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The Western Indian Ocean Island States: Problems and Prospects for Utilizing Marine Resources as a Base for Industrial Development

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The Western Indian Ocean Island States:
Problems and Prospects for Utilizing Marine Resources
as a Base for Industrial Development

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Executive Summary

The island states of the Western Indian Ocean, Comoros, Madagascar, Maldives, Mauritius and Seychelles, share many common problems and potentials. After their independence in the 1960s and 1970s, 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 they were producing, whose prices fluctuated widely on the world market. Comoros and Madagascar have yet to develop the tourism sector extensively.

As these states plan their individual methods of economic development, and as they promote industrialization, they need to examine more closely the ways in which they can base that growth and development on their own natural resources. The island states are not well endowed with natural resources, although in most cases there is little information available locally on exactly what resources are available. This is particularly so in the case of marine and coastal resources. Nevertheless, these are obviously the most important resources for these countries. With the advent of the United Nations Convention of the Law of the Sea (UNCLOS III), these island States will no doubt look even more to their off-shore marine resources. For the short term, these island States will no doubt further develop their living marine resources, mostly on an independent basis. For the medium term, the States will have a chance to further develop their light and medium scale manufacturing industries (using local marine resources), with perhaps some degree of regional cooperation. For the longer term, each of the five states

has claimed a 200 mile Exclusive Economic Zone, the potential for which is largely unknown.

These states' marine resources have yet to be fully exploited, and eventually they can play an increasingly important role. Additionally, these states need to exploit their marine resources for the long term development process, by using new methods of management and protection.

These island nations, while sharing common problems and potentials, are each unique. They range from tiny and extremely poor Comoros and Maldives, to the world's third largest island, Madagascar, to Mauritius and Seychelles, both with relatively high GNP per capita.

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 poorest and most densely populated states (with a per capita GNP of less than $350 and a density of 350 people per sq km). The nation has very few natural resources. Comoros entered a period of severe political and economic disequilibrium following independence, a condition from which it is only now beginning to emerge.

About 80 percent of the population are dependent on agriculture. Plantation agriculture (primarily ylang-ylang, or aromatic essence) provides about 40 percent of the country's GDP. Comoros has about 7,000 fishermen, almost all of whom are artisanal, using low technology and labor intensive fishing methods.

The government has a goal of achieving self sufficiency in food, and improving health and living standards. One way to help achieve these goals would be to better utilizing its marine resources. However, these resources are extremely, especialy in terms of near-shore fisheries and proximate sources of construction materials (sand, gravel and limestone from coral). Although limited, Comoros could improve its marine fisheries industry and its construction industry by better use and conservation of its marine building materials.

MADAGASCAR

Relative to the other four countries in this study, the Democratic Republic of Madagascar is large, both physically and in population terms, and possesses a variety of natural resources. Nevertheless, by virtually any standard, Madagascar is poor economically. Its major economic sector is agriculture, where over 80 percent of its population work. For a variety of reasons, Madagascar has suffered significant declines in food consumption per head since independence. It could help increase its food production by better marine resources utilization.

Of the states under discussion, Madagascar depends the least on its marine resources, regardless of the fact that more than half of its major cities -- excluding Antananarivo, the capital-- are located in the coastal zone. The major areas of potential, besides increased food production by larger amounts of fish caught, and improved seafood processing/distribution, are coastal tourism, better uses of local building materials (marine sands and gravel) and coastal canal transportation improvement and development.

Nevertheless, while Madagascar's uses of marine resources as a base for industrial development has potential, other additional actions will most likely have to wait for the longer term.

MALDIVES

Maldives is a small nation, comprised of over 1,200 tiny islands and atolls, whose total land area is less than 300 square miles. It supports a total population of about 150,000, of whom nearly 90 percent live on the capital island of Male. Maldives has made impressive economic strides since independence, given its lack of natural resources, isolation and low level of human and physical infrastructure development.

The economy is not diverse. Maldives' two major industries are tourism (with over 70,000 tourists in 1983) and fisheries. Maldives, perhaps as much as any nation, depends on its marine resources. Indeed, the government's twin objectives of rapid economic growth and regional economic development balance among islands will depend on even better utilizing its marine resources. In fact, Maldives is already taking appropriate steps in that direction. It could focus on improving fishing gear and techniques (thus increase its total catch), seafood processing, boat repairing and building, and on promoting a local handicraft industry using indigenous marine resources.

MAURITIUS

Mauritius has a relatively diversified economy. It is comprised of one major island, plus a few smaller outlying islands, or dependencies, with a total land area of a little less than 2,000 sq km. Its population of over one million is

one of the world's most mixed, with a blend of peoples from South and Southeast Asia, Africa and Europe.

Until quite recently, Mauritius' economy hinged on sugar production. While agriculture in general still remains important, its share of GDP has declined from over 18 percent of the total to about 13 percent during the late 1970s and early 1980s. Fisheries, once more important, have also declined in recent years. The economy has begun to diversify by increasing its local manufactures, light industrialization and tourism.

Mauritius has a number of marine resources which could be better utilized. Mauritius could explore possibilities of beginning a local pharemceutical industry based on marine plants, increased aquaculture and mariculture opportunities, improved fish catches and processing facilities, becoming self sufficient in salt, and developing its off-shore marine minerals, including construction materials.

SEYCHELLES

Seychelles has a population of about 65,000 people (of whom 95 percent live on the main island of Mahe), making it one of the world's smallest states. In physical terms it is also minute; for example, only about 80 square miles are suitable for agriculture.

Seychelles economy and society has transformed greatly since independence, and with the opening of its international airport and increases in tourism. For example, agriculture, which during the 1960s contributed over 75 percent of GNP, now contributes only 5 percent. Fisheries has been an

important occupation for Seychelles, and much of the fishing is done in open, traditional boats near the coast. There is also a significant long-line fisheries sector, operating from relatively small "whale boats", which exploits more distant reefs.

The Seychelles government has focused on marine resources as part of its national development strategies, and recognizes the ecological costs and constraints to massive development along 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.

Other areas where Seychelles could better utilize its marine resources as bases for industrial development are in supporting local handicraft production using marine minerals and other resources, boat building and repair, industrial uses of granite (of which most of the main islands are composed), improved local shipping and increased exploration of its marine resources.

The international development community can offer much to these island states. This study recommends first that more be learned about these island's marine resources, particularly in the 1.5 million square miles of sea economically controlled in the EEZs. Further, a multilateral and/or an individual focus on the development of several important marine resources as a potential base for further industrialization would include: ocean minerals, marine fisheries, mariculture, energy production, shipping and ports, and coastal tourism.

The study also recommends that UNIDO, subject to availability of resources, act as a coordinator for a series of regional workshops, entitled, "**Technical Workshop for Utilizing Marine Resources as a Base for Industrialization in the Western Indian Ocean Island States**".

These workshops would not address broad policy issues, but rather, they would deal with very technical, site specific problems, and offer solutions for improvement. The workshops' participants would include representatives of the five island states in the region; experts from academia, government and industry from outside the region; and the support of various international organizations. The topics for the workshops suggested here are:

Coral Reef Exploitation and Management for Construction Industries

Cottage Industry Production Using Local Materials

Potential for Mariculture/Aquaculture Development

Developing Alternative Ocean-Based Energy Sources

Improving Commercial Seafood Processing and Distribution

Fishery Gear/Technology Improvement and Development

Strengthening Cooperatives for Boat Building/Repair Facilities

Developing Techniques for Surveying and Assessing Marine Resources in EEZs

Industrial Uses of Marine Plants for Pharamacutical Production

I. The Importance of Marine Resources in Island Development

The island states of the Western Indian Ocean[1], ie, Comoros, Madagascar, Maldives, Mauritius and Seychelles share many of the same 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 and markets, but nevertheless share severe density problems, limited land available 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, and fragile eco-systems with unpredictable weather (including severe cyclones in some areas). Three of the five have been classified as LLDCs by the UN, and have some of the lowest GDP per capitas and PQLIs in the world.[2] Nevertheless, despite common limitations, their short and medium term potentials and current levels of development varies greatly, with Mauritius and Seychelles at one end, Comoros and Maldives at the other, and with Madagascar somewhere in between.

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[1]There are, of course, other islands located in the Indian Ocean. 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 scientific or military purposes.

[2]This study recognizes that GDP per capita is at best a poor method of measuring a country's level of economic development, as it says nothing, for example about equity or distribution issues. Nevertheless, it is useful in placing some rank on the relative "wealth" of a country. Another way to measure levels of "development" is by the Physical Quality of Life Index, which measures infact mortality, literacy and crude birth rates.

The countries in the region range from very small Maldives, with an area of 298 km sq, followed by Seychelles (444 km sq), Mauritius (1,960 km sq), Comoros(2,170 km sq), and Madagascar (592,000 km sq). Maldives also has the highest population density, with 520 people per square kilometer, with Mauritius next (495), followed by Comoros(165), Seychelles(142), and Madagascar (only 15). In population terms, 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 smallest population growth rate in the region (and one of the smallest in the developing world) of 1.4 percent. The highest population growth rate in the region is Maldives' 3 percent. Seychelies and Mauritius have by far the highest GNP per capita, $1,666 and $1,267 respectively, while Madagascar, Comoros and Maldives all have GNP per capitas under $350.

As these states decide on the best methods of pursing economic development, and as they promote industrialization, they will begin to examine more closely the ways they can base that growth and development using their own natural resources.[3] Being islands, all of these States use marine resources to some degree, some more than others. Marine resources include non-living resources such as minerals and non-minerals (eg, off-shore oil, corals, salt) and living resources (eg, marine animals and plants).

[3]For the rationale and concepts of natural resource-based industrialization, see UNIDO, Industrial Processing of Natural Resources, Vienna: UNIDO, ID/261, 1981.

Nevertheless, none of these island States fully utilize their near-shore and off-shore marine resources. Only recently have these states begun to look more toward ocean resources; and now, with the advent of the United Nations Convention on the Law of the Sea (UNCLOS III), finalized in 1982, these island States can be expected to further utilize these important marine and coastal resources. The four major areas of UNCLOS III for these island States pertain to: 1) the contiguous zone; 2) the continental shelf; 3) the exclusive economic zone and 4) the international seabed area and Authority.[4]

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

The continental shelf: Now States have the exclusive sovereign rights to explore and exploit the natural resources of the seabed and subsoil of the continental shelf laying within the 200 nautical miles from its coastline.

The exclusive economic zone: The area described above lies within these States EEZs. However, within the EEZ, there are activities which may be enjoyed by only the coastal State, and activities which may be enjoyed by other States. The coastal State has exclusive rights:

[4]For an excellent review of the history of the UNCLOS III, see Oxman, B H, et al, Law of the Sea: US Policy Dilemma, San Fransisco: Institute for Contemporary Studies, 1984. The summary of the four major areas discribed here are principally from that volume, p147-172.

"...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 expoloitation and exploration of the zone, such as production of energy from the water, currents and winds;

"...to control the construction and use of all atrificial islands and instillations and structures that are used for economic purposes...

"...to be informed or participate in proposed marine science research projects, and to withhold concent for a project...

"...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..." [5]

Also within the zone, any State has the following rights:

"...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 pipelines."

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[5]Oxman, B H, ""Summary of the Law of the Sea Convention", p152-157 in Oxman, B H, et al, Law of the Sea: US Policy Dilemma, San Fransisco: Institute for Contemporary Studies, 1984.

Additionally, the coastal State is charged with conserving its living resources within its EEZ, and also with promoting the optimum utilization by determining harvest limits and also 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.[6] The principal resources in the Indian Ocean are the polymetallic nodules which lay at or near the surface of the deep sea beds.

Nevertheless, despite the fact that the principle of economic jurisdiction over adjacent waters to the 200 mile limit has finally become firmly entrenched in international law, few countries have developed methods of exploiting the resources located in thir EEZs. In fact, few states --and none in the Indian Ocean-- really have a good idea of what resources are located in their EEZs.

Further, with regard to the fragility of these islands, development must be pursued in a manner which keeps ecological costs to a minimal.[7] The island states under study here have suffered from poorly planned port facility

[6] The Authority would be an international organization with an Assembly from all participating States, a Council of limited membership and a Secreteriat. This particular feature, ie, deepsea mining, of the UNCLOS III was the one most objected to by the US, and the US, along with three other States, delined to sign the Treaty. It is not now clear how deepsea mining under international supervision will actually take place in the future.

[7] However, strategies for exploitation, protection and management developed for temperate zone, developed countries are generally inappropriate for these tropical, developing nations, and new methods must be found.

expansions, wastewater discharge outfalls, waste disposal installations, cannery discharges, intensive mineral mining ventures, inappropriately located and scaled tourist facilities and poorly planned urbanization. As Ray Fosberg warned,

> Maybe you can afford to make a mistake on a continent. The thing you damage or destroy probably exists in two or three other places but almost every island has something unique on it. Anything you do on an island makes a difference. You just can't always tell what the difference is going to be.[8]

For the Western Indian Ocean island States, and most other island States as well, there is a general lack of awareness about the potential value and importance marine resources can provide. Further, in some states the people themselves, particularly those living in the hinterland, have little knowledge or interest in coastal or ocean resources. Ocean resources are not generally identified as resources for development in government planning, and governments do not allocate adequate research and development funding in the area. In fact, better planning and management of ocean resources has been viewed as,

> ...an orderly attempt to gain a degree of internal control over one area of the domestic domain that is still amenable to public intervention...[9]

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[8]Quoted in Gosnell, M, "The Island Dilemma", International Wildlife, 6 (5), 1976.

[9]Elroy, J L, "Economic and Social Impacts of the Virgin Islands Coastal Zone Management Program", U S Virgin Islands Planning Office, 1978, quoted in Towle, E L, The Island Microcosm", Washington, DC: Island Resources Foundation, 1974, p116.

Although there is some cooperation now, in general there has been little regional or international coordination and sharing of knowledge. Further, until quite recently there has been scant assistance from international development agencies. As Towle points out, a 1974 UNCTAD study devoted to the special problems and characteristics of "Developing Island Countries" devoted only two paragraphs out of 44 pages to exploiting and managing marine resources. In 1975 a UN/ECOSOC study also devoted only two paragraphs (out of its 26 pages in its study on special problems of developing island countries) on coastal management and development. However, during the 1970s, the UN Ocean Economics and Technology Office and UNESCO's Man and the Biosphere Program and its Marine Science Division did make worthwhile contributions to coastal and marine resource development/management issues in developing island states.[10] Other UN family members, including UNDP, UNIDO, UNEP, UNITAR, UN/DIESA, IMO, FAO, UNCTAD, IOC, and the World Bank have begun to recognize the importance of ocean resources and have instigated independent or joint programs to address key issues.

Nevertheless, while islands' coastal and marine zones are highly vulnerable ecologically, and the island states governments perhaps are not always aware of their value, they present some of the best potentials for growth and development. [11] Marine resources are important, indeed, essential. And, unlike the case of large, inland states, marine resources play an

[10]Towle, E L, The Island Microcosm", Washington, DC: Island Resources Foundation, 1974, p118.

[11]For a more detailed, and persuasive argument along these lines, see in particular Towle, E L, "The Island Microcosm", Island Resources Foundation, Washington, DC, 1984. Some of this chapter owes its inspiration to that excellent study.

instrumental role in the national economy as a whole, especially given the important forward and backward linkages and multipliers involved.[12] These linkages should be kept in mind when reviewing the country surveys found in the next chapter. Such 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 coral sand and block for construction use, fish processing; and,
> --Demand, where incomes generated by marine/coastal related industries stimulate increased demands for consumer goods and services.[13]

Besides providing resources for small and medium scale industry, better utilization of ocean resources are important for overall sustained economic growth and development. 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;

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[12]As mentioned in Towle's work, it is sometimes difficult to factor out the significance of ocean resources in a country's GDP, as national accounts are generally kept by economic sector, rather than by functional or spatial breakdown. For the most current methods and models of appropriate analysis, see Pontecorvo, G, et al, "Contribution of the Ocean Sector to the United States Economy", Science, 208:1000-1006, 1980.

[13]For details of this analysis, see Towle, E L, "The Island Microcosm", Washington, DC. Island Resources Foundation, 1984, p121-124.

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

--foreign exchange earnings, with increrased revenues from off-shore minerals, energy and tourism;

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

--self esteem, as people learn the importance of their natural physical and human rescurces, and how the marine sector relates to them; and,

--economic self sufficiency, as less imports are needed, either as food or as inputs for some industrial activities.

This study will provide a brief overview, or survey, of each island State in the Western Indian Ocean, and discuss potentials for better utilizing their marine resources for economic growth in general and as a potential base for industrialization in particular. This study is a "survey", and it is not intended to offer detailed analysis or prescriptions or blueprints for improving the utilization of marine resources for all these states; much more research is needed for that task. Rather, it will offer, in one place, an overview of the problems and some suggestions as to how these island nations could work individually and on a regional level to find ways of better utilizing their marine resources.

II. Prospects for Utilizing Marine Resources in the Western Indian Ocean Region

The prospects for the five states to better utilize their marine resources as a base for industrialization are mixed.[1] For the near and medium term, the prospects appear quite good. For the longer term, the prospects are less certain.

For the short term, the individual island States will most likely focus their efforts on fisheries (improving processing, marketing, gear and technology and manpower training). While there could be some areas of regional cooperation, most of these activities will most likely be carried out individually. For the medium term, the States might consider more concrete moves into light and medium scale manufacturing (particularly better utilizing more local resources as basic components in the construction industry, pharamacuticals, local cottage industry and cooperatives development). Again, while there will be some potential for collaboration between States, most of these activities will be done independently. For the long term, these island States will most likely turn to more distant off-shore resources in their EEZs (including energy production from waves, OTEC and oil exploration, deep sea nodules and other deep sea minerals). All of these activities are expensive, and would almost, by their very nature, require a degree of regional cooperation. Even with such cooperation, and with the support of the international community, these States must realize the problems associated with recovering such resources in their EEZs and much

[1] For an excellent survey and overview of some 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.

work will need to be done before they realize significant results from their efforts.

Nevertheless, with the opening of over 1.5 million square nautical miles of EEZs, the potential for the longer term (ie, past the year 2000) is astonishing. There are a number of different resources, some mentioned previously, which would be appropriate for exploitation on a unilateral or multilateral (ie, regional) basis. Development of some of the following sectors could be pursued by any, all or any combination of the five states under study here.

MINERALS

Although little is now known about the location and exact amounts or types of minerals, the region has mixed potential for mineral exploitation. Within the 200 mile EEZ of most of the five states, there are a number of important mineral deposits, found primarily in the silt sediments (some as much as 100 meters thick), 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 at relatively shallow depths. Seychelles has tried to identify offshore deposits of limestone. The saltwater contains exploitable minerals, and some 14 million tons (or 8 percent of the world's total) salt production comes from the Indian Ocean. However, with the exception of oil and gas, the potential for most of these mineral as resources to form bases for industrial processing or refining and other uses in the five states is probably not high. The problem, of course, is the fact that the exorbitant costs off-shore exploration and exploitation will make the chances of successful economic uses for them poor in the short term.

Further, such offshore materials as manganese nodules[2] or polymetallic sulfides will also have to wait until the costs of exploration and exploitation become more moderate, or until a successful "Enterprise" operation under the UNCLOS III (or some national or private sector deep sea ocean mining venture) comes into being, neither of which events appears likely to occur within this decade. Perhaps the most promising short term marine minerals would be marine salts and possibly oil and gas, all of which might be able to support local refining and value added components to lessen foreign exchange losses due to currently high imports.

Regardless of the problems of marine minerals exploitation (at least for the short term), the countries should nevertheless continue their exploration and assessment efforts. Increased cooperation with the private sector and international development agencies appear to remain key to this process.

Fisheries

Fishing is an important tradition in most of the five states under study. Marine fisheries play an important role in all of the economies, except for 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 percent of the fish caught in the region, however, is by the African mainland states.[3] Processing of fish by the island states is minimal: more than half is marketed fresh off the boats, perhaps one third is cured by smoking or drying, another

[2]These nodules form at depths of 3.5 to 5 kilometers. The principle elements contained in these nodules include manganese (14.7%), iron (13.5%), nickel (.4%), cobalt (.3%), and copper (.2%). The manganese content is a bit higher in the nodules found in the eastern part of the region, and lower in the northwest.

[3]See Table59.

5 percent is processed for fishmeal, 5 percent is frozen and 1 percent is canned. Thus, one of the region's most obvious marine resources for current and long term expansion is marine fisheries. While there have been inadequate stock assessments in the region, more assessments and research are being conducted under the FAO Indian Ocean Regional Fisheries Project (based in Seychelles). Additional research is needed, however.

The expansion of this industry will depend on the successful integration of government support of the capital-intensive, "modern" commercal/industrial fisheries, and the labor intensive, "traditional" small scale fishermen. Increases in certain species, by using "fish aggregating devices" and finding ways to protect breeding habitats is highly 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.[4] Such efforts should also include improving navigation and safety. Emphasis will also have to be placed on marketing research (potential for expansion within the countries, between the countries and with the rest of the world), storage and processing. In fact, much of the modern fishing fleets retain freezing/processing units outside the jurisdiction of the island State, thus depriving that state of any value added by the processing.

[4]For example, it is estimated that as much as 400,000 tons of sharks could be harvested annually in the western part of the Indian Ocean.

AQUACULTURE AND MARICULTURE

Aquaculture and mariculture are still in their early stages of development worldwide, although several developing countries (eg, Ecuador) have had good success. The Indian Ocean island states have climates for virtually year-round grow-outs, although there is limited land area available in every state except Madagascar. Nevertheless, aquaculture could prove important in improving general living and nutrition standards, employment, and in strengthening the economy by increased foreign exchange earnings.[5] Certain species (eg prawns) could be cultivated for the growing demand caused by tourists. Thus, it is important that every state in the region continue to consider increasing its research and development efforts toward finding suitable species and processes.

ENERGY

The region exhibits some characteristics for potential energy production. There are some places which have the necessary conditions for developing ocean thermal energy conversion (OTEC)[6], although the current level of practicality in other areas of the world would indicate the possibilities for immediate or short term development would be mixed. Nevertheless, Seychelles has investigated using a small OTEC plant located about 60 km

[5]For example, in Mauritius the large sugar estates have decided to diversify into aquaculture in an effort to become less dependent on a single crop, ie sugar, whose fluctuating prices that depend so much on events over which Mauritius has little control. Mauritius did produce some 18 tons of prawns in 1980.

[6]A temperature differential of 20 Celsius degrees over a depth of 1,000 meters is considered technically adequate for OTEC. Such a tempature differential between the sea surface and the 1,000 meter depth is found in many places in the Indian Ocean between 20 degrees north and 20 degrees south. Thus, the geographical distribution of this thermal resource suggests that OTEC should be investigated by the states under consideration in this study.

southwest of Mahe, the capital island tethered at the edge of the continental shelf, which is hoped would supply some 20MW, equal to about the total electricity consumption of the main island. Several of the States, including Seychelles and Madagascar in particular have off-shore oil and natural gas potential. In fact, 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 electrical generation from wave action; occasional high waves and cyclones may preclude commercial development of this option in the area, however.

Shipping & Ports

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. However, the sector has not received the attention it deserves. There has been little investment in small boat building or 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 as opposed to more economical containerized cargo facilities.[7] However, break-bulk facilities do encourage more labor intensive activities, adding to employment potentials. The region needs to find ways to economically revitalize some of

[7]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.

the smaller ports to spread the national economic development more evenly across the respective States.

TOURISM

During the past ten-fifteen years[8] tourism --based primarily on development of sites in the coastal areas-- has virtually changed the nature of the economies of three of the five states in the region. In fact, for Seychelles and Maldives, tourism quickly became the states' major sector, largest single employer, and largest contributors of foreign exchange. Most importantly, marine/coastal-based tourism could well become the region's major sector over the next decade. Madagascar and Comoros have not yet had the success of Maldives, Seychelles or Mauritius in attraction foreign visitors to their coastal areas, although the potential is there. Unfortunately, the five states essentially compete with each other for primarily Western European tourists, who come for the pristine beaches and excellent climates. The region also competes against closer destinations in the Mediterrean, and in the Caribbean. To remain competitive, the Indian Ocean island states realize they will have to maintain strict ecological standards against unwise exploitation of their coastal areas. The countries should also consider regional cooperation in tourism development.

[8]Most of the airports capable of handling large jumbo jets were only built in the early 1970s, thus ending the "isolation" from the rest of the world, at least as far as tourism goes. Tourism in most states went from a very low level before the airports were built to several thousands in less than a year.

III. Comoros

A. Socio-Economic Trends

The Federal and Islamic Republic of the Comoros consists 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] Situated halfway between the equator and the tropic of Capricorn, Comoros has a tropical marine climate, subject to severe cyclones and long droughts.

Comoros has a population of over 350,000, and with over 350 people per square kilometer 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 percent annually), and an influx of Comorans formerly residing in Madagascar and East Africa.

The country is isolated and is one of the poorest in the world, with a per capita income of less than $350. Its GDP in 1984 was about $91 million, almost doubled its 1980 GDP (at market prices). Health conditions on the islands are inadequate and malnutrition, particularly protein deficiency, is widespread. The country is poor in natural resources. For example, less than one half of its total land area is suitable for agriculture. Because of their volcanic origins, above ground permanent water courses are virtually non-existent (especially on Grande Comore), despite fairly abundant rainfall. There are few marine resources. Inshore fisheries are poor, and there is no

[1]The Comoros Archipelago is comprised of 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 comprised of Grande Comore, Moheli and Anjouan, and all data and statistics refer only to there three islands, unless otherwise specified.

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 economy depends on a few export agricultural commodities, whose prices fluctuate widely. Finally, manufacturing and tourism are in the most early stages of development.

Directly following independence, Comoros entered a period of acute recession, from which it is only now beginning to slowly emerge. Its GDP has continued to climb, although only slightly, from Cf 26.7 million in 1980 to some Cf 31.4 million in 1984. Such increases, however, cannot keep pace with the rapid population growth mentioned above.[2] Further, there have also been dislocations resulting from continued volcanism on Grande Comore.

B. Economic Structure: Resources and Manufacturing

The Comoran economy is not diverse, consisting principally of small-scale agriculture. The most important sector in the Comoran economy is agriculture: some 80 percent of the people are directly dependent on agriculture for their livelihood. Agriculture is also responsible for virtually all export earnings and contributes nearly 40 percent of the country's GDP.[3] However, food production cannot keep up with the population growth, and Comoros is forced to import substantial amounts of foodstuffs annually.

The agricultural sector consists of export crops and food production. The major export crops are vanilla, copra, cloves and ylang-ylang (a tree whose

[2]See Table 1.

[3]For a breakdown of GDP by sector of origin, see Table 2.

flowers are distilled for a perfume base).[4] These commodities are subject to wide price fluctuations: vanilla prices (per kilogram) have fluctuated from Cf 14,846 in 1980, down to Cf13,556 in 1981 and up to an estimated Cf26,000 in 1984; copra from Cf 100 in 1980 to Cf97 in 1982 to Cf 120 in 1984; cloves from Cf1,523 in 1980 to Cf2,200 in 1984; and ylang-ylang from Cf18,500 in 1980, down to Cf17,500 the next year, and up to an estimated Cf20,500 in 1984.[5] Although these prices have recently shown a general upward movement, they are also subject to physical constraints (cyclones and drought), and man made constraints (ie, world demand), both over which Comoros has virtually no control. The major food stuffs grown are coconuts, bananas, rice, cassava and maize. Comoros also has some animal husbandry, representing about 12 percent of agricultural value-added.[6] Serious constraints, including lack of fresh water and poor volcanic soil, limit the growth of Comoros herds.

There are about 7,000 artisanal fishermen (from about 140 villages) in Comoros, who fish mostly along the coast for their and their famlies' own consumption. Total fish production has remained at about 4,500 tons annually. 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). These fishermen operate some 2,800 boats, primarily dug-outs powered by sail (outriggers) or row-boats (about 3 percent are motor powered). Fishermen in these boats catch an average of 15 kg per

[4]Comoros is the world's largest producer of ylang-ylang, and the world's second largest producer of vanilla, after Madagascar.

[5]See IMF, Comoros: Recent Economic Developments, Washington, DC: IMF (SM/85/46), 1985, p9.

[6]See Table 3 for the production of beef, fish and dairy products.

day, and make 100 trips annually. 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. Fishermen earn less than the official minimum wage, and they comprise one of the poorest and least socially respected groups in Comoros. The fisheries yield has remained low for a number of reasons: there are unfavorable hydrological conditions of the continental shelf upon which the islands rest which limit the number of fishing days of traditional vessels; there is a lack of adequate or appriopriate gear and equipment; and little cash is available to purchase the fish. This is compounded by a lack of storage, marketing and processing facilities. The result is that most fish is sold at the 150 or so coastal villages, consumed in the coastal zone, and most people in the uplands and further away from the ocean cannot obtain fish. There is no commercial fishing industry in Comoros presently.

Manufacturing

Manufacturing accounts for less than 4 percent of GDP, and employs some 800 people. Most manufacturing in Comoros consists of processing and distilling ylang-ylang, and preparing vanilla and copra for export. Export processing is done primarily by small farmers who use firewood for energy, which has caused serious problems with Comoros' forests. 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. Finally, there are also a number of small

enterprises (employing about 20 people each) including a small printing plant, a few bakeries and a small factory which makes plastic sandials.

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. The IMF concludes that the limited size of the Comoran market, a lack of trained personnel and the high costs of energy are the major constraints for further expansion of the manufacturing sector.[7] Nevertheless, 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.

C. Population and Employment

Comoros' population has increased dramatically since 1960, when the total population was under 200,000. By 1974 the country had 321,000 people, and currently the population is estimated at about 350,000. The World Bank estimates that by 1990 the population will have increased to 565,000 and by the year 2000, it will be nearly 800,000.[8] The growth rate accelerated from about 3 percent annually before the 1970s, and nearly 4 percent annually since then. This increase was the result of somewhat lower mortality rates, and the return of several thousand Comorans who were living in Madagascar and East Africa. If the trends continue, therefore, the population will more than double by the year 2000.

[7]See IMF, Comoros: Recent Economic Developments, Washington, DC: IMF, SA/85/46, 1985, p1214-15.
[8]Table 4.

The population of Comoros is young, and there is a high ratio of children to adults. About 45 percent of the population is under 15 years old, and about 65 percent is under 25 years old. Population pressures, already serious, will become acute as the government currently has no birth control or family planning programs.

Of the total work force of 120,000 (of which one third are women), about 80 percent are employed in agriculture, and the remaining 20 percent in the modern, cash economy. There are about 15,000 salaried workers in Comoros.[9] 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.

Inflation in Comoros has been moderate. People spend most of their income on food and clothing and these prices rose by 15 per cent in 1982, 8 per cent in 1983 and 7 per cent in 1984.[10]

D. Recent Development Planning and Policies

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

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[9]See Table 5.
[10]According to World Bank estimates.

--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 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 percent of the total expenditure), and general administrative (17 percent of the total).[11]

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 Printing Office; Petroleum Importing and Marketing Organization; Air Comoros; CREDICOM; and the National Bank of Comoros (the latter two having been replaced by the Development Bank and the International Bank

[11] See Table 6.

of Comoros, respectively). Internal distribution of goods has remained, by and large, in traditional channels.

The government established the Societe de Credit pour le Development des Comoros (CREDICOM) in 1974. From 1974-1977, the latest period for which data is available, CREDICOM made 1,076 credits worth CF 1,100 million. Most of these credits went to building materials and housing. Less than 2 percent went for fisheries and maritime transport.[12]

E. Prospects for Better Utilizing 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.

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 harvests 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 accessible to small motorized boats.

The most rapid way of increasing fish production would be to introduce industrial-sized, capital intensive boats. However, this method would by-pass 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.

[12]See Table 7.

Perhaps more appropriate would be a project Comoros tried some years ago. In 1977 a pilot project was begun, whereby a small motor boat was used to tow five outrigger canoes to the fishing areas. Some 15 of these motorized boats were to be distributed to cooperatives, but they were seconded by the military, as were several refrigeration units which were part of the project. This type of project should be tried again, and if successful, could also encourage the beginning of a small boat construction industry.[13]

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 amounts remain 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. [14] 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

[13]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-UNIDO/IO/R.56, Vienna, 1983, or Morales-Casoriz, A, "Ways and Co-Operation Procedures for Developing Shipyards and Mixed Enterprises to Ensure the Volume of Ships Required by the Area", UNIDO-ID/WG.375/35, Vienna, 1983.

[14]According to the World Bank. See World Bank, The Comoros: Problems and Prospects of a Small, Island Economy. Washington, DC: IBRD, 1983, p62 and also UNDIO, "Feasibility Study for the Establishment of an Integrated Tuna Fish Processing Industry: Mauritius". By Promopeche, Contract 69/4, nd.

production would be entirely for export, and would not be allowed to undercut artisanal fishing. This project has not been implemented. Implementation of such a project should be approached with caution, however. As a foreign exchange earning device, the project has merit. However, if the goal is to increase earnings of fishermen, and help solve the protein deficiency of poorer Comoroans, the project would probably not work well. The focus might 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. Such a project would entail a substantial "marine extension" component.

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 such use will cause erosion problems on the three islands, and destroy any possible potential for increased tourism. Extensive use can also damage the aquifer level, thus reducing fresh water supplies. Destruction of coastal habitats also reduces nursery grounds for commercially important species as well as habitats of subsistence fisheries.[15] Crushed lava could be used as a substitute for the marine materials, but several small crushers would be needed to process sufficient lava for building materials.

Due to its small size and location, Comoros is an isolated country. Grande Comoroe and Anjouan each have only one small artificial harbor, and large

[15]See DuBois, R and Towle, E, "Coral Harvesting and Sand Mining Management Practices", Washington, DC: Island Resources Foundation, 1985.

ships must anchor offshore and be serviced by small, wind-powered dhows, a process which is expensive and inefficient. 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. Comoros could also improve its inter-island transport system by upgrading the small boat fleet.

Table 1. Balance of Payments 1980-84
(Comoran Francs, 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, DC: IMF (SM/85/46), 1985, p72.

Table 2. Gross Domestic Product by Industrial Origin 1980-84
(Comorian Francs, millions -- 1980 prices)

	1980	1981	1982	1983	1984
Agriculture, live-stock, 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	6,499	[illegible]38	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	4,98[illegible]	5,227	[illegible],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, DC: IMF (SM/85/46), 1985, p63.

Table 3. Production of Fish, Beef and Dairy Products 1980-84
(In 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 liters)	637	637	637	637	637
Eggs ('000)	730	1,230	1,730	2,329	2,500

Source: IMF, Comoros: Recent Economic Developments, Washington, DC: IMF (SM/85/46), 1985, p64.

Table 4. Population Growth and Densities

A. Growth

	1966	1980	1990	Av An Growth (1966-1980)
TOTAL	212,298	346,992	565,192	3.6%
Grande Comoros	118,924	192,1	--	3.5%
Anjouan	83,829	137,621	--	3.6%
Moheli	9,545	17,194	--	4.3%

B. Densities

	Per km^2	Per km^2 of Cultivable land
TOTAL	154	331
Grande Comoros	143	410
Anjouan	285	448
Moheli	59	100

Note: Data for 1990 are projections from the World Bank.

Source: UNDIO, Federal and Islamic Republic of the Comoros: Survey of Selected Economic Sectors, World Bank/UNIDO Co-Operative Programme, UNIDO/IO.520, 1982, p73 and World Bank, The Comoros: Problems and Prospects of a Small, Island Economy, Washington, DC: IBRD, 1984, p6 and 112.

Table 5. Employment (1980)

Sector	Number Employed	Percent 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: UNDIO, Federal and Islamic Republic of the Comoros: Survey of Selected Economic Sectors, World Bank/UNIDO Co-Operative Programme, UNIDO/IO.520, 1982, p72.

Table 6. Government Expenditure
(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%)

(Amounts are budgeted, not necessarily actual expenditures.)

Source: World Bank, The Comoros: Current Economic Situation and Prospects, Washington, DC: IBRD, 1983, p79.

Table 7. Credits Awarded by CREDICOM*

	Number of Credits	Value (CF Millions)
Agriculture	10	37
Fisheries & maritime transport	19	8
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

*= Societe de Credit pour le Development des Comoros.

Source: UNDIO, Federal and Islamic Republic of the Comoros: Survey of Selected Economic Sectors, World Bank/UNIDO Co-Operative Programme, UNIDO/IO.520, 1982, p39.

IV. Madagascar

A. Socio-Economic Trends

The Democratic Republic of Madagascar, located some 300 km east of Mozambique, is a large country (somewhat more land area than France), has a population of about 9.5 million (with a growth rate of 2.8 percent), and a variety of natural resources. Combined with an industrious labor force, this diversified resource base should have provided sustained economic growth and development during the two decades since independence.

However, Madagascar is one of the world's poorest countries, and real GDP was about the same in 1983 as it was in 1973, while GDP per capita actually fell by some 30 percent during the decade.[1] About half of the population exists below the poverty line, and more than 85 percent of the national labor force is employed in the agricultural sector, which contributes some 40 percent of GDP.[2] Madagascar's balance of payments has remained negative for several years. While its current accounts deficit improved from -SDR461 million in 1980 to -SDR262 million in 1984, its overall balance has declined from -SDR176 million to -SDR198 million over the same period.[3]

Madagascar's natural resources are generally underutilized, and plainly so with regard to its marine resources. While it has several coastal cities (indeed, about half of its major cities are port cities, or located along the coast), Madagascar has done little to plan for economic development in, or off

[1] Madagascar's GDP per capita is less than $300. See Table 8 for recent GDP growth rates.
[2] See Table 9.
[3] See Table 10.

its coastal zone. Many of these coastal cities and towns are remote, and transportation (other than expensive air service) into the interior is poor.[4]

B. Economic Structure: Resources and Manufacturing

Madagascar has the potential for a diverse economy. Currently, however, the major sectors are agriculture, and to a lesser extent, mining and manufacturing.

Agriculture

In many ways, agriculture is the most important sector of the Malagasy economy. However, its 40 percent share of GDP does not reflect its true importance: about 85 percent of the population is engaged in crop farming, animal husbandry, fishing and allied activities, and agriculture is the largest source of foreign exchange (about 85 percent 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.

Rice is the most important food crop, accounting for about 50 percent of the total land area under cultivation. It is the staple of the diet, and nearly 70 percent of the population grows rice. Madagascar's other major food crops include maize, fruits, potatoes, beef, pork, poultry and fish.[5] Output of these crops generally increased (albeit very slowly) during the mid and late 1970s. The major cash crops are coffee, cloves and vanilla, while cotton, sugarcane and groundnuts are of less importance. Output of these crops stagnated during the late 1970s and early 1980s, due to a number of reasons:

[4]The Pangalanes Canal runs along the eastern coast and could provide excellent intra-coastal transportation, but it has fallen into disrepair in most parts.

[5]See Table 11 and Table 12 for recent agricultural production.

unfavorable weather conditions (including three hurricanes), the deteriorating transport system (and infrastructure in general), shortages of important inputs (due to a foreign exchange crisis), and inappropriate government pricing and marketing policies.

Fisheries

Madagascar's marine fisheries are generally underexploited, and offshore fishing potential is estimated by the World Bank at 150,000 tons per year, with higher value crustaceans potentially providing an additional 8,000 tons annually. There are about 11,000 full-time traditional fishermen who use about 7,000 dugout canoes. In the modern sector there are about 650 fishermen who use 62 motor boats and 42 trawlers.[6] Capital-intensive commercial maritime fishing is conducted by four joint venture companies, which operate along the northwest coast and provide most of the fish for exports. The volume of saltwater fish harvested has grown by some 40 per cent since 1981, becoming an increasingly important source of foreign exchange earnings.[7] Further, the government is developing joint venture arrangements with other foreign partners to diversify the kinds of species caught (eg, it could begin a tuna industry[8]) and improve its current performance.

Mining

[6]For a complete description of the fishing industry, see FAO, SWIO Fisheries Bulletin, Victoria, Seychelles, nd, "Fishing Country Profile: Madagascar".

[7] Fish exports amounted to $27 million in 1980. Also, see Table 12 and Table 13.

[8]Such a development could also lead to beginning a tuna processing industry. See for example, UNIDO, "Feasibility Study for the Establishment of an Integrated Tuna Fish Processing Industry: Mauritius", by Prompeche, Contract 69/4.

Madagascar has significant mineral deposits, the most important being nickel, bauxite, chromite and graphite. Oil exploration is being conducted in the eastern part of the country, but there has been limited off shore exploration for oil or other minerals.[9] Mineral production for export has declined in recent years, and exports for 1983 were only 62 percent 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. All the large industrial enterprises are majority-owned by the Madagascar Government.[10]

In 1979 manufacturing output reached a peak of 19.3 percent of real GDP, but has declined since (both in relative and absolute terms) because of the lack of imported inputs. However, in 1983 industrial output increased by some 3.5 per cent, despite shortages of imported materials and spare parts, difficulties in obtaining local inputs and poor transportation. The increase was led by food processing (13 per cent increase) and textile industries (5 per cent increase). Several sub-sectors declined in 1983. One of the largest declines has been in petroleum processing (a 44 per cent decline in 1983), following the refinery closing due to an industrial accident.

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[9]Amoco's is the major oil exploration effort currently being done in eastern Madagascar.

[10]There are several excellent analysis of the industrial sector. For example, see David, C, "Rapport preliminaire: Regime fiscal et developpement industriel a Madagascar, Vienna: UNIDO, 1984 or UNDP/UNIDO, "L'industrie Malagache: Analyse du fonctionnement et propositions d'action", Vienna: UNIDO, DP/MAG/81/018, 1982.

Industrial capacity utilization fell from 73 per cent in 1979 to about 50 per cent in 1980. This decrease was a result of the Government's decision to allocate scarce foreign exchange toward the more effecient enterprises, and with a priority toward rehabilitating existing capacity rather than toward capacity expansion.

The IMF concludes that the industrial sector will continue to grow, but will be hampered by a shortage of raw materials and spare parts caused by inadequate foreign exchange.[11] The Government is revising its Investment Code for industry which should improve the level of foreign investment. Finally, in an effort to make the manufacturing sector more stable and viable, the Government has also relaxed controls over prices for a number of industrial products.

C. Population and Employment

Madagascar's population has doubled since 1950, from 4.6 million people to 8.7 million in 1980. By the year 2000, the population will have more than tripled the mid-century number, to an estimated 15.9 million. Additionally, the numbers of people moving to the urban areas will also increase; in 1960 only 11.1 percent of the total population was "urban", as opposed to 17.6 percent in 1980 and an estimated 26.7 percent in the year 2000.[12]

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[11] IMF, Madagascar: Recent Economic Developments, Washington, DC: IMF, SM/84/218, 1984, p13.

[12] See Table 14.

Most of the working population (about 88 percent) is engaged in agriculture, some 4.08 million people of a total labor force of 4.7 million.[13] Interestingly, from 1980 to 1983 the proportion of the working force engaged in agriculture declined by about one half of a per cent, while agriculture's contribution to real GDP increased from 37 per cent to 42 percent. Industry employs .69 million people or about 1.5 per cent of the total.

Madagascar's consumer price index has increased rapidly during the past few years. Using 1972 as equaling 100, the general index more than doubled from 221 in 1980 to 452 in 1983.[14] Food consumption per head has generally declined during the past few years.[15] For example, rice consumption, the main staple, has fallen from 135 kg per person in 1962 to 120 kg per person in 1978; meat declined from 30 kg p/p to 20 kg; bread from 12 kg p/p to 10 while fish remained at 3.5 kg p/p.

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 (and thus lower unemployment). The final phase (1993-2000) is projected toward growth and expansion, with greater industrial development, rising living standards and full employment.

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[13]See Table 15.

[14]See Table 16.

[15]These statistics are for the capital, Antananarivo, and data for other parts of the country are not available. See Table 17.

Since 1983, Madagascar has moved toward greater encouragement of the private sector, and has been promoting industry as fundamentally supportive of agriculture. Investment has also been geared more heavily toward agriculture, after comparative neglect before the late 1970s. Madagascar has done very little planning in its marine sector.

Government expenditures have gone overwhelmingly toward the social services (including national health and education) and public administration, which, combined, totaled MFG 120.9 billion (or over 80 percent of total government expenditures) in 1984.[16]

E. Prospects for Better Utilizing Marine Resources

As discussed above, for a variety of reasons, Madagascar has suffered significant declines in food consumption per head since independence. Perhaps the most obvious need is to find ways of increasing its domestic food production for local consumption. One way to do this is to strengthen the artisanal fisheries sector.[17] Another way would be to establish a viable alternative fishing industry, concentrating on currently underutilized species, for example, tuna.[18] Further, in an effort to increase protein for most of the population, Madagascar could consider launching an intensive

[16]See Table 18.

[17]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 Malegaches", UNDP Report, December 1982.

[18]Of particular interest is UNDP, "Project de Prospection des Resources Pelagiques", DP/MAR/77/009, nd and UNDP, "Developpement des Peches Maritime: Madegascar, Conclusion et Recommendations", FI-DP/MAR/80/008, nd.

aquaculture or mariculture program, initially using lessons learned in other LDCs.

Another equally important task facing the government is to produce a detailed survey of its marine resource, particularly those lying off-shore. Currently, very little is known about such resources. Its recent symposuim on marine resources is a step in the right direction, but more detailed work will be essential.[19] Madagascar could take advantage of satellite technology for extensive surveys.

Madagascar has little tourism now, and has only one coastal resort, located at Nosy-Be on the north-western coast.[20] It could consider developing more of its beautiful coastal regions to tourism, and try to utilize local marine resources to sustain the industry; for example, producing such items as food for tourists.

With internal transportation at such a low level, every effort should 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 percent of total maritime freight traffic in 1978.[21] The Pangalanes Canal, which is now virtually unutilized (except in a few isolated locales) should be considered as a means of [illegible]ing transportation along the eastern coast. The canal could have other potential uses. For example,

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[19]"Connaissance et mise en valeur des ressources biologiques aquatiques a madagascar", Dec 19, 1984- Jan 19, 1985, Centre d'information, French Mission of Cooperation, Antananarivo.

[20]Because of high costs and low volume of tourists, the principal resort, a Holiday Inn runs at approximately 5 percent of capacity, according to the US Embassy in Antananarivo.

[21]See Table 12.

unused parts can provide excellent wildlife habitats or marine impoundments, which could be used as bases for aquaculture development. Further study is needed to detail what level of disrepair the canal is currently in, and to offer suggestions as to how it could be repaired and better utilized.

Further, Madagascar could better utilize its existing natural resources for industrial use, for example, cement production.[22] Madagascar could also begin producing more of its salt needs from local materials.[23]

Finally, Madagascar's use of its marine resources as a base for industrial development will probably have to wait for the longer term. However, this in no way should discourage Madagascar from investigating all its options with regard to coastal and ocean resources.

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[22]Several studies have been done on improved cement production, including most recently Horvath, Kosteiny and Mikula, "Cement Plant in Ambania, Madagascar: Feasibiliyty Study", UNIDO: Vienna, SI/MAG/82/801, 1983. Methods using coastal resources should also be examined in more detail.

[23]See for example, Mannar, M G V, "Guidelines for the Establishment of Solar Salt Facilities from Seawater, Underground Brines and Salted Lakes", UNIDO-UNIDO/IS.330, Vienna, 1982.

Table 8. Gross Domestic Product 1980-84
(FMG Billions, current price)

	1980	1981	1982	1983	1984
GPD	690.0	789.0	995.6	1,221.0	1,438.9

*Note: 1984 data is estimated.

Source: International Monetary Fund, Madagascar: Recent Economic Developments, Washington, DC: IMF (SM/84/218), 1984, p65.

Table 9. Major Sectors of the Economy
(Percentage of Total GDP)

	1980	1981	1982	1983	1984
Agriculture	37.0	39.0	41.0	42.0	41.0
Industry	20.0	17.0	15.0	15.0	16.0
Services	38.0	40.0	41.0	40.0	40.0

Data for 198- are estimates.

Source: International Monetary Fund, Madagascar: Recent Economic Developments, Washington, DC: IMF (SM/84/218), 1984, p2.

Table 10. Balance of Payments 1980-84
(SDR Millions)

	1980	1981	1982	1983	1984
Overall Balance	-176	-109	-123	-248	-198
Trade balance	-387	-234	-197	-137	-91
Exports, fob	335	282	303	298	315
Imports, cif	-722	-516	-500	-424	-406
Services and transfers	-74	-126	-132	-159	-171
Current accounts	-461	-360	-329	-296	-262

Data for 1984 are estimates.

Source: International Monetary Fund, Madagascar: Recent Economic Developments, Washington, DC: IMF (SM/84/218), 1984, pv.

Table 11. Agricultural Output 1970-77
(FMG Millions, Current Prices)

	1970	1972	1974	1976	1977
TOTAL GROSS OUTPUT	100,092	119,252	187,043	205,890	232,608
Cereals	30,294	32,463	64,214	66,042	76,473
Starchy foods	9,292	11,321	13,132	20,471	21,406
Vegetables	2,994	4,196	5,643	6,570	7,603
Fruits	2,943	5,256	9,622	8,053	10,458
Cash crops	20,740	20,264	28,918	33,241	35,588
Livestock	25,599	33,098	40,258	42,696	47,181
Fisheries	2,986	3,879	5,617	5,329	6,551
Forestry	7,596	12,288	18,639	23,488	27,348

Cereals include rice and maize.
Starchy food includes potatoes and cassava.
Fruits include bananas and citrus foods.
Cash crops include cloves, coffee, seed cotton, groundnuts, pepper, sisal, sugar cane, tobacco, vanila.
Livestock includes beef, pork and poultry.

Source: World Bank, Madagascar: Recent Economic Developments and Future Prospects, Washington, DC: IBRD, 1980, p114.

Table 12. Livestock and Fisheries Marketed Output 1980-84
(In tons)

	1980	1981	1982	1983	1984
Cattle					
(1,000 head)	95	41	28	8	--
(ton equiv)	9,050	3,880	2,680	743	--
Shrimp	4,270	3,150	5,895	5,907	6,205
Crabs	435	480	520	490	490
Saltwater fish	7,830	6,660	8,000	8,859	9,150
Freshwater fish*	10,400	10,660	12,000	12,800	13,000

*= Fish marketed by the modern sector.

Source: International Monetary Fund, Madagascar: Recent Economic Developments, Washington, DC: IMF (SM/84/218), 1984, p67.

Table 13. Salt Water Fisheries (Marketed Catch) 1970-77
(Metric tons)

	1970	1972	1974	1976	1977
Fish /1	1,838.9	8,482.7	13,197.3	4,683.6	3,948.2
Shrimp /2	4,370.4	3,236.1	5,172.3	644.7	4,453.1
Crabs	179.9	141.2	380.0	523.3	560.7
Crayfish /3	69.9	45.6	132.0	40.2	106.2
Other /4	60.4	184.8	397.5	61.8	223.2
Total	6,546.3	12,090.4	19,279.1	5,953.6	9,291.4

/1=Fresh, dried, salted or smoked.
/2=Fresh or frozen.
/3=Alive or frozen
/4=Oysters, mussels, octopi, turtles, etc.

Source: World Bank, Madagascar: Recent Economic Developments and Future Prospects, Washington, DC: IBRD, 1980, p112.

Table 14. Population Growth

	Total Pop ('000)	Urban Pop ('000)	Urban as % of Total
1950	4,620	na	--
1960	5,481	610	11.1
1970	6,759	1,006	14.9
1980	8,744	1,544	17.6
1990*	11,755	2,515	21.4
2000*	15,966	4,100	25.7

*= Projections.
Note, urban population = towns over 5,000 inhabitants.

Source: World Bank, Madagascar: Recent Economic Developments and Future Prospects, Washington, DC: IBRD, 1980, p68.

Table 15. Employment 1980-83
('000)

	1980	1981	1982	1983
TOTAL LABOR FORCE	4,375	4,431	4,536	4,660
Agriculture	3,893	3,882	3,997	4,086
Industry	66	69	67	69
Construction	37	40	37	40
Commerce, banking and insurance	100	103	100	108
Transport and communications	32	33	30	32
Administration	144	153	158	160
Other	139	151	167	165

Source: International Monetary Fund, Madagascar: Recent Economic Developments, Washington, DC: IMF (SM/84/218), 1984, p72.

Table 16. Consumer Price Index 1980-84
(1972 = 100)

	1980	1981	1982	1983
Food	238	315	413	480
Fuels	213	285	379	411
General Index	221	288	379	453

Source: International Monetary Fund, Madagascar: Recent Economic Developments, Washington, DC: IMF (SM/84/218), 1984, p22.

Table 17. Food Consumption per Head (in Antananarivo) (kg)

	1962	1978
Rice	135	120
Roots & tubers	5	12
Bread	12	10
Meat	30	20
Fish	3.5	3.5
Fruits	18	16
Vegetables	30	35
Sugar	8.5	7
Edible oil	2	2
Salt	4.5	5

Source: World Bank, Madegascar: Recent Economic Developments and Future Prospects, Washington, DC: IBRD, 1980, p217.

Table 18. Government Expenditures 1980-84
(FMG Billions)

	1980	1981	1982	1983	1984
Public Administration	47.3	51.1	52.8	56.2	62.9
Economic Services	12.4	11.1	12.5	10.8	14.6
agriculture	6.0	4.4	5.5	5.6	5.3
public works	2.6	1.9	2.3	2.4	3.4
Social Services	43.3	38.7	46.1	54.4	58.0
national education	31.4	30.5	35.4	42.1	37.2
health services	10.3	6.8	9.0	10.7	10.6
Other	8.7	10.5	15.0	14.5	16.4
TOTAL	111.7	111.4	126.4	136.0	151.9

Note: 1984 data is estimated.

Source: International Monetary Fund, Madagascar: Recent Economic Developments, Washington, DC: IMF (SM/84/218), 1984, p76.

Table 19. Maritime Freight Traffic 1960-78
(Thousand metric tons)

	1960	1965	1970	1975	1978
Total traffic	1,010	1,331	2,462	2,779	2,291
Coastal traffic as % of total	325	456	658	774	753

Source: World Bank, Madagascar: Recent Economic Developments and Future Prospects, Washington, DC: IBRD, 1980, p123.

V. Maldives

A. Socio-Economic Trends

The Republic of Maldives, an archipelago of 1,201 tiny coral islands extending over 820 kilometers in a north-south direction, is located about 650 kilometers southwest of Sri Lanka and southern India. Maldives is isolated, small (with only 298 square kilometers of land), densely populated (over 500 people per square kilometer) and one of the poorest countries in the world. Maldives is an open economy; in 1983 merchandise imports were equivalent to 83 percent of GDP, and merchandise exports equal to about 29 percent of GDP. It is not endowed with many natural resources, and its economy is centered on tourism and fishing.[1] Nevertheless, Maldives depends on marine resources as much as, if not more, than virtually any other country.

Although Maldives is a poor country, it has made impressive economic achievements, especially during the last five years. From 1978-82, strong economic growth was led by the rapid development of fishing and tourism, as well as an acceleration in public sector investment in infrastructure. For example, during that period, real GPD increased at 12 percent per year, and per capita GDP at nearly 10 percent.[2] Total employment from 1978-80 also grew, by about 3.5 percent annually, keeping pace with the labor force's growth rate.

B. Economic Structure: Resources and Manufacturing

[1] Maldives has resources in its 200 mile EEZ, but there have been only a few resource surveys thus far. There has been limited oil exploration efforts, but the company involved found that the surveys indicated it would not be cost effective to drill.

[2] See Table 20.

The Maldivian economy is not diverse. The major sectors of the economy are fisheries and services (ie, tourism).[3]

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 percent of the employed labor force are working as fishermen, or in related activities such as drying, salting and canning fish, and in boat building and maintenance. Further, the growth of tourism has led to labor migration from fishing areas to the capital of Male for work in tourist-related activities and cargo handling.

The major fish for Maldives is tuna. During the early 1970s, Maldives progressively lost its major market (Sri Lanka) for dried, salted or smoked tuna 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 alternative (ie, non-Sri Lankan) markets. Also during that time the Maldives began a program to mechanize the fishing fleet (the dhonis), in order to better supply the foreign collector fleets. Indeed, the number of mechanized dhonis increased from 805 in 1980 to 1,306 in 1984.

During 1978-81 the volume of fish exports grew at an average annual rate of 7 percent, and the value rose by 25.5 percent annually. [4] Export prices are negotiated between the government and foreign collecting companies, and

[3]See Table 21 and Table 22.
[4]For more recent data, see Table 23.

prices are set depending on the weight of the fish (2 kg is the dividing point). 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.[5] Also during 1982 one of the foreign collecting companies (which had been handling some 30 percent 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 traveling out of familiar waters), shortages of diesel fuel plus fuel price increases, and inadequate offshore collector capacity. Indeed, the World Bank[6] 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); nearly Rf 1,000 in annual per capita wages (compared to about Rf 1,600 per capita actually obtained by them).

Maldives' major exports are various species of fish, primarily "skipjack", also known as "Maldive fish".[7] As mentioned previously, the price for export

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[5]See Table 24.

[6]World Bank, The Maldives: An Updating Economic Memorandum, Washington, DC: IBRD, Report Number 4445-MAL, 1983, p9.

[7]See Table 25.

tuna is set by the government, indeed, much of it is sold by the State Trading Organization.[8] 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.

Such fluctuations in Maldives fishing sector has caused the government to look at alternatives to stabilize and improve the sector, as well as to diversify.

Tourism

With the completion of the Hulele International Airport [9] in 1981 and the beginning of direct flights from Europe, tourism witnessed a spectacular rise: during the 1981/82 November-March high season, there were some 60 percent more tourist nights recorded than the previous year.[10] Even before the 1981 airport opening, however, tourism was showing impressive growth. Importantly, this growth coincided with the declines in the fishing industry. The annual number of tourists have more than doubled from 1980 to 1984, from 34,695 to 82,579, and their average length of stay has increased from 8.6 days to 10.9 days. Most importantly, tourist expenditures increased from $9.4 million in 1980 to $25.3 million in 1984.[11]

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[8] 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 percent share in the garment manufacturing operations. It is important in distributing most of the country's food items such as rice, sugar and wheat flour.

[9] The airport is located on a small islet approximately 1 kilometer from Male, the capital. Its links with Male are by boat.

[10] For a listing of "source" areas of Maldives tourists, see Table 26.

[11] See Table 27.

Tourism now plays a major role in the economy, contributing about 14 percent of GDP, with strong multiplier effects throughout the Maldivian economic system, particularly on the construction and services sectors. Further, tourism related jobs have had a benefical impact on developing skills in the hotel and catering trades, as well as in construction and engineering. Tourism wages are higher than those in fishing or agriculture. All the hotels are located on fifty small islands within several hours distance (by boat) from the capital of Male. Because of religious beliefs and government policy, Maldivians are forbidden on these "tourist islands" except as employees. The government owns most of the larger resorts, but private resorts now account for 56 percent of the total bed capacity, compared to 44 percent in 1978.

Agriculture, Shipping and Construction

Agriculture and related activities (ie, gathering of timber and firewood) plays a minor role in the economy, accounting for perhaps 10 percent of GDP and employment. Most of the agricultural production is very small scale, for garden production, growing such crops as fruits, tubers, vegetables and coconuts. The total cultivatable area in the Maldives is only about 2,800 hectares, and combined with poor soil, inadequate extension and transport services, inhibits agricultural growth. Nevertheless, there are prospects for improving cultivation practices, particularly needed in the small coconut industry. 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.

Maldives Shipping Ltd (MSL) is the government-owned shipping line (formed in 1967) with a fleet of 41 vessels (up from 29 in 1978). MSL provides employment for Maldivian nationals (about 70 percent of the crew is now Maldivian, up from 67 percent in 1978), 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.[12] The port is also important to the economy. The number of ships calling at the port declined dramatically from 88 in 1976 to 48 in 1981. Nevertheless, the amount of traffic (measured in tons) almost tripled during the same period, from 27,900 tons to 76,700 tons. [13]

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. Such activities accounted for 3 per cent of GDP. As with agriculture, most of the manufacturing done in Maldives has remained small scale, cottage industry variety.

With the development of the garment industry, beginning in 1981, the manufacturing sector's per centage of GDP increased to 4.5 percent by 1983. Currently, nearly all textiles (suits, cotton shirts and blouses) are exported to

[12] IMF, Maldives: Recent Economic Developments, Washington, DC: IMF (SM/85/11), 1985, p10.
[13] See Table 28.

the United States.[14] By 1983, textile exports accounted for nearly half of all Maldives' exports (46 per cent), or $6.2 million. However, their net contribution to balance of payments has been smaller, because of the high import content. The sector's contribution to GDP has been about 10 percent, although the employment contribution is considerable, accounting for perhaps 22 percent of the working age population.

C. Population and Employment

Maldives' population has doubled since the middle of this century, growing from 77,273 people in 1953 to 142,832 in 1977 (the year of the last official census) to over 155,000 in 1985.[15]

Fishing is still the major occupation in Maldives, accounting for 44 percent of the workforce (down from 45.4 percent in 1978). This is followed by the manufacturing and construction industries, representing 26.9 percent of the workforce (about the same as in 1978). The public sector (Government workforce) has grown to about 7.4 percent of the total in 1980, up from 5.1 percent in 1978. Workers in tourism have grown fastest, from 0.7 percent of the total workforce in 1978 to 3 percent in 1980.[16] Unemployment is higher on the main island of Male than in the rest of the country. In 1977 unemployment was 15.3 percent in the capital island, and 3.7 percent on all the other atolls, representing a national unemployment rate of 5.8 percent.

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[14] Production of knitted woolen sweaters has been somewhat limited by US quota restrictions. In 1982, Maldives were producing 64,000 dozens against an annual quota by the US of 26,000 dozens, raised to 150,000 dozens 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.

[15] See Table 29. For a complete analysis of Maldivian demographics, see Republic of Maldives, Population and Housing Census, 1977, National Planning Agency, Male, 1981.

[16] See Table 30.

Inflation has been moderate in Maldives. The consumer prices of essential items rose by 11 percent in 1981, declined by 1 percent in 1982, increased by 8 percent in 1983 and another 4-5 percent in 1984.[17]

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;

--Reduce dependence on foreign assistance.

Government expenditure has been heavily geared toward public and social services. In 1984 "Public Services" (including general administration and security) accounted for Rf55.5 million, nearly 50 per cent of total government expenditures, up from Rf 18.8 million (or 47.7 per cent) in 1980. Social Services followed with Rf37.9 milion, or 33.8 per cent of the total, up from Rf 15.3 million (38.8 per cent of the total) in 1980. Expenditures on "Economic Services" were Rf 11 milion (9.8 per cent of the total) in 1984, up from Rf4.5 million in 1980.[18]

[17] IMF, Maldives: Recent Economic Developments. Washington, DC: IMF (SM/85/11), 1985, pv.

[18] See Table 31.

E. Prospects for Better Utilizing Marine Resources

Maldives, perhaps as much as any other nation, depends on its marine resources. Indeed, the government's twin objectives of rapid economic growth and regional economic development balance among islands will of necessity depend on opening new tourism zones, better utilization of its marine resources, and better development of its human resources. These underutilized resources are found in the more distant islands, which at present "...are poorer relative to Male only because of past policy neglect."[19]

Maldives is already undertaking significant and appropriate steps in developing these marine resources. It is beginning programs to solve problems and bottlenecks in fuel distribution, fish storage and freezing, fish collecting and boating navigational aids.[20] If these projects are successfully completed, the result will most likely be increased fish exports, additional foreign exchange earnings, higher wages for fishermen and a general improvement in fishing communities, the majority of which are located in the more distant islands.

Nevertheless, much remains to be done. 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

[19]World Bank, The Maldives: An Updating Economic Memorandum, Washington, DC: IBRD, Report Number 4445-MAL, 1983, p iii-iv.

[20]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. For example, see UNIDO, "Feasibility Study for the Establishment of an Integrated Tuna Fish Processing Industry: Mauritius", nd.

surface waters of the inter-atoll basin and within 25 km , which leaves vast areas outside the 25 km, plus the deeper waters nearby, 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 25km zone. A number of species in that area have been identified, including barracuda, snapper, spiney lobster and wahoo. Finally, Maldivian diet has tended to favor various varieties of tuna rather than the more protein-rich reef species. Species and product acceptance measures (ie, public demonstrations, exhibits in schools, etc) 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). The experiments have demonstrated that migratory species (eg, 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 FADs are needed. New and improved appriopriate gear for labor-intensive fishermen is urgently needed.

It has been increasingly difficult for fishermen in Maldives to obtain bait. This bait is integral to the method used by artisanal fishermen, and the scarcity causes a substantial time loss for the fishermen.[21] Besides growing bait fish, Maldives could consider a number of aquaculture or mariculture activities for growing such species as mussels, oysters and spiney lobsters.

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[21]Bait fish must remain fresh to attract fish. Increased production of bait fish could be assisted by cultivating appropriate species such as tilapia. See Berenschot, Moret and Bosboom, "Project Identification, Programing and Planning in Maldives, Volume1", 1980.

Maldives has a history of using coral for building materials, but coral mining destroys the habitats of bait fish.[22] 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 construction could also be used to upgrade some of the major roads on the main island, none of which are now paved.

Maldives could work more with ongoing regional programs, such as the FAO Indian Ocean Project.[23] It might also be appropriate to increase its sales of exotic and other fish to Europe by increasing its air transport capabilities.[24] Many of the very small, outlying islands have no facilities for repairing their fishing boats. More facilities should be established and existing boat repair facilities could be improved, and additional training for mechanics is much needed.[25] Finally, given the importance and potential of tourism, Maldives

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[22]See Chapter on Comoros, footnote 13.

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

[24]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).

[25]Maldives might find an example in similar work that has taken place in the Seychelles. For example, 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.

could produce more handicrafts (using local resources), to sell to tourists much the same way Seychelles is trying to do.[26]

[26]See Guentner, F. "Seychelles: The Processsing of Shells and Other Naturally Renewable Raw Materials into Buttons and Jewelery: Technical Report", UNIDO-DP/ID/SER.A/487, 1983.

Table 20. GDP Per Capita 1978-82
(Constant 1980 market prices)

	1978	1979	1980	1981	1982
GDP (Rf milions)	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, p5.

Table 21. GDP by Sector of Origin (1980-83)
(Rf millions, 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	31.1
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

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

Source: IMF, Maldives: Recent Economic Developments (Washington, DC: IMF,SM/85/11, January 1985), p3

Table 22. GDP by Sector of Origin (1980-83)
(Percentage of Total)

	1980	1981	1982	1983
Gross Domestic Product	100.0	100.1	100.0	100.0
Primary Sector[a]	35.8	34.8	29.1	29.7
Of which: Fisheries	21.9	20.1	15.6	17.6
Secondary Sector[b]	13.9	10.9	12.2	11.2
Of which: Construction	10.6	6.3	7.4	6.7
Service Sector	50.1	54.3	58.7	59.0
Of which:				
Transport	7.1	12.1	10.0	9.1
Tourism	10.5	12.5	14.0	13.9
Trade	11.7	10.6	12.3	10.7
Government	12.0	11.0	13.6	15.0
Other	8.7	8.0	8.8	10.2

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

Source: IMF, Maldives: Recent Economic Developments (Washington, DC: IMF,SM/85/11, January 1985), p3.

Table 23. 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
Skipjack	23.5	20.9	15.6	19.7	19.0
Yellow fin	4.2	5.3	4.0	6.2	7.0
Other tuna	2.7	3.2	4.0	5.6	5.0
Reef & bottom fish	4.2	5.5	6.7	7.0	8.0
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

Note: Data for 1984 are estimated.

Source: IMF, Maldives: Recent Economic Developments (Washington, DC: IMF,SM/85/11, January 1985), p 5 and Ministry for Fisheries, Republic of Maldives.

Table 24. Prices of Fresh Skipjack 1980-84

	1980	1981	1982	1983	1984
			(In $ per metric ton)		
Export price					
Over 2 kg.	400	465	270	334	363
Under 2 kg.	250	295	182	196	229
			(In Rufiyaa per metric ton)		
Prices paid to fishermen					
Over 2 kg.	12500	1500	1500	1500	1500
Ur ler 2 kg.	900	1100	1100	1100	1100
			(In percent of export price)		
Prices paid to fishermen					
Over 2 kg.	42	43	79	64	59
Under 2 kg.	48	50	86	80	69

Note: market exchange rates used (1979-81: Rf 7.5 = $1; 1982-84: Rf 7.0 =$1)

Source: IMF, Maldives: Recent Economic Developments (Washington, DC: IMF,SM/85/11, January 1985), p 54.

Table 25. Major Exports 1979-83
($ '000)

	1979	1980	1981	1982	1983
TOTAL	4,585	7,778	8,649	9,798	13,441
Exports by State Trading Organization	3,367	5,187	7,273	8,361	12,537
Dry skipjack	62	82	23	88	735
Fresh skipjack	3,288	4,763	5,240	3,563	3,891
Other fresh fish	2	--	--	--	613
Shark liver oil	--	--	--	278	253
Fresh lobsters	6	--	--	--	--
Salted dry reef fish	--	--	--	320	654
Salted dry skipjack	9	338	674	690	--
Canned fish	--	--	--	41	115
Apparrel/clothes	--	--	1,336	3,229	6,276
Black embergris	--	--	1,336	3,229	6,276
Exports by Private Sector	1,218	2,595	1,376	1,437	904
Salted dry skipjack	850	385	--	--	--
Dry sharkfins	146	347	226	345	266
Salted dry reef fish	--	887	692	753	--
Canned fish	--	--	--	11	--
Tortoise shells	86	--	--	--	--
Black embergris	117	410	39	5	372
Cowrie shells	12	61	24	27	25
Red coral	5	--	--	1	4
Fish dust	2	--	--	--	--
Live tropical fish	--	40	54	61	52
Shark oil	--	15	88	--	--
Other marine products	--	--	15	1	--
Fabricated mica	--	444	211	144	185
Apparrel/clothing	--	--	27	89	--
Others	--	6	--	--	--

Source: Republic of Maldives, Statistical Yearbook of Maldives, 1984, Ministry of Planning & Development, 1984, p134.

Table 26. Tourist Arrivals by Nationality (1980-84)

	1980	1981	1982	1983	1984
Total arrivals	**42,007**	**60,385**	**74,411**	**74,163**	**40,29?**
Europe	32,197	43,866	52,438	53,637	32,198
France	4,776	6,126	6,839	4,935	2,944
Germany	11,085	15,352	19,226	21,307	11,446
Italy	7,259	9,963	12,863	14,181	10,303
Asia	8,467	14,336	19,784	17,789	5,865
India	5,764	10,144	14,972	12,073	1,752
Sri Lanka	1,548	1,981	2,264	2,466	1,562
Others					
South Africa	209	242	304	231	116
US	504	1081	783	907	583
Australia	261	413	638	1,022	1,069

Note: data for 1984 includes only January-June.

Source: IMF, Maldives: Recent Economic Developments (Washington, DC: IMF,SM/85/11, January 1985), p 55.

Table 27. 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
Average length of stay (days)	8.6	9.0	10.3	10.8	10.9
Total tourist expenditures ($ millions)	9.4	14.5	20.6	21.4	25.3
Resorts bed-night capacity-utilization	43.6	45.8	46.1	40.4	54.9

Source: IMF, Maldives: Recent Economic Developments (Washington, DC: IMF,SM/85/11, January 1985), p 9.

Table 28. 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 prod	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, p74.

Table 29. Population

Year	Number of People
1911	72,237
1921	70,413
1931	79,281
1946	82,068
1957	83,075
1960	92,247
1967	103,801
1970	114,469
1977	142,832

Source: Republic of Maldives, Population and Housing Census, 1977, National Planning Agency, Male, 1981, p29.

Table 30. Employment
(Percent 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 ('ooo persons)	59,890	66,310
In Public sector	4,939	
In Private sector	55,320	
Unemployment Rate	5.8%	

/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.

Source: World Bank, The Maldives: An Updating Economic Memorandum (Report Number 445-MAL), April 1983, p6 and p39.

Table 31. Government Expenditure (1980-84)
(Rufiyaa 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 programs	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, DC: IMF,SM/85/11, January 1985), p 61.

VI. Mauritius

A. Socio-Economic Trends

Mauritius lies some 800 kilometers east of Madagascar. It incorporates Rodrigues and a few other smaller islands and is part of the Mascarene islands group, which also includes Reunion (an overseas department of France). While its total land area is only 1,960 sq km, 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 percent of Mauritius' total population of over one million people live on the main island, making it one of the more densely populated countries in the world (over 600 persons per sq km). Mauritius' GDP per capita was Rs11,177 in 1984, almost double the 1979 figure of Rs6,359[1]. However, average economic growth rates reflect primarily the erratic production and prices for sugar. For example, total GDP declined by 10 percent in 1980 (in terms of real output), but recovered at about 6 percent during the next two years. This was followed by little growth in 1983.

Mauritius shares many of the same problems of the LDCs of sub-Saharan Africa and South Asia, but it also differs in many ways. Mauritius has a well developed physical and human infrastructure, and could almost be classified as a Newly Industrialized Country (NIC). With the establishment of its Export Processing Zone in 1970, Mauritius moved to become a much more highly diversified economy.

[1]Table 32.

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 Rs1,224 million in 1979 to Rs1,415 million in 1983[2], its relative share of GDP declined from 18.7 per cent of the total GDP to 13.2 per cent over the same period[3]. Further, employment in this sector declined from nearly 60 per cent of the total workforce in 1976 to 52.4 per cent by 1983.

Sugar has been and remains the most important commodity in Mauritius' agricultural sector. It accounts for about 60 percent of merchandise exports and sugar export duties account for some 15 percent of government revenues. Over 45 percent of the island's total land area (and over 90 percent of Mauritius' cultivated land) is occupied by sugar cultivation. Unfortunately, as discussed earlier, 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.[4] Further, production has declined somewhat since the late 1970's, from 6.3 million m/tons in 1979 to 5.2 million m/t in 1983.[5] The large sugar estates[6] in Mauritius have begun an attempt at diversification into a number of areas, including aquaculture of marine species.

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[2]See Table 33.

[3]See Table 34.

[4]Sugar prices ranged from about $.08-.10 per pound during the early 1970s, climbed to nearly $.60 per pound in late 1974-early 1975, declined back to the $.06-.15 until early 1980, when it climbed again to nearly $.40, and declined later that year to the 1984 price of between $.05-.10 per pound.

[5]See Table 35.

[6]At the core of this sector are 21 sugar mills, down from 259 in the mid-19th century.

Mauritius produces a variety of food crops and livestock, but it is self sufficient in only a few of these crops, and has to import much of its staples such as rice and wheat flour. Imports of food, livestock and oils account for about 25 percent of the country's imports, and are equal to approximately half the value of its sugar exports. The government has placed emphasis on greater agricultural diversification and import substitution.

Fisheries

Fisheries play an important role in the economy, but their importance as a food supply has declined since the mid-1970s. For example, in 1975 fish represented 54.5 percent of total food production in Mauritius; by 1980 fish only represented just 19.1 percent of total food consumption. Additionally, while fish consumption has decreased relative to other foods, Mauritius paradoxically has had to increase its imports of fish, from $4.5 million in 1975 to $11.5 million in 1980. Finally, the nominal catch in Mauritius has also declined from 7,038 tons in 1975 to 5,344 tons in 1980.[7]

The artisanal fishery sector has also declined significantly over the past five years. The total artisanal catch in 1978 was 1,964 tons, but had declined to 1,170 tons by 1983. 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 cyclical stocks, unfavorable weather conditions, and increases in fuel

[7]See Table 36.

coats, boat maintenance and gear and tackle. In Mauritius' banks fisheries, some of the fish caught contains ciguatera poisoning, and perhaps as much as 10 percent of the catch has to be thrown away. Finally, certain practices (such as dynamite fishing), while illegal, continue in certain isolated cases, and reduce the amount of fish available for future harvests.

Academics in Mauritius has made suggestions as to how the country could better use its marine resources. These resources include: algae and seaweeds (marine macrophytes), a number of molluscs (including octopus, squids, oysters, clams, and mussels), crustaceans, salts, sand, polymetallic nodules and a number of species suitable for mariculture.[8]

Tourism

Tourism continues to play a significant role in the economy, increasing in importance dramatically after the opening of the international airport at Plaisance.[9] Since the mid-1970s tourism has steadily increased, unlike nearby Seychelles, where tourism fluctuated wildly during the same period. For example, from 1977 to 1983 the number of arrivals increased from 102,500 annually to 124,800, with only two years of small declines. Further, by late 1983-84, Mauritius saw a marked increase in arrivals. Arrivals during the first four months of 1984 were 17 per cent higher than those one year earlier, and earnings were running 10 percent higher. In fact, Mauritius' earnings from tourism have increased every year since 1976, from Rs184 million that year to Rs503 million in 1983. Also, the number of

[8]See the last section in this chapter for details as to how these resources might be better utilized.

[9]For a review of the tourist industry, see Archer, B and Wankill, S, The Economic Impact of Tourism in Mauritius. University of Surrey, September 1981.

hotels has increased from 37 in 1976 to 55 in 1983.[10] Visitors to Mauritius come primarily from Europe (with France leading the Europeans) and from Reunion (the largest place of origin, although many of these tourists probably originated in mainland France) and South Africa.[11]

Manufacturing

Manufacturing has become much more important in the Mauritius economy, especially since the Government established the Export Processing Zone (EPZ) outside Port Louis in 1970.[12] Maunfacturing now accounts for 13-14 per cent of GDP, 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.

The major industries located in the Export Processing Zone are textile-related and electronics, although a number of other products, such as canned tuna, eyeglasses, watches and cut diamonds are also produced. Textiles 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. Employment in textiles 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. The number of textile firms in the EPZ has also increased, from 42

[10]See Table 38.

[11]See Table 39.

[12]Firms located within the Zone are granted significant tax holidays, custom duty exemptions and non-financial incentives (eg. improved infrastructure).

firms in 1976 to 77 in 1984. Other firms, primarily in electronics, have also increased, from 43 firms in 1976 to 77 today.[13] Ownership of firms is more than half Mauritian, reflecting substantial investment from the sugar and trade sectors in the past.

The EPZ grew in real terms at about 15 per cent annually during the 1970s, but declined somewhat to about an average 13 per cent growth by the early 1980s. In 1982, however, with the international recession and growing protectionism abroad, the real growth rate in the EPZ came to a virtual standstill. Improvements came by 1983, and value added rose by 4 per cent that year. Additional investment from the Middle East and Hong Kong began during 1984, with an additional 5,000 jobs created in the EPZ.

C. Population and Employment

Since 1941 Mauritius' population has more than doubled, from less than half of a million people to over one million in 1983.[14] Its population is a unique blend of peoples from South Asia, Southeast Asia, Africa and Europe. The work force has increased from 52 per cent of the total population in 1962 to 56 percent in 1972.[15] Most people are employed in social services (primarily government), which overtook employment in agriculture in 1977. In 1976 52,400 people were employed in social services, compared with 59,500 in agriculture; by 1983 64,400 were in the social services sector, compared with 52,400 in agriculture. Manufacturing is the third most

[13]See Table 37.
[14]See Table 40.
[15]See Table 41.

important employment sector, with 36,900 people employed in 1983.[16] Such employment trends are matched closely by wage remuneration. In 1983, agricultural workers' pay exceeded only that of those working in the mining and manufacturing sectors. Those engaged in transportation and communications and financing were the highest paid in the economy, followed by employees in wholesale and retail trade and in the social services sector.[17]

While the number of those employed in Mauritius has increased every year but one since 1977 (from 272,000 to 294,000), the numbers of unemployed has also risen every year (from 20,000 in 1977 to 61,000 in 1983). Unemployment remains a serious concern to the government, as the unemploymet rate has increased from 6.8 per cent in 1977 to 17.2 per cent in 1983.[18]

Inflation has fluctuated in Mauritius during the past decade. The rate of inflation has ranged from 5.6 percent (in 1983) to 42 percent (in 1980). Since 1980, however, inflation has declined dramatically. The consumer price index's yearly average more than doubled from 1976 to 1981; the rate from 1982 to 1983 was the lowest since 1976.[19]

D. Recent Development Planning and Policies

[16]Thus, agricultural employment has actually declined in a relative, as well as an absolute sense, while public sector employment has been on the increase. See Table 42.
[17]See Table 43.
[18]This figure does not include under-employment or disguised employment, and the figure is probably higher than 20 percent. Also, see Table 13.
[19]See Table 45.

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 to replace food and energy imports by local production.

The Government's expenditures have risen from Rs1,971 million in 1980 to Rs3,222 million in 1983. The largest expenditures (besides public debt and miscellaneous) go toward education, public services, social security and health.[20]

E. Prospects for Better Utilizing Marine Resources

As discussed previously, Mauritius has a number of marine resources which could be better utilized.[21] Mauritius has over 40,000 km^2 of fishing surface area in the Indian Ocean. However, while several surveys of this resource has been conducted,[22] more are needed. Further, if Mauritius could increase

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[20]See Table 46.

[21]Mauritius recently established a National Sub-Committee on Fisheries in the Ministry of Agriculture, Fisheries & Natural Resources, and it has conducted preliminary reports on the prospects for the marine sector. Unfortunately, however, these reports have not yet been released. For details on the marine fisheries in Mauritius, 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.

[22]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, p54-62.

its total fish catches, it should also try to market it better as well.[23] Further consideration should be given to regional cooperation in fisheries. [24]

Seaweed is abundant in Mauritius, and algae can be used as a source of food, feed, drugs[25], and fertilizers. Mauritius has surveyed and inventoried some of its alga resources, but specific studies need to be conducted for seaweed cultivation.

Mauritius has a number of valuable mollusc species, including octopi, squid, oysters[26], giant clams and mussels which chould be better utilized. For example, 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 and turtles and sharks.[27] In fact, a recent symposium at the University of Mauritius maintained that,

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[23]See for example FAO, "Fisheries Development Project: Mauritius, Marketing Fisheries Products", Rome, FAO, FI:SF/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.

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

[25]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.

[26]Currently only a few farmers are growing the local oyster (Crassostrea cuculata) because it takes so long to reach marketable size. Other species are faster growing, however, and could well be suitable for Mauritius. Nevertheless, some species, such as Osterea edulis have not been able to adapt to local conditions, and production could not go forward.

[27]Sharks are perhaps one of the most underutilized species. They are plentiful in the Indian Ocean, and all parts of the shark body can be used: eg, meat for human consumption; liver oil for vitamin A and D, tanning and lubrication; teeth for tourism (necklaces, curios, etc); or cartilage for pharmaceuticals.

"Promotion of coastal aqueculture and mariculture to supplement marine production is highly desirable and every individual effort should be given maximum encouragement. We have been raising notes of alarm about the degradation of our lagoons which have been in the past a rich habitat for lobsters, crabs and shrimps. Reclamation of these lagoons would now take several years. Development of lobsters, crabs and shrimps should be envisaged...".[28]

Mauritius has to import table salt, and recommendations have been made to increase local production. Experiments on salt in Mauritius have been carried out.[29] Further, Mauritius has a number of sand deposits which could be better exploited. For example, Ile aux Fourneaux apparently has a large sand quarry which is currently unexploited.[30]

The Export Processsing Zone might possibly find ways to better utilize indigenous natural resources, rather than having to import their manufacturing inputs.[31] Investors in the EPZ find an attractive package of fiscal incentives: ten years total tax relief on corporate income, five year tax

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[28]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, p3.

[29]See UNIDO, " Report on Analysis and Other Experiments Conducted on Mauritius Salt", by C L Malhotra (MAR/72/002) nd. 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.

[30]Blacksand can be used in glass making, and would be appropriate in small industry applications in Mauritius.

[31]See UNIDO, "Export Processing Zones in Developing Countries: UNIDO Survey Findings and Recent Developments". Vienna: UNIDO, 1982.

holiday on dividends tax rebates for foreign technicians, free repatriation of profits, as well as other guarantees. 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 in the south of Mauritius, or to increase canning of tuna and other living marine resources.

Organizations in Mauritius are supporting a broadly based regional effort to better manage and utilize resources in the area. A new group, "IBION" (Issue-Based Indian Ocean Network) was established to "...advance knowledge and action around the current and emerging geopolitical, developmental and environmental issues of the Indian Ocean". It is too early to tell if these efforts will be successful, but at least they show promise.

Mauritius has significant coastal and marine resources ready to be exploited. As will most of its neighbors, Mauritius will have to carefully examine how best to use, develop and protect these resources in a sustainable manner and for the long term.

Table 32. GDP Per Capita: 1979-83

	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, DC: IMF, 1984, SM/84/213, p4 and Central Statistical Office, Government of Mauritius, Bi-Annual Digest of Statistics. Rose Hill: CSO, 1984, p9.

Table 33. Gross Domestic Product by Industrial Origin: 1979-84 (Rupees million)

	1979	1980	1981	1982	1983	1984
GDP (current factor cost	**5,876**	**7,191**	**7,890**	**9,245**	**10,429**	**11,200***
	6,540	**7,389**	**8,765**	**10,050**	**10,650**	**na**
Agriculture, Forestry/Fishing	1224	914	1257	1510	1415	
Sugar --	953	598	899	1140	1010	
Mining	12	15	16	18	19	
Manufacturing	972	1127	1377	1620	1735	
Sugar --	276	178	251	313	290	
EPZ --	223	321	421	470	520	
Electricity, Gas	161	209	188	255	270	
Construction	552	561	588	625	656	
Wholesale/Retail	779	1050	1219	1290	1410	
Transportation	653	837	1012	1112	1210	
Financing & misc	1045	1309	1517	1775	1945	
Govt Services	793	952	1104	1280	1375	
Other community or Govt Services	349	415	487	565	615	

* = Data from IMF.

Source: International Monetary Fund, Mauritius: Recent Economic Developments, Washington, DC: IMF, 1984, SM/84/213, p4 and Central Statistical Office, Government of Mauritius, Bi-Annual Digest of Statistics. Rose Hill: CSO, 1984, p66.

Table 34. Gross Domestic Product by Industrial Origin: 1977-83 (Percent of Total)

	1979	1980	1981	1982	1983
SECTOR					
Agriculture, Forestry/Fishing	18.7	12.3	14.3	15.0	13.2
Sugar --	14.5	8.0	10.1	11.3	9.4
Mining	.1	.2	.1	.1	.1
Manufacturing	14.8	15.2	15.7	16.1	16.2
Sugar --	4.2	2.4	2.8	3.1	2.7
EPZ --	3.4	4.3	4.8	4.6	4.8
Electricity, Gas	2.4	2.8	2.1	2.5	2.5
Construction	8.4	7.5	6.7	6.2	6.1
Wholesale/Retail	11.9	14.2	13.9	12.8	13.2
Transportation	9.9	11.3	11.5	11.0	11.3
Financing & misc	15.9	17.7	17.3	17.6	18.2
Govt Services	12.1	12.8	12.5	12.7	12.9
Other community or Govt Services	5.3	5.6	5.5	5.6	5.7

* - Data from IMF.

Source: International Monetary Fund, Mauritius: Recent Economic Developments, Washington, DC: IMF, 1984, SM/84/213, p4 and Central Statistical Office, Government of Mauritius, Bi-Annual Digest of Statistics. Rose Hill: CSO, 1984, p66.

Table 35. Agricultural Production: 1979-83

	1979	1980	1981	1982	1983
Cash Crops					
Sugar cane ('000 m/tons)	6,313	4,564	5,302	6,582	5,252
Tea (m/tons)	25,718	22,438	24,926	26,482	31,103
Tobacco(m/tons)	705	1153	1247	624	785
Vegetables & Fruits (m/tons)	**47,313**	**39,450**	**46,211**	**48,740**	**41,225**

Source: Central Statistical Office, Government of Mauritius, Bi-Annual Digest of Statistics. Rose Hill: CSO, 1984, p134.

Table 36. Fishery Statistics: 1975-80

	1975	1976	1977	1987	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 % 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, p42.

Table 37. 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	17403	21642	23601	23870	25526	28954
Textiles	12392	17226	20281	20155	21045	23896
Other	5011	4416	3320	3715	4481	5058

Source: International Monetary Fund, Mauritius: Recent Economic Developments, Washington, DC: IMF, 1984, SM/84/213, p16.

Table 38. Tourism: 1976-1983

	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

Source: International Monetary Fund, Mauritius: Recent Economic Developments, Washington, DC: IMF, 1984, SM/84/213, p103.

Table 39. Tourists (by Country of Origin): 1983

Country:	Number:	Percent of Total:
Total	**123,820**	**100***
Europe		
France	22,052	17.8
FRG	6,960	5.6
Italy	5,520	4.4
Switzerland	2,570	2.0
UK	5,860	4.7
Africa		
Kenya	690	0.5
Madagascar	8,110	6.5
Reunion	30,180	24.3
Seychelles	560	0.5
RSA	27,150	21.9
Tanzania	330	0.3
Zambia	720	0.6
Zimbabwe	1,730	1.4
Asia		
Australia	1,680	1.3
India	1,710	1.4
America		
USA	1,020	0.8
Other	**6,980**	**5.6**

*= Does not total 100% due to rounding.

Source: Central Statistical Office, Government of Mauritius, Bi-Annual Digest of Statistics. Rose Hill: CSO, 1984, p32.

Table 40. Population Growth

1846	158,462
1861	310,050
1881	359,874
1901	371,023
1921	376,485
1941	419,185
1962	681,619
1972	826,199
1980	950,000
1983	1,005,135

Source: Central Statistical Office, Government of Mauritius, Bi-Annual Digest of Statistics. Rose Hill: CSO, 1984, p1-3; International Monetary Fund, Mauritius: Recent Economic Developments, Washington, DC: IMF, 1984, SM/84/213,pv; International Bank for Reconstruction and Development, World Bank Atlas, Washington, DC: IBRD, 1984.

Table 41. Demographic Indicators 1962 and 1972

YEAR:	1962	1972
Total Population:	681,619	826,199
Age 0-14:	308,676	331,285
% of Total	45%	40%
Age 15-64:	350,669	463,724
% of Total	52%	56%
Aged 65 & Over:	21,959	30,267
% of Total	3%	4%

Source: Central Statistical Office, Government of Mauritius, Bi-Annual Digest of Statistics. Rose Hill: CSO. 1984. p7.

Table 42. Employment (by Major Industrial Sector): 1976-83 ('000s)

	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	.1	.1	.1	.1	.1	.1	.1	.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

Source: Central Statistical Office, Government of Mauritius, Bi-Annual Digest of Statistics. Rose Hill: CSO, 1984, p97.

Table 43. Average Monthly Earnings (by Sector): 1978-83
(Rupees)

	1978	1979	1980	1981	1982	1983
Average:	790	885	1067	1227	1400	1541
Agriculture and Fisheries	647	687	781	889	1031	1132
(sugar)	664	692	765	890	1030	1122
Mining	498	441	521	579	668	702
Manufacturing	550	610	746	843	920	998
Electricity	1303	1501	1802	1754	1959	2296
Construction	715	868	1064	1293	1440	1535
Wholesale/Retail	1013	1085	1289	1513	1712	1788
Transport/Communications	992	1250	1744	2163	2319	2580
Financing	1700	1783	2143	2389	2664	2860
Community and Social Services	983	1094	1301	1507	1745	1923
(Government)	977	1080	1281	1492	1749	1936
(Private)	1117	1264	1498	1703	1935	2078
Not Specified	456	497	598	736	904	1162

Source: Central Statistical Office, Government of Mauritius, Bi-Annual Digest of Statistics. Rose Hill: CSO, 1984, p101.

Table 44. Employment and Unemployment: 1977-83
(thousands)

	1977	1978	1979	1980	1981	1982	1983
Estimated labor force	292	303	313	324	332	339	355
Employed	272	279	286	289	290	289	294
Unemployed	20	24	27	35	42	50	61
Unemployment rate	6.8%	7.9%	8.6%	10.8%	12.7%	14.7%	17.2%

Source: International Monetary Fund, Mauritius: Recent Economic Developments, Washington, DC: IMF, 1984, SM/84/213, p23.

Table 45. Consumer Price Index: 1976-83

	Yearly Average:	Annual Inflation Rate:
1976	101.2	13.4%
1977	110.5	9.2%
1978	119.0	8.5%
1979	137.3	14.5%
1980	194.9	42.0%
1981	223.1	15.5%
1982	100.0	11.4%
1983	106.6	5.6%

July 1976-June 1982: 1976 =100.
July 1982-Dec 1983: 1982= 100.

Source: Central Statistical Office, Government of Mauritius, Bi-Annual Digest of Statistics. Rose Hill: CSO, 1984, p82.

Table 46. Government Expenditure (by Function): 1980-83
(Rupees 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
Gen 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 & Misc	731.5	978.4	1229.6	1375.6
Rice and Flour	130.0	203.0	230.0	190.0
TOTAL CURRENT EXPENDITURE:	1971.9	2471.0	2892.2	3222.6

Source: Central Statistical Office, Government of Mauritius, Bi-Annual Digest of Statistics. Rose Hill: CSO, 1984, p39.

VII. Seychelles

A. Socio-Economic Trends

The Republic of Seychelles is an archipelago with about 400,000 square miles of ocean territory, but it is nevertheless a small country with limited area for agricultural self-sufficiency and few proven natural resources. Except for artisanal fishing, its use of coastal and marine resources has not been extensive in the past. Located some 1,600 kilometers east of Kenya's coast, the Republic is comprised of some 150 granite and coralline islands, with a total land area of 404 square kilometers. About 95% of the 65,000 Seychellois live on Mahe, also the location of the capital, Victoria.

Until quite recently, Seychelles' society was comprised of , "...great poverty and little security. The vast majority of the population was dependent on a very few employers. Individuals were constrained by poverty, a small social universe, and the general lack of alternatives."[1] However, Seychelles' economy has changed dramatically in less than a generation, moving from essentially an isolated, agriculture-based and poverty-stricken economy (subsistence and a few cash crops) to a service-based economy. Moreover, per capita Gross Domestic Product has increased dramatically; by 1983 Seychelles had a per capita GDP of nearly SR7,000 ($1,870), compared to $514 a decade earlier. This per capita GDP is the third highest in sub-Saharan Africa. [2]

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[1] Benedict, M and Benedict, B, Men, Women and Money in the Seychelles. Berkeley: University of California Press, 1982, p107.

[2] See Table 27.

There was a significant shift in the economy --led by the quick growth of tourism-- after the construction of the international airport in 1971, some five years before independence from the UK. Major infrastructural facilities[3] 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 where less than 10 per cent of the population live. This expansion --with linkages throughout the economy-- resulted in a sustained annual growth rate of about 10 per cent of real GDP in the early 1970s.

After independence in 1976 the growth continued, although it slowed somewhat to perhaps 7 per cent annually by the later part of the decade. The rapid economic growth of the 1970s came to an abrupt end in 1979 with the decline of tourism (the number of tourists fell each year from 1979-82). Tourism's rapid growth (and subsequent decline) was matched by a corresponding stagnation of the traditional sectors of the economy.

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.[4] The major crops grown today include copra, cinnamon and tea, while cattle and pigs make up most of the livestock.[5]

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[3] These projects were financed by new revenue from tourism as well as ODA from the UK and elsewhere. Infrastructure development has not ended; the government is planning a major port extension project (SR 67 million) as well as several other infrastructure projects in the 1985-89 National Development Plan.

[5] This percentage has declined dramatically over the past decade; for example, in 1971 agriculture comprised over 20% of GDP. However, agricultural production has not declined precipitously. Rather, production has remained fairly constant, but rising population and increased tourists have put more demand on food, and agriculture's relative share of GDP has declined

[5] See Table 48 and Table 49.

Coconuts are the major agricultural export of Seychelles. Coconuts are generally grown on plantations in the flat coastal zones, and currently there are some 80 such plantations, occupying approximately 16,000 acres. Additionally, there are five large coconut pilot schemes covering about 25 acres for growing and testing hybrid seedlings.[6] Coconuts are primarily grown for the export of copra, although they have some by-products which are used primarily in the domestic market. Copra exports grew steadily between 1971 and 1979, then declined. The 2,176 tons exported in 1982 was 31 percent below its comparable level in 1981, and 37 percent less than the highest 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. Nevertheless, Seychelles enjoys premium prices in the world market for its high quality cup copra.

However, with only about 80 square miles of suitable agricultural land, agricultural production has not been able to meet domestic (including tourist) demand. Further, there has been a shift in the pattern of food consumption away from traditional products and a need for increased imports.[7] The Seychelles' Government has recognized the need for crop diversification, and has recently completed a number of programs (including "The Year of Agriculture" in 1982) to try to increase food production and limit the levels of food imports, particularly for the tourist

[6]This project, financed by the French Caisse Centrale de Cooperation, is in the experimental steges. It is capable, however, of producing 3 tons per hectre with a maximum of 8 tons as compared to the national average of .6 tons.

[7]Food imports increased by 372% between 1972 and 1980, and maintained an annual growth rate of about 20%.

sector. Farms in Seychelles are primarily privately owned, although the State is getting more involved in agriculture.

Being an archipelago nation, fisheries naturally play an important role in the economy, typically the nation's second highest earner of foreign exchange. 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 done in small open boats (wooden or fiberglass), outboard motor powered, and by whale boats, with inboard diesels. And, a variety of methods are used in inshore waters, including trapping, gill netting and handling and some beach seining.

In 1983, 3,750 tons of fish were landed, a decline from 4,600 tons landed in 1977.[8] Nevertheless, fish is Seychelles' most important source of animal protein, and the current level of national consumption is estimated at about 5,000 tons per year. In recent years (until 1982), however, fish output has exceeded local demand, thus creating a viable export industry. Air transport and cold storage facilities has enhanced greater exports to Europe and to neighboring states such as Reunion and Mauritius. Indeed, export earnings from fish increased from SR 3.2 million in 1977 to SR 9.5 million in 1983. Additionally, fish exports as a per centage of domestic exports increased dramatically over the same period, from 13 percent of all exports in 1977 to 37.5 per cent by 1983. With the establishment of the 200-mile Exclusive Economic Zone bevond its 12 miles of territoral waters (giving the Seychelles

[8]See Table 50.

an economic area of over 1 million sq km), the potential for increased fish output (and export) is good.

The government's long-term objective is to expand and improve the nation's demersal and pelagic fishing for increased productivity, and thus improve export potential and expand local fish processing. The government wants the fisheries sector to help lead to a greater diversification of the economy. In 1981 the Fisheries Development Company was established (now changed to the Seychelles Fishing Authority) to implement the Fishery Management and Development Strategy. The major objectives of this strategy are to:

1. Develop Port Victoria into the primary tuna port of the Western Indian Ocean;
2. Develop a national fishing capability on an industrial scale;
3. Exploit potentials for fish processing for export;
4. Safeguard and strengthen artisanal fishing;
5. Sustain the exploitation of all fishery resources; and,
6. Exploit the potential contribution of mariculture both as a means for satisfying local needs and for earning foreign exchange.[9]

Nevertheless, 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 and the Ivory Coast with licenses granted to about 40 purse seiners. Additionally, about 100 Korean longliners

[9]Republic of Seychelles, National Development Plan 1985-89, p83. In fact, the plan calls for SR 217.5 million in investment in this sector, behind only tourism, air transport, water/sewerage and housing.

have been granted short term licences which extend from 2-4 months. Also, in 1981, a Seychellois longliner "Seykor", run by Korean officers with a Seychellois crew, joined the fleet. By 1984, the "Seykor" caught 360 tons of tuna which were exported to Japan.[10]

Minerals

Currently, guano production is the only mining activity in Seychelles, although there is a potential for offshore oil and granite production. 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 percent in 1980 and 68 percent in 1981.[11]

Seychelles 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 greater than merchandise exports during the year.

Offshore oil exploration began in 1977 when concessions covering 32,000 sq km were awarded to three groups of oil companies. [illegible]atory drilling was conducted by Amoco during 1980-81 in an area 125 k[illegible]est of Mahe. While there have been no finds, exploration efforts have confirmed the existence of favorable conditions (ie, marine Jurassic sediments below volcanic layers) for hydrocarbon deposits. Thus far such searches have been limited to the shallower continental shelf area, which represents only some 5 per cent of

[10]Seychelles Fishing Authority, "The Present Fishery Situation in the Seychelles", appear presented to the "FAO/SWIOP Workshop on Licensing and Control of Foreign Fishing", Mahe, Seychelles, May 1984., p 4.

[11]IMF, Seychelles - Recent Economic Developments. Washington, DC: IMF, SM/83/176, 1983, p13.

the EEZ. Additional drilling in deeper water will be necessary. In 1982 Amoco conducted an aeromagnetic survey of 23,000 line km and is now evaluating the data obtained. Amoco has been granted an extension to continue exploration in 25 of its blocks, has surrendered the remainder of its 337 blocks; however, the 8,650 sq km distributed over 19 blocks which were issued under the 1977 Petroleum License continue. Nevertheless, because of the high costs involved, Amoco will probably have to decide soon (perhaps this year) whether to continue with its efforts. Shell Oil (not involved in exploration efforts) uses Seychelles as a major transhipment point, because of the large number of ships which use Mahe as a refueling port. In fact, Seychelles depot is Shell's fourth largest worldwide.

The government has two major petroleum objectives over the next five years[12]:

1. Promote further exploration; and,
2. Ensure that the data derived from six years of exploration are fully evaluated.

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 from 1978-82. Tourism has played the most crucial part of the economy's growth since 1971, when the

[12]Republic of Seychelles, National Development Plan 1985-89, p133.

international airport --built with funding from the UK-- was opened.[13] The IMF estimates that by 1980, besides the significant employment and income produced by tourism (or tourist-related sectors of the economy), at least 25 per cent of government revenue came from tourism, and the foreign exchange provided by tourists represented nearly 50 per cent of all receipts of goods and services. [14] Interestingly, by the mid-1970s, there were as many (if not more) visitors coming annually to the island than the country's population.

However, due to perceived political instability in the Seychelles [15], combined with significant price increases in oil (and thus air ticket costs), the world recession, the revaluation of the Rupee in March 1981, high costs, and distance from major points of departures, the number of tourists declined in the early 1980s.[16] Such declines were coupled with continued expansion of hotels, and thus the hotel bed occupancy rate fell to 37 per cent in 1982 (from 64 per cent in 1979). There has been a slight recovery in this sector, and in the first quarter of 1984 the hotel bed occupancy rose to 60 per cent, but fell to 50 per cent by the end of the second quarter.[17] Seychelles

[13]Until 1970 the islands were serviced by weekly flights from Mombasa by Pan Am pontoon-planes, and by infrequent international passenger and cargo traffic. In 1970 less than 2,000 people visited the Seychelles, but by 1979 some 70-80,000 tourists were visiting the islands annually. Further, the government is planning for 93,000 tourists annually by 1987, and 100,000 by 1988.

[14]See International Monetary Fund, Seychelles - Recent Economic Developments. Washington, DC: IMF, August 1983, SM/83/176, p 64.

[15]Before the November 1981 coup attempt, South Africa and the Seychelles maintained significant levels of commercial activities, including trade, investment and tourism. South African Airways is no longer allowed to land in the Seychelles, and South African tourism and trade has declined.

[16]See Table 4. In fact, tourism declined from 1979 to 1982 at an average yearly rate of 16%.

[17]Central Bank of Seychelles, Quarterly Review (Volume II, Number 3). Victoria: Government Printers, November 1984, p24. For 1984, 63,400 visitors arrived in Seychelles.

depends on "package" tours, almost exclusively from Western Europe , and while each tourist in a package tour typically spends less than the individual traveler, the government is now claiming more of this income since it is directly participating in the charter/package tour business.

Manufacturing

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

Manufacturing's share of GDP in 1982 was only 6.4 per cent, and employed about 9 per cent of the formal sector, or 1,300 people. This sector is comprised of over 50 small enterprises engaged in processsing or semi-processing local agricultural products for export (such as copra and cinnamon), or some basic import substitution. There is also a small handicraft sector, oriented primarily toward the tourist market. The major activities include a brewery, cigarette factory, plastic factory, tailoring, boat building, furniture making, soft drink bottling and food canning. The IMF concludes that the growth of the manufacturing sector in Seychelles will be constrained by a lack of trained manpower, very small size of the domestic market, and limited export opportunities due to the high cost of labor.[18]

C. Population and Employment

[18] IMF, Seychelles: Recent Economic Developments, Washington, DC: IMF, SM/83/176, 1983, p12.

Seychelles has a population of about 65,000 and a growth rate of 2.7 per cent. From 1950 to the end of the century, the population will have almost tripled in size.[19] Currently, the median age in the Seychelles is 19.6 years, and that will actually increase (unlike typical LDC demographic rates) to a medium age of 24.2 years by the year 2000. Further, the percentage of those in the 15-64 year old catagory (those economically active) will increase from about 55 per cent of the total population today to about 60 per cent of the total population by the year 2000. [20]

In 1983 there were 17,500 people engaged in formal employment (the "wage economy"), comprising about 26 per cent of the population. [21] Also in 1983 there were over 6,000 people unemployed, mostly from the service and transport/laborer sectors. [22] Unemployment remains a serious and growing problem. The Government has launched a number of programs which it hopes will increase employment opportunities. The public and parastatal sectors 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 the parastatal or private sectors.[23] The retail price index has increased dramatically in fish and other foods, fuels and transportation, but less so in clothing, services, personal items and housing.[24]

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[19]See Table 52.
[20]See Table 53.
[21]See Table 54.
[22]See Table 55.
[23]See Table 56.
[24]See Table 57.

D. Recent Development Planning and Policies

Development planning began in earnest after World War II, in 1947, when the British established the Development Programme Committee.[25] The most recent National Development Plan (as have most in recent years) will cover five years (1985-89) and has the following objectives: 1) creating employment; 2) improving balance of payments; 3) re-establishing economic growth; and, 4) increasing exports. The new Plan will focus on four major areas: housing, agriculture, tourism and light industry.[26]

Government expenditure has increased steadily over the past five years, from SR327 milion in 1979 to SR434 million in 1983.[27] Reflecting generally increased demand from the population, the government increased the Social Services sector (which includes education, health, labor, youth development and the National Youth Service) from SR59 million in 1979 to SR163 million in 1983. Social Services is the largest item of government expenditure, surpassing the General Administration sector which had been the largest item. 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

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25 For a history of development planning, see Central Bank of Seychelles, Quarterly Review (Volume II, Number 3) November 1984.

26 See Republic of Seychelles, National Development Plan 1985-89.

27 See Table 58.

Seychelles is in a good position to better utilize its marine and coastal resources, which have been neglected compared to the development of the tourism-led services sector.

The Seychelles' Government is concerned that its one million sq km of ocean and seabed be fully exploited. It believes --correctly-- 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 demersal species[28]. Nevertheless, such a focus should not exclude less capital-intensive initiatives, especially with regard to improving the traditional fishery sector. Further, the focus should be expanded to include the industrial potential of other living marine resources, such as, for example, the industrial, pharmaceutical[29] and food processing potentials of seaweeds and plants, salt[30] and coconut based industries[31] and non-living marine resources such as lime deposits and

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

[29]See UNIDO, "Traditional Pharmacopoeiqas Revisited: A Resume of the Goals and Philosophies Underlying UNIDO's Programmes in the Industrial Utilization of Medical and Aromatic Plants in Developing Countries". Vienna, 1982, UNIDO-UNIDO/IO.511.

[30]See UNIDO, "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-UNIDO/S.330.

[31]See for example, Adair, D & Marter, A, "The Industrial Production of Coconut Cream, Supporting and Background Information to the Production Concept", Vienna: UNIDO-UNIDO/IO/R.48, 1983 or Adair, D & Marter, A, "The Industrial Production of Coconut Cream: The Production Concept". Vienna: UNIDO-UNIDO/IO.528, 1982.

manganese nodules on the sea floor. Cement could be a major growth industry, using local materials, as could granite processing[32].

Perhaps the most significant hinderence to such utilization is the lack of information about such resources. The government has instructed its Ministry of National Development's Technology for Development Division 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 should not be done in a vacuum, and should be 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.[33] Additionally, the government has launched an ambitious port development program and a "marine transport" project [34], whose major objectives are to:

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[32]See 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. However, 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 are not threatened. This industry could proceed, but it must do so cautiously, and with full impact evaluations conducted.

[33]See Taracki, B J, "Seychelles: Establishment and Operation of a Boatyard and Boat maintenance Complex", Vienna: 0-UNIDO/IO/R.56, 1983 and Mazarkiewicz, 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.

[34]Republic of Seychelles, National Development Plan 1985-89, p142-148. 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.

1. Provide adequate facilities for and services to international shipping to meet national requirements for the movement of imports and exports;
2. Provide inter-island cargo and passenger services, particularly in connection with promoting exports and tourism, and exercise control over the services; and,
3. Control the movement of vessels within Port Victoria and the harbors of Seychelles.

One of the most promising developments , (with significant employment generating possibilities) Seychelles could pursue would be developing craft industries, by using more local marine resources[35]. According to the Seychelles government, tourists spend on average SR 23 per day on handicrafts. Assuming an average length of stay of 10 days, and 65,000 tourists per year, this translates into an annual expenditure of about SR 15 million annually. Unfortunately, not all these expenditures go to local craftsmen; about two thirds of all craft products sold in Seychelles are imported, mostly from East Asia. This industry should be promoted by increased training and education, with the ultimate aim of encouraging more young people to enter the industry, as well as teaching new and improved techniques to experienced craftsmen. The government has recommended a National Design Center for designing and adapting craft products with strong local components. It has also created a Handicraft Co-ordination Committee to oversee the development of the crafts industry, and co-operatives are

[35]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.

being organized for craftsmen. [36] Finally, more use of local resources should be encouraged, including 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.[37]

[36] It is important that the Industrial Development Division of the Ministry of National Development work closely with the Technology for Development Division in developing this sector.

[37] It is essential, however, that such exploitation, especially in fragile coral areas, be done with utmost care; see the Chapter on Comoros, foornote 13. Seychelles has an international reputation for protection of its natural resources, and it realizes the importance of conserving and managing its resources for future use. Additionally, uses of such protected species as turtle shells would require exemption from or amendments to certain international conservation conventions, eg. CITES. Nevertheless, such threatened species could be harvested without undue danger if strict conservation and management legislation was passed and enforced.

Table 47. GDP and GDP Per Capita 1976-83

	GDP (SR millions)	Population	GDP Per Capita* (SRupees)
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

GDP is measured at 1976 prices.

Source: IMF, Seychelles: Recent Economic Developments. Washington, DC: IMF, SM/83/176, August 1983, p3.

Table 48. Gross Domestic Product by Industrial Origin 1978-82 (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	8.5	7.3	5.9
Finance	12.1	11.8	11.7	11.9	12.5
Govt Services	13.9	14.2	15.1	17.7	19.0
Import Duties	10.0	10.8	11.2	11.8	13.3

Note: GDP measured at Current Prices

Source: Government of Seychelles, Statistical Abstract 1983 (p56).

Table 49. Agricultural Production (1976-82)

	1976	1978	1980	1982
Crops (tons)				
Copra	2,792	3,000	3,200	2,176
Cinnamon	1,171	544	522	810
Tea	181	170	167	146
Livestock (number)				
Cattle	352	278	422	331
Pigs	3,724	4,557	5,431	5,186

Source: IMF, Seychelles: Recent Economic Developments, (Washington, DC: IMF, SM/83/176, August 1983, p9).

Table 50. Trends in the Fisheries Sector: 1977-83

	1977	1978	1979	1980	1981	1982	1983
Fish Landings (in tons)	4600	5400	4908	4377	4444	3897	3750
Fish Exports (in SR'000)	3184	3608	6304	9623	4443	7347	9460
Domestic Exports (in SR'000)	24385	24705	30948	32930	27471	20297	25200
Fish Exports as % 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, p84.

Table 51. Tourists (by Country of Origin) 1979-83

COUNTRY:	1979	1981	1983
Total	**70,852**	**60,425**	**55,867**
Europe	**50,805**	**37,831**	**37,763**
UK/Ireland	12,925	7,900	4,065
France	14,577	9,352	8,820
FRG	5,194	6,417	9,759
Italy	8,469	8,599	5,667
Switzerland	3,540	1,621	6,192
Africa	**13,632**	**9,420**	**8,049**
Mauritius	870	668	499
Reunion	1,1919	899	1,179
East Africa	3,749	2,371	2.155
RSA	3,646	3,402	2 76
Asia	**9,258**	**8,122**	**7,574**
India	2,494	1,260	874
Hong Kong	1,277	380	265
Japan	2,031	3,390	3,931
America	**3,652**	**3,946**	**1,998**
USA	2,665	2,848	1,694

Source: Republic of Seychelles, Statistical Abstract 1983 (p32).

Table 52. Population Growth

Year	Population
1771	28
1803	2,121
1851	6,841
1901	19,237
1951	34,370
1971	54,659
1981	64,035
1990	69,551
2000	82,443

Source: Republic of Seychelles. Statistical Abstract 1983 (p20).

Table 53. Population Projections: Demographic Indicators

YEAR:	1980	1985	1990	1995	2000
Total Population:	63261	65092	96551	75714	82443
Age 0-14 years:	24299	23597	24292	25769	27229
% of Total Pop:	38%	36%	35%	34%	33%
Age 15-64 years:	34856	37330	40796	45209	50214
% of Total Pop:	55%	57%	42%	60%	60%
Dependency Ratio:*	814.9	743.7	704.9	674.8	641.8
Median Age:	19.6	21.0	22.3	23.3	24.2

*= Number of persons aged <14 and >65 who are dependent on population of working age (15-64) and is expressed per 1000.

Assumptions: Mortality rates remain constant; moderate decline in fertility; increase in proportion of children born to women in the 25-29 and 30-34 age groups; decrease in net migration. Projections provided by Statistics Division of Government of Seychelles.

Source: Republic of Seychelles, Statistical Abstract 1983 (p21).

Table 54. 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

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

Source: Republic of Seychelles, Statistical Abstract 1983 (p87).

Table 55. Unemployment by Age and Occupation (1983)

Occupation:	Youths	Adults	Total
Professional, technical and related workers	80	267	347
Administrative and managerial workers	5	42	47
Clerical workers	84	734	818
Sales workers	32	385	414
Service workers	89	1877	1966
Agriculture, fishermen, forestry workers	7	65	72
Laborers, transport and related	237	2505	2742
TOTAL	534	5875	6409

Aged less than 18 years.

Source: Republic of Seychelles, Statistical Abstract 1983 (p97).

Table 56. Public, Parastatal and Private Sector Employment 1983

INDUSTRY:	PUBLIC	PARASTATAL	PRIVATE*
Agriculture, Fishing& Forestry	756	802	528
Manufacturing	0	210	757
Mining & Construction	0	1002	406
Wholesale/Retail Trade	0	308	874
Restaurants	0	81	179
Hotels	0	307	1,425
Transport/Communications	360	933	672
Public Administration	2,218	0	0
Finance	0	370	457
Social/Community	3,466	29	271
TOTAL	6,800	4,818	5,902
Average Earnings by Sector (Rupees):	R2,173	R1,767	R1,787

* Note: Private sector figures exclude domestic workers in private households, self employed and family workers.

Source: Republic of Seychelles, Statistical Abstract 1983 (p87-89; 95).

Table 57. Retail Price Index 1981 and 1983

ITEM:	1981	1983
Fish	189	232
Other Food	118	125
Non-Food Items	137	141
Alcoholic Beverages& Tobacco	156	165
Clothing	114	104
Housing	126	133
Fuel	161	171
Household Items	129	124
Personal Items	123	104
Transportation	158	185
Services	137	116
ALL ITEMS:	133	140

Note: January 1979 = 100.

Source: Republic of Seychelles, Statistical Abstract 1983 (p83-86).

Table 58. Government Expenditure (by Function) 1979-83 (Rupees 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**	**163.2***
Education	31.5	54.1	70.9	78.7	79.5
Health	22.0	31.5	34.9	41.5	39.7
Labor	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**

* = 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.

Source: Government of Seychelles, Statistical Abstract 1983 (p67) and IMF, Seychelles: Recent Economic Developments (Washington, DC: IMF, SM/83/176, August 1983, p35).

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IX. Annex

Annex 1. Major Government Ministries

A. Comoros

Min of Agricultural Production, Industries and Crafts
Min of Defense
Min of Economy and Finance
Min of Equipment, Environment & Town Planning
Min of Foreign Affairs, Cooperation & Foreign Trade
Min of Interior
Min of Justice
Min of Moslem Affairs
Min of National Education, Culture, Youth & Sports
Min of Production & Industry
Min of Public Works
Min of State
Secretary of State for Economy & Finances
Secretary of State for Posts & Telecommunications
Secretary of State for Transport & Tourism

B. Madagascar

Min of Agricultural Production & Agrarian Reform
Min of Animal Husbandry, Fisheries, Forests & Water Resources
Min of Civil Service, Labor & Social Law
Min of Commerce
Min of Defense
Min of Finance & Economy
Min of Foreign Affairs
Min of Health
Min of Higher Education
Min of Industry, Energy & Mining
Min of Information & Ideological Orientation
Min of Interior
Min of Justice, Keeper of the Seal
Min of Population, Social Condition & Youth
Min of Posts & Telecommunications
Min of Public Works
Min of Revolutionary Art & Culture
Min of Scientific Research & Development of Technology
Min of Secondary & Primary Education
Min of Transportation and Supply

C. Maldives

Min of Agriculture
Min of Atolls Administration
Min of Defense & National Security
Min of Education
Min of Fisheries
Min of Foreign Affairs
Min of Health
Min of Home Affairs & Social Services
Min of Planning & Development
Min of Trade & Industries
Min of Transport & Shipping

D. Mauritius

Min of Administrative Reform
Min of Agriculture, Fisheries & Natural Resources
Min of Defense & Internal Security
Min of Economic Planning & Development
Min of Education, Arts, Cultural Affairs & Leisure
Min of Employment, Social Security & National Solidarity
Min of Energy & Communications
Min of External Affairs, Tourism & Emigration
Min of Finance
Min of Health
Min of Housing, Lands & Environment
Min of Industry, Trade, Prices & Consumer Protection
Min of Information
Min of Internal Communications
Min of Justice
Min of Labor & Industrial Relations
Min of Local Administration
Min of Public Works
Min of Reform Institutions
Min of Rodrigues & Outer Islands
Min of Women's Rights & Family Affairs
Min of Youth & Sports

E. Seychelles

Min for Administration
Min for Agriculture
Min for Education & Information
Min for Finance
Min for Health
Min for Industry
Min for Labor & Social Services
Min for National Development
Min for Planning & External Relations
Min for Tourism
Min for Transportation
Min for Youth & Defense

Annex 2. Currency Exchange Rates

A. Comoros

Comorian Franc (CF)
Fiscal Year: January 1 - December 31

Annual Average:	$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

B. Madagascar

Malagasy Franc (FMG)
Fiscal Year: January 1 -December 31

Annual Average:	$1 = FMG:	SDR 1 = FMG:
1973	22.70	
1974	240.50	
1975	214.36	
1976	238.98	
1977	245.67	
1978	225.64	282.50
1979	212.72	274.84
1980	211.30	275.01
1981	271.73	320.41
1982	349.71	386.08
1983	430.45	460.15

C. Maldives

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

Official Accounting Rate (used for official government transactions):

From February 1973: $1 = MR3.93
Since January 1984: $1 = MR6.00

D. Mauritius

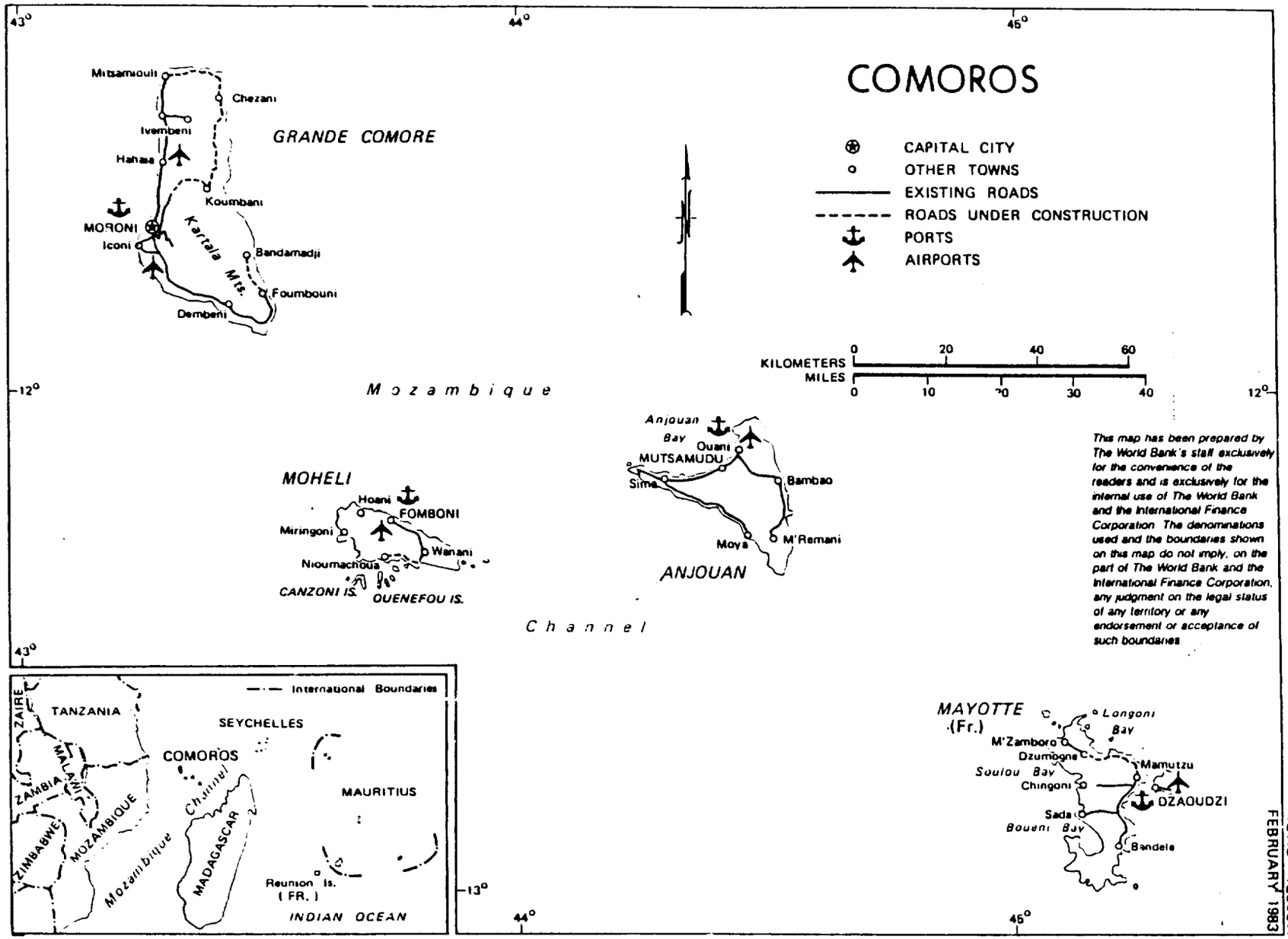
Mauritius Rupee (MR)
Fiscal Year: July 1 - June 30

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

E. Seychelles

Seychelles Rupee (SR)

1976-79:	£1 = SR 13.33
1979:	SDR 1 =8.3197
1981:	SDR 1 = 7.2345



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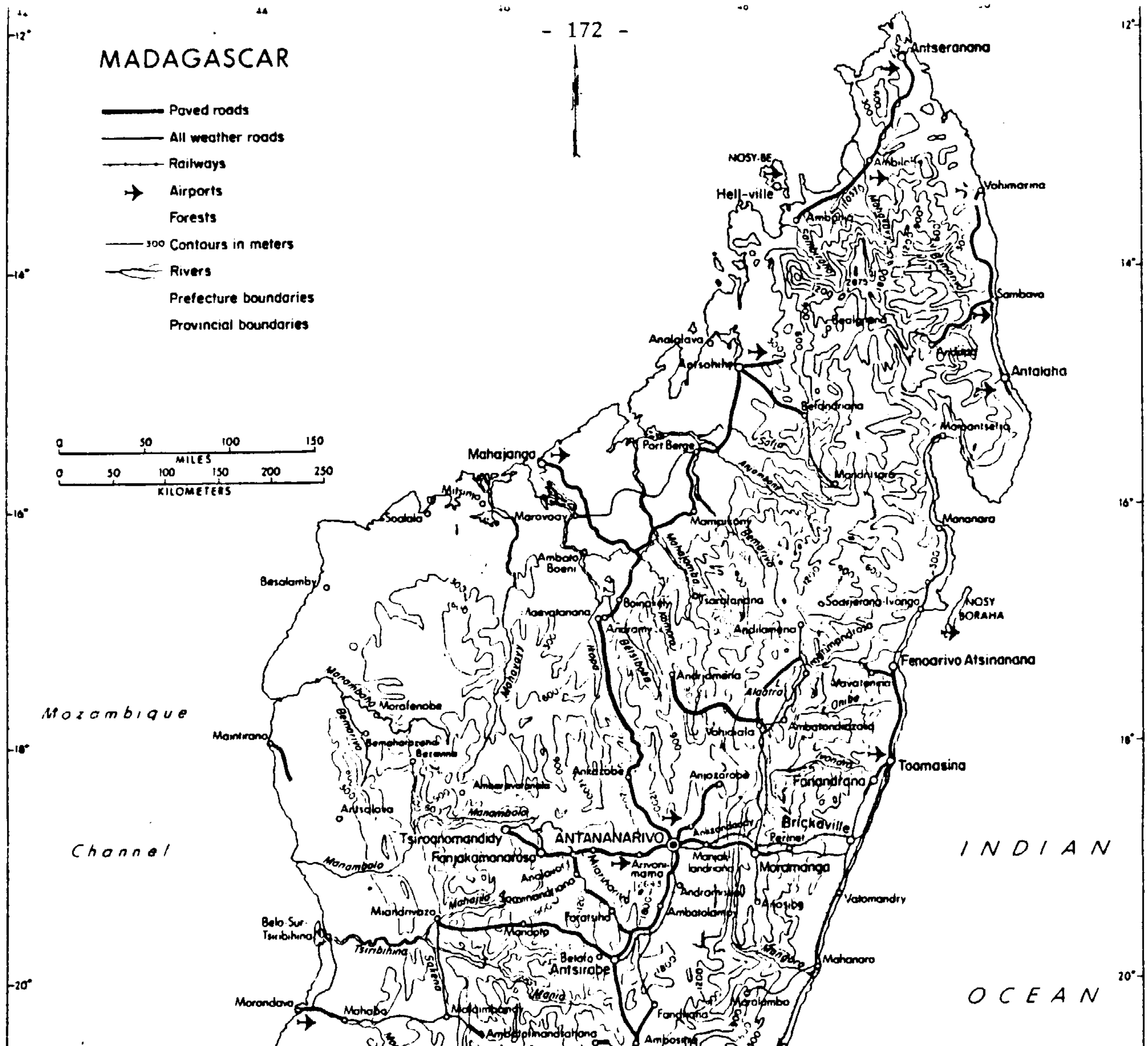
IBRD 12893R
FEBRUARY 1983


MADAGASCAR
Paved roads
All weather roads
Railways
Airports
Forests
Contours in meters
Rivers
Prefecture boundaries
Provincial boundaries
MILES
KILOMETERS
Antseranana
NOSY-BE
Hell-ville
Vohimarina
Sambava
Antalaha
Analalava
Mahajanga
Port Berge
Maroantsetra
Marovoay
Mananara
Besalampy
NOSY BORAHA
Fenoarivo Atsinanana
Mozambique
Channel
Maintirano
Toamasina
Tsiroanomandidy
ANTANANARIVO
Brickaville
Moramanga
INDIAN
OCEAN
Vatomandry
Mahanoro
Belo Sur Tsiribihina
Antsirabe
Morondava
Nosy Varika
Mananjary
Fianarantsoa
Morombe
Ihosy
Manakara
Vohipeno
Farafangana
Toliara
Vangaindrano
Ampanihy
Ambovombe
Taolanaro
AFRICA
INDIAN OCEAN
ATLANTIC OCEAN
MADAGASCAR
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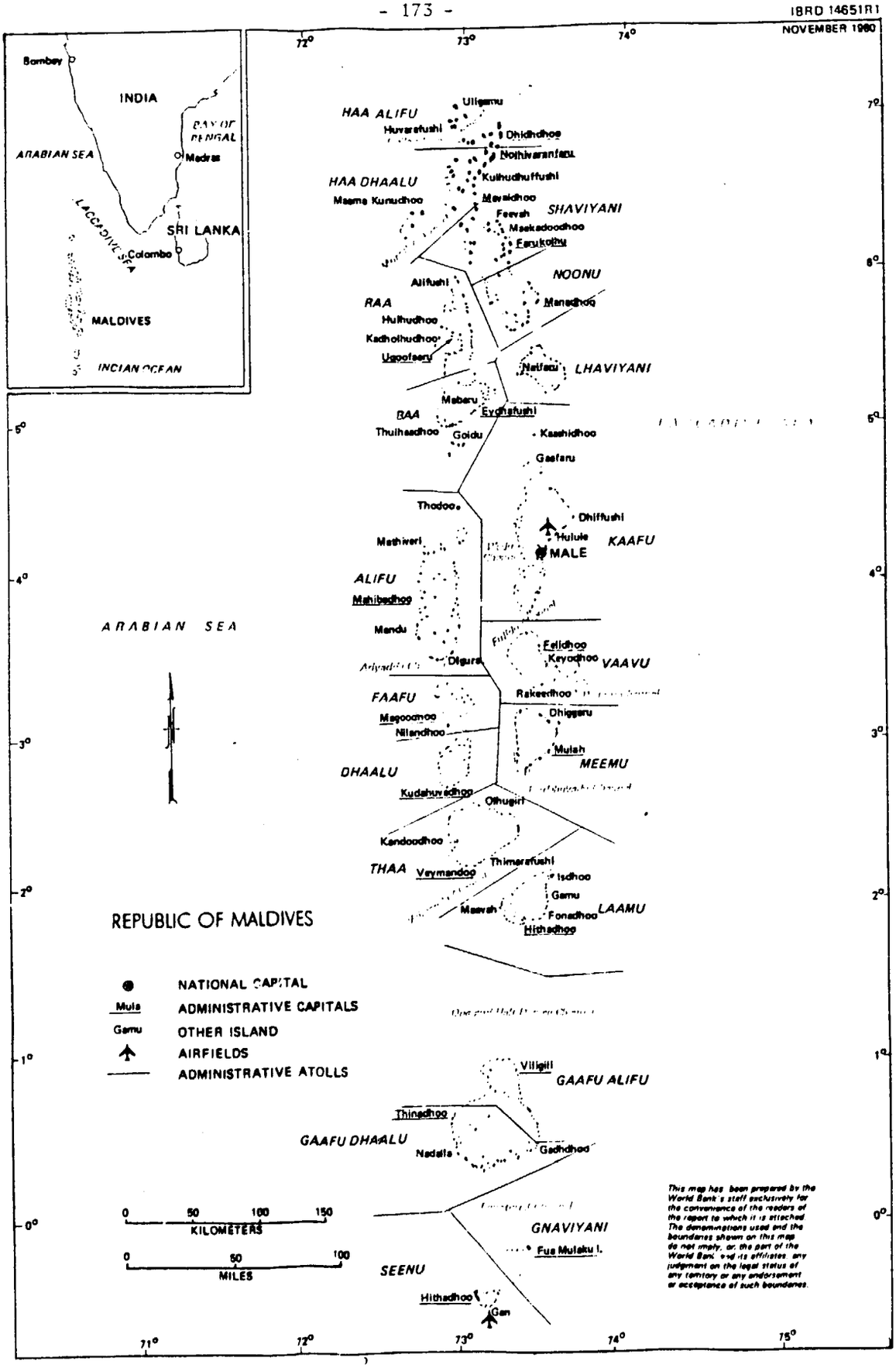
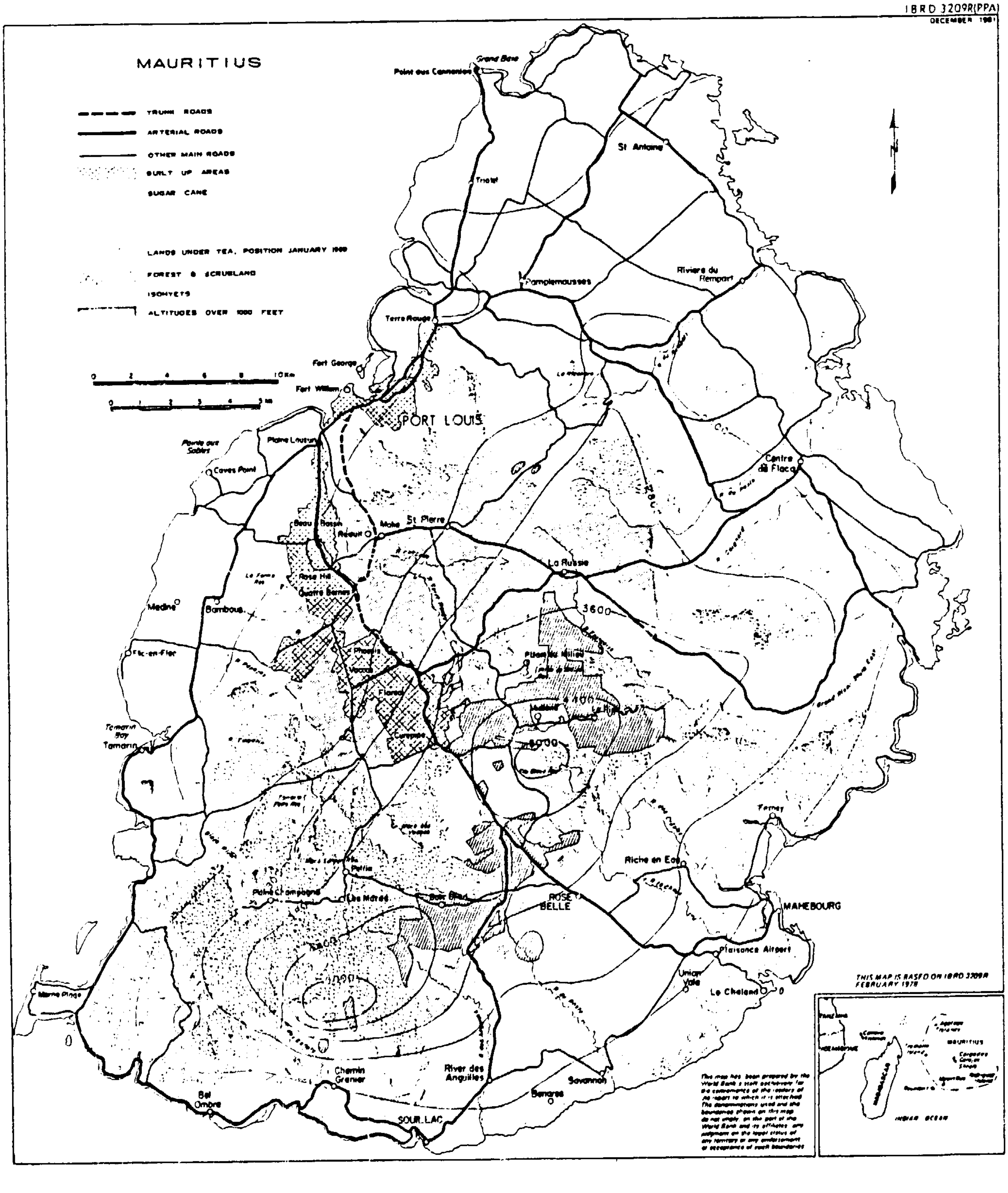
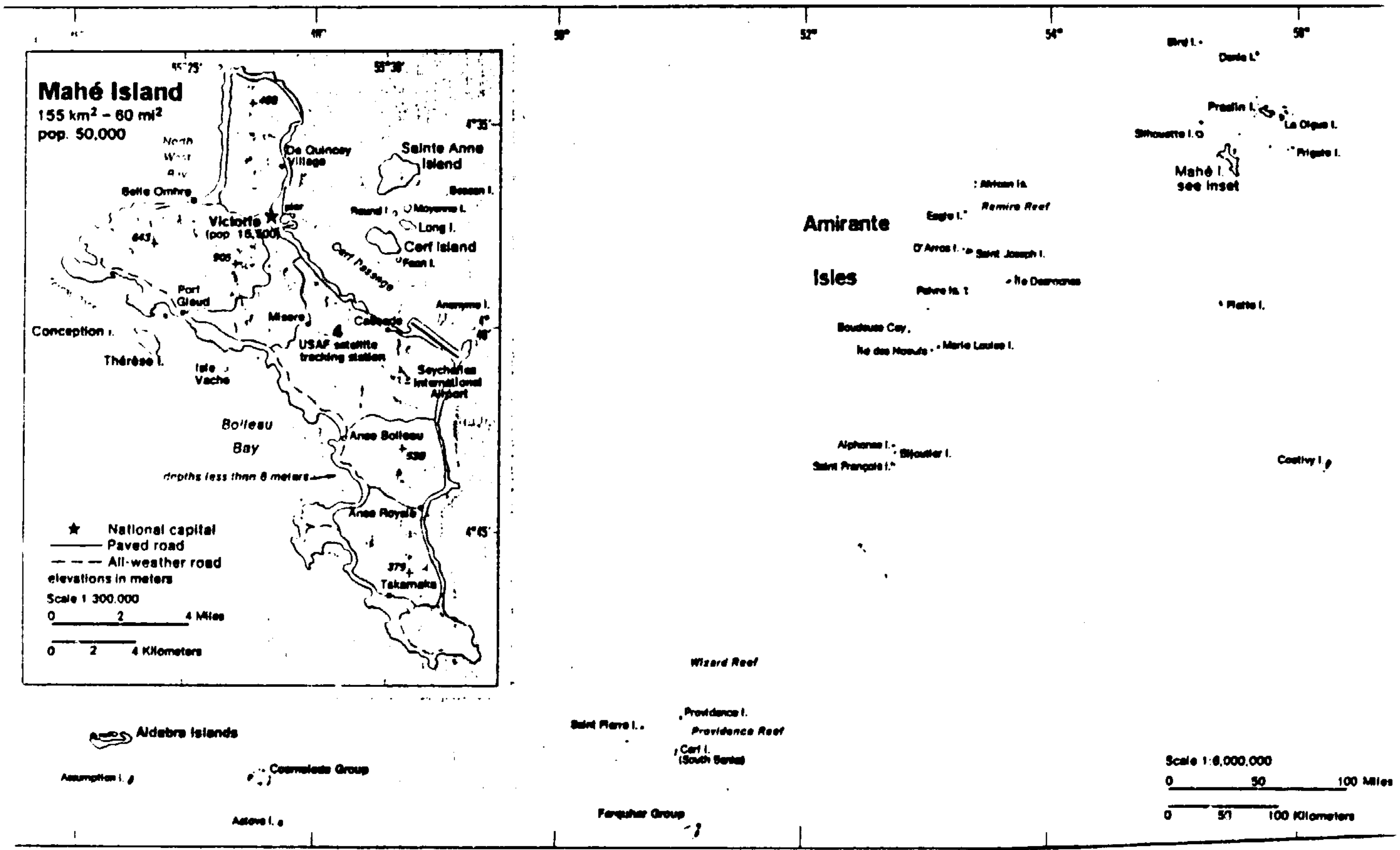
APRIL 1979
IBRD 14150


IBRD 14651R1
NOVEMBER 1980
Bombay
INDIA
BAY OF BENGAL
ARABIAN SEA
Madras
LACCADIVE SEA
SRI LANKA
Colombo
MALDIVES
INDIAN OCEAN
HAA ALIFU
Ulligamu
Huvarafushi
Dhidhdhoo
Noonivaranfaru
HAA DHAALU
Kulhudhuffushi
Maamu Kunudhoo
Maradhoo
Feevah
SHAVIYANI
Maakadoodhoo
Farukolhu
NOONU
Alifushi
Manadhoo
RAA
Hulhudhoo
Kadholhudhoo
Ugoofaaru
Nellaidu
LHAVIYANI
Meeru
Fydhafushi
BAA
Thulhaadhoo
Goidu
Kashidhoo
Gaafaru
Thodoo
Dhiffushi
Hulule
KAAFU
MALE
Mathiveri
ALIFU
Mahibadhoo
ARABIAN SEA
Mandu
Eydhafushi
Keyodhoo
VAAVU
Digura
FAAFU
Rakeedhoo
Magoodhoo
Dhiggaru
Nilandhoo
Muli
MEEMU
DHAALU
Kudahuvadhoo
Olhugiri
Kandoodhoo
Thimarafushi
THAA
Veymandoo
Isdhoo
Gamu
Maavah
Fonadhoo
LAAMU
Hithadhoo
REPUBLIC OF MALDIVES
NATIONAL CAPITAL
Muli
ADMINISTRATIVE CAPITALS
Gamu
OTHER ISLAND
AIRFIELDS
ADMINISTRATIVE ATOLLS
Viligili
GAAFU ALIFU
Thinadhoo
GAAFU DHAALU
Nadella
Gadhdhoo
GNAVIYANI
Fua Mulaku I.
SEENU
Hithadhoo
Gan
0 50 100 150
KILOMETERS
0 50 100
MILES
This map has been prepared by the World Bank's staff exclusively for the convenience of the readers of the report to which it is attached. The denominations used and the boundaries shown on this map do not imply, on the part of the World Bank and its affiliates, any judgment on the legal status of any territory or any endorsement or acceptance of such boundaries.
72°
73°
74°
7°
6°
5°
4°
3°
2°
1°
0°
71°
75°


IBRD 3209R(PPA)
DECEMBER 1981
MAURITIUS
TRUNK ROADS
ARTERIAL ROADS
OTHER MAIN ROADS
BUILT UP AREAS
SUGAR CANE
LANDS UNDER TEA, POSITION JANUARY 1969
FOREST & SCRUBLAND
ISOHYETS
ALTITUDES OVER 1000 FEET
Grand Baie
Point aux Cannoniers
St Antoine
Triolet
Pamplemousses
Riviere du Rempart
Terre Rouge
Fort George
Fort William
PORT LOUIS
Plaine Lauzun
Caves Point
Centre de Flacq
Beau Bassin
Moka
St Pierre
Reduit
La Russie
Rose Hill
Quatre Bornes
Medine
Bambous
3600
Phoenix
Vacoas
Floreal
Curepipe
Tamarin Bay
Tamarin
Ferney
Riche en Eau
ROSE BELLE
MAHEBOURG
Plaisance Airport
Union Vale
Le Chaland
Plaine Champagne
Les Mares
Bois Cheri
Morne Plage
Chemin Grenier
River des Anguilles
Savannah
Benares
Bel Ombre
SOUILLAC
THIS MAP IS BASED ON IBRD 3209R FEBRUARY 1979
INDIAN OCEAN


Mahé Island
155 km² - 60 mi²
pop. 50,000
Victoria
Sainte Anne Island
Cerf Island
USAF satellite tracking station
Seychelles International Airport
Boileau Bay
National capital
Paved road
All-weather road
elevations in meters
Amirante Isles
Mahé I. see inset
Aldabra Islands
Farquhar Group
Wizard Reef
Providence Reef
Scale 1:6,000,000

SPECIAL ANNEX

The Western Indian Ocean Island States: Problems and Prospects for Utilizing Marine Resources as a Base for Industrial Development

Immediate Potential Activities: Regional Workshops

SPECIAL ANNEX

Immediate Potential Activities: Regional Workshops

There are a number of low-cost, high-yield activities which could be begun expedicously. The major activity (or rather series of activities) suggested by this study would be a number of technical workshops. These workshops would differ significantly from the other conferences and symposia which have been held during the past decade in the region. Those conferences generally have been very broad in scope, and policy or scientific oriented, and not technical. For example, the latest regional symposium, "Conference on Economic, Scientific and Technical Co-operation in the Indian Ocean in the Field of Marine Affairs in the Context of the New Ocean Regime" will discuss relevent marine resources development issues, but on a broader level than the technical workshops envisioned here.[1] Because these islands are small, a good return can be made on a small investment, such as the workshops suggested below. The following proposed technical workshops will involve regional and non-regional participants and several international agencies. Such participants would come from academia, government and the private sector. Subject to resource availability, sponsorship and support could come

[1]That important five day conference, held in Sri Lanka in July, 1985, will address the following topics: marine science, technology and environment; ocean services; living and non-living resources, fisheries, minerals; marine affairs management; law of the sea; marine law and policy; economic potential; maritime transportation and safety, communications; and, shipping efficiency. Interestingly, Sri Lanka will be hosting another regional conference in July 1985, the "IOC-UNESCO Workshop on Regional Co-Operation in Marine Science in the Central Indian Ocean and Adjacent Seas and Gulfs", which will focus on marine science.

from all three sectors as well, with the overall coordination of UNIDO, subject to resources availability.[2]

A suggested venue for the series of workshops might be Mauritius,[3] although they could be held at differing locales as well. The following provides some of the topics and potential sponsors and participants of such technical workshops:[4]

[2]The costs of such workshops could be shared by sponsoring agencies, participating governments, public foundations and the private sector.

[3] The advantages of Mauritius are: first, it is the only country in the region which can be reached via direct flights (except Maldives, where passengers would have to go via Nairobi), and participants from Europe and elsewhere can fly to Mauritius directly; second, the School of Industry is the only school of a university with the appropriate orientation in the region, in fact Madagascar has the only other university in the region; third, there are excellent simultanous interpretation facilities for English and French at the University of Mauritius; fourth, the university has a history of successfully holding international conferences; fifth, several hotels in Mauritius offer attractive rates to such regional conferences; and sixth, Mauritius, like many of the states, has the official objective to learn more about, and better utilize its indiginous marine resources. It should be noted that the University of Mauritius has in no way agreed to act in such capacity at this time, nor has the topic been broached to it.

[4]This list is preliminary, and incompete. Some of the agencies listed here may not want to support such workshops, while others not yet identified may well.

Technical Workshop for Utilizing Marine Resources as a Base for Industrialization in the Western Indian Ocean Island States: Coral Reef Exploitation and Management for Corstruction Industries

Sponsored by: UNIDO/IUCN/UNEP

Potential Regional Participants (Government Ministries):

Comoros: ***Agricultural Production, Industries & Crafts; Equipment, Environment & Town Planning; Production and Industry***
Madagascar: ***Industry, Energy & Mining; Public Works; Scientific Research & development of Technology***
Maldives: ***Planning & Development; Trade & Industries***
Mauritius: ***Agriculture, Fisheries & Natural Resources; Housing, Lands and Environment; Public Works***
Seychelles: ***Industry; National Planning***

Potential International Participants:

International Organizations
UNIDO
IUCN
UNEP
UNDP
UNESCO
Ocean Economics & Technology Branch, DIESA
Center for Science and Technology for Development

Others
To be announced

Potential Private Sector Participtants:
To be announced

Duration:
5 days

Major Objectives:

To examine ways to better use coral reefs as a building resource, and to successfully strengthen construction industries. Emphasis would be placed on long term exploitation, protection and management of the resources.

Technical Workshop for Utilizing Marine Resources as a Base for Industrialization the Western Indian Ocean Island States:
Improving Commercial Seafood Processing and Distribution

Sponsored by: UNIDO/FAO

Potential Regional Participants (Government Ministries):

Comoros: ***Agricultural Production, Industries & Crafts; Production & Industry***
Madagascar: ***Animal Husbandry, Fisheries, Forests & Water Resources; Industry, Energy & Mining***
Maldives: ***Fisheries; Planning & Development; Trade & Industries***
Mauritius: ***Agriculture, Fisheries & Natural Resources; Industry, Trade, Prices & Consumer Protection***
Seychelles: ***Agriculture; Industries; Planning & External Relations***

Potential International Participants:

International Organizations
UNIDO
FAO
Others
US NMFS

Potential Private Sector Participants
To be announced

Duration:
5 days

Major Objectives:
To examine ways of strengthening local value added components in processing fish and other seafood products. Special session on marketing and storage, using labor intensive methods.

Technical Workshop for Utilizing Marine Resources as a Base for Industrialization in the Western Indian Ocean Island States:
Fishery Gear/Technology Improvement and Development

Sponsored by: UNIDO/FAO/UNESCO

Potential Regional Participants (Government Ministries):

Comoros: ***Agricultural Production, Industries & Crafts; Production & Industry***
Madagascar: ***Animal Husbandry, Fisheries, Forests & Water Resources***
Maldives: ***Agriculture; Fisheries; Trade & Industry***
Mauritius: ***Agriculture, Fisheries & Natural Resources; Labor & Industrial Relations***
Seychelles: ***Agriculture; National Development; Industry***

Potential International Participants:

International Organizations

UNIDO
FAO
ILO
WFP
UNESCO
Ocean Economics & Technology Branch, DIESA
Center for Science and Technology for Development

Others

To be announced

Potential Private Sector Participants:

To be announced

Duration:

5 days

Major Objectives:

To examine ways to assist local fishermen in improving their catch by using improved appropriate gear and technologies.

Technical Workshop for Utilizing Marine Resources as a Base for Industrialization in the Western Indian Ocean Island States: Developing Cottage Industries Using Local Materials

Sponsored by: UNIDO/WTO/UNCTAD/UNDP

Potential Regional Participants (Government Ministries):

Comoros: ***Agricultural Production; Industries & Crafts; Production & Industry; Transport & Tourism***
Madagascar: ***Industry, Energy & Mining; Commerce; revolutionary Arts & Culture***
Maldives: ***Trade & Industries***
Mauritius: ***Industry, Trade, Prices & Consumer Protection, External Affairs, Tourism & Emigration***
Seychelles: ***Industry; Tourism***

Potential International Participants:

International Organizations

UNIDO
UNCTAD
WTO
UNDP
UNESCO
Ocean Economics & Technology Branch, DIESA
Center for Science and Technology for Development

Others

To be announced

Potential Private Sector Participants:

To be announced

Duration:

5 days

Major Objectives:

To examine ways local resources can be better utilized for manufacturing handicraft for export and to satisfy local tourism demand. Also, examine the potential for establishing a regional design center which

could promote the design of craft products using coral, quartz or other semi-precious materials, shells or wood.

Technical Workshop for Utilizing Marine Resources as a Base for Industrialization in the Western Indian Ocean Island States: Strengthening Cooperatives for Boat Building/Repair Facilities

Sponsored by: UNIDO/FAO

Potential Regional Participants (Government Ministries):

Comoros: ***Agricultural Production, Industry & Crafts; Public Works***
Madagascar: ***Commerce; Industry, Energy & Mining; Animal Husbandry, Fisheries, Forests & Water Resources***
Maldives: ***Trade & Industries; Transport & Shipping; Fisheries***
Mauritius: ***Agriculture, Fisheries & Natural Resources; Labor & Industrial Rlations; Public Works***
Seychelles: ***Industry; National Development; Transportation***

Potential International Participants:

International Organizations
- UNIDO
- ILO
- FAO
- UNDP
- Ocean Economics & Technology Branch, DIESA
- Center for Science and Technology for Development

Others
- To be announced

Potential Private Sector Participants
- To be announced

Duration:
- 5 days

Major Objectives:

To examine ways of developing indigenous cooperatives for establishing or improving small boat repair or building facilities.

Technical Workshop for Utilizing Marine Resources as a Base for Industrialization in the Western Indian Ocean Island States:
Industrial Uses of Marine Plants for Pharmaceutical Production

Sponsored by: UNIDO/FAO/WHO

Potential Regional Participants (Government Ministries):

Comoros: ***Agricultural Production, Industries & Crafts; Public Health & Population***
Madagascar: ***Animal Husbandry, Fisheries, Forests & Water Resources; Health; Industry, Energy & Mining***
Maldives: ***Agriculture; Health; Trade & Industries***
Mauritius: ***Agriculture, Fisheries & Natural Resources; Health; Industry, Trade, Prices & Consumer Protection***
Seychelles: ***Agriculture; Health; Industry; National Development; Planning & External Relations***

Potential International Participants:

International Organizations
UNIDO
FAO
UNDP
WHO
Ocean Economics & Technology Branch, DIESA
Center for Science and Technology for Development

Others
To be announced

Potential Private Sector Participants
To be announced

Duration:
5 days

Major Objectives:
To examine ways of producing bio-medicinal products from selected marine plants.

Technical Workshop for Utilizing Marine Resources as a Base for Industrialization in the Western Indian Ocean Island States:
Potential for Aquaculture/Mariculture Development

Sponsored by: UNIDO/FAO/UNESCO

Potential Regional Participants (Government Ministries):

Comoros: ***Agricultural Production, Industries & Crafts; Production & Industry***
Madagascar: ***Animal Husbandry, Fisheries, Forests & Water Resources***
Maldives: ***Agriculture; Fisheries; Trade & Industry***
Mauritius: ***Agriculture, Fisheries & Natural Resources; Labor & Industrial Relations***
Seychelles: ***Agriculture; National Development; Industry***

Potential International Participants:

International Organizations

UNIDO
FAO
WFP
UNESCO
Ocean Economics & Technology Branch, DIESA
Center for Science and Technology for Development

Others

To be announced

Potential Private Sector Participants:

To be announced

Duration:

5 days

Major Objectives:

To examine ways to create or strengthen various species for aquaculture or mariculture development, with the objective to strengthen protein for local consumption, as well as foreign exchange earnings. Appropriate species would be identified, and potential markets assesed.

Technical Workshop for Utilizing Marine Resources as a Base for Industrialization in the Western Indian Ocean Island States:
Developing Alternative Ocean-Based Energy Sources

Sponsored by: UNIDO/UNDP/IBRD

Potential Regional Participants (Government Ministries):

Comoros: ***Production & Industry; Public Works***
Madagascar: ***Industry, Energy & Mining; Public Works; Scientific Research & Development of Technology***
Maldives: ***Planning & Development***
Mauritius: ***Energy & Communications; Public Works***
Seychelles: ***Industry; Planning & External Relations***

Potential International Participants:

International Organizations

UNIDO
IBRD
UNDP
Ocean Economics & Technology Branch, DIESA
Center for Science and Technology for Development

Others

To be announced

Potential Private Sector Participants

To be announced

Duration:

5 days

Major Objectives:

To examine ways to develop alternative, new and renewable sources of energy for industrial uses, including geothermal, tidal, OTEC and solar.

Technical Workshop for Utilizing Marine Resources as a Base for Industrialization in the Western Indian Ocean Island States: Developing Techniques for Surveying and Assessing Marine Resources in EEZs.

Sponsored by: UNIDO/FAO/UNESCO-IOC

Potential Regional Participants (Government Ministries):

Comoros: ***Equipment, Environment & Town Planning; Foreign Affairs, Cooperation & Foreign Trade; Public Works***

Madagascar: ***Commerce; Foreign Affairs; Industry, Energy & Mining; Scientific Research & Development of Technology***

Maldives: ***Fisheries; Foreign Affairs; Planning & Development***

Mauritius: ***Economic Development & Planning; Energy & Communications; Housing, Lands & Environment; Agriculture, Fisheries & Natural Resources; External Affairs, Tourism & Emigration***

Seychelles: ***Agriculture; National Development; Planning & External Relations***

Potential International Participants:

International Organizations

UNIDO
FAO
UNDP
UN/OET
UNESCO-IOC
IUCN
UNEP
IMO
Ocean Economics & Technology Branch, DIESA
Center for Science and Technology for Development

Others

To be announced

Potential Private Sector Participants

To be announced

Duration:

5 days

Major Objectives:

To examine ways of surveying and then assessing the living and non-living marine resources located in the 200 mile EEZs of the Indian Ocean Island States.