

INDEX

1. INTRODUCTION	1
1.1. PLAN INSERTION	3
1.2. THE IMPORTANCE AND SIGNIFICANCE OF THE PARK	4
2. OBJECTIVES.....	5
2.1. GENERAL OBJECTIVES.....	5
2.2. VISION OF THE PARK.....	5
2.3. SHORT AND LONG TERM OBJECTIVES	6
2.3.1. LEGAL ASPECTS: LIMITS AND REGULATIONS	6
2.3.2. ADMINISTRATION OF THE PARK	6
2.3.3. REGIONAL AND INSTITUTIONAL CONTEXT	6
2.3.4. RESOURCES ADMINISTRATION.....	7
2.3.5. SOCIAL ECONOMIC DEVELOPMENT	7
2.3.6. COMMUNITY MANAGEMENT	7
2.3.7. ARCHAEOLOGICAL AND CULTURAL.....	7
2.3.8. TOURISM DEVELOPMENT.....	7
2.3.9. MONITORING AND RESEARCH	8
2.3.10. PUBLIC AWARENESS.....	8
3. ZONING.....	8
3.1. ZONING DESCRIPTION	8
BAZARUTO NATIONAL PARK.....	11
3.2. PROPOSED ZONING FOR THE ARCHIPELAGO	11
3.2.1. WILD ZONE	12
3.2.2. ZONE OF TOTAL PROTECTION.....	12
3.2.3. LOCAL COMMUNITIES LIMITED USE ZONES	17
3.2.4. INTENSIVE USE ZONE	17
3.2.5. MULTIPLE USE ZONE	17
4. MANAGEMENT PROGRAM.....	19
4.1. LEGAL ASPECTS: LIMITS AND REGULATIONS.....	19
4.2. ADMINISTRATION OF THE PARK.....	21
4.3. REGIONAL AND INSTITUTIONAL CONTEXT.....	23
4.4. HABITATS AND RESOURCES MANAGEMENT	26
4.4.1 MARINE ENVIRONMENT	26
4.4.2. TERRESTRIAL ENVIRONMENT	40
4.4.3. WATER ENVIRONMENT	57
4.5. COMMUNITY MANAGEMENT.....	61
4.5.1. POPULACIONAL SETTLEMENT	63
4.5.2. ECONOMIC AND SUBSISTENCE ACTIVITIES	64
4.6 COMMERCIAL DEVELOPMENT	68
4.6.1 Tourism.....	68
4.6.2 Crocodile farms	76
4.6.3 Sport fishing.....	77
4.7 EDUCATION AND ENVIRONMENTAL AWARENESS	79
4.8 FINANCIAL ADMINISTRATION OF THE PARK	80

1. INTRODUCTION

The present Integrated Management Plan for the Bazaruto National Park is conceived in the context of ensuring a sustainable development of the region, and of implementing a management program for the next five years, based on ecological and socio-economic measures adjusted to the local environment conservation and preservation.

Special attention is given to the management of the Park and to the local communities' involvement in the management of the archipelago resources, as well as to the improvement of their socio-economic livelihoods.

The present plan is integrated in the Inhambane Province Northern Zone development program, specifically of Vilanculos and Inhassoro districts; and at the national level, the plan is integrated in the National Program on Forestry and Wildlife.

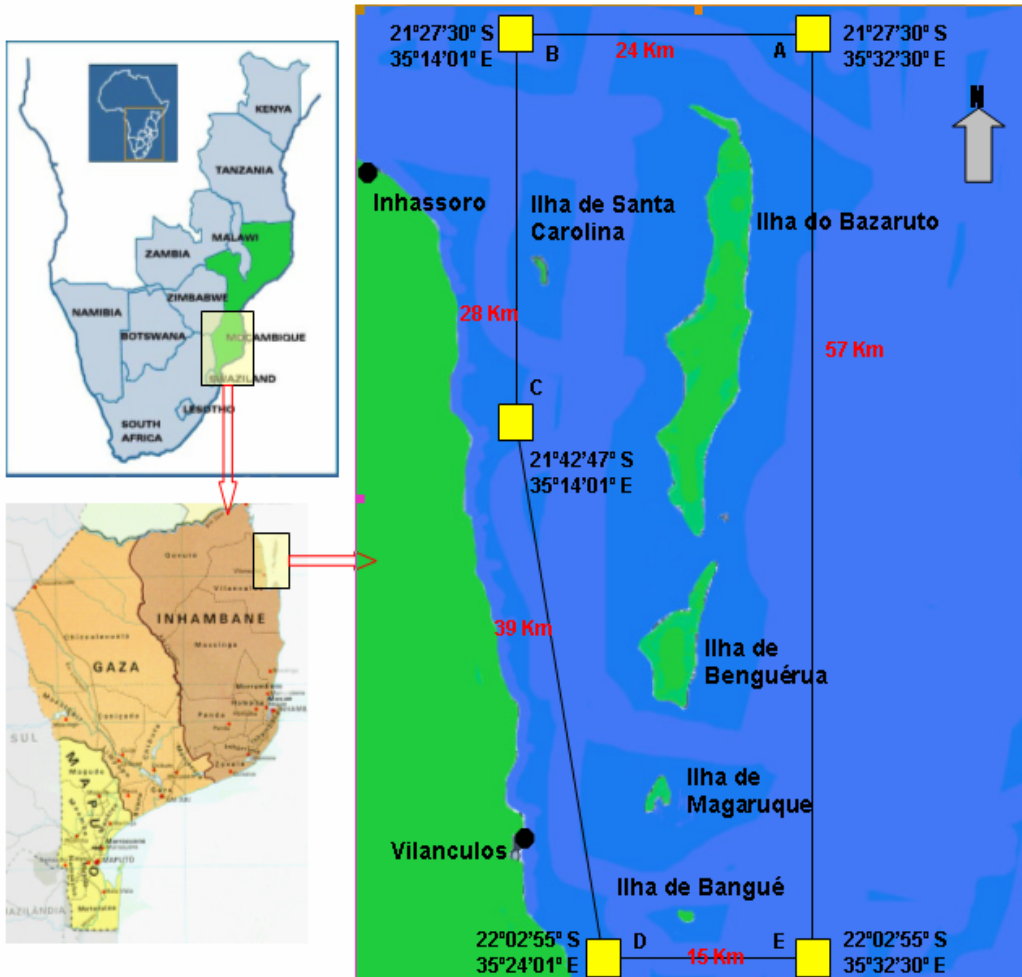
This present volume (Vol. 2) constitutes the base plan for the integrated management of the Bazaruto Archipelago. It will serve as guidance for the integrated development and ecological quality conservation of the region.

The planning process was comprehensive and participative despite time as resources constraints. The same elapsed between February (1996) and June (1998), in a three phase's process:

1. **Consultation:** consisted on the listing the actual situation of the Park, its functionality in the local and regional context; issues and conflicts identification; and a definition of a guiding line for the park development;
2. **Definition of Options:** through a development and evaluation of a whole range of alternative strategies which will help achieving the Park management objectives; the Park zoning was integrated in this phase in order to regulate the resources users activities;
3. **Plan Elaboration:** outline of the management strategies and compilation of all important information for the plan execution;

BAZARUTO ARQUIPELAGO NATIONAL PARK

Scale: 1:250 000 (approximated)



The management plan does not constitute a fixed management framework, due to the general evolution dynamics in the all country in general and in the Archipelago region in particular. Its implementation will be flexible and adaptable to the local reality according to space and time.

Assuming that there is a proposal to change the current limits of the Park to incorporate all the islands that compose the archipelago, for the present plan, the Bazaruto Archipelago will be treated as integral unit of the Park.

The present plan is divided in two volumes:

- **VOLUME 1:** contains all the information related to the Park, required to understand the management plan;
- **VOLUME 2:** contains the Park framework, the zoning plan and the management strategies for the effective management of the Park;

The elaboration of the management plan was financed by the European Union and WWF, through the Bazaruto Archipelago Conservation Project implemented by DNFFB with the support of WWF and EWT.

1.1. PLAN INSERTION

The Bazaruto National Park was created in 1971, through the Legislative Diploma 46/71 of May 25th of 1971, with the objective of conserving marine species with highly ecological value, specifically dugongs, dolphins and marine turtles. On its creation, the Park lodged three southern islands: Benguérua, Magaruque and Bangué, their eastern marine strip up to the 100 meters bathymetric line, and their western marine strip up to the 5 kilometers line. The Bazaruto and Santa Carolina islands were defined as Special Surveillance Zones.

Since its creation in 1971 up to 1989, there was never a presence of the conservation authorities. Since the 70's, new developments such as tourism, the installation of crocodile's farms, and the civil war, that resulted in the increment of the human population affected the archipelago integrity.

Then the Park was treated as a unit of free and disordered access, having increased the index of activities with negative impacts on species and habitats in the Park shifting agriculture , pasture, non-licensed and uncontrolled fishing, use of inadequate fishing gear, uncontrolled use of firewood and other).

This trend changed slightly from 1989 onwards with the beginning of ecological and socio-economic studies and the appointment of the first Park Administrator. At the same time, participative management projects involving the local communities, the private sector (tourism operators) and other, resources users started in the Archipelago aiming at the conservation and sustainable use of resources, through the maintenance of subsistence and recreational activities of the local communities.

As result of the participative management, some of the degraded habitats have recovered. As the archipelago was bearing coastal and terrestrial components of high biodiversity value, it was opted to develop a conservation and development program which could ensure the sustainable use of resources and improve the livelihoods of the islanders. The other sectors of the economic activities would perform their functions of increasing the revenues at the local level.

This plan succeeds a previous Plan, designated **Master Plan for Conservation and Long Term Development Plan for the Bazaruto Archipelago**, and prepared by Dutton and Zolho in 1990 which established the blueprints for the archipelago development through tourism, fishing, and trade, socio-economic and cultural development and of the administrative and ecological management of the Park.

The Dutton and Zolho Master Plan of 1990 were never approved. It was considered a descriptive plan, referring to ecological and socio-economic aspects, without presenting a management strategy or program. However, since its conception in 1990, it has been used until now as a baseline for the implementation of participative management programs in the archipelago.

Based in the acquired experience and in the achieved objectives, it was necessary to develop this management proposal plan, in order to present a more participative management program of the archipelago.

1.2. THE IMPORTANCE AND SIGNIFICANCE OF THE PARK

- **The only marine National Park in the country:** The simple fact that the Bazaruto National Park is the only marine Park in the country is per se important. Its creation demonstrates the recognition of the importance of the coastal and marine ecosystems in the maintenance of the ecological balance and of the marine biodiversity that exists in the archipelago.
- **Landscape Beauty:** The archipelago provides spectaculars and picturesque landscapes, immense dunes, going through forests, prairies, lagoons and beautiful beaches. The archipelago possesses great reputation and it is internationally recognized for its natural beauty and for maintaining its natural characteristics.
- **Marine Mammals:** The combination of shallow waters, as well as nutrients availability and the quietness of the area, allows for the occurrence of dugongs, dolphins, whales, and other marine mammals.
- **Dugongs:** The Park is home of the largest and most viable population of dugongs of the whole Eastern Indian Ocean.
- **Marine Turtles:** The five species of marine turtles occurring in the country are represented in the archipelago.

- **Corals:** The Park is much known for the transparency of its waters, and for the quality and beauty of its coral reefs, still intact in its majority.
- **Fisheries:** A big diversity of fisheries is found in the area, in which about 80% of ichthyologic fauna species representative of the Indo-Pacific region are present in the archipelago.
- **Wetlands and migratory birds:** The archipelago possesses a variety of wetlands, which include mangroves, salt marshes, seagrass beds, lagoons, swamps and swamp forests. These areas, due their natural conditions and nutrients availability, attract a great diversity of migratory birds. This elevates the archipelago to an important site for migratory birds.
- **Park and people:** The Park possesses human population living legally in its interior, having excellent conditions for the development of community programs of conservation and sustainable use of the natural resources that can be used as an example for other conservation areas, helping in the mechanism definition for a major participation of the rural communities in natural resources management.
- **World Natural Heritage:** Given the above-mentioned characteristics and according to experts in the area, the archipelago has all the conditions to be elected a Natural Universal Heritage under the UNESCO classification.

2. OBJECTIVES

2.1. GENERAL OBJECTIVES

- Administer the Park, including all the islands that compose the archipelago, ensuring the conservation of the whole ecological unit and protecting the resources globally.
- Ensure the maximization of the benefits coming from the tourism and other economic developments in the archipelago, maintaining the local artisanal activities which guarantee the sustainable development of the Park and promote the conservation of the ecological integrity of the Archipelago.
- Proportionate the State the maximum collection of benefits of this unique coastal area, through sustainable development and the adoption of long term environmental conservation strategies.

2.2. VISION OF THE PARK

The Bazaruto National Park management plan establishes, according to the current situation, the basis for the future development of the archipelago. Its vision reflects the importance of the Park in an integrated system of conservation areas and regional interactions.

VISION FOR THE NATIONAL PARK OF BAZARUTO

The long-term vision of the Park is to:

- Establish a sustainable coastal development model that contributes to the national economic growth;
- Create harmony between man and nature, expressed through the rational and sustainable use of the natural resources, and its maintenance for the present and future generations;
- Promote a true improvement of the livelihoods and social conditions of the local communities;
- Establish a structure of effective and joint management, where the Park is administered based in a structure of participative management;
- Proclaim the archipelago as world natural heritage, where functionally healthy ecosystems, biodiversity, the aesthetic and cultural values are protected and preserved;
- Establish a financial sustainable structure at the Park level;

2.3. SHORT AND LONG TERM OBJECTIVES

The vision of the park involves four components of the archipelago management:

- i) An integrated model of coastal management;
- ii) A system of social development promotion at local level;
- iii) A tourism development that promotes the image of the archipelago and generates revenues;
- iv) The biodiversity protection and preservation at the level of the value of the local resources.

The objectives which will serve as the mechanisms for action plan are described bellow:

2.3.1. LEGAL ASPECTS: LIMITS AND REGULATIONS

- Extend the limits of the Park, at the protection level of all the islands of the archipelago and of the adjacent marine strip, restricting activities in this strip.
- Approve the Park regulations and establish an administrative structure that meets various demands.

2.3.2. ADMINISTRATION OF THE PARK

- Administer the Park integrally representing the National Directorate of Forestry and Wildlife.
- Enforce the regulations related to the Park.

2.3.3. REGIONAL AND INSTITUTIONAL CONTEXT

- Promote the creation of an adequate institutional framework adequate to guide and implement the Park management with the participation of the main stakeholders.

- Establish relationships with several players that promote the scientific, social, community, tourist and administrative development of the Park.

2.3.4. RESOURCES ADMINISTRATION

- Conserve the ecological integrity, biodiversity and scenarios of a unique marine and terrestrial ecosystem.
- Ensure the conservation of rare and protected marine species under protection regime in the archipelago.

2.3.5. SOCIAL ECONOMIC DEVELOPMENT

- Achieve the economic self-sufficiency through generation of revenues derived from the sustainable use of the Park resources.
- Promote the establishment of trade between the local communities and the economic players in the mainland.

2.3.6. COMMUNITY MANAGEMENT

- Allow a major participation of the local communities in the management and sustainable use of the natural resources of the Park, as well as in its benefits.
- Promote sustainable use of the resources among local communities, inside the archipelago.
- Reduce current conflicts and the future conflicts that could emerge from the conservation, through integration of local development in the Park management, as well as the creation of local benefits.

2.3.7. ARCHAEOLOGICAL AND CULTURAL

- Preserve the archaeological heritage of the archipelago and other items of historical, cultural and patrimonial value.
- Maintain the local systems of resources management, and to promote a major understanding of the cultural and traditional systems of resources use.

2.3.8. TOURISM DEVELOPMENT

- Ensure that the tourism development in the archipelago does occur in a planned manner in order to avoid social, economic, cultural and environmental negative impacts.
- Promote a tourism development that promotes the image of the archipelago, generates revenues to finance the management activities of the Park and create benefits to the local communities.
- Allow the creation of recreation facilities for national and foreign tourists, according to the ecological and social conditions of the Park.

2.3.9. MONITORING AND RESEARCH

- Promote research studies needed for the correct resource management and for ensuring socio-ecological sustainability of the Park.
- Establish monitoring and evaluation programs of resource and biodiversity dynamics, community aspects, tourism and its development, and effectiveness of the management activities to be developed in the archipelago.

2.3.10. PUBLIC AWARENESS

- Provide environmental education to the local communities, resources users, tourists, visitors and researchers.
- Promote training actions to individuals linked to the environmental sciences.

3. ZONING

3.1. ZONING DESCRIPTION

The zoning concept for the Bazaruto archipelago was conceived considering the ecological biodiversity of the archipelago, the socio-economics conditions, the local communities, the different resources users and the management objectives intended for the region.

With the Zoning, it is intended to regulate the resources user's activities inside the Park, including the tourism, guaranteeing the conservation of the habitats and of resources of ecological and socio-economic value. It is intended to regulate and to guide the patrolling activities, inspection and monitoring inside the Park.

The zones established inside of the different zoning categories, will allow all resources users, including the visitors, a better understanding of the allowed and not allowed activities inside of the Park.

Five use zones were established:

- Wild zone
- Total protection zone
- Local communities limited use zone
- Intensive use zone; and
- Multiple use zone

Wild Zones

Wild zones are considered the first level of protection inside of the archipelago. They are defined as areas of maximum protection, for being the most sensitive area of the archipelago, susceptible to erosion and that constitute refuge of numerous species. They guarantee an important protection of the islands from an ecological point of view.

In these zones, it shall not be allowed all forms of development, infrastructures construction, and opening of secondary roads.

The use of vehicles is interdicted in these zones, with exception of the Park vehicles used in the management activities.

The local communities will have access to these zones only for non extractive purposes, which means that the practice of agricultural activities, pasture and vegetation cutting shall not be allowed. The collection of wild fruits, medicinal plants, occasional extraction of vegetable products and collection of firewood shall be allowed.

The tourists will have access to these zones, through walking and on foot visits.

Other visitors, such as scientists, photographers and students, will have access to these zones through walks and on foot visits. However, when necessary, they can make use of Park vehicles, when accompanied by a technician of the Park.

Total Protection Zones

The total protection zones are considered the second level of protection in the archipelago.

They constitute specific habitats, reserved for the conservation of certain sensitive or in need of careful management.

Some of these zones were already used by the population, or are being degraded naturally and need to be protected. Others maintain their natural value, needing an appropriate management and special care. Others are important sources of tourist attraction and source of income, provided by the tourism and recreational activity, being that considered inside of this zoning category.

The total protection zones are hindered to all forms of extractive activities. However, activities such as the exercise of non-extractive and reduced environmental impacts activities shall be allowed.

Local Communities Limited Use Zones

Areas defined only for the local communities use, in the development of their socio-economic and cultural activities.

These zones were established as one of the protection modalities and use of resources respecting the sacred habitats and other local of socio-economic and historic-cultural importance of the local community.

Intensive Use Zones

The intensive use zones bear this designation, for being concessions areas attributed inside of the archipelago, for being used for tourism and commercial development and several public or guided services.

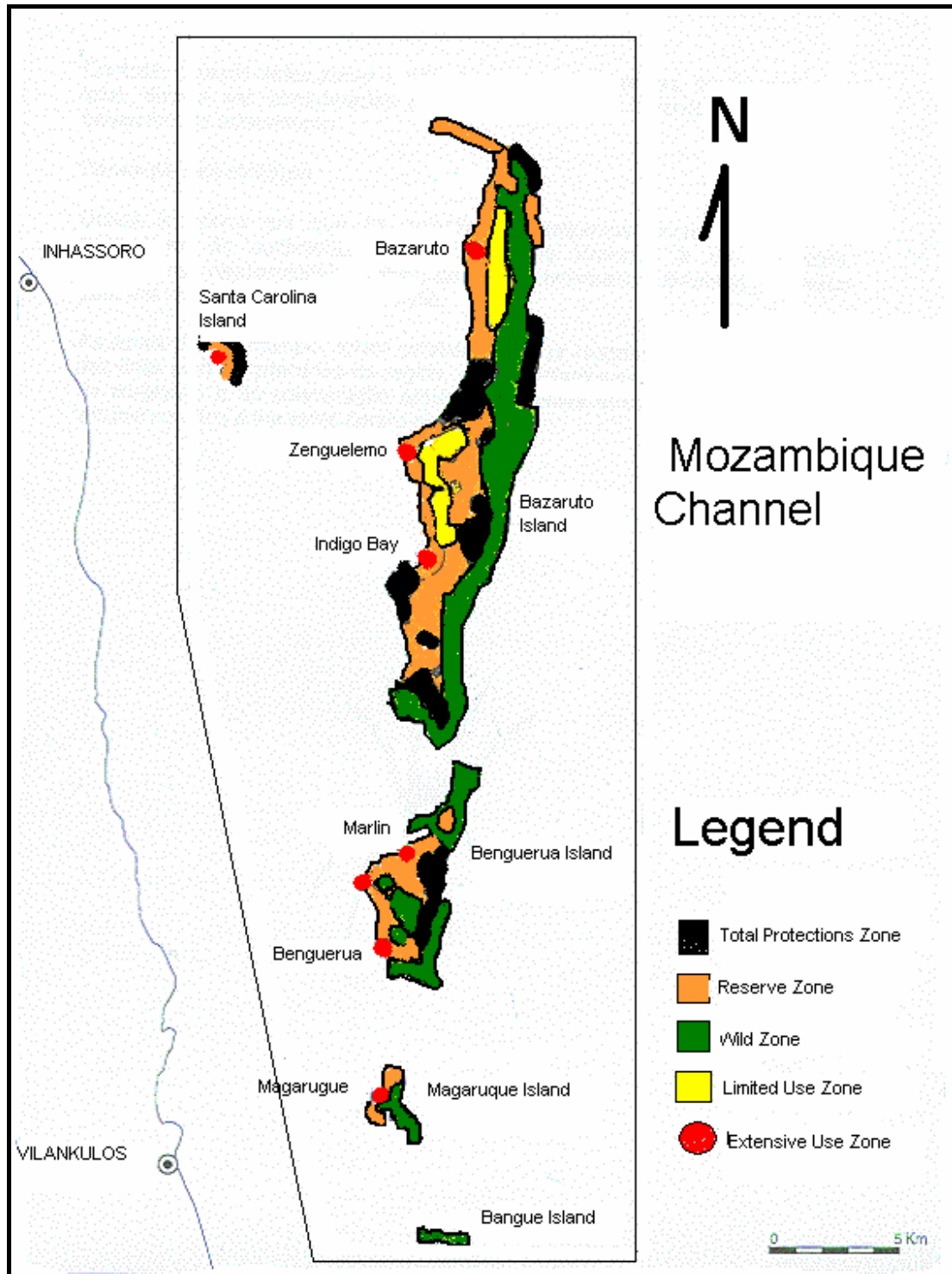
However, when these zones incise on wild zones or of total protection, they should be considered primarily, as being part of those zoning categories.

Multiple Use Zones

From the time that the fishing activities happen in the area, fishermen of the continent, mainly from Vilanculo and Inhassoro, move regularly to the islands for commercial and subsistence fishing activities.

The of multiple use zones were established recognizing the importance of the islands for the fisheries in the region, and for intending to settle down a co-administration and collaboration systems among the different users, reducing the actual conflicts among them, inside the region

**BAZARUTO NATIONAL PARK
TERRESTRIAL ZONING**



3.2. PROPOSED ZONING FOR THE ARCHIPELAGO

The maps of the proposed zoning show in detail the zoned areas in the Park, with the different uses categories in view.

3.2.1. WILD ZONE

Include the whole terrestrial area of the small and uninhabited Bangué Island.

Includes the whole actual and active system of sand dunes of the Bazaruto, Santa Carolina, and Benguérua and Magaruque islands.

Comprehends the dunes which are disposed in parallel to the Eastern coast of those islands, in the oceanic side, and the dunes that are disposed on the western side, subjected to the coastal erosion.

Includes all the forests and vegetation forms that incise on the margins of the wild zones of dunes.

3.2.2. ZONE OF TOTAL PROTECTION

a) Marine area

The totally protected marine areas will be designated as marine reserves.

In these areas, non-extractive such as the tourism, recreational, scientific and of monitoring activities shall be allowed.

It shall be allowed to tourists underwater and mask diving. Underwater photography can be done when accompanied by the diving instructor responsible for the zone.

Boats movement shall be allowed but without anchoring in the reefs.

It shall not be allowed the development of any type of fishing art in the marine protected areas by the islanders and other resources users.

No marine organism can be removed of the marine protected areas.

Coral reefs totally protected:

- Coral garden and the Lighthouse coral in the north of the eastern coast of the Bazaruto island.
- Ponta Mulidza reef in the western coast of the Bazaruto island.
- Venges and Xilolo reefs in the eastern coast of the Bazaruto island.

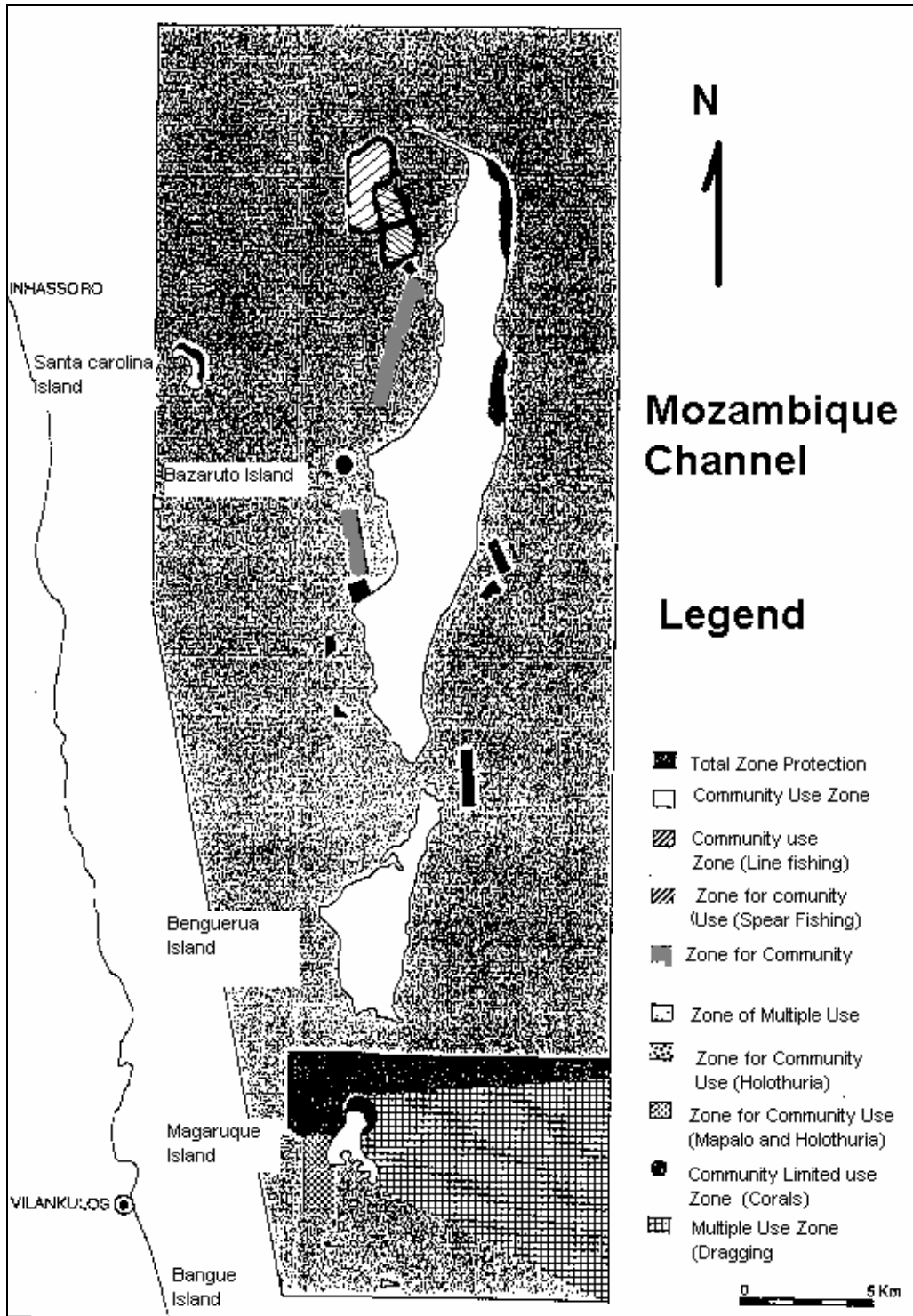
- Two miles reef between the southern coast of the Bazaruto island and the Northern coast of the Benguérua island.
- Reefs of the northeast and southern zone of the Santa Carolina's Island.
- Reefs of the northeast point of the Magaruque island.

In the Bazaruto island, the marine area on the oceanic side, from Dom Carlos Point up to Govane Point, will be designated marine reserve as it accommodates most of the protected reefs of the island and of the habitats among tides. This applies to the adjacent terrestrial part for being the area where the marine turtles nest.

Seagrass beds

The sea grass beds will be considered of total protection when occurring only in the protected reefs and in the areas of marine reserves.

BAZARUTO NATIONAL PARK MARINE ZONING



b) Terrestrial area

Mangroves

All the mangroves estuaries and forests of the archipelago were considered under the total protection regime, due to its high ecological and socio-economic value.

Such means that no profit exploitation activities are allowed and that all activities in these current zones should observe maximum care.

Totally protected lakes and swamps:

Some lagoons and swamps assume the designation of totally protected zones for being important habitats of fauna and freshwater and serving the birds reproduction. Also for being surrounded of forests and trees, that penetrate in the swamps.

No extractive and agricultural activity will be allowed around these lagoons and swamps, as well as no type of fishing activity will be allowed.

The Mbite, Lengué lagoons and the Gundi's swamp in the Bazaruto island.

The Zivane and Bomopomo lagoons in the Benguérua island.

Forests

All forests areas of the archipelago were designated totally protection areas.

No exploratory activity or profitable use of forest resources will be allowed in these areas.

Subsistence and consumption activities will be allowed, such as harvesting of wild fruits, medicinal plants, dry sticks for firewood, the extraction of other products in a sustainable way, and important cultural activities for the islanders.

Forests totally protected:

- Bush
- Vegetation that occur in the movable sand dunes;
- Evergreen forest of the Benguérua and Magaruque islands;
- Marshy forests of the Benguérua and Magaruque islands;
- *Dialium schlegter* and *Julbernardia globiflora* forests;
- *Hygrophilous* forests;
- Remaining coastal dunes forests;
- Remaining *mesica-climax* forests;

The practice of agriculture in Santa Carolina's and Magaruque Island will not be allowed, due to its habitat vulnerability

The archaeological station of Ponta Dundo, in the Bazaruto Island, will be considered in total protection regime for constituting an important testimony of the archaeological heritage of the archipelago.

Most of the marine and terrestrial species occur in all proposed zoning categories. However, the following species are strictly protected:

Mammals

Common name	Species
Whales and dolphins	All species
Dugong	<i>Dugong dugon</i>
Simango monkey	<i>Cercopithecus mitis</i>
Galago	<i>Galago senegalensis</i>
Red duiker	<i>Cephalophus natalensis</i>
Red squirrel	<i>Paraxerus palliatus</i>
Four fingers Musaranho	<i>Petrodromus tetradactylus</i>

Reptiles

All reptile species, including the five species of marine turtles, crocodile and all ophidians and lizard's species.

Common designation	Species
Loggerhead turtle	<i>Caretta caretta</i>
Green turtle	<i>Chelonia mydas</i>
Hawksbill turtle	<i>Eretmochelys imbricata</i>
Olive riddley turtle	<i>Lepidochelys olivacea</i>
Leatherback turtle	<i>Dermochelys coriacea</i>
Crocodile	<i>Crocodylus niloticus</i>

Avifauna

All species of birds, except the exotic birds.

Corals

All soft and hard coral species.

Mollusks

Common designation	Species
Bazaruto cone	<i>Conus pennaceus bazarutensis</i>
Trumpet Triton	<i>Charonia tritonis tritonis</i>
Horned Helmet	<i>Cassis cornuta</i>
Giant Clam	<i>Tridacna squamosa</i>
Maxima Clam	<i>Tridacna maxima</i>

3.2.3. LOCAL COMMUNITIES LIMITED USE ZONES

a) Marine Area

Corresponds to the zones among-tides, sand banks, where the islanders develop artisanal fisheries activities, areas of marine resources harvesting, and boats anchorage.

All seagrass beds and coral reefs, which were not considered inside of the totally protection category, will be considered inside of the limited use zone to the local communities.

b) Terrestrial Area

The terrestrial strip along the beaches, where the islanders establish their fishing camps, fishing processing and moor their boats.

Covers zones with the population houses, central and western island areas, areas with vegetation where the islanders establish their fields, and the surrounding pasture areas.

Includes the lagoons and swamps, areas of savannah and prairie vegetation, which were not considered inside the totally protected zones and are broadly being used by the islanders.

3.2.4. INTENSIVE USE ZONE

Comprehends the tourism concessions areas of the archipelago, the Park camps, the areas with social infrastructures, and areas with the State services (Schools, Hospitals, Police Stations, and Administrative Posts).

Includes the landing strips of the archipelago and the Bazaruto island lighthouse to the north. However, because this is located in the wild zone of the dunes, the climbing to the lighthouse will only be allowed following the existent trails on the Eastern side of the island, having the transients to walk on foot.

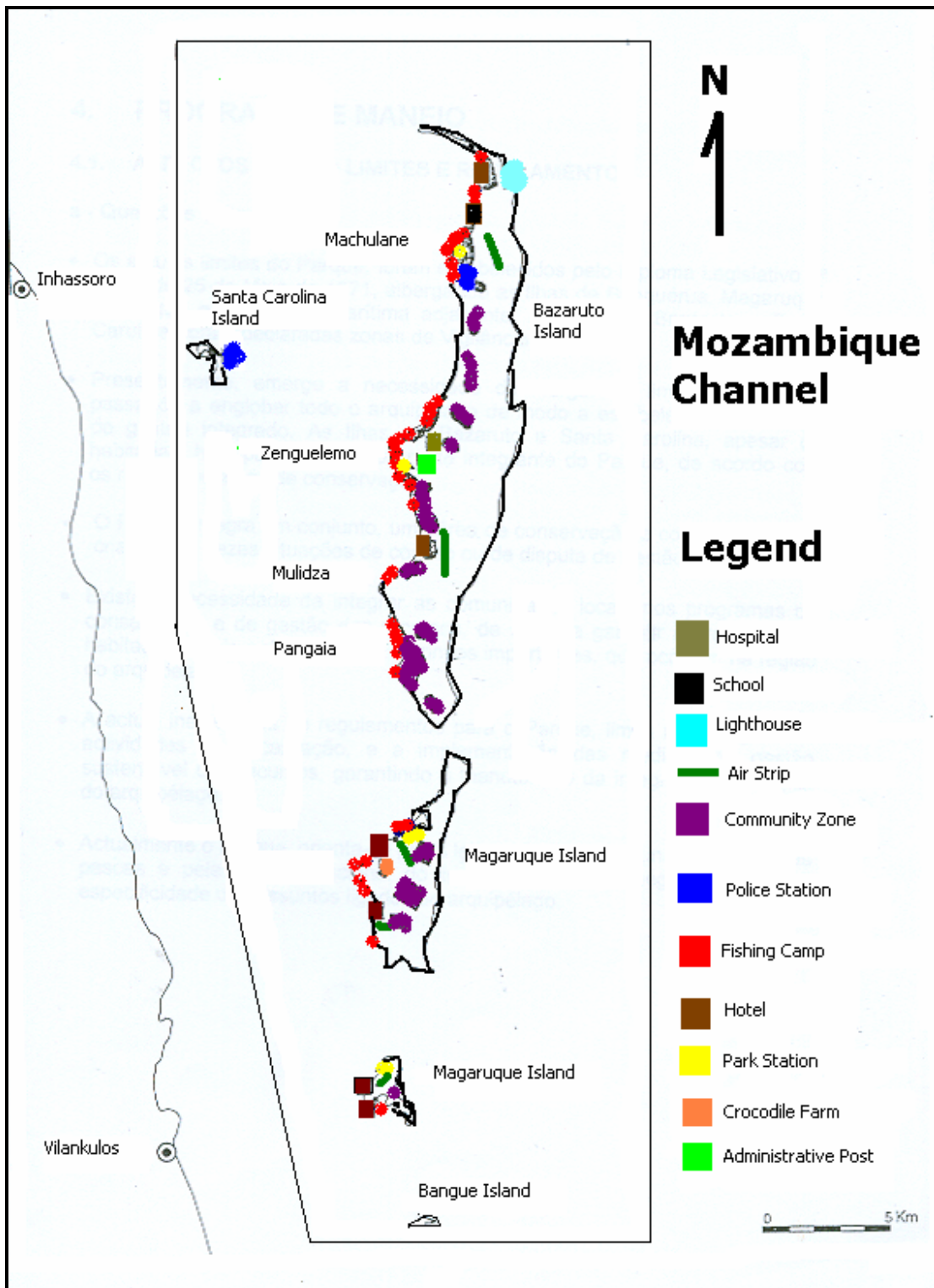
3.2.5. MULTIPLE USE ZONE

Corresponds only to the marine portions of the archipelago. These zones are open only for the local artisanal and semi-industrial fishing from the mainland.

In these zones, only line fishing will be allowed. It will not be allowed the industrial fishing, the use of mash nets, dragging nets and other arts and forms of fishing.

The marine areas on the oceanic side, outside of the marine reserves and of the coral reefs totally protected, are part of this zoning category.

Map 3 – Infrastructures and community areas



4. MANAGEMENT PROGRAM

4.1. LEGAL ASPECTS: LIMITS AND REGULATIONS

a) Issues and Conflicts

- The actual limits of the Park were established by the Legislative Diploma n°. 46/71 of May 25th, 1971, lodging the Benguéria, Magaruque and Bangué Island and the adjacent marine strip. The Bazaruto and Santa Carolina Island were declared zones of Special Surveillance.
- Presently, necessity of enlarging the Park limits rises, to include include the whole archipelago in order to establish an integrated management system. The Bazaruto and Santa Carolina island, although inhabited, today they can constitute integral part of the Park, following the new conservation concepts.
- The Park integrates together, a conservation and rural community area, creating sometimes resources management conflicts or dispute situations.
- There is a need to integrate the local communities in the resources conservation and management programs, to ensure the protection of fragile habitats and of important marine species that occur in the archipelago.
- The actual inexistence of regulations for the Park, limits the execution of the patrolling activities and the implementation of sustainable resources management measures, which guarantee the maintenance of ecological integrity of the archipelago.
- Presently the Park is oriented by the Forestry and Wildlife, Fisheries Law and the National Tourism Policy which do not cover the specificity of subjects related to the archipelago.

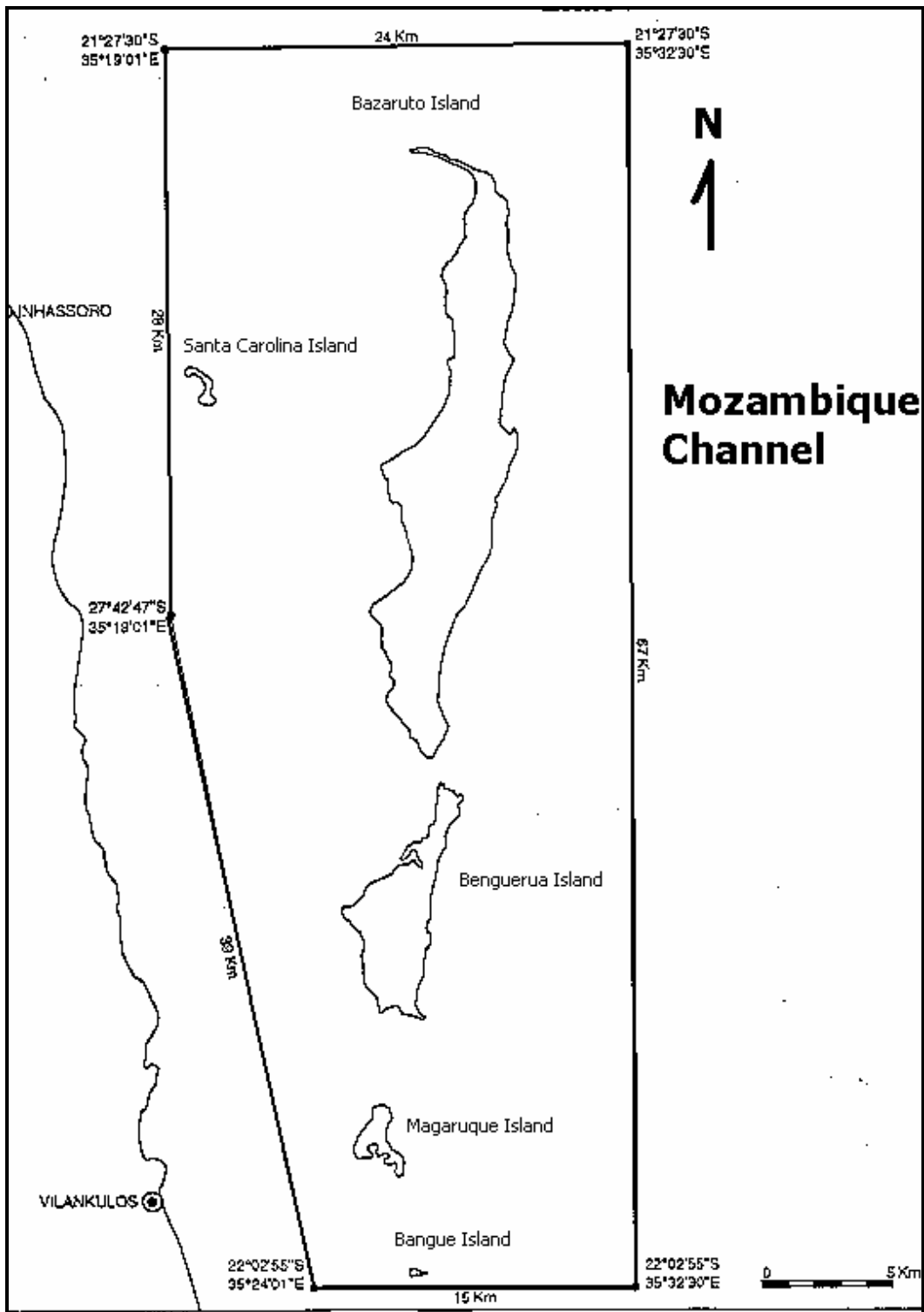
b) Objectives

- Extend Park limits to the level of protection of all the Islands of the archipelago, and marine strip adjacent to these islands, restricting the allowed activities.
- Approve the Regulations of the Bazaruto National Park, and establish an administrative structure, that can responds to various demands.

c) Strategies and Actions

- Develop mechanisms, which guarantee the approval of the Park limits, moving into a situation where all the islands that integrate the Archipelago are included.
- Update the proposal of the new limits of the Park and its regulations and submit for approval.
- Enforce the Bazaruto National Park regulations in archipelago, through patrolling actions, environmental education and community participation.
- Rationalize the use of resources combining the economic development and their conservation.

Map 4 – Park New Limit



4.2. ADMINISTRATION OF THE PARK

a) Issues and Conflicts

- The administrative framework of the Park is composed by one Administrator, one patrol chief, one sociologist, one administrative, one logistic, one mechanic, a fiscals and community guards' team, extensions leaders, and several supporting people. This framework is insufficient to cover the demand of activities that is intended for a good administration of the Park.
- Lack of equipments and management funds, constitute another limitation for the implementation of activities and for the payment of salaries Park staff.
- At the moment, WWF and EWT, together with DNFFB, constitute jointly the contributors for covering the Park management operational costs. Therefore, there is a necessity, in a medium term, to define options in order to promote the self-sustainability of the Park and to re-define its administrative management.
- For the control of the marine portion of the Park, it becomes necessary to improve the patrol level, and approve the Park regulations, as the regulator tool for the local level activities.

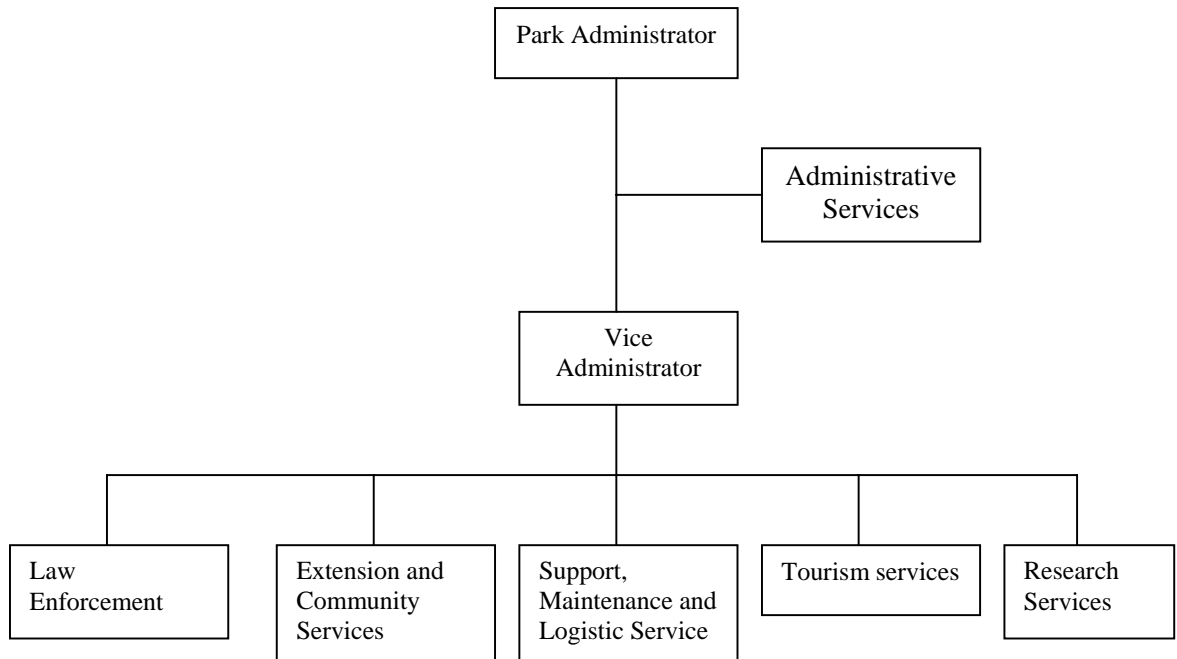
b) Objectives

- Administer the Park integrally on behalf of the National Direction of Forestry and Wildlife;
- Enforce the Park regulations.

c) Strategies and Actions

- Enable the Park with means and personnel to cope with the management activities in course. In long-term it is intended to establish self-sustainability of the Park and of the local communities, through the revenues generated with the development of the tourism activities and other services rendered in the archipelago.
- Raise the level of marine and terrestrial patrol in place in order to guarantee the maintenance of the ecological equilibrium of the region, and the safeguard of the local resources.
- Guarantee the training of the existing staff in the Park, through training courses, maintenance and handling of goods, equipments, and current management activities in the archipelago.
- Recruit the necessary staff, to cover the necessary activities and for the execution of management activities of the archipelago.

Park Organ gram



Minimum Personnel Required

Service	Need
Administration	1 Administrator 1 Vice Administrator 1 Administrative Assistant
Patrolling	1 Service chief with Medium Level 17 Patrol guards
Extension and Communities	1 Sociologist 3 Assistant with Medium level 7 Extensions
Support, maintenance and logistic	1 Service chief 19 Workers (mechanics, bricklayers, carpenters, sailors, cooks and servants, guards and gardener)
Tourism	1 Assistant of Medium Level*
Research	1 Biologist* 1 Assistant*

* The assistants of the tourism and research services will act as the assistants for the extension and communities services, in accumulation of functions.

4. 3. REGIONAL AND INSTITUTIONAL CONTEXT

a) Issues and Conflicts

- DNFFB is the State institution responsible for the management and administration of the Bazaruto National Park that it is located in the archipelago of the same name. Administratively the archipelago belongs to the Districts of Inhassoro and Vilanculo. The marine delegations of Vilanculo and Inhassoro are the responsible institutions controlling the territorial waters of the archipelago, and for licensing and charging taxes referring to the fishing activities. Other institutions, such as Provincial and District Directions of Agriculture and Rural Development, Fisheries, Industry, Trade and Tourism, and NGO's (WWF and EWT) intervenes and influences in the administration and decisions making on the archipelago related subjects.
- Despite the innumerable institutions, NGO's and private sector intervening in the Park, an inappropriate of inter-institutional coordination is denoted. A weak participation and involvement of those institutions is verified, being this one of the causes for the existing conflicts and of responsibilities overlapping among the institutions and other players.
- In the institutional context, an inter-institutional network has not yet been developed; it's verified the lack of agreements and the institutional integration in the management programs of the Park. Presently a domain of macro-economic policies for the area over the conservation policies is verified.

b) Objectives

- Promote the appropriate creation of an institutional framework to guide and accomplish the management of the archipelago, involving the main intervenient.
- Establish relationships with the several players that could promote the scientific, social, community, tourist and administrative development of the Park.

c) Strategies and Actions

- Establish a management structure, that can be integrated in the regional development context and that can maintain regular contacts with several institutions linked to the administration of the archipelago.
- Promote active participation of all stakeholders in the archipelago management, in the planning and decision making processes on activities with negative impact and on those that support the conservation of the area.
- In a participative and consultation process, there will be negotiated, and established the mechanisms of co-management with the different institutions.
- A directive and representative body of the archipelago will be formed constituting the basis for everybody's participation in the management and conservation of the

Park. This will be designated as then **Bazaruto Archipelago Management Committee**.

- The committee will have as its function, ensuring conservation, control and sustainable use of the resources in the archipelago. It should establish mechanisms for retention and management of a portion of the revenues generated in the archipelago.
- The structure and the type of the committee to be established, will depend on the local conditions, and it will be regulated by a juridical statute.

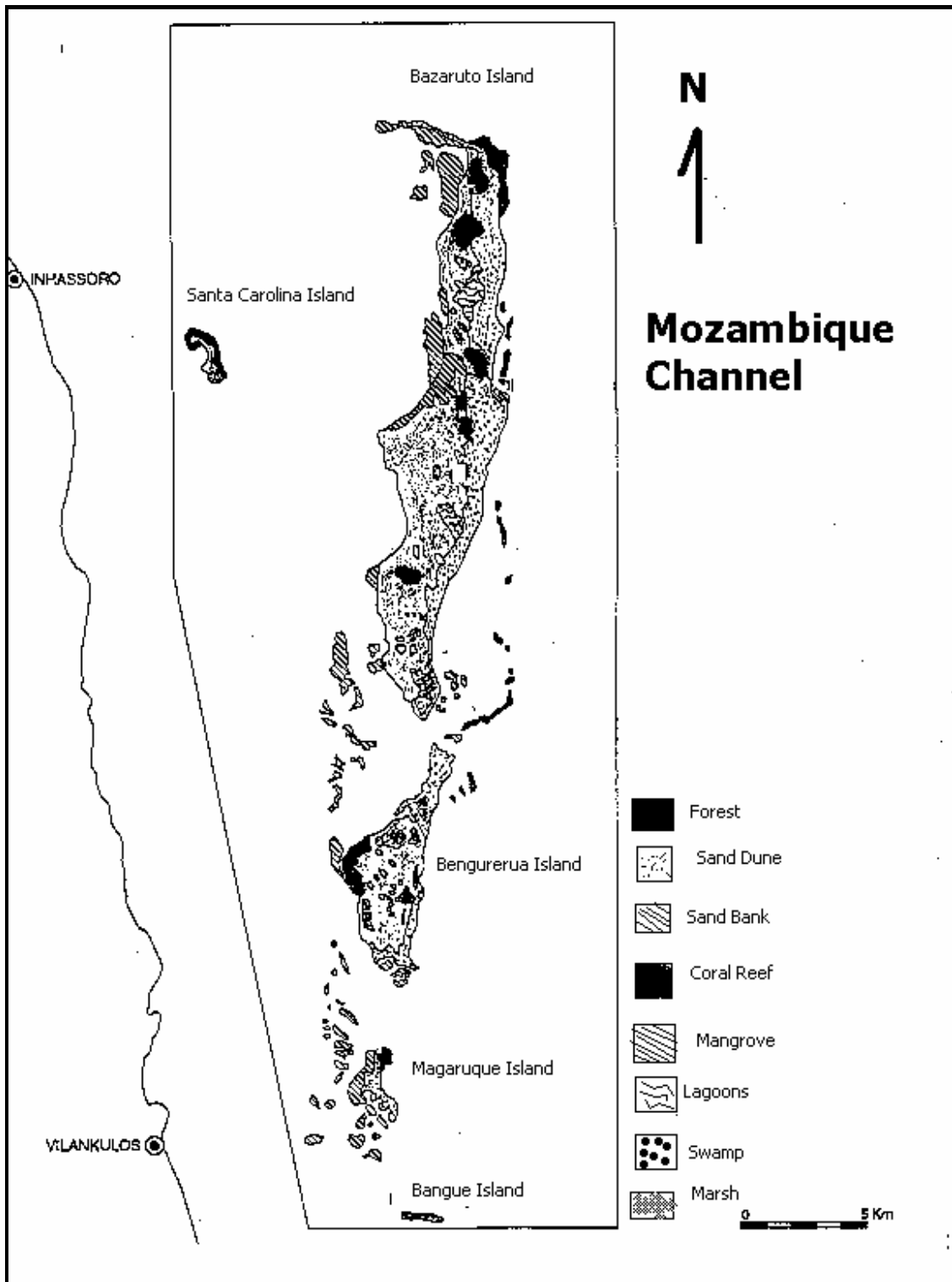
The committee will be composed by:

- DNFFB, through the Park Administrator;
- Local Communities;
- Private Sector (Tourism operators);
- Local, District and Provincial administrative authorities;
- NGO's;

Still in the regional and institutional context, it is necessary to:

- Ensure that all actions to be developed inside the archipelago are acknowledged by the Park Administrator and have his opinion before their execution.
- Re-launch the local power structures, reactivating its mobilization and organization role.
- Integrate the management plan of the archipelago in the programs of sustainable development and territorial administration at the local, the regional and the national level.

Map 5 – Natural Resources



4.4. HABITATS AND RESOURCES MANAGEMENT

a) Objectives

- Conserve the ecological integrity, biodiversity and scenarios the unique marine and terrestrial ecosystem.
- Ensure the conservation of rare marine and/or under protection regime species in the archipelago.

4.4.1 MARINE ENVIRONMENT

A - LITTORAL ZONE

Beaches

a) Issues and Conflicts

- The littoral zone, that includes the beach line, constitutes an important habitat for species of crabs, migratory birds, and it serves as place for turtles spawning. It is used broadly by the local community, and tourists, for movement of motor vehicles.
- The potential threats are the excessive use of motor vehicles, the spill of motorized vehicles oils, erosion caused by the removal of rocks and sands, disturbances in the migratory bird's population and in the nests of marine turtles.

b) Objectives

- Protect the habitats for birds landing and spawn and the nestling of turtles, and to maintain the species biodiversity.
- Protect the habitats against erosion and pollution and to maintain or increase the local aesthetic quality.

c) Management Strategies

Habitats Protection

- Identify crucial species and habitats and its protection needs (Biologist).
- Continue the establishment of sanctuaries and protection zones, including fallow, reproduction and nesting areas (Park Administrator, Biologist).
- Reassess and update the zoning, whenever necessary (Park Administrator).
- Continue the fauna guard's involvement in the awareness and environmental education campaigns for the protection of the littoral zone (Park Administrator, Biologist, fauna Guards).
- Determine the importance of establishing prohibitions and special accesses areas, for example in the points and sand banks, during the migration periods of birds (Biologist).
- Prohibit the removal of rocks and sands in the beaches, in order to prevent the erosion (Park Administrator).

Species protection

- Assess the human impact level in the species of the littoral zone (Biologist).

- Distribute leaflets about the dynamics of the most important species along the different seasons of the year and about the measures to be taken to minimize the impacts on these species (Park Administrator, Biologist, Sociologist).
- Restrict the movement of vehicles, in the areas of spawns during the turtles' reproduction period (Park Administrator).
- Assess the sustainability of shells harvesting in the beach and to establish a harvesting limit (Park Administrator, Biologist, and Sociologist).

Aesthetic quality

- Promote campaigns on the importance of garbage removal in the beaches with the local authorities, communities, students and hotels. (Sociologist, Fauna guards).
- Promote campaigns for the establishment of appropriate mechanisms of fish processing in the fishing camps (Sociologist, Biologist).
- Continue the pressure on vehicles users about the need of providing adequate maintenance in order to prevent oil spilling in the beaches (Park Administrator).
- Negotiate at national and international level, oil tanker washing in the archipelago waters (Park Administrator).

Co-management systems

- Promote the community involvement, through co-management systems (Sociologist).
- Integrate the local communities, in the monitoring and research activities (Sociologist, Biologist).

Restoration plan for degraded or eroded areas

- Identify solutions for the restoration of the sensitive habitats, such as the stabilization of sands by vegetation plantation in the eroded areas, or by the substitution of rocks with cement blocks in areas where these were degraded (Park Administrator, Biologist).

d) Activities in the zoning areas

- Most of the beaches were defined as zones of extensive use, allowing the movement of motorized vehicles. Presently there are not major restrictions. However, adaptive management measures must be implemented, in order to prohibit traffic in the points, sand banks and fallow areas during the periods of migration of birds, and periods of turtles nesting.

e) Monitoring

- The most important monitoring to be carried out in these zones is the one on turtle's nests and eggs appearance, the one on the recognition of the migratory bird's population in the fallow areas, and the one on levels of oils spilling by motorized vehicles.

f) Success Indicators

- Reduction motor vehicles movement, oil spilling in the beaches, and improvement of the aesthetic beauty of the islands.
- Increase of the migratory bird's population in the fallow areas, during the migration periods.

g) Monitoring and research

- On the effect of motor vehicles movement in the littoral zone.
- On the effect of oil spilling on the microscopic organisms.
- On the disturbance effect of on the fallow rate of migratory birds.
- On the sustainability of shells harvesting in the beach.

B – INTER TIDAL ZONES

Sand banks

a) Issues and Conflicts

- Sand banks in zones among tides constitute habitat of numerous macro-invertebrates, such as crustaceans and echinoderms, and they are an important pasture area for marine birds. This habitat plays an important role in the maintenance of the livelihoods and subsistence of the islanders. The sand oyster, the peanut worm and other species of value such as holothurians are found in this habitat.

The potentials threats for these habitats are:

- Pollution from the oil tankers, overgrowth of algae caused by evacuation of residual waters and of sewages close to the sea, erosion caused by the extraction of rocks from the beach, extraction of sand oyster peels and bivalve removal in the inter tidal zone, reduction of bird species that feed in the sand banks, due to the disturbances, and overexploitation of species such as sand oyster of holothurians.

b) Objectives

- Preserve the species biodiversity and habitats.
- Guarantee the maintenance of pasture areas for marine and migratory birds.
- Establish sustainable use systems of sand oyster and holothurians.

c) Management Strategies

Habitats Protection

- Establish agreements with the resources users for the control of the fuel transport mechanisms to and from the mainland, in the sailing boats and its handling in the beaches (Park Administrator, Sociologist).
- Promote campaigns with BATA and at the Park administration level, in order to give them the responsibility for the movement of vehicles in the beaches (Park Administrator).
- Publicize the importance of this habitat for the birds (Biologist, Sociologist).

- Prohibit the deposit of residual and sewage waters coming from the hotels or from the park camps in the inter tidal zone (Park Administrator).
- Prohibit the extraction of rocks in the beach for (Park Administrator, Sociologist).
- Prohibit the extraction of sand oyster peels or other bivalve of the inter tidal zone for the establishment of trails for tourists walking (Park Administrator, Sociologist).

Species diversity: Monitoring and research

- Promote research for the identification of indicating species of sand bank conservation status (Biologist).
- Determine tolerance degree for the indicating species of pollution level of the effluents by oils and petroleum, ensuring the maintenance or reduction of the acceptable pollution levels for these species (Park Administrator, Biologist).

d) Activities in the zoning areas

- The areas of sand banks, close and around the hotels, on park camps and close to the community resource use areas were established as extensive use.
- The allowed activities in these areas include: boat traffic and their anchorage, invertebrate extraction by the artisanal fishermen, drag fishing, tourism and beach diving.
- The prohibited activities include the removal of rocks for the construction in the beach, removal of sand oyster peels in the zone among tides for establishment of trails and steppingstone for the tourists.

e) Monitoring

- In the sand banks, in front of the hotels and park camps, the following monitoring will be made:
 - Deposit of dejects and residual waters, that causes the growth of algae in the soil.
 - On the movement of oils to the beach zone and to the sea.
 - On bivalves removal.

f) Success Indicators

- Non existence of pollution indicators algae species growth (eg. Enteromorpha).
- Existence of intact bivalves of genre Pinna, in the inter-tidal zone.
- Invertebrate Populations with a good conservation state.

g) - Investigation

- Pollution studies.

C – PELAGIC ZONE

Turtles and marine mammals

a) Issues and Conflicts

- The Bazaruto Archipelago was designated as National Park in 1971, with the objective of protecting marine mammals and turtles. At least, four species of

marine turtles and ten of mammals are known as occurring in the archipelago. It is considered the largest and best region for the conservation and reproduction of dugongs, as a vulnerable species in whole Eastern Africa coastal area.

- Considering that the size of this dugong population is in decline, due to catches, the use of mesh nets and human overexploitation of its habitats, it becomes strategically important to establish management measures that protect them and their habitats.

b) Objectives

- Protect and ensure the conservation of rare marine species diversity, in danger of extinction and/or in under regime.
- Protect the pasture, reproduction areas and habitats of dugongs, dolphins and marine turtles.
- Ensure that the size of marine mammals populations do not decrease in the region due to the human impact.
- Improve the local knowledge with regard to the biology and the behavior of the dugongs' populations, dolphins, other marine mammals and turtles.
- Promote campaigns of public awareness about the importance of the region on the conservation of dugongs, dolphins, other marine mammals and turtles.

c) Management strategies

Habitats Protection

- Based in the scientific research and traditional knowledge, identify crucial areas in the protection of turtles and marine mammals, and its conservation needs (Park Administrator, Biologist, Fauna Guards).
- Continue the establishment of marine reserves according to the protection needs of species with important ecological value (Park Administrator, Biologist).
- Review and update the mechanisms ensuring protection of crucial areas, including changes in the zoning and legislation (Park Administrator).
- Maintain the identification and divulgation of fishing areas that need an appropriate management (Park Administrator, Biologist and Sociologist).
- Based in the scientific research and traditional knowledge, establish prohibition periods for accessing crucial habitats (Park Administrator Biologist, Sociologist).

Fishing Activities

- Maintain the coordination with the tutoring authorities in order to prohibit industrial fishing and use of mesh nets inside of the Park (Park Administrator, Biologist).
- Maintain the coordination with the Marine authorities, in order to include the limits of the Park in the fishing licenses (Park Administrator, Biologist).
- Maintain the coordination with District authorities and associations of local fishermen, in order to promote dialogues, and encourage the application of joint practices for protection of turtles and marine mammals (Park Administrator, Sociologist).

Co-management and conservation of marine mammals, turtles and its habitats

- Promote the community involvement in the management of marine resources, through co-management systems (Sociologist).
- Maintain the fauna guard's involvement in the campaigns of environmental education and management of marine aspects (Sociologist, Guards of Fauna).
- Collaborate with the research institutions and establish guidelines in the involvement of researchers in research works about social and community aspects of marine mammals and turtles use (Sociologist).
- Establish a community council to facilitate the communication and understanding among local managers, local communities and researchers (Park Administrator, Sociologist).
- Maintain the collection of traditional knowledge from the local communities and from the coastal area of the continent, in the management of marine resources, particularly of marine mammals and turtles (Biologist, Sociologist).

Reduction of accidental and illegal deaths of marine mammals and turtles

- Promote awareness campaigns to the sailors about the occurrence of the dugong's habitats and turtles (Park Administrator, Biologist, Sociologist).
- Promote the local communities awareness in the need of reporting the accidental death of marine mammals and turtles (Park Administrator, Biologist, Sociologist).
- Gather information about the level of dugongs, dolphins and turtles mortality (Biologist, Sociologist, Fauna Guards).
- Esteem the catch levels of marine mammals and turtles by the community (Biologist, Fauna Guards).
- Improve the monitoring and patrolling programs at level of marine area of the Park (Park Administrator, Biologist).
- Review the existing legislation related to deaths and illegal captures of marine species (Park Administrator).

Adhesion to International conventions for the protection of marine mammals and turtles

- Follow the developments on the International resolutions concerning the protection of species in danger (Park Administrator, Biologist).
- Collaborate with the neighboring countries on the monitoring of the related capture statistics of marine mammals and turtles (Park Administrator, Biologist).
- Consider the support and involvement of international organizations, in conservation actions in the archipelago (Park Administrator, Biologist).
- Prioritize the monitoring and research needs on marine mammals and turtles that contribute to the adoption of conservation strategies which included the combination of scientific and traditional knowledge (Park Administrator, Biologist).

Public relationship in the actions in the conservation of marine mammals and turtles related actions

- Establish a consistent basis of communication among the Park, DNFFB and other administration structures (MICOA, IIP, IDPPE, and other) related to the conservation of marine mammals and turtles (Park Administrator).

- Establish mechanisms that contribute to the involvement of groups of interest, in the definition of conservation strategies for turtles and marine mammals (Park Administrator).
- Promote awareness and environmental education campaigns, at local, District and regional level, about the need to conserve turtles and marine mammals, through stamping of pamphlets and environmental education programs (Park Administrator, Sociologist, Biologist).

d) Activities in the zoning areas

- The marine mammals occur predominantly in of multiple uses areas, not having in these terms a zone of total protection for these species. However, it becomes extremely important, to prohibit the all industrial and mesh fishing.
- Based on management and research actions establish zoning of the critical areas for a total protection.

e) Monitoring

- Carry out annually aerial recognitions for counting the populations of the different groups of marine mammals. For such it should be used the transect method with stratified sampling. The use of a standardized methodology, allow comparisons among the different recognitions realized annually in the archipelago.
- As far as possible establish dugongs' monitoring programs through radio transmitter for emission of satellite sign, in order to study the pattern of migration of this species in the archipelago area.
- At the same time mark the turtles that spawn in the archipelago, to know the species and populations that occur in the area, and its migration pattern.

f) Success Indicators

- Reduction of human action in the destruction of crucial habitats for marine mammals and turtles.
- End of industrial dragging and of mesh fishing, at level of the archipelago, in order to minimize the accidental and illegal captures of dugongs, dolphins and turtles and its habitats.
- An effective patrol system and community collaboration, which reduces the accidental and illegal deaths of marine mammals and turtles.

g) Research

- Develop studies on the biology, dynamics and the pattern of migration of dugong's populations. The enrichment of the database on this mammal will facilitate the management and knowledge of the most important habitats for pasture and reproduction.
- Studies on the dynamics and migration pattern, of the important turtle populations to adopt management strategies and knowledge of reproduction areas of the Olive Ridley and hawksbill turtles.

Coral reefs

a) Issues and Conflicts

- Coral reefs are ecosystems with an enormous biodiversity occurring in waters of low profundity in the tropics areas. The reefs are in important because they lodge a high biomass and fish productivity.
- In the archipelago, the reefs are an important protein and subsistence source for the local communities, being broadly procured by continental fishermen that seek species of fish and other shellfishes of great commercial value. They also constitute an attraction for the tourists due its characteristics and excellent conditions for diving and thus generating revenues.
- The main threats are the semi-industrial drag fishing, underwater hunting and uncontrolled line fishing, which destroy and cause damages in the reefs, and in the populations of coral reefs species are the most notable.
- Fishing by the mainland fishermen in the reefs zones with sophisticated means and methods, freezing systems, motor boats competing the local fishermen.
- Damages caused by uncontrolled tourist activities and by inexperienced divers that destroy the corals.
- Removal or extraction of coral reefs flora or fauna.

b) Objectives

- Protect the biological diversity of the coral reefs.
- Protect and preserve areas of unique beauty and of potential for revenue generation.
- Preserve and improve coral reefs areas and its fish populations, improving the state of the species populations of the adjacent areas, the reefs quality and the neighboring fish quality reefs, and the fish stocks.
- Maintain these areas for underwater diving, generating revenues from the tourism.

c) Management Strategies

Habitats Protection

- Based on traditional knowledge and research, identify crucial areas that need protection (Park Administrator, Biologist).
- Establish means which guarantee the existence of a suitable protection in critical habitats, including alterations in the zoning and legislation, when necessary (Park Administrator).
- Indicate areas where fishing or diving beginners are not allowed (Park Administrator, Biologist, Sociologist, and Fauna Guards).
- Increase the regular patrolling system (Park Administrator, Fauna Guards).
- Establish closed season or marine sanctuaries areas in the hinder period (Park Administrator).

Co-management to regulate locally the use and conservation of the reef areas

- Involve the fauna guards and local communities in the monitoring and research (Sociologist, Biologist, Fauna Guards).
- Establish guidelines for involvement of researchers in social and community studies on the reefs utilization (Park Administrator, Sociologist).

- Promote the establishment and acceptance of local uses and habits, with the support of local communities and the Park (Park Administrator, Sociologist, Biologist, Fauna Guards).

Protection of marine reserves

- Through patrolling actions with the community support, minimize the illegal fishing and exploitation of resources in marine reserves (Park Administrator, Sociologist, Biologist, Fauna Guards).
- Control the size of the population predator's species such as starfish to avoid the occurrence of plagues (Biologist).

Monitoring, research and restoration plan

- Investigate the causes of habitats degradation and decline in the number of species (Biologist).
- Monitor the degradation of coral reefs, caused by storms (Biologist).
- Establish signalization and buoys in the protected coral reefs and in the marine reserves.
- Evaluate the benefits of establishing buoys in the coral reefs, and identify the best areas for their establishment (Park Administrator, Biologist).

Co-management systems

- Through the fauna guards, promote with the local communities and hotels, awareness and divulgation campaigns about the advantages of the delimitation of total protection zones and of limited use (Park Administrator, Sociologist, Biologist, Fauna Guards).

d) General Zoning of the coral reefs and use norms

- The areas around the coral reefs are, in principle, subject to high turbulence effects and that is the reason why the reefs are endowed with a community of soft and hard corals of recognized robustness. In cases of hard corals, these areas can be opened to experienced or inexperienced divers.
- The areas in the interiors of the reefs are constituted, in principle, by ramified corals, which are mainly Acropora species that are prone to damages caused by divers. In these sites diving should be restricted only to competent divers, and access to more sensible areas should be prohibited..
- The superficial parts of the reefs, and coral gardens, which are areas of low profundity, where plane, spatula and ramified corals are susceptible to the degradation by divers, for walking on these, should be prohibited to inexperienced divers and only allowed to the experienced ones.

e) Regional Zoning of the coral reefs

The coral reefs areas are divided in two zones:

1. Total Protection for marine reserves.
2. Limited use by local communities.

(i) Protection Zones

The zones of total protection must be designated marine reserves, and in these zones it will only be allowed non-extractive activities. It must only be allowed diving and mask swimming; it must not be allowed fishing or harvesting any resource. It must be permitted the movement of boats without anchoring on the reefs.

(ii) Local Communities Limited Use Zones

These zones are limited to local communities' use, only for subsistence or sale to the islanders and hotels.

f) Activities in the zoning areas

Protected reefs

Diving norms in protected reefs zones:

- It must be prohibited the use of gloves. The largest damage caused by divers to corals was breaking them when divers tried to hold or sustain themselves on them.
- Before authorizing the access to protected reefs, the competence of the diver must be demonstrated. The buoyancy is how the diver should be maintained away from the corals.
- It is recommended that mask divers use diving suits without heavy belts. Such facilitates the buoyancy and allows maintaining a horizontal diving posture avoiding the diver to walks on the corals.
- It is prohibited the removal or extraction of any living being from the coral reefs, plants or animal by divers.
- The harpoon fishing is not allowed in the reefs.

Boats handling

- The boats must not anchor above or in areas adjacent to the reefs, to prevent their damage.
- The divers must be taken in small boats until the coral surface, guaranteeing its safety and supplying employments to the islanders as sailors.
- The administration of the Park, will establish anchorages places next to the reefs, in a minimum distance of 20 meters.

Zones of limited use

- These zones will be limited to the local communities' fishermen that are licensed to develop the fishing in the pelagic zone, to catch lobster or mollusks for self consumption or sale.

The harpoon fishing is limited to the pelagic zone. This technique is prohibited on catching fish in the reefs zone, bottom species or lobsters. The harpoon fishermen shall not jump on the corals when they cross them to fish around. They should verify that its fishing lines do not touch the corals.

The **lobster** must be fished taking into account the non-extraction of pregnant or in reproductive age specimens.

The **mollusks** must be harvested by licensed fishermen that obey the norms of the Park, in terms of quotes and captures. Forbidden species, dead or alive, should not be harvested.

The **holothurians** must not be harvested before studies to determine the size of the existing population in the area, and authorization by the administration of the Park.

The line fishing can be done by licensed fishermen for these zones; however attention must be paid to avoid overexploitation or damage the corals.

The boats operation, bottle and mask diving can be realized in these zones with minding the anchoring on the corals or damage them.

Corals or coral fish cannot be extracted for commercial ends. The extraction of any marine organism or other material for research purposes, require special authorization of the Park Administrator.

The **tourism activities** must not put at risk the life of any marine organism, including the mollusks.

g) Monitoring

- An annual monitoring of the protected reefs must be carried out. The objectives of this monitoring are:

- Evaluate the status of the reefs, in relation to their diversity and state.

- Evaluate the growth of the starfish population or other species that can damage the reefs. In the case of starfish overgrowth the management will consist on its reduction by application of sodium tiussulfato.

- Evaluate the natural damages on the reefs and their regeneration capacity. In addition, evaluate the damages caused by boats driving and anchorage or line nets dragging above or around the corals. Clean garbage around the corals.

h) Success Indicators in the protection coral reefs

- Maintenance of the species diversity.
- Maintenance or increase of resident fish and fauna population around the reefs, without biomass losses.
- Active community participation in the protection reefs, adhering to the prohibitions agreements and hinders of certain fishing areas, and advising about this practice.

i) Impact of the management activities in the coral reefs

- The management team must ensure the enforcement of the orientation rules for reef protection by on users.

- The management techniques and monitoring established for the Park, must not extract the specimens. The extractions of specimens' samples for research must occur out of marine reserves area under orientations of the Park Administrator.
- The following management activities can have negative impacts on coral reefs and should be followed by correctives action:
 - The training of management personnel in submarine diving and in the introduction to the marine environment.
 - The use of measuring tapes, in transects monitoring of corals, can break or stress the corals or other reefs fauna.
 - Attention should be taken when anchoring close to the reefs. These should be in a relative distance from the reefs, avoiding touching the reefs by the anchor strings.

j) Research

- Presently the following studies are considered priority:
 - The study the population's dynamics of the holothurians with commercial value.
 - The study the populations of indicative fish of the environmental status of the coral reefs.

Seagrass beds

a) Issues and Conflicts

- The seagrass beds of the archipelago bear an important ecosystem. They supply shelter and protection to the accompanying fauna and algae communities, besides of being the reproduction and growth locations of numerous species. They are very productive ecosystems with a great capacity of nutrient recycling.
- They are also important, as food source for dugongs and green turtles, which are endangered species requiring appropriate management strategies.
- The main threat related to the seagrass beds is its excessive use and the eventual unsustainable harvesting by the communities and continental fishermen of sand oyster, holothurians and langoustines.

b) Objectives

- Protect the biodiversity.
- Protect the habitats of seagrass in general.
- Protect the seagrass beds, as the pasture areas for dugongs and green turtles.
- Ensure the maintenance of these areas, as pasture sites and reproduction for numerous species of marine fauna.
- Control the exploitation seagrass beds for the holothurians, sand oysters and other bivalves' extraction.

c) Management Strategies

Habitats Protection

- Prohibit the whole forms of destructive exploitation in the seagrass beds (Park Administrator, Fauna Guards).
- Maintain the patrolling systems by the fauna guards and fiscals in the seagrass beds (Park Administrator, Fauna Guards).

- Inform the local community fishermen about the importance of protecting the seagrass beds (Park Administrator, Sociologist, Biologist, Fauna Guards).
- Inform the local community fishermen about the importance on conserving the seagrass beds, dugongs and turtles (Park Administrator, Sociologist, Biologist, Fauna Guards).
- Monitor regularly the impacts of exploratory activities in the seagrass beds (Biologist).

Species Protection

- Establish and inform about the limit on sand oyster or other mollusks extraction (Park Administrator).
- Prohibit the use of rake and other destructive utensils during the exploitation of seagrass beds (Park Administrator, Sociologist, Fauna Guards).
- Prohibit the holothurians extraction (Park Administrator, Sociologist, Fauna Guards).
- Maintain the monitoring of all species exploited in the seagrass beds (Biologist).
- Maintain the monitoring of dragging fishing in the seagrass beds (Biologist, Sociologist).
- Carry out studies to know the reproductive stations of the most important species, in the seagrass beds (Biologist).
- Establish in most exploited areas prohibitions periods to protect the reproductive season of the most vulnerable species (Administrator of the Park, Biologist).

Co-management for a sustainable use of resources

- Continue the establishment co-management systems and local ownership of the resources by the fishermen and local communities (Sociologist).
- Continue the protection of the most vulnerable species (Sociologist, Fauna Guards).
- Continue the supervision of the resources extraction methods and establish guidelines on the most sustainable methods of resource exploitation (Park Administrator, Sociologist, Fauna Guards).
- Maintain the control system of resources extraction by the fauna guards, through patrolling actions (Park Administrator, Fauna Guards).
- Establish an inspection and of fining system to the infractors (Park Administrator, Fauna Guards).
- Promote campaigns on sustainable use of resources and promote the support of District authorities in these actions (Park Administrator, Sociologist).

Monitoring and research

- Carry out studies on the biology and dynamics of commercial holothurians populations (Biologist).
- Carry out studies on reproductive behavior of the sand oyster (Biologist).
- Carry out studies on vulnerable species of higher economic value about their harvesting and possibility for captivity cultivation (Biologist).

d) Activities in the zoning areas

- Most of the seagrass beds are presently defined as local community limited use zones. However, part of those seagrass beds are integrated in the category of total protection zones when they occur in protected reefs and in areas of marine reserves. The seagrass beds that occur out of these categories are classified in multiple use zones.

Guidelines for different zones activities:

Seagrass beds totally protected

- No extraction of any resource is allowed. Fishing is not allowed in these areas.
- Bottle underwater diving, surface mask diving and submarine photography are allowed.
- Boat driving is allowed in these areas; however, the **moor** of the boats with anchor is prohibited. The moor in buoys is allowed.

Seagrass beds limited to the community use

- Exploratory activities by the local communities are allowed.
- Holothurians exploitation is prohibited.
- The exploration of sand oyster is only limited to the use of traditional baskets.
- The extraction of sand oyster with rake is prohibited.
- The extraction of crabs is allowed.
- The lobster capture is allowed, however avoiding the extraction of pregnant or juvenile specimens.
- The harpoon fishing is only allowed for pelagic fishes.
- The navigation and boat mooring it is allowed, however, avoiding the navigation above the corals.

Seagrass beds of multiple use

- Exploratory activities are allowed to the local and continental adjacent area fishermen, however, when properly licensed.
- Holothurians exploitation is prohibited.
- The exploitation of sand oyster is only limited to the use of traditional baskets.
- It is prohibited the extraction of sand oyster with rakes.
- The extraction of crabs is allowed.
- The lobster capture is allowed, however, avoiding the extraction of pregnant or juvenile specimens.
- The harpoon fishing is only allowed to pelagic fishes.
- The navigation and boat mooring it is allowed, however, avoiding the navigation above the corals

e) Monitoring

The monitoring activities to be developed in the seagrass beds should include the following:

- Exploitation index of sand oyster, other mollusks, crustaceans, echinoderms and fish by nets or lines usage.

f) Success Indicators

- Improvement in the harvesting methods of sand oyster.
- Evidences of a continuous increment in the length classes of the sand oysters harvested.
- Reduction in the number of people that come from the continent for the harvest of sand oyster.
- Adherence of all people to the harvesting of sand oyster using traditional baskets.
- Maintenance of the same length classes harvesting of mollusks.
- Maintenance of the same number and length classes harvesting of crabs.
- Improvement in capture methods of lobster, rejecting the juvenile and pregnant females.
- The end of the illegal harvesting of holothurians.
- Maintenance of the same length classes of fish capture.
- Maintenance or improvement of the seagrass covering areas and its quality.

g) Research

The following studies are considered priority:

- Identification of the areas and species of seagrass in the archipelago.
- Identification of most important or dugongs' preferred seagrass.
- Extensive mapping of the seagrass beds of the archipelago.
- Identification of species, biology and dynamics of holothurians population with commercial value.
- Extensive mapping of holothurians distribution along the seagrass beds.

4.4.2. TERRESTRIAL ENVIRONMENT

Mangroves

a) Issues and Conflicts

Mangroves ecosystems act as an important habitat for a large number of sensitive marine communities. They have a high ecological and socio-economic value which includes:

- The maintenance of the coastal water quality.
- The reduction of wave's forces and floods during the coastal storms.
- Nurseries and pasture area for a wide variety of commercial value fish, and other marine organisms.
- Important habitat and pasture area, for several benthic and pelagic marine organisms and species of birds.
- Forest and wood production area.
- It used to exist in the archipelago a larger mangroves community. The actual mangroves system was reduced and deforested, not acting presently as "nurseries" for juvenile species. However, it is necessary to establish a careful management for its protection, particularly against its exploitation and transit way for vehicles, thus avoiding its degradation.
- Other factor that could have contributed to reduce the mangroves community is the dependence and unsustainable use by local communities of stakes for construction.

b) Objectives

- Protect the biodiversity.
- Preserve a special habitat for the reproduction and feeding of marine species and of birds.
- Establish mechanisms of controlled and sustainable use of mangroves by the local community.

c) Management Strategies

Habitats Protection

- Minimize or eradicate the exploitation activities of mangroves, and establish suitable protection measures for this habitat.

Promote co-management systems related to the use of mangroves

- Promote community involvement, in the management marine resources (Sociologist).
- Continue the involvement the fauna guards and local communities in the monitoring and research of mangroves (Biologist, Fauna Guards).
- Promote the environmental awareness and education campaigns to avoid littering and the cut of stakes (Park Administrator).
- Community's awareness and environmental education programs (Sociologist, Fauna Guards).
- Alert the hotels about the importance of preserving the habitats and the biodiversity of mangroves (Park Administrator, Biologist).

Control of illegal and destructives activities

- Estimate the level of illegal stakes exploitation and flamingos hunt (Sociologist, Biologist).
- Improve the monitoring and inspection programs (Park Administrator).
- Identify the impacts and modifications in the use of mangroves, and adopt management measures (Park Administrator).

Restoration plans

- Alter the routes passing through the mangroves (Park Administrator).
- Stop the removal of sands from the mangroves for construction activities (Park Administrator).
- Evaluate the problems of mangroves degradation and establish management measures (Biologist).
- Continue the progress of sand dunes of sand towards of mangroves system monitoring (Fauna Guards).
- Eradicate the channels made in the mangroves zones (Park Administrator).

Monitoring and Research

- Identify and prioritize the monitoring and investigation needs in mangroves areas (Biologist).
- Establish mechanisms to control the mosquitoes dissemination in the archipelago (Park Administrator, Biologist).

d) Mangroves Zoning

The whole mangroves ecosystem was designated as an integral part of the total protection zone. Such means that no kind exploitation is allowed and that the whole current activities in this area should obey maximum of care.

Norms for motor vehicles users:

- In the long-term it's intended to restrict the movement of vehicles in mangroves areas. This zone is very delicate, plain and without a defined structure, being broadly flooded with the minimum ascension of the water levels. The existence of wheels trails perpendicular to the water movement directions impels the progress of the water in the low tide. The wheels trails parallel to the progress of the waters, conducts the waters provoking erosion and repressing the ground forming channels. In both cases, the natural balance enters into a disequilibrium originating negative ecological effects on these communities.
- The hotel operators should avoid changing the natural flow of the mangroves waters. They should not interfere in the movement of seas, trying to create dikes. The waters should continue to flood the saline and the whole extension of the ecosystem.

* This measure applies to the actual concession of Marlin Lodge area in the Benguérua Island. It intends to avoid the morphology alteration of the mangroves systems.

- It must not be allowed the introduction of exotic species in this ecosystem.
- The mosquito's pests must only be controlled biologically, or in other way under the recommendation of environmental impact assessment elaborated by a competent entity.

Use of local resources:

- The cut mangroves stakes for construction or other objectives must be restricted or controlled.
- The sustainable use of mangroves should is only to be allowed to people, that depend on these resources in fact.

e) Monitoring

Continue the annual to monitoring of the mangroves ecosystems, in order to:

- Evaluate the regeneration flora of the mangroves.
- Monitor the species composition of birds and size of these populations inside the ecosystem.
- Establish management recommendations based in the actual conditions and knowledge.

f) Success Indicators in the protection of mangroves

- Increase or maintenance of the biodiversity without loss of species.
- Blockage of the continuous degradation of the mangroves ecosystems.
- Regeneration of the mangrove flora.

- Increase or maintenance the bird's nests.

g) Impact of the management activities in the mangroves

Some management activities must be carried out with care, avoiding negative impacts on the mangroves communities. It will not be necessary the removal of samples from the site, except in particular cases, under the authorization of the Park Administrator:

- Birds counting operations can cause disturbances on birds nesting if such activity include, trapping and marking the birds.

h) Research

The priority studies include:

- Traditional use of mangroves in the archipelago.
- Sustainable use and regeneration rates of the mangroves communities.

Sand Dunes

a) Issues and Conflicts

- The Bazaruto archipelago is dominated by a system of continuous and high sand dunes in four of the five islands of the archipelago. These are more prominent in the Bazaruto Island, where they lay in the eastern side along the coastal line, covering 27% of the island surface.
- The system of dunes separates the east side oceanic beaches from the plains lands of the interior, forming an extensive barrier against the rains and prevalent winds from the ocean to the western side.
- The system of dunes, topographically, establishes a high source of rainwater retention that combined with the high porosity and permeability of the soil acts as the largest reservoir of underground water in the island. The most superficial source of water is located in the west outermost of the dunes decline, and islanders do open holes of water capitation and establishment of cultivation areas are using these areas.
- Jointly with this active and dominant sand dunes system, a wide system of old dunes exists, which is located in parallel, in the west side of the actual dynamic system of dunes. Topographically, these dunes are ancestral and less high, they are covered with vegetation, and they are more stable than the actual.

The main threats to the dune systems in the archipelago are:

- Shifting cultivation practice on the margins of dunes.
- Pasture of goats and sheep in the dunes.
- Erosion caused by the action of winds, progress of the anterior face of dunes or growth in layers, and damage of plants and vegetation that colonize the dunes.
- People and motor vehicles movement in areas of sand dunes, causing coastal erosion.

b) Objectives

- Maintain the system of dunes as the largest reserve of underground water in the islands.

- Maintain the system of dunes, as a protection barrier against the action of prevalent winds on the east side, and of erosive winds on west side of the islands.
- Minimize human destabilizing action on dunes system in order to stabilize and delay their movement speed inwards.

c) Management Strategies

Habitats Protection

- Identify crucial areas for protection (Biologist).
- Ensure the accomplishment of the defined zoning strategies for dunes (Park Administrator, Sociologist).
- Through awareness campaigns, environmental education and negotiated agreements restrict the vehicles access in dunes (Park Administrator, Sociologist).
- Through awareness campaigns and negotiation agreements with the local communities, restrict shifting cultivation agricultural practices next to dunes (Park Administrator, Sociologist).
- Establish prohibition mechanisms for constructions on the dunes (Park Administrator, Sociologist).
- Maintain the monitoring of sand dunes movements (Biologist, Fauna Guards).

Species protection

- Promote the awareness and environmental education campaigns on the casuarinas species for firewood production, thus protecting other species (Park Administrator, Sociologist, Fauna Guards).

Co-management systems for management activities in the dunes

- Involve local communities in management activities through co-management systems (Park Administrator, Sociologist).
- Maintain the fauna guards as the communication vehicle with the local communities, in the management activities (Park Administrator, Sociologist, Biologist, Fauna Guards).
- Adopt alternatives against the practice of agriculture and pasturing in the dunes (Park Administrator, Sociologist, Biologist).
- Through awareness campaigns and environmental education programs, create consensus about the management of dunes by the local communities and hotel operators (Park Administrator, Sociologist, Biologist, Fauna Guards).

Restoration Plans

- Through research and monitoring actions, determine the causes of habitats degradation and decline of species (Biologist).
- Evaluate the needs for restoration of certain dunes habitats (Biologist).
- Evaluate reforestation possibilities of cleared dunes areas with vegetative native species in collaboration with local communities and the hotel operators (Park Administrator, Biologist, Sociologist).

d) Sand dunes Zoning

Sand dunes are divided in two zones:

- Wild Zone
- Local Community Limited Use Zone

(i) Wild Zones

- The dunes designated by wild zones consist of actual and active system of dunes, most of them disposed in parallel to the Eastern coast of the islands of the oceanic side where the predominant winds of the area blow, subjecting the dunes to a fast mobility. Another system of dunes is disposed westwards being subject to coastal erosion. These systems of dunes are the most sensitive of the archipelago, because they guarantee an important island protection.
- The dunes of these zones are only opened for non-extractive use, meaning that is not allowed the practice of agriculture, pasturing, and firewood and stakes cut.
- New roads are not allowed and the movement of vehicles is interdicted, with exception of those of the Park, during management activities.

(ii) Local Community Limiter Use Zones

- These zones are limited to the use by local communities, and consist of the old system of dunes already stabilized in the interior side of the islands, which are smaller than the actual dynamic dunes of the coastal part. Most of these dunes were already used as cultivation areas and are important for cultivation of mielt

e) Activities in the zoning areas

(i) Wild Zones of dunes:

Tourism

- In the Northern part of the Bazaruto Island a lighthouse already exists. It is allowed climb to the lighthouse through the existent trails on the eastern and western side of the island. The guard of the lighthouse is a helpful guide to show the interior and to reach on the top of the lighthouse.
- Tourists are not allowed to explore the dunes with the use of motor vehicles, they should only walk on foot.
- In order to avoid the erosion, it is not allowed to build any kind of infrastructure in the top or in the adjacent margins the dunes, especially in top and base declines, whether its covered or not covered with vegetation.
- It is prohibited construction of Sanitary or infrastructures that drain residual waters to **belowground** of dunes or in groundwater next or around the systems of dunes.

Agriculture and firewood harvesting

- The agriculture practice will on the dunes or their margins will not be allowed. All agricultural activities should be practiced far from the anterior face of dunes, and not even direction of their progression. Such prevents the removal of surrounding vegetation, delaying the progress of dunes and guaranteeing a larger stabilization of the old dune system.

- Agriculture areas should be located in a distance of at least 30 meters far from the anterior margin of any nude dunes system, without vegetation cover, allowing fast vegetation covering of the actual dunes system.
- It is prohibited to cut native species close to the dunes for firewood production. It is permitted the cut of exotic species such as casuarinas for firewood production.

Domestic animals

- It is prohibited to graze goats, sheep, oxen and other animals close to the dunes, because these cause high damages, inducing erosion and destabilization of dunes.

Crocodiles eggs harvesting

- Crocodiles nests are located in the dunes, close to the superior part of the lagoons. In the Bazaruto and Benguérrua Islands the Park it is allowed the harvest of eggs for the “Benguela Lodge” crocodile farm. Local communities will be authorized to removal the eggs for sale.

(ii) Zones of limited use

Agriculture

- These areas are limited to community use, serving as cultivation areas for mielt it is only allowed to maintain the existent cultivation areas; the vegetation cut for opening new cultivation areas will be regulated. After the opening of cultivation areas, the local communities, will be motivated cover the soils with vegetable, herbs, fertilizers or planting propagative vegetation, avoiding soil erosion.

Domestic animals

- In these zones, it is interdicted the grazing of goats, sheep, oxen and other animals, as it constitutes a destructive practice, causing wide damages caused by opening of areas and turning the soils prone to erosion, destabilizing the dunes.

f) Monitoring

Quarterly monitoring will be carried out on the dunes total protection regime in order to:

- Measure the progress level of the anterior face of the dunes, its layer growth and compare the revegetation rates between the active dunes denuded dunes and with the stabilized and covered vegetation dunes. The seasonal variation of these indexes will be evaluated.
- Establish a system for data gathering, including physical parameters of wind speed, barometric pressure and precipitation. Whenever possible meteorological data from the Bazaruto lighthouse should be collected which are adequate to the zone.
- Monitor annually the morphologic changes of sand dunes and verify the variations in long term, through photographic comparisons.

g) Success Indicators in the sand dunes protection

- End of shifting cultivation agriculture practices on or in the margins of dunes and protections zones.
- End of the firewood cut in dunes, and casuarinas replacement by native species.

- End of domestic animals pasture in any area of dunes.
- End of construction of any kind of infrastructures in the dunes wild zones.
- End of construction of polluting sewers system close to the underground water reserves in dunes.
- Absence of tourists motor vehicles movement by tourists in the dunes zones designated wild.

h) Impact of management activities in the dunes areas

- The monitoring techniques should be simple, with the use of a photographic machine and measuring tape, including sampling techniques in order to avoid negative effects on dunes. If there is a need of specimens' extraction, such should have the authorization of the Park Administrator.
- The patrolling staff usually walk on dunes, in cleared areas, causing movement of sands. The patrol personnel should walk on the stabilized areas.

i) Research

- Collect and establish a database in the long term, on geophysical parameters of the area such as wind speed, barometric pressure and precipitation.
- Research on the improvement of the agricultural practices system in dunes, especially of mielt and its cultivation areas.

Forests, Savannas and Prairies

a) Issues and Conflicts

- The forest areas of the archipelago are small and limited due to its excessive and unsustainable use by the local communities for firewood harvesting and opening cultivation areas.
- The remaining forest consist of the following types:
 - Mangroves forests in the coasts of the Bazaruto, Benguérrua, Santa Carolina and Magaruque islands.
 - Remaining coastal dune forest.
 - Hygrophilous forest.
 - Remaining mészica climax forest.
 - Dialium Schlegleri and Julbernardia globiflora forest.
 - Swamp forest.

The other predominant vegetation types in the archipelago consist of:

- Swamps
- Prairies and savannas
- Bush
- Pioneer vegetation of dunes
- Casuarinas.

b) Objectives

- Protect the biodiversity
- Protect the remaining forests, avoiding the deforestation of new areas for harvesting of firewood, stakes and opening of agriculture areas.

- Improve the conservation state of the forests, through reforestation campaigns with native species.
- Guarantee a safe habitat for the endemics fauna species, native and migratory birds.
- Improve the aesthetic and scenario beauty of the area.
- Ensure that the local communities use the natural resources without negative impacts on the atmosphere.

c) Management Strategies

Habitats Protection

- Identify and adopt management strategies against human destructives activities, in order to protect the crucial habitats (Park Administrator, Sociologist, Biologist).
- Monitor all current activities in order to determine the nature and level of destructive activities (Park Administrator, Sociologist, Biologist, Fauna Guards).
- Evaluate the needs on re-establishing zoning limits to ensure a suitable protection of species and habitats (Park Administrator, Sociologist, Biologist, Fauna Guards).

Co-management for the forests, savannas and prairies management

- Promote community involvement in management activities, through co-management systems (Park Administrator, Sociologist, Fauna Guards).
- Maintain the fauna guards in management and patrolling activities (Park Administrator).
- Involve the local communities in the monitoring activities (Park Administrator, Sociologist, Biologist, Fauna Guards).
- Establish norms of involvement of researchers in research studies (Park Administrator, Sociologist).
- Establish levels of sustainable use for agricultural activities, extraction of palm wine (Utxema) and other activities (Park Administrator, Sociologist, Biologist).
- Incentive the traditional knowledge and use of forest resources as medicinal plants (Sociologist, Biologist, Guards of Fauna).
- Create an understanding environment with hotel operators, communities and local authorities, through programs and regular meetings (Park Administrator, Sociologist).

Reduction of habitats loss

- Promote sensitization and environmental education campaigns about the norms of avoiding the uncontrolled burning practice (Park Administrator, Sociologist, Fauna Guards).
- Through sensitization campaigns, with community participation, force the reduction of the habitats loss index and incidence (Park Administrator, Sociologist, Fauna Guards).

Plans of restoration – degraded habitats and declining population re-establishment

- Promote research in order to determine the level of habitats degradation (Biologist).

- Prepare an inventory of habitats, identifying areas with restoration needs (Biologist).
- Investigate, define and prioritize restoration action, including cost/benefits analysis (Park Administrator, Biologist).

d) Forests, savannas and prairies zoning

- All forest areas were designated total protection zones. Such means that, in these areas, no exploratory activity (agriculture, pasturing, vegetation cut) shall take place. The harvesting of wild fruits, medicinal and plants and others of cultural value for the communities will be allowed, however, actions taking place in these areas should be done with care to preserve the ecosystem and not damage the local fauna and flora.
- If a forest occurs on a wild zone, or along the margins of active dunes, it will be part of the wild zone.

Zoning of another vegetation types:

- The wild zones include all the pioneer dunes and most of the bush.
- The total protection zones include the remaining bush.
- The local community limited use zones lodge all the savanna and prairie areas.

e) Activities in the zoning areas

(i) Wild Zones

- The activities in these zones must be regulated in order to minimize the impacts. It is prohibited the cut, disturbance of forest lines, or all the vegetation type that relapses on the wild zones.

(ii) Protected Zones

- In protected zones it will be restricted the opening fields for agriculture, harvest or cut of firewood, either at the forest or bush level. The harvest of wild fruits, medicinal plants and others for consumption and subsistence will be allowed.
- Tourists are allowed to take photographs in these areas.
- In these areas it is prohibited the extraction of fauna and flora species.

(iii) Limited Use Zones

- The agriculture practice by local communities is allowed in these zones, however, under the Park Administrator's authorization and the support of the Administrative chief.
- Without encouraging such practice it is allowed the grazing of domestic animals by the local community in these zones, however should be identified together with communities, alternatives of reduction of the number of animals in the islands.
- In these zones is permitted the extraction of palm wine (Utxema) by the local communities, however, should be controlled the burning that follow this activity. Local communities should avoid burning of wind periods avoiding that these burning reach the basal part of palm trees. Kindred of not reducing the landscape beauty it shall be avoided to use the palm trees that are along the **trials**.

- The introduction of casuarinas in the habitats of the archipelago is limited and not ecologically recommended, due to space competition with other vegetable species and disintegration in the aesthetic beauty. It is recommended that the islanders have access to certain areas of casuarinas on the western side of the islands for firewood extraction.
- In the areas where the casuarinas protect certain targets they should be maintained in order to avoid erosion and wind actions.

f) Monitoring

The following monitoring studies will be done:

- Evaluation of the forest areas status.
- Control of the agriculture areas.
- Evaluation of the status of prairies and other vegetation types, that suffer the action of goat pasture. Such, shall take place with the use of aerial photographs or located quadrates. A comparison will be made between the small squares, that are left intact and the ones that suffer pasture action of different herbivores, evaluating the damages caused by herbivores, and the capacity of vegetation regeneration.
- In the stock and firewood availability and ecological recovery of areas where there was casuarinas substitution by native species.
- In the impact of management recommendations in the conservation actions based in the actual conditions of the area.

g) Success Indicators

- Improvement of forest conservation status.
- Control of shifting cultivation agriculture, improvement in land use forms and improvement in the agricultural income.
- Reduction of number of goats, sheep and oxen and a better control of its pasture areas.
- Re-establishment of casuarinas nurseries for firewood production, replacement of this species by native species in eroded areas, and the end of firewood cut in forest and bush areas.

h) Impact of management activities

- In the monitoring actions a minimum impact on habitats shall be observed and these actions shall not be extractives. The sample gathering should take place only when necessary.

i) Research

Themes that need collaboration with local communities are:

- Detailed mapping and nomenclature vegetation types of the archipelago.
- The needs of agricultural production for the communities, and alternative practices choice such as trade and products change in order to discourage the opening of new cultivation fields inside of the Park.
- Adoption of pasturing alternatives in the archipelago.

TERRESTRIAL FAUNA

BIRDS

a) Issues and Conflicts

- Existing studies point out that at least 34 species of aquatic birds and more than 58 thousand specimens lodge in zone among tides of the archipelago, during the middles of January of every year.
- While existing a total of 20 thousand residents Charadriiformes, the total of *Pluvialis squatarola* exceeds 1% of the population size that migrates during the winter to Eastern Africa. The archipelago is qualified as a humid zone of extreme international importance, accordingly to the Ramsar Convention criteria.

b) Objectives

- Guarantee the control and the conservation of resident and migrant birds' habitat, and of its reproduction and pasture area.
- Allow that the birds during its transit in the archipelago do not suffer declines in size of its populations.

c) Management Strategies

Habitats Protection

- Based on research and traditional knowledge, identify crucial birds habitats and its protection needs (Park Administrator, Biologist).
- Maintain the establishment of reserves along the Park, in order to accommodate palearctic migratory birds, guaranteeing its pasture and reproduction (Park Administrator, Biologist).
- Establish mechanisms for protection of crucial habitats, through zoning actions (Park Administrator, Biologist).
- Promote awareness and of environmental education campaigns, divulgating areas of great importance for the introduction of delimitation plates. Create tourist guides system during critical periods of migration. Establish prohibition areas, if necessary, restricting the access to these areas, in the equinoxes, storms and at night (Park Administrator, Sociologist, Biologist, Fauna Guards).
- Disseminate pamphlets, informing the local communities and tourists, about the need of conserving the birds and its habitats.

Co-management

- Maintain the fauna guards rangers involvement in the management actions (Park Administrator, Biologist, Fauna Guards).
- Ensure that the hotel operators and the local communities, promote awareness on aspects related to the importance and the need to accommodate different stations, migratory birds, in order assure general conservation assistance (Park Administrator, Sociologist, Biologist).

Monitoring and research

- Identify and prioritize the research on critical habitats (Park Administrator, Biologist).

- Maintain research actions in humid areas for five years, in such way that the results are of international recognition, and the archipelago becomes eligible to the international statute of important humid zone (Biologist).
- Mark Palearctic migratory birds to better know its migration routes (Biologist).
- Consider the support and involvement of national and international ornithological groups in the conservation actions and bird's research in the archipelago (Park Administrator, Biologist).

d) Zoning

- The birds occur in all the zoning categories at level of the archipelago, being important to mark residence areas of the birds, particularly for Palearctic migratory birds.
- Most of these habitats, coincide with protection zones (mangroves and some swamps), zone of community use (some swamps used as pasture areas) and zones of intensive use (hotel concessions and sand banks) accordingly to the actual zoning.

Zones and important habitats for birds:

- The sand banks in the north of Bazaruto island, the Ponta Dom Carlos.
- The area to the south of Ponta Sitone (Madivadge area).
- The zone of Pangaia beach, in the south of Bazaruto island.
- The mangroves in the north of Dundo Point (Chitoana).
- The sand bank in the north of Benguérrua island (Mwanha).
- The mangroves of the Benguérrua island.
- The Southern Point of the Magaruque island.
- The mangroves of the Santa Carolina's island (Nzoka).

e) Activities in the zoning areas

- Sand banks are mainly used by tourists as fishing zones, transit roads and for leisure.
- Some sand banks of birds pasture are used by fishermen to collect invertebrates. In the management strategy, the objective is to reduce the disturbance degree to resident birds. In the periods of high-waters, access to these banks shall be restricted in a way that does not prevent the marine birds landing. Driving vehicles in the night should be avoided and tourist guides system should be promoted by the birds observers' group.

f) Monitoring

- In order to cover the register of the palearctic migratory birds, monitoring shall be conducted in January of every year, under the form of recognitions of humid areas. Whenever possible, for comparative ends a second recognition will be accomplished in July of every year.
- For the monitoring of resident birds, annual or bi-annual recognitions will be accomplished.

g) Success Indicators

- Increase of the number of migratory birds crossing the archipelago.
- Decrease of disturbance level of birds habitats.
- Improvement of the habitat quality, pasture areas and reproduction of the birds.

h) Research

- Study the pasture areas of different groups of birds.
- Prepare inventory of the birds of all fresh water habitats of the archipelago.

TERRESTRIAL MAMMALS

Domestic animals

a) Issues and Conflicts

- Three of the islands of the archipelago (Bazaruto, Benguérua and Magaruque) are inhabited by local communities which create domestic animals. Domestic species include goats, sheep, pigs, oxen and small species animals. Goats and sheep, are in considerable number putting in danger vulnerable habitats, sand dunes area and the important humid areas for birds reproduction of birds.
- The number of goats and sheep is increasing, due to its low consumption and sale, and for serving as financial reserves for their creators. The goats and sheep are the major concern due to its non selective pasture diet, putting in danger the different vegetation types. The owners burn extensive areas to renew the pasture, becoming an ecological danger for the archipelago.
- The damages caused by goats, affects also the cultivation fields, causing conflicts between the owners and women that use low areas for cultivation of sweet-potato and other cultures, forcing the women to seek areas next to dunes.

b) Objectives

- Reduce the number of domestic animals presently existing in the archipelago.
- Reduce the existing pasture areas for domestic animals.
- Stop the devastation of important habitats to native fauna, due to presence of domestic animals.
- Control the number of domestic animals allowed by family, minimizing the impacts of pasture and habitats destruction by domestic animals.
- Improve the conservation status of the vegetation damaged by domestic animals.

c) Management Strategies

Habitats Protection

- Through zoning, restrict the pastures in wild and total protection areas.
- Continue promoting the research and traditional knowledge for the identification of inadequate areas for domestic animals pasture (Park Administrator, Biologist, Sociologist).
- Establish limited areas for domestic animals pasture (Park Administrator, Biologist).
- Establish co-management systems with the communities and local authorities in order to control grass removal burning and to maintain the integrity of the vegetation and habitats (Park Administrator, Biologist, Sociologist, Fauna Guards).

Reduction of the size of domestic animals populations

- Find alternatives and negotiate with local communities, ways of ensuring the control and reduction of the number of domestic animals and to minimize the impact of pasture on vegetation (Park Administrator, Sociologist, Fauna Guards).
- Maintain fauna guards involvement in environmental education campaigns about the impact of domestic animals in habitats (Park Administrator, Sociologist, Fauna Guards).

Monitoring and research

- Maintain the effect of domestic animals pasture monitoring on the native vegetation and habitats, through photography and other research methods (Biologist, Fauna Guards).

d) Activities in the zoning areas

- The creation of domestic animals is only allowed in limited to community use zones of savannas and prairies.
- The creation of domestic animals is not allowed in sand dunes and beaches, as they induce a fast degradation and erosion of these habitats.
- The creation of domestic animals is not also allowed in zones of extensive use, because they collide with the hotel installations the Park camps management.

e) Monitoring

- Presently in the Bazaruto island a quarterly photographic monitoring of some pasture areas is carried out. The maintenance of this activity, allows the comparison the effect of pasture on vegetation in a seasonal base. These monitoring activities should be extended to cover whole Bazaruto island, the Benguérua and Magaruque islands.

f) Success Indicators

- Improvement of the habitats status in the domestic animals grazing area.
- Reduction of the domestic animals population's size in the archipelago.
- Establishment of a functional co-management system involving the communities and local authorities.
- Improvement of the habitats and vegetation status where domestic animals do exist.

g) Research

- Estimate the carrying capacity of domestic animals in pastures areas.
- Carry out comparative studies of vegetable species diversity between pasture and the fallow areas. The experiences should cover areas with low, average and high density of pasture and evaluate the necessary periods for vegetation replacement.

Native fauna

a) Issues and Conflicts

- The archipelago lodge natives and introduced species of small, medium and large size which include *simango* monkey, nocturne galago, red goat, red squirrel, *imbabala*, *musaranho*, crocodiles and birds.
- There is the intention of introducing wild terrestrial fauna in order to attract tourists and to give alternative of animal protein to the local communities, with animals of added value. These species of antelopes possess less destructive pasture habits in relation to goats and sheep, being intended its introduction, starting Benguérrua island where the habitats are more suitable.
- Most of the management actions and research works in the archipelago, are turned for the marine area. There is little knowledge about the existing terrestrial species in the archipelago, its habitats, its conservation state and size of these populations.

b) Objectives

- Maintain the species and increase their diversity.
- Maintain the size of animals populations at a level below the carrying capacity of the islands.
- Improve the state of the habitats.
- Control the plagues of rodent animals.
- Maximize the tourism value of the islands.

c) Management Strategies

Habitats identification and its conservation status

- For the existent species in the archipelago, identify the used habitats and its conservation state (Biologist).
- Investigate the habits, uses and customs of local fauna and mammals (Sociologist, Biologist, Fauna Guards).
- Evaluate the size of available habitats for this mammal's population (Biologist).

Size of population

- Quantify the size populations, through stratified sampling (Biologist, Fauna Guards).

Carrying capacity

- Based in the actual size of the habitats and its conservation status estimate the archipelago carrying capacity for most important species (Biologist).

Wild fauna introduction

- Evaluate the habitats existence to accommodate the introduction of proposed species in the Park (Biologist).
- Estimate the size of the habitats and the carrying capacity for species to be introduced (Biologist).
- Based in the habitats availability and carrying capacity, evaluate the viability of introducing animals in the islands (Biologist, Sociologist).
- Monitor the effects of animal introduction on the habitats (Biologist).

- Establish agreements, among the Park, communities and local authorities and hotel operators in the management of the introduced fauna (Park Administrator, Sociologist, Biologist).
- Establish slaughter quotes of the introduced fauna, consonant with its growth in order to maintain the animal population in the carrying capacity limits (Park Administrator, Sociologist, Biologist).
- Evaluate the impacts of animal's introduction on local communities (Park Administrator, Sociologist, Biologist).
- Evaluate the general impact of animal introduction on fauna and flora (Park Administrator, Biologist).

Indicators of populations in plague state and control mechanisms

- Identify plagues species in the archipelago (Biologist).
- Establish a control mechanism that includes approach indicators of carrying capacity (Biologist).

Monitoring and research

- Evaluate the impact of introduction of exotic species on local fauna and flora (Park Administrator, Sociologist, Biologist).
- Evaluate the benefits of the introduction of wild fauna on local communities (Park Administrator, Sociologist, Biologist).
- Evaluate the impacts of tourist value increment of the archipelago (Park Administrator, Sociologist, Biologist).

d) Activities in the zoning areas

- The fauna is not limited to specific zones. This has preference to occupy the most protected and hidden zones, where there is more vegetation cover, camouflage possibility and smaller incidence of human activities. It is important that this fauna, do not destroy special habitats such as climax forest of coastal dune. During the fauna introduction, the occupation of sensitive areas should be avoided.

e) Monitoring

- Carry out annual or bi-annual recognitions, estimating the size of fauna population, through stratification methods.
- Monitor the impact of introduced species on vegetation (e.g. photographic monitoring).

f) Success Indicators

- Maintenance or increase of the native species population size.
- Improvement in the habitats state and quality of vegetation.
- Maintenance or increase of introduced species population size.
- Administration and integrated management among the Park, local communities and hotel operators.

g) Research

- Study the biology and dynamics of fauna species population.

4.4.3. WATER ENVIRONMENT

Lakes, Swamps and Salinas

a) Issues and Conflicts

- Occurring predominantly in Bazaruto and Benguérrua islands, these bodies of water are of extreme importance for the archipelago. The lakes are habitats of crocodiles (*Crocodilus niloticus*) and of aetiological fresh water fauna tilapia species (*Oreochromis mozambicus*). These are perennial bodies of water, constituting an important source of drinkable water for local fauna and pasture area for numerous bird species.
- The swamps and saline adjacent to the lakes constitute important habitats for resident and migratory species. Despite the swamps not being permanently flooded, they receive water during the rains periods, enough to supply great part of the year. The herbs, graminea, reeds plantations and rushes that occur in the swamps and margins of lagoons constitute an important habitat for a wide fauna variety, especially to migratory birds. For numerous birds, these habitats are suitable for reproduction.
- The vegetation of lagoons and swamps, reeds plantations, rushes, and herbs are used by local communities for construction and craft. The little swamp forests are used for sweet-potato cultivation and part of local community practices fishing in some lagoons. Some of these habitats show degradation signs due to its excessive and uncontrolled use, being verified alterations in its natural form, and bringing implications for local communities and animal life dependent of these.

b) Objectives

- Maintain the quality of fresh water lagoons.
- Preserve the native fauna of the lagoons.
- Supply pasture and fallow areas for local and migratory fauna.
- Supply shelter and reproduction areas for resident and migratory birds.
- Promote sustainable use of lagoons, swamps and saline by local communities.

c) Management Strategies

Habitats Protection

- Identify critical marshy areas, which need protection (Park Administrator, Biologist).
- Maintain the protection zones, as pasture and reproduction areas for the species (Park Administrator, Biologist).
- Review the zoning, to guarantee an appropriate protection (Park Administrator, Sociologist, Biologist).
- Acknowledge and inform about zones under protection regime (Park Administrator, Sociologist, Biologist, Fauna Guards).

- Based in research and traditional knowledge, establish prohibition periods for fishing activities in critical habitats (Park Administrator, Sociologist, Biologist, Fauna Guards).

Co-management

- Involve local communities in management activities, through promotion of forms of sustainable resources use (Park Administrator, Sociologist, Fauna Guards).
- Maintain fauna guards involvement in the management of swamps (Sociologist, Biologist, Fauna Guards).
- Involve local communities in monitoring and research activities (Park Administrator, Sociologist, Biologist, Fauna Guards).
- Maintain and develop communication means with the communities and local authorities, on the importance of establishing co-management systems (Park Administrator, Sociologist, Biologist, Fauna).
- Establish sustainable levels of agriculture practice in swamp areas (Parks Administrator, Sociologist, Biologist).
- Maintain the registries of traditional knowledge (Park Administrator, Sociologist, Biologist, Fauna Guards).
- Through awareness and of environmental education campaigns, create an understanding environment on the importance of preserving the lagoons and swamps (Park Administrator, Sociologist, Biologist, Fauna Guards).

Degraded habitats of restoration habitats

- Evaluate the habitats status (Biologist).
- Evaluate the need of restore degraded habitats (Park Administrator, Sociologist, Biologist).
- Establish a nursery of native plants for reforestation of degraded habitats (Park Administrator, Sociologist, Biologist).

d) Lagoons and swamps zoning

The lagoons and swamps are divided in two zones:

- Total protection zone.
- Community limited use zone.

(i) Protection Zones

Some of the swamps take this designation for being protected habitats and serving for birds reproduction. Usually these swamps are surrounded by forests or trees that penetrate in the swamps. These areas are hindered to any type of extractive or agricultural activity.

(ii) Limited use zones

Most of lagoons and swamps take this designation and they are only reserved to the use by local communities, for subsistence, consumption and cultural activities.

e) Activities in the zoning areas

(i) Lagoons and protected swamps

- In these areas, it must not be allowed the cut of herb, reeds, rushes, tree felling and gap opening.
- Around these swamps, it must not be allowed cultivation of sweet-potato and other cultures.
- In a ray of 50 meters around the swamps, it must not be allowed agricultural practices.
- It must be established the protection regime for birds in the reproductive period.
- It must not be allowed pumping water from these areas, for any kind of use.

(ii) Limited use zones

- In the lagoons line fishing practice is allowed by local communities, however, net fishing practice is not allowed.
- The communities are encouraged to protect crocodile's nests for selling to the crocodile farm (Benguela Lodge), in a process assisted by the Park. The eggs extraction from the nests should be done by fauna guards.
- All interference or disturbance to birds and its nests are discouraged.
- In the lagoons and swamps margins it is not allowed the cut of herbs, reeds and rushes.
- Inside of lagoons and swamps it is allowed the cut herbs, reeds and rushes, which can be used in the construction, craft and sale. The hotel operators should not extract these resources; they can buy it in the local communities.
- Around lagoons and swamps it is allowed to cultivate sweet-potato.
- It is not allowed to establish irrigation channels from the lagoons and swamps.
- Exceptionally the Park administration can allow pumping water from these areas, for hotels or other operators. However, such activity should deserve an environmental impact study and its sustainability evidence, ensuring least impacts to fauna and flora.

f) Monitoring

An annual monitoring will be carried out on these ecosystems, in order to:

- Assess the quality of lagoons water.
- Monitor the crocodiles population and females in reproduction.
- Guarantee the protection of crocodiles nests.
- Monitor the population of birds and its specific composition.
- Guarantee the protection of birds and its nests.
- Guarantee the sustainability of fish stocks in the lagoons.
- Monitor the specific composition of species populations of the lagoons.
- Evaluate the impact of agriculture and graminea cut on lagoons and swamps.
- Based in the actual knowledge and state of the habitats, adopt recommendations of these ecosystems.

g) Success Indicators in the protection of lagoons and swamps

- Maintenance or improvement of water quality.
- Maintenance or increase of the population size of crocodiles and its nests.
- Maintenance or increase of the populations' size of birds and diversity of species.

- Sustainable exploitation levels of fish Stocks.
- Maintenance of the number of populations' species.
- Low impact of agriculture practices in appropriate areas.

h) Impact of management activities in lagoons and swamps

- The monitoring techniques should be based in observations and not in samples extraction. Whenever it is necessary to extract samples, such should have the authorization of the Park Administrator, and the gathering done by qualified personnel. Some management activities can have negative impacts on the lagoons and swamps, so it should be followed by subsequent management actions.
- Birds catch using nets, for marking, or the gather of important information, can disturb them. Therefore, these operations should always be carried out by qualified personnel.

i) Research

Priority research areas are the following:

- Assessment of water quality of the lagoons in a regular base, at least once a year.
- Study the migration routes of birds that cross the archipelago.
- Study the swamps fauna of the Bazaruto archipelago.

4.5. COMMUNITY MANAGEMENT

a) Issues and conflicts

- The Park lodges a population of local communities residing legally in its interior, since its creation.
- It is considered, that presently 3.500 inhabitants reside in the archipelago about where stand out two groups: The real islanders, considering islanders the people born in the archipelago or members of its families by marriage liaisons or birth. The second group, are of immigrant families, they reside in the archipelago as workers of the tourism establishments and of the Park, war refugees and dealers, that noticed permanently in the islands.
- The local communities' economy is based on fishing. The economic power is low, having a relative absence of economic alternatives.
- In general, problems of agriculture practice and pasturing are verified in the dunes and ecological sensitive areas, uncontrolled burning and non licentiate and uncontrolled fishing on reefs and reserves area, using inadequate arts for the area, such as mash nets and industrial fishing.
- The initiatives for the management and sustainable use of resources by local communities, are in course in the archipelago since 1990, and were already established healthy relationships and of collaboration with local communities.
- Lack of benefits along with the weak local administrative skills to create a an organized capacity in the community, constitute a concrete problem and limitation the participation and responsibilities on the Park resource management and administration, reducing the actual conflicts resulting from restrictions in the use of resources.

b) Objectives

- Allow a larger participation of local communities in the management and sustainable use of natural resources of the Park, as well as of its benefits.
- Promote the sustainable use of the resources by local communities, inside of the archipelago.
- Reduce the actual conflicts and the ones that can emerge from the conservation through the integration of local development in the management of the Park, as well as of creation of local benefits.

c) Strategies

Establishment of co-management systems

- Community participation in resource management constitutes priority in the context of conservation and sustainable resource management of the Park.
- In agreement with the desires and principles expressed by local communities, it will be established the mechanisms for resources management and benefits share resulting from the conservation activities and of the restrictions the certain activities, through:
 - Promotion of a good collaboration, trust and relationship with local communities.

- Collaboration with the local structures, encouraging them to organize the local communities and motivate them to practice traditional management systems, establishing local mechanisms of resources control.
- Encourage the creation of associations and community groups that represent the whole community's interests and coordinate the management activities.
- **Establishment of community committees:** Local communities are identified accordingly to the community zones. Managements Community Committees will be constituted by zones and islands, which will constitute the base for the community's participation in the administration and conservation of the resources, and they will represent the interests of the community at the administrative body of the archipelago.
- The zone committee zones are automatically members of the archipelago administration committee, to be established. It is intended through this structure, to ensure that the communities carry out an important role in the administration and conservation of the archipelago and execute the Park.
- The structure and the type of committee to establish will depend on the local conditions. The communities will commit themselves to follow the existent norms and other regulations to be she established in participative way during the establishment of the committees. The non accomplishment of the regulations will be pained in accordingly to regulated measures, by the loss of benefits right, and other convenient mechanisms.

Sustainable use of resources

- Local communities will be interdicted of practicing activities subjected to certain restrictions in the use of resources. This is a pressing need for the establishment of effective management and regulated use of resources in the Park.
- Local communities can develop production activities and exploitation of marine and terrestrial resources, using only handmade forms for subsistence and consumption. They can develop and establish areas for habitation, fishing, agriculture and pasturing.
- Through zoning and local and traditional systems of use of resources, the communities will be encouraged to find local mechanisms of control and management of resources. They will have the support from the Park administration, through fiscals and fauna guards, for the control of infringers coming from the continent, population settlement problems and other concerns.
- The proposed zoning for the Park, foresees the existence of areas of community use and of multiple use, as a protection modality and sustainable use of resources, respecting the sacre habits and other local of historical importance. This means that the local communities should respect the norms established for wild and of total protection zones.
- Local communities, as integral part of the Park, will have the right to usufruct of the natural resources, through zoning plan; however, they shall not demand land ownership, because this belongs to the Park tutorship.

Benefits Share:

- The implementation of the management recommendations will increase significantly the local communities and the main resources users responsibility, to find new forms for satisfaction of its subsistence needs, in detriment of the actual uncontrolled and unsustainable exploitation forms.
- It is intended to attenuate the actual conflicts and compensate the local communities for the restrictions, inconveniences and costs of the existence of the Park.
- The actual costs of the Park existence for the local communities are the restrictions in agriculture practice, pasturing and fishing in some zones. Through the zoning, they will have a limited access of some resources zones. There will be socioeconomic impacts from tourism activity. The socio cultural liaisons between the local communities and their relatives of the adjacent mainland will be partially broken.
- The benefits of the Park existence will be financial derived from the share of the revenues and taxes charged in the Park, the infrastructural developments and social services, the creation of institutions that ensure the sustainable use of resources in benefit of actual and future generations, the creation of regulations that restrict the free access to the resources, access to the sacred places and of cultural value, the development of sustainable agriculture practices, and generation of incomes from craft selling and tourism services.
- Part of the revenues and taxes collected in the Park, will be driven to the local communities, through the zone committees.

4.5.1. POPULACIONAL SETTLEMENT

a) Issues and Conflicts

- The connection of the islands with the adjacent continental part is narrow. The contact with the mainland for trade, marriages, labor acquisition for the islands, search of cultivation areas for the islanders and others.
- Being a tourism development area where work conditions and possibilities of business development do exist, there are verified in the archipelago, intense, temporary and permanent movements of population.
- About 90% of the hotels workers come from the continent, creating negative development social aspects in the population neighborhoods. There is an increase of population as result of this factor.
- Future perspectives shows that if there is an increment of inhabitants in the island, there will be an increment of negative impacts and pressure on the resources and the Park biodiversity.

b) Objectives

- To reduce the demographic pressure on the area and create a solid base for the development of community management programs.

c) Management Strategies

- Population settlement policies for the population in the Park should be defined in a short term at Local and District level.

- In order to create a solid basis for the development of community administration programs, reduce the demographic pressure and to protect the biodiversity, there are recommended the following actions:
 - Only local communities established in the islands, with long experience of fishing, the tourism establishments' employees and park workers can reside in the archipelago.
 - The local communities will be encouraged not to allow, the settlement of populations from the mainland, with interests of residing in the archipelago, through co-management actions with the committee zones.
 - The local administrative services in collaboration with the administration of the Park will be annually qualified to register the resident population in the archipelago, and control the population movements and the establishment of new habitations.
 - The tourism establishments will be responsible for the systematic control of entrances and exits of their workers. The recruitment of labor to the hotels should be acknowledged to the Park administration.

4.5.2. ECONOMIC AND SUBSISTENCE ACTIVITIES

Fishing Activities

a) Question and conflicts

- The artisanal fishery and the use of marine resources constitute the main activities in the archipelago.
- One of the largest concerns in the use of the marine resources is its free and uncontrolled access, mainly by the continental fishermen.

The main problems linked to the fishing activities are:

- Unlicensed and uncontrolled fishing.
- Licenses issuing for the archipelago without the previous knowledge by the Park administration.
- Artisanal, semi-industrial and industrial fishery for fleets and embarkations from the mainland with commercial objectives, whose impact is ignored, and competing with the local handmade fishermen. The Park presently is facing the conflicting fishing law, which authorizes the Province licensed fishermen to exercise fishing activities in the Park.
- Use of mash nets, affects the survival threatened and in extinction species, such as dugongs, dolphins and marine turtles.
- Destructive fishing in the areas of coral reefs and marine reserves.
- Overexploitation and unsustainable collection of species with economic value such as lobsters, holothurians and sand oyster.

b) Objectives

- Guarantee and to establish forms of sustainable use and control of marine resources by the local communities.
- Maintain the subsistence activities of local communities and of resources users from the adjacent area of the continent.
- Protect the endangered marine species and other fragile marine habitats of extinction.

c) Management strategies

- Only the artisanal fishery and marine resources exploitation are allowed inside the Park limits.
- Manual dragging and line fishing, diving for lobster, collection of mollusks, and the use of fishing traps (gamboas) by the local communities in zones of limited use, are allowed.
- Semi-industrial and line fishing by the continental fishermen in multiple use zones is allowed.

Inside the Park limits will not be allowed:

- The industrial fishing, the use of mesh nets, the use of explosive and valves traps and submarine fishing by continental fishermen.
- All fishing activities in the Park need license and the its issuing shall have the opinion of the Park administration, either for handmade or for semi-industrial fishing.
- The licenses for the shells commercialization and other ornamental products will only be issued to the local communities.
- Drag nets should have the mesh length, width and size the authorized by the marine administration after consultation to the Park Administrator.
- The sand oyster (mapalo) can only be collected through the use of traditional baskets. It will be prohibited the use of rake, plastic bags and the processing in the zones close to catches banks. It will be motivated, the respect of reproduction seasons.
- The continental people should only collect sand oyster in multiple use zones.
- Holothurians cannot be exploited in the Park unless with license issued by the Marine Delegation, after written authorization of the Park administration in coordination with the community committees.
- The local communities, through the zone committees, in collaboration with the Park administration and Marine Delegation, can establish prohibitions periods for any marine species.
- The local communities, through the community zone committees, in collaboration with the Park administration, shall continue to develop possible strategies of management, through community programs, inspections and monitorings of the marine areas, including the adoption of solutions for uncontrolled problems and unsustainable use of the resources, to guarantee the conservation of species and habitats.

Other relative aspects of fishing activities are approached in the chapter related to the habitats and marine resources managements.

Agriculture

a) Issues and Conflicts

- Agriculture in the archipelago is practiced in the Bazaruto and Benguérua islands, with subsistence ends. This is practiced in the low zones, humid of swamp forests and in the dunes using sequeiro regime.
- The problems related to these activities are: inadequacy of lands with agricultural aptitude, due to sandy soils, poor in nutritious and easily eroded.
- Shifting cultivation practices in dunes, devastation of vegetation enriched areas and forests and the annual opening of new areas for cultivation.

b) Objectives

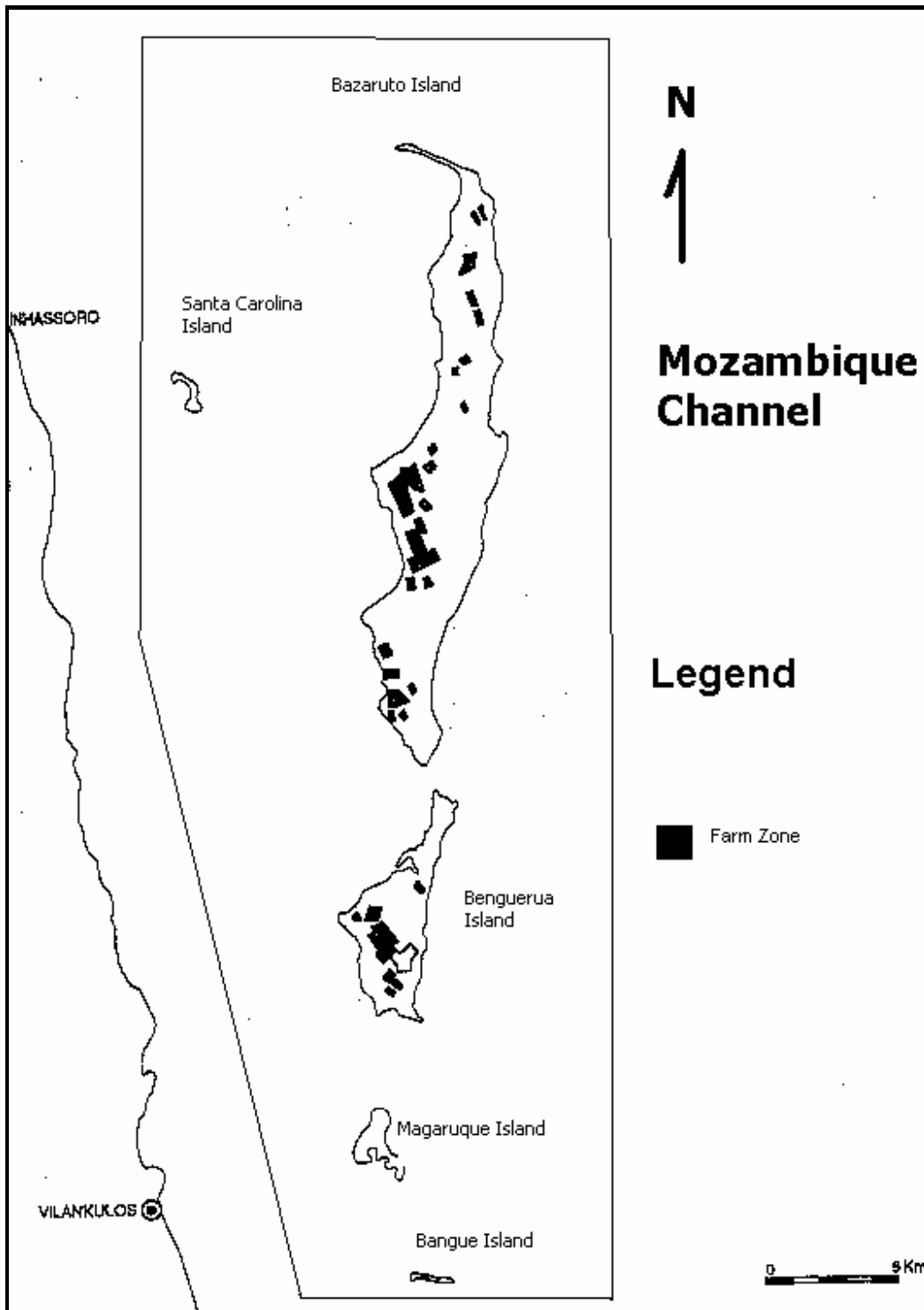
- Reduce the agriculture practice in the dunes, and in ecological sensitive areas.
- Motivate the local communities to practice permacultura using organic fertilizers and carrying out reforestation actions.

c) Strategies

- Local communities shall practice agricultural activities for subsistence inside the Park limits.
- The agriculture practice is only allowed in community use zones accordingly to the zoning.
- Practice of agriculture in the dune shall be interdicted in the dunes. The zone committees should in coordination with local administrative authorities and the Park administration identify suitable areas for agriculture practice.
- Local communities will be encouraged to introduce intensive agriculture methods, in small areas, increasing the density of cultures per area, and reducing the size of the cultivation fields. It will be motivated the use of improved seeds and permacultura.

Other aspects related to agricultural activities and reforestation are dealt with in the chapter related to management of habitats and terrestrial resources.

Figura 6. Mapa – áreas de cultivo



4.6 COMMERCIAL DEVELOPMENT

4.6.1 Tourism

a) Issues and conflicts

- Tourism is recognized as an important source of income and hard currency for the country, particularly in this Archipelago, being recognized as a tourism jewel in the region, due its natural landscape beauty, species, marine and terrestrial habitats richness.
- According to the National Tourism Policy, the archipelago is characterized for lodging tourism of high class and low volume. Actually there are six hotel settlements in the archipelago: two in Bazaruto Island, one in Santa Carolina Island, two in Benguérua Island and one in Magaruque Island.
- In 1995, the National Tourism Policy established non permission of more lodging entrepreneurs in the archipelago, allowing for the possibility of expansion of the existing hotels. However, new concessions did happen in the archipelago. There is a need to evaluate the current hotel carrying capacity of the archipelago in order to determine the maximum number of hotels allowed in the area and at same time to promote ecotourism.

b) Objectives

- Ensure that the tourism development in the archipelago development is planned, avoiding negative social, economic, cultural and environmental impacts.
- Promote tourism development that enhances the archipelago image and generates revenues finance management activities in the archipelago and benefit local communities.
- Allow for the establishment of recreation facilities according to the ecological and social conditions of the archipelago for both national and foreign tourists.

c) Management strategies

Habitat protection

- Identify and inform the hotel managers the localization of key habitats that will need future protection in areas next to hotel concessions (Park Administrator, Biologist, and Sociologist).
- List all activities that can be carefully implemented in the archipelago without disturbing the ecological integrity and resources sustainability (Park Administrator, Biologist, Sociologist)
- Promote awareness campaigns close to the hotels on the need of observing seasonal restrictions in areas of species protection (Park Administrator, Biologist, Sociologist, Rangers).

Co-management between the hotels and local community

- Promote collaboration between the park administration and hotel operators, through permanent dialogue.
- Identify conflicting areas between the hotels and the local community (Park Administrator, Biologist, and Sociologist).
- Establish a committee that facilitates the communication and understanding between park administration, hotel operators, local communities and local authorities (Park Administrator, Biologist, and Sociologist).
- Establish mechanism the hotel operator's contribution in management activities, through support in patrol activities, monitoring and other services.

Maintenance of the aesthetic value of the habitats

- Establish with the hotel operators alternative mechanisms for the movement of motor vehicles in the beaches and other sensitive habitats (Park Administrator, Biologist).

Resources use and energy source

- Negotiate with hotel operators alternatives related to the use of new improved technologies of water extraction and sewerage systems, according to tourism regulations (Park Administrator, Biologist).
- Establish norms to ensure that resources for construction and energy supply are acquired in the mainland (Park Administrator, Biologist, Sociologist).

Population control

- Ensure that the hotel operators use their concession areas to lodge the hotel workers residences (Park Administrator).
- Establish agreements with hotel managers to control the limits of labor from the mainland. Negotiate the possibility of creating single workers' neighborhoods, restricting the establishment of their families in the islands, avoiding the increment of the population size in the islands (Park Administrator)

Financial benefits

- Establish legal mechanism which guarantees that the benefits coming from the tourism and other local income are distributed among local communities, park administration and others involved (Park Administrator, Sociologist).
- Investigate with the hotel operators and local communities, the possibility of creating an **Archipelago Management Society**, where the revenues are shared.

Monitoring and Research

- Monitor hotels' activities, ensuring that they develop ecologically sound activities.
- Study the socio-economic and cultural impacts of tourism development in the archipelago.
- Assess the environmental impacts of tourism development in the archipelago.

d) Regional zoning of tourist areas

- Concession areas of the hotels are considered zones of intensive use. In areas where these concessions include zones of dunes or marine reserves the considered zoning according to the wild zones, protected zones or zones of limited use classification categories.

e) Activities in the zoning area

(i) Intensive use zones

Norms for tourism activities in these zones

- Resource use and sportive activities.
- Any recreational fishing activities need a fishing license establishing a fishing quota, issued by the Park administration.
- The fish caught by the recreational fishermen shall not leave the archipelago.
- Recreational activities such as swimming, sailing, aquatic-ski, tag-and-release fishing, flying fishing, volleyball, beach games and trail walking are allowed activities in these areas.

Vehicle movement:

(ii) Terrestrial zone

- The administration of the park should maintain the dirty roads system inside the islands. The pavement of the dirty roads shall be improved with oyster shells, sand or other material and the adjacent vegetation should be cut to facilitate the traffic.
- In the Bazaruto and Benguérua islands, movement of motor vehicles is authorized along the existing dirty roads. In these islands, new dirty roads can only be opened with prior permission of the park administration.

- The vehicles should only use the existing the dirty roads and the existing small roads in the Benguérua island should be closed for movement. On this issue, an agreement should be promoted between the hotels and the Park about the norms of use of those secondary roads.
- It is not allowed to asphalt or cement the dirty roads in the park.
- The vehicles speed should be regulated, to avoid disturbance of fauna and the aesthetic quality.
- As far as possible, the landing-strip in Bazaruto and Benguérua islands should be asphalted or cemented, to improve safety measures and to preserve the habitat.
- The opening of new landing strips should not be authorized in the archipelago without prior opinion of the Park administration and the civil aviation authorities.

iii) Inter tidal zones

- The vehicles should only transit in the zone among tides in order to guaranteeing that the soil disturbance lasts as long on tide cycle.
- From October to March of every year, it will be restricted the movement of vehicles along the beaches where turtles spawns occur.
- Motor vehicles should not transit on the sand banks for loading and unloading boats. Sand banks are sensible zones and vehicles trails disturb the layer of algae that protect them, avoiding the flow of waters on the surface of these. Such, induces to a change in the movement of the sediments currents in the sand banks.
- The movement with motor vehicles along mangroves should be restricted to the minimum. These zones are fragile and do not stand the high impacts of the vehicles traffic. The vehicles trails produce small channels that alter the movement of water direction. In Bazaruto island, next to Zengueleno an alternative road should be established avoiding the line of the mangroves and it should move towards the Mbiti lagoon.

Vehicles management

- The park administration should control the number of vehicles in the archipelago. Introduction of new vehicles should have prior permission of the park administration.
- The hiring of vehicles to the tourists shall always be accompanied of drivers. The tourists shall never drive.

- In order to reduce soil erosion, the vehicles shall use radial tires.
- Vehicle washing shall be done in solid surfaces to avoid oil absorption by the soil. Oils shall be removed by absorbents and thrown in the mainland.

Boats and other means of marine transport

- The Park administration should establish the limit of boat limit in use in the hotels. Introduction of new motor boats in the archipelago should have prior permission of the Park administration.
- Tourists shall not introduce boats or Yates in the hotels, without prior permission of the Park administration.
- Tourists owning or hiring boats coming from the mainland should announce their arrival in the Park administration, guards and fiscal camp or in the hotels.
- The boats should only anchor in areas designated for this purpose or in front of hotels and park camp

Infrastructures

- The hotels should promote the use of local material in the construction, covering and ceiling establishment. Exceptions are opened for specific architectonic standards, such as warehouse for flammable products and kitchens.
- At level of the archipelago, the constructions shall not be more than two floors higher.

Construction materials

- It is prohibited the extraction of rocks, coral and other rocky materials because it induces erosion.
- In Santa Carolina island, it is prohibited the use of beach sand for construction. The size, the ecological zoning and the critical status of the island, does not allow removal of beach material, because it accelerates erosion and degradation process.
- The extraction of sand in the other islands shall be done with care in specific zones, to avoid erosion and shall have prior permission of the park administration.

Water supply

- Regular tests shall be conducted to assess the water quality and define if it is potable. Studies shall be taken to assess the contamination of subterranean water by the sewers system. A copy of these results test shall be given to the Park administration.

Treatment of residual water

- The hotels and other infrastructures should establish a sewer system treatment, ensuring that residual waters meet the international standards. The administrations of the Park are responsible to establish the criteria for the water quality assessing.
- The hotels should realize tests on residual water to avoid contamination. The water quality should meet the recommended quality standards and only qualified entity should realize these tests. A copy of the test result should be given to the Park administration.

Energy supply

- In order to avoid that the oils from the hotel machine houses are absorbed by soils, it shall be demanded cement pavements in those facilities.
- Fuel storage should be safe and without overflowing risks. It is strictly recommended the use of elevated tanks.

Treatment of residues

- Organic residues must be used as fertilizers.
- Paper derived garbage must be regularly burned.
- All inorganic and not biodegradable residues such as cans, bottles and plastics must be compressed and transferred to the continent for recycle. The administration of the Park and the hotel operators must establish agreements with the authorities of the Vilanculo district to empty its residues in this zone.
- All the oils and toxic residues must be conserved in closed containers and transferred to mainland.
- Boat and vehicle carcasses should be transferred to mainland.
- The hotels and other agents, in collaboration with the Park administration must promote campaigns for litter removal along the beaches and hotels. This must be a joint activity where is promoted environmental education campaigns to the local community, tourists and other resource users.
- The hotels must be responsible for keeping their concession and beaches around clean.
- The hotels must have dustbins available in their concession.

Infrastructure

- No construction or infrastructure shall be established in zones of potential erosion.

- No construction or infrastructure shall be established less than 50 meters from the anterior side of the dune.
- No infrastructure shall be established close to the dunes.
- No infrastructure improvement can be carried out by the hotel operators without the say of the Park administration. Namely opening secondary roads, landing strips, drainage channels, dams and other construction.
- The establishment of any infrastructure must be done with minimal removal of trees and other vegetation.
- The establishment of stepping-stones in the hotels should be done with care, to avoid erosion and damage in the vegetation.
- The hotels must promote environmental impact studies in case of extensions of the existing facilities, through a competent and recognized entity, and follow the recommendations.

Yards gardening

- The use of chemical fertilizers should be regulated due to soil porosity and its incapacity to retain nutrients. The impact can be severe to the vegetation; this could break the hydric and osmotic balance, polluting the subterranean waters, sand banks and marine environment with chemicals.
- The use of exotic ornamental plants should only be restricted to the hotel installation.

f) Monitoring

- The Park administration should regularly monitor the hotel activities to ensure that the norms are being accomplished.
- In the maintenance of the aesthetic integrity of the archipelago and the ecotourism norms.

g) Success indicators

- Tourist operators and local communities participating actively in the Park management, following the established norms.
- Hotel operators creating facilities to local community through compensation and income canalization.
- Tourist following all the Park rules and norms.
- Minimal vehicles impact in areas where traffic is allowed.

h) Research

- Study the impact of tourism development in the archipelago.
- Study the possibility of new tourism facilities in the archipelago, through carrying capacity assessment.

Camping

a) Issues and conflicts

- The Bazaruto archipelago was conceived according to the National Tourism Policy, to develop high level and low volume tourism.
- The establishment of camping areas in the archipelago facilitates the access for both national and foreign tourist with low income to contemplate the landscape value of the archipelago.
- The Park administration is responsible to evaluate, together with local communities and hotel operators, the viability of the establishment of this type of tourism in the region.
- These activities can be additional sources of revenue to the local community and the park.

b) Objectives

- Create opportunities to both national and foreign tourist with low income to contemplate the landscape wealth of the archipelago.
- Establish recommendations on the establishment of camping areas and its management.
- Promote norms of use for these areas, without interfering with high level tourism development in the region.

c) Management strategies

- Meetings between tourism operators, local community and authorities and the Park administration shall be held to assess the viability of camping area and decide about its usage.
- Regulate the management of camping area, on which it will be specified the tutorship, who does the management, the role of local communities, the role of the Park and the hotel operators or concessionaries including the benefits share among them.
- Carry out viability studies about the maximum capacity of tourists camping in the area, types of facilitation to be offered and the type of infrastructure development. The study shall be submitted to the archipelago management committee for analysis.

- Start the camping developments in the archipelago.

4.6.2 Crocodile farms

a) Issues and conflicts

- The exploitation of crocodiles in Bazaruto archipelago lifts a concern in the ecological point of view.
- Lifts a concern in the ecological sustainability point of view.

b) Objectives

- Establish recommendations about crocodile exploitation in farms and its management in natural habitats.

c) Management strategies

- Evaluate the viability of this type of activity in the archipelago (DNFFB, Park Administrator, Biologist)
- Evaluate the use of the local resources for the support of this activity (e.g. fish and eggs collected in the nests) (Park Administrator, Biologist)
- Evaluate the financial viability that these enterprises bring to the archipelago (Park Administrator, Sociologist, and Biologist).
- Monitor the species and quantities of fish, and other food sources given to the crocodiles.

d) Activities in zoning areas

- The creation of crocodiles in farms, occur only in the zones of intensive use, in spite of the eggs collection from the nests occurring occur in zones of community use, margins of the wild zones (in the dunes of sand next to the lagoons) and in mainland.
- To obtain fish which serves as food to the crocodiles, other zones are also used. The catch is from community use and multiple use zones. In these terms it is considered that the creation of crocodiles, covers all zoning categories.

e) Monitoring

- In the numbers of nests found per season.
- In species, amounts and sources of fish that is used as food to the crocodiles.

f) Success indicators

- End of the exploitation of crocodiles in farms in the archipelago and its transfer to mainland.

4.6.3 Sport fishing

a) Issues and conflicts

- It is defined as the fishing activity practiced for amusement, competitions and search of trophies. It is practiced as leisure activities, without intention of obtaining food or income.
- In the archipelago this activity is realized by different groups, nationals and foreigners, and sometimes without observance of the norms for the exercise of this or knowledge of the existence of a conservation area.
- Sometimes it is observed an indiscriminate capture of fish species, and exportation of fishing trophies for the mainland and countries in the region.

b) Objectives

- Ensure that the archipelago continues to produce quality fishing trophies during the management program implementation, with objective of conservation, sustainable use and income generation at the local level.
- The management activities aim still at the valuation and preserve the country tourism potential and create interest to both nationals and foreigners sport fishermen.
- Control the activities of sport fishing in the archipelago area.

c) Management strategies

Habitat protection

- Inform the hotel operators the norms of sport fishing activities in order to have the practitioners knowing the areas where fishing is allowed (Park Administrator, Sociologist, fauna guards)

Species protection

- Disclose the norms on the protection of pelagic and benthic species, type and use of materials, technologies and arts of fishing sport acceptable in the archipelago (Park Administrator, Biologist, Sociologist, fauna guards)
- Issue sport fishing licenses for tourists (Park Administrator).
- Promote the fishing art of marking and returning to the fish to the sea (Park Administrator, Biologist, Sociologist, fauna guards).
- Monitor and to patrol the fishing zones, in order to ensure the norms and park rules enforcement (Park Administrator, Biologist, Sociologist, fauna guards).

Benefits to the park and the local communities

- Negotiate the possibility of generating benefits to the park and to the local communities, through issuing to the tourists payable licenses for sport fishing during the fishing competitions (Park Administrator).

Monitoring and research

- Train the fishing guides of the hotels and boat sailors on the identification of the species of fish and in the filling of sport fishing cards that shall be distributed to the fishermen (Biologist).
- Maintain the fishing capture registries in the hotels and send to ORI or IIP for processing (Park Administrator, Biologist).
- Ensure that the results of fish capture processed by the ORI or IIP are given back to the Park and disposed to general knowledge (Park Administrator, Biologist)

Understanding environment

- The institutions that promote the sport fishing competitions must create an understanding environment with the local communities and the Park, executing the norms of these activities, filling the registries cards of fishing captures, and address the benefits from these activities to the local communities and to the Park.

d) Activities in the zoning area

- Fishing activities must take place in the multiple uses and of extensive use zones. These zones, allow the exploitation of fish as a resource for recreational fishing, and should consider the fishing art of line for pelagic fish. In both zones, it should be promoted the art of marking and returning the fish to the sea

e) Monitoring

- The use of capture registries cards must be compulsory, scoring all the captures. The processing system of these cards should be improved and maintained.

f) Success Indicators

- Regular filling of the fishing cards for all captured species.
- Organization of sport fishing competition with the consent of the Park administration

d) Research

- The dynamics of the beak fish population (e.g. Marlin and Sailfish) at the archipelago level.

4.7 EDUCATION AND ENVIRONMENTAL AWARENESS

a) Issues and Conflicts

- Following the elaboration of new limits proposal to the development of the regulations, and management plans for the Park, there is a need to improve the awareness level to the local communities and of adjacent continental zone, and visitors to the archipelago, about the its ecological value and existence of a conservation area in the region.
- It will be necessary increase the awareness and knowledge of the local and of mainland communities in order to obtain their collaboration in the management activities in course in the archipelago.

b) Objectives

- Provide environmental education to the local communities, local and District authorities, resources users, tourists and visitors, hotel operators and researchers.
- Promote understanding and knowledge about the Park, its regulations, problems that affects it to the local communities and resources users in general.
- Promote training actions to individuals linked to environmental sciences.

c) Management Strategies

- Administer close to community zones, tourism establishments, tourists and visitors and areas adjacent to the continent, lectures about the Park and its conservation and sustainable resources use needs.
- Provide environmental education materials for local communities, schools, tourism establishments, tourists and visitors, and authorities of the adjacent continental zone, through divulgation of posters, pamphlets, audiovisual and others.
- Publicize the regulation of the Park and management plan to local communities, schools, tourism establishments, tourists and visitors, and authorities of the adjacent continental zone, in order to have the collaboration of these in the management of the Park.
- Encourage visits to the Park by school groups accompanied by teachers and by tertiary institutions students..

4.8 FINANCIAL ADMINISTRATION OF THE PARK

a) Issues and Conflicts

- The high costs of the Park and Archipelago management are currently being covered by external financing sources from donors. The available funding is not enough to cover the current levels of operational costs.
- The sustainability Park administration and management activities are dependent on a future retention of a portion of the income generated locally, for the benefit of local communities, for the Park and the archipelago in general.
- Studies carried out in the archipelago showed that tourism and fishing activities may represent the potential sources of income for a long term sustainability of the archipelago.
- Currently there are no legal mechanisms enforcing the retention of revenues in favor of the local communities and for the Park operational disbursements.

b) Objectives

- Ensure, in the long term, the establishment of mechanisms for the self sustainability of the Park through income generated locally.
- Establish benefits sharing mechanism for the income generated locally.

c) Management Strategies

- Establish legal mechanisms of retaining part of the income generated at local level for the benefit of the archipelago.
- The Park, in collaboration with the administration committee of the archipelago and hotel operators, will carry out control of registries of tourists' entrance. In the first month of every year, the hotels will make the transfer of the collected taxes Park, to be shared by the beneficiaries.
- Establish a base of the income sharing for the funds generated locally as guarantee to the self sustainability of the Park and promotion of conservation activities.

Beneficiaries	% of Income Sharing
Local community	30 %
Park administration	30 %
Provincial and District authorities	25 %
Fund for the promotion of agriculture and rural development	15 %

- This sharing mechanism intends to compensate and benefit local communities for the restrictions imposed in the use of the local resources. The Park needs income to cover the management activities and services. It is intended also to benefit the Provincial and District authorities in order to promote its development, reducing the pressure on the archipelago. The Fund for the Promotion of Agriculture and Rural Development benefits from part of the generated income to cover its operational costs.