

COASTAL LIVELIHOODS IN THE UNION OF COMOROS

GENERAL INTRODUCTION

The Agulhas and Somali Current Large Marine Ecosystems (ASCLME) project is focused on the two large marine ecosystems of the Western Indian Ocean (WIO) region, covering nine countries that are directly influenced by these current systems. It is estimated that at least fifty-six million people are reliant either directly or indirectly on the goods and services provided by these two current systems. The ASCLME project aims to support these countries in their efforts to collectively manage the marine resources on which their people and economies depend. Fisheries and other key coastal activities, including various forms of tourism, aquaculture, shipping and coastal transport, the energy sector, agriculture and forestry, are very important contributors to the economies of the countries of the WIO. In recognition of the complexity and importance of these activities, a Coastal Livelihoods Assessment (CLA) component was developed for the ASCLME project.

The CLA component had three main objectives:

- to collect as much existing information as possible about the main coastal activities in the nine participating countries as a contribution to the national Marine Ecosystem Diagnostic Analyses (MEDAs);
- to make input into ensuring that this information is stored and organised in a manner that will allow easy access and maximum utility to multiple stakeholders, both during and after the lifetime of the ASCLME Project;
- to review and synthesise the information collected in order to provide useful inputs to the TDA and SAP processes.

In order to achieve these objectives, the CLA component was separated into three distinct phases, with the first phase kicking off in May 2009. During phase one, a “desktop” review of available data was conducted by the regional project coordinators, input was made into the design of a literature management tool to facilitate the storage of information, and preparations were made for the in-country data gathering process. Planning meetings were held between the core CLA team and the in-country Data and Information (D+I) Coordinators in August 2009. The processes involved in the in-country component of recruitment and data gathering was discussed and confirmed at this stage.

Phase two involved in-country personnel having been identified and recruited through a regionally inclusive recruitment process. Nominations were invited and received from country focal points and D+I Coordinators. Twenty three consultants were recruited to assist with the project. For some sectors international experts (drawn from the region where possible) were asked to provide information for all countries in the region while in others, where good local capacity existed, in-country consultants were recruited. This group of consultants collected information from existing resources, such as published articles, government reports, regional reviews, project reports and outputs, policy documents as well as a range of other grey literature that was likely to be useful.

Phase three involved the organisation of the information into country Coastal Livelihood Reports where individual sector reports have been assessed and the key elements from each sector extracted and presented in a summarised format. These country reports will be reviewed by project representatives in each country and once accepted, will be incorporated as a separate Coastal Livelihoods chapter in the overall country MEDA documents. It is anticipated that the information collated in these reports will allow examples of best-practice to be identified for application in other parts of the region. The objective is to build on approaches that work rather than to duplicate efforts. Information gaps will be identified and addressed in subsequent phases of the ASCLME, including during a Cost/Benefit Analysis (CBA)

exercise designed to weigh up the costs and benefits of various development options. Key information from these reports will feed into the CBA and hopefully provide useful guidelines for the Transboundary Diagnostic Analysis (TDA) and the development of Strategic Action Plans (SAP) for the overall ASCLME project.

The following country report begins with an overview of coastal livelihoods in Comoros, which provides a concise overview of the seven sector reports and the findings of the in-country and regional consultants. This overview ends with a conclusion which summarizes the collected information as it relates to the coastal zone in Comoros in general. This overview is followed by the more detailed sector reports, which represent the original contributions by the in-country and regional consultants. The sectors are organized in the following order: Small-scale Fisheries, Tourism, Mariculture, Agriculture and Forestry, Energy, Ports and Coastal Transport and Coastal Mining.

Each sector report has been prepared by specialists in that particular sector drawn either from the country or internationally. Sector reports have been prepared according to a pre-determined template to ensure that the relevant aspects of that sector were captured by the consultants. Reports include descriptive sections on the biophysical environment, human environment, policy and governance, planning and management, and development, trade and projects related to that sector. Each report is concluded with a SWOT analysis which provides a summary of the Strengths, Weaknesses, Opportunities and Threats facing that sector. It is the outputs of these SWOT analyses that are of particular importance to the strategic planning aspects of the overall ASCLME project. These reports were initially submitted to the regional coordinators for review and have subsequently been corrected and updated by the consultants themselves.

Finally, each sector report has a bibliography containing key references and links to relevant information. Full details of the information resources collected during compilation of each sector report, as well as electronic copies of literature (where available), are included in the overall ASCLME reference management system.

OVERVIEW OF COASTAL LIVELIHOODS IN COMOROS

I. Small-Scale Fisheries

The Small-scale fisheries in Comoros employs 6% of the country's population, with women mainly being employed in post-catch operations, while 30% of the population is dependent on the fishery. The sector contributes 8% to GDP, 24% to agriculture GDP and also makes up 5% of total foreign exchange annually, making fishing not only a net supplier of foreign exchange, but also a key component of the country's balance of payments. The small-scale fishery is, in this respect, a vital link to the global economy for the Comoros.

With the government's goal of replacing frozen fish imports in the 1980's through targeted investment and development, production output tripled from 1986 through 2004. This has been followed with further government commitment with the 'Comorian Fisheries Development Strategy' in 2007, which emphasized the responsible and inclusive development of the small-scale fishery. The government has also fostered development in the small-scale fisheries through revenue accrued from the larger industrial fishing industry, with upwards of 60% of revenue from fishing agreements being made available for the development of a cold chain and fishermen training programs. This has allowed the small-scale fishery to indirectly grow and benefit from the industrial fishery. Small-scale fishermen are also permitted to fish without licenses, as well as fish in protected areas, both of which are privileges that have not been granted to the industrial fishery. Both the industrial and small-scale fisheries, however, continue to target the same

resource (tuna), making for potential conflicts of interest in the future. Many of the government's programs have also not been operational due to the lack of available capital and capacity, which has hindered further development in the small-scale fishery. Likewise, heavy exploitation of the coastal zone may also become problematic if monitoring and regulatory techniques are not improved.

State capacity and infrastructure remain constraints on the sector, however, government commitment, along with an improving investment climate and potential for further increases in production, makes the small-scale fishery a prospect for strong and sustainable development in the future. While the coast is becoming over-exploited and access to credit remains weak in the sector, the international demand for fishery products, as well as the existence of untapped niche markets, highlights the many opportunities that the small-scale fishery could capitalize on. With greater attention devoted to sustainable production, sanitary processing and better marketing, the small-scale fishery has much potential for future development.

II. Tourism

Tourism contributed between 2% and 4.1% of total GDP in 2005, generating 500 direct jobs, 80% of which were in the hotel sector. Tourism also generated 500 indirect jobs in 2005, largely around the food-supply and handicrafts sectors. 90% of total bed capacity in the sector is located on the island of Grand Comore, which contains the country's only international airport and business hotel. International arrivals have been increasing in recent years, however, both total arrivals and leisure-based travel has been declining, with leisure based travel decreasing from 27,000 in 1994 to just 3,000 in 2007.

The greatest constraints in the sector are clearly in capacity. Limited accommodation capacity, banking facilities and transport have all been highlighted as weaknesses in the sector, while political instability and a lack of disposable capital at the community level continue to constrict growth. Issues of sustainability have also been raised, not only in regards to natural resources, such as water, but also in relevance to donor support. Illegalities in investor-government relations, as well as unrest in rural areas, have also been highlighted as challenges in the sector.

There are, however, numerous opportunities that can be capitalized on to mitigate some of the aforementioned constraints. For example, the potential for new international airline connections could lower travel costs, while opportunities for eco-friendly hotels and construction materials could help in the development of eco-tourism in the country. The country's ideal climate, natural environment, and rare marine resources also give the sector a comparative advantage over other tourist destinations, while its unique cultural heritage and active volcanoes could also help in marketing the sector abroad. Nevertheless, before these strengths can be sufficiently utilized to the benefit of the sector, political instability needs to be improved, particularly as a means to establish certainty and confidence in the country's business environment and overall economy.

III. Mariculture

With no designated mariculture zones, limited fresh or brackish water resources, and limited areas suitable for culture, there are currently no operating mariculture activities in the country. There are, however, some opportunities for growth in the sector.

In Grande Comoros, northern areas such as Mitsamiouli and Bouni, as well southern areas, including Sima Amboini and Fouboni, have been recognized as having potential for mariculture development. Likewise, the south west coastline of Moheli, in particular in the vicinity of the Parc Marin de Moheli, provides an ideal environment for cage cultures to be developed. These opportunities are also indirectly

supported with the reduction in lagoon fisheries, which could potentially create greater incentives to develop mariculture activities. However, with limited mangrove areas and accompanying salt flats that could be used for pond culture, any potential mariculture development is somewhat constrained.

While capacity, infrastructure and the lack of available data continue to constrain the development of the sector, the central and local government has shown a willingness to support its development. Similarly, with abundant opportunities for business development and job creation in the sector, mariculture has the potential to create an alternative stream of income in the country. Mariculture activities could also be utilized as an alternative method of coastal zone management, which could potentially create incentives to reduce environmental degradation on the coast. Overall, with the proper bio-technical and financial assistance, mariculture has the potential to become a new industrial sector in the Comorian economy.

IV. Agriculture and Forestry

Agriculture and forestry currently employs between 70% and 80% of the total Comoros population, accounting for nearly 45% of GNP and totaling 98% of all exports. It continues to grow at an annual rate of 2%. Vanilla is the most dominant commodity in the sector, making up 60% of all exports, making it the principal source of foreign exchange in the country. National agricultural production, however, accounts for only 40 per cent of the country's food needs, wherein, production for domestic consumption contributes some 47 per cent of the sector's added value. Food imports, particularly rice, thus consume much of the country's foreign exchange.

With much biodiversity and diverse landscapes, Comoros receives a considerable amount of international support that focuses on natural resource conservation. Forest destruction, due to rapid agricultural expansion, has however led to upwards of 57% of total forest area being degraded. With the total population in the coastal areas expected to increase to 65% of the total country population by 2050, degradation of the forests, which have been valued at \$698 Million USD, could be fatal for connected coastal ecosystems.

The government and the international community has, however, shown a strong commitment to promoting the sustainable use of the country's forestry and agriculture. With the adoption of the National Environmental Policy in 1993, the Comoros government began promoting the protection of biodiversity and environmentally viable agricultural production. The country has also received backing from IFAD and the UNDP to promote training in sustainable agriculture and climate-change management respectively, both of which emphasized the empowerment of local communities in managing their resources. Existing policies in the sector have also been studied and implemented using empirical evidence, which instills greater confidence from both donors and investors. While an over-reliance on commodity exports continues to attach the economy to volatile commodity prices, the country's beautiful landscape, as well as the great potential for sustainable eco-tourism, highlights the many opportunities within the sector for development. With increased capacity at the local level, along with diversification into food-based agriculture for domestic consumption, the agriculture and forestry sector has the potential to revitalize both the Comorian economy and environment.

V. Energy

There is very little activity in oil, gas and biofuels in Comoros. The country has no proven oil and gas reserves, forcing it to import the majority of its petroleum from Tanzania and other mainland African states. The country consumes an estimated 1,000 barrels of oil per day, with imports accounting for 750 barrels per day, often resulting in supply deficits. In the downstream sector, the state-owned Société Comorienne des Hydrocarbures (SCH) is responsible for the importation, storage and distribution of oil

and LPG. In the past, the SCH has poorly managed fuel and LPG needs and stocks, creating recurrent disruptions. The state-owned entity is, however, currently being privatized, while there are also reports that maritime fuel distribution between Anjouan and Moheli is also being privatized. Due to limited available land, there are currently no biofuels projects in the country.

Numerous constraints have been identified in the sector. For example, data on the sector is not easily available, there is no record of oil and gas policies and there is no record of reports or projects, all of which severely constrains analysis and planning in the sector. Comoros also has a relatively weak central government system which, in conjunction with political instability, makes policy implementation extremely difficult. Under these conditions it has been suggested that any discovery of oil could not only lead to more political turmoil, but would increase the risk of spills and accidents. The country's small, but fast growing, population, along with its vulnerability to climate change and rising sea levels, were also highlighted as weaknesses in the sector.

There are, however, strengths and opportunities highlighted in the sector report. For example, the privatization of the SCH has the potential to increase efficiency in the downstream sector, while local and international NGO's could potentially serve as industry watchdogs, which is particularly important considering the inefficiencies present in the central government. The decentralization of resource management could also be very positive, particularly as a means to empower communities to be responsible for their own resources. The potential for eco-tourism is also promising, not only as a means to generate employment, but also as a means to shift labor away from the more resource-intensive sectors. Nevertheless, the country does remain extremely dependent on an assortment of imports, and given that all of its petroleum is imported from neighboring states, it is likely that strategies to mitigate the over-dependence on non-domestic resources will be required before any substantial progress can be made.

VI. Ports and Coastal Transport

There are four major ports in Comoros, located in Moroni, Fomboni, Mutsamudu and Mayotte. The main port in Moroni is accessible by road, however, dangerous currents and water depth force ships to dock away from the port, leaving ship cargo to be transferred to the port through smaller vessels. The port in Mutsamudu has access to important fish-processing storage facilities, while the Fomboni and Mayotte ports also both have links to the fishing industry.

While the government continues to operate the port in Mayotte with French assistance, the operation of the other ports has been contracted out to Gulf-state companies, most recently with the UAE based container port management company Gultainer at Moroni and Mutsamudu. This business with Gulf-state partners has also created opportunities for tourism from other countries in the Middle East, as well as made possible the potential upgrades in port operations and technology.

Competition in fishing and tourism from Madagascar and other island states, along with the threat of piracy due to the country's proximity to Somalia, continues to constrain ports and shipping in Comoros. However, investment in ports from the Middle East, along with the potential for an offshore financial center, does highlight the potential for growth and development in the ports and shipping sector. If political stability can be advanced, the sector will benefit greatly.

VII. Coastal Mining

There are no commercially exploitable mineral resources in the country, thus, energy, cement, steel and other materials are imported. New construction techniques using volcanic ash are, however, expected to

decrease the country's dependence on foreign cement and sand imports. The mineral industry in the Comoros is still nevertheless limited to the production of local building materials.

The use of beach sand for construction materials has inevitably led to the erosion and degradation of the country's beaches. While the country does have environmental regulations, no management plan on sand mining has been implemented to date. The United Nations - Division for Ocean Affairs and the Law of the Sea – has, however, conducted two studies with recommendations for management of the Comoros coastal zone.

While coastal mining does not present any immediate commercial opportunities and the affects of sand mining remain problematic, numerous local NGO's, such as The Association for Intervention for Development and the Environment (AIDE), Action Comoros and the Management Committee of the Marine Park of Moheli, continue to monitor the socio-economic and ecological status of the country's coastal zone. Thus, while the central government lacks the capacity to monitor the impact of economic activity in the coastal zone, there are agencies on the ground that continue to do so.

Conclusions

Each sector has had, and will continue to have, a distinct impact on the socioeconomic and environmental status of the coastal communities concerned. There are many constraints that remain constant across sectors, such as political stability, the over-exploitation of natural resources and infrastructure, all of which have had a widespread impact on all of the sector's considered in the coastal livelihoods study. There are also numerous strengths and opportunities apparent, including the commitment to sustainable development, support from government and international agencies, as well as the empowerment of local communities. In this respect, while each of the seven sectors have their own distinct institutions and processes that are unique to the sector in question, they are nevertheless extensively linked economically, socially and environmentally.

One clear link between many of the sectors is the constraint posed by poor infrastructure and weak capacity. In the small-scale fisheries, a lack of electricity and water at fishing sites has constrained storage and cooling capacity, which subsequently affects the marketability of the product. In the mariculture sector, a lack of relevant policy, institutional capacity for effective coastal monitoring and data management, continues to constrict the regulation of coastal zone degradation and the general development of mariculture activities. In the agriculture and forestry sector, resources to implement policies for improved coastal zone management and development are lacking. The same can be seen with the management of sand mining. However, despite these constraints, many projects and sectors have been able to develop with domestic and international support. For example, investment in infrastructure and training in the small-scale fisheries has allowed the sector develop side-by-side with the larger industrial fleets. Likewise, good water quality and governmental support could be very helpful for the potential development of mariculture activity, while international support to assist in improved coastal environmental management, as well as more empirically-backed data and policies, have been beneficial in the agriculture and forestry sector. Similarly, the ports and shipping sector has the opportunity to grow if infrastructure can be enhanced with foreign investment.

The commitment from government to monitoring and regulating the utilization of the country's natural resources highlights the potential for improvement in management regimes. By harnessing the country's rich biodiversity and promoting future sustainable development, the coastal zone has the potential to not only diversify it's economy, but also create spillovers that could promote alternative streams of income in the process. For example, the development of a mariculture sector has the potential to not only help compensate for the over-exploitation of fisheries resources, and increase employment opportunities, but

could also potentially promote the development of eco-tourism. Likewise, by promoting investment in a sustainable agriculture and forestry sector, not only could forest degradation be slowed down, but opportunities for organic, food-based agriculture could be promoted. This has the potential to both reduce costly foreign imports, as well as diversify the economy and again create alternative streams for income generation.

The willingness of government to empower local communities in relation to their natural resources is also a positive sign moving forward. Whether it's with capacity-building in the small-scale fisheries or training in sustainable agriculture techniques, both the Comoros government and the relevant international organizations have committed to devolving knowledge and capacity to the coastal communities whose lives depend on their natural resources.

Overall, while infrastructure, political instability and the over-exploitation of natural resources present many challenges in the Comoros coastal zone, the commitment to sustainable social and economic development at the community level is high. As long as political stability prevails, business opportunities can be promoted across sectors, and investment, employment and economic growth has the potential to flourish. This, in turn, has the potential to decrease the country's dependence on volatile commodity exports and subsequently revitalize the socio-economic status of the Comoros coastal zone.

DETAILED SECTOR REPORTS

I. Small-Scale Fisheries - Prepared by Mr. Ali Mohammed Youssouf,
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1. Country Overview

The Comoros archipelago is located at the northern entrance of the Mozambican Channel, about 200 km Northwest of Madagascar and 300km East of Mozambique. It consists of four volcanic islands: Grande Comoro (1 148 km²), Anjouan (424 km²), Mayotte (374 km²) and Moheli (290 km²). In spite of the country's accession to international sovereignty in 1975, Mayotte is still under French administration.

The total area of the three islands that now form the Union of Comoros is 1 862 km². This document refers only to the three independent islands grouped together as the Union of Comoros. The general population and housing census (GPHC) done in 2003 showed a total of 575 660 inhabitants with a growth rate of 2.1% and an average density of 309 inhabitants per km², which varies significantly from one island to the next. 72.0% of the population is rural and 28.0% is urban. The population is mostly concentrated in the coastal area (65%).

Young people under 20 represent 57.4% of the population and those younger than 15 represent 42% of the population. Together, the latter category and that of persons over the age of 64 represents 89% of the population.

The islands' climate is tropical marine with two seasons: a hot and humid season from November to April and a cool, dry season between May and October. The islands' climate is tempered by the altitude.

The Comoros economy suffers from many structural imbalances and is highly subject to natural and external constraints on which the country has no control: Geographical isolation, remoteness of international markets, high transportation costs, insurance and re-insurance, a constrained local market, in a context of limited resources, and in the absence of economies of scale.

The current macro-economy situation is characterized by low GDP growth (1%) in 2008, domestic arrears (49.3 billion U.S. dollars) representing 26.4% of GDP (debt service, Ministry of Economics, March 2009), and external arrears representing 235% of goods and services' exports. However, development opportunities are real and important in the fields of agriculture, fisheries and tourism and are already the subject of an integrated development strategy.

In agriculture, particularly, the strategy covers all sectors of the activity: production, preservation, transportation, distribution, processing and export. The growth and poverty reduction strategy paper (GPRSP), adopted in 2005, makes up the overall framework for the country's economic development. This document gives central priority to the promotion of agricultural development, identified as a motor of economic growth.

The government has also prepared a report on the Millennium's Development Goals which reinforces the GPRSP actions in the agricultural sector, by reducing by half, between 1990 and 2015, the population that suffers from hunger and by reversing the actual trend of environmental resources' loss.

2. Overview of Coastal Fisheries and other Related Activities

Artisanal Comorian fishing contributes to reducing unemployment and improving the income of poor families. It is practiced with fibreglass boats (1 500 units) powered by outboard motors of 15-40 Hp and wooden canoes (3 500 units)¹. These boats mainly use dragnets and hand lines and annually lands 16 200 tonnes of fish for a turnover of over 14 billion Comorian Francs (28.6 million Euros). The wooden canoes mainly fish in the coastal zone while the motorized vessels go beyond the territorial waters (further than 12 miles). Most of the wooden canoes' production is intended for self consumption, while the motorized boats' activity is purely commercial.

Fishing contributes to the availability of animal proteins since it provides almost all of the fish destined for direct consumption and this, in addition to imports of other products of animal origin (chicken, meat etc).

Fishing is practiced in an estimated marine area of more than 160 000km² that covers 900km² of continental shelf and 427km of coastline. This area overflows with potential resources estimated annually at 33 000 tons². It employs 6% of the population (8 500 direct jobs and 24 000 indirect jobs) and about 30% of the population depends on this activity. It contributes to 8% of the GDP and 5% in foreign exchange³.

3. Introduction

Small-scale Fishermen and Small Coastal Fisheries

The different types of fisheries are clearly categorized by the national law on fisheries and aquaculture enacted August 29, 2007⁴. A distinction is made between artisanal, commercial, industrial, traditional and subsistence fishing. Small-scale fishermen are exclusively involved in traditional, artisanal and commercial fishing as the industrial fishing activity is the prerogative of licensed foreign ship owners, without any real social impact on the country. It is therefore an activity that evolves in parallel with the economic realities of the country (no transfer, processing and marketing activity).

The available statistics (sampling system of the catches in 1994, updated in 2004) were conducted with the aim of obtaining data on the quantity and composition of catches, but also on the fishing activity (types of boats and crews). Other socio-economic studies conducted in the area were used to estimate the portion of the population depending on the fishing activity.

The analysis of existing data on this sector allows us to easily measure the sector's contribution to the national economy (contribution to GDP and foreign exchange from foreign trade).

Industrial fishing, carried out exclusively by foreign companies, primarily brings license fees to our country. Other related activities are not conducted in our country but in neighbouring countries (Seychelles, Madagascar) that have suitable support infrastructures. Nevertheless, 60%⁵ of the revenue from fishing agreements is made available to the Ministry of fisheries for the development of the fishing sector (consisting exclusively of small fisheries). These funds are used for the development of the cold

¹ Fishing Study TCP 2902, 2002-2003

² National Fishery Resources Evaluation Campaign, FAO, 1970

³ Socio-economic Study of Comorian Fishing, Fisheries ENSAR 1995

⁴ Law on Comorian Fishing and Aquaculture, 2007

⁵ Comoros-European Union Fishing Agreement 2006-2010

chain (ice production, cold rooms etc), fishermen training and production enhancement (FADs). Thus, we can consider that licensed industrial fishing contributes indirectly to the development of small fisheries. Superficially, there are no apparent conflicts between industrial fisheries and small fisheries since the fields of action of the various fisheries are conceptually different (small fisheries within 12 miles, industrial fisheries beyond 12 miles). In reality, a conflict of interest must exist, especially concerning the catch, as the targeted resource remains the same (tuna). The fishing licenses are for tuna and more than 80%⁶ of the small fisheries' catch is tuna. The interaction between the state of the tuna resource and the results of the two fisheries concerned is very clear.

Description of the fishing chain "from the hook to the cook" for the most important small-scale fisheries

Since independence in 1975 until 2004, fishing has strategically been considered as a subsistence sector of which the main objective was to meet the population's fish needs. This displayed vision was materialized by the fact that fishing has always been regarded as a subcomponent of Agriculture in the Agricultural Strategy adopted in 1994. The implementation of this overall strategy has shown disparities in the allocation of investments to the subcomponents of agriculture. This is why the fishing activity did not have a booming development that would have enabled it to contribute to the country's socio-economic development. The Government's concern to replace the frozen fish imports by domestic production has resulted in a mobilization of first investments during the period of 1989-1995. These investments should lead to the introduction of new fishing techniques and motorized boats capable of decongesting the coastal zone.

This intention that was expressed by the authorities has today led to a tripling of the production output (6 000 tons in 1986 to 16 200 tonnes in 2004)⁷, an emergence of some professionals and a total substitution of fish imports.

Given the difficult economic environment that the Comoros is experiencing on its traditional export products (Vanilla, cloves, Ylang-Ylang), the country has adopted since 2004, a new development strategy entitled " Growth and Poverty Reduction Strategy Paper (GPRSP)" which highlights new growth sectors such as fishing, tourism and services. This new approach gives a clear recognition to the fisheries sector as a new pillar of the national economy, but investment has been slow.

The main types of small-scale fisheries are:

- Seasonal fishing, on foot, of which the main goal is to provide fish for home consumption. It is practiced by more or less a hundred women in the North and South of Grande Comoro Island;
- Traditional fishing, with wooden canoes (using paddles, no motor) and using a hand line, essentially practiced by illiterate and elderly people from disadvantaged families. This activity either takes place near the coast or around the coastal FADs and the catch is intended largely for home consumption. It concerns more or less 3 500 people;
- Artisanal fishing using motorized vessels capable of operating within the Exclusive Economic Zone for a relatively long period or around the open sea FADs. This new type of fishing concerns a new generation of fishermen with a certain level of education and from middle class families. The catch is mainly intended for sales on the major city markets. This fishing activity directly concerns 4 500 people.

⁶ Final Report on Comorian Artisanal Fishing Statistics, 1995

⁷ Fishing Study TCP 2902, FAO 2002-2003

Pre-fishing activities such as the manufacture and repair of vessels (ten workshops nationally, about 40 persons), the maintenance and servicing of outboard motors (about fifteen persons), the supply of fishing inputs (about twenty persons) and other needs (about fifteen persons) involve a total of approximately 100 people (mostly men) participating in support activities all over the country.

Post-fishing activities mainly concern preservation and marketing, as the transformation process is almost nonexistent. These activities concern about 24 000 people nationally whereof the majority consists of a group of women acting as intermediaries on the Grande Comoro Island. These women lead a middle class life and live mainly from this activity. Regarding the two other islands (Moheli and Anjouan), the fishermen sell their catch directly at the landing site or at the local market (see Annex 7).

4. Biophysical Environment

The main fishing areas are:

- The coral reef near the coast and the continental shelf (very reduced in the three islands) for wooden canoes; very limited due to their means of propulsion (paddle). This area is targeted to search for bottom fish.
- The Fish Aggregating Devices (FADs) located in both the coastal area (to locate the canoes' fishing areas) and on the open sea (to improve the fishing yields of the motorized vessels). Their locations are the subject of preliminary studies and are identified by the fisheries departments and cooperatives. The FADs are operated using vertical long lines or hand lines.
- The open sea, often exploited by motorized boats using dragnets in search of pelagic species such as tuna.
- Some open sea areas containing coral reefs and acting as natural fish aggregating devices (Raya...). These areas are exploited by motorized boats (see Annex 7).

5. Human Environment

a) Socio-economic importance of the sector

Fishing plays a crucial role in employment, income generation and nutrition. The sector has the particularity of employing mostly women in the post-catch operations, one of the poorest classes of the population. The sector contributes about 8% of the GDP, 24% of the agricultural GDP and 5% in foreign exchange injection. The sector's added value comes from the sales of fish by the fishermen themselves and then the resale by the saleswomen (including a profit margin). Fish contributes up to 10% of the total protein intake and 40% of the animal protein intake. The promotion of fishery products' exports allowed the national economy to enter the international market, especially the exotic (crustaceans, cephalopods ...) and tuna markets. Despite the modest amount of currency from within the industry, fishing is a net supplier of foreign exchange (license fees and fishing agreements royalties) to the national economy because imports of fishery products are negligible (dried fish and shrimp ...). Thus, fishing is a key sector for the stability of our trade balance. Other taxes may be levied on imports of fishing equipment and fish exports. These different incomes can contribute to the costs of fisheries management but also to the development of infrastructures and basic social services both within and outside the sector. The revenue that can be recorded in this sector will have multiplier effects in other economic sectors (education and health etc). Unlike most of the rural population, fishermen earn money every day and use their income to purchase goods and services produced by other sectors of the economy, making fishing a major engine for economic development. The fishery products contribute to food security both directly, by providing animal protein and nutrients, and indirectly, by providing a source of income for fishing communities and the state.

Fish consumption per capita is 29 kg⁸ against an international average of 16 kg⁹. Fish thus provides 40% of animal protein. Poor people, especially those living in the coastal zone, have easier access to fish than to meat or chicken. From a nutritional point of view, fishery products are an important source of nutrients (protein and polyunsaturated fatty acids), of vitamins (A, B and D ...), of minerals (calcium, phosphorus and iron ...) and of trace elements (iodine). The foreign exchange from possible fishery products' exports can provide us with basic food for our population. Fishing, through its current and potential contribution to poverty reduction and food security and its potential as a resource, is now a focus area for fulfilling our country's commitment to the Millennium's development goals.

b) Pre and Post Catch Sector

These sub-sectors remain very poorly organized, whether concerning landing, collecting, processing, distributing or marketing of the products. The landing of the production is dispersed in a multitude of sites at the fishermen's villages. Each town receives the production of the boats whose owners come from that town (port or home base). After landing, each fisherman takes care of the preservation and sales of his catch, himself or through an intermediary (independent saleswoman or a member of his family).

The bulk of the catch is kept in domestic freezers if it is not immediately sent to the nearest town's market. Thus, these products are distributed to the different sales points, individually and in inappropriate conditions (public transport and without respect for hygiene). The products are sold fresh or frozen. On a national level, a processing chain is almost non-existent. Some communities organized themselves into fishery cooperatives and as a consequence have preservation facilities (cold rooms, ice plants, insulated rooms ...) and distribution means (refrigerated vehicles). These communities seek to organize their sales by pooling their production in these facilities. This system generates an indirect financial contribution from the fishermen to the functioning of the cooperative. On the markets, hygiene conditions are not always respected. Fish are often exposed to ambient air without any means of storage/conservation (ice, insulated containers ...). This explains the poor quality of certain fish products sold on the market, but also the largest post-harvest losses during high season. This system shows the concentration of post-catch activities around the fisherman's family and therefore the low impact the fishing industry has in terms of creating added value and private support structures (marketing, processing and input supply and credit ...). The segment's revenue is derived from direct fish sales by the fishermen (often in bulk at the landing sites) or by the saleswomen on the markets (the beneficiary margin is the sector's actual added value, as there is no transformation process).

c) The Fishing Community's Voice

The participatory approach is on the agenda since 2000. The fishermen are by nature individualistic, so it was necessary to impose some obligations in order to allow the profession to begin to organize itself (Government initiative). Thus, we have initiated a process of formalizing the existing village groups and associations through the establishment of fishermen cooperatives, in Grande Comoro most was done since 1992, in Anjouan since 2001, whereas in Moheli, the existing village associations cover more than just fishing in their attributions.

The purpose of these cooperatives is very varied:

- Improving the technical level of fishing, of the boats and of the other fishing equipment.

⁸ Study TCP FAO 2902

⁹ State of World Fisheries and Aquaculture (FAO, 2005)

- Training, informing and educating members on fishing activities.
- Initiation of fishermen on teamwork and making decisions together.
- Facilitate access to the ports (developing the landing sites).
- Helping fishermen in danger and fishermen's orphans that are of schooling age.
- Promotion of the fishing industry.
- Professionalization of the sector.
- Acquisition of fishing inputs.
- Creation of jobs.
- Safety at sea

Rules, such as the prohibition of certain materials (nets, lamps, etc.) or a ban to go to sea (two boats must go together for safety reasons), etc. can be determined. Offenders will be fined. The customary rules can determine the fishing calendar as well as the prohibited species and fishing practices for the maritime area concerned by the community.

Cooperatives get resources through membership fees, annual fees, a tax on fishing (one fish per fishing trip) and fines. All the cooperatives do not have the same level of organization. Some have not yet decided on the amount for membership fees, while others have already created shops in order to facilitate procurement of fuel or materials for their members. It is expected that the better organized cooperatives will be able to stand as security for the financial credits of their members (fishermen). However, it seems that all have in common a planned organization in case of a disappearance at sea, which allows for the mobilization of all the fishermen for up to three days.

The cooperatives of each island are grouped within a regional fishermen organization (the island's trade union) and the three regional fishermen organizations are then grouped in the National Trade Union for the Development of Comorian Fisheries (NTUDCF). The NTUDCF has a privileged relationship with the Fisheries Administration and other partners, and it's thanks to their understanding that many problems, such as access to credit have been resolved. The NTUDCF is the appropriate national structure to apply pressure on the fishermen; both for compliance with national fishery regulations, as for accepting the licensing system (see Annex 6).

6. Policy and Governance

There are no specific policies and laws for the small-scale fisheries or coastal fishing in our country. The existing texts deal with the fishery sector as a whole, although, in reality Comorian fishing can be considered as small-scale fisheries because it is artisanal fishing. The fisheries sector was endowed with a specific legal and policy framework since August 2007. Before this date, fishing was strategically considered as a small livelihood component in the 1994 Agricultural Strategy. Thus the fisheries sector was treated as such from 1994 until August 2007. The new strategy for fisheries development, named "Comorian Fisheries Development Strategy", fixed, as its overall target, to contribute to the fight against poverty among the poorest fishermen households and to sustainably develop the production, processing and marketing activities of fishery products, with special attention to women whose engagement in the sub-sector is important and likely to grow more intensely in the future.

The sector's development prospects are described in the framework document entitled "Comorian Fisheries Development Strategy". This strategy calls for the development of Comorian fisheries according to the following three axes:

- Strengthening fisheries institutions and services to plan and promote the responsible development of the sector;

- Development of production by promoting a participatory approach to the global organization of the sector and the responsible management of its natural resources;
- Improving the marketing system, development of the domestic market and exploring export opportunities.

The implementation of the Law on the Fisheries Code became necessary in order to provide our country with an updated legal framework, especially as we did not have one since independence. This was also justified by the evolution of international law on the subject, especially since the adoption of the United Nations Convention on Sea Law in December 1982, ratified by the Union of Comoros on June 21, 1994, and by the increase of regional cooperation concerning fishing. It became absolutely necessary that the Union of Comoros gets a modern law framework on fisheries and aquaculture, reflecting the international rules and standards and translating the international commitments of the Union of Comoros into domestic law.

The law on the Fisheries and Aquaculture Code of the Union of Comoros consists of general provisions and specific provisions covering:

- The sustainable management of fisheries resources;
- The protection of species and aquatic ecosystems;
- The economic and financial aspects (Title 4);
- Fisheries and aquaculture police;
- Miscellaneous as well as final provisions;

To enable the Union of Comoros to assert its international responsibilities as a Flag State, the scope of the law was expanded to include, not only waters under the sovereignty (inland marine waters, archipelagic waters and territorial sea) or the jurisdiction of the Comoros (Exclusive Economic Zone), but also to those located beyond these waters for local ships or fishing boats.

The development of the fisheries and aquaculture sector has been identified by the Government of the Union of Comoros as one of the country's economic priorities. However, it was recognized that this development should be gradual and controlled so as not to deplete the fishery resources found in the waters under the sovereignty or jurisdiction of the Comoros. Also, in order to ensure the sustainable exploitation of these resources, development plans of the country's major fisheries will be established and implemented. These plans are intended to establish conservation and management measures for each fishery.

The Law on the Fisheries Code needs to be supported by subsidiary legislation that provides solutions to the various problems encountered in the daily management of the resources. These texts are currently under development.

For the fisheries development strategy, we can consider that the guidelines are given, but they need to be materialized through investment programmes in order to achieve the fixed targets.

Resource Management Related Issues

- The fisheries resource management is done by the Ministry of Fisheries of the Union of Comoros through the National Department of Fishery Resources (Policy Development) and the Island Ministries of Fisheries (Policy Implementation).
- The professional organizations (fishermen trade unions, cooperatives) are largely involved in this process.

- Human resources as well as financial and material resources are very limited (insufficient) to ensure efficient and effective management of the sector.
- Institutional capacities are also limited
- The tasks are not clearly defined between the central Government and the Islands.
- Staff assigned to the fisheries management services is inadequate (quality and quantity).

Fisheries Legislation Related Issues

- The laws ensue from the national development programmes
- Each Ministry sets the development policy in harmony with the National Plan as well as the legal and regulatory support frameworks.
- The regulatory texts are signed by the ministers concerned.
- These texts are submitted to the National Assembly for adoption and the President of the Republic for promulgation.
- Depending on the scope of these texts, the implementation is ensured by all relevant institutions including civil society.
- A 1982 law defines the Comorian maritime zones.
- Negotiations aimed at determining the boundary lines with neighbouring countries are ongoing (Seychelles-Comoros, Comoros-Tanzania, Comoros-Mozambique).
- The territory of Mayotte (the fourth island of the Comorian archipelago) is the subject of dispute between the Union of Comoros and France.
- Domestic (motorized) and foreign fishing boats wishing to operate in the Comorian EEZ are subject to mandatory fishing licensing.

Fisheries governance (including small-scale fisheries and coastal fishing) is initiated by the government through the supervising ministry, but a participatory approach is followed because the fishermen are fully involved in its design and implementation. This governance also involves external partners (Regional and international fishery organizations) which requires from us, as a member or observer country, proceedings and resolutions in terms of resource management.

The existing fishery policy recognizes the rights of small-scale fishermen to partake in the decision making process. Indeed, they participate in the development and adoption of strategies and the regulation of the sector programmes. They are represented on the decision-making boards (projects and programmes' steering committees, Chamber of Commerce and Credit Institutions' Board of Directors ...). One can observe, through the sector's policy, specific rights and advantages given to small-scale fishermen (fishing without licenses, fishing area protected from industrial activities). However, it should be better developed and provisions guaranteeing their rights in their activity's scope should be made.

The policy's targets relate directly to the primary key objectives. However, the sub goals relating to poverty eradication, food security and gender equality require further consideration.

Given the fact that traditional fishermen (wooden canoes) cannot keep up with the development pace initiated in the sector (access to credit, other assistance reserved for artisanal fishing ...), special provisions are set aside for them. They have a free and open access to resources.

To limit their fishing area and avoid canoes going too far offshore, the fish aggregating devices are implanted very close to the coastal zone. In the villages' community life, their financial contributions are low because of their low income. However, traditional fishermen are respected by the new generation

operating with motorized boats and are influential on the policy level because they are a senior generation with a long fishing experience.

The Law on the Fisheries Code introduced, under general provisions (Title 2, Chapter 1), a principle on the settlement of conflicts "The development of the fisheries sector through the sustainable management of fisheries resources requires the creation of an environment that will avoid conflicts between fishermen using different fishing vessels". The door is thus open to find a solution to the various conflicts between fishermen of neighbouring villages, through the development of regulations based on local realities.

The fisheries policy does not define clear principles on respecting indigenous and local knowledge nor a mechanism for the inclusion thereof in scientific knowledge.

In the sector-based policies, there is no firm commitment to democratic and fair approach to fisheries governance. However, these principles are relevant in the daily management of public affairs. The authorities are making efforts to be in line with these principles, especially since today they are a prerequisite on the part of the donors. The principle of coordination and transversal integration for fisheries development and sustainability is not clearly identified in the sector-based policy. These aspects could be targets for improving the existing policy framework.

In our country, the strategy of integration and coordination of multi-sector activities is not under the responsibility of a single department but rather under that of the Secretary General within a Ministry or the Planning Commission for national development plans. Thus it is these institutional mechanisms that can perform arbitration in the coordination of the activities.

7. Planning and Management

There are currently no specific management plans for fisheries. However, these plans are necessary and should flow from an actual assessment of the potential of the different maritime areas under Comorian jurisdiction as well as from the estimated harvested level of the existing stocks. This work has never been done in our country even though it is considered as a prerequisite before any mobilization of a sizeable investment in the sector. There are no specific mechanisms to manage fisheries apart from the central and regional (island) administrations which in turn, count on the National Trade Union of Fishermen and the village cooperatives.

These local structures have a traditional or customary power that allows them to impose the rules in the adjacent maritime areas.

Indeed, customs have a very important place in the regulation of local fishing, because it is the method that was applied before the arrival of common law for the fisheries. However, it varies according to the islands, regions or villages. Some fishing methods are permitted in some villages but prohibited in others. This is the case of a certain types of nets, lamp fishing, the latter is forbidden in some villages around the capital (Moroni) while it is still allowed in several other villages on the same Island and on the other two Islands. This custom has no legal value because it is not yet recognized by the courts, but it does have a law enforcing effect in the villages. In each village there is a 'committee of the wise', composed of former notables from fishermen's neighbourhoods in larger towns, the village chief and recently, the executive board of the cooperative. This committee plays the role of the legislator by establishing rules that are announced to the village and must be respected by the fishermen. It should be emphasized that in Comoros, customary rules are much more respected than the written law. The fishermen themselves are responsible for enforcing these rules by preventing and punishing those fishermen who break them. Often, the problems that the committee of the wise have to address, are settling disputes arising from fishermen

of different villages fighting at sea. For reasons of safety at sea, the cooperative, in collaboration with the committee of the wise, directs fishermen to go fishing in small groups to avoid getting lost and to assist one another in case of a breakdown. When a case is considered serious, they call up a regional committee which includes notables from the different neighbouring villages or of the island in order to find a solution for the problem. This process happens more often in Grande Comoro than in the other two islands where the notability phenomena is less appreciated and therefore does not have the same power. This procedure should be in writing and have the force of law, instead of leaving its implementation to the fishermen's discretion. The subsidiary legislation of the Law on the Fisheries Code (under development) must take into account the measures taken by the cooperatives for safety at sea, while improving them and giving them the force of law. This would help to ensure that the fisheries legislation takes into account all the related issues.

Currently a special institutional structure concerns the Moheli Marine Park, initiated nearly ten years ago. The park management is following a principle of co-management through a management committee consisting of members from surrounding villages (see Annex 2).

Other marine parks are currently being considered for the other islands, but have not yet been recognized and classified.

An integrated management plan for the coastal zone is under preparation and it takes into account the fisheries related issues. This plan represents the first result of work initiated by the National Committee for Sustainable Development (NCSDD) which was launched by the Regional Programme for Sustainable Management of Coastal Zone Resources of the Indian Ocean Countries (ReCoMaP). In this plan, fisheries are treated in the same way as the other sectors of which the development may have an impact on the state of the coastal zone.

Fisheries are managed under an open regime for non-motorized traditional craft; however, motorized and industrial boats are subject to a regime of annual licenses (payment of a fee) issued by the fisheries administration. But, as the Fisheries Law was enacted recently and as it lacks support (subsidiary legislation), its acceptance by the fishermen remains a problem. This is why the national licensing rights of motorized boats are not properly collected by the fisheries administration. We can observe some resistance from the concerned fishermen to adhere to the system.

Marine protected areas are the Moheli Marine Park, justified by the need to safeguard the turtle nesting area and the Coelacanth Park in the South of Grande Comoro. The co-management system introduced in these two parks involves the fisheries and the environmental administrations as well as the communities concerned.

The control and surveillance means of the relevant institutions are very limited; however the communities exercise a more or less effective control in the protected areas. The authorities do not have the necessary resources to ensure systematic monitoring of marine waters and this leads us to believe that illegal fishing activities are present in Comorian waters. A mechanism of regional surveillance has been ongoing since September 2007, but it is not representative over time and space. Given the geographical position of the Comoros and the strong presence of various fleets that are not from Indian Ocean countries and do not have agreements with the Comoros, illegal fishing in Comorian waters involves; non compliance to the protocols and national rules by the licensed vessels and repetitive raids by unauthorized vessels operating in waters adjacent to the Comorian EEZ.

8. Development, Marketing and Projects

Development projects implemented by the state include:

- The development project of Comorian artisanal fisheries (EDF, 1987-1995)
- The FAO technical cooperation projects (TCP 1986 and 1989)
- The Tuna Association project (EDF, Indian Ocean Commission, 1988 to 1996).
- The JICA Japanese assistance (fishing equipment, training, boats, other equipment 1981.1982 and 1984).
- The Fisheries Development Project (African Development Bank in 1982).
- Support to artisanal fisheries development (fishing agreements with external partners, annually)

The main targets of all these projects were to improve the production means and techniques, develop skills and conservation techniques and improve the knowledge of producers in order to have a regular supply of fish to the national market.

These projects have enabled the increase of production and storage capacity in several fishing communities.

The trend of the fishery products' trade is the organization of national distribution, because production is concentrated around the large urban areas despite the high demand from within the country.

This organization would be needed once the offer has been improved and stabilized. The emergence of small marketing companies would allow the separation between the production activity and that of marketing and sales. The current level of production does not allow us to consider exportation, thus limiting the sector's contribution to the national economy. Strategically, foreign trade of fishery products is a priority, but we must first increase the production, improve the health/sanitary environment (certification ...) and organize the transport conditions (maritime and air). Tourism, which should boost the production capacity of the sector, has undergone major difficulties in recent years (fewer visitors, deterioration of infrastructure to support tourism).

9. SWOT Analysis

<p>Strengths</p> <ul style="list-style-type: none"> • Potential production increase of open sea fishing • The investment climate promoted by the Comorian government • An international fishing context marked by full or over exploitation of the majority of fish stocks/resources • Existence of an artisanal fishery sector whose size and expertise are sufficient to serve as a basis for starting an appropriate development. • Bovine and goat (caprine) sectors are not doing so good (need for substitutes) 	<p>Weaknesses</p> <p><i>Weakness of the support services and of the sector's management and planning capacities:</i></p> <ul style="list-style-type: none"> • The isolated aspect of the three islands • Lack of data and information on the resources • Low participation of civil society and the private sector in fisheries. • The sector's development plan and legislation not yet operational • Difficult financing conditions (credit ...) in the sector • Lack of tools for assessing the sector (data base, research) • The absence of a training centre in the sector • The danger at sea <p><i>Low global production capacities:</i></p> <ul style="list-style-type: none"> • No capitalization of fishing inputs and tools • The historical bankruptcy of the Fishing Cooperatives, • The lack of alternative employment sources, • The overexploitation of the coastal strip, • The virtual absence of inland fisheries and aquaculture, • The isolation of the landing sites. <p><i>Insufficient product stocking and distribution means:</i></p> <ul style="list-style-type: none"> • No electricity and water at the Fishing sites • Difficult access to bigger markets • The fluctuating demand and huge price movements according to the seasons • Lack of an organized marketing system
<p>Opportunities</p> <ul style="list-style-type: none"> • The government's will to develop small-scale fisheries • Strong market demand for fishery products; nationally, regionally and internationally • Existence of high value niche markets, currently untapped (cephalopods, rock lobster ...) 	<p>Threats</p> <ul style="list-style-type: none"> • A heavily exploited coastal area, for years and without real resource monitoring • A coastal area subject to various operations (population pressure, extraction of materials, waste management....)

Acronyms and Abbreviations

GPHC General Population and Housing Census

GDP Gross Domestic Product

GPRSP Growth and Poverty Reduction Strategy Paper

FAD Fish Aggregating Device

NTUDCF National Trade Union for the Development of Comorian Fisheries

EEZ Exclusive Economic Zone

NGO Non Governmental Organization

NCS National Committee for Sustainable Development

ReCoMaP Regional Programme for Sustainable Management of Coastal Zone Resources of the Indian Ocean Countries

EDF European Development Fund

TCP Technical Cooperation Programme

JICA Japanese International Cooperation Agency

SWOT Strength, Weakness, Opportunity and Threat Analysis

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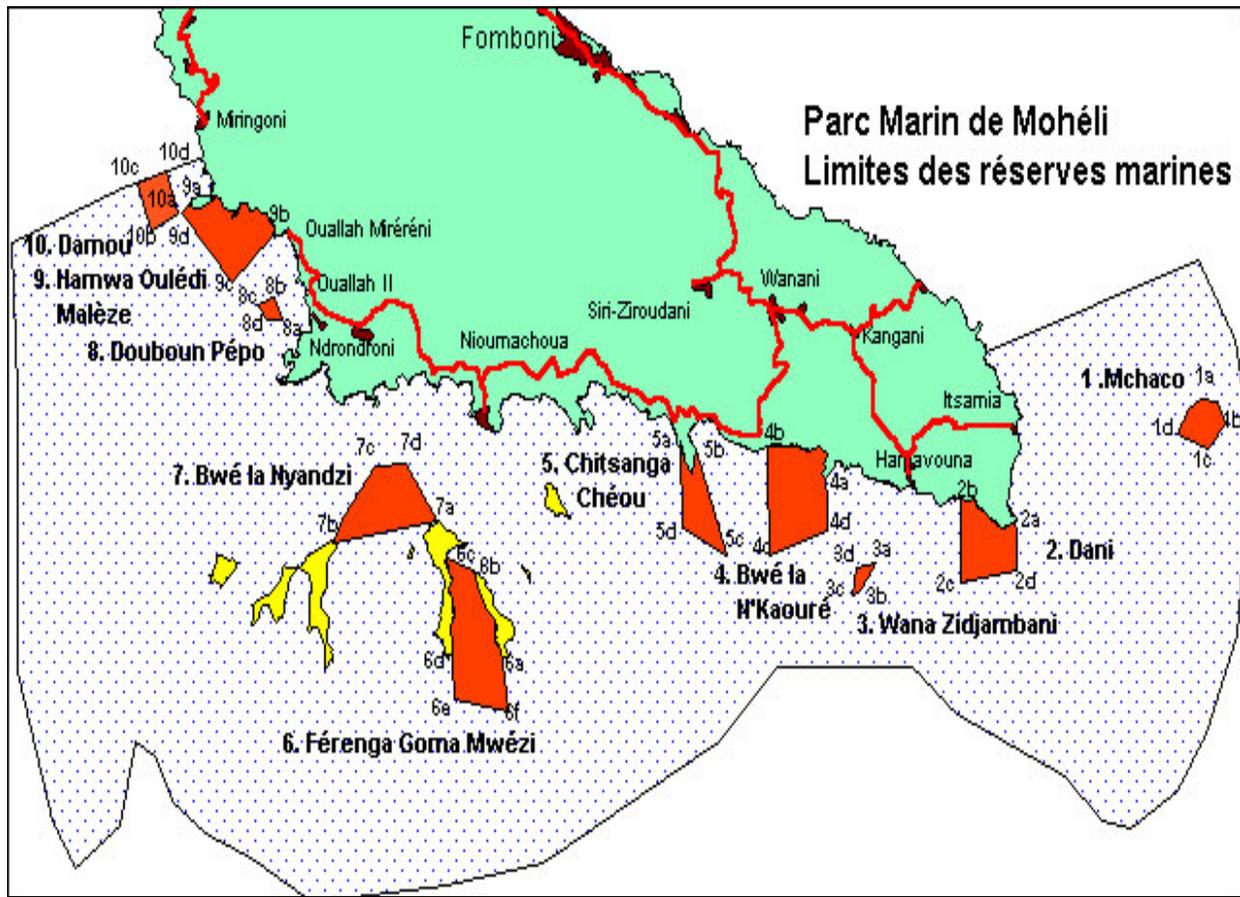
ANNEX 1

List of Persons met

Surname and Name	Post	Institution
Farid Anasse	GIS Manager and ASCLME programme coordinator	Ministry of Agriculture and Fisheries
Mrs Sitti Attoumani	Tourism Director	Ministry of Tourism
Akim Amady	Former coordinator of the programme on fisheries' statistics in the Comoros	Ministry of Fisheries
Ahmed Said Soilih	Statistics Manager	Department of Fisheries
Ben Massoundi Rachid	General Director of Fisheries	Ministry of Fisheries
Ahmed Abdoukarim	Oceanographic Data Manager	National Documentation and Research Centre
Hassani Ahamada	Former Legal Advisor	Ministry of Fisheries' cabinet/office
Abdouchakour Mohamed	Focal Point of the IOC project on tuna tagging	Department of Fisheries
Said Ahamada	Reef Network Manager	Ministry of Fisheries
Charaf-edine Msaidié	General Director of the Environment	Ministry of Fisheries
Ali Msa	President of the trade union branch of Grande Comoro	National Trade Union for the Development of Comorian Fisheries
Alfeine Ahamada	Secretary General	National Trade Union for the Development of Comorian Fisheries

ANNEX 2

Moheli Marine Park



Moheli Marine Park

Marine Reserve's Boundaries

ANNEX 3

List of Projects Conducted in the Fisheries Sector in Comoros

Project and programme names	General and Specific Targets	Period	Donor and Amount in Euro
1. Cooperation Programme with Japan(JICA)	<ul style="list-style-type: none"> • Improve production means and techniques • Capacity building of stakeholders • Sea Rescue 	1981-1986	JICA (2,5 million)
2. Artisanal Fisheries Development Programme	<ul style="list-style-type: none"> • Infrastructure construction for fisheries development (cold rooms) • Manufacture of boats • Facilitate the transport of goods on the Islands • Facilitate access to Credit 	1982-1985	ADB (2,3 million whereof only 611 000 Euro have been used)
3. FAO Technical Cooperation Programmes	<ul style="list-style-type: none"> • Administrative assistance of the Fisheries' services • Strengthening of the fisheries policy and regulatory framework 	1986-1987 (TCP/COI/4504) 1989-1990 (TCP/COI/8851) 2002-2004 (TCP/COI/2902)	FAO(403 000 Euro)
4. Comorian Artisanal Fisheries Development Programme	<ul style="list-style-type: none"> • Manufacture of motorized boats • Improve fishing techniques • Mechanical capacity building, preservation • Facilitate access to Credit 	1987-1993	EDF(3,2 million)
5. The development project of tuna fisheries in the Indian Ocean	<ul style="list-style-type: none"> • Introduction of new fishing techniques • Increase tuna production • Fishermen training • Management and monitoring of tuna resourcesIntroduction to industrial fishing on a regional level 	1990-1996	EDF(5 million whereof 600 000 Euro for specific Comorian support)
6. Regional project on Tuna tagging in the Indian Ocean	Evaluation of the regional tuna resources	2005-2009	EDF (14 million)
7. Regional Pilot project for the Monitoring, Control	<ul style="list-style-type: none"> • Strengthen the capacity of resource evaluation and monitoring • Elimination of illegal fishing 	2005-2008	EDF (3,5million) whereof 150 000 Euro for specific Comorian support

and Surveillance of Fishing in the Indian Ocean (MCS)	<ul style="list-style-type: none"> • Strengthen regional MCS collaboration 		
8. Regional Plan for Fishing Control in the South-western Indian Ocean	<ul style="list-style-type: none"> • Fight against illegal fishing • Strengthen regional cooperation in fishing control 	2007-2012	16 million Euro whereof 180 000 Euro for specific Comorian support
9. South West Indian Ocean Fisheries Project (SWIOFP)	<ul style="list-style-type: none"> • Establishment of Regional statistics and documentaries • Research of biological data on the species • Exchange of information on a regional level • Evaluation of the regional potential of fishing resources 	2008-2012	12.000.000 US\$ whereof 192.914 US\$ for the Comoros

ANNEX 4

Catch Structure in the Comoros

- The fleet's contribution to the annual production (16 200 tons):
- 60% by open, motorized fibreglass boats
- 40% by wooden canoes propelled by paddles/poles

SPECIES NAME		%
English	Local	
Skipjack Tuna	Pwere	24,4
Atlantic Yellowfin Tuna	Mbassi	31,8
Dolphinfish	Pandje	2,3
Sailfish	Mbassi Maranga	3,5
Large pelagic	Pwere, Ngou, M'che, Mhoudana, Mchemamba	8,8
Sharks and Skates	Pangagnile	1,8
Carangue	Nkawa Songoro Gourou	3,8
Small pelagic	Hanale, Nkoule, Mtsoumbou	8,6
White-edged lyretail	Koutse	~ 0
Demersal fish	Ntsechele, Tratrayo, Ndzidzi, Mrongo, Nkoukou, Ndziyache	11,8
Other	Ndezasaliya	3,2
	Total	100

Production distribution per Island

Anjouan	29,6%
Moheli	9,6 %
Grande Comoro	60,8%

ANNEX 5

Detailed List of Species Caught in the Comoros

Comorian Names	English Names
Small Pelagic	
Mpava	Blacktip Sardinella
Mpava mooneye	Spotted Sardinella
Daba	Anchois SP (? Anchovy)
Daba	Shorthead Anchovy
Mloulou	Roundjaw Bonefish
Trouyi La Mbassi	Delicate Round Herring
Mtsoumboui	Agujon Needlefish
Nkoulé	Lutke's Halfbeak
Nkoulé Madzi	Black-barred Halfbeak
Mpandzi	Pharao flyingfish
Mché	Bigeye barracuda
Mché Mamba	Barracuda SP (? Barracuda)
Hanalé Foundroudrou	Bigeye scad/mackerel
Hanalé Mtsoutsou	Indian scad
Hanalé Mtsoutsou	Roughear scad

Large Pelagic and related species	
Mhadana	Barracuda
Ngou	Wahoo
Pangué	Common dolphinfish
Mbassi manyo	Dogtooth tuna
Mpassi Kouri	Sailfish
Mbassi	Yellowfin tuna
Mbassi	Bigeye tuna (patudo)
pouéré panga	Atlantic Bonito
Pouéré	Skipjack tuna (listao)
Mbassi Bourou	Bigeye tuna (patudo)
Mbassi Ntrouaro	Blue Marlin
Songoro	Rainbow runner
Bottom fish	
Nkougou	Two-spot red snapper
Nkougou	Mangrove red snapper
Ndzyaché	Emperor red snapper
Mrongo	Green jobfish
Molé	Deepwater red snapper
Mdougui	Deepwater longtail red snapper
Fimanyo	Crimson jobfish

Ntsantsalé	Vivaneau Rayé, Jaunet du Large (? Striped snapper)
Ntsaouzia	Blue-lined large-eye bream
Ntsangou	Thumbprint emperor
Kapwa moro	Sky emperor
Nyadromoué	Spotcheek emperor
Ndzizi	Yellowlip emperor
Ntsehelé Maouet	Brownspeckled grouper
Mvoué	Blacktip grouper
Ntsehelé mounyé	Malabar grouper
Ntsehelé nyochi	Snubnose grouper
Mzoussi mkoundrou	Blacksaddled coral grouper
Mzoussi nyochi	Coral hind / Coral rockcod
Bandrama	Redmouth grouper
Hassiné	Potato grouper
Koutsé	White-edged lyretail
Nkawa	Yellowspotted trevally
Soumaha	Comet grouper
Yawa	Longface emperor
Hazi	Common bluestripe snapper
Ntromboue	Russell's snapper
Nkawa simbi	Black jack / Black Kingfish

Nangoussi	Longfin yellowtail
Tratraou	Vivaneau SP (? Snapper)
Coral fish	
Mhongojo	Cigar wrasse
Do	Banana fusilier
Tsimi makassi	Chiseltooth wrasse
Nkourou maouet malomo	Sling-jaw wrasse
Tsimi	Barred thicklip
Holé	Vieille SP (? Masked grouper)
Tchekwa	Fivefinger wrasse
Tsimi Mtsanga	Rockmover wrasse
Gousi Chitsosi	Bird wrasse
Madassane	Checkerboard wrasse
Mrenou Gnavou	Daisy parrotfish
Mrenou mbawa makoundrou	Bridled parrotfish
Mrenou chilevou cheou	Roundhead parrotfish
Mrenou	Common parrotfish
Mhoundragi	Cinnabar goatfish
Mhoundragi moustari moundra	Yellowstripe goatfish
Mhoundragi anlama mbili	Doublebar goatfish
Chtrili nya- ndromoué	Sabre squirrelfish

Chtrili tsanga	Sammara squirrelfish
Chtrili ntsomoué	Silverspot squirrelfish
Nkowana	Cohana SP (? Bream)
Mpandzi ya ouzimou	Oriental flying gurnard
Samouli	Moontail bullseye
Ngoué	Striped eel catfish
Mnyo wa ntrovi	Gracile lizardfish
Chimasi	Lined surgeonfish
Ntassi	Shoemaker spinefoot
Ntassi Mwamba	Brown-spotted spinefoot
Chicandra Bororo	Honeycomb filefish
Cartilaginous fish	
Mpampa	Shark
Ntra	Skate / Ray
Ngnessa	Ruvet (? Rouvet = oilfish)
Gombessa	Coelacanth
Cephalopods	
Mpouedza	Octopus
Mpouedza Languissi	Cuttlefish, Squid
Shellfish	
Kakatrou	Crab

Nkamba	Shrimp
Nkamba ya baharini	Rock lobster

ANNEX 6

List of Fishermen Cooperatives and Unions in Comoros

Designation	Place Names	Managers' Surnames/Names	Post	Contact Numbers	
National Fishermen's Union	Union of Comoros	Badroudine	President	3339654	
	Union of Comoros	Alfeine Ahamda	Secretary General	3210475	
Grande Comoro Island					
Regional Union	Grande Comoro	Ali m'sa	President		
	Grande Comoro	Alfeine Ahamada	Secretary General	3210475	
Villages	Iconi	Ibrahima Mada	President	3370992	
	Bangwa hambou	Hassani moussa	President	3371124	
	Moidzaza Mboini	Ibrahim Soilihi	President	3366163 / 3366424	
	Salimani hambou	Mmadi chahahé	Inspector	3330451	
	Mbabani	Soilihi yousouf			
		Saïd Mmadi	Manager		3354936 / 3399249
Chindini	Mmadi mabrouk	Secretary General		3336376	

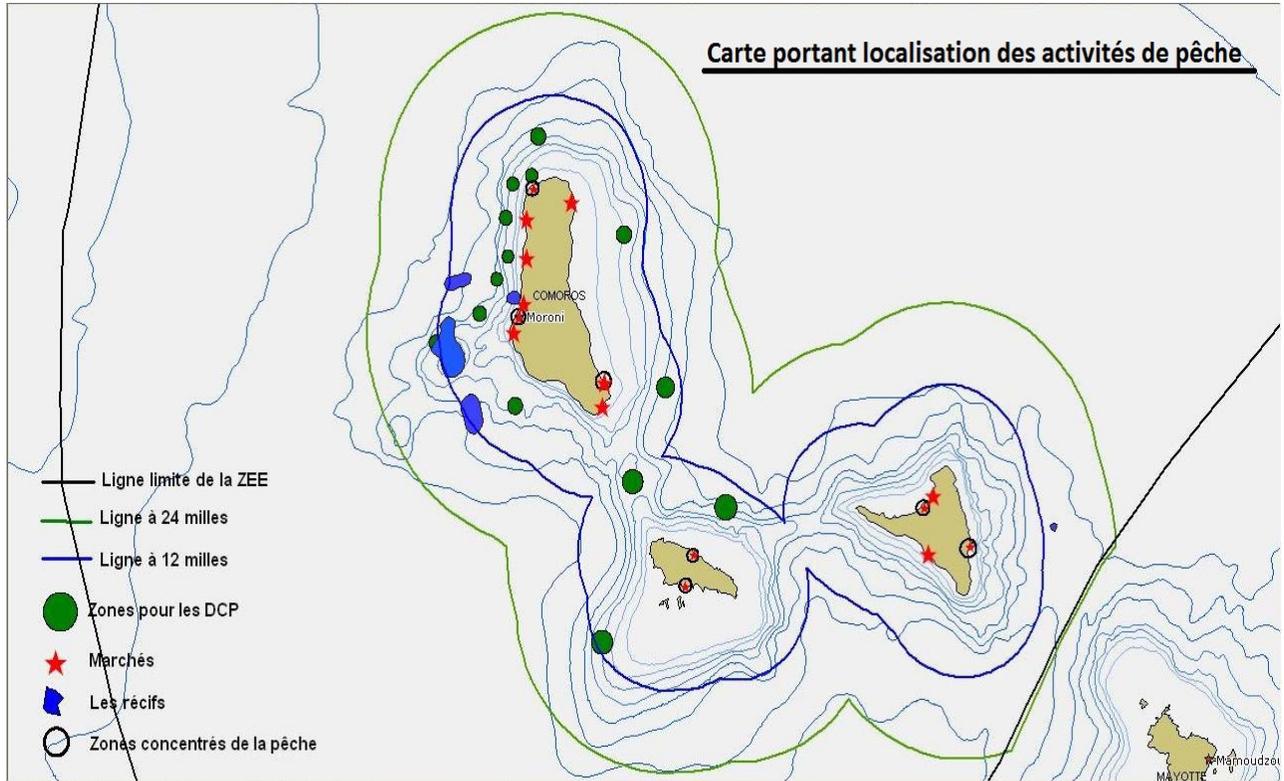
		Nassuf hassani	Secretary General	3389221
Mbachilé		Kélé msaidié	President	7631689
		Ibrahim	Secretary General	3334778
Ouropveni		m'ze hamadi adam	Member	
Malé		Idi mouigne	President	
		Chahrane mmadi	Inspector	3379495/779062
Foumbouni		Chabani abdou	President	
Kouhani		Adamou M'madi	Member	
Séléyani		Assoumani Moumine	Member	
Ouella		Saïd ali	Member	
Mtsaéni		Mohamed Mougni Achrafi	Member	
Ndroudé		Mchangama Hamidou	Member	
Hatsindzi		Mmadi youssouf ali mlozi	Member	
Bangwa kouni		Djoumoi Mhadjou	Member	
	Mitsamiouli	Moumine Mmadi	Member	
	Fassi	Mbaé djibaba	President	3338264
	Djomani	Said mdoihoma	President	3318137
	Hahaya	Saïd mmadi mlozi	Secretary	3319575 (friend)
	Pvanaboini	Ali chanfi	Secretary	3359900
	Hantsambou	Hamada chanfi	Manager	

	Itsandra	Said Abdou	Manager	
Anjouan Island				
Regional Union	Anjouan	Abdallah Ahmed	Active Member	3341950
	Anjouan	Kassim	Active Member	3329867/ 3236986
Villages	Mutsamudu	Kassim	Financial Manager	3329867/ 3236986
		Président	Coop President	3204601
	Ouani	Abdillah Ahmed	President	3341950
	Mdjimlimé			
	Ongoni	Mohamed Ladoine	Member	
	Harembo	Ahmed Med	Member	3382298
	Hadjoho	Mohamed soilih	Member	
	Bambao Lamtsanga	Rachid abdou	Member	
	Mirontsi	Attoumani Msa	Member	
	Mpadjé	Youssouf amir	Member	
	Mviya	Abdouroihamane Ahmed	Member	
	Domoni	Mohamed Ismail	Member	3356881
		Mohamed hamad		3314388
	Mramani	Mohamed toibou	Member	3363644
	Bimbini	Soilih Amane		
Moya	Said Mpé	Member		

Mohéli Island				
Regional Union	Fomboni	Soifouani	President	3372879
	Gnoumachoua	Soumaila	Secretary	
Villages	Fomboni	Soifoine Ishaka	President	3372879
	Djoézi	Abdou Soidri	Member	
	Mbatsé	Alain fourgeron	President	7720070
	Domoni	Boina said	Member	3379774
	Barakani	Nidhoime Said	Member	
	Howani	Mmadi Mbaba	Member	3204609
	Miringoni	Moussa Ali		
	BandariSalama	Youssef djoum	President	3310020
	Itsamiya	Bacar Zoubeir	Member	
	Hamavouna	Gachera	Member	
	Mirereni	Niktoir Amir	Member	
	Miremani	Abdoulmadjid	Member	
	Ngoumachouwa	Ismael Habib	Member	
	Stsanga Chilé			
	Hagnamoida	Dhounraine	President	7728018

ANNEX 7

Fishing Activities Map



Fishing Activities Map

- EEZ Boundary
- 24 Mile Boundary
- 12 Mile Boundary
- FAD Zones
- ★ Markets
- Les récifs
- Concentrated Fishing Areas

II. Tourism – Prepared by Mrs Sitti Attoumani and Dr David Picard,
E-mail: sitti_attoumani@hotmail.com; piccccc@gmail.com

Union of the Comoros Overview

The Union of the Comoros is a nation-state located in the Western Indian Ocean, between Madagascar and Mozambique, in the northern part of the Mozambique Channel. The Comoros comprise three islands, Grande Comore (Ngazidja), Anjouan and Mohéli (Mwali). It has been independent from former coloniser France since 1975. The fourth island of the archipelago, Mayotte, has remained under French administration. The main economic sectors of Comoros are agriculture, fishing and forestry which contribute (50.3% of gross domestic product in 2007), followed by services (38.8%) and manufacturing (4.2%)ⁱ. In 2006, exports of agricultural commodities such as ylang-ylang, vanilla and clove counted for \$32 million, while imports of petroleum products, vehicles and equipment, and food commodities for \$143 millionⁱⁱ. As a result of the persistently unbalanced external trade balance and poor public financial management, the country has been experiencing a prolonged debt crisis. Comoros is likely to reach completion point under the IMF and World Bank's Heavily Indebted Poor Countries (HIPC) initiative in 2012, which remain, however, conditioned to an ambitious and potentially politically sensitive reform agenda, among others of public servicesⁱⁱⁱ.

1. Coastal Tourism Overview

Tourism currently plays only a relatively marginal role in the national economy of Comoros and the livelihood of the islands' populations. While international arrivals have recently been growing, mainly due to the vacations and home visits by the Comorian diaspora (around 8,000 arrivals per year), economically more important leisure-based tourists have seen their lowest arrival numbers since the late 1980s. In 2005, tourism activities contributed between 2% and 4.1% (according to the sources) to the country's GDP and generated around 500 direct jobs^{iv}. 80% of these jobs were situated in the hotel sector. Indirect activities (estimated at 500 jobs in 2005) include food supply sectors, a very limited handicraft industry, and other services. Most tourist activities are concentrated in the largest island, Grande Comore, which currently has the only functioning business hotel and international airport, and counts for almost 90% of the country's bed capacity. Sporadic, economically very little viable tourist activities also exist in the islands of Anjouan and Mohéli, which include several private and community-run guest-houses, a defunct national park and low standard hotels. Here again, tourism has only a very marginal impact on local livelihoods. The total annual revenues generated by the three community-run guest-houses in Mohéli in 2001 were, respectively \$1,660, \$2,296 and \$3,090^v, insufficient to maintain the infrastructures and generate, at least partially, a livelihood alternative. The vast majority of leisure tourists are French, many of whom are expatriates living and working in Mayotte. In 2004, the average per tourist expenditure was around \$1600 and the average length of stay 7 days. Comoros also encounters an important influx of business travelers, around 2,300 per year, many of whom experts and consultants working for international development cooperation projects. Main attractions visited by leisure tourists are the islands' beaches, fauna and flora, and also the active volcano in Grande Comore. Additional attractions, though little valorized for tourism, are the old town of Moroni and various essential oil production sites in Grande Comore and Anjouan.

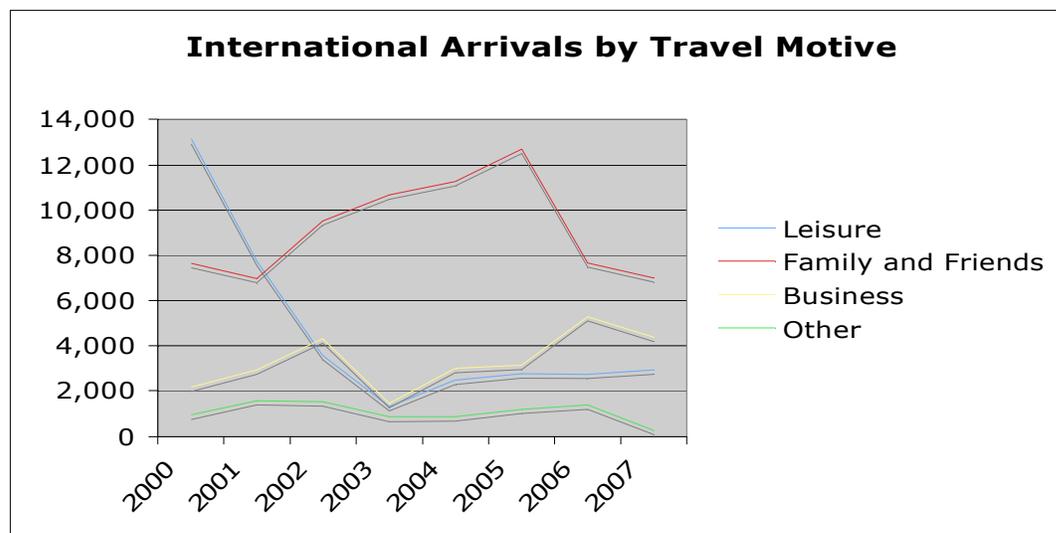
The decline of the leisure-based tourism sectors, which had successfully grown during the 1990 (27,100 tourists in 1994 against around 3,000 in 2007^{vi}), appears related to a general lack of economic competitiveness, poorly developed and marketed products and a low visibility amongst potential target markets^{vii}. According to various subsequent expert reports, the main factors for this situation are to be found in the poor condition and insufficient bed capacity of the country's hotels, the partly defective, unreliable and relatively expensive air transport facilities, the poorly maintained and little

professionalized tourism infrastructures, and the wide scale destruction of tourism related cultural and natural assets through sand mining, urbanization and poor waste management¹⁰. Some of these reports do also mention the geographical isolation of the islands as a major constraint. The latter argument may seem paradoxical, considering that other geographically at least equally isolated archipelagos in the Indian Ocean – e.g. the Seychelles and the Maldives – have managed to successfully establish an international tourism sector. Also, the relative success of tourism development in Comoros during the 1980s and 1990s seems to indicate the existence of deeper-lying factors that have effected and so far prevented a sustainable tourism industry to emerge.

Table: Comoros inbound tourism by travel motive

Year	Leisure	Family and Friends	Business	Other	Total arrivals
2000	13,141	7,646	2,150	956	23,893
2001	7,742	6,968	2,903	1,548	19,356
2002	3,553	9,538	4,301	1,496	18,702
2003	1,281	10,672	1,423	854	14,229
2004	2,464	11,266	2,993	880	17,603
2005	2,737	12,708	3,128	1,173	19,551
2006	2,730	7,677	5,289	1,365	17,060
2007	2,916	6,999	4,375	292	14,582
2008	2,800	6,297	4,194	1,463	14,753
2009	2,612	4,478	2,963	1,343	11,396

Source: Direction nationale du tourisme et de l'hôtellerie¹⁰¹¹



¹⁰ Union des Comores (2009) *Fréquentation touristique Années 2000/2007*. Tourism Direction.

¹¹ Union des Comores (2010) *Fréquentation touristique Années 2008/2009*. Tourism Direction.

2. Biophysical Environmentⁱⁱⁱ

The Comoros are of volcanic origin. The geomorphology of Grande Comore, the largest of the islands, is dominated by the 2361 meter-high Karthala, a still active volcano that is flanked by appendices in the north and south respectively. Anjouan and Moheli are older volcanic formations which, as a result of erosion, present a more dissected relief with steep valleys and abrupt flanks. Recent sedimentary formations in the islands are of both biogenic and terrigenous origin and include coral reefs white, sand beaches, solidified lava, and eroded stones and rocks from the sea. The coral reefs that have formed around the islands are generally of a ringing type, which is essentially due to the steep mountainous relief of the coasts. Coastal erosion is being observed in all islands, partly due to the natural sedimentation dynamic of the coasts, more importantly due to human activity, in particular sand mining for construction and as a result of terrigenous deposits (caused by land erosion resulting from the deforestation of the islands). The beaches constitute an important protection of the shores against coastal erosion. They are also an important regional nesting ground for sea turtles. Before their human colonisation, the Comoros were quasi entirely covered by forests. While the climate of the islands is marked by a varied, though generally rich pluviometry, differences in the composition of the soils make that Grande Comore, with highly permeable soils, has no rivers or lakes, whereas Anjouan and Moheli, with less permeable soils, have abundant surface waterⁱⁱⁱ.

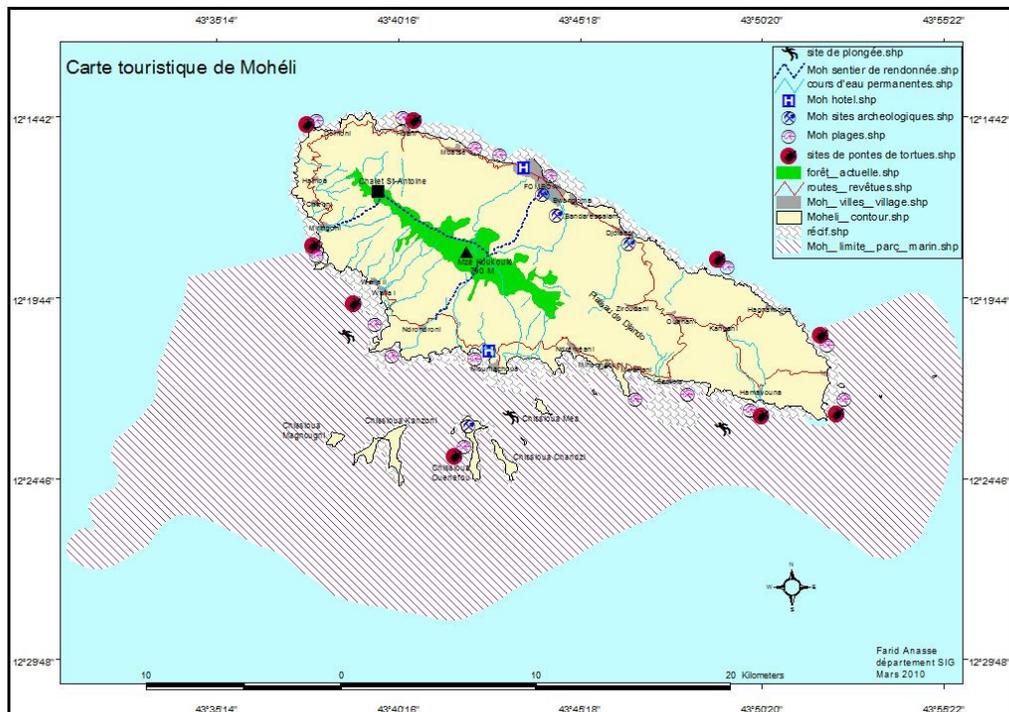
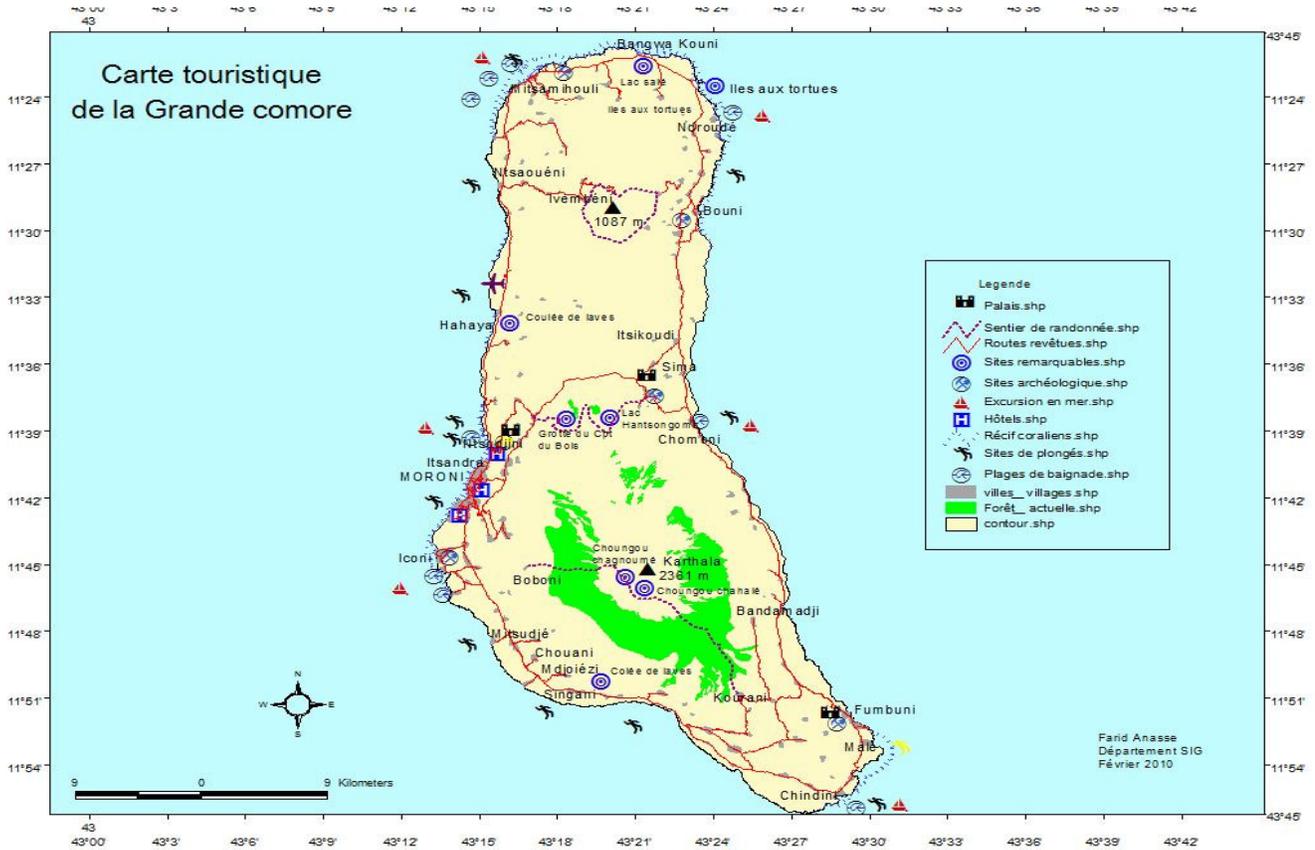
The coastal relief of the islands is generally rocky, intersected by a large number of wide sandy bays, the type of natural environment ideally required for commercial tourism and leisure activities. While all islands and most regions within the islands offer this type of natural environment, tourism activities are currently concentrated in some areas only. Factors for this partial concentration are related to transport infrastructure constrains and the particular history of settlement of the islands. The by far largest concentration of tourist activities and hotel bed capacity is currently found near the capital city of Moroni, on Grande Comore, close to the country's only international airport. Regions that effectively, or potentially, most benefit here from tourism include Itsandra, Mboikou, Hamahamet, and Bambao. Regions further away and more difficult to access (considering the poor conditions of the roads), and which consequently benefit less from tourism, include Hambou and Bandamdji. Moreover, tourism activities have also been developed in the two other islands, though at a far smaller scale. In Anjouan, which has the only large harbor of the islands, the regions of Mutsamudu and Sima benefit from sporadic tourist activities, whereas the regions of Jimilimé, and Nioumakélé remain widely cut off tourism activities and potential income. Similarly, in Moheli, which has several white-sand beaches, a pristine forest and a marine protected area, tourist activities remain actually limited to a few sites in the Mledgelé and Djandro regions. The regions of Dewa and Moimbao remain off the tourist track. The poor standard of road, sea and air transport, but also the political tensions between the island's semi-autonomous governments are the main factors for this disequilibrium.

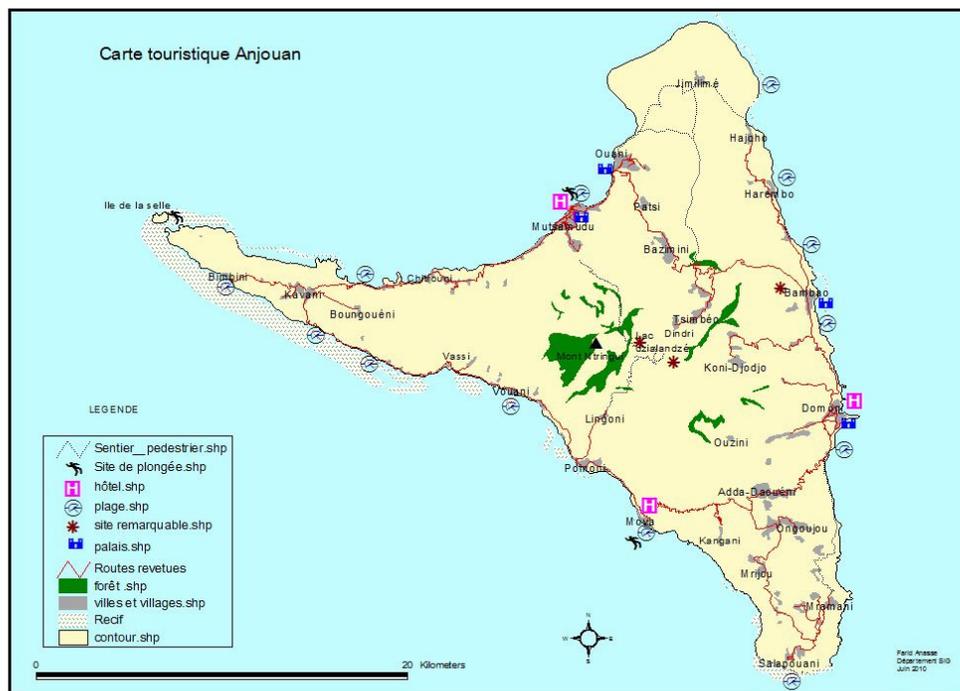
Tourism activities, due to their very low level, have today a negligible impact upon the natural environmentⁱⁱⁱ. More than any other factor, it is the phenomenal demographic growth of the Comoros' population over the past decades which was responsible for increased pressure on the biophysical environment, creating public health problems, threatening a fragile ecological environment, and damaging the very resource base for future tourism development. The rapid urbanisation of the coastal towns has been accompanied by poor liquid and solid waste management facilities. In many cases, current practices consist of disposing of sewage in a hole dug in the ground or the beach, which creates risks of groundwater contamination, especially in Grande Comore where the soil is highly porousⁱⁱⁱ. Several Cholera outbreaks have been observed over the past decadesⁱⁱⁱ. Solid waste management is another major problemⁱⁱⁱ. Traditionally, various forms of waste (including night soil) were disposed of in forests, at beaches and on the sea. With the widespread emergence of inorganic waste, this technique, which is still in use, creates a situation where litter is found everywhere in the public areas of cities, villages, and

beaches (with few exceptions)^{viii}. In many cases, waste is taken to open air dumps, provoking complaints by neighbouring residents, about odours, flies, mosquitoes and other health hazards. In a context marked by the absence of a waste management strategy at Union or island level leaving, many community associations have ventured alternative solutions, many of which generate further environmental health hazards (where waste is buried at the beach, or ashes of burnt waste thrown into rivers^{viii}). In some cases, village associations charge for waste collection or for access to a previously cleaned beach (while the surrounding remains littered). Few have been successful in implementing sustainable awareness-raising and change campaigns, which would approach the problem at the source. Inorganic litter is obviously an image antithetic to that of pristine nature researched by most tourists.

Another major threat to the natural environment – the main resource base for tourism activities – is sand mining. According to a UNEP estimate^{ix}, during the 1990s around 90% of the sand beaches in Grande Comore have disappeared, leading to coastal erosion, the disappearance of ecosystems and the loss of turtle nesting grounds. In view of the high costs of alternative building materials, the extraction of sand for the fabrication of cement bricks is common practice, even in highly environmentally aware communities. While officially prohibited, the practice is likely to further increase where former organic building materials are progressively replaced by concrete. Alternatives suggested by an EU project, using stabilised earth bricks, are only hesitantly adopted by the local populations. These bricks have so far only been used in the construction of tourist facilities.

The relative scarcity of resources like fresh water constitutes a further issue, directly linked to potential tourism developments. While it is claimed that Grande Comore disposes of abundant untapped groundwater resources, large sectors of the population lack access to freshwater. Tourism developments are likely to use a proportionally very important quantity of fresh water. Another issue concerns the contested claims to the ownership of tourism resources have in the past created tensions at community level, in some cases leading to violent unrest^x. One case concerns the “ownership” of the Livingstone, a rare bat species found the forests of Moheli, and the right to guide tourists to its habitat. Another case concerns the marine turtles nesting at a beach in South-Western Moheli. While these turtles represent a food resource for some, they have recently gained value as a resource within the conservation and tourism economy for others. The contested claims over the ownership of these turtles, and the right to exploit them either for food or for tourism and conservation has repeatedly created tensions between coastal villagers and external fishermen, some of which led to armed conflict.





3. Human Environment

With almost 5 children born per woman, the Comoros have one of the highest population growth rates worldwide (estimated at 2.77% in 2010^[33]). In 2008, the islands (excluding Mayotte) counted around 660,000 inhabitants (up from 330,000 in 1980^[34]), 80% of whom in the largest island, Grande Comore. A further 300 000 Comorians are estimated to live abroad, essentially in mainland France (200,000), Mayotte (60,000) and the French overseas department of La Reunion (50,000)^[35]. 95% of the population is Muslim (mostly Sunni). In an economically and socially persistently desolate climate – marked by high unemployment, political volatility, and the dependence on international aid and money transfers from the Diaspora – one in two adult Comorians would emigrate if they could, preferentially to France (according to Gallup’s Potential Net Migration Index)^[36]. The average per capita income is below \$1,000. 60% of the population live below the poverty line. The organization of social life is essentially family-based, with Comorian society being considered as a “large family” or, as a more or less hierarchical conglomerate of families, where each individual is identified within a conjugal family, a wider family, a lineage and a clan. Individually generated income and savings are in priority used to provide for the family and their financially very considerable ceremonial needs (weddings, pilgrimage to Mecca, funerals)^[37]. In particular, the very costly *grand marriage (anda)* represents an important passage rite allowing an individual and their family to claim and maintain social status as a notable. Beyond, and often tacitly within, the structures of, and hierarchies between, the family can be found various forms of village or local associations. The traditional aim of these associations is to generate income to provide for the local community, but also, increasingly, to work as interface for local development initiatives and to provide services such as waste management, schooling or tourism project management which the government fails to deliver^[38]. In the recent past, these local associations have been the preferential intermediaries of a number of community-level tourism development projects sponsored by international donors (see section 5 on *Planning and Management*). The lack of macro-economic considerations in the development of these projects at island level and the overall poor professionalization of those operating the projects at community level have proven here to be major constrains. A more effective development cooperation accompanied by the elaboration of viable business plans and the continued professional training of those working in tourism projects at community level can create here conditions for a more sustainable development. Moreover, the advocacy of fair land lease deals at public private partnerships, again at community level, may provide here sustained incomes and benefits to communities. A major constraint

remains however the overall limitations of tourism transport capacities and infrastructures, currently making most community level projects little viable.

In the past years, the country's president, Ahmed Abdallah Sambi, has successfully lobbied firms and governments of various Middle-Eastern countries to increase their foreign direct investment (FDI) in the Comoros and get involved in the modernization of transport and tourism infrastructures. Contracts were signed with UAE based firms to refurbish and rebuild two luxury hotel resorts, build road and harbor infrastructures and facilitate educational and health programs. Mr Sambi has equally initiated structural reforms at government level. The impact of the global economic crises on the UAE-based firms (who retracted from their project in 2008; the hotel building contract was taken over by a Qatar based hotel group), as well as political tensions at senior policy level within the Comoros prevented many of these ambitious projects to achieve their aims, if not, at least, to get started. Much of the country's prospects will depend on its new leader who, according to the rotating presidency system, must come from the island of Mohéli. Mr Sambi is expected to hand over power after elections at the end of 2010.

4. Policy and Governance

Benefiting from a tropical climate, and featuring white sandy beaches, coral reefs, an active volcano, a fascinating history that has left traces in the islands' architecture and traditions, and rare endemic flora and fauna, the Comoros seem to offer the ideal location to establish an upscale tropical island tourism industry. Tourism policy and planning are regulated in the Tourism Framework Law and fall under the responsibility of the Ministry of Tourism. As a matter of fact, tourism had repeatedly been brought forward as an economic development option since the 1980s. In 1986, the World Tourism Organization (UNWTO), as executing agency for a 5-year project run by the United Nations Development Program (UNDP), elaborated the *Schema of Tourism Potentialities*^{viii}, which included a detailed list of potential sites and products, and recommendations for the creation of institutional and economic conditions that would enable development of these sites. In 1996, the Indian Ocean Commission (IOC), a multilateral institution regrouping several Indian Ocean island-nations and France (La Reunion), financed the elaboration of a tourism master plan (*Plan directeur du tourisme des Comores*)^{viii}, which took up the principal components of the earlier WTO document, and pointing to the same structural and institutional insufficiencies. In 2005, an international donors conference in favor of the Comoros signed off the *Framework Document and Tourism Strategy*^{viii}, renewing and reaffirming once more the tourism related development ambitions of the earlier plans. In 2008, Dubai World Africa, through its property development arm, Istithmar Real Estate, opened a tender for international consultancies to develop a "holistic tourism strategy for the Comoros"¹ with recommendations of strategic actions relating to the development of tourism infrastructure, marketing and branding of the destination, and functioning of the tourism authority. At the time of writing this report, it was not clear if this tender had effectively resulted in the writing of yet another development plan.

The overarching aims stressed by these consecutive development initiatives remain largely consistent. Tourism is to create jobs, enterprises, income both at government and community level, and infrastructures such as roads, transport links, water treatment plants, energy supply, hospitals and schools that benefit the island as a whole. To achieve their aims, each of these plans specified a number of strategic objectives, which, once again, remain largely consistent from one text to the other. These usually distinguish between two levels of engagement. One is situated at a macro-economic and societal level. A viable tourism sector, it is mainly argued here, can only develop if sufficient air transport and accommodation capacity at international standard is being created, if those working in this sector are sufficiently professionalized, if the very assets for which tourists come to the islands are preserved and valorized, and if Comoros is effectively marketed in its potential source markets. The other is situated at a micro-local or micro-economic level, stressing the need to facilitate and secure foreign direct investments,

to integrate tourism activities to local communities and economies, and to create conditions to preserve the resource bases of tourism activities, in particular natural landscapes. To guarantee their effective implementation, the different aforementioned development initiatives all include externally funded action plans, in order to achieve their objectives. These, again in a very consistent way, include the setting up of training programs and tourism curriculums, the encouragement of foreign direct investment in the sector, the development of a marketing campaign, the creation of distribution networks among the smaller actors, the development of effective measures and safeguards to allow the preservation of the tourism related assets. While these actions were financed mainly through international donor money and led to the realization of a certain number of projects on the ground, what looked good on paper did not eventually work out in terms of a long-term sustainable development. Tourism remained largely marginal. Most of the actions eventually proved little viable.

To understand the difficulties to effectively implement these development plans and create conditions for a sustainable tourism industry, one may look at the political uneasiness manifested in particular through – today widely substantiated – accusations that the tourism sector in Comoros had been related to, if not directly implicated in neocolonial projects “tolerated”, at least, by two former French governments. Most expert reports analyzing tourism development in Comoros content to explain the current situation of non-development by “political instabilities”, usually validating their argument through the almost ritualized repetition of the information that the country had known 20 coups d’état or attempted coups d’état the country since independence. Not talking about the political context of Comoros and the deeper lying reasons why tourism development was relatively successful in one context, and not in another, seems a major hindrance for any serious attempt to understand processes of development in the islands and make realistic recommendations. The frame of this text does only allow for a short description of key facts marking the recent history of tourism development in Comoros, yet these facts point toward issues that, in our opinion, need to be further elucidated in order to apprehend the structural difficulties marking of the island’s society and economy – and the very moderate success of the tourism development initiatives since the mid-1980s.

In 1982, 7 years after the Comoros’ independence, a joint-venture between the then newly founded Comorian state company, Comotel, and the French hotel group, ACCOR, allowed the renovation of several hotels which predated the country’s independence^{xxx}. Between 1982 and 1984, the total bed capacity at international standard increased to 326. However, facing high transport prices, the hotels did not manage to attract sufficient tourists and became economically unviable.^{xxx} Several reports and articles point toward additional elements of explanation. In 1979, French mercenary Gilbert Bourgeaud, aka Bob Denard, overthrew the Comoros’ first president, Ahmed Abdallah, who had unilaterally proclaimed independence from France four years earlier. Ahmed Abdallah was replaced by Ali Soilih, while Denard made himself the effective ruler of the islands. It is today widely acknowledged that the French government of the time was complicit in this move, nervous about the further spread of communism and its loss of geostrategic influence in the Western Indian Ocean. Bob Denard lived on a large farm and used his position to develop agricultural and hotel businesses^{xxx}. According to several sources he also developed the 300 man-strong Comorian Presidential Guard as a private army that he used to maintain his power in the islands and that he also rented out to generate income. In 1989, the year in which Bob Denard was made to leave the islands (as a result of negotiations overseen by France), the South-African hotel group, Sun International, opened a new hotel, the Galawa, in a beach front site near Moroni, the capital of the Grande Comore. Bob Denard’s regime had repeatedly been accused of using Comoros as a covert re-shipment harbor to allow third countries to trade with South-Africa. International trade with this country then remained significantly restricted due to an international embargo to protest against the Apartheid state. Based on available sources, Denard’s involvement in the transport and hotel industry and the circumstances of the implantation of the South African hotel in Moroni remain unclear. Fact is that the number of tourist arrivals, mainly from South Africa, grew from 7,600 in 1988 to 27,100 in 1994. South-Africa had then become the islands’ most important tourism inbound market. In 1995, Bob Denard

succeeded yet another coup d'état in the Comoros, yet was ousted a month later by an overwhelming French expedition force. Denard was brought to court in Paris. The end of the Cold War in 1989 and of the Apartheid regime in South-Africa in 1995, as well the emergence of private security firms seemed to have made persons such as Bob Denard superfluous.

In the second half of the 1990s, the number of guests at the Sun International run Galawa Hotel progressively decreased. The hotel closed in 2001. The circumstances of this closure remain unclear. One explanation is the changed economic context of tourism in the late 1990s, with newly emerging tourism markets and changing consumer demands, making “all-inclusive” hotels like the Galawa appear outdated. Also, the increased competition and rationalizations in the international air transport sector during the 1990s may be a reason why companies like Air France (in 1991) and Singapore airlines (1995) stopped their direct service to Comoros^{xxxxi}, thus dramatically reducing the accessibility of the islands by its core markets. Other international companies – e.g. Air Madagascar, Air Tanzania, Yemenite, Bourbon Air – started to serve the islands, yet with no direct connection to any of the source markets. The inability, by the Comorian government to replace or renew the bed capacity and maintain international quality standard in its hotels (the Galawa was nationalized after the departure of Sun, and subsequently closed), and to preserve Comoros’ image as an international tourist destination consequently provoked an ongoing decline of the tourism sector. While earlier hotel initiatives like the Galawa had created an important professional capacity among its Comorian employees, many of whom opened guest houses themselves, the sector overall slid into a sustained crisis. During the 2000s, it was marked by very low tourist arrivals and expensive, low value-for-money products^{xxxxii}. In 2006, the situation further worsened when the European Union black-listed the Comoros national airline, for failing to meet minimum security standards.

5. Planning and Management

In 1997, a report by the Indian Ocean Commission severely criticized the type of hotel development represented by the Galawa Hotel, in particular for not effectively contributing to the sustainable development of the country. Managed by an international company, the report claimed, a large part of revenues generated were not re-invested in the country. Moreover, the hotel’s supply chains were alimented through imports rather than the use of local producers and produce, and wages for international staff were paid through foreign bank accounts^{xxxxiii}. A year before, in 1996, the Indian Ocean Commission funded *Projet du plan directeur du tourisme des Comores*^{xxxxiv} suggested a re-orientation of the Comoros’ tourism development policy towards an “alternative tourism” (“*autre tourisme*”) based on more small-scale, environmentally integrated and community-based tourism initiatives. The European Development Fund (EDF) and World-Bank/Global Environmental Facilities (GEF) consequently financed the implementation of several tourism infrastructure and institutional capacity building projects. As part of these projects, a marine reserve was created in the southern part of Mohéli, as well an ecotourism-office (*maison de l'eco-tourisme*) to promote and regulate development of ecotourism activities in this island and also to act as a reservation centre for a number of community-run eco-lodges, equally funded by these projects. International consultants were brought in to design eco-friendly and somehow exoticist-fantasy based lodges, and to train communities in their exploitation.

Only a few years after their inauguration, in 2006, a report for a coastal zone development programme by the Indian Ocean Commission^{xxxxv} noted the poor condition of most of these infrastructures and their incongruent management (the build infrastructures were badly maintained and the material had not been renewed, the hospitality was severely slow and mobilised a disproportional amount of human resources, poor financial management). Some of the community staff trained to run the infrastructures had found better and more regularly paid jobs in the hotels. Despite the good-will by the community participants, most of these projects subsequently failed to provide sustainable livelihood. Reasons for these failures can

be found both at micro-economical and macro-economical levels. In a context where tourism development was not envisioned at a macro-level, the very small-scale developments (most eco-lodge sites had a bed capacity of less than 7) had little chances to become economically viable. In the absence of considerable foreign direct investment in the hotel sector, generating sufficient bed capacity to allow international airlines and tour operators to work with the Comoros, there were simply not enough tourists to use these “alternative” forms of accommodation. Another reason must be imputed to the poor understanding, by the international experts, of the working of “communities” at the local level. The ideology of “alternative tourism” seems to have developed here its own community paradigm (as democratic, peaceful, often somehow close-to nature) which eventually proved quite far from the social realities found in place. At village level, notables (having accomplished their ceremonial obligation with regard to their own wedding and that of their daughter) appear to be key for effective implementation of whatever initiative brought in from outside. The support of Imams is also important to approve the compliance of projects with Islam, whereas the role of mayors seems less important^{xxxx}. Ignoring the social hierarchies at local level, for instance by directing support in priority towards younger and better educated people represents here a major cause for project failures. Also, it is little understandable how the external experts envisioned it feasible to train communities to a professional standard through short term workshops, where professional hotel training in most countries of the world requires two to three year full time classroom and on-the-job training. “Alternative tourism” often seems here part of a product rather than of the development concept; indeed a far more sophisticated product than standard mass tourism, integrating Western primordialist community fantasies and utopias in the commercialised tourist experience^{xl}.

Throughout the second half of the 2000, facing the sustained crisis of its tourism industry and the very limited trust by international investors in the sustainability of their potential investments, the government of the Comoros offered wide ranging tax and investment facilitations. In a political climate marked by political conflict between the islands, several attempts to negotiate the renovation and subsequent exploitation of the former Galawa hotel by South African hotel groups failed. In 2006 a memorandum of understanding was eventually signed with Dubai World-Africa, an UAE based investment firm, to redevelop a beach front location of 23ha, including the former Galawa hotel adjacent Itsandra hotel, into a luxury hotel and residential resort, with 150 rooms and a hundred residential townhouses or villas. In 2008, international hotel group, Kempinski was selected to run the to-be built site. In the same year, in the context of a quickly spreading global financial and economic crisis, Dubai World, owned by the royal family of Dubai, slid into debt crisis. The investment in the Comoros was cancelled and the land restituted to the government of the Comoros. In 2009, Qatar National Hotels, owned by the government of Qatar, signed a similar memorandum of understanding, regarding the reconstruction and exploitation of the same site. The document specifies that the 23ha of land, including the sea-shore adjoining them is being donated, indefinitely, to Qatar National Hotels Company. The government of Comoros gains, in return, 5% of the equity of the firm created to exploit the new hotel business, while Qatar National Hotels Company is entitled to exercise full management control over the business and affairs of this company. The memorandum further specifies that the three beaches adjoining the properties will be private and the shareholders company will have full exclusivity on these beaches. In addition, the foreign investor agreed to rebuild or renovate the road between the airport and the investment site, up to a cost of €2.5 million. The foundation stone for the project was laid in mid-2010.

These two relatively recent initiatives appear underpinned by different logic, though their combined pragmatisms may be necessary for future sustainable tourism development in the Comoros. The large-scale hotel resort complex, if eventually realized in terms of its ambition, will generate sufficient bed capacity to allow more regular airline connections and the integration of Comoros to various source markets. This will also allow a diversification of source markets, tapping into the huge potential of Middle Eastern, Indian, Chinese and East-Asian markets. As the experience of the Galawa hotel has shown, this will have important macro impacts on livelihoods in the Comoros. Through its 5% stake in

the company exploiting the hotel, the government of Comoros will have a constant stream of income, as long as the hotel works in a viable way. The hotel will pay local labor to build and maintain its infrastructures, and also train, and eventually employ, local labor to work in its different departments. It is likely that the smaller community-run projects as well as various nature sites in all three islands will directly benefit from the ameliorated professional capacity generated by this hotel, and also from the additional tourist influx. The wider visibility of the Comoros in various source markets is very likely also to increase demand for “alternative” tourism products in the islands. A professionalisation of the current “alternative” tourist infrastructures would probably be required to help them become sustainable. It is also likely that many staff trained at the new hotel resort will, over time, use their experience to open their own accommodation facilities (family run hotels, guesthouses, etc.).

6. Development, Trade and Projects

The Comoros Growth and Poverty Reduction Strategy (*Stratégie de Croissance et de Réduction de la Pauvreté SCRP*)³³ identifies tourism as a priority development sector for the islands able to create jobs and generate economic growth at a wider scale. While European luxury hotels usually work with a staff-to-guest ratio of 1:4, many hotels in lower income countries inverse this ratio by employing considerably more staff, often up to 4 staff for every guest. Considering the consistently higher wages paid by up-market hotels and their need for relatively more staff, luxury hotel initiatives like the rebuilding of the Galawa are, in principal, best-practice with regard to the values of responsible and sustainable tourism development. This remains conditioned, however, to a certain number of yet so far unclear issues regarding the training of local labour, the type of work contracts granted, and the access of local suppliers to the hotel’s production chain (provision of food, services, souvenirs, etc.). It also concerns the technical feasibility and equitable use of water and energy resources; considering that the Memorandum of Understanding between the hotel developer and the government of Comoros obliges the latter to provide an uninterrupted supply of water and electricity. There is no clear data available to confirm the presence of abundant fresh water resources in Grande Comore, which would be a pre-condition for the aforementioned initiative. It is also not clear how the hotel will deal with issues of liquid and solid waste management, or use alternative energy technologies. Yet, absence of information is not equivalent for absence of procedures and technologies that may, or may not already have been put in place. More information about the modalities of this redevelopment project should therefore be gained. This will also allow the many existing projects to articulate their activities with the expected increased influx of international tourists. This articulation is sensitive, both economically and politically, and involves a number of issues that need to be addressed.

Most small scale projects managed by local associations (see list at the end of this section) are dependent on a permanent influx of foreign financial support. They are not sustainable for not having created conditions allowing economic viability. They are socially sustainable in the sense that they maintain community life and fundamental institutions such as schools, security or waste management. Many of these associations were not designed to manage tourism enterprises, but primarily to generate money and oversee social and religious activities within the local community context. A professionalization of tourism enterprises, with realistic business plans and trained professionals at the interface between hosts and guests is advisable. Community-run projects, if they wish to become viable need to integrate to the economic structures and hierarchies at community level. It is best practice to loan government or community controlled land to private investors (instead of donating as in the case of the Galawa hotel project) and oblige the latter to train community members to professional standard.

The past experiences have shown that dealing with foreign investors did not necessarily generate conditions for sustainable development. In some cases, investors got caught up in power struggles between different levels of governance and eventually left the country (or never initiated their projects)³⁴.

In others, larger tourism enterprises (including the wide-scale nature conservation industry in Mohéli fed by international NGOs and donor money) created forms of unilateral economic dependency that, when activities or cash flows suddenly dropped, created wider crisis. Moreover, at a wider, macro-political level, it is not clear, at the time of writing this report, how peaceful the handover of power at the end of 2010 will be, and if the new leader will sustain the country's privileged relations with Middle Eastern countries and development agencies. The political opportunism at that wider scale has created an uncertain business environment where some investors have adopted a wait-and-see attitude.

A further issue concerns the defective or absent transport infrastructure within and between the islands. The issue is currently partly addressed by means of a \$386m project by the UAE based maritime transportation firm, HSS, to build deep water ports and an inter-island passenger and cargo service^{xxxx}. Other projects are en route, though they will only achieve a sustainable livelihood impact if they train local staff and empower them to become technically more independent. This is the case in all sectors, and in tourism policy in particular. The weak professional capacity of the tourism division here makes it necessary to employ international experts to do the job, rather than those who know the context best become responsible for the strategic planning and the outputs of projects like the one this report is part of.

7. List of major tourism related projects

<p>Qatar National Hotels and Union of the Comoros</p> <p>Redevelopment of former Galawa and Maloudja Hotels</p> <p>2010-2011 (funded by private sector and Government of Comoros)</p>	<p>Jan Poul de Boer, Chief Executive Officer, Qatar National Hotels Company, PO BOX 2977</p> <p>Tel: 00 974 485 7777</p>
<p>Comoros Gulf Holding</p> <p>Renovation et extension de l'hôtel Itsandra</p> <p>2010- 2011</p>	<p>Ali Kasma, Vice Président of Comoros Gulf Holding (ali@comoros-islands.com)</p> <p>00269 77619 81</p>
<p>People's Republic of China & Ministries of Tourism / of Infrastructures</p> <p>Creation of a National Tourist Office</p> <p>2010 -2011 (funded by People's Republic of China PRC)</p>	<p>Hassani Bacar Maecha, Directeur National des Infrastructures (danibacar@yahoo.fr)</p> <p>Tel: 00269 332 15 85</p>
<p>Indian Government and Ministries of Tourism / of Infrastructures</p> <p>Creation of a Hotel and Restaurant Training Centre</p> <p>2011-2014 (funded by Indian Government)</p>	<p>Maka Idarousse, Directeur National de l'Enseignement technique et de la Formation Professionnelle (Darousse_maka@yahoo.fr)</p> <p>Tel: 00269 320 06 30</p>
<p>Ministries of Tourism / of Infrastructures</p> <p>Development of a Network of Ecotourism Hiking</p>	<p>Hassani Bacar Maecha, Directeur National des Infrastructures (danibacar@yahoo.fr)</p>

<p>Qatar National Hotels and Union of the Comoros</p> <p>Redevelopment of former Galawa and Maloudja Hotels</p> <p>2010-2011 (funded by private sector and Government of Comoros)</p>	<p>Jan Poul de Boer, Chief Executive Officer, Qatar National Hotels Company, PO BOX 2977</p> <p>Tel: 00 974 485 7777</p>
<p>Circuits</p> <p>2011- 2014 (funded by World Bank, African Development Bank – currently pending)</p>	<p>Tel: 00269 332 15 85</p>
<p>Ministries of Tourism / of Infrastructures</p> <p>Rehabilitation of historic sites and monuments including the Medina of Moroni</p> <p>2011-2014 (funded by UNESCO, Union of the Comoros –currently pending)</p>	<p>Aboubacar Boina, Représentant aux Comores de l’UNESCO (aboubakariboina@yahoo.fr)</p> <p>Tel: 00 269 333 53 62</p>
<p>Ministries of Tourism / of Infrastructures / of Environment</p> <p>Creation of the Karthala Park</p> <p>2011- 2014 (funded by World Bank, African Development Bank – currently pending)</p>	<p>Charaf-eddine Msaidie, Directeur de l’Environnement et des Forêts (Charafeddine2008@gmail.com)</p> <p>Tel: 00269332 08 49</p>
<p>Ministries of Tourism / of Infrastructures</p> <p>Creation of a barge for nautic sports activities in Chindini</p> <p>2011-2014 (funded by Union of the Comoros, World Bank, African Development Bank –currently pending)</p>	<p>Said Salim, Directeur des Transports Maritimes (Aicha_lubna@yahoo.fr)</p> <p>00 269 333 97 07</p>

7. SWOT Analysis

<p>Strengths</p> <ul style="list-style-type: none"> • An ideal natural environment and location to develop luxury tropical island tourism • Additional comparative advantages are the presence of an active volcano; rare marine and terrestrial flora and fauna • Existing ecotourism products and distribution infrastructures • Existing networks of institutions at government and community level • A large diaspora in Europe able to contribute to tourism promotion • University-level tourism curriculum 	<p>Weaknesses</p> <ul style="list-style-type: none"> • Very limited and expensive air transport • Very limited accommodation capacity • Very limited banking facilities • Very limited disposable capital at community level • Largely unmanaged environmental impacts on tourism resources • Political volatility and uncertain business environment • Limited sustainability of donor supported tourism development programmes
<p>Opportunities</p> <ul style="list-style-type: none"> • New (potentially) eco-friendly high quality hotel construction projects • Potential new airline connections with international hubs in UAE, Yemen, Mauritius Ethiopia, Kenya, Tanzania • Very rare fauna, extraordinary nature and exceptional volcano to become ecotourism products • High quality cultural heritage valorization • Tourism constructions as an engine to popularise eco-friendly building materials (e.g. brick, low energy technology) 	<p>Threats</p> <ul style="list-style-type: none"> • Pressure on scarce natural resources (e.g. water, building material) • Non-management of solid waste • Dependency on economic monoculture (e.g. tourism) • Polarisation and unrest in rural areas due to competition over tourism resources • Asymmetrical power relations between investors and government undermining legal planning processes • Emergence of an uncontrolled informal tourism economy; migrations

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III. Mariculture - Prepared by Dr. Thomas Ashley Shipton, E-mail: t.shipton@envirofishafrica.co.za

1. Introduction

There are no mariculture activities in the Comoros (FAO 2010).

2. Biophysical

The biophysical conditions for mariculture development in the Comoros are extremely limited. With a view to developing the sector in the country, Shipton and Hecht (2007) undertook a rapid assessment of the biophysical environment on Grande Comoros and Moheli on behalf of ReCoMap. The assessment reported the following:

Grande Comoros

Grande Comoros is typified by a larval coastline, a short shallow lagoon shelf and fringing reef system (approximately 5-30m deep, running 50-300m offshore). Past the fringing reef, there is a precipitous drop off into deep oceanic waters (+100m depth). There are no extensive mangrove areas and accompanying salt flats that could be used for pond culture. Mariculture interventions in the deep oceanic zone is an unrealistic proposition, and therefore the only areas that could provide suitable culture sites are in the lagoon areas. The fringing reef / lagoon system on Grande Comoros is discontinuous, and the principal areas where this habitat exist are:

- Iconi to Voidjou on the West Coast.
- South of Mitsamiouli in the North West to Chomoni on the East Coast (North of the island).
- The Southern Tip of the Island between Sima Amboini and Foumboni.

Initial observations indicate that in the majority of locations, the fringing reef is too close to shore to provide meaningful areas for mariculture development. Those areas that hold the most promise are located at the Northern areas (Mitsamiouli to Bouni) and the Southern areas (Sima Amboini and Foumboni).

Moheli

Moheli is surrounded by fringing reef. On the North Eastern Coast, much of the reef is close to shore and therefore there are very limited opportunities for mariculture development in this area. In contrast, the South West Coastline, and in particular the Parc Marin de Moheli provides perhaps the best potential of all the sites in the Comoros group. The area is characterised by extensive lagoon areas (area undefined) and encompasses the Chissioua archipelago) There are a number of areas in the lagoon with water depths of 20-30m which could be suitable for some form of cage culture operation. In addition, the presence of the Island archipelago could also provide some shelter for “in-water structures” from the prevailing South Westerly swells.

There are very limited mangrove areas in the marine park, a preliminary assessment of these areas suggest that they provide little scope for a development of any kind. To date, there have been no assessments of the biophysical environment and the potential for mariculture development on Anjouan.

3. Human Environment

There are no mariculture activities in the Comoros FAO (2010), and thus the sector does not contribute to coastal livelihoods in the country.

4. Policy and Governance

4.1 Policy

Legislation	Present	Comment
Fisheries Act	Yes	La présente loi porte Code des pêches et de l'aquaculture de l'Union des Comores (2004).
Aquaculture Act	No	The legislative framework for aquaculture development has been included as a component of the fisheries legislation.
Aquaculture Policy	No	
Sub-sector development plans	No	
Aquaculture Master plan	No	
Aquaculture zoning	No	
Environmental Management Acts	Yes	Environmental Action Plan
EIA Requirements	Yes	Environmental impact assessments are mandatory prerequisites for aquaculture developments

4.2 Governance

The administrative responsibility for the regulation and development of the aquaculture sector lies with the Fisheries Division of Ministry of Agriculture, Fisheries and the Environment (Union of the Comoros). In terms of governance, each island is provided with a level of autonomy from central government, and while they have their own government structures and respective Fisheries Departments, they take their lead from the Union Government structures. With respect to governance capacity in the aquaculture

sector, all structures, and most notably at the Island Government level, are under-resourced and lack capacity. The Directorate of the Environment in the Ministry of Agriculture, Fisheries and the Environment is responsible for developing government policy with respect to environment, and regulating activities relating to the protection of national heritage, the creation of protected areas and environmental impact studies and assessments.

5. Planning and Management

Applications to engage in mariculture are made through the Fisheries Department of Ministry of Agriculture, Fisheries and the Environment (Union of the Comoros). The issuing of a permit to undertake mariculture is a legislative prerequisite. While aquaculture is defined as an activity requiring an EIA, there is no “one-stop shop” for applications, and the application process itself has never been tested.

There is very limited aquaculture capacity in the Comoros to develop or promote the sector. In 2007, the Fisheries Division (Union Government) employed two MSc grade aquaculture graduates. However, while well intentioned, these graduates were under-resourced, lacked technical and regulatory experience, and were not in a position to drive the sector. At the time, neither the National Institute for Agriculture, Fisheries and the Environment nor the University of Comoros had any aquaculture capacity, and no NGOs were active in the sector. It is therefore true to say that there was no credible technical, research or extension capability in the country to assist in the development of the sector.

6. Development, Trade and Projects

In the past there have been no attempts to develop mariculture in the Comoros.

7. SWOT Analysis

<p>Strengths</p> <ul style="list-style-type: none"> • Reduction in lagoon fisheries and a concomitant need to supply more fish to consumers • Good water quality • Critical need for alternative income and business opportunities • Central and Island governments support the development of the sector 	<p>Weaknesses</p> <ul style="list-style-type: none"> • No defined mariculture zones, and limited areas suitable for the culture • No mariculture infrastructure • Absence of mariculture technical and extension capacity at all levels • Absence of mariculture research capacity • Low level of administrative and evaluation capacity for mariculture • No strategic development plan • Low level of education of fishers • Limited freshwater resources. Limited areas suitable for mariculture (this needs to be established empirically). • Having to change livelihoods focus from fishing to farming • Relatively high fuel price and labour costs • Poor cold chain logistics in the fisheries sector • Marketing opportunities and constraints of mariculture products on Grand Comore and Moheli unknown • Limited potential to develop farm-made feeds - low levels of fish production in the fisheries, resulting in low levels of trash fish for feed. Terrestrial plant sources limited (this needs to be confirmed)
<p>Opportunities</p> <ul style="list-style-type: none"> • Harmonising mariculture development and integrated coastal zone management objectives from zero base • Alternative business opportunities • Job creation • Developing a new sector from scratch 	<p>Threats</p> <ul style="list-style-type: none"> • Inappropriate site selection • Uncontrolled development and environmental consequences (need monitoring and management control systems) • Access issues to sites in the Moheli marine park • User conflict with tourism • Unrealistic expectations

8. Recommendations to support Sectoral Development

The development of a mariculture industry in the Comoros would require the creation of a new industrial sector. To date, there has been no indepth study to determine the potential to develop the sector. In this regard, Shipton and Hecht (2007) undertook a short exploratory mission to the country to assess the potential to develop a sector and indicated that there are significant constraints to sectoral development, and that the potential to develop the sector is limited. Certainly, in the short term, the development of mariculture activities in the Comoros will be difficult to achieve, and prior to farm developments there is a need for a detailed bio-technical and financial assessment of the mariculture opportunities and constraints.

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Legislation

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IV. Agriculture and Forestry - Prepared by Dr. Elizabeth Ann Daley, E-mail: lizdaley@mafinga.demon.co.uk

1. Introduction

The economy of the Union of the Comoros is mainly based on agriculture, which represents between 40 and 44 per cent of GNP. Agricultural production occupies approximately 67 per cent of the land use and employs between 70 and 80 per cent of the total population. The main export crops are vanilla, ylang-ylang and cloves, while cereals, rice, potatoes, fruits and legumes are grown mainly for local consumption (Wio-Lab 2008). Vanilla is the principal source of foreign exchange, worth approximately US\$10m in 2001 and 2002, or 60 per cent of total export value. However, since those two years, international vanilla prices later collapsed (IMF 2006). The 70 to 80 percent of the population who engage in agriculture generate 98 per cent of Comoros' export revenues. However, national agricultural production accounts for only 40 per cent of the country's food needs, with the remainder being imported. With population growth outpacing economic growth, the government struggles to provide basic social services and runs at a chronic deficit (GEF 2009).

Agricultural production for domestic consumption contributes some 47 per cent of the sector's added value. Sectorally, fishing contributes 21 per cent, agricultural production for export contributes 13 per cent, forestry 11 per cent, and animal husbandry 8 per cent. The agricultural sector is growing around 1.5 to 2 per cent per year. Comorian agriculture is essentially small-scale and composed of gardens with banana trees, other fruit trees, vegetables for domestic consumption and sometimes for markets. It is characterized by high land fragmentation which is increasing with population pressure. Traditional food producing activities are insufficient to meet the needs of internal demand and significant quantities of cereals (e.g. rice, wheat flour) are annually imported to compensate. Imported rice is sold at more competitive prices than local products, which discourages local production. In the context of a restriction of available land, the development of food production for domestic consumption and export will require an intensification of agricultural techniques including higher levels of input use such as pesticides and fertilizers (Ministry of Agriculture, Fisheries and the Environment no date).

2. Biophysical

Due to its recent volcanic nature, size, and insularity, the Union of the Comoros has a diverse landscape and contains a rich array of biodiversity, both marine and terrestrial (fauna and flora). Internationally, Comoros is one of 20 island groups or archipelagos characterized by their endemic diversity. The country has a particularly significant endemic plant diversity making it a high-priority area for biodiversity conservation (Ministry of Agriculture, Fisheries and the Environment no date). Up to 2,000 species of plants are found in the Comoros with major natural plant assemblages including dense humid forests, shrubby thickets and open woodlands, although the actual number of endemic species is not known (Wio-Lab 2008).

The Comorian environment is fragile and highly threatened by human activities directly linked to the environmental specificities of the islands (e.g. steep slopes are subject to erosion), as well as to the socio-economic situation of the population. Environmental problems appear to be caused by:

- rapid population increase and demographic pressure (with differences between the islands and regions);
- high poverty levels;
- insufficient economic growth and decreasing agricultural production; and

- land instability discouraging long-term investment and macroeconomic distortion at the expense of natural resources.

Forest destruction is occurring rapidly in the Comoros (at a rate of about 50ha per year) due to extensive agricultural production over large areas, and rapid population growth linked to poverty. Forest destruction leaves bare soil, which results in an increase in streams and rivers drying up and in soil runoff that suffocates coral reefs and disrupts the equilibrium of the marine ecosystems (IMF 2006). In many cases habitats and the species associated with them have deteriorated or are in the process of being degraded due to the combined impact of natural causes (erosion) and man-made behavior (pollution of the coastline, destructive fishing techniques, poaching, encroachment of agriculture on what is left of the forests etc.).

The Comorian environment is therefore highly sensitive and priority attention needs to be paid to actions designed to protect, conserve, and manage the natural heritage. It is a potentially very interesting site from the point of view of the diversity of flora and fauna and its varied landscapes are a potential tourist attraction. However, a large number of endemic and specifically Comorian species are in danger of extinction unless certain protective measures are taken quickly (IMF 2006). The approximate value of the Comoros' diverse coastal ecosystems are outlined in Table 1 below:

Table 1: Valuation of Ecosystem Goods and Services in Comoros

Coral Reefs		Mangroves		Coastal Forests		Total
Area (km ²)	Value (Million US\$)	Area (km ²)	Value (Million US\$)	Area (km ²)	Value (Million US\$)	Value (Million US\$)
430	261	1	1	2,170	436	698

Source: Wio-Lab 2008

The Comoros has great potential, which, if it is exploited, could help reduce poverty. However, that potential is fragile because it is threatened by the negative impact of the ways in which the environment is being treated and used. As Table 2 below demonstrates, the forests are being destroyed and the soil is being degraded, which shows the need for careful future management of these islands to protect its endemic diversity.

Table 2: Exploitation of Forests and Soils in Comoros

Forests	Estimates of natural forest surface area have changed in recent years to show a startling decline. There are no more completely intact natural forests. Between 1950 and 1995, the total forest area fell from 31,000 hectares to 8,100. The flora and fauna of the Comoros, which are considered rich and contain species of world importance, are also on the way to extinction.
Soils	The soils are fragile and their distribution is related to their volcanic origin and the techniques used to exploit them. There are three main categories of soil: 1) ferralitic; 2) brown; and 3) andosols. Soil degradation is a major concern, affecting on average 57.5 per cent of farmland (65,335ha).

Source: IMF 2006

The extent of degradation of the coastal forests can also be seen in Table 3 below which shows the area of forest on each of three islands in the Comoros and the percentage of degradation, which is 50% or above in each case.

Table 3: Forest Degradation in the Comoros

Island	Surface/hectares	Percent of degradation
Njazidj	33,120	50
Mwali	8,125	52
Nzwan	24,200	65
Total	65,335	57.5

Source: IMF 2006

3. Human Environment

Projections based on expected population growth estimate that 65 per cent of the Comoros' total population will be living in coastal areas and low lying lands by 2050. Based on available information, the cost of the destruction of coastal infrastructure and assets directly caused by climate changes is estimated to be USD\$400m in 2050, 2.2 times the country's GDP for 2001 (Union of the Comoros 2002).

Local agriculture and water products do not meet the needs of the local population. The country is not self sufficient in basic food products and has to import almost all of its rice (which is currently the country's primary food staple), sugar, wheat flour, salt, etc. In terms of performance, the Comoros economy has been declining. GNP growth was -0.4 percent during the period 1989-1999, while GNP per capita decreased by 2.9 percent during the same period. In 1999, GNP decreased by 1.4 percent and GNP per capita by 4.1 percent. The ratio between public debt and GNP has gone from 0.88 in 1989 to 1.09 in 1999 (Ministry of Agriculture, Fisheries and the Environment no date).

4. Policy and Governance

In 1993, the Union of the Comoros developed and adopted a National Environmental Policy (Politique Nationale de l'Environnement, PNE-decree n° 93-214) on the basis of the Diagnosis of the State of the Environment in Comoros. The National Environmental Policy aims at integrating the environmental dimension into social and economic development policy, with the objective to guarantee sustainable management of resources through:

- Supporting the sound management of natural resources and the development of alternative resources;
- Safeguarding and protecting biological diversity and the areas of environmental and cultural interest;
- Developing or updating knowledge on the environment;
- Promoting economically and environmentally viable agriculture;
- Promoting forest conservation and reforestation; and
- Establishing appropriate management of maritime and coastal areas.

The Ministry of Agriculture, Fisheries and the Environment is responsible for the implementation of the Environmental Plan of Action (PAE), which includes the National Environmental Policy (PNE) and the strategy of implementation of this policy. Implementation is to be based on a participatory approach aimed at sharing efforts with all stakeholders including local and regional communities, NGOs and associations, teachers, media, private sector, and civil society. The objective is to progressively transfer to the communities the responsibility for managing their environment.

The national institutions responsible for the management and use of natural resources and the environment have been restructured several times in recent years. Agriculture, forestry, fisheries and environment are now all accommodated under the Ministry of Agriculture, Fisheries and the Environment, which includes the Environment Department.

5. Planning and Management

Currently, however, activities concerning the management and monitoring of the coastal zones are not within a single ministry, as Comoros has established national and regional structures that are responsible, directly or indirectly, for environmental management.

The Ministry of the Union in charge of the Environment (Ministry of Agriculture, Fisheries and Environment no date):

- defines the policy on agriculture, animal husbandry, fisheries, forests, natural resources, farming research, rural legislation, rural development and equipment, and packaging of farming products and related areas (e.g. training, assistance/advice, conservation, and marketing of farming products);
- defines the rules for protection and the sound management of natural resources (including water resources) and monitors their implementation in collaboration with the Islands and Union ministries concerned;
- ensures application of the rules through quality control of farming products, water resources products, and food products;
- defines the state policy on town and country planning, sanitation, and environment; and
- follows the implementation of international conventions related to its areas of responsibility.

The National Environment, Forests and Agriculture Strategies (DNEFSA) and the National Research Institute on Agriculture, Fisheries and the Environment (INRAPE) are technical departments of the Ministry. The mandate of the DNEFSA is the following (Ministry of Agriculture, Fisheries and the Environment no date):

- sound and sustainable management of natural resources;
- coordination, follow-up, and evaluation of the activities linked to the environment and forest sector, including activities to implement international conventions including better coordination of the activities of the focal points for each international convention;
- suggest relevant measures to fight pollution and mobilise funding; and
- develop and implement the communication and public awareness strategy on environment and forest issues.

6. Development, Trade and Products

National Programme for Sustainable Human Development (PNDHD)

This programme is funded by IFAD in the form of a grant under the Debt Sustainability Framework and has the aim of reducing poverty in the poorest rural zones of the three islands of the Union of the Comoros, incorporating environmental protection, diversified agricultural production and increased productivity (IFAD 2010). The programme intends to increase household income while curbing natural resource exploitation and degradation. To achieve its objectives, the programme proposes:

- Joining forces with FAO to revitalize agricultural training centers under a new type of management involving farmers' organizations, local development associations and private-sector intermediary organizations;
- Providing better training for inhabitants in agricultural and good governance techniques, and enabling them to gain greater autonomy in the management of local development.
- Protecting catchment areas and coastal zones through a system of terraces and hedges which will improve soil fertility and local production, and also in the long run regenerate marine resources.

Initially planned to be carried out in one or two zones on each island, these activities will then be transposed to other regions through exchanges between farmers' organizations and field visits (IFAD 2010).

Adapting Water Resource Management in Comoros to Increase Capacity to Cope with Climate Change

This GEF project from the Least Developed Countries Fund is as detailed in Table 4 overleaf, and includes the three components outlined in Table 5 (also overleaf).

Table 4: Project Details

LDCF Grant	\$3,850,000
Co-financing	\$5,600,000
NAPA completion	November 2006
Inclusion in LDCF Work Program	June 2009
Expected CEO endorsement	April 2010
Expected Implementation start and completion	July 2010–July 2014
GEF Agency	United Nations Development Programme (UNDP)
Other executing partner	National Direction of Environment and Forests, Ministry of Agriculture, Fisheries and Environment

Source: GEF 2009

Table 5: Components Involved in GEF Increasing Water Resource Management Project

Component	Activities
Support institutional development to integrate climate change into water resource management	<ul style="list-style-type: none"> • Capacity development e.g. knowledge development, training, and equipment is needed for stakeholders such as the institutions in charge of water management, community structures involved with water resource management, and the national water supply company • These efforts build upon existing plans to develop a Sustainable Development Commission and Water Management Policy, supported by the UNDP
Demonstration of pilot water interventions that can mitigate climate change risk, targeted to vulnerable communities	<ul style="list-style-type: none"> • Focuses on technologies to improve water access and quality that simultaneously mitigate climate change, such as soil conservation measures, water harvesting, and remedial work on existing boreholes • An Integrated Water Resource Management (IWRM) plan is followed. • This approach is particularly important in Comoros, where, because of the country's small size, fresh and saline water sources must be managed in a coherent way.

<p>Development of knowledge products to communicate results to policy makers and the international community:</p>	<ul style="list-style-type: none">• Knowledge products are developed on lessons learned for policy makers, communities, and donors, and a national knowledge platform is developed to retain and facilitate learning from project implementation.• The project also contributes learning from the Comorian experience to the Adaptation Learning Mechanism (ALM) and IW Learn, in particular on the question of adaptation financing needs and on efficient ways of allocating public financing into adaptation.
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Source: GEF 2009

7. SWOT Analysis

<p>Strengths</p> <ul style="list-style-type: none"> • Several international projects involved in the Comoros, perhaps because of great biodiversity which is prioritized – this means international support and funding for an otherwise small and poor country to assist in improved coastal environmental management • Existing policies are solid and based on proper environmental diagnosis (i.e. evidence-based) • Diverse ecology and beautiful landscapes provide a solid base for positive future development 	<p>Weaknesses</p> <ul style="list-style-type: none"> • Comorian government runs a deficit and has inadequate resources to implement policies for improved coastal zone management and development. • Inadequate agricultural structure to meet domestic food demand, and high reliance on food imports, weakens the economy and drives poverty. • Over-reliance of exports of specialized crops such as vanilla leaves the economy vulnerable to swings in international prices
<p>Opportunities</p> <ul style="list-style-type: none"> • Potential for tourism (if carefully managed such as ethical or eco-tourism) to generate increased revenues, livelihood diversification and improved natural resource management • Organic and food-based agriculture could also be developed to meet local consumption if other export-related industries could be promoted to generate revenues (e.g. offshore call centres, tourism etc.) and replace the current reliance on commodities such as vanilla • Community-led management of their own environments could be very positive for small and remote communities on the islands, if sufficient capacity building support is provided to enable this 	<p>Threats</p> <ul style="list-style-type: none"> • Poverty and population growth threaten to undo environmental management improvements • Impact of climate change on rising sea-levels not yet certain but likely to impact on small island states such as the Union of the Comoros – development therefore needs to take into account measures to mitigate and prepare for this

8. Bibliography

GEF (2009) *The Least Developed Countries Fund (LDCF)*.

IMF (2006) *Union of the Comoros: Interim Poverty Reduction Strategy Paper*.

Ministry of Agriculture, Fisheries and the Environment (no date) *National Implementation Plan of the Union of Comoros*.

Union of the Comoros (2002) *Initial National Communication on Climate Change*.

Wio-Lab (2008) *Transboundary Diagnostic Analysis of Land-based Sources and Activities in the Western Indian Ocean Region*

9. List of Datasets

None found.

10. List of Sector-Related Projects

IFAD projects which are well supported in the Comoros. Since 1984 there have been five of these all described on the IFAD website (IFAD 2010):

- The National Programme for Sustainable Human Development (PNDHD) (as described in Section 6 above)
- The Pilot Agricultural Services Project (PPSA)
- The Support to Economic Grass Roots Initiatives Project (AIEB)
- The Nioumakélé Small Producers Support Project (APPN)
- The Rural Services Project (PASR)
- <http://operations.ifad.org/web/ifad/operations/country/home/tags/comoros>

Annex 1 – All References and Web-Links Identified and Reviewed in Report Preparation

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2	Brugere et al (2008) FAO: Livelihood Diversification in Coastal and Inland Fishing Communities: Misconceptions, Evidence and Implications for Fisheries Management (working paper) . Available at: ftp://ftp.fao.org/fi/document/sflp/wp/diversification_june200
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10	Union of the Comoros (2002) Initial National Communication on Climate Change . Available at: http://www.ccsr.u-tokyo.ac.jp/unfccc4/pdfs/unfccc.int/resource/docs/natc/comnc1e.pdf

1. Introduction

The Union of the Comoros is an archipelago island nation in the Indian Ocean, located off the eastern coast of Africa on the northern end of the Mozambique Channel between northeastern Mozambique and northwestern Madagascar. Other countries near to the Comoros are Tanzania to the northwest and the Seychelles to the northeast. The former French colony is one of the poorest countries in the world. The capital is Moroni on Grande Comore. With a population estimated at 798,000 (excluding Mayotte), it is the sixth-smallest African nation by population—although it has one of the highest population densities in Africa. The archipelago is notable for its diverse culture and history, as a nation formed at the crossroads of many civilizations and has three official languages: Comorian, Arabic and French. At 1,862 km² (719 sq mi) (excluding Mayotte), the country is the third-smallest African nation by area.

Nearly 52 percent of the population lives on the largest island, Ngazidja (or Grande Comore), which is also home to the Union capital, Moroni, which is the seat of the Union government. The second largest island, Nzwani (Anjouan), has 42 percent of the population, while the smallest, Mwali (Mohéli), contains 6 percent. A fourth island, Mahoré (Mayotte), opted against independence from France in a referendum held on all four islands in 1974.



Figure 1: Map of Comoros

Identified as a Small Island Developing State, the Comoros has several specific attributes worth noting:

- From its archipelago nature, its EEZ is 163 733 squared miles and is a source of conflict with neighboring nations
- With more than 20 coups since its independence, Comoros is classified as a poor fragile state
- The nation has been independent since 1975

1.1 Oil and Gas sector overview

Sector activities can be split in two sub-sectors:

- **Upstream activities:** Although several exploration operations have been conducted, the Union of Comoros has no proven oil or gas reserves. Onshore prospects were launched in 2007.
- **Downstream activities:** The downstream oil industry is wholly dependent on refined petroleum products imported from Tanzania and other mainland African countries. The Société Comorienne des Hydrocarbures (SCH) is responsible for the importation, storage and distribution of oil and LPG.

SCH is a state-owned corporation under the Ministry of Budget supervision. It is currently being privatized. According to blogs, maritime transportation and distribution of fuel and LPG between the islands and in Anjouan and Moheli have been conceded to the private sector. No official confirmation could be found.

According to news websites, SCH governance is poor:

- SCH poorly manages fuel and LPG needs and stocks, creating recurrent disruptions
- SCH has not paid taxes and has not presented a statement of its accounts for 3 years

No data could be found on its storage capacity. Statistical data shows that Comoros oil consumption is estimated at 1,000 barrels per day, with its imports amounting to 750 barrels per day. Supply deficits are, thus, recurrent.

No information could be found on the economics of downstream activities. Since fuel distribution has been conceded to the private sector, SMEs must have been created. Nevertheless, there is no information on:

- Job creation
- New gas stations

1.2 Biofuels sub sector

Given the size and agro-climatic specificities of the Comoros islands, it is not a good location for growing biofuels. Understandably, there is no record of activities or foreign investors in agribusiness.

1.3 Trends and prospects

The SCH privatization process began in 1995. 15 years later, it is still state-owned. According to the IMF Memorandum, SCH governance reform is being studied, with IFC technical backstopping.

2. Biophysical

Due to its volcanic nature, size, and insularity, the Union of the Comoros has a diverse landscape and contains a rich array of biodiversity, both marine and terrestrial (fauna and flora). Internationally, Comoros is one of 20 island groups or archipelagos characterized by such endemic diversity. The country has particularly significant endemic plant diversity, making it a high-priority area for biodiversity conservation (Ministry of Agriculture, Fisheries and the Environment no date).

The uniqueness of Comoros comes from its archipelago nature:

- Shipping is the main means of supply to the country
- Shipping is the main transportation between the three islands
- With a 20kg per capita of fish consumption, sea fish is the main source of protein. Marine preservation is therefore a cornerstone in ensuring the future livelihoods of the population.

Given its insularity and its location in a cyclone-prone zone, there are high risks of marine pollution due to tanker accidents. However, no such event has been reported. In 2008, oil spills were reported on Anjouan beach, which appeared to have resulted from a ship cleaning or emptying its tanks.

Table 1: National data on energy consumption and impacts of climate change

Energy use (kt of oil equivalent)	Combustible renewables and waste (% of total energy)	Fossil fuel energy consumption (% of total)	CO2 emissions (kt)	CO2 emissions (metric tons per capita)
			87.94	0.14

Source: World Bank, year 2006

Table 2: Environmental and social issues of oil, gas and biofuel activities in the coastal zone

Coastal Oil & Gas Activity	Environmental issues	Social issues
Offshore exploration	<ul style="list-style-type: none"> • Oil spills, accidents 	<ul style="list-style-type: none"> • Restrictions for fishing zones • Opportunities for employment
Oil & Gas transport	<ul style="list-style-type: none"> • Oil spills, accidents • Water and soil contamination • Invasive species in ballast waters 	<ul style="list-style-type: none"> • Risks of accidents (fire, collision, etc) • Improvement in transportation network
Gas station and retail	<ul style="list-style-type: none"> • Oil spills, accidents • Water and soil contamination 	<ul style="list-style-type: none"> • Opportunities for employment • Opportunities for new services • Fuel availability
Biofuels development	<ul style="list-style-type: none"> • Swamp drainage • Monoculture and biodiversity loss • Pollution 	<ul style="list-style-type: none"> • Opportunities for employment • Opportunities for new services • Competition for arable land

Given the lack of activity in the case of Comoros, these issues remain somewhat hypothetical. However, oil and gas operations always bear the same environmental risks. Employment opportunities seem rather restricted in the downstream oil sector, while biofuels development does not appear to be an option for Comoros.

3. Human Environment

Projections based on expected population growth estimate that 65 per cent of the Comoros' total population will be living in coastal areas and low lying lands by 2050. Based on available information, the cost of the destruction of coastal infrastructure and assets directly caused by climate changes is estimated to be USD\$400m in 2050, 2.2 times the country's GDP for 2001 (Union of the Comoros 2002).

Local agriculture and water products do not meet the needs of the local population. The country is not self sufficient in basic food products and has to import almost all of its rice (which is currently the country's primary food staple), sugar, wheat flour, salt, etc. In terms of performance, the Comoros economy has been declining. GNP growth was -0.4 percent during the period 1989-1999, while GNP per capita decreased by 2.9 percent during the same period. In 1999, GNP decreased by 1.4 percent, while GNP per capita decreased by 4.1 percent. The ratio between public debt and GNP has gone from 0.88 in 1989 to 1.09 in 1999 (Ministry of Agriculture, Fisheries and the Environment no date).

3.1 Socio-economical indicators

Comoros has a high population density of about 328 inhabitants per square kilometer and a population growth rate estimated at 2.1 percent. An estimated 53 percent of the population is younger than 20 years old. With a GDP estimated at US\$530 million in 2009, GDP per capita is around US\$823. Nearly 45 percent of the population lives below the poverty line, however, poverty varies significantly across the islands and is generally higher in rural areas and in Anjouan. Comoros ranked 139 out of 182 countries on the UN Human Development Index in 2009.

GDP per capita growth is negative, meaning that the population is growing faster than production. Comoros society is both matriarchal and matrilineal.

Table 3: National economic indicators

GDP (million current US\$)	GDP growth (annual %)	GDP per capita (current US\$)	GDP per capita growth (annual %)	GINI Index (2007)
530.11	0.97	823.7	- 1.40	64.3

Source: World Bank, year 2008, and HDI

Table 4: National social indicators

Population, total (million)	Population growth (annual %)	Poverty headcount ratio at \$1.25 a day (PPP) (% of population)	Human poverty index (HPI-1)	Human development index
0.64	2.38	46.11 (2004)	20.4	0.576

Source: World Bank, year 2008, and HDI, year 2005

Table 5: National gender indicators

Life expectancy at birth, female (years)	Life expectancy at birth, male (years)	Literacy rate, adult female (% of females ages 15 and above)	Literacy rate, adult male (% of males ages 15 and above)	Gender-related development index (GDI)
67.6	63.2	67.8	79.3	0.571

Source: World Bank, year 2008, and HDI, year 2005

3.2 Details of corporate and social responsibility programmes of the oil and gas companies

No CSR is reported.

4. Policy and Governance

4.1 Policy and Legislation

In 1993, the Union of the Comoros developed and adopted a National Environmental Policy (Politique Nationale de l'Environnement, PNE-decree n° 93-214) on the basis of the Diagnosis of the State of the Environment in Comoros. The National Environmental Policy aims to integrate the environmental dimension into social and economic development policy, with the objective to guarantee the sustainable management of resources through:

- Supporting the sound management of natural resources and the development of alternative resources;
- Safeguarding and protecting biological diversity and the areas of environmental and cultural interest;
- Developing or updating knowledge on the environment;
- Promoting economically and environmentally viable agriculture;
- Promoting forest conservation and reforestation; and
- Establishing appropriate management in maritime and coastal areas.

The environmental regulation in Comoros is set out in the Decree No 94-100/PR, which is related to the promulgation of the law's related to the environmental framework.

Strategies / Regulations	Description - Comments
Energy sector	
Stratégie de Croissance et Réduction de la Pauvreté	2006-2009 PRSP second generation with facts and figures, there is no special goal pertaining to Oil&Gas or Oil spills
Politique Nationale de l'Environnement (Environment National Policy)	PNE-decree n° 93-214
Environmental regulations	Décret No 94-100/PR Portant promulgation de la loi relative au Cadre de l'Environnement

No information was found on oil and gas activities in the documents quoted, while no specific oil and gas policies or reports could be found.

4.2 Governance

The Ministry of Agriculture, Fisheries and the Environment is responsible for the implementation of the Environmental Plan of Action (PAE), which includes the National Environmental Policy (PNE) and the strategy of implementation for the policy. Implementation is to be based on a participatory approach, aimed at sharing efforts with all stakeholders including local and regional communities, NGOs and associations, teachers, the media, the private sector, and civil society. The objective is to progressively transfer responsibility to communities to manage their environment.

The national institutions responsible for the management and use of natural resources and the environment have been restructured several times in recent years. Agriculture, forestry, fisheries and environment are now all accommodated under the Ministry of Agriculture, Fisheries and the Environment, which includes the Environment Department.

The DGE is the Department in charge of the environment. Its mandate includes:

- Sound and sustainable management of natural resources;
- Coordination, follow-up, and evaluation of the activities linked to the environment, including activities to implement international conventions including better coordination of the activities of the focal points for each international convention;

- Suggest relevant measures to fight pollution and raise funds; and
- Develop and implement the communication and public awareness strategy on the environment.

The Service de l'Aménagement du Territoire, Land Planning Service, supervised by the DGE, is responsible for:

- Defining the spatial and environmental dimensions of the socioeconomic goals of national projects and programmes
- Giving the compulsory approval prior to exploitation or using of sites
- Participating in solving land issues

The CNCD is an advisory organ which supports all the authorities, legislative and executive, by issuing their approval on any programme which may impact the environment.

No information could be found on those particular operating bodies. According to the documents found, oil exploration activities should be approved by STA, a DGE Service. Offshore exploration was conducted by GX Technology in 2007, however, no record of any environmental approval or monitoring could be found.

Entity	Responsibility/ Description
Vice Presidency, in charge of the Ministry of Agriculture, Fisheries, Environment, Energy and Artercrafts	Ministry supervising the DGE
Direction Générale de l'Environnement (Environment Department)	Department in charge of Environment affairs Permanent Secretariat of the CNCD
Services Régionaux de l'Environnement (Regional Environment Services)	3 Decentralized DGE services, 1 per island
Comité National de Coordination du Développement Durable (CNCDD)	Interministerial committee dealing with the environment and development
Comités Régionaux Consultatifs pour l'Environnement	Issues approval to management programmes of the regional environment
Service de l'Aménagement du Territoire (Land Planning Service)	Issues approval prior to exploitation or use of sites

5. Planning and Management

There is no record on 2006-2009 PRSP completion or on a new PRSP draft.

Policy Planning initiative	Objective
Stratégie de Croissance et Réduction de la Pauvreté (PRSP 2006-2009)	A high growth ratio and the poor ratio diminution
Politique Nationale de l'Environnement (Environment National Policy) PNE-decree#93-214	Transfer progressively to the communities the responsibility for managing their environment
L'île de Grande Comore: Profil côtier et stratégie de planification	

6. Development, Trade and Projects

There is no record of any projects. Comoros is, however, a part of the regional Indian Ocean programme RECOMAP.

The Association for Intervention for Development and the Environment (AIDE)

A national NGO created in 1997 to contribute to the sustainable development of Comoros through

conservation actions and research on the natural environment. AIDE's specific aims are ecological and socio-economic monitoring of natural resources, environmental education, design and implementation of conservation and development projects and environmental management. Two studies done under the auspices of the UN (Division for Ocean Affairs and the Law of the Sea and PNUE/FAO/PAP) have outlined the base line and needs for coastal zone management. To date, there is no sign of implementation of these studies.

Development project	NGO / Donor / Private Sector	Project details
Regional Coastal Management (ReCoMap)	EU	ReCoMap is a regional programme for the sustainable management of the coastal zones of the countries of the Indian Ocean. It is an initiative of the Indian Ocean Commission which deals with seven countries of the region, namely Mauritius, the Seychelles, Madagascar, the Comoros Islands, Kenya, Tanzania and Somalia. The programme started in August 2006 and will end in 2011. The Programme aims to improve valorisation and sustainable management of coastal resources in the seven countries of the region.
Western Indian Ocean Marine Highway Development and Coastal and Marine Contamination Prevention Project	GEF	Concerned countries: South Africa, Mozambique, Tanzania, Comoros, Madagascar, Mauritius, Seychelles and the Reunion Island. All countries are required to have a NOSRCP to provide a national framework for responding to oil spills and protecting coastal resources

7. SWOT Analysis

<p>Strengths</p> <ul style="list-style-type: none"> • High endemicity and biodiversity • Several international projects involved in the Comoros, mainly on biodiversity issues, supporting improved coastal environmental management. 	<p>Weaknesses</p> <ul style="list-style-type: none"> • No available data • No record of reports or projects • No official websites (e-governance) • No record of oil and gas policy • Dispersed island archipelago • Weak central government • Poor population with scant resources • Fast growing population • History of coup d'états • Small population
<p>Opportunities</p> <ul style="list-style-type: none"> • Studies by national and international experts have laid out a coastal management plan. • Local and international NGOs could act as watchdogs. • Potential for tourism (if carefully managed such as ethical or eco-tourism) to generate increased revenues, diversify livelihoods and improve natural resource management • Community-led management of their own environments could be very positive for small and remote communities on the islands, if sufficient capacity building support is provided to enable this. 	<p>Threats</p> <ul style="list-style-type: none"> • Increase in oil operations (drilling, exploitation, transport, processing, storage, etc.) could increase oil spill risks. • Private companies from emerging countries are not always respectful of environmental and social regulations • Oil discovery would make political instability worse and threaten the marine ecosystem • Underfunded and chaotic national government • Impact of climate change on rising sea-levels not yet certain but likely to impact on small island states such as the Union of the Comoros – development therefore needs to take into account measures to mitigate and prepare for this.

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VI. Ports and Coastal Transport - Prepared by Professor Gavin Maasdorp, E-mail: gmaasdorp@imanidevelopment.com

1. Introduction

The country of Comoros officially consists of the four islands – Ngazidja (French: Grande Comore), - Mwali (French: *Mohéli*), - Nzwani (French: *Anjouan*), - Mahoré (French: *Mayotte*), as well as many smaller islands in the volcanic archipelago, situated about 300 km west of Madagascar and 300 km from the coast of Mozambique.

The government of the Union of the Comoros (or its predecessors, since independence) administers the first three main islands but not the island of Mayotte, which France still administers as an “overseas collectivity” due to the fact that Mayotte was the only island in the archipelago that voted against independence from France.

The total area of the islands is approximately 373 square km with a population of about 168,000. There are about 900 km of roads of which 689 km are paved. There is an international airport, (Moroni-Hahaya) on Ngazidja Island and smaller airfields on the other islands that are critically important to the tourist trade. There are regular services to and from Europe, South Africa and a range of other countries. Each of the Comoros islands has a port, and the marine activities of the islands and tourism are of great importance to their economies.

The island of Mayotte is a French island departmental “collectivity”. Mamoudzou is the capital and largest city. The land is gently rolling, with some mountains of ancient volcanic origin and deep ravines. The climate is tropical, with a hot and humid rainy season and a cooler dry season.

2. Extent of Ports and Transport Activities

Moroni

Moroni is the main port of Comores and is situated on the island of Grande Comore (Ngazidja). Due to depth of water and a difficult entrance rendered dangerous by currents, ships lie at anchor outside the line of the coral reef, and cargo and containers are transported from ship to wharf by smaller launches. All transport to and from the port is by road.

Mutsamudu

The port of Mutsamudu is located on the west coast of the island of Anjouan (Nzwani). The port has a single breakwater that extends into deep water with a quay that provides berths for 2-3 small vessels. The berths on the south of the estuary have access to extensive fish-processing storage facilities.

Fomboni

The small port of Fomboni on Mwali Island serves to receive imported supplies and handles the output from the local fishing industry.

Mayotte

The port of Mamoudzou lies within an extensive coral reef, and is reached by a channel into the large deepwater bay. The extensive fleet of fishing and leisure craft anchor to the south of the main quay.

3. Policy and Governance of Ports and Transport

The policy of the Comoros Republic has been to contract port operating companies from the Gulf area to assume control of operations and provide the capital to modernise and expand facilities. In Mayotte there is a dependence on France for assistance, but the port is still run by the local port authority.

It has been noted that, due to the geographic location of Comoros, there is an element of vulnerability to the threat of Somali piracy and even possible actions against the shore-based communities, with talk of developing military capability to withstand any invasive actions. Local and visiting yachts and shipping are very vulnerable to piracy.

4. Planning and Management of Ports

A 15-year contract has been awarded to a UAE based container port management company Gulftainer, to take over operations at Moroni and Mutsamudu. Operations at Moroni have started but at Mutsamudu there are delays caused by contractual issues. On Mayotte the port is managed by the local Port Authority as part of the governmental management functions.

5. Development, Trade and Products

Agricultural production on the islands of the Republic of Comoros, is based mainly on export of vanilla, cloves, sisal, cocoa and palm products. Fishing is the main industry, followed by tourism. The economy of Mayotte is largely agricultural and includes livestock raising and fishing. Mayotte exports perfume oils, vanilla, seafood, coffee and rice. Much of its food is imported, mainly from France. The profitability of the vanilla exports suffers from fluctuations in the market prices and competition with Madagascar, and the entire economy is heavily dependent on the major users of vanilla such as Coca-Cola.

6. Ports Impact and Benefits to Coastal Communities

On all the islands the ports, together with the coastal anchorages afforded by the protection of the very extensive coral reefs, promote the local fishing industry and attract sport and leisure fishermen and yacht travellers. Inland from the ports most occupations are linked to agriculture, but development of the tourist industry adds opportunities for supplying food and beverages to the more affluent visitors.

The remoteness of the islands makes it difficult to develop economic activities linked to exports, apart from the essential oils and vanilla that have become the staple export products. Local production of other crops and animals is mainly geared to local consumption. There is a need for promotion of manufacturing and processing to increase employment.

7. SWOT Analysis

Strengths <ul style="list-style-type: none">• Apparent homogeneity of the population.• Relatively low population density.	Weaknesses <ul style="list-style-type: none">• Political instability that is diluting investor confidence• Limited local resources and GDP• Proximity to Somalia• For Mayotte, some residual territorial friction and dependence on France
Opportunities <ul style="list-style-type: none">• Tourist and port development based on affiliations with Middle East states.• Establishing off-shore financial centre	Threats <ul style="list-style-type: none">• Somali piracy and impacts on shipping and fishing activities.• Competition for fishing and tourism from Madagascar and other island states

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VII. Coastal Mining - Prepared by Mr. Thomas Cushman,
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Introduction

The Union of the Comoros is an archipelago island nation in the Indian Ocean, located off the eastern coast of Africa, on the northern end of the Mozambique Channel, between northeastern Mozambique and northwestern Madagascar. Other countries near to the Comoros are Tanzania to the northwest and the Seychelles to the northeast. The former French colony is one of the poorest countries on earth. The capital is Moroni on Grande Comore. At 1,862 km² (719 sq mi) (excluding Mayotte), the Comoros is the third-smallest African nation by area. With a population estimated at 798,000 (excluding Mayotte), it is the sixth-smallest African nation by population—although it has one of the highest population densities in Africa. Its name derives from the Arabic word for moon. The archipelago is notable for its diverse culture and history, as a nation formed at the crossroads of many civilizations. Though in the island of Mayotte the sole official language is French, the "Union of the Comoros" has three official languages: Comorian, Arabic and French.



The country officially consists of the four islands in the volcanic Comoros archipelago: northwestern most Grande Comore or Ngazidja, Mohéli or Mwali, Anjouan or Nzwani, and southeastern most Mayotte or Mahoré, as well as many smaller islands. However, the government of the Union of the Comoros (or its predecessors, since independence) has never administered the island of Mayotte, which France still administers as an overseas territory. The islands of the Comoros Archipelago were formed by volcanic activity. Mount Karthala, an active shield volcano located on Ngazidja, is the country's highest point, at 2,361 m or 7,748 ft (2,362 m) it contains the Comoros' largest patch of its disappearing rainforest. Karthala is currently one of the most active volcanoes in the world, with a minor eruption in May 2006, and prior eruptions as recently as April 2005 and 1991.

Mining Overview

There are no commercially exploitable mineral resources in the Comoros. Small quantities of clay, sand, gravel, and crushed stone are produced for domestic consumption, and the former French colony is dependent on imports to meet all its energy and cement needs. Promotion of a new construction technique using lava and volcanic ash is expected to reduce cement imports and sand and coral mining. Political

instability in recent years has continued to hurt the economy, and the outlook on minerals output was not expected to change significantly.

The demand for cement, steel, petroleum, and petroleum products was met through imports. Use of beach sand for cement for construction especially of large public works (airport, roads, hospitals, mosques) has led to increased beach degradation and erosion

The mineral industry of the Comoros is limited to the production of local building materials, mainly of volcanic rocks and beach sand.

1. Coastal Mining Overview

Our research did not mention an existence of any formal companies with mines in the Comoros. However, there are sand and coral mining along the beaches for construction use.

2. Policy and Governance

2.1 Legal frameworks

Our research did not mention the existence of a mining law in Comoros.

The environmental regulation in Comoros is set out in the Decree No 94-100/PR related to the promulgation of the Law related to the environmental framework.

3. Livelihood Benefits, Social Organisations and Environmental Responsibilities

Environmental Entities or NGO's acting in the coastal mining zone

The Association for Intervention for Development and the Environment (AIDE)

A national NGO created in 1997 to contribute to the sustainable development of Comoros through conservation actions and research on the natural environment. AIDE's specific aims are ecological and socio-economic monitoring of natural resources, environmental education, design and implementation of conservation and development projects, and environment management.

Action Comores

Action Comores is an NGO involved in conservation work, scientific research, direct conservation action, and environmental education. A primary focus is the conservation of the endemic and endangered fruit bat Livingstone's flying fox (*Pteropus livingstonii*) and its habitat.

Management Committee of the Marine Park of Mohéli

The Marine Park of Mohéli was inaugurated officially in 2002 to become an area co-managed with the local communities, a sanctuary for biodiversity, and a tool for conserving the environment for the long-

term use of the marine resources.
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4. Human Environment

Socio-Economic Indicators

Social indicator	Comoros
Social indicators	
Total population (2009)	0.666 millions
Population growth rate (2005-10)	2.3%
Economical indicators	
GDP (2009)	US \$0.532 billion
GDP (2008 growth rate at 1990 prices)	1%
GDP per capita (2009 current prices)	\$798.791

5. Policy and Governance

5.1 Policy and Legislation

Coastal Mining Regulations	Description - Comments
Mining activities laws and regulations	None
Environmental regulations	Décret No 94-100/PR Portant promulgation de la loi relative au Cadre de l'Environnement
Coastal Mining specific regulation	None

5.2 Governance

Entity	Responsibility/ Description
Comité National de Coordination du Développement Durable (CNCDD)	Interministerial committee dealing with the environment and development
Ministère du Développement Rural, de la Pêche et de l'Environnement,	Ministry in charge of coastal development

Environment Management and Coastal Zone Management

Two studies done under the auspices of the UN (Division for Ocean Affairs and the Law of the Sea and PNUE/FAO/PAP) have outlined the base line and needs for coastal management. As yet no sign of implementation of these studies has been found.

6. SWOT Analysis

<p>Strengths</p> <ul style="list-style-type: none"> • No mineral resources 	<p>Weaknesses</p> <ul style="list-style-type: none"> • Dispersed island archipelago • Weak central government • Poor population with scant resources • Need for sand and gravel for cement • No management plan for sand mining
<p>Opportunities</p> <ul style="list-style-type: none"> • Studies by national and international experts have laid out a coastal management plan • Local and international NGO's 	<p>Threats</p> <ul style="list-style-type: none"> • Underfunded and chaotic government • Fast growing population • History of Coup d'états • Widespread beach erosion

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