most promising short-term marine minerals would be marine salts and possibly oil and gas, all of which could support local refining, raise local value-added components and reduce imports.

Energy

The region exhibits some potential for energy production. Some areas have the necessary conditions for developing ocean thermal energy conversion (OTEC), although its short-term practical feasibility is not fully assured yet. Nevertheless, Seychelles considers using a small OTEC plant located about 60 km southwest of Mahe, the capital island, at the edge of the continental shelf. It is expected to supply some 20MW, equal to about the

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1/ These nodules form at depths of 3.5 to 5 kilometers. The principal elements contained in these nodules include manganese (14.7%), iron (13.5%), nickel (0.4%), cobalt (0.3%), and copper (0.2%). The manganese content is a bit higher in the nodules found in the eastern part of the region, and lower in the northwest.

total electricity consumption of the main island. Several of the countries, in particular Seychelles and Madagascar, have off-shore oil and natural gas potential. There has been exploration off Madagascar, Maldives, Mauritius and Seychelles during the past decade, but without significant finds. Finally, Mauritius has investigated the possibility of electricity generation from wave action; occasional high waves produced by geologic action and cyclones may preclude commercial development in the area, however.

Related Sources of Income

The area's marine transportation infrastructure leaves much to be desired. In some areas (particularly in Comoros), marine transportation is essential for intra-State communications and commerce, but there has been little investment in small boat building or in establishing repair facilities. While the ports of Victoria in Seychelles and Port Louis in Mauritius have had (or will have) major renovations and refurbishing, at high economic and ecological costs, smaller scale port development has been haphazard at best. The nations' markets are so small that they must generally maintain break-bulk cargo facilities as opposed to more economical containerized cargo facilities.[1/] However, break-bulk facilities do encourage more labour-intensive activities, adding to employment potential. Tourism - based primarily on development of sites in the coastal area - changed the nature of the economies of three of the five States in the region after the improvement of airport facilities in the early 1970s. In fact, for Seychelles and Maldives, tourism quickly became the major economic sector, largest single employer, and largest contributor of foreign exchange. Marine/coastal-based tourism could well become the region's major sector over the next decade. Madagascar and Comoros have not yet developed their tourism potential. Unfortunately, the five states compete with each other for primarily Western European tourists, and with closer destinations in the Mediterrean and in the Caribbean. The countries could consider regional co-operation in tourism development, and could maintain strict safeguards to maintain the natural beauty of coastal areas.

1/ Of course, the advantages of containerized cargo loses much of its economic advantages if the remainder of the country's transportation system is not capable of handling the throughput.

II. COMOROS

A. Socio-economic Trends

The Federal and Islamic Republic of the Comoros consits of three of the four major islands of the Comoros Archipelago, stretching over an area of 2,166 square miles in the Mozambique Channel.[1/] Comoros has a population of over 350,000, and with over 350 inhabitants/km^2 of arable land, the islands are some of the most densely populated in the region. Further, land pressures are worsening because of a rapid natural population growth (2.7 per cent annually), and an influx of Comorans formerly residing in Madagascar and East Africa. It is estimated that by 1990 the population will have increased to 565,000.

The country is one of the least developed in the world, with a per capita income of less than $350. Health conditions on the islands are inadequate and malnutrition, particularly protein deficiency, is widespread. The country is poor in natural resources. Less than one half of its total land area is suitable for agriculture. Because of the highly permeable volcanic soil, permanent surface water supplies are virtually non-existent and in spite of a fairly abundant average rainfall, long droughts may occur. There are few known marine resources. Inshore fisheries are poor, and there is no continental shelf for nearby or deep sea fishing. Further, there are no known mineral resources, either on or off-shore, except for sand and lime from coral reefs. The monetized economy centres on the export of a few agricultural commodities whose prices fluctuate widely. Manufacturing and tourism are in very early stages of development.

Directly following independence in 1975, Comoros entered a period of acute recession, from which it is only now beginning to slowly emerge. Its GDP has grown slightly, from Comorian francs (Cf.) 26.7 million in 1980 to

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1/ The Comoros Archipelago comprises Grande Comore, Moheli, Anjouan and Mayotte. When admitted to the UN in 1975, the new Comoran State was recognized as comprising all four islands. However, the island of Mayotte remains under France administration as a "territorial community". For economic purposes, therefore this study considers Comoros as consisting of Grande Comore, Moheli and Anjouan, and all data and statistics refer only to the three islands, unless otherwise specified.

some Cf. 31.4 million in 1984, but the increase cannot keep pace with the rapid population growth. Volcanic eruptions on Grande Comore have caused dislocation of the population and added to the social and economic problems.

B. Economic Structure: Resources and Manufacturing

Agriculture and fisheries

The Comoran economy consists principally of small-scale agriculture. Some 80 per cent of the population are directly dependent on agriculture for their livelihood. The major foodstuffs grown are coconuts, bananas, rice, cassava and maize. Animal husbandry is seriously constrained by lack of fresh water and unsuitable soils. Agriculture is responsible for virtually all export earnings and contributes some 40 per cent of the country's GDP (see Table II.1). However, food production cannot keep up with the population growth, and Comoros is forced to import substantial amounts of foodstuffs annually.

The major export crops are vanilla, copra, cloves and ylang ylang (a tree whose flowers are distilled for a perfume base). These commodities are subject to wide price fluctuations, and although prices have recently shown a general upward movement, earnings are subject to physical constraints on output (cyclones and drought), and fluctuations in world demand over which Comoros has no control.

There are about 7,000 artisanal fishermen in Comoros, who fish mostly along the coast for family or local consumption. Total fish production grew from 4,000 to 4,500 tons annually during the 1980-1984 period, and fish is by far the most important source of protein (see Table A-1). There are some small shoals near Anjouan and Moheli, but the majority of the total catch is taken in the Mayotte lagoon (in the French administered area). Most fishing boats are traditional dug-outs powered by sail or oars, and the average catch is 15 kg per day. The World Bank estimates that fishermen with motorized boats could probably catch three times as much fish. Further, because of the strong monsoon winds, fishing is possible only for about 200 days per year. Although the monetized sector of the economy is small, there is a certain market potential for fish outside coastal areas. The country however lacks

storage, marketing and processing facilities. There is no commercial fishing industry in Comoros presently.

Table II.1 Gross domestic product by industrial origin, 1980-84

(Cf. million, at 1980 prices)

	1980	1981	1982	1983	1984
Agriculture, livestock, fisheries, forestry	10,593	11,343	11,655	12,007	12,298
Manufacturing	1,214	1,385	1,409	1,427	1,445
Electricity, gas, water	110	121	128	136	144
Construction and public works	2,354	2,540	2,687	2,822	2,903
Trade, hotels, bars, restaurants	6,214	6,459	6,808	7,160	7,488
Transport and communications	385	408	432	450	477
Banks, insurance real estate	687	727	745	764	784
Public administration	4,995	4,988	5,227	5,388	5,592
Other services	194	206	226	248	274
GDP at market prices	26,746	28,217	29,317	30,402	31,405
Net indirect taxes	2,297	2,680	3,106	4,322	3,884
GDP at factor cost	24,449	25,537	26,211	26,080	27,521

Source: IMF, Comoros: Recent Economic Developments, Washington, D.C., (SM/85/46), 1985, p. 63.

Manufacturing

Manufacturing accounts for less than 4 per cent of GDP, and employs some 700 people (see Table II.2). Most manufacturing in Comoros consists of processing and distilling ylang ylang (virtually the only activity in the chemical products branch) and preparing vanilla and copra for export. Export processing is done primarily by small farmers who use wood as an energy source, which, together with land clearing in densely populated areas, has caused a serious decline of Comoros forests. Management for other activities

is usually provided by expatriates. Presently, the only other significant manufacturing industries in Comoros are soap, the gas enterprise (Gascom), a soft drink bottling plant and some wood and iron workshops. There are a few handicraft workers who specialize in wood sculpture, pottery and clothing and a number of other small enterprises including a printing plant, a few bakeries and a factory which makes plastic sandals.

Value-added in manufacturing grew at a nominal rate of 5.1 per cent during 1981-84. However, this rate in real terms is only about 1.4 per cent, significantly below the overall economic growth rate of 4.1 per cent. Further, the manufacturing sector's share of GDP has fallen from 4.8 per cent in 1981 to 3.9 per cent in 1984. Capacity utilization tends to be low, as a result of low demand, irregular supply of inputs and insufficient maintenance. The limited size of the Comoran market, a lack of trained personnel, inadequate infrastructure and irregular supplies are the major constraints for further expansion of manufacturing sector.[1/] In an effort to attract private investment in manufacturing, the Government revised its Investment Code in 1984 which offers advantages to both foreign and domestic investors, but the most important factors influencing the establishment of productive projects will be those of a qualitative nature, such as political stability, assistance to entrepreneurs in project preparation, availability of training schemes for labour and management, improvement of infrastructure facilities, and long-term financing availability.

C. Employment

Of the total work force of 120,000 (of which one-third are women), about 80 per cent are employed in agriculture, and the remaining 20 per cent in the modern cash economy. There are about 13,000 salaried workers in Comoros (see Table A-2). Because of a relatively large number of public works projects, the number of workers in the modern sector has increased more rapidly than those in the traditional sector of the economy. Wages and salaries remain low, due to the subsistence nature of the economy. The minimum wage, for example, has remained at Cf. 24.6 per hour since 1973.

1/ See UNIDO: Federal and Islamic Republic of the Comoros: Survey of Selected Economic Sectors, World Bank/UNIDO Co-operative Programme, UNIDO/IO.520, 1982.

Table II.2 Establishments and employment in manufacturing, 1980

Branch	Establishments	Employment
Food industry	5	89
Textiles	12	25
Wood products	62	282
Papers, paper products, printing	1	21
Chemical products	29	244
Other	16	24

Source: UNIDO, Federal and Islamic Republic of the Comoros - Survey of Selected Economic Sectors, World Bank/UNIDO Co-operative Programme, UNIDO/IO.520, 1982.

D. Recent Development Planning and Policies

The Government launched its first Five-Year Development Plan in 1983. This Plan is supposed to be an interim one, to be replaced by a more comprehensive Plan for the period up to 1990. The principal goals of the Plan are to:

- develop agriculture with special emphasis on self-sufficiency in food, and export expansion;
- reduce the geographical isolation of the country;
- develop energy;
- develop water resources for public consumption and agricultural uses;
- improve health care; and,
- improve the capacity for technical and professional training.

The Plan currently places little emphasis on better utilizing coastal or marine resources.

The federal Government is the most important component of the public sector. Its major items of expenditure in 1981 were health and education

(37 per cent of the total expenditure), and general administration (17 per cent of the total (see Table A-4).

Comoros has only a small number of public enterprises, and most were created during 1979-82 in response to the growing concern over the stability of supply of certain important imports, including petroleum, rice and medicine. In 1980 there were six parastatals: Electricity and Water; National Priniting Office; Petroleum Importing and Marketing Organization; Air Comoros; CREDICOM (see below); and the National Bank of Comoros. The latter two have been replaced by the Development Bank and the International Bank.

The Government established the Société de Crédit pour le Développement des Comoros (CREDICOM) in 1974. From 1974-1977, the latest period for which data is available, CREDICOM make available 1,076 loans worth Cf. 1,100 million. Most of these loans went to building materials and housing (see Table A-5).

E. Prospects for Better Utilization of Marine Resources

Comoros is not endowed with plentiful natural resources. Its potential for better utilizing its marine resources is also rather limited, although there are areas where Comoros could improve such utilization. Some marine resources, such as sea salt, could be used to create small-scale import substituting industries.

The most important area for improvement is in the fisheries sector. However, the coastal waters around Comoros are not rich in fish. Comoros fisheries potential is estimated at perhaps 6,500 tons per annum (it harvets some 4,500 tons annually now). Within a 50 km radius of Comoros, there is potential for harvesting approximately 20,000 tons of tuna annually, about half of which could be caught by small motorized boats.

The most rapid way of increasing fish production to these limits would be to introduce medium- to large-sized, capital-intensive boats. However, this method would bypass the majority of the country's fishermen, and recurrent costs might prove prohibitive. Additionally, there is little indigenous expertise to keep these types of boats in operation. Perhaps it would be more

appropriate to reconsider a 1977 pilot project whereby small motor boats were used to tow outrigger canoes to the fishing areas. Refrigeration units were also supplied. This type of project, if successful, could also encourage the beginning of a small boat construction industry.[1/]

Marketing remains a major problem. Poor families, whose diets lack protein, will most likely remain unable to buy fish, even if the supply is increased. Most fish is consumed fresh, in the coastal towns and villages, and little remains to be preserved (the usual method is by drying). Refrigeration could be increased, but the costs might put the product even further out of reach of the people who need fish most.

A Joint FAO-Japanese mission explored the possibility of Comoros establishing an industrial tuna fishery in 1975.[2/] A proposal was prepared for a $ 15 million project involving ten 200-ton fishing boats, a canning factory and a refrigeration facility for freezing up to 5,000 tons. Tuna production would be entirely for export, and would not be allowed to undercut artisanal fishing. This project has not been implemented, and such projects should be approached with caution. As a foreign exchange earning device, the project has merit, if overseas markets can be captured. However, if the goal is to increase earnings of fishermen, and help solve the protein deficiency of poorer Comorans, the project would probably not work well. The focus should rather be on the small-scale fisherman, helping him identify underutilized species, improving his gear, and instructing him on updated navigational techniques which would allow him to fish beyond his traditional frontiers.

1/ Some studies have been done in other areas. For example, see Anderson, D.C., Application of Wind Power in Shipbuilding, UNIDO-ID/WG.375/40 or UNIDO, Wind Power Vessels for Coastal and Inter-Island Use in the ESCAP Region, UNIDO-ID/WG.413/2, Vienna, 1984. Also, Comoros could improve its boat repair and building facilities. See, for example, Tarhacki, B.J., Seychelles: Establishment and Operation of a Boatyard and Boat Maintenance Complex, UNIDO/IO/R.56, Vienna 1983, or Morales-Casorlz, A., Ways and Co-operation Procedures for Developing Shipyeards and Mixed Enterprises to Ensure the Volume of Ships Required by the Area, UNIDO-ID.WG/375/35, Vienna, 1983.

2/ See World Bank, The Comoros: Problems and Prospects of a Small, Island Economy. Washington DC: IBRD, 1983, p. 62 and also UNIDO, Feasibility Study for the Establishment of an Integrated Tuna Fish Processing Industry: Mauritius, by Promopeche, Contract 69/4.

The construction industry makes use of marine resources. In the past it has traditionally used lava, coral and sand taken from beaches. However, coral and sand are limited resources, and extensive exploitation will cause environmental problems on the three islands, and destroy any possible potential for increased tourism. Extensive use can also damage aquifers, reducing fresh water supplies. Destruction of coastal habitats also reduces nursery grounds for commercially important species as well as habitats of subsistence fisheries.[1/] Crushed lava could be used as a substitute for the marine materials.

Comoros has a potential for tourism, but poor infrastructure and international communication have kept the number of visitors low. The Government has come to favour a selective approach to tourism. An international conference centre was opened in 1985.

To help facilitate the growth of traffic both between the islands and the rest of the world, the Government is developing the port of Mutsamudu on Anjouan, which will be able to accommodate ships of 15,000 mt. At present, Grande Comore and Anjouan only have one small artificial harbour, and large ships must anchor offshore and be served by small, wind-powered vessels. Comoros could also improve its inter-island transport system by upgrading the small boat fleet.

Prospects for other marine-resource-based industries may be examined in the context of the industrial opportunities outlined in chapter VII.

1/ See DuBois, R. and Towle, E., Coral Harvesting and Sand Mining Management Practices, Washington, DC, Island Resources Foundation, 1985.

III. MADAGASCAR

A. Socio-economic Trends

The Democratic Republic of Madagascar is by far the largest of the countries. It has a population of about 9.7 million (with a growth rate of 2.8 per cent). By the year 2000, the population will be an estimated 15.9 million, 26.7 per cent of whom will be living in urban areas, as compared to 17.6 per cent in 1980.

Madagascar is one of the world's least developed countries. Economic growth during the first half of the 1980s was insufficient to keep pace with population growth. Measured in constant prices GDP per capita in 1985 was 20 per cent lower than the level achieved in 1980. The most recent estimate indicates a GNP per capita of $310.

Despite current economic difficulties the Government has made significant progress towards stabilizing the economy. From 1980 to 1985 the Government succeeded in reducing both the overall budget deficit from 18 per cent to about 5 per cent and the current account deficit on the balance of payments from 20 per cent to 10 per cent of GDP as well as curtailing the rate of inflation from 15 per cent (and about 25 per cent in 1981-83) to 10 per cent in 1984-85. These macro-economic improvements were accomplished by reducing government expenditure, net imports and bank lending while domestic savings increased. At the same time the currency was devalued by about 75 per cent, representing a real adjustment of around 25 per cent.

The balance of payments constraint has been serious. While net imports declined from US$ 557 million in 1980 to US$ 140 million in 1985 exports also fell from US$ 518 million to US$ 348 million. The external debt service rose from 17 per cent to 47 per cent of exports during the same period.

Madagascar has a variety of natural resources which are generally underutilized, especially so the marine resources. The country has the human and natural resources needed to achieve more rapid economic development. Half of its major cities are located along the coast, and Madagascar has done little to plan for economic development in, or off its coastal zone.

Many of the coastal cities and towns are in isolated locations, and transportation (other than air service) into the interior is poor.[1/]

B. Economic Structure: Resources and Manufacturing

Agriculture

Agriculture is the most important sector of the Malagasy economy. Its true importance is reflected by the 85 per cent of the population engaged in crop farming, animal husbandry, fishing and allied activities. Agriculture accounts for 33 per cent of GDP (Table III.1) and is the largest source of foreign exchange (about 85 per cent in 1983-84). This sector provides most of the population's food needs and also supplies much of the raw material for the manufacturing sector.

Madagascar had to continue to import rice during the 1980-85 period although they declined due to foreign exchange scarcity. Production of other crops such as maize, potatoes, cassava, and sweet potatoes grew steadily and significantly. Apart from cotton and sugarcane the production of industrial and export crops stagnated (tobacco, coffee, pepper) or declined (groundnuts, butter beans). The output of vanilla and cloves, the two other principal export crops, was restrained in the face of limited world market demand. Output of many crops stagnated during the late 1970s and early 1980s, due to unfavourable weather conditions, deteriorating infrastructure, shortages of imported inputs (due to a foreign exchange crisis), and distortions in government pricing and marketing policies. In 1982 the Government liberalized or increased prices for several major crops and allowed private traders to compete with State enterprises.

Fisheries

Madagascar's fishery resources are generally underexploited, and offshore fishing potential is estimated by the World Bank at 150,000 tons per year,

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1/ The Pangalanes Canal running along the eastern coast could provide excellent intra-coastal transportation, but it has fallen into disrepair in most parts.

Table III.1 Madagascar: Gross domestic product by industrial origin at 1970 prices, 1978-84
(FMG billions)

Origins	1978	1979	1980 a/	1981 a/	1982 a/	1983 a/	1984 a/
Agriculture, forestry & fishing	71.3	76.4	78.3	74.8	77.8	77.9	84.3
Industry	50.1	56.5	55.0	42.4	36.4	36.9	35.7
Services b/	80.7	90.1	90.7	84.5	83.6	83.0	84.2
Public administration	37.3	40.0	41.7	43.8	44.2	44.7	45.4
Import duties	9.3	10.1	9.6	6.0	4.9	4.7	4.6
Gross domestic product at market price	248.7	273.1	275.3	251.5	246.9	249.0	254.2

Source: Planning Directorate.

a/ Estimates.
b/ Includes domestic services of households.

with higher value crustaceans potentially providing an additional 8,000 tons annually. Only a small part of the catch is processed at present (see Tables A-7 and A-8). There are about 11,000 full-time traditional fishermen who use traditional canoes. In the modern sector there are about 650 fishermen who use motor boats and trawlers.[1/] Capital-intensive maritime fishing is conducted by four joint venture companies, which operate along the northwest coast and provide most of the fish for exports. Saltwater fish is becoming an increasingly important source of foreign exchange earnings. Fish exports amounted to FMG 13.4 billion in 1984. Further, the Government is developing joint venture arrangements with other foreign partners to diversify the kinds of species caught and processed (e.g. tuna)[2/] and improve its current performance.

Mining

Madagascar has significant mineral deposits, the most important being nickel, bauxite, chromite, graphite and quartz. Oil exploration is being conducted in the eastern part of the country, but there has been limited offshore exploration for oil or other minerals. Mineral production for export has declined in recent years, and exports for 1983 were only 62 per cent of the 1980 level. Such declines can be attributed to slackened world demand, combined with increasing internal transportation difficulties.

Manufacturing

The manufacturing sector is geared primarily toward the domestic market (except for textiles), and is concentrated in food processing and clothing

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1/ For a complete description of the fishing industry, see FAO, SWIO Fisheries Bulletin, Victoria, Seychelles, "Fishing Country Profile: Madagascar".

2/ See for example, UNIDO, Feasibility Study for the Establishment of an Integrated Tuna Fish Processing Industry: Mauritius, by Prompecho, Contract 69/4.

(see Tables III.2, A-9). All the large industrial enterprises are majority-owned by the Madagascar Government.[1/]

In 1979 industrial output reached a peak of 20.6 per cent of real GDP (see Table III.1) but has declined since (both in relative and absolute terms) because of the irregular supply of domestic and imported inputs and spare parts. However, in 1983 industrial output increased slightly, in spite of these shortcomings and of poor transportation. The increase was led by the food processing and textile industries (see Table III.2). Several sub-sectors declined in 1983. One of the largest declines has been in petroleum processing, the refinery closing due to an industrial accident. Manufacturing output grew modestly in 1985. However, manufacturing growth in 1983 and 1985 could not compensate for the decline in the other years since 1980.

Industrial capacity utilization fell from 73 per cent in 1979 to about 50 per cent in 1980. Many industries operate at a level far below this sector average. The decrease was partly a result of the Government's decision to allocate scarce foreign exchange to inputs for the more efficient enterprises. The priority now is to rehabilitate existing capacity rather than expand capacity.

Although some sources expect the manufacturing sector to grow (slowly) during the coming years,[2/] the sector continues to suffer from shortages of capital, spare parts and raw materials. The problems are compounded by inappropriate pricing policies (although price controls for a number of products have been relaxed), incoherent planning and a lack of qualified labour, although educational levels are comparatively high. More attention

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1/ For an analysis of the industrial sector, see UNIDO - (1985) Madagascar - La gestion des prix industriels, Regional and Country Studies Branch (restricted study), UNIDO - (1985) Madagascar - Regime fiscal et développement industriel, Regional and Country Studies Branch (restricted study), or UNDP/UNIDO, L'industrie Malgache: Analyse du fonctionnement et propositions d'action, Vienna, UNIDO, DP/MAG/81/018, 1982.

2/ IMF, Madagascar: Recent Economic Developments, Washington, DC, SM/84/218, 1984, p. 13.

Table III.2 Madagascar: Industrial production indices, 1978-84
(1978 = 100)

Item	Weights	1978	1979	1980	1981	1982	1983	1984
Industry								
Mining	3.88	100	103	112	81	50	46	54
Food and beverage	31.60	100	98	94	81	63	72	63
Tobacco	5.35	100	100	98	84	88	77	84
Textiles	26.34	100	106	104	98	95	99	93
Clothing	7.39	100	103	114	105	78	78	74
Wood	1.20	100	95	87	80	74	55	69
Paper	4.03	100	103	96	72	74	79	[illegible]
Printing	2.49	100	99	103	110	99	103	98
Leather	2.17	100	114	104	92	58	84	84
Rubber	0.53	100	123	130	80	47	43	67
Chemicals	8.08	100	106	86	62	47	54	52
Petroleum refining	2.61	100	94	141	100	97	63	16
Construction material	3.01	100	94	89	66	70	79	66
Transport equipment	1.32	100	98	135	63	17	10	8
General index	100.00	100	102	101	86	74	78	72
Electricity								
Production index	100.00	100	111	119	119	122	127	129
Hydro	41.00	100	102	128	133	197	214	220
Thermal	59.00	100	117	113	110	69	67	66
Consumption index (High voltage)		100	102	103	99	108	115	...

Source: World Bank; The Democratic Republic of Madagascar, Country Economic Memorandum, March 18, 1986.

Note: These indices are based on INSRE's regular surveys of large enterprises and do not necessarily represent the entire branch or subsector.

could be paid to linkages between the sectors and between manufacturing branches. The Government has initiated a series of industrial policy changes; easing price controls, improving the administration of foreign exchange controls and legislating a new investment code which aims at attracting foreign private investors. These positive policies would need to be complemented by rationalizing the tariff system and simplifying administrative practices.[1/]

C. Employment

Some 88 per cent of the working population is engaged in agriculture, 4.4 million people out of a total labour force of 5.0 million. From 1980 to 1984 the proportion of the working force engaged in agriculture declined by about 0.36 per cent, while agriculture's contribution to real GDP increased from 28.4 per cent to 33.2 per cent. Industry employs 135,000 people or about 2.7 per cent of the total labour force. While there is a shortage of qualified labour for the sector on the one hand, there is considerable unemployment and underemployment on the other.

D. Recent Development Planning and Policies

Madagascar has a three-phased, long-term development strategy which is targeted toward the year 2000. The first period (1978-84) was to have laid the foundations for future development, concentrating specifically on infrastructure, basic industry, food processing and textiles. The second phase (1985-92) is planned to be one of expansion and diversification, with employment creation. A final phase (1993-2000) of growth and expansion is expected to lead to greater industrial development, rising living standards and full employment. The implementation of this strategy is to an important extent dependent on external sources of finance, as the projects for the manufacturing sector show, and will also depend on a more coherent and efficient approach by the government organizations involved.

1/ World Bank: The Democratic Republic of Madagascar, Country Economic Memorandum, March 18, 1986, p. 4.

Since 1983, the private sector has received more encouragement, and manufacturing activities which support agriculture have been promoted. The Investment Code for industry is being revised to attract more foreign investors. More attention is now paid to agriculture. After comparative neglect until the late 1970s, the enhancement of the role of agriculture as a supplier of inputs for the processing industry (without detracting from self-sufficiency) is a major goal. Little planning for the marine sector has taken place so far.

Government expenditure has gone overwhelmingly toward the social services (including national health and education) and public administration, which, combined, totaled MFG. 120.9 billion (or over 80 per cent of total government expenditures) in 1984. Madagascar's balance of payments has remained negative for several years. Its current accounts deficit improved from -599 million US$ in 1980 to -256 million US$ in 1985 (see Table A-11).

The rise in world coffee prices and falling oil prices have improved the short-term economic outlook. Economic prospects for the rest of the decade and beyond will depend crucially on the Government's ability to adjust the economy. The achievement of a satisfactory rate of economic growth and the gradual restoration of balance of payments viability would require enhancement of investment efficiency particularly in the public sector, higher domestic savings and rapid growth of exports. A recent World Bank study[1/] concluded that Madagascar can indeed aspire to halt the decline in per capita income and achieve real development, despite its current balance of payment problems, if external donors and creditors will support domestic efforts to reform the economy. A key area for improvement concerns public sector budget formulation and monitoring of cash resource availabilities as well as spending transactions.

E. Prospects for Better Utilizing Marine Resources

One obvious need in Madagascar is to find ways of increasing its domestic food production for local consumption. One way to do this is to strengthen

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1/ World Bank: The Democratic Republic of Madagascar, Country Economic Memorandum, March 18, 1986, p. viii.

the artisanal fisheries sector.[1/] Another way would be to diversify the fishing industry, concentrating on currently underutilized species, for example, tuna.[2/] Further, in an effort to increase protein consumption, Madagascar could consider launching an intensive aquaculture or mariculture programme, initially using lessons learned in other developing countries. Increased marine-based production could also provide inputs for domestic industries, reducing dependence on imported inputs.

Another equally important task facing the Government is to produce a detailed survey of its marine resources, particularly those lying off-shore. Currently, very little is known about such resources,[3/] and Madagascar could take advantage of satellite technology for surveys. While many resources remain unexploited, overexploitation of known land resources (forests, e.g.) is already leading to serious problems and should stimulate a more careful approach to the exploitation of marine resources.

With the difficulties facing internal transportation, every effort would need to be made to enhance coastal communications. Madagascar's maritime transport is important in its overall economy, and in fact coastal traffic accounted for some 33 per cent of total maritime freight traffic in 1978. The Pangalanes Canal, which is now virtually unutilized and in disrepair could be considered as a means of improving transportation along the eastern coast. The canal could have other potential uses. For example, unused parts can provide excellent wildlife habitats or marine impoundments, which could be

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1/ See for example Guyardeau, E., and Prado, J., Rapport sur le developpement de la peche artisanale, UNDP Report, 1982, or Ralison, A. and Aubray, R., Rapport sur les directives pour un programe general de developpement des peches maritimes Malagasches, UNDP Report, December 1982.

2/ Of particular interest in this context is UNDP, Project de Prospection des Resources Pelagiques", DP/MAR/77/009, and UNDP, Developpement des Peches Maritime: Madagascar, Conclusion et Recommendations, EI-DP/MAR/80/006.

3/ A symposium on marine resources was an important step forward. See Connaissance et mise en valeur des resources biologiques aquatiques a Madagascar, Dec. 19, 1984 - Jan. 19, 1985, Centre d'information, French Mission of Cooperation, Antananarivo.

used as bases for aquaculture development. To enhance income from shipping, the Government decided to make Madagascar a "flag of convenience" country in 1984.

Madagascar could make more extensive use of existing marine resources for manufacturing, e.g. cement production,[1/] salt and related chemicals production, etc. Madagascar could also begin producing more of its own salt.[2/] Finally developing coastal regions for tourism could be considered, which would also have an impact on other sectors (construction, sea food production for tourists).

In coastal centres, there is scope for the development of saline-based industries such as caustic soda and every effort could be taken to develop this potential.

Prospects for other marine-resource-based industries may be investigated in the context of industrial opportunities outlined in chapter VII.

1/ Several studies have been made on improved cement production, including Horvath, Kosteiny and Mikula, Cement Plant in Ambania, Madagascar: Feasibility Study, UNIDO, Vienna, SI/MAG/82/801, 1983. Methods using coastal resources could also be examined in more detail.

2/ See for example, Mannar, M.G.V., Guildelines for the Establishment of Solar Salt Facilities from Seawater, Underground Brines and Salted Lakes, UNIDO, UNIDO/IS.330, Vienna, 1982.

IV. MALDIVES

A. Socio-economic Trends

The Republic of Maldives, an archipelago of 1,201 small islands with a total surface of 298 km^2, extending over 820 kilometers in a north-south direction, is located about 650 kilometers southwest of Sri Lanka and southern India. With over 500 inhabitants/km^2, Maldives is densely populated. It is one of the poorest countries in the world, *per capita* GDP being less than $350. The country is not endowed with many natural resources on land, and its economy is heavily centered on tourism and fishing (see Table IV.1). Development in the modern sector is highly concentrated in or near the capital of Male.

Although Maldives is classified as least developed country, it has made impressive economic achievements, especially during the last five years. From 1980-83, strong economic growth was led by the rapid development of fishing and tourism, as well as by an acceleration in public sector investment in infrastructure. Real GPD increased at 12 per cent per year, and *per capita* GDP at nearly 10 per cent during that period. Total employment grew by about 3.5 per cent annually from 1978-80, keeping pace with the growth rate of the labour force.

B. Economic Structure: Resources and Manufacturing

Fisheries

Despite the fact that tourism now generates nearly twice as much foreign exchange earnings, fisheries remain the mainstay of Maldives' economy. About 30,000 people, representing 44 per cent of the employed labour force, are working as fishermen, or in related activities such as drying, salting and canning fish, and in boat building and maintenance.

During the early 1970s, Maldives progressively lost its major market (Sri Lanka) for dried, salted or smoked tuna (the main catch) as Sri Lanka was forced to cut back its food imports, due to foreign exchange difficulties. Maldives adjusted by inviting foreign companies to start collecting fresh fish

for freezing and exporting to other markets. Also during that time the Maldives began a programme to mechanize the fishing fleet, in order to better supply the foreign collector fleets.

Table IV.1 GDt by Sector of Origin, 1980-83
(Rf. millions, at 1982 market prices)

	1980	1981	1982	1983
Gross domestic product	374.2	417.6	444.7	461.9
Primary sector a/	134.3	145.3	129.2	137.2
of which: Fisheries	82.3	84.0	69.4	81.4
Secondary sector b/	52.3	45.6	54.3	52.0
of which. Construction	39.6	29.6	32.8	31.3
Service sector	187.6	226.7	261.2	272.7
of which: Transport	26.4	50.7	44.7	42.1
Tourism	39.4	52.4	62.1	64.4
Trade	44.0	44.3	54.7	49.7
Government	44.9	46.0	60.4	69.5
Other	32.9	33.3	39.3	47.0

Source: IMF, Maldives: Recent Economic Developments, Washington, D.C., SM/85/11, January 1985, P.3.

a/ Includes agriculture, fisheries, coral and sand mining.
b/ Includes construction, manufacturing and electricity.

During 1978-81 the volume of fish exports grew at an average annual rate of 7 per cent, and the value rose by 25.5 per cent annually. After a short recession in the early 1980s, the volume of estimated fish exports in 1984 was almost back at 1981 levels, while the value of exports had risen by 36 per cent (see Table A-17). Export prices are negotiated between the Government and foreign collecting companies. Because of a large stock of frozen tuna on the world market, these prices fell to $270/MT in 1982, down from about $450/MT the year before. Also during 1982 one of the foreign collecting companies (which had been handling some 30 per cent of Maldivian exports, plus the only canning factory on one of the smaller islands) withdrew, and the Government stepped in to keep the canning factory operating. The cannery is running at full capacity, having to turn away potential customers. The capacity is planned to be expanded to 25 tons in two years, and there is need to establish another canning factory with a 20-30 ton capacity.

However, even before the collapse of tuna prices in 1982, the fishing sector was facing severe problems, including scarcity of bait fish, lack of navigational aids (which prevented boats from travelling out of familiar waters), shortages of diesel fuel plus fuel price increases, and inadequate offshore collector capacity. Indeed, the World Bank[1/] has estimated that for 1981, the combined impact of these problems amounted to potential losses of some 12,500 MT potential catch (roughly 35 per cent of the annual catch), about $ 5 million potential export revenue (nearly 70 per cent of actual fish export revenues) and nearly Rf 1,000 in annual per capita wages (compared to about Rf 1,600 per capita actually obtained).

Fish are the country's major exports. As mentioned previously, the price for export tuna is set by the Government; indeed, much of it is sold by the State Trading Orgainzation (STO).[2/] Exports handled via the STO have risen dramatically since 1980, from $ 3.3 million to $ 12.5 million in 1984. Maldives major trading partners are Japan, Sri Lanka and recently, the US.

Tourism

With the beginning of direct flights from Europe in 1981, tourism witnessed a spectacular rise: during the 1981/82 November-March high season, there were some 60 per cent more tourist nights recorded than the previous year. Importantly, this growth coincided with the decline in the fishing industry. The annual number of tourists has more than doubled from 1980 to 1984 and their average length of stay has increased from 8.6 days to 10.9 days. Tourist expenditures increased from $ 9.4 million in 1980 to $ 25.3 million in 1984 (see Table A-18). Tourism now contributes about 14 per cent of GDP, with strong multiplier effects throughout the Maldivian economic system, particularly on the construction and services sectors. Further,

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1/ World Bank, The Maldives: An Updating Economic Memorandum, Washington, DC, IBRD, Report Number 4445-MAL, 1983, p. 9.

2/ The STO is under the Ministry of Trade & Industry and plays an important role in the economy. Besides handling most of the fish exports, it holds a 51 per cent share in the garment manufacturing operations. It distributes most of the country's food items such as rice, sugar and wheat flour.

tourism related jobs have had a beneficial impact on developing skills in the hotel and catering trades, as well as in construction and engineering. Wages in the sector are higher than those in fishing or agriculture.

Agriculture

Agriculture and related activities (i.e. gathering of timber and firewood) account for perhaps 10 per cent of GDP and employment. Most of the agricultural production is on a very small scale. The total cultivatable area in the Maldives is only about 2,800 hectares, which combined with poor soil, inadequate extension and transport services, inhibits agricultural growth. Nevertheless, there are prospects for improving cultivation practices, particularly of coconuts. The Government designated 1983 as National Agricultural Year, during which some 100,000 coconut palms, 40,000 saplings of food crops and 300,000 saplings of hardwood timber were planted.

Shipping

Maldives Shipping Ltd. (MSL), the government-owned shipping line, provides employment for Maldivian nationals (about 70 per cent of the crew is Maldivian) and it also provides the Government with $ 1.4 million in revenues from profits in 1981. However, since 1980 the MSL has encountered serious operational problems, as a result primarily of the world recession, declining freight rates and closure of shipping routes.[1/] The number of ships calling at the economically important port of Male declined dramatically from 1976 to 1981, but total tonnage rose from 27,900 tons to 76,700 tons (see Table A-19).

Manufacturing

Until the early 1980s, manufacturing in the Maldives was geared almost exclusively toward the domestic market, with production consisting principally of clothing, furniture, soft drinks, bread, fishing boats and handicrafts.

1/ IMF, Maldives: Recent Economic Development, Washington, D.C., (SM/85/11), 1985, p. 10.

These activities accounted for 3 per cent of GDP. Most of the manufacturing in Maldives is of the small scale, cottage industry type.

With the development of the garment industry, beginning in 1981, the manufacturing sector's percentage of GDP increased to 4.5 per cent by 1983. Currently, nearly all textiles (suits, cotton shirts and blouses) are exported to the United States. Production of knitted woolen sweaters, an important product, has been somewhat limited by US quota restrictions. In 1982, Maldives were producing 64,000 dozen against an annual quota by the US of 26,000 dozen, raised to 150,000 dozen for a three year period ending in 1985. Producers of sweaters have diversified into other materials, most notably cotton and synthetics, to minimize the effects of this quota. By 1983, textile exports accounted for 46 per cent of all Maldives' exports of $ 6.2 million. However, their net contribution to the balance of payments has been smaller, because of the high import content. The sector's employment contribution is estimated at 22 per cent of the working age population.

C. Employment

Fishing is still the major occupation in Maldives, accounting for 44 per cent of the workforce (down from 45.4 per cent in 1978). This is followed by the manufacturing and construction industries, representing 26.9 per cent of the workforce (about the same as in 1978). The public sector (Government workforce) has grown to about 7.4 per cent of the total in 1980, up from 5.1 per cent in 1978. Employment in tourism has grown fastest, from 0.7 per cent of the total workforce in 1978 to 3 per cent in 1980 (see Table A-20) and has led to labour migration from the fishing areas to the capital of Male. Unemployment is higher on the main island of Male than in the rest of the country. In 1977 unemployment was 15.3 per cent in the capital island, and 3.7 per cent on all the other atolls (the latter percentage may hide unregistered unemployment and underemployment). The national unemployment rate is 5.8 per cent.

D. Recent Development Planning and Policies

The Ministry of Development and Planning was formed in 1982, and is responsible for preparing the medium-term development plans for Maldives. The

Government is concentrating, as mentioned earlier, on fisheries and tourism. The major objectives for the 1985-87 National Development Plan are to:

- improve the living standards of the population;
- reduce imbalances in economic conditions between regions, which would also reduce congestion in Male;
- reduce dependence on foreign assistance.

The industrialization strategy aims mainly at export promotion, with import substitution as a secondary objective.

Government expenditure has been heavily geared toward public and social services. In 1984 public services (including general administration and security) and social services accounted for some 80 per cent of total government expenditure. Expenditures on economic services were Rufiyaa (Rf.) 11 million (9.8 per cent of the total) in 1984, up from Rf. 4.5 million in 1980 (see Table A-21).

E. Prospects for Better Utilization of Marine Resources

The Government's twin objectives of rapid economic growth and regional economic development balance among islands will partly depend on opening new tourism zones and on better utilization of its marine resources, especially those of the more distant islands.

Maldives is already undertaking significant and appropriate steps in developing these marine resources. There is some potential for the production of chemicals on the basis of sea salt. It is also beginning programmes to solve problems and bottlenecks in fuel distribution, fish storage and freezing, fish collecting and navigational aids.[1/] Fish canning capacity as mentioned

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1/ Such projects are being assisted by a number of agencies, including OPEC Fund, IFAD, Kuwait Fund and IDA. The two major fisheries development projects are the Maldives Fishwealth Exploitation Project, which focuses on the southern atolls, and the IDA Second Fisheries Project in the northern parts of the country. Maldives could benefit by looking at efforts other countries are taking in tuna processing. See, e.g., UNIDO, Feasiblity Study for the Establishment of an Integrated Tuna Fish Processing Industry: Mauritius, by Promopeche, Contract 69/4.

above could be expanded. If these projects are successfully completed, the result will most likely be increased exports, additional foreign exchange earnings, higher wages for fishermen and a general improvement in the fishing communities, the majority of which are located in the more distant islands. Thus, an important contribution to the diffusion of development could be made.

A number of problems will have to be surmounted. First, there is little accurate data on Maldives fisheries stocks. Stock assessments are urgently needed, as well as an overall resources survey. Currently, most of the fishing is done in the surface waters of the inter-atoll basin and within 25 km of the coast, which leaves vast areas unexploited. While much of the fishing in these areas would have to be capital intensive, fishermen could adopt techniques to allow them to fish deeper within the 25 km zone. A number of species in that area have been identified, including barracuda, snapper, spiney lobster and wahoo. Finally, Maldivian diet has tended to favour tuna rather than the more protein-rich reef species. Species and product acceptance measures would have to be used to help alter these preferences.

Maldives has been testing fish aggregating devices (FAD), and thus far the results are promising. Such devises are moderately priced (Rf. 10,000 each). Experiments have demonstrated that migratory species (e.g. tuna) "aggregate" near these floating devices, which enable fishermen to save time in locating the stock, as well as fuel in getting to the fish. Additional support for FAD is needed, as well as new and improved appropriate gear for traditional labour-intensive fishing.

It has been increasingly difficult for fishermen in Maldives to obtain bait, and the scarcity causes a substantial time loss for the fishermen. Besides growing bait fish, Maldives could consider a number of aquaculture or mariculture activities for growing such species as mussels, oysters and spiney lobsters.

Maldives has a history of using coral for building materials, but coral mining destroys the habitats of bait fish. While coral mining is a viable development process for Maldives, and has been important in its construction industry, protective measures must be taken to safeguard against destruction of marine habitats, especially in the more heavily populated areas of the

country. If used properly, sand could also be used to upgrade some of the major roads on the main island, none of which are now paved. There have been limited oil exploration efforts, and surveys have indicated that drilling would not be worthwhile.

Maldives could work more with ongoing regional programmes, such as the FAO Indian Ocean Project.[1/] Ways of increasing sales of exotic and other fish to Europe could be considered[2/]. More fishing boat repair facilities could be established on the very small, outlying islands and existing boat repair facilities could be improved. Additional training for mechanics is much needed.[3/] Finally, given the importance and potential of tourism, Maldives could produce more handicrafts (using local resources) for sale to tourists, following the example of the Seychelles.

Prospects for other marine-resource-based industries may be examined in the context of industrial opportunities outlined in chapter VII.

1/ The programme would have to be expanded to accommodate Maldives. See FAO, Indian Ocean Fishery Commission: A Plan for Fishery Development in the Indian Ocean Region, (IOFC/DEV/71/1), 1971.

2/ For example of other LDCs, see International Civil Aviation Organization, A Review of the Trade in Fish Transported by Air from Selected African Countries, UNDP/ICAO Project (RAF/74/021).

3/ Similar projects in the Seychelles might serve as examples. See Mazarkiewicz, B.K., Seychelles: Establishment of a New Boatyard, Boat Maintenance Complex on the Island of Praslin, A Technical Report, UNIDO, UNIDO/IO/R.47, 1983, or Taracki, B.J. Establishment and Operation of a Boatyard and Boat Maintenance Complex, UNIDO, UNIDO/IO/R.46, 1983.

V. MAURITIUS

A. Socio-economic Trends

Mauritius lies some 800 kilometers east of Madagascar. While its total land area, including a few smaller islands, is only 1,960 km^2, Mauritius' Exclusive Economic Zone (EEZ) gives it control of about 1.2 million sq km, and its potential for better utilizing its coastal and marine resources is good.

Over 95 per cent of Mauritius' total population of 1,002,000 live on the main island, making it one of the more densely populated countries in the world (over 600 inh./km^2). Mauritius' GDP per capita was Rupees (Rs.) 11,177 in 1984, almost double the 1979 figure of Rs. 6,359 (see Table A-23). The erratic production and prices for sugar, the main export product, is reflected in economic growth rates. Total GDP e.g. declined by 10 per cent in 1980 (in terms of real output), but recovered at about 6 per cent during the next two years, to be followed by low growth in 1983.

Mauritius has a well-developed physical and social infrastructure. With the establishment of its Export Processing Zone in 1970, Mauritius became a much more diversified economy.

B. Economic Structure: Resources and Manufacturing

Agriculture

Agriculture is still vital to Mauritius' economy. However, while agriculture (and forestry and fisheries) increased in GDP value from Rs. 1,224 million in 1979 to Rs. 1,415 million in 1983 (see Table V.1), its relative share of GDP declined from 18.7 per cent of total GDP to 13.2 per cent over the same period. Further, employment in this sector declined from nearly 60 per cent of the total workforce in 1976 to 52.4 per cent by 1983.

Mauritius produces a variety of food crops and livestock, but it is self-sufficient in only a few food products. Sugar has been and remains the most important commodity in Mauritius' agricultural sector. It accounts for

Table V.1 Gross domestic product by industrial origin, 1979-84
(Rs million/percentage shares)

	1979		1980		1981		1982		1983		1984
GDP (current prices)	5,879		7,191		7,890		9,245		10,429		11,200*
(factor cost)	6,540		7.389		8,765		10,050		10,650		n.a.
Agriculture, forestry/fishing	1,224	18.7	914	12.3	1,257	14.3	1,510	15.0	1,415	13.2	...
Sugar	953	14.5	598	8.0	899	10.1	1,140	11.3	1,010	9.4	...
Mining	12	.1	15	.2	16	.1	18	.1	19	.1	...
Manufacturing	972	14.6	1,127	15.2	1,377	15.7	1,620	16.1	1,735	16.2	...
Sugar	276	4.2	178	2.4	251	2.8	313	3.1	290	2.7	...
EPZ	223	3.4	321	4.3	421	4.8	470	4.6	520	5.8	...
Electricity, Gas	161	2.4	209	2.8	188	2.1	255	2.5	270	2.5	...
Construction	552	8.4	561	7.5	588	6.7	625	6.2	656	6.1	...
Wholesale/retail	779	11.9	1,050	14.2	1,219	13.9	1,290	12.8	1,410	13.2	...
Transportation	653	9.9	837	11.3	1,012	11.5	1,112	11.0	1,210	11.3	...
Financing & miscellaneous	1,045	15.9	1,309	17.7	1,517	17.3	1,775	17.6	1,945	18.2	...
Government services	793	12.1	952	12.8	1,104	12.5	1,280	12.7	1,375	12.9	...
Other community or government services	349	5.3	415	5.6	487	5.5	565	5.6	615	5.7	...

Source: International Monetary Fund, Mauritius: Recent Economic Developments, Washington, D.C., IMF, 1984, SM/84/213, p.4; and Central Statistical Office, Government of Mauritius, Bi-Annual Digest of Statistics, Rose Hill: CSO, 1984, p. 66.

* Data from IMF.

about 60 per cent of merchandise exports and sugar export duties account for some 15 per cent of government revenues. Over 45 per cent of the island's total land area (and over 90 per cent of Mauritius cultivated land) is used to grow sugarcane. The price of sugar has fluctuated sharply over the past decade, and currently the price is down substantially from the highs of 1974-75 and 1980. Production has declined somewhat since the late 1970s, from 6.3 million tons in 1979 to 5.2 million tons in 1983. The large sugar estates in Mauritius have begun an attempt at diversification into a number of areas, including aquaculture of marine species.

Fisheries

Fisheries play an important role in the economy,but their importance for food supply has declined since the mid 1970s. For example, in 1975 fish represented 54.5 per cent of total food production in Mauritius; by 1980 fish only represented 19.1 per cent of total food consumption. While fish consumption has decreased relative to other foods, Mauritius has had to increase its imports of fish as the nominal catch in Mauritius declined from 7,038 tons in 1975 to 5,344 tons in 1980 (see Table A-24).

While some 2,500 people claim to be regularly employed in the artisanal fish industry, probably less than 2,000 people are engaged in this work on a day-to-day basis. Of these, about 500 are members of cooperatives which have been formed by the Government to focus assistance efforts. For the past few years this sector has been marked by fluctuating and diseased stocks, unfavourable weather conditions, improper fishing practices, and increases in fuel, boat maintenance and gear and tackle costs.

Tourism

Since the mid 1970s tourism has steadily increased; from 1977 to 1985 the number of arrivals increased from 102,500 annually to 147,000 with only two years of small declines. Growth decreased in 1985, but earnings during that year were still some 35 per cent higher than in 1984. In absolute figures, Mauritius earnings from tourism have increased from Rs. 184 million in 1976 to an estimated Rs. 850 million in 1985 (see Table A-25).

Manufacturing

Manufacturing has become an important sector in the Mauritius economy, especially since the Government established the Export Processing Zone (EPZ) outside Port Louis in 1970. Manufacturing now accounts some 15 per cent of GDP (see Table V.1), as compared with less than 10 per cent in 1976. Manufacturing also accounts for nearly 20 per cent of employment in the formal sector and over 30 per cent of merchandise exports. Textiles account for about one third of manufacturing value added, with food and beverages accounting for perhaps one fifth. Waste from sugar production is used to generate electricity, but the sugar industry seems to offer relatively little short-term potential for a diversification of manufacturing activities.

Industries located in the Export Processing Zone include textiles, electronics, fish canning, eyeglasses, watches and cut diamonds. Textiles followed by electronics are the most important sub-industry, and the knitwear industry, practically non-existent in the early 1970s, now ranks among the leading producers in the world. Textiles are also by far the largest employer. The number of textile firms in the EPZ has also increased, from 42 firms in 1976 to 77 in 1984. Other firms, primarily in electronics, have increased, from 43 in 1976 to 77 today (see Table V.2). Ownership of firms is predominantly Mauritian, reflecting substantial investment from the sugar and trade sector.

In real terms, the EPZ grew at about 15 per cent annually during the 1970s, but growth declined to about 13 per cent in the early 1980s. In 1982, with the international recession and growing protectionism abroad, the real growth rate in the EPZ came to a virtual standstill. By 1983, value added rose again by 4 per cent, and EPZ exports grew during 1984 and 1985. Investment from the Middle East and Hong Kong during 1984 resulted in an additional 5,000 jobs. A new cotton spinning mill is to be set up in the EPZ, providing a hitherto unusual example of vertical integration in the EPZ. Investors in the EPZ find an attractive package of fiscal incentives: ten years total tax relief on corporate income, five year tax holiday on dividends tax rebates for foreign technicians, free repatriation of profits, as well as other guarantees.

Table V.2 Export processing zone activity, 1976 and 1980-84

	1976	1980	1981	1982	1983	1984
Number of firms:	85	101	107	115	146	153
Textiles	42	47	52	58	74	77
Other	43	54	55	57	74	77
Number of employees:	17,403	21,642	23,601	23,870	25,526	28,954
Textiles	12,392	17,226	20,281	20,155	21,055	23,896
Other	5,011	4,416	3,320	3,715	4,481	5,058

Source: International Monetary Fund, Mauritius: Recent Economic Developments, Washington, D.C., 1984, SM/84/213, p. 16.

C. Employment

The work force has increased from 52 per cent of the total population in 1962 to 56 per cent in 1972. Most people are employed in community and social services, which overtook employment in agriculture in 1977 (see Table A-26). Manufacturing is the third most important employment sector, with 36,900 people employed in 1983. Employment in textiles alone has increased from 17,403 in 1976 to 28,954 in 1984. Some 80 per cent of the workforce in the EPZ is female, which reflects the lower wages for women. Wages in transportation and communications and financing were the highest in the economy, followed by those for employees in wholesale and retail trade and in the social services sector. Those employed in agriculture, mining and manufacturing received the lowest wages.

While the number of those employed in Mauritius has increased, the numbers of registered unemployed has also risen (from 20,000 or 6.8 per cent of the labour force in 1977 to 61,000 or 17.2 per cent in 1983): population growth outpaces the growth of renumerated employment. Unemployment and under-employment remain a serious concern to the Government.

D. Recent Development Planning and Policies

Two medium-term development plans were implemented during the 1970s. They emphasized employment generation through export-oriented manufacturing and tourism. The first Plan was relatively successful, but the second became increasingly dependent on substantial external borrowing. An interim Three-Year Plan (1980-82) emphasized fiscal and balance of payments adjustment. A new Three-Year Plan is being completed with the goal of encouraging export-led growth as well as replacing food and energy imports by local production. Although the EPZ has been successful in terms of employment creation, future policies might stimulate the growth of the very low (and declining) local content share in EPZ manufactures.

The Government's expenditures have risen from Rs. 1,971 million in 1980 to Rs. 3,222 million in 1983. The largest expenditures (besides public debt and miscellaneous) are for education, public services, social security and health (see Table A-28).

E. Prospects for Better Utilization of Marine Resources

Mauritius has over 40,000 km^2 of fishing surface area in the Indian Ocean. This resource is underutilized, and while several surveys have been conducted, more are needed.[1/] Further, if Mauritius could increase its

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1/ See Ardill, J.D., "Country Statement on the Marine Fisheries in Mauritius", in Gulland, J.A. (ed.), Report of the FAO/IOPO Workshop on the Fishery Resources of the Western Indian Ocean South of the Equator. Mahe, Seychelles: Development Report, Indian Ocean Programme, PP. 54-62; and Ministry of Agriculture, Fisheries and Natural Resources and the School of Agriculture, University of Mauritius, Proceedings of a Seminar on Marine Fisheries Development in Mauritius, 1983. Mauritius recently established a National Sub-Committee on Fisheries in the Ministry of Agriculture, Fisheries and Natural Resources, and it has conducted preliminary surveys on the prospects for the marine sector.

total fish catches, there remains the problems of improved marketing.[1/] Further consideration could be given to regional cooperation in fisheries.[2/]

Seaweed is abundant in Mauritius, and algae can be used as a source of food, feed, drugs,[3/] and fertilizers. Mauritius has surveyed and inventoried some of its algae resources, but specific studies need to be conducted for seaweed cultivation. The country also disposes of a number of valuable mollusc species, including octopi, squid, oysters,[4/] giant clams and mussels which could be better utilized. Extracts from certain species have potential pharmacological applications. Further, mollusc shells can be ground and used for a variety of purposes, such as for animal feed and building materials. Other living marine resources with potential for development include sea urchins, marine shrimp, lobster, crab, turtle and shark. There has however been concern over the degradation of the lagoons which were a habitat of some of these species, and exploitation should therefore take the fragility of the natural resource base into account.[5/]

Mauritius has to import table salt, and recommendations have been made to increase local production. Experiments on salt have been carried out in

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1/ See for example FAO, Fisheries Development Project: Mauritius, Marketing Fisheries Products, Rome, FAO, FI:SE/AMR/50, 1975 or International Civil Aviation Organization, A Review of the Trade in Fish Transported by Air from Selected African Countries, UNDP/ICAO Project Number RAF.74/021.

2/ See FAO, Indian Ocean Fishery Commission: A Plan for Fishery Development in the Indian Ocean Region, Rome, FAO (IOFC/DEV/71/1), 1971.

3/ See especially UNIDO, Traditional Pharmacopeias Revisited: A Resume of the Goals and Philosphies Underlying UNIDO's Programmes in the Industrial Utilization of Medical and Aromatic Plants in Developing Countries, Vienna, UNIDO, UNIDO/IO.511, 1982.

4/ Currently only a few farmers are growing the local oyster (Crassostrea cuculata) because it takes long to reach marketable size. Other species are faster growing however, and could well be suitable for Mauritius.

5/ See Ministry of Agriculture, Fisheries and Natural Resources and the School of Agriculture, University of Mauritius, Proceedings of a Seminar on Marine Fisheries Development in Mauritius, 1983, p.3.

Mauritius.[1/] Further, Mauritius has a number of sand deposits which could be better exploited. Ile aux Fourneaux, e.g., apparently has a large sand quarry which is currently unexploited. Sand could be used in the small-scale glass industry.

The Export Processing Zone might also find ways to better utilize indigenous natural resources, rather than importing manufacturing inputs and gradually develop some linkages to the domestic productive sectors.[2/] For the longer term, it is possible that Mauritius could use the EPZ as a site to process some of the off-shore mineral resources such as polymetallic nodules which are abundant to the south of Mauritius, or to increase canning facilities for tuna and other living marine resources.

Organizations in Mauritus are supporting a broadly based regional effort to better manage and utilize resources in the area. A new group "IBIOM" (Issued-Based Indian Ocean Network), e.g. has been established to "... advance knowledge and action around the current and emerging geopolitical, developmental and environmental issues of the Indian Ocean", but it is too early to evaluate the efforts of this group yet.

Prospects for other marine-resource-based industries may be examined in the context of industrial opportunities outlined in chapter VII.

1/ See UNIDO, Report on Analysis and Other Experiments Conducted on Mauritius Salt, by C.L. Malhotra (MAR/72/002). Also see Mannar, M.G.V., Guidelines for the Establishment of Solar Salt Facilities from Seawater, Underground Brines and Salted Lakes, Vienna, UNIDO, UNIDO/IS.330, 1982.

2/ See UNIDO, Export Processing Zones in Developing Countries: UNIDO Survey Findings and Recent Developments, Vienna, UNIDO, 1982.

VI. SEYCHELLES

A. Socio-economic Trends

The Republic of Seychelles, located north of Madagascar, is an archipelago with about 400,000 square miles of ocean territory, and a total land area of only 404 km^2. The agricultural area is very limited and there are few proven natural resources. Except for artisanal fishing, coastal and marine resources have largely remained unexploited. About 95 per cent of the 65,000 Seychellois live on Mahe island, also the location of the capital, Victoria. The population has a growth rate of 2.7 per cent, and by the end of the century, the population is expected to exceed 80,000 persons.

Until quite recently, the vast majority of the population was very poor and there was a lack of alternative income opportunities. However, the country has changed in less than a generation from an essentially isolated, agriculture-based economy to a service-based economy. Per capita gross domestic product has increased dramatically: by 1983 Seychelles had a per capita GDP of nearly Seychelles Rupees (SR.) 7,000 ($1,870), compared to $514 a decade earlier (see Table A-30). This per capita GDP is the third highest in the region.

The shift in the economy was led by the quick growth of tourism after the construction of the international airport in 1971, some five years before independence. Major infrastructural facilities such as electricity, roads and water were built or extended throughout the main island of Mahe, as well as to many of the outlying, smaller islands. This expansion - with linkages throughout the economy - result in a sustained annual growth rate of about 10 per cent of real GDP in the early 1970s.

Since independence in 1976 real GDP growth was sustained until 1979. Real GDP suffered negative growth rates in the early 1980s.

B. Economic Structure: Resources and Manufacturing

Agriculture and Fisheries

Agriculture, once quite an important sector for Seychelles, now comprises only about 5 per cent of GDP. Agricultural production has not declined strongly; rather, production has remained fairly constant, though rising population and increased tourism have increased the demand for food. The major crops grown today include copra, cinnamon and tea, while cattle and pigs make up most of the livestock. Coconuts are primarily grown for the export of copra, although some by-products are used primarily in the domestic market. Copra exports grew steadily between 1971 and 1979, then declined, the 2,176 tons exported in 1982 being 37 per cent below the level of export reached in 1979. The future of copra production in Seychelles depends on the results of the current experiments with hybrid coconuts as well as the improvement of the world market price for copra.

Table VI.1 Gross domestic product by industrial origin, 1978-82 (current prices)
(Percent of total)

Sector	1978	1979	1980	1981	1982
Agriculture	5.2	4.6	3.8	3.7	2.7
Fishing	3.0	2.5	2.9	2.5	2.7
Forestry	.2	.1	.2	.2	.2
Mining	.2	.1	.1	0	0
Manufacturing	4.8	4.8	6.3	7.7	7.8
Handicrafts	1.3	1.3	1.1	1.1	8.1
Construction	6.7	8.4	8.0	7.5	5.7
Transport, communications	30.7	29.2	30.8	28.0	34.1
Hotels/restaurants	10.3	10.9	8.6	7.3	5.9
Finance	12.1	11.8	11.7	11.9	12.5
Government services	13.9	14.2	15.1	17.7	19.0
Import duties	10.0	10.8	11.2	11.8	13.3

Source: Government of Seychelles, Statistical Abstract 1983, p. 56.

With only about 80 square miles of suitable agricultural land, much of it taken up by coconuts, agricultural production has not been able to meet domestic (including tourist) demand. A shift in the pattern of food consumption away from traditional products has added to the problems, and food

imports increased by 372 per cent between 1972 and 1980. The Government has recognized the need for crop diversification, and has recently completed a number of programmes (including "The Year of Agriculture" in 1982) to try to increase food production and limit the levels of food imports, particularly for the tourist sector.

Fisheries play an important role, being the nation's second highest earner of foreign exchange and the most important source of protein. Fishing is the traditional occupation of about 1,000 households which engage in artisanal fishing (either full or part-time), usually along the shallow coastal waters above banks on the continental shelf, which range from 10 to over 200 km from Mahe, the major island. Fishing is partly done by modern boats and in the artisanal sector outboard engines are commonly used.

Although fish landings have declined in recent years, fish output has exceeded local demand, creating a viable export industry. Air transport and cold storage facilities have enhanced exports to Europe and to neighbouring states such as Reunion and Mauritius. Export earnings from fish increased from SR. 3.2 million in 1977 to SR. 9.5 million in 1983. Additionally, fish exports as a percentage of domestic exports increased from 13 per cent of all exports in 1977 to 37.5 per cent by 1983 (see Table A-31). With the establishment of the 200 mile Exclusive Economic Zone beyond the 12 miles of territoral waters, the potential for increased fish output (and export) is good.

The Government has established the Seychelles Fishing Authority (formerly the Fisheries Development Company) to help develop the sector and thus to strengthen the economy. Until the local industry develops to the stage of fully exploiting its fishery potential, the Government has decided to license foreign vessels to fish in its territorial waters for specified fees. Thus far, fishing agreements have been signed with the EEC, Spain, Côte d'Ivoire and the Republic of Korea.

Minerals

Currently, guano production is the only mining activity in Seychelles, although there is a potential for offshore oil and production of building

materials.[1/] Mining was neglected in the 1970s, as tourism increased in importance, and guano production declined dramatically into the 1980s, with production levels falling by 40 per cent in 1980 and 68 per cent in 1981.[2/]

Offshore oil exploration began in 1977 when concessions covering 32,000 km^2 were awarded to three groups of oil companies. Exploratory drilling was conducted by Amoco during 1980-81 in an area 125 km west of Mahe. While there have been no finds, exploration efforts have confirmed the existence of favourable conditions for hydrocarbon deposits. Thus far such searches have been limited to the shallower continental shelf area, which represents only some 5 per cent of the EEZ. Additional drilling in deeper water will be necessary. New exploration data are now being evaluated. Because of the high costs involved, Amoco may have to decide during 1986 whether to continue its efforts.

Seychelles thus continues to be dependent on imported petroleum. Despite declines in tourism and the reduction in the use of petroleum, costs of imported oil remained at SR. 129 million in 1982, which was some SR. 44 million higher than merchandise exports during the year.

Tourism

The Seychelles' economy is now led by the tourist service sector (including land transportation, air transport, tour operations, hotels and restaurants) which comprised nearly 40 per cent of GDP in the 1978-82 period. The IMF estimates that by 1980, besides the significant employment and income produced by tourism (or tourist-related sectors of the economy), tourism

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1/ See, e.g., Cotter, William, Seychelles: The Potential for Development of a Granite Quarrying and Processing Operation (Terminal Report), Vienna, UNIDO/DP/ID/SER.B/427/Corr.1. With regard to increased use of sand for construction, caution must be exercised so that coastal erosion is not precipitated, and that the stability of smaller islands is not threatened. This industry could proceed, but it must do so cautiously, and with full impact evaluations conducted.

2/ IMF, Seychelles - Recent Economic Developments, Washington, D.C., SM/83/176, 1983, p. 13.

provided 25 per cent of government revenue and the foreign exchange provided by tourists represented nearly 50 per cent of all receipts of goods and services.[1/]

Due to perceived political instability in the Seychelles, combined with significant price increases in oil (and thus in air fare), the world recession, the revaluation of the Rupee in 1981, high costs, and distance from major points of departures, the number of tourists declined in the early 1980s (see Table A-32). In recent years, the number of tourists has grown again without, however, reaching the levels of the late 1970s.

Manufacturing

Seychelles' industrial development has been limited by a number of factors, including the small size of the domestic market, limited factor endowment, lack of trained manpower and high labour costs.

Manufacturing produced only 6.4 per cent of GDP in 1982, and employed about 9 per cent of the formal sector, or 1,300 persons. The sector consists of over 50 small enterprises, mostly engaged in the processing of local agricultural products for export (such as copra and cinnamon), or in import substitution. There is also a small handicraft sector, oriented primarily toward the tourist market. The major activites include a brewery, a cigarette factory, a plastic factory, tailoring, boat building, furniture making, soft drink bottling and food canning. Table VI.2 gives the production volumes of major items during 1983 and 1984.

C. Employment

In 1983 there were 17,500 pople engaged in formal or wage economy employment (see Table A-33). In 1983 there were over 6,000 people registered as unemployed, mostly from the service and transport sectors. Unemployment

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1/ See International Monetary Fund, Seychelles - Recent Economic Development, Washington, D.C., IMF, August 1983, SM/83/176, p. 64.

Table VI.2 Major industrial products, 1983 and 1984

	1983	1984	Unit
Soft drinks	33,700	32,000	hectolitres
Beer	38,720	38,000	hectolitres
Cigarettes	51,600	64,900	thousands

Source: Information Department, Ministry of Education and Information.

remains a serious and growing problem. The Government has launched a number of programmes which it hopes will increase employment opportunities. The public and parastatal sector continue to employ almost twice as many people as the private sector (in 1983 some 11,600 people were employed in these two sectors, compared to 5,900 in the private sector). The public sector's wages are somewhat better than either those of the parastatal or the private sector.

D. Recent Development Planning and Policies

Development planning began in 1947. The most recent National Development Plan will cover five years (1985-89) and has the following main objectives:

- creating employment;
- improving balance of payments;
- re-establishing economic growth; and
- increasing exports.

The new Plan will focus on four major areas: housing, agriculture, tourism and light industry. An overview of expenditure is given in Table A-36. Among others, a major port extension project (SR. 67 million) has been planned.

Government expenditure has increased steadily over the past five years, from SR. 327 million in 1979 to SR. 434 million in 1983 (see Table A-35). Reflecting generally increased demand from the population, the Government increased the social services sector (which includes education, health,

labour, youth development and the National Youth Service) from SR. 59 million in 1979 to SR. 163 million in 1983. Social services now surpasses the General Administration sector as the largest item of government expenditure. The Government's total expenditure and net lending equalled SR. 522 million in 1983, against total receipts of SR. 424 million. The SR. 98 million deficit was met by SR. 60 million in domestic financing, and SR. 38 million in foreign borrowing.

E. Prospects for Better Utilization of Marine Resources

The Seychelles' Government is concerned that its one million km^2 of ocean and seabed be better exploited. It believes that the focus must initially be on the identification of hydro-carbon potentials and the development of a fishery industry, based on exploiting tuna stocks and processing various forms of pelagic and other species.[1/] Further, the focus might be expanded to include the industrial (pharmaceutical, food processing, etc.) potential of other marine resources, such as seaweeds, plants, salt, lime deposits and manganese nodules on the sea floor.[2/]

The Fishery Management and Development Strategy includes the following major objectives:

- develop Port Victoria into the primary tuna port of the Western Indian Ocean;
- develop a national fishing capability on an industrial scale;
- exploit potentials for fish processing for export;
- safeguard and strengthen artisanal fishing;

1/ See FAO, Indian Ocean Fishery Commission: A Plan for Fishery Development in the Indian Ocean Region, Rome, FI:SF/AMR/5, 1971.

2/ See UNIDO, Traditional Pharmacopoeias Revisited: A Resume of the Goas and Philosophies Underlying UNIDO's Programmes in the Industrial utilization of Medical and Aromatic Plants in Developing Countries, Vienna, 1982, UNIDO/IO. 511, and Report on Analysis and Other Experiments Conducted on Mauritius Salt, by C.L. Malhotra (MAR/72/002) and Mannar, MGV, Guidelines for the Establishment of Solar Salt Facilities from Seawater, Underground Brines and Salted Lakes, Vienna, UNIDO/IS. 330.

- sustain the exploitation of all fishery resources; and
- exploit the potential contribution of mariculture both as a means for satisfying local needs and for earning foreign exchange.[1/]

Perhaps the most significant hindrance to such utilization is the lack of information about such resources. The Government has instructed the Technology for Development Division of the Ministry of National Development to carry out detailed studies over the next five years to gain a better understanding of what its natural resource potential really is. However, such studies would benefit from being carried out in cooperation with other investigations planned or underway in the region.

There is also the need to improve ship repairing facilities in Seychelles, and this includes a range of activities, such as training repairmen, improving machinery and new maintenance equipment.[2/] Additionally, the Government has launched an ambitious port development programme and a "marine transport" project[3/], whose major objectives are to:

- provide adequate facilities for and services to international shipping;
- provide inter-island cargo and passenger services;
- control the movement of vessels within Port Victoria and the harbours of Seychelles.

One of the most promising projects (with significant employment generating possibilities) could be the development of craft industries using more

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1/ Republic of Seychelles, National Development Plan 1985-1989, p. 83.

2/ See Tarachi, B.J., Seychelles: Establishment and Operation of a Boatyard and Boat Maintenance Complex, Vienna, O-UNIDO/IO/R.56, 1983 and Mazarkiewics, B. K., Seychelles: Establishment of a new Boatyard, Boat Maintenance Complex on the Island of Praslin, Technical Report, Vienna, UNIDO-IDO/IO/R.47, 1983.

3/ Republic of Seychelles, National Development Plan 1985-89, pp. 142-148. There is fear that the port development project was done without proper impact analysis, and that the results of the expansion could cause a decline in fishery grounds due to increased siltation.

local marine resources.[1/] According to the Seychelles Govenment, tourists spend on average SR. 23 per day on handicrafts, and about two-thirds of all craft products sold in Seychelles are presently imported, mostly from East Asia. This industry could be promoted by increased training and education, especially focusing on young people. The Government has recommended the establishment of a National Design Center for designing and adapting craft products with strong local components such as shells, pearl, turtle shells and coconut shells, and semi-precious marine resources such as coral, quartz and crystal which can be found in the granitic islands.[2/] The Government has also created a Handicraft Co-ordination Committee to oversee the development of the crafts industry, and co-operatives are being organized for craftsmen. Further, the Government has requested technical assistance for the development of mother of pearl plant and a tuna fish canning industry, the latter to be financed by the Caisse Centrale de Coopération Economique (CCCE).

Further prospects for marine-resource-based industries may be examined in the context of industrial opportunities outlined in chapter VII.

1/ See Guentner, F., Seychelles: The Processing of Shells and Other Naturally Renewable Raw Materials into Buttons and Jewellery, Vienna, UNIDO-DP/ID/SER.A/487, 1983.

2/ Use of such protected species as turtle shells would require exemption from or amendments to certain international conservation conventions. Nevertheless, such threatened species could be harvested without undue danger if strict conservation and management legislation was passed and enforced.

VII. INTERNATIONAL CO-OPERATION FOR THE ENHANCED UTILIZATION OF MARINE RESOURCES FOR INDUSTRIAL DEVELOPMENT

A. Industrial Opportunities Stemming from Marine Resources

The sea represents a reservoir of mineral, vegetal, biological and thermal resources that could be tapped for industrial use. For the island States which are generally at a disadvantage in terms of land-based resources, fishing, transport, offshore oil, gas and minerals constitute a large potential for industrial development. To enhance the utilization of marine resources for industrial development, specific marine resource development projects could be initiated in key areas. National or regional workshops, involving international, government and private organizations, could be held on the following subjects to explore the opportunities, identify pertinent projects and to lay the pathway for international co-operation:

- exploiting the potential for mariculture/aquaculture development;
- improving commercial seafood processing and distribution;
- promoting fishery gear/technology improvement and development;
- strengthening cooperatives for boat building/repair facilities;
- promoting the processing of salt based on seawater reservoirs;
- introducing industrial uses of marine plants for food, pharmaceutical and chemical production;
- promoting utilization of fish skin (particularly shark, eel and salmon) for leather industry development[1/] as a by-product of fish processing;
- promoting cottage industry production using local materials (such as shell buttons, jewellery, pearls, ornamental uses, etc.);
- enhancing coral reef exploitation, management and environmental protection for construction industries (sand, gravel, limestone);
- developing techniques for surveying and assessing marine resources in EEZs; and
- developing alternative ocean-based energy sources.

1/ See UNIDO (1976) Republique du Cap-Vert; Utilization des Produits Dérivant du Requin et Note pour l'Industrie de la Tannerie (UNIDO/IO.39).

These workshops could be followed up by multilateral and bilateral technical assistance and investment co-operation at the national and regional levels.

The exploration and exploitation of ocean resources depend upon marine technology. The island States would need to strengthen their scientific and technological base in marine science to take advantage of the rich potential that the ocean offers for their industrial development process.

B. Manufacturing Implications of Marine Biotechnology[1/]

Genetic engineering of marine and estuarine animals and plants for food production, marine pharmaceuticals and marine specialty chemicals seem to offer prospects for both immediate and long-term rewards in the sphere of marine-resource-based industrial development. The island States could explore the potentialities of marine biotechnology unique to each country.

Aquaculture

Successful aquaculture of many species of invertebrate animals has been achieved with the aid of new techniques in genetic engineering. Application of genetic engineering and modern biotechnology has stimulated the proliferation of marine living sources that could be efficiently used by the manufacturing sector.

Seaweeds

Seaweeds are far more economically important than generally realized. They are used as human and animal food, in medicine and agriculture, and as a source of raw materials for many industries. The Porphyra, or nori, industry in Japan alone is estimated to involve over 60,000 hectares in cultivation area and to be worth more than $730 million annually. In fact, Porphyra is the most important mariculture crop in Japan at the present time.

1/ For a review of marine biotechnology and an assessment of promising product areas, see UNIDO, Marine Biotechnology and the Developing Countries, IS.593, 1986.

In the western hemisphere, seaweeds are principally utilized as a source of phycocolloids, which include agar, carrageenan and alginate. These three phycocolloids have a combined current world market value in excess of $250 million annually.

Marine pharmaceuticals

One of the examples of marine biotechnological applications is in marine pharmaceuticals. Many marine pharmaceuticals have proven to be anti-bacterial, anti-fungal and anti-viral. In many cases, biological activities have been confirmed in more extensive assays employing tumour cells, pathogenic microorganisms and viruses. A variety of compounds from the sea acts on the cardiovascular and central nervous systems. Marine animals and plants have yielded cardiovascular-active substances including histamine and N-methylated histamines of sponges. Several marine organisms provide useful drugs; liver oil from some fish provides excellent sources of vitamins A and D. Insulin extracted from whales and tuna fish and the red alga are used as an antihelmintic.

Marine toxins

A toxin has the potential of being applied as a drug or pharmacological reagent. The toxin can serve as a model for synthesis or improvement of other drugs. Tetrodotoxin is a valuable pharmacolcgical reagent because it specifically inhibits the sodium permeability of nerve membranes.

Industrial chemicals

Carregeenan is a major product from the red seaweeds and is widely used as an extender in foods and related products, ranging from evaporated milk to toothpaste. Significant economic values could stem from possible market opportunities.

Technical assistance provided by international organizations and agencies could be geared towards establishing laboratory facilities, with modern microbiology, biochemistry and engineering techniques that are required to achieve the above-mentioned manufacturing implications of mari.

biotechnology. Technical assistance could also be in the form of advisory services to island countries that may wish to draft national programmes in marine biotechnology in pursuit of fostering marine-resource-based industrialization.

Annex A. Summary of the Main Points of the United Nations Convention on the Law of the Sea (UNCLOS III)

UNCLOS III distinguishes four major sea areas: 1) the contiguous zone; 2) the continental shelf; 3) the exclusive economic zone; and 4) the international seabed area and authority.[1/]

The contiguous zone: States may claim 24 nautical miles from their coast as their "contiguous zone" now, an extension of the 12 nautical mile limit under the previous, 1958 accords. Within this zone, a country has full enforcement authority.

The continental shelf: States have the exclusive sovereign rights to explore and exploit the natural resources of the seabed and subsoil of the continental shelf. In case the continental shelf extends more than 200 miles beyond a State's territorial waters, an upper limit of 350 miles applies.

The exclusive economic zone: An area extending 200 miles beyond the territory waters constitutes the exclusive economic zone (EEZ). Within the EEZ, there are activities which may be enjoyed by all countries but the coastal State has exlusive rights:

> "... for the purpose of exploring, exploiting, conserving, and managing the living and non-living natural resources of both the waters and the seabed and subsoil;
> "... to control other activities for the exploitation and exploration of the zone, such as production of energy from the water, currents and winds;
> " to control the construction and use of all artificial islands and insulations and structures that are used for economic purposes ...
> "... to be informed or participate in proposed marine science research projects, and to withhold consent for a project ...

1/ For a review of the history of the UNCLOS III, see Oxamn, B.H. et al, Law of the Sea: US Policy Dilemma, San Francisco, Institute for Contemporary Studies, 1984. The summary of the four major areas described here are principally from that volume, pp. 147-172.

"... to control dumping of wastes ...
"... to board, inspect, and when there is a threat of major damage, arrest a merchant ship suspected of discharging pollution in the zone ..."[1/]

The following rights within the zone may be enjoyed by all states:

"...freedom of navigation, overflight, and the laying of submarine cables and pipelines;
"other internationally lawful uses of the sea related to these freedoms, such as those associated with the operation of ships, aircraft, and submarine cables and pipalines."

Additionally, the coastal state is charged with conserving the living resources within its EEZ, and also with promoting the optimum utilization by determining harvest limits and by allowing access to foreign vessels to fish for any surpluses which may from time to time exist.

The international seabed area and authority: Beyond the EEZs lies the "international seabed area" which has been declared the "common heritage of mankind". This area, the "open seas", can be explored by any state, but mining will require a contract from the International Seabed Authority. The Authority would be an international organization with an Assembly from all participating countries, a Council of limited membership and a Secretariat. It is, however, not clear how deepsea mining under international supervision will actually take place in the future, as several countries have declined to sign the Treaty.

1/ Oxman, B.H., "Summary of the Law of the Sea Convention", pp. 152-157 in Oxman, B.H. et al, Law of the Sea: US Policy Dilemma, San Francisco, Institute for Contemporary Studies, 1984.

Annex B: Statistical Annex Tables

Table A-1. Comoros: Production of fish, beef and dairy products, 1980-84
(Metric tons)

	1980	1981	1982	1983	1984
Meat and fish					
Beef	505	666	880	1,164	1,170
Sheep & goats	74	87	102	120	130
Poultry	30	49	79	129	140
Fresh fish	4,010	4,151	4,300	4,450	4,450
Other					
Milk ('000 litres)	637	637	637	637	637
Eggs ('000)	730	1,230	1,730	2,329	2,500

Source: IMF, Comoros: Recent Economic Developments, Washington, D.C.: IMF (SM/85/46), 1985, p.64.

Table A-2. Comoros: Employment, 1980

Sector	Number Employed	Per cent of Total
All sectors	12,747	100
Public	6,985	54.8
Private	5,762	45.2
Agriculture	1,349	10.6
Industry	685	5.4
Utilities	206	1.6
Construction	3,579	28.1
Wholesale/retail trade	1,210	9.5
Transport	975	7.6
Banking/insurance	146	1.1
Public services	4,597	36.1

Source: UNIDO, Federal and Islamic Republic of the Comoros: Survey of Selected Economic Sectors, World Bank/UNIDO Co-Operative Programme, UNIDO/IO.520, 1982, p.72.

Table A-3. Comoros: Balance of payments, 1980-84
(Cf millions)

	1980	1981	1982	1983	1984
Balance of goods and services	-7,850	-8,811	-9,143	-11,050	-16,216
Exports (fob)	2,364	4,461	6,435	7,419	7,053
Imports (fob)	-4,301	-6,154	-7,507	-9,274	-11,657
Trade balance	-1,937	-1,693	-1,072	-1,855	-4,604
Services	-5,913	-9,118	-8,071	-9,195	-11,612
Unrequited price transfers (net)	-400	130	-790	-822	-1,060
Current account balance =A=	-8,250	-8,681	-9,933	-11,872	-17,276
Unrequited public transfers (net)	5,403	6,465	6,332	7,662	7,731
Current account balance =B=	-2,847	-2,216	-3,601	-4,210	-9,545

Source: IMF, Comoros: Recent Economic Developments, Washington, D.C., SM/85/46, 1985, p.72.

Table A-4. Comoros: Government expenditure, 1979-81
(Cf millions and percent of total)

	1979		1980		1981	
Administrative	890.8	(25%)	991.7	(20%)	1,030.8	(17%)
Finance	503.7	(14%)	598.7	(11%)	537.4	(8%)
Foreign affairs	88.7	(2%)	167.7	(3%)	169.2	(3%)
Public works	304.6	(8%)	611.0	(11%)	545.1	(9%)
Agriculture & industry	39.5	(2%)	88.7	(2%)	93.0	(2%)
Defense	386.8	(11%)	156.9	(3%)	426.8	(7%)
Transport & tourism	118.4	(3%)	156.9	(3%)	426.8	(7%)
Health & education	1,222.6	(34%)	1,898.5	(35%)	2,349.1	(37%)
Unclassified	78.3	(2%)	193.2	(4%)	433.9	(7%)

Source: World Bank, The Comoros: Current Economic Situation and Prospects, Washington, D.C.: IBRD, 1983, p.79.

Table A-5. Comoros: Credits awarded by CREDICOM[a/]

	Number of credits	Value (Cf millions)
Agriculture	10	37
Fisheries & maritime transport	19	[illegible]
Hotels	4	78
Trade, air transport	8	287
Industry, artisans	39	226
Housing	218	226
Building materials	586	154
Purchase of automobiles	153	75
Purchase of equipment	39	9
Total	1,076	1,100

Source: UNIDO, Federal and Islamic Republic of the Comoros: Survey of Selected Economic Sectors, World Bank/UNIDO Co-Operative Programme, UNIDO/IO.520, 1982, p.39.

a/ CREDICOM: Société de Crédit pour le Développement des Comoros.

Table A-6. Comoros: Currency exchange rates, 1968-84 (selected years)
Comorian Franc (CF)
Fiscal year: January 1 - December 31

	Annual averages	
	$1 = CF	SDR 1 = CF
1968	246.85	
1970	277.70	
1975	214.32	
1976	238.98	
1977	245.76	
1978	225.64	282.50
1979	212.72	274.83
1980	211.30	275.01
1981	271.73	320.41
1982	328.62	362.80
1983	381.07	407.36
1984	470.86	487.62
1986 (May)	349	

Table A-7. Madagascar: Disposition of domestic fish catch, 1980-83
('000 metric tons)

Year	Total	Fresh	Freezing	Curing	Canning	Reduction	Other uses
1980	48.1	37.6	3.5	7.0			
1981	48.5	37.5	4.0	7.0	-	-	-
1982	48.0	37.0	4.0	7.0	-	-	-
1983	54.5	43.5	4.0	7.0	-	-	-

Source: FAO data base.

Table A-8. Madagascar: Salt water fishing - marketed catch, [a/] 1978-84
(metric tons)

Item	1978	1979	1980	1981	1982	1983	1984
Fish	4,892	4,219	5,450	6,600	8,000	8,859	9,150
Shrimps	5,332	6,100	6,500	5,075	5,261	5,503	5,873
Crabs	674	780	830	480	520	490	490
Lobsters	66	83	78	76	72	80	75
Other [b/]	369	108	150	170	177	180	185

Source: Ministère du Développement et de la Réforme Agraire; quoted from World Bank: The Democratic Republic of Madagascar, Country Economic Memorandum, March 18, 1986.

a/ Fresh, frozen, dried, salted, smoked.
b/ Oysters, mussels, octopi, turtles, etc.

Table A-9. Growth of value added, by branch of manufacturing, 1963-85
(at constant 1980 US dollars)

	Manufacturing		Food manufacturing			Beverages			Tobacco manufactures			Textiles		
	1980-U.S. dollars million	growth rate %	1980-U.S. dollars million	growth rate %	share %	1980-U.S. dollars million	growth rate %	share %	1980-U.S. dollars million	growth rate %	share %	1980-U.S. dollars million	growth rate %	share %
1960	115.07#		46.240n		40.2	0.954n		0.8	1.7480n		1.5	8.30n		7.2
1961	119.99#	4.3	46.818n	1.2	39.0	1.272n	33.3	1.1	2.1260n	21.7	1.8	10.37n	25.0	8.6
1962	128.02#	6.7	46.240n	-1.2	36.1	1.908n	50.0	1.5	1.9000n	-10.7	1.5	15.56n	50.0	12.2
1963	151.70#	18.5	60.690n	31.2	40.0	2.544n	33.3	1.7	2.2800n	20.0	1.5	18.67n	20.0	12.3
1964	128.81#	-15.1	39.882n	-34.3	31.0	3.498n	37.5	2.7	2.7360n	20.0	2.1	19.70n	5.6	15.3
1965	150.27#	16.7	42.194n	5.8	28.1	3.498n	0.0	2.3	2.9640n	8.3	2.0	30.07n	52.6	20.0
1966	185.98#	23.8	58.378n	38.4	31.4	5.088n	45.5	2.7	2.8880n	-2.6	1.6	34.22n	13.8	18.4
1967	214.45#	15.3	50.864n	-12.9	23.7	5.406n	6.2	2.5	3.0400n	5.3	1.4	44.59n	30.3	20.8
1968	248.90#	16.1	52.598n	3.4	21.1	6.678n	23.5	2.7	3.0400n	0.0	1.2	43.55n	-2.3	17.5
1969	247.86#	-0.4	52.598n	0.0	21.2	950n	19.0	3.2	3.3440n	10.0	1.3	43.55n	0.0	17.6
1970	297.96#	20.2	53.754n	2.2	18.0	9.222n	16.0	3.1	3.6480n	9.1	1.2	65.33n	50.0	21.9
1971	322.18#	8.1	49.130n	-8.6	15.2	11.130n	20.7	3.5	3.6480n	0.0	1.1	79.85n	22.2	24.8
1972	326.09#	1.2	54.910n	11.8	16.8	12.084n	8.6	3.7	4.1800n	14.6	1.3	87.11n	9.1	26.7
1973	337.75#	3.6	53.176n	-3.2	15.7	13.674n	13.2	4.0	5.0920n	21.8	1.5	87.11n	0.0	25.8
1974	371.80#	10.1	60.690n	14.1	16.3	18.126n	32.6	4.9	4.9400n	-3.0	1.3	105.77n	21.4	28.4
1975	358.41#	-3.6	60.690n	0.0	16.9	21.306n	17.5	5.9	4.7880n	-3.1	1.3	99.55n	-5.9	27.8
1976	342.70#	-4.4	57.222n	-5.7	16.7	23.532n	10.4	6.9	5.4720n	14.3	1.6	102.66n	3.1	30.0
1977	369.42#	7.8	69.360n	21.2	18.8	27.348n	16.2	7.4	6.9160n	26.4	1.9	102.66n	0.0	27.8
1978	359.77#	-2.6	61.268n	-11.7	17.0	25.758n	-5.8	7.2	7.6000n	9.9	2.1	102.66n	0.0	28.5
1979	366.32#	1.8	58.378n	-4.7	15.9	28.302n	9.9	7.7	7.7520n	2.0	2.1	108.86n	6.1	29.7
1980	361.80#	-1.2	57.800n	-1.0	16.0	31.800n	12.4	8.8	7.6000n	-2.0	2.1	103.70n	-4.8	28.7
1981	320.25#	-11.5	56.066n	-3.0	17.5	20.988n	-34.0	6.6	7.1440n	-6.0	2.2	101.63n	-2.0	31.7
1982	291.78#	-8.9	43.928n	-21.6	15.1	13.038n	-37.9	4.5	7.9040n	10.6	2.7	94.37n	-7.1	32.3
1983	297.52#	2.0	50.864n	15.8	17.1	23.532n	80.5	7.9	6.8400n	-13.5	2.3	92.42#	-2.1	31.1
1984	322.50#	8.4	51.664#	1.6	16.0	25.582#	8.7	7.9	7.2094#	5.4	2.2	102.80#	11.2	31.9
1985	330.51#	2.5	47.318#	-8.4	14.3	27.414#	7.2	8.3	7.4471#	3.3	2.3	110.56#	7.5	33.5
1986	343.39#	3.9	47.237#	-0.2	13.8	29.144#	6.3	8.5	7.5785#	1.8	2.2	117.53#	6.3	34.2
1987	355.12#	3.4	46.642#	-1.3	13.1	31.320#	7.5	8.8	7.7750#	2.6	2.2	125.16#	6.5	35.2

Table A-9 (continued)

	Wearing apparel			Leather and fur product			Footwear			Wood and cork products			Furniture and fixtures		
	1980 U.S. dollars million	growth rate %	share %	1980 U.S. dollars million	growth rate %	share %	1980 U.S. dollars million	growth rate %	share %	1980 U.S. dollars million	growth rate %	share %	1980 U.S. dollars million	growth rate %	share %
1960	9.105#		7.9	0.0287#		0.0	2.813#		2.4	3.1620n		2.7	0.6820n		0.6
1961	9.431#	3.6	7.9	0.0316#	10.4	0.0	2.935#	4.3	2.4	3.0090n	-4.8	2.5	0.6490n	-4.8	0.5
1962	10.031#	6.4	7.8	0.0355#	12.1	0.0	3.138#	6.9	2.5	4.0290n	33.9	3.1	0.8690n	33.9	0.7
1963	11.221#	11.9	7.4	0.0418#	18.0	0.0	3.494#	11.3	2.3	3.1110n	-22.8	2.1	0.6710n	-22.8	0.4
1964	10.216#	-9.0	7.9	0.0481#	15.0	0.0	3.152#	-9.8	2.4	3.1620n	1.6	2.5	0.6820n	1.6	0.5
1965	11.497#	12.5	7.7	0.0614#	27.6	0.0	3.489#	10.7	2.3	3.7230n	17.7	2.5	0.8030n	17.7	0.5
1966	13.971#	21.5	7.5	0.0942#	53.4	0.1	4.060#	16.4	2.2	5.1510n	38.4	2.8	1.1110n	38.4	0.6
1967	15.624n	11.8	7.3	0.10801	14.7	0.1	4.469n	10.1	2.1	5.8650n	13.9	2.7	1.2650n	13.9	0.6
1968	21.049n	34.7	8.5	0.14401	33.3	0.1	6.649n	48.8	2.7	6.0690n	3.5	2.4	1.3090n	3.5	0.5
1969	14.973n	-28.9	6.0	0.46801	225.0	0.2	6.649n	0.0	2.7	6.2730n	3.4	2.5	1.3530n	3.4	0.5
1970	18.6621	24.6	6.3	0.46801	0.0	0.2	7.957n	19.7	2.7	6.8850n	9.8	2.3	1.48501	9.8	0.5
1971	15.4071	-17.4	4.8	0.48601	3.8	0.2	9.483n	19.2	2.9	9.0780n	31.9	2.8	1.95801	31.9	0.6
1972	20.8321	35.2	6.4	1.02601	111.1	0.3	9.592n	1.1	2.9	5.9160n	-34.8	1.8	1.27601	-34.8	0.4
1973	20.6151	-1.0	6.1	1.24201	21.1	0.4	8.938n	-6.8	2.6	4.9470n	-16.4	1.5	1.06701	-16.4	0.3
1974	21.4831	4.2	5.8	1.58401	27.5	0.4	9.483n	6.1	2.6	4.5390n	-8.2	1.2	0.97901	-8.2	0.3
1975	22.3511	4.0	6.2	1.13401	-28.4	0.3	8.066n	-14.9	2.3	3.7230n	-18.0	1.0	0.80301	-18.0	0.2
1976	20.8321	-6.8	6.1	1.17001	3.2	0.3	8.284n	2.7	2.4	3.8760n	4.1	1.1	0.83601	4.1	0.2
1977	21.0491	1.0	5.7	1.42201	21.5	0.4	7.957n	-3.9	2.2	5.3040n	36.8	1.4	1.14401	36.8	0.3
1978	21.2661	1.0	5.9	1.60201	12.7	0.4	9.374n	17.8	2.6	5.3550n	1.0	1.5	1.15501	1.0	0.3
1979	21.9171	3.1	6.0	1.81801	13.5	0.5	11.445n	22.1	3.1	5.1000n	-4.8	1.4	1.10001	-4.8	0.3
1980	21.700<	-1.0	6.0	1.8000<	-1.0	0.5	10.900n	-4.8	3.0	5.1000n	0.0	1.4	1.1000n	0.0	0.3
1981	20.007#	-7.8	6.2	1.7229#	-4.3	0.5	9.810n	-10.0	3.1	5.1000n	0.0	1.6	1.1000n	0.0	0.3
1982	18.409#	-8.0	6.3	1.5924#	-7.6	0.5	7.194n	-26.7	2.5	6.2220n	22.0	2.1	1.3420n	22.0	0.5
1983	18.014#	-2.1	6.1	1.5421#	-3.2	0.5	7.159#	-0.5	2.4	6.1477#	-1.2	2.1	1.3260#	-1.2	0.4
1984	19.893#	9.3	6.1	1.7226#	11.7	0.5	7.842#	9.5	2.4	6.8214#	11.0	2.1	1.4713#	11.0	0.5
1985	20.241#	2.8	6.1	1.8696#	8.5	0.6	8.339#	6.3	2.5	7.1031#	4.1	2.1	1.5320#	4.1	0.5
1986	20.283#	0.2	5.9	2.0095#	7.5	0.6	8.640#	3.6	2.5	7.2912#	2.6	2.1	1.5726#	2.5	0.5
1987	20.712#	2.1	5.8	2.1828#	8.6	0.6	9.094#	5.3	2.6	7.5419#	3.4	2.1	1.6267#	3.4	0.5

Table A-9 (continued)

	Paper and paper product			Printing and publishing			Industrial chemicals			Other chemical products			Petroleum refineries		
	1980-U.S. dollars million	growth rate %	share %	1980-U.S. dollars million	growth rate %	share %	1980-U.S. dollars million	growth rate %	share	1980-U.S. dollars million	growth rate %	share %	1980-U.S. dollars million	growth rate %	share %
1960	1.553#		1.3	6.347#		5.5	0.3190n		0.3	4.230n		3.7	0.000n		0.0
1961	1.697#	9.2	1.4	6.605#	4.1	5.5	0.3190n	0.0	0.3	4.230n	0.0	3.5	0.000n		0.0
1962	1.892#	11.5	1.5	7.051#	6.7	5.5	0.2320n	-27.3	0.2	3.290n	-22.2	2.6	0.000n		0.0
1963	2.330#	23.1	1.5	7.893#	11.9	5.2	0.1740n	-25.0	0.1	2.350n	-28.6	1.5	0.000n		0.0
1964	2.616n	12.3	2.0	7.216#	-8.6	5.6	0.2030n	16.7	0.2	2.585n	10.0	2.0	0.000n		0.0
1965	3.488n	33.3	2.3	8.137#	12.8	5.4	0.2900n	42.9	0.2	3.760n	45.5	2.5	0.000n		0.0
1966	2.616n	-25.0	1.4	9.938#	22.1	5.3	0.2900n	0.0	0.2	3.525n	-6.3	1.9	2.304n		1.2
1967	3.488n	33.3	1.6	11.130n	12.0	5.2	0.2900n	0.0	0.1	3.760n	6.7	1.8	17.856n	675.0	8.3
1968	4.251n	21.9	1.7	11.865n	6.6	4.8	0.4350n	50.0	0.2	5.405n	43.7	2.2	24.576n	37.6	9.9
1969	4.251n	0.0	1.7	11.235n	-5.3	4.5	0.8700n	100.0	0.4	8.225n	52.2	3.3	24.960n	1.6	10.1
1970	5.123n	20.5	1.7	13.650n	21.5	4.6	1.3630n	56.7	0.5	10.810n	31.4	3.6	35.712n	43.1	12.0
1971	5.559n	8.5	1.7	10.920n	-20.0	3.4	2.0880n	53.2	0.6	16.685n	54.3	5.2	33.408n	-6.5	10.4
1972	5.232n	-5.9	1.6	11.865n	8.7	3.6	1.7690n	-15.3	0.5	14.100n	-15.5	4.3	34.752n	4.0	10.7
1973	6.976n	33.3	2.1	12.390n	4.4	3.7	1.9140n	8.2	0.6	15.040n	6.7	4.5	41.088n	18.2	12.2
1974	8.720n	25.0	2.3	12.705n	2.5	3.4	2.0300n	6.1	0.5	16.215n	7.8	4.4	39.360n	-4.2	10.6
1975	8.829n	1.2	2.5	9.765n	-23.1	2.7	2.1750n	7.1	0.6	17.155n	5.8	4.8	44.736n	13.7	12.5
1976	7.521n	-14.8	2.2	10.815n	10.8	3.2	2.3490n	8.0	0.7	18.565n	8.2	5.4	33.024n	-26.2	9.6
1977	9.701n	29.0	2.6	11.025n	1.9	3.0	2.5520n	8.6	0.7	20.210n	8.9	5.5	31.296n	-5.2	8.5
1978	10.573n	9.0	2.9	10.815n	-1.9	3.0	2.7260n	6.8	0.8	21.620n	7.0	6.0	22.272n	-28.8	6.2
1979	10.900n	3.1	3.0	10.605n	-1.9	2.9	2.9000n	6.4	0.8	23.030n	6.5	6.3	20.928n	-6.0	5.7
1980	10.900n	0.0	3.0	10.500<	-1.0	2.9	2.9000n	0.0	0.8	23.500n	2.0	6.5	19.200n	-8.3	5.3
1981	10.900n	0.0	3.4	9.670#	-7.9	3.0	3.4510n	19.0	1.1	15.040n	-36.0	4.7	18.240n	-5.0	5.7
1982	9.701n	-11.0	3.3	8.881#	-8.2	3.0	3.1900n	-7.6	1.1	10.810n	-28.1	3.7	16.896n	-7.4	5.8
1983	9.734#	0.3	3.3	8.396#	-5.5	2.8	2.9176#	-8.5	1.0	9.765#	-9.7	3.3	15.426#	-8.7	5.2
1984	10.818#	11.1	3.4	9.127#	8.7	2.8	3.2060#	9.9	1.0	10.552#	8.1	3.3	15.916#	3.2	4.9
1985	11.622#	7.4	3.5	9.137#	0.1	2.8	3.4133#	6.5	1.0	10.985#	4.1	3.3	15.157#	-4.8	4.6
1986	12.311#	5.9	3.6	9.023#	-1.2	2.6	3.5794#	4.9	1.0	11.371#	3.5	3.3	14.272#	-5.8	4.2
1987	13.074#	6.2	3.7	9.030#	0.1	2.5	3.7957#	6.0	1.1	11.962#	5.2	3.4	13.597#	-4.7	3.8

Table A-9 (continued)

	Misc. petroleum and coa			Rubber products			Plastic products n.e.c.			Pottery, china and eart			Glass and glass product		
	1980-U.S. dollars million	growth rate %	share %	1980-U.S. dollars million	growth rate %	share %	1980-U.S. dollars million	growth rate %	share %	1980-U.S. dollars million	growth rate %	share %	1980-U.S. dollars million	growth rate %	share %
1960	0n		0.0	0.2569#		0.2	0.2298#		0.2	0n		0.0	0.8541#		0.7
1961	0n		0.0	0.2796#	8.8	0.2	0.2495#	8.6	0.2	0n		0.0	0.7824#	-8.4	0.7
1962	0n		0.0	0.3068#	9.7	0.2	0.2730#	9.4	0.2	0n		0.0	0.7153#	-8.6	0.6
1963	0n		0.0	0.3522#	14.8	0.2	0.3118#	14.2	0.2	0n		0.0	0.7888#	10.3	0.6
1964	0n		0.0	0.3847#	9.2	0.3	0.3388#	8.7	0.3	0n		0.0	0.6997#	-11.3	0.5
1965	0n		0.0	0.4610#	19.8	0.3	0.4011#	18.4	0.3	0n		0.0	0.7599#	8.6	0.5
1966	0n		0.0	0.6353#	37.8	0.3	0.5401#	34.7	0.3	0n		0.0	0.8445#	11.1	0.5
1967	0n		0.0	0.7260n	14.3	0.3	0.6160n	14.1	0.3	0n		0.0	0.9206#	9.0	0.4
1968	0n		0.0	0.9020n	24.2	0.4	0.9680n	57.1	0.4	0n		0.0	1.0132#	10.1	0.4
1969	0n		0.0	0.8360n	-7.3	0.3	1.2760n	31.8	0.5	0n		0.0	1.1051#	9.1	0.4
1970	0n		0.0	1.01201	21.1	0.3	0.8140n	-36.2	0.3	0n		0.0	1.2182#	10.2	0.4
1971	0n		0.0	1.05601	4.3	0.3	0.9900n	21.6	0.3	0n		0.0	1.3492#	10.8	0.4
1972	0n		0.0	1.23201	16.7	0.4	1.0560n	6.7	0.3	0n		0.0	1.4972#	11.0	0.5
1973	0n		0.0	1.36401	10.7	0.4	1.4080n	33.3	0.4	0n		0.0	1.6588#	10.8	0.5
1974	0n		0.0	1.60601	17.7	0.4	1.6720n	18.7	0.4	0n		0.0	1.8272#	10.2	0.5
1975	0n		0.0	1.73801	8.2	0.5	2.0240n	21.1	0.6	0n		0.0	2.0172#	10.4	0.6
1976	0n		0.0	1.82601	5.1	0.5	1.9580<	-3.3	0.6	0n		0.0	2.0174#	0.0	0.6
1977	0n		0.0	1.76001	-3.6	0.5	2.1560<	10.1	0.6	0n		0.0	2.2385#	11.0	0.6
1978	0n		0.0	1.80401	2.5	0.5	2.1560<	0.0	0.6	0n		0.0	2.5483#	13.8	0.7
1979	0n		0.0	2.22201	23.2	0.6	2.2220<	3.1	0.6	0n		0.0	2.9389#	15.3	0.8
1980	0n		0.0	2.2000<	-1.0	0.6	2.2000<	-1.0	0.6	0n		0.0	3.3000n	12.3	0.9
1981	0#		0.0	2.0320#	-7.6	0.6	2.0345#	-7.5	0.6	0#		0.0	3.0729#	-6.9	1.0
1982	0#		0.0	1.8750#	-7.7	0.6	1.8796#	-7.6	0.6	0#		0.0	2.9730#	-3.2	1.0
1983	0#		0.0	1.8228#	-2.8	0.6	1.8465#	-1.8	0.6	0#		0.0	2.6549#	-10.7	0.9
1984	0#		0.0	2.0257#	11.1	0.6	2.0527#	11.2	0.6	0#		0.0	2.8129#	6.0	0.9
1985	0#		0.0	2.1759#	7.4	0.7	2.2069#	7.5	0.7	0#		0.0	2.8857#	2.6	0.9
1986	0#		0.0	2.3032#	5.8	0.7	2.3432#	6.2	0.7	0#		0.0	2.9497#	2.2	0.9
1987	0#		0.0	2.4448#	6.1	0.7	2.4926#	6.4	0.7	0#		0.0	3.0683#	4.0	0.9

Table A-9 (continued)

	Other non-metalic miner			Iron and steel			Non-ferrous metals			Metal products excl mac			Non-electrical machiner		
	1980-U.S. dollars million	growth rate %	share %	1980-U.S. dollars million	growth rate %	share %	1980-U.S. dollars million	growth rate %	share %	1980-U.S. dollars million	growth rate %	share %	1980-U.S. dollars million	growth rate %	share %
1960	0.6820n		0.6	0n		0.0	0n		0.0	11.627#		10.1	0n		0.0
1961	0.7700n	12.9	0.6	0n		0.0	0n		0.0	11.898#	2.3	9.9	0n		0.0
1962	0.6380n	-17.1	0.5	0n		0.0	0n		0.0	12.417#	4.4	9.7	0n		0.0
1963	1.4960n	134.5	1.0	0n		0.0	0n		0.0	13.774#	10.9	9.1	0n		0.0
1964	1.6060n	7.4	1.2	0n		0.0	0n		0.0	12.342#	-10.4	9.6	0n		0.0
1965	1.4520n	-9.6	1.0	0n		0.0	0n		0.0	13.472#	9.2	9.0	0n		0.0
1966	1.8480n	27.3	1.0	0n		0.0	0n		0.0	15.131#	12.3	8.1	0n		0.0
1967	2.1780n	17.9	1.0	0n		0.0	0n		0.0	16.385n	8.3	7.6	0n		0.0
1968	2.4860n	14.1	1.0	0n		0.0	0n		0.0	23.635n	44.2	9.5	0n		0.0
1969	2.8380n	14.2	1.1	0n		0.0	0n		0.0	24.650n	4.3	9.9	0n		0.0
1970	2.7500n	-3.1	0.9	0n		0.0	0n		0.0	25.085n	1.8	8.4	0n		0.0
1971	2.8160n	2.4	0.9	0n		0.0	0n		0.0	26.680n	6.4	8.3	0n		0.0
1972	2.3540n	-16.4	0.7	0n		0.0	0n		0.0	16.820n	-37.0	5.2	0n		0.0
1973	2.5740n	9.3	0.8	0n		0.0	0n		0.0	22.910n	36.2	6.8	0n		0.0
1974	2.2660n	-12.0	0.6	0n		0.0	0n		0.0	22.330n	-2.5	6.0	0n		0.0
1975	1.8480n	-18.4	0.5	0n		0.0	0n		0.0	11.310n	-49.4	3.2	0n		0.0
1976	2.3760n	28.6	0.7	0n		0.0	0n		0.0	4.930n	-56.4	1.4	0n		0.0
1977	1.9140n	-19.4	0.5	0n		0.0	0n		0.0	8.700n	76.5	2.4	0n		0.0
1978	2.3760n	24.1	0.7	0n		0.0	0n		0.0	12.905n	48.3	3.6	0n		0.0
1979	2.3100n	-2.8	0.6	0n		0.0	0n		0.0	12.760n	-1.1	3.5	0n		0.0
1980	2.2000n	-4.8	0.6	0n		0.0	0n		0.0	14.500n	13.6	4.0	0n		0.0
1981	1.3200n	-40.0	0.4	0#		0.0	0#		0.0	7.540n	-48.0	2.4	0#		0.0
1982	1.3200n	0.0	0.5	0#		0.0	0#		0.0	16.385n	117.3	5.6	0#		0.0
1983	1.3420n	1.7	0.5	0#		0.0	0#		0.0	16.256#	-0.8	5.5	0#		0.0
1984	1.3661#	1.8	0.4	0#		0.0	0#		0.0	15.592#	-4.1	4.8	0#		0.0
1985	1.3833#	1.3	0.4	0#		0.0	0#		0.0	15.296#	-1.9	4.6	0#		0.0
1986	1.3802#	-0.2	0.4	0#		0.0	0#		0.0	15.445#	1.0	4.5	0#		0.0
1987	1.3883#	0.6	0.4	0#		0.0	0#		0.0	15.107#	-2.2	4.3	0#		0.0

Table A-9 (continued)

	Electrical machinary			Transport equipment			Professional and scient			Other manufactures		
	1980-U.S. dollars million	growth rate %	share %	1980-U.S. dollars million	growth rate %	share %	1980-U.S. dollars million	growth rate %	share %	1980-U.S. dollars million	growth rate %	share %
1960	4.377#		3.8	11.148#		9.7	0n		0.0	0.4182#		0.4
1961	4.549#	3.9	3.8	11.509#	3.2	9.6	0n		0.0	0.4541#	8.6	0.4
1962	4.844#	6.5	3.8	12.156#	5.6	9.5	0n		0.0	0.4967#	9.4	0.4
1963	5.405#	11.6	3.6	13.542#	11.4	8.9	0n		0.0	0.5674#	14.2	0.4
1964	4.895#	-9.4	3.8	12.228#	-9.7	9.5	0n		0.0	0.6184#	8.8	0.5
1965	5.459#	11.5	3.6	13.557#	10.9	9.0	0n		0.0	0.7295#	18.3	0.5
1966	6.487#	18.8	3.5	15.878#	17.1	8.5	0n		0.0	0.9620#	34.6	0.5
1967	7.200n	11.0	3.4	17.523n	10.4	8.2	0n		0.0	1.1200n	14.1	0.5
1968	8.496n	18.0	3.4	21.948n	25.3	8.8	0n		0.0	1.7600n	57.1	0.7
1969	8.064n	-5.1	3.3	20.001n	-8.9	8.1	0n		0.0	2.3200n	31.8	0.9
1970	9.288n	15.2	3.1	22.1251	10.6	7.4	0n		0.0	1.4800n	-36.2	0.5
1971	10.152n	9.3	3.2	28.3201	28.0	8.8	0n		0.0	1.8000n	21.6	0.6
1972	11.016n	8.5	3.4	25.3111	-10.6	7.8	0n		0.0	1.9200n	6.7	0.6
1973	11.016n	0.0	3.3	20.7091	-18.2	6.1	0n		0.0	2.5600n	33.3	0.8
1974	12.672n	15.0	3.4	19.4701	-6.0	5.2	0n		0.0	3.0400n	18.7	0.8
1975	10.584n	-16.5	3.0	19.8241	1.8	5.5	0n		0.0	3.6800n	21.1	1.0
1976	10.584n	0.0	3.1	19.1161	-3.6	5.6	0n		0.0	3.5600<	-3.3	1.0
1977	11.448n	8.2	3.1	19.1161	0.0	5.2	0n		0.0	3.9200<	10.1	1.1
1978	11.448n	0.0	3.2	18.2311	-4.6	5.1	0n		0.0	3.9200<	0.0	1.1
1979	8.928n	-22.0	2.4	17.8771	-1.9	4.9	0n		0.0	4.0400<	3.1	1.1
1980	7.200n	-19.4	2.0	17.700<	-1.0	4.9	0n		0.0	4.0000<	-1.0	1.1
1981	3.384n	-53.0	1.1	16.305#	-7.9	5.1	0#		0.0	3.6992#	-7.5	1.2
1982	5.472n	61.7	1.9	14.980#	-8.1	5.1	0#		0.0	3.4176#	-7.6	1.2
1983	4.971#	-9.2	1.7	13.758#	-8.2	4.8	0#		0.0	3.3572#	-1.8	1.1
1984	5.482#	10.3	1.7	15.008#	9.1	4.7	0#		0.0	3.7323#	11.2	1.2
1985	5.409#	-1.3	1.8	15.006#	-0.0	4.5	0#		0.0	4.0125#	7.5	1.2
1986	5.461#	1.0	1.8	14.918#	-0.6	4.3	0#		0.0	4.2603#	6.2	1.2
1987	5.545#	1.5	1.8	15.097#	1.2	4.3	0#		0.0	4.5319#	6.4	1.3

Explanation of Indicators (placed right of items):

The first character following a data item is indicating the SOURCE this figure is coming from:

		Occurance in:					
		1982	1983	1984	1985	1986	1987
E	OECD	2	15	258	247	0	0
I	IMF, Internat. Financial Statistics	0	0	4	6	0	0
N	National statistical institute or national bank	56	122	153	79	0	0
R	UN regional economic commission the country belongs to	8	20	63	0	0	0
U	United Nations Statistical Office	0	0	14	11	0	0
#	UNIDO/IS/GLO estimates or forecasts	447	945	1862	2026	2369	2369
n	UNIDO/IS/SSU estimates based on national sources	1181	1212	0	0	0	0
i	UNIDO/IS/SSU estimates based on international sources	0	0	0	0	0	0
<	UNIDO/IS/SSU (provisional) estimates	0	0	0	0	0	0
●	UNIDO/IS/REG (published reports)	5	28	15	0	0	0
		2369	2369	2369	2369	2369	2369

Any lower case character afterwards marks sectors which have to be filled by disaggregated values.

Table A-10. Madagascar: Economically active population by sector, 1980 and 1984[a/]

Sector	1980			1984		
	Urban Milieu urbain	Rural Milieu rural	Total	Urban Milieu urbain	Rural Milieu rural	Total
Agriculture, forestry	95	4,000	4,095	135	4,221	4,356
Industry	94	33	127	99	36	135
Manufacturing	61	25	86	67	26	93
Construction	28	7	35	28	7	35
Others	5	1	6	4	2	7
Services	233	124	357	253	147	400
Commerce, banking	55	60	115	57	63	120
Transport	31	20	51	33	22	55
Public administration	60	22	82	61	22	83
Education	21	19	40	42	37	79
Health	6	3	9	9	3	13
Others	60	0	60	51	0	50
Unallocated	40	11	51	42	12	54
Total	462	4,168	4,630	529	4,416	4,945

Source: Planning Directorate; quoted from World Bank: The Democratic Republic of Madagascar, Country Economic Memorandum, March 18, 1986.

a/ Estimates.

Table A-11. Madagascar: Summary balance of payments, 1980-85
(US$ million, in current prices)

	1980	1981	1982	1983	1984	1985[a/]
Merchandise exports, fob	436	332	327	310	333	278
Merchandise imports, fob	764	511	452	378	352	336
Services (net), of which:	-275	-250	-246	-239	-229	-213
Scheduled interest payments[b/]	(42)	(89)	(97)	(112)	(137)	(126)
Private current transfers (net)	4	4	-1	-1	4	15
Current account balance	-599	-425	-372	-308	-244	-256
Public transfers	43	63	72	61	68	68
M&LT loans (net)	374	280	122	197	160	148
Disbursement	(417)	(327)	(210)	(194)	(121)	(146)
Scheduled amortization	(43)	(110)	(181)	(196)	(130)	(149)
Debt relief (net)	(0)	(63)	(93)	(199)	(169)	(151)
Net credit from IMF	49	37	57	7	18	-4
Arrears (- = decrease)	227	70	70	74	-9	-8
Other capital[c/]	11	-15	60	-45	32	32
Change in reserves (- = increase)	-105	-10	-9	14	-25	20

Source: World Bank: The Democratic Republic of Madagascar, Country Economic Memorandum, March 18, 1986.

a/ Estimate.

b/ These interest payments include moratorium interest on rescheduled debt. Rescheduled interest is capitalized and included within the debt relief item in the capital account. Total interest payments rescheduled during 1981-85 amounted to about US$ 215 million. If account is taken of moratorium interest, which is levied on the rescheduled amounts of principal and interest and on the consolidation of arrears, the net relief on interest payments amounted to about US$ 55 million during 1981-85.

c/ Includes short-term capital, SDR allocation, valuation adjustment, and errors and omissions.

Table A-12. Madagascar: Industrial production, 1978-84
(Quantities)

Item	1978	1979	1980	1981	1982	1983	1984
Food processing and beverages[a/]							
Sugar	115,624	109,293	109,037	104,694	82,159	95,822	73,377
Tapioca	1,965	2,061	1,541	1,360	817	331	390
Starch	728	783	1,388	1,557	1,180	1,003	487
Edible oils	4,425	3,817	3,985	2,731	1,988	1,494	1,537
Beer[b/]	257,037	283,819	318,166	210,400	190,071	236,268	228,777
Milk, concentrate	5,414	5,949	4,854	2,761	2,447	3,875	3,105
Beef, processed	1,231	3,281	1,308	...	...	...	...
Pork, processed	507	...	367	...	...	...	...
Tobacco industry[a/]							
Cigarettes	1,983	2,014	1,983	1,867	2,065	1,780	2,137
Smoking tobacco	153	126	162	94	99	54	18
Chewing tobacco	2,123	2,121	2,042	1,584	1,542	1,442	1,327
Textile industry							
Cotton fabrics[c/]	78,184	83,289	79,260	74,833	72,889	76,040	68,584
Sacks[a/]	2,815	3,268	3,418	2,370	1,491	449	646
Blankets[a/]	1,800	2,006	2,082	2,117	1,481	1,268	1,141
Sisal products[a/]	705	705	710	707	732	897	1,060
Leather industry[d/]							
Shoes	2,584	3,196	3,083	2,701	2,000	2,302	2,133
Paper industry[a/]							
Pulp	12,636	13,057	12,115	9,035	9,312	9,987	9,165
Paper	8,927	9,120	8,360	7,855	6,395	6,341	6,381
Chemical industry							
Soap[a/]	16,585	19,294	17,989	10,132	8,983	10,978	13,424
Candles[a/]	4,308	4,554	4,556	4,957	2,774	3,693	1,078
Matches[a/]	68,949	53,705	45,978	19,715	6,088	886	...
Paint[a/]	3,699	3,802	4,250	3,075	1,826	1,805	1,835
Petroleum refining[e/]							
Butane	7,487	7,005	8,877	5,933	4,371	2,095	2,252
Motor spirits	93,629	76,010	119,491	86,542	76,035	38,536	13,755
Kerosene	42,834	43,731	60,966	53,265	46,506	27,840	7,845
Gas oil	102,038	79,881	147,905	118,411	116,740	64,386	20,537
Fuel oil	168,599	183,050	252,586	151,463	163,068	89,480	22,863
Other[a/]							
Cement	56,044	63,052	50,050	35,796	35,921	36,237	36,580
Corrugated sheet metal	9,301	15,412	11,504	1,605	1,695	2,428	3,825
Nails	842	835	941	488	1,061	927	1,476
Batteries[f/]	20,693	20,561	16,406	8,164	12,963	16,191	13,062

Source: Planning Directorate/Direction Générale du Plan; quoted from World Bank; The Democratic Republic of Madagascar, Country Economic Memorandum, March 18, 1986.

a/ Metric tons.
b/ Hectoliters.
c/ '000 meters
d/ '000 pairs.
e/ '000 boxes.
f/ Cubic meters.
g/ Number of pieces.

Table A-13. Madagascar: Crop production, 1978-84

Item	1978	1979	1980	1981	1982	1983	1984
Cereals							
Paddy	1,918	2,045	2,109	2,011	1,969	2,147	2,131
Maize	115	116	127	121	113	132	141
Sorghum	1	1	1	1	1	2	2
Pulses							
Beans	37	41	38	36	37	39	37
Butter beans	8	10	6	5	6	6	7
Other pulses[a/]	2	...	...	...	...	...	...
Roots and tubers							
Potatoes	181	183	166	161	201	253	263
Cassava	1,594	1,569	1,683	1,670	1,898	1,992	2,047
Sweet potatoes	325	365	373	399	356	463	462
Taro	72	76	80	77	78	85	93
Industrial and export crops							
Sugar cane	1,375	1,444	1,395	1,421	1,409	1,616	1,660
Groundnuts	34	40	39	33	30	32	32
Tobacco	3	4	4	3	3	2	3
Cotton	33	30	23	28	26	26	33
Coffee (green)	78	82	80	83	81	81	81
Cocoa	1	2	2	2	2	3	3
Pepper	3	3	3	3	3	3	3
Vanilla (dry)	5	2	3	4	5	5	5
Cloves	13	4	12	11	10	4	13
Tung seed oils	1	...	...	...	...	...	...
Sisal	16	18	16	15	15	19	19
Vegetables							
Green beans	2	2	2	2	...	...	...
Carrots	3	4	4	5	5	5	5
Turnips	0	0	0	0	...	...	...
Onions	5	5	5	5	5	5	5
Cauliflower	1	1	0	0	...	...	...
Tomatoes	4	8	9	8	10	13	17
Cucumbers	1	0	1	1	...	...	...
Cabbages	7	7	9	10	10	10	10
Water cress	0	1	1	1	1	1	1
Fruits							
Bananas	233	250	270	280	284	286	224
Citrus fruits	80	59	59	59	80	81	81
Pineapples	47	48	53	49	50	50	50
Peaches and plums	13	13	11	11	7	7	8
Apricots	0	1	...	...	...	...	...
Apples and pears	4	4	6	6	6	6	6
Grapes	4	8	9	8	8	9	10
Lychee	26	26	32	33	33	34	35
Forestry produces							
Raffia	2	7	8	8	8	8	8
Paka	0	0	0	0	...	...	...

Source: Ministère du Développement Agricole et de la Réforme Agraire; quoted from World Bank: The Democratic Republic of Madagascar, Country Economic Memorandum, March 18, 1986.

a/ Provisional.

Table A-14. Madagascar: Currency exchange rates, 1980-85
Malagasy Franc (FMG)

	US$1 = FMG (Annual averages)	SDR1 = FMG
1980	211.28	274.99
1981	271.73	320.41
1982	349.74	386.12
1983	430.45	460.15
1984	576.60	591.02
1985	662.48	673.21

Table A-15. Madagascar: 1984-87 Plan: Major industrial projects
(FMG million)

	Investment	
	Total	Foreign exchange (currency requirements)
Projects to be completed or extended		
Chemical fertilizers a/	75	...
Parquet flooring	130	53
Steel rolling mill	650	150
Fibre panels	100	80
Cotton textiles	200	50
Salt works	120	100
Plastic bags	370	305
Simulated leather	420	400
Batteries	300	300
Enterprises to be rehabilitated		
Oil & soap factory	...	...
Starch factories	150	150
Sugar estates	...	...
Cotton weaving and synthetic fibres	350	350
Jute bags	...	...
Tannery	400	400
Match factory	...	...
Cement works	...	...

Source: Marchés Tropicaux et Méditerranéens.

a/ Completed in 1985.

Table A-16. Maldives: GDP per capita, 1978-82
(constant 1980 market prices)

	1978	1979	1980	1981	1982
GDP (Rf millions)	271.0	299.9	355.6	384.0	418.4
Population ('000)	147.0	150.0	153.0	156.0	160.2
GDP per capita (Rf)	1,843	1,999	2,324	2,461	2,611

Source: World Bank, The Maldives: An Updating Economic Memorandum (Report Number 445-MAL), April 1983, p.5.

Table A-17. Maldives: Fish production and exports, 1980-84
(Thousands of metric tons)

	1980	1981	1982	1983	1984
Landings	34.6	34.9	30.3	38.5	39.0
Fish processing:					
Freezing	14.0	13.8	9.8	7.9	...
Curing	9.4	6.7	7.5	8.9	...
Canning	...	...	...	...	...
Other	...	...	...	...	...
Exports of fresh fish	14.0	13.9	10.1	7.9	12.5
Exports of other fish	7.8	5.7	6.3	7.2	7.5
Dry skipjack	...	...	...	1.4	2.2
Dry salted skipjack	3.3	2.7	2.4	3.5	1.8
Dry salted reef fish	4.5	3.0	3.9	2.3	2.1
Canned fish	...	...	...	...	1.4
Total fish export	21.8	19.6	16.4	15.1	20.0
(in $ millions)	7.3	6.9	5.5	6.7	9.4

Source: IMF, Maldives: Recent Economic Developments (Washington, D.C., IMF, SM/85/11, January 1985), p.5; Ministry for Fisheries, Republic of Maldives; FAO data base.

Table A-18. Maldives: Tourism, 1980-84

	1980	1981	1982	1983	1984
Total arrivals	42,007	60,358	74,411	74,163	84,579
Of which tourists	34,695	48,233	57,175	59,624	82,579
Total tourist expenditure ($ millions)	9.4	14.5	20.6	21.4	25.3

Source: IMF, Maldives: Recent Economic Developments, Washington, D.C., IMF, SM/85/11, January 1985, p.9.

Table A-19. Maldives: Male port statistics, 1976-81

	1976	1977	1978	1979	1980	1981
Number of ships calling	88	62	39	44	47	48
Total incoming traffic ('000 tons)	27.9	32.8	19.3	37.8	48.1	76.7
Composition of incoming traffic ('000 tons)						
Foodgrains	17.9	21.6	7.7	21.9	20.9	24.5
Petroleum products	2.5	4.1	2.4	5.0	11.0	8.5
Other cargo	7.5	7.2	9.2	11.3	16.1	43.7

Source: World Bank, The Maldives: An Updating Economic Memorandum (Report Number 445-MAL), April 1983, p.74.

Table A-20. Maldives: Employment, 1978 and 1980
(Per cent of total)

	1978[a/]	1980
Primary production	56.0	54.1
Of which: Fishing	45.4	44.0
Secondary production[b/]	26.6	26.9
Services	17.4	19.0
Of which: Tourism	0.7	3.0
Transport	5.5	5.0
Commerce	3.2	5.0
Government	5.1[c/]	7.4[c/]
Total employment ('000 persons)	59,890	66,310
In public sector	4,939	
In private sector	55,320	
Unemployment rate (per cent)	5.8	

Source: World Bank, The Maldives: An Updating Economic Memorandum (Report Number 445-MAL), April 1983, p.6 and p.39.

a/ Based on December 1977 Census.
b/ Manufacturing, construction and electricity.
c/ Excluding government employees in tourism, transport and commerce.
d/ Excludes 369 persons not classified.

Table A-21. Maldives: Government expenditure, 1980-84
(Rf millions)

	1980	1981	1982	1983	1984
Current expenditure	39.4	52.3	92.8	95.2	112.0
Public services	18.8	26.2	31.0	41.6	55.5
General administration	11.4	16.2	19.6	27.5	40.0
Public order/security	7.4	10.0	11.4	14.1	15.5
Social services	15.3	18.1	48.6	39.1	37.9
Education	4.2	7.0	9.7	13.1	15.8
Health	3.3	4.3	7.4	7.1	9.8
Social security	1.8	1.8	2.0	1.9	2.3
Welfare services	2.2	1.5	25.1	11.8	4.7
Community programmes	3.8	3.5	4.4	5.2	5.3
Economic services	4.5	6.8	9.0	10.1	11.0
Agriculture	0.3	0.4	0.5	10.1	11.0
Fisheries	0.3	0.4	0.7	0.8	1.0
Transportation	3.4	4.9	6.1	6.5	6.8
Post	0.5	0.6	0.7	0.4	0.4
Tourism	...	0.5	0.8	1.1	1.2
Trade & industry	...	...	0.2	0.7	1.0
Interest on public debt	0.8	1.2	4.2	4.4	7.6

Source: IMF, Maldives: Recent Economic Developments (Washington, D.C.: IMF, SM/85/11, January 1985), p.61.

Table A-22. Maldives: Currency exchange rates, 1974-84
Maldivian Rupee (MR)

	Annual average (Free market rate) $1 = MR
1974	6.65
1975	5.75
1976	8.75
1977	8.80
1978	8.88
1979	7.50
1980	7.54
1981	7.55
1982	7.55
1983	7.05
1984	7.05

Note: Official accounting rate (used for official government transactions):
From February 1973 - $1 = MR 3.93
From January 1984 - $1 = MR 6.00.

Table A-23. Mauritius: GDP per capita, 1979-84

	GDP (Rs millions)	Population	GDP per capita (Rupees)
1979	5,876	924,242	6,359
1980	7,191	938,502	7,666
1981	7,890	950,365	8,305
1982	9,245	959,905	9,640
1983	10,429	969,191	10,762
1984	11,200	1,002,000	11,177

Source: International Monetary Fund, Mauritius: Recent Economic Developments, Washington, D.C.: IMF, 1984, SM/84/213, p.4 and Central Statistical Office, Government of Mauritius, Bi-Annual Digest of Statistics, Rose Hill: CSO, 1984, p.9.

Table A-24. Mauritius: Fishery statistics, 1975-80

	1975	1976	1977	1978	1979	1980
Nominal catch (tons)	7,038	6,660	7,668	7,111	6,520	5,344
Fish imports ($ '000)	4,452	5,203	8,025	11,149	11,244	11,500
Fish as percentage of food consumption	54.5	47.8	34.8	33.8	24.4	19.1

Source: Choolun, R., "Fish and the Mauritian Diet", in "Proceedings of a Seminar on Marine Fisheries Development in Mauritius", University of Mauritius, July, 1983, p.42.

Table A-25. Mauritius: Tourism, 1976-83

	Hotels (Number)	Arrivals (Thousands)	Earnings (Millions of MRupees)
1976	37	92.6	184
1977	37	102.5	210
1978	38	108.3	230
1979	38	128.4	260
1980	43	115.1	325
1981	51	121.6	433
1982	51	118.4	450
1983	55	123.8	503
1984	...	139.7	630
1985	...	147.0a/	850a/

Source: International Monetary Fund, Mauritius: Recent Economic Developments, Washington, D.C., IMF, 1984, SM/84/213, p. 103; Mauritius Government Tourist Office.

a/ Provisional.

Table A-26. Mauritius: Employment (by major industrial sector), 1976-83
(Thousands)

	1976	1977	1978	1979	1980	1981	1982	1983
Agriculture and fisheries	59.5	61.4	58.4	55.6	54.0	53.5	52.5	52.4
Sugar	52.6	54.4	51.3	48.7	47.5	46.3	46.5	46.1
Mining	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.6
Manufacturing	26.4	30.9	31.9	35.1	36.2	36.9	38.3	36.9
Electricity	3.1	3.3	3.5	3.9	4.6	4.4	4.5	4.2
Construction	7.8	7.3	8.8	9.1	8.12	7.3	5.7	4.5
Wholesale/retail	7.6	8.1	9.1	9.4	9.3	9.1	9.1	9.0
Transport/ communications	9.0	10.2	9.8	9.9	8.7	7.8	7.8	7.6
Financing	2.9	3.5	4.1	4.3	4.4	4.6	4.7	4.7
Community and Social services	52.4	54.6	57.6	61.6	62.7	62.8	64.0	64.4
Government	46.2	47.4	49.5	53.0	54.1	54.5	55.7	55.1
Private	6.2	7.2	8.1	8.6	8.6	8.3	8.3	8.3
Not specified	7.8	14.4	11.8	10.2	8.2	6.9	6.4	6.1
Registered unemployment	...	20.0	24.0	27.0	35.0	42.0	50.0	61.0[a/]

Source: Central Statistical Office, Government of Mauritius, Bi-Annual Digest of Statistics, Rose Hill, CSO, 1984, p.97.

a/ International Monetary Fund, Mauritius: Recent Economic Developments, Washington, D.C., IMF, 1984, SM/84/213, p.23.

Table A-27. Mauritius: Balance of payments, 1980-84
(million US$)

	1980	1981	1982	1983	1984
Merchandise exports fob	430.1	326.5	363.8	367.3	370.4
Merchandise imports fob	-511.8	-474.5	-394.2	-384.5	-407.4
Trade balance	-81.7	-147.9	-30.4	-17.2	-37.0
Exports of services & IPD	143.9	179.8	142.8	139.5	135.9
Imports of services & IPD	-200.7	-201.6	-189.5	-170.2	-175.1
Net private transfers	9.7	11.5	14.3	16.2	18.0
Net official transfers	11.0	4.2	18.6	7.9	6.7
Balance on current account	-117.9	-154.0	-43.1	-23.9	-51.4
Direct investment	1.2	0.7	1.7	1.6	4.9
Other long term capital	21.0	55.0	7.8	-19.4	-
Short term capital	43.7	-30.5	-19.8	0.8	6.5
Balance on capital account	65.9	25.2	7^.3	9.8	11.4
Errors & omissions	24.0	13.0	-u.9	9.6	18.2
Counterpart items	5.1	0.3	5.9	4.1	4.7
Exceptional financing	45.5	0.8	40.3	1.0	40.5
Change in reserves (- indicates increase)	-22.6	114.7	1	26.2	-23.4

Source: IMF, International Financial Statistics.

Table A-28. Mauritius: Government expenditure (by function), 1980-83
(Rs millions)

Function	1980	1981	1982	1983
Public services	361.9	417.7	491.3	521.7
Defense	19.0	66.1	29.0	32.2
Education	354.9	420.4	474.9	532.6
Health	172.9	203.3	235.2	261.4
Social security	273.9	317.1	377.0	443.5
Housing	35.1	33.8	43.8	34.4
Community services	17.2	18.7	19.4	21.5
Economic services	154.0	182.9	181.1	220.3
General administration	13.9	16.6	24.2	26.0
Agriculture, forestry and fishing	103.2	114.2	130.2	153.1
Mining, manufacturing and construction	2.9	3.8	3.6	5.3
Electricity, gas and water	12.1	21.6	1.3	5.6
Roads	1.9	2.2	...	...
Waterways	...	3.7	1.0	1.1
Public debt	323.9	461.4	642.2	773.4
Other & miscellaneous	731.5	978.4	1,229.6	1,375.6
Rice and flour	130.0	203.0	230.0	190.0
Total current expenditure	1,971.9	2,471.0	2,892.2	3,222.6

Source: Central Statistical Office, Government of Mauritius, Bi-Annual Digest of Statistics, Rose Hill: CSO, 1984, p.39.

Table A-29. Mauritius: Currency exchange rates, 1975-83
Mauritius Rupee (MR)
Fiscal Year: July 1 - June 30

	Annual average $1 = MR
1975	6.0268
1976	6.6824
1977	6.5496
1978	6.1460
1979	6.4017
1980	7.6896
1981	9.0911
1982	10.873
1983	11.706

Table A-30. Seychelles: GDP and GDP per capita, 1976-83

	GDP (SR millions)	Population	GDP per capita[a/] (Rupees)
1976	366.4	60,504	6,056
1977	394.2	61,786	6,380
1978	412.0	63,150	6,769
1979	488.2	62,686	7,788
1980	477.2	63,261	7,543
1981	438.7	64,035	6,851
1982	436.5	64,410	6,777
1983	435.6	64,054	6,801

Source: IMF, Seychelles: Recent Economic Developments, Washington, D.C.: IMF, SM/83/176, August 1983, p.3.

a/ GDP is measured at 1976 prices.

Table A-31. Seychelles: Trends in the fisheries sector, 1977-83

	1977	1978	1979	1980	1981	1982	1983
Fish landings (tons)	4,600	5,400	4,908	4,377	4,444	3,897	3,750
Fish exports (SR '000)	3,184	3,608	6,304	9,623	4,443	7,347	9,460
Domestic exports (SR '000)	24,385	24,705	30,948	32,930	27,471	20,297	25,200
Fish exports as percentage of domestic exports	13	14.6	20.4	29.2	16.2	36.2	37.5

Source: Republic of Seychelles, National Development Plan, 1985-89, Victoria: Seychelles National Printing Company, Ltd., 1984, p.84.

Table A-32. Seychelles: Tourism, 1979-84

	1979	1980	1981	1982	1983	1984
Visitor arrivals ('000)	78.9	71.8	60.4	47.3	55.9	63.4
Gross tourism receipts (SR million)a/	291	326	285	220	233	283

Source: Republic of Seychelles: 1984 Migration and Tourism Statistics.

a/ Commercial bank purchases of foreign exchange.

Table A-33. Seychelles: Formal employment by sector (public & private), 1979-83

Sector	1979	1981	1983
Agriculture, fishing & forestry	2,046	1,585	2,086
Manufacturing	1,593	1,801	1,743
Mining & construction	2,719	2,560	1,408
Wholesale/retail trade	738	1,028	1,182
Restaurants	454	232	260
Hotels	2,235	1,993	1,732
Transport/communications	2,118	2,096	1,965
Public administration	1,685	2,208	2,218
Finance	645	762	827
Social/community	2,204	2,998	3,766
Other	393	320	333
Total	16,830	17,583	17,520
Registered unemployment			6,409

Source: Republic of Seychelles, Statistical Abstract 1983, p.87, 97.

Note: These totals exclude domestic workers (private households), self-employed and family workers.

Table A-34. Seychelles: Balance of payments, 1978-83
(million US$)

	1978	1979	1980	1981	1982	1983
Merchandise exports fob	6.6	6.2	5.7	4.6	3.9	5.1
Merchandise imports fob	-51.8	-71.6	-83.7	-79.2	-83.0	-74.5
Trade balance	-45.2	-65.4	-78.0	-74.5	-79.1	-69.4
Other goods & services, net	32.6	45.6	49.1	43.6	30.6	32.2
Private transfers	-0.7	-1.0	-1.5	-2.7	-3.2	-2.8
Official transfers	9.8	9.0	14.5	12.8	9.6	14.1
Current account balance	-3.6	-11.8	-15.9	-20.9	-42.1	-25.8
Direct investment	2.4	3.0	4.3	1.4	3.7	4.4
Other long term capital	4.1	7.7	11.8	6.7	23.0	10.4
Short term capital	0.6	4.6	0.8	3.2	4.7	-0.4
Balance on capital account	7.0	15.3	16.9	11.3	31.4	14.4
Errors & omissions	-4.4	0.2	6.9	4.5	10.5	8.9
Counterpart items	-1.4	-0.7	-1.6	0.5	-0.5	-0.6
Change in reserves (- indicates increase)	2.3	-2.9	-6.3	4.6	0.7	3.1

Source: IMF, International Financial Statistics.

Table A-35. Seychelles: Government expenditure (by function), 1979-83
(Rs millions)

	1979	1980	1981	1982	1983
General administration	112.5	126.4	112.9	116.3	125.2
Public order	43.7	49.2	46.2	48.2	57.8
Finance	10.8	12.2	10.9	11.3	10.7
Foreign affairs	13.1	5.4	6.7	7.5	6.1
Legal affairs	2.3	2.6	3.4	4.6	3.8
General services	16.0	22.4	10.7	12.5	16.4
Pensions	10.9	12.2	12.0	11.0	9.4
Social security	16.4	22.4	23.0	21.2	21.0
Economic Services	27.7	29.4	33.0	38.1	38.2
Agriculture/land use	19.4	18.5	12.5	10.4	17.7
Economic development	4.8	6.6	15.6	14.7	6.2
Tourism	3.5	4.3	4.9	13.0	14.3
Social services	59.0	92.3	127.5	153.5	163.2a/
Education	31.5	54.1	70.9	78.7	79.5
Health	22.0	31.5	34.9	41.5	39.7
Labour	3.9	3.0	5.6	3.4	3.9
Youth development	1.6	3.7	4.1	2.8	2.2
National youth service	...	...	12.0	26.7	37.9
Financial	22.8	48.1	73.8	83.0	88.3
Public debt	6.0	13.1	13.7	21.2	37.9
Transfers	10.0	25.0	33.0	30.0	15.0
Other	6.8	10.0	27.1	31.8	35.4
Public enterprises	105.4	103.3	29.4	19.5	19.7
Electricity	26.5	39.4	...	...	...
Public works	52.0	30.0	...	...	...
Postal services	2.1	3.4	4.4	2.6	3.5
Printing	2.6	3.2	3.8	...	...
Marine and port	12.3	15.1	5.9	3.7	4.1
Civil aviation	9.9	12.2	15.3	13.2	12.1
Total	327.4	399.5	376.6	410.0	434.6

Source: Government of Seychelles, Statistical Abstract 1983, p.67, and IMF, Seychelles: Recent Economic Developments (Washington, D.C.: IMF, SM/83/176, August 1983, p.35).

a/ The IMF indicates a higher amount spent for Social Services, but it also includes a community development category. In particular, the IMF's education expenses estimates are almost twice as high as those provided by the Seychelles Statistical Abstract.

Table A-36. Seychelles: Investment by sector in the 1985-89 Development Plan

(SR million at constant 1984 prices)

	1985	1986	1987	1988	1989	Total 1985-89	Per cent of total
Productive & economic	306.8	322.4	219.6	133.6	102.6	1,084.9	38.4
Infrastructure	101.2	92.3	43.2	209.4	16.5	462.6	16.4
Utilities	95.9	99.7	119.1	101.3	89.9	505.9	17.9
Services	175.4	170.4	156.1	128.8	97.2	727.9	25.8
Land use & environment	9.7	15.1	8.0	4.4	1.2	38.5	1.4
Public administration	3.1	3.3	0.2	...	...	6.5	0.2
Total	692.1	703.1	546.2	577.5	307.3	2,826.3	100.0

Source: Republic of Seychelles, National Development Plan 1985-89.

Table A-37. Seychelles: Currency exchange rates, 1976-84
Seychelles Rupee (SR)

1976-79	£1 = SR 13.33
1979	SDR 1 = 8.3197
1981	SDR 1 = 7.2345
1984	US$ = 7.381

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