

Comoros: Tourism, protected areas and development

The three islands of the Islamic Republic of Comoros are located between 11° 20' and 11° 4' South in latitude and 43° 11' and 45° 19' Est in longitude in the northern part of Mozambique canal between Madagascar and East Africa. Ngazidja in the North West is the biggest island covering over 1.011 km² and at 300 km off Mozambique coast. Ndzuani, the most southwards covers 424 km² and Mwali is the smallest and more southern covering a surface of 211 km². These islands are characterized by a great variability of factors concerning climate, geology, sedimentology, soils within relatively small surfaces and a contrasted topography.

The altitude increases from South to North: *Mwali* has a sharp ridge of hills with torrents and falls in its virgin forest, and several coastal plains. *Ndzuani* is more mountainous with sharp sides falling into the sea or into big cories and almost no more virgin forest left. *Ngazidja* is less eroded and mainly characterized by its huge volcano the Karthala towering at 2 360 m with still a big virgin forest, and an older massif of more than hundred small volcanoes in the north. This island relies only on rain fall since it does not have any permanent rivers and its soil is porous.

The mean pluviometry is between 1.500 et 5.000 mm by year but varies a lot according to exposure and altitude. Cyclones have impacted the islands, the worse passed over Mwali, Ellinah in 1983, Ngazidja in 1984 and 1985 destroying habitations, plantations and ecosystems. Volcanic activity dates from Tertiary, Mwali is the oldest and Ngazidja the most recent formation.

The marine and coastal environment shelters a

great variety of ecosystems characterized by a high biodiversity included in different habitats: cliffs, coastal plains, lava flows, beaches of white coral sand, grey sandstone sand, red pouzzolane sand, shingle beaches, mangroves, coastal marshes, sea-grass fields, reef flats, coral reefs, islets with some submarine called mayas, and in the sea, benthic, pelagic and bathyal ecosystems including upwelling areas.

These ecosystems are fragile due to natural conditions (climate, volcanoes, cyclones, rough seas and are presently threatened by man through the collect of sand and corals, overfishing and destructive fishing practices, pollution due to solid and liquid waste, pesticides, deforestation, and in general mispractice of coastal management.

The coral reefs of Comoros are still hardly known and have not yet been mapped. The three islands have fringing reefs with older formations in Mwali wich has coastal extensions as pseudo lagoons up to 3000 m into the blue, the most recent reefs are in Ngazidja covering 60% only of the coast.

The inventory of faunistic data is incomplete and needs to be performed more comprehensively. Although poor in big mammals, the fauna in Comoros is diversified and well balanced (all the main zoological groups are represented). Comoros is characterized by recent (quaternary) faunal and floral communities in relation to the fact that they are islands and volcanic.

Although Comoros have been hardly studied, they are ranked after Madagascar concerning the diversity of the species and after Seychelles for their endemism. More than 2000 floristic species

have been inventoried among which 43 threatened orchid species, 33% of the vascular plants and 55% of the threatened floral species. 30 to 60% of the insects are endemics and 1200 insect species are mostly butterflies and spiders, several dozens of terrestrial molluscs are threatened. Reptiles need to be assessed, there are at least 11 endemic species among the 25 indigenous species (5 geckos, 2 cameleons, 1 scinque et 3 snakes). A total of 98 bird species among which 35 sub-endemic sub-species, 60 nesting species and 30 migratory species. Around 40% of endemism for the forest bird species. A total of 17 mammal species among which two species and 3 sub-species are endemic, 3 megachiroptera with especially the giant Livingstone bat *Pteporus livingstonii* and a lemurian *Lemur mongoz*.

The coastal and marine fauna of Comoros is rich and includes species of world importance. However more comprehensive studies are needed to complete the inventory of the resources. More than 820 marine fish species have been listed. The black coral *Antipathes dichotoma* and all the *Antipatharia spp.* are threatened. One mollusc is endemic to Comoros: *Chiton comorensis*. Are also threatened: *Cypraecassis rufa*, *Charonia tritonis*, *Cassis cornuta*, *Turbo argyrostamu*, *T. marmoratus*, *Tridacna squamosa*, *T. maxima*, *Hippopus hippopus*, *Pinctada spp.* Among threatened crustacean species: *Palinurus sp.*, *Birgus latr.* The fossil fish of world importance *Latimeria chalumnae* is threatened as for the Dugong *Dugong dugong*, the turtles *Chelonia mydas*, *Eretmochelys imbricata*. All these species are threatened by illegal fishing, collecting, touristic curios.

The natural primary forest is a unique reservoir for numerous endemic species and specific ecosystems with still many species new to science not yet collected. Deforestation threatens this unique biodiversity. Among the 500 known species of plants, 50 are endemic (numerous orchids...).

Economical activities are very numerous and diversified; they are mainly localized on the coastal area. Most relate to the primary sector (agriculture, animal husbandry, fisheries, sand collection) and to the tertiary sector (tourism, hotels, trade...).

The population of Comores is characterized by a great youth (41% less than 15 years old) and a relatively high demographic growth (presently 2,7%) due to the improvement of sanitary conditions, generalisation of polygamy and insufficient contraception. A total of 90% of the population lives on the coastal margin and creates a pressure on arable land. Urbanisation is explosive and an-

archical, lacking collective equipments due to the absence of urban planning and the non respect of the "Service de l'Urbanisme" to give construction permits.

Land tenure is quite complexe and precarious depending on 3 tenure systems: colonial Law, muslim Law and the traditional Law and without any registration of land. Land tenure in Comoros discourages comorians to invest in land while enhancing quality and conservation matters.

Air traffic between the islands is quite insufficient, random and lacking security control. As for the maritime traffic, dughouts and traditional "boutres" work with no insurance and no facilities at the harbour; oil spills are common. International flights are quite expensive and not frequent enough.

The collect, sanitary control and distribution of drinkable water is not properly achieved and managed differently on the 3 islands. The production of electricity is mainly thermic thus depending on the importation of raw oil except at Ndzuani and Mwali which rely on hydroelectrical plants.

There is an increasing production of liquid and solid wastes, untreated hospital wastes, oil, gaz leaks. The coast is traditionally a large public latrine. Oil tankers also discharge at sea and leaks can come to the coast impacting the beaches and the reefs. The lack of management of waste treatment is an issue growing in proportion to escalating demography in urban areas. There is a major risk of pollution of the water table by the cesspools and the infiltration wells and of the coastal waters by the discharge of solid wastes and sewage. These insalubrious conditions favor the expansion of contagious diseases and of the population of pests.

Sand and coral are still collected illegally. Presently 90% of the beaches of Ngazidja have disappeared in the last ten years and thus have accelerated coastal erosion impacting the remaining beaches. The consequences are a diminution of touristic potentials, of landing areas for the fishermen and of the nesting sites of marine turtles.

Agriculture in Comoros takes up 80% of coastal land and is in a bad state. It is mainly meant for autoconsumption with nevertheless crops of vanilla, ylang-ylang and clove. Cultural technics are inadapted and rudimentary. The productivity of food crops is insufficient especially as the agricultural sector is considered as the motor of the revival of the comorian economy. The diversity of terrestrial ecosystems is conditioned by altitude and thus by the variability of microclimates, soils and geomorphology especially in Ngazidja: lava fields



with lichen on the summit of the Karthala volcano, moors with bushy heather *Philippia sp.* above 2000m, dry mountain vegetation between 1600-1700m, thick humid forest at 1000-1600m on the more humid west and south slopes and where the soil is the richest, rain forest at 800-900m with giant ferns, food crops associated to the forest between 300 and 800m with banana trees, taros, coconut trees and fruit trees.

The lack of a marketing network, sanitary and genetic control, technical and financial assistance to the farmers and breeders are limiting factors to the development of farming production. There are no food-processing industries in Comoros, only small artisanal units for transforming local products (fruits, milk, vanilla, clove, copra, ylang-ylang). Considering that the local food production is insufficient for the country, importations are consequent and the commercial balance largely in deficit. Devaluation did not permit to boost exportations of vanilla, clove, ylang-ylang and coprah which are badly competing with cheaper products of synthesis and the presence of new producing countries.

Animal husbandry is traditional, poorly organized and not integrated to agriculture. Most of the husbandry is localized in the coastal plains except on the highs of the Karthala on Ngazidja. Mostly goats compose the livestock. Deforestation is carried out for firewood, construction and to increase arable land leading to a diminution of fertility, denatured soils and thus continuing deforestation. The clearing of river basins is also the cause of great erosion and of the drying of rivers especially on steep slopes as on Ndzouani and Mwali. Sediment transport into the sea causes the siltation of the reefs and on a long term the death of the corals.

Fishing is a traditional activity in Comoros practiced by most of the men in coastal villages and no catches are exported. In 1994 a census of more than 8000 fishermen on the three islands for 4000 traditional dugouts has been taken. Fishing is mainly on the fringing reef with lines; other techniques are still used although illegal such as poisoning, D6 pesticides, dynamite, very small mesh nets. Other fishing techniques on pelagic and demersal fish have been introduced by cooperation projects with european tuna companies (new boats with engines, Agregative Fishing Devices, trawling technics...) in order to reduce the pressure on the reefs and to secure the sustainability of the fish resource. Different development projects on fisheries have focused on conservation technics and on fish marketing.

The economic and legal environment do not encourage the development of private enterprise in Comoros due to the absence of raw material, the isolation from the world, the high cost of energy and the absence of a Trade Court.

Political, legal and institutional framework

Comoros have adopted a National Policy for the Environment in 1993. This policy has been elaborated on basis of the "Diagnostic de l'état de l'environnement aux Comores" financed by UNDP and implemented jointly by Unesco and IUCN (UNDP COI/91/006). The elaboration of a National Policy for the Environment and an Environmental Action Plan approved in 1995 shows the determination of the comorian government to protect the sensitive ecosystems of the country by establishing a rational and sustainable management of the resources. Comoros signed the following International conventions: RAMSAR, World heritage, CITES, East African Fauna and Flora, Ozone layer, Biological diversity, Climate change, Hazardous substance and Law of the sea.

Classified areas and protected areas

RAMSAR site

There is a RAMSAR site in Mwali since 1995 localized within the area of the volcano lake of Dziani Bunduni. Not only does the lake present a landscape and aesthetic value, it is also of scientific interest due to its biological diversity, flora and fauna both considered. The last inventories displayed 10 different species of birds living in proximity to the lake which also attracts migratory species such as other areas in Madagascar and eastern Africa. On the top and the sides of the volcano lake more than a dozen of forest species among which several endemics hosting endemic mammals (*Lemur mongoz*, Livingstone bat). This site presents also a geological interest as a volcano lake and more specifically for the sulphurous emissions and different water levels. However although the remarkable actions of the Ulanga association of Itsamia to protect the area, the site is heavily threatened by overgrazing and intense deforestation

Protected areas

There are no protected areas yet established in Comoros, however several sites have been pro-



posed by UNDP in a project of conservation of the biodiversity within a sustainable development financed by GEF (Global Environmental Fund): on Ngazidja, a terrestrial area in the forest of the Karthala volcano and a marine park in the coelacanth area, on Mwali, a marine park in the Nioumachoi area including the islets and the Boundouni area and on Ntsouani a marine park in the Bimbini area and the "ilôt de la Selle" and a terrestrial park in the relic forests at altitude.

A feasibility study has been achieved by the EU PRE/COI programme funded by FED for the development of a national park in the Karthala forest on Ngazidja and the preservation of the relic forests on the other islands. The two projects of marine parks on Mwali and Ndzouani are presently carrying feasibility studies.

The Nioumachoi marine park on Mwali

UNDP is funding a GEF project for the conservation of the biodiversity in Comoros which is implemented by IUCN. The Nioumachoi marine area including several islets is of particular ecological and aesthetic interest; it is planned to be officially declared as a marine protected area. The natural resources are of scientific importance and have a recreational value: the white coral sand beaches host a great number of turtle nests, mangroves, relatively diverse coral reef ecosystems, important fish populations, pelagics of great size, natural vegetation on the islands. One of the priorities of the project is to integrate local village communities to the process.

However this future marine park is threatened by several issues: overfishing, illegal turtle hunting, deforestation, soil erosion, sand extraction and uncontrolled tourism. Therefore the creation of the park has for objectives:

- the conservation of part of the reef ecosystem and of associated habitats and communities in order to maintain at a sustainable level associated fish communities,
- the conservation of the biological diversity of the area,
- the preservation of populations of threatened species,
- the possibility of integrating adjacent terrestrial areas to the conservation project
- to emphasize the recreational and touristic potential of the area within a conservation of the nature strategy

The coelacanth marine park

The coelacanth is a fossil fish, only survivor of crossopterygians thought to be extinct 60 to 70 million years ago and discovered in Comoros in 1938.

Recent studies made by the German Council and the zoological society of Frankfurt have noticed the decline of the coelacanth population in Comoros and are financing a research project on the protection of the species. An European programme proposed a feasibility study for establishing a marine park in the south eastern area of Ngazidja. Different measures are to be taken:

- traditional fishing will be allowed in shallow areas,
- deep fishing with lines will be forbidden and alternative solutions are to be proposed with aggregative fishing devices moored at greater depths,
- an information center will be built for awareness campaign with a library, a research center. A camera will be installed to monitor coelacanths in one of the caves at 250-400m depth.

Tourism and leisure activities

Tourism is still just beginning in Comoros and currently progressing. The evolution of the number of visitors progressed from 16 942 in 1991 to 27 474 in 1998. In 1998, 46% of the tourists are European and 41% are from Africa and Indian Ocean. However, this is far from the numbers of neighboring countries such as in Seychelles, Mauritius...

Tourism represents presently about only 2,2% of the Gross Domestic Product of Comoros while it is 17,8% in Seychelles. It may be also an advantage for Comoros to start to develop tourism after a diagnosis of its potentials which are great although threatened.

Comoros plan to choose touristic activities adapted to the protection and a sustainable exploitation of its natural resources and its historical and cultural heritage. The economical repercussions would be distributed to all activity sectors (agriculture, fisheries, construction, transport, handicrafts, hotels, restaurants...)

The present threats on tourism are: an irrational exploitation of the resources, anarchic urbanisation with no management and no sanitary plan, political instability, expensive plane traffic, expensive and mainly urban hotels with poor quality standards, insecurity, sanitary risks like the cholera..



A general policy for the development of tourism has been developed and supported by an adapted legislation taking in account local customs, activities within the villages and the community systems.

The development of handicraft, the creation of thematic areas and the set up of a network for ecotouristic relays and hiking tours are some of the objectives of the present projects on tourism development.

Actors and institutional tools are the following

– The “Administration du Tourisme”, more specifically “la Direction Générale du Tourisme et de l’Hôtellerie (DGTH)” has for role to assume the elaboration and the implementation of the policy of the government in the sector of hotel industry and tourism and to protect and promote touristic sites in collaboration with the “Direction Générale de l’Environnement”.

– L’Association Comorienne du Tourisme created in 7 juin 1995 federates most of the hotels, restaurants, travelling agencies, carriers and plane companies.

– The private and associative sector focusing on touristic activities involves the protection and the management of the environment.

– The inevitable tax to pay when entering the country.

– The ministerial decree of 25/2/1995 has created an interministerial structure, “the Conseil Consultatif du Tourisme et des Transports”. Its role is to propose a policy and strategy of the touristic sector, to conceive a global Action Plan for the development of the touristic sector and to elaborate an incentive for legal, institutional and regulatory framework.

– The «Assemblée Fédérale» has recently adopted two laws essential to the development of tourism:

– the classification of the “hébergement touristic” and

– the “code des investissements” (fiscal measures adopted in June 30 1995).

– The «Programme régional de Développement du Tourisme dans les pays de l’Océan Indien», financed over 3 years by European Union, VIème FED (4,7 millions d’Euros) and VIIème FED (1,57 millions d’Euros); it has for general objective to develop jointly touristic activities in the 5 countries members of the COI by the creation, the promotion and the settlement of a new regional product.

– Several programmes of the COI integrate a touristic dimension:

– the programme “Plantes médicinales, aromatiques et ornementales”,

– the programme “Appui aux programmes environnementaux dans les pays membres de la COI”,

– the programme “Artisanat Régional” with the building of “the Centre National d’Artisanat” in Moroni, Ngazidja,

– the UNDP/BIT project to support the private sector (CASP/FASP) technical assistance to investment projects

– the UNDP project “capacity building for a sustainable management of the environment, Capacity 21”.

– the UNDP/GEF project “Conservation of the biodiversity in RFI Comoros”.

Cultural, historical and architectural heritage

An inventory of the comorian heritage has been achieved by UNDP/OMT in 1986 and is regularly updated by CNDRS (Centre National de Documentation et de Recherche Scientifique). This heritage includes archeological, religious, historical sites, fortifications and burial places from the bantus, arabs from the 8th century, the sultans era, shiraz from 13th century, portugese from the 16th and 17th century and malagazy from the 18 and 19th century. Most of the historical monuments are damaged and need to be restored to be exploited for tourism. The CNDRS organizes awareness campaigns with the population explaining the importance of keeping intact the cultural and historical environment as well as the natural environment.

Craft industry

Traditions and comorian culture is rich and original. The CNDRS has set up a museum displaying artifacts on these themes and a National Center for handicrafts (pottery, basketry, embroidery, chiromanis, dolls...).

Traditional village activities

Different activities, and events are still traditional and celebrated at different ages such as: oral tradition perpetuated through songs, tales and proverbs, games, cards, comorian boxing based on dance steps, perfumes, beauty masks made with santal wood and coral powder, tradi-



tional medicine with plants, magic and withcraft often from malagazy origin...

The natural heritage

Can be enjoyed by beach activities, hiking in forests, marine recreational activities and sports, off shore fishing and diving.

Hotel capacity

Since 1989 with the opening of the South African hotel the Galawa of the group Sun International located in the northern part of Ngazidja and since new international connecting flights, tourism has progressed. In 1995 there were 775 beds on the 3 islands and in 1997, a total of 1033 has been recorded with a concentration of 889 on Ngazidja.

