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Literature Review on the Quirimbas National Park, Northern Mozambique

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Foreword

This literature review is part of an applied Eastern and Southern Africa Partnership Programme (ESAPP) of the Centre for Development and Environment CDE, University of Berne, Switzerland. The project's name is „Synthesis of experiences on integrated management of protected areas and its implications for the Quirimbas National Park, Northern Mozambique". The project started in February 2005 and its mission is "to draw on eperiences from CDE and from the NCCR working group "People and Protected Areas" from all over the world to contribute to the further formulation, jointly with the local stakeholders, of priorities and approaches for an integrated management of the Quirimbas National Park".

This literature review is a first step in this project and has the objective to identify the main issues -problems and potentials- for an integrated management of the newly established Quirimbas National Park, looking at the institutional, the ecological and the socio-economic context.

1. Introduction

The Quirimbas National Park in Mozambique's northern-most Cabo Delgado province is not only a conservation jewel but also represents a globally significant conservation achievement. The park covers an area of 750.639 ha of which 598.402 ha are terrestrial and 152.237 ha are marine and island habitats. The southernmost eleven islands of the Quirimbas Archipelago (a chain of 28 islands stretching from the city of Pemba to the town of Palma) are included in the park.[1]

The importance of the area in terms of biodiversity becomes clear when we consider that the central and coastal districts of Cabo Delgado Province contain four of the WWF's Global 200 eco-regions. These four habitats are:

- Southern Inhambane-Zanzibar Coastal Forest (No. 23)
- East African Mangroves (No. 118)
- Eastern Africa Marine eco-region (No. 193)
- Eastern Miombo Woodlands and Savannahs (No. 55)

The marine area of the park has been surveyed in some detail by Frontier Mozambique[2] showing that the coral reefs are diverse and important regionally (or globally). Unlike the marine area the terrestrial areas of the park have only been scarcely visited. The overall biological value of the area remains unknown. It is simply known that an important population of elephants is found here, but lists inventories of the plants, birds, smaller mammals, amphibians and reptiles are not available. This hinders the development of a comprehensive management plan for the park, and also hinders the parks possibilities to receive funding from agencies which need to know the biological importance before they can release funds.[3]

It is important to notice that the establishment of the park has been called for by the local communities in order to help address serious conflicts with wildlife and to gain security for the natural resources they depend on. According to WWF: This offers an opportunity for an exemplary model of sustainable development, integrating conservation and wise resource use, helping support livelihoods and food security for the local human populations.

Although a great potential and a promising source of revenue and employment in the area is the development of environmentally-responsible nature-based tourism[4] the park and its management meet a lot of challenges such as the extreme poverty of the local population and the difficulty to integrate local actors in the park management, resource degradation (over-fisheries in the marine part and soil degradation in the continental part), a lacking infrastructure in the continental part of the park which hinders its development and conflicts between humans and wild animals (especially elephants).

[1] http://www.wwf.org.mz/index1.php?pg=projects_quirimbas&lang=en
Notice that the history of the park concept can be found on this homepage
[2] www.frontier.org
[3] http://www.tfcg.org/pdf/article_mozambique.pdf
[4] http://www.wwf.org.mz/index1.php?pg=projects_quirimbas&lang=en

2. Institutional Context

2.1. Peter and Ruth Bechtel: Seminar on the Creation of a National Park in the Province of Cabo Delgado[5]

On the 13th/14th of December 2001 a seminar on the creation of a National Park was held in Pemba. The seminar was co-hosted by the local NGO Gecorena and the Provincial Department for the Coordination of Environmental Affairs and it was financed by the WWF.[6] A survey team of 6 people presented their research findings as well as the proposed zoning plan and management plan for the park.
The Governor highlighted the importance of combined effort between the government, the private sector, the local communities and NGOs in the endeavour of the declaration of a National Park. He emphasised the need to base such initiatives within the context of the Provincial Strategic Plan and the concepts of sustainable tourism and the preservation of biodiversity, all of which are possible through conservation protection and sustainable management of the natural resources of Cabo Delgado.
Further remarks were made by the national representative for WWF, Dr. Helena Motta.[7]

The objectives of the seminar were: To improve the concepts of the park, to create a consensus about the zoning plan and the park management log frame and to present research findings and proposals to the decision-making structures (stake holders at provincial and national level).

The Park was divided into 4 types of zones:[8]

1. Sanctuaries: where there shall be no extractive activities of any kind
2. Reserves: where there shall be some restricted extraction activities
3. Zones for Population Use: for use by the residents of the area
4. Buffer zones: for the protection of the Park

According to the research team, the concept of the National Park will turn the area's problems into opportunities, as:

- the poverty of the population is a motivating factor for the development of new livelihoods strategies (tourism);
- lack of industrial development means the existence of natural resources;
- difficult access and isolation means new destinations for tourists as well as strong tradition and culture;
- conflicts between wild animals and people means the existence of animals for the tourism industry.

The basic principle proposed for of the park is the "African Stove" (Fogão Africano)[9] which has three corner stones that represent the fundamental concepts of the park's formation: 1. Ownership: the Park belongs to the inhabitants, 2. Benefit: the Park brings benefits for all, 3. Responsibility: benefits for all motivates strong management and sustainable use of the natural resources.

[5] The following is a summary of the "Report for the Seminar on the Creation of a National Park in the Province of Cabo Delgado"
[6] A list of the participants can be found in the "Report for the Seminar on the Creation of a National Park in the Province of Cabo Delgado"
[7] See the "Report for the Seminar on the Creation of a National Park in the Province of Cabo Delgado", Annex 4
[8] Note that in the Plano de Maneio 2004-2008 (See also Annex B) only three zones are determined.
[9] See also page 23

The research team had met with representatives of the communities and they consulted 40 communities. In these meetings, the idea of creating a park was presented to the people and preliminary zoning was carried out, marking areas of population use and those of animal and vegetation concentration. The agreement between park authorities and local communities was the following: In return for their acceptance of the park and shared responsibility for its management, communities would also share in the benefits of the park and would participate in all management decisions which might affect their lives.

2.1.1. Recommendations and Key Issues

The participants accepted the zoning proposal and the maps presented by the research team and contributed the following points:

- A suggestion was made to increase the boundaries of the park in the southern part from the Massaiga- Mareja Road (the present boundary) to the Muagide river (proposed boundary). The team was requested to look into the impacts of a) including this piece in the park, or b) maintaining it as a buffer zone;
- It will be difficult for people and animals to share the same water sources. The project will have to consider creating alternative water sources where necessary;
- If people are to be moved from the sanctuary and conservation areas to the zones of population use, it should be ensured that these population zones are agriculturally productive;
- The zoning procedure should not force people to move from one place to another, but should create incentives to motivate people to move by choice;
- There should be no sanctuaries outside the park;
- The boundaries of the elephant corridor need to be identified and marked;
- The park boundaries can be marked with painting trees that grow on the boundary line. Another suggestion was to put boards with written warnings around the park boundary.
- If fishing with mosquito nets and cloth are prohibited (which fishing is done by women) what will be the alternative for the women fishermen? It will be necessary to look into this aspect;
- It was suggested that heavy taxation should be applied to fishermen from Nacala and existing legislation should be applied to fishermen from Tanzania. However, some of the participants were strongly against the discrimination of Mozambican citizens from Nacala. To resolve the issue, it was agreed that all fishing should be licensed, and that local communities should have a voice in the issuing of licenses, the creation of local fishing policies, and participate in marine fiscalisation;
- Licensing for all fishing should be introduced all over the Province.
- Consultations with the communities should be maintained during all the necessary processes. Community representatives should take part in decision making;
- Communities should be educated/trained in environmental issues in order for them to make informed decisions.

At the end of the seminar **six specific objectives** were set, from which the main ones are:

1. "To protect, conserve and restore….all the natural resources of the park and its area of influence."

2. Priority should be given to the following activities:
In the marine section:

- Implementation of fisheries co-management programme to regulate/license fishing within the park; establishment of similar programme to regulate community resource

extraction in reserve areas and buffer zones, with particular attention to mangrove, prawn, intertidal resources, timber, wildlife, and rare/endangered plants;
- Investigate the effects of seine-netting; develop a policy in collaboration with local community users;
- Net exchange programme, illegal nets for legal ones, in the first year of the park;
- Development of policy and management programme for the Rio Montepuez and Tandanhangue prawn fishery that favours capture (and thus management) by local community residents.

In the continent section:
- Development of livelihoods alternatives in community growth areas. Specific programmes already identified include goat production, cashew production, sesame production, irrigation development, community timber and bamboo harvesting, and others to be identified (aqua-culture of algae, etc);
- Control of problem animals in community growth points and on park borders (also on agricultural areas defined within 'reserve' zones).

And in general:
- Strategic alliances with other developmental actors to promote the above (NGOs, donors, tourist operators, etc.);
- Training, liaison, and informational support to local residents to take advantage of tourism opportunities (contracts to supply foodstuffs or services, etc.).
- Community education programmes as needed.

3. Suggestions regarding activities:
- Elaboration and implementation of construction and rehabilitation regulations conserving original design and architectural styles;
- Creation and formalisation of an authorising body to approve/reject/modify building plans in collaboration with government and local NGOs;
- Creation of awareness within the local communities about the conservation of existing resources;
- Formulation of a management plan for the management of these resources;
- Identify, document and publicise the tourism potential of the area;
- Create, inside the park, centres for cultural interest and for entertainment;
- Construction and rehabilitation of access roads;
- Protect the existing eco-system;
- Create incentives for initiatives for using/ exploring the region's touristic resources.

4. and **5.** Suggestions regarding activities:
- Elaboration and implementation of construction and rehabilitation regulations 'conserving original design and architectural styles'
- 'Creation and formalisation of an authorising body to approve/reject/modify building plans in collaboration with government and local NGOs
- Creation of awareness within the local communities about the conservation of existing resources
- Formulation of a management plan for the management of these resources
- Identify, document and publicise the tourism potential of the area
- Create, inside the park, centres for cultural interest and for entertainment
- Construction and rehabilitation of access roads
- Protect the existing ecosystem
- Create incentives for initiatives for using/exploring the region's touristic resources.

6. "Attract investment to secure the sustainability of the park."

2.2. The World Wildlife Found - WWF

The WWF mentions eleven main reasons for the importance of the area and its declaration as a National Park:

1. The area has been identified as an area of high habitat and species diversity; three areas within it, the Ibo stand mangrove, the Montepuez Bay, and the fringing reef, have been identified as key sites for marine biodiversity conservation, while the Banco de São Lázaro is a unique and important site as well.

2. Park fisheries are extremely important in terms of the provincial economy and the survival of the Muani people and culture; local residents understand the problems facing the fishery and are in full support of the park.

3. The establishment of the park responds to the desire of local communities to sustainably manage their natural resources using a unique blend of traditional and modern conservation techniques.

4. The park area has a diverse undersea topography, creating a variety of habitat types but preventing its use for commercial fishing purposes.

5. The park area provides feeding and/or nesting grounds for sea turtles, dugongs, dolphins, a number of species of sharks and whales, all of which are of conservation importance.

6. The park area has world-class diving and snorkelling.

7. The park area contains three elephant migratory routes, as well as lion, leopard, buffalo, wild dog, sable antelope, eland, and a number of other large animal species. Elephant populations are rising throughout the park.

8. The park area contains a number of important types of miombo forest, coastal forest and thicket, with high levels of plant species diversity and endemism (including Guibortia schliebenii thicket, as yet unprotected in Mozambique). Large areas of undisturbed vegetation exist within the park.

9. The population of the park area is concentrated in four settlement zones, leaving vast areas unoccupied. The population supports the creation of the park.

10. The park area is important culturally and historically, with Arab, Portuguese, and African sites and historical monuments, including the historic town of Ibo and its fortresses.

11. Due to limitations in soil fertility, access, groundwater resources, and other factors, conservation and tourism represent 'best practice use' of the park area.[10]

Further WWF alludes to the Quirimbas National Park's goal and objectives:

The park goal is "to conserve the diversity, abundance, and ecological integrity of all physical and biological resources in the park area, so that they may be enjoyed and used productively by present and future generations".[11]

This goal is supported with six objectives:

[10] http://www.wwf.org.mz/index1.php?pg=projects_quirimbas&lang=en
[11] http://www.wwf.org.mz/index1.php?pg=projects_quirimbas&lang=en

1. to protect, conserve, and where necessary and practical, restore the ecosystem processes and the species and genetic diversity of all terrestrial and marine resources (living and non-living) in the park area and its area of influence;

2. to promote the economic and social well-being of the park's ancestral inhabitants by the promotion of sustainable resource use strategies, by the development of ecologically sensitive livelihoods options, and by prioritising their interests in the economic opportunities deriving from the establishment of the park;

3. to insure that all stakeholders—including but not limited to residents, tourist operators and investors, and park management structures—share both the benefits of and the management responsibility for the park;

4. to protect, conserve, and rehabilitate historical monuments, ruins, and other cultural resources in the park area (including local culture and tradition);

5. to stimulate and facilitate the growth of eco-tourism in the park area, the province, and the north of Mozambique;

6. to insure the sustainability of the park itself by the adoption of appropriate fund-raising mechanisms, cost-effective operational systems, and the development of partnerships with other stakeholders and relevant research institutions.[12]

Obviously there is a long-term concern both with the conservation of the park area as well as the 'conservation' of its human inhabitants. The National Park is intended to be of direct benefit to local users, who will also participate in the management of the park's resources. A main strategy of the park is the harmonisation of potentially conflicting uses. Zoning is an essential tool: Three types of zones are created, allowing for a range of human uses and impacts from total protection to community development and sustainable use. These zones interact with each other in a synergetic way, benefiting all concerned.[13]

Reading WWF's descriptions of the Quirimbas National Park one gets the idea of a very positive and successful development within the area. Although constrains and problems are mentioned it appears as if finding solutions was a rather easy task.

2.3. Gecorena[14]

In 1999 eleven organisations that had been working on conservation and community development came together to form a locally registered NGO, Gecorena (Comité de Gestão Comunitária dos Recursos Naturais, The Coalition for Community Resource Management). The group included members of the Provincial Forests and Wildlife Departments, the Tourism Department, the marine Administration, the Ministry of Environmental Affairs and several local and international NGOs. Gecorena mounted a community-managed conservation protect in the inselbergs of Meluco District with the aim of creating a formal elephant reserve. The communities surrounding the reserve signed letters of agreement supporting the creation of the Putho Reserve. Community development and conservation activities began immediately and game numbers began to increase. The Putho Reserve has been incorporated into the Quirimbas National Park as the Putho Specified Use Zone.

[12] http://www.wwf.org.mz/index1.php?pg=projects_quirimbas&lang=en
[13] A map of the three zones (1. Zona de Protecção Total, 2. Zona de Uso Específico, 3. Zona de Uso e Desenvolvimento Comunitário) can be found in the Plano de Maneio 2004-2008, Parque Nacional das Quirimbas or in Annex B.
[14] http://www.wwf.org.mz/index1.php?pg=projects_quirimbas&lang=en

2.4. Karibo[15]

The Associação Karibo, the Association of Friends and Natives of Ibo Island[16] works in small projects in fishing, goat production and other micro-enterprises for the coastal population, supported by various donors. It was co-founded by Aida Safire and Augusto Omar and became known as a voice for the people, a lobby for the little guy against outside political and economic interests.

Karibo's work with fishermen brought Aida and Omar to realize that the key economic problem of the coastal zone was the exhaustion of fishing resources and furthermore that existing donor programs of handing out fishing nets, boats and fish hooks were unable to solve this problem. They insisted that Karibo join Gecorena and were convinced that the best way to help the Muani people was through the declaration of the Quirimbas National Park. Only through a degree of legal protection could fish stocks be recuperated and marine habitats protected. They understood that conservation as a road to improved livelihoods could only work if the population understood the idea and supported it, which means that it would have to be a bottom-up activity. They realized that existing conflicts between fishermen and conservationists were unnecessary as everybody (fishermen, tourist operators, politicians…) wanted improvements in marine habitats and species.
Aida and Omar had great influence on the park management plan. According to the results of the community consultations they set two priorities: the first was more fish, to allow for more protein and family income; which means the creation of fish sanctuaries to protect key habitats and to allow for the recuperation of fish stocks, the second was the high level of animal/human conflicts on the continent; thousands of fields were being destroyed annually by elephants, which resulted in a human-elephant conflict management programme. A zoning plan was developed which based directly on community maps created during the community consultation process.[17]
Omar was setting up the park's pilot human-elephant conflict mitigation programme and was having steady success in reducing animal human conflict using coconut rope, elephant dung, old engine oil and hot chillies.[18] The programme was working so well that it expanded from 8 villages to more than 25. He organized volunteer rangers in participating villages. The willingness of local communities to participate in conservation activities was very high. Aida concentrated on the organization of marine sanctuaries in key habitats in the park and worked with groups of volunteer rangers.

2.5. L`Agence française de développement (AFD)[19]

Two years after the establishment of the Quirimbas National Park in June 2002 the park had been granted a 4.2 million Euro funding boost from the French Development Agency (AFD). The funds should facilitate the implementation of a five year Park Management Plan (2004-2008) for which WWF is the implementing agency in collaboration with MITVR. The AFD

[15] WWF Press Release, Mozambican Community Leaders of Quirimbas National Park win "National Geographic Society/Howard Buffet Award".
[16] Ibo is an ancient trading and slaving city, now in ruins, and is the spiritual home of the Muani people.
[17] See page 4 and footnote No. 7
[18] To protect the elephants from poaching and the farmers from crop-raiding the chilli pepper cloth is a cost-efficient anti-crop-raiding technique. The cloths are impregnated either by smearing them with grease that has been mixed with chilli pepper powder or soaking them in oil mixed with chilli powder. They are then hung on a wire around the farms. Because the elephants have a highly developed sense of smell and dislike the chilli, simply hanging the cloths around the farms has proved effective in deterring them from entering the farm. The technique is cheaper than installing and maintaining electric fences and easier and quicker than traditional methods such as burning fires and sounding drums. (www.fao.org/newsroom/en/field/2004/52461/index.html)
[19] WWF Sarpo Bulletin, Vol 4 No. 4, July 2004

grant came as an addition to WWF's own commitment of over 1 million Euros towards the park.
The five year project that WWF should implement with these funds included the establishment of park infrastructure, procurement of various equipment, training of park management personnel, such as rangers, biodiversity protection and grant making for community projects aimed at improving the livelihoods of the park's nearly 55.000 inhabitants.

2.6. Aga Khan Development Network

The Aga Khan Foundation began working in the Cabo Delgado province in early 2001. The foundation's North Coast Rural Support Programme started in two main districts of the province: Ibo, a cluster of islands, and Quissanga, the district on the mainland. It gradually expanded in order to reach all of the following 12 districts: Ibo, Quissange, Pemba-Metuge, Macomia, Mocimboa de Praia, Meluco, Muidumbe, Nangade, Mueda, Montepuez, Ancuabe and Palma.
Its broad objectives are to help rebuild the physical and economic infrastructure, improve health and education and create the human resources required to drive and sustain development. Specific projects focus on raising agricultural productivity, increasing family income, promoting economic exchange, increasing the quality of education, improving nutrition and health and increasing the number and effectiveness of village organisations dedicated to solving development challenges.[20]

2.7. Helvetas

In 2001 Helvetas initialised a program for water supply and sanitation in the provinces of Maputo and Cabo Delgado. Existing drinking water facilities are being redeveloped and expanded and new facilities are constructed. [21]

[20] Aga Khan Foundation, Coastal Rural Support Programme (CRSP-M). (More detailed information about the foundation's work in the area is found in this paper.)
[21] For further information see http://www.helvetas.ch/deutsch/projekte/laender/afrika/mocambique_mo37_38.html

3. Ecological Context

3.1. Marine Components - Islands

3.1.1. General Description

Mozambican coastal waters support high and long recognised fish diversity. The number of fish species in major reef systems of Mozambique decreases southwards due to the subtropical subtraction effect. A contribution to the diversity of the Quirimbas Archipelago is the direct input of larvae and gene flow from the south equatorial current. Whittington et al., 1998 mention a number of 375 species found in the reef system of Quirimbas Archipelago.

As reef-associated fishes are extremely affected by the characteristics of the reef habitat species diversity, abundance and biomass of the fish community is positively related to the structural complexity of the substrate and live substrate cover. Therefore in reefs with high live coral cover fish diversity and density is higher than in reefs with lower coral cover. This highlights the importance and need for management actions of the reefs in better conditions.[22]

The islands of the Quirimbas Archipelago are all low-lying (<15m above Chart Datum) and formed from extended outcrops of coral rag. Their vegetation varies from dense woodland to sparse grassland, with many of the islands supporting mangrove stands along their more sheltered shorelines.
The total resident population on the islands was approximately 9000 in 1998, although this was significantly increased by the large numbers of itinerant fishermen that visited the island from Tanzania and Nampula Province. Ibo was the only island with a developed infrastructure.[23]

3.1.2. Biological Survey[24]

Mangroves
The islands support large areas of mangrove (total area approximately 2000ha). It is an important habitat type with eight species of mangrove tree (from the nine species known to occur along mainland East Africa).
Current threats to mangroves were generally low at the time of the survey with the scale of cutting limited and localised in most stands. However, many of the more accessible areas have had the majority of the more prized species removed.

Intertidal
The typical tidal range of four meters and the shallow waters surrounding many of the islands have produced extensive intertidal zones along most shorelines.
The species richness of macroalgae was high, with total of 204 species recorded. The species composition varied between islands. The threats to the status of intertidal macroalgae were low as no species were observed to be utilised by the islands' population. The only obvious impacts were reef trampling by invertebrate collectors and the dragging fishing nets.

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[22] Pereira Marcos, A Review on the Ecology, Exploitation and Conservation of Reef Fish Resources in Mozambique, presented at the second National Conference on Coastal Zones Research, Maputo 27-29 September 2000
[23] M.W. Whittington et al (1998), C.M. Antonio, M.S. Heasman, M. Myers, D. Stanwell-Smith (1998), Darwin/Frontier-Mozambique Quirimbas Archipelago, Marine Research Program: Technical Report No. 6: Results summary and management recommendations
[24] M.W. Whittington et al (1998)

There was a large variety of intertidal invertebrate populations. The dominant fauna was the phylum Mollusca which were subject to a high level of exploitation.

Sea Grass Meadows

Sea grasses constituted the dominant vegetation in the shallow water ecosystems in areas unsuitable for coral reef growth and development. No sea grasses were collected by the islanders. Impacts were limited to damage caused by the dragging of seine nets and trampling during invertebrate collection in the shallow subtidal areas.

The number of fish populations of the sea grass meadows was high (with 249 species being identified) as sea grass beds are home to thousands of small species of animals and plants including seaweeds, sponges, worms, crabs, shrimps, marine snails, starfish, sea cucumbers and fish. Some of these depend on the sea grass beds for shelter, food or as nursery grounds. Much larger creatures like the dugong and marine turtles also feed on sea grasses.

Coral Reefs

The islands supported a diversity of corals comparable with the best found along the East African coastline and a high level of diversity of reef invertebrates. Over 50 genera of corals have been recorded in the area.

The islands exhibited a variety of reef types with the exposed reef as the most widespread type, occurring along the eastern shores of Matemo, Ibo, Quirimba, Sencar, Mefunvo and Quisiva islands. In general, all the reefs were well-developed, in good condition and supported abundant biota.

The species richness of fish at most of the reef sites was estimated to be high, the overall condition of reef areas within the islands was good and the diversity of fish was not limited by the scale and condition of the reef habitat. The status of reefs was good with no evidence of major damage recorded. At most sites anchor damage was recorded but was limited in scale.

3.1.3. Resource Use[25]

Finfish fisheries

The *sea grass fishery* was vital to a large proportion of the islands' community particularly on Ibo, Quirimba and Mefunvo, where it provided the primary source of protein. The fishing was carried out on a subsistence basis as the fishermen had only limited access to refrigeration facilities or transportation to sell fish outside the local area. The heavy reliance on, and resulting exploitation of, the fish populations of the sea grass meadows presents a clear threat to the status of the habitat and the sustainability of the fishery.

From discussion with local communities there was evidence that the high level of fishing intensity observed in some areas (e.g. Montepuez Bay) is a relatively recent development. The majority of fishermen have moved to the islands in the past decade to either escape the fighting during the civil war, or in more recent years, to find an area of productive fishing following the depletion of their own local fish populations.

The *reef-based fishery* was mainly limited to the more sheltered areas. Handlining and spearing were both employed along all areas of the islands' reefs, preventing the safe use of canoes and traditional sailing vessels close to the reef edge. The exposed nature and corresponding rough conditions on the fringing outer reef appear to protect the resident fish populations from being targeted as a resource by fishermen. Consequently the fish biodiversity is currently under little threat.

[25] M.W. Whittington et al (1998)

Invertebrate collection
The majority of *intertidal invertebrates* were collected on a subsistence basis for consumption at home or barter on the islands for other staple food items. In general it was the adult women that collected invertebrates and the gathering of intertidal resources was one of the most important work components for the women on the islands.
The scale and nature of the exploitation of intertidal invertebrates varied considerably between the islands and was the product of the size of the intertidal area, the distribution of the habitats, the demographics of the human population and the scale of other resource use activities based on the island.
The intertidal collection of invertebrates could be considered a relatively intensive resource use activity and one which poses a threat to the biodiversity of the intertidal habitat. Quirimba Island supported the highest number of collectors due to its extensive intertidal and large population.
During the period of the survey work, the human impact was increasing with the arrival of greater numbers of invertebrate collectors from nearby mainland, Nampula province and Tanzania, especially to the less populated islands such as Quilaluia.

Two resource use activities were observed which may directly affect the diversity and abundance of populations of selected groups of reef invertebrates: The ***collection of gastropod molluscs for the curio trade*** and the ***collection of sea cucumbers***.

The diversity of gastropods within the Quirimbas has attracted commercial collectors and traders to the islands and encouraged the islands' community to regard gastropods as a profitable resource to exploit. A significant number of itinerant fishermen visiting the islands had come primarily for the subtidal collection of gastropods for the curio trade. The collected shells were sold to commercial traders on Ibo and Mefunvo islands and in Pemba. Many shells were bought by the "Luso Africa" company based in Nacala, which exports to Europe. The shift of emphasis for the collection of gastropods from the intertidal to the subtidal areas suggests that populations of the target species have already been diminished considerably in the former habitat. Additionally, given the large concentration of collectors that are targeting relatively small reef areas, it is probable that overexploitation of target species is already occurring in localised areas of the subtidal habitats as well.

Sea cucumber collection occurred on a large scale throughout the Quirimba Archipelago and was almost certainly the most valuable commercial resource use activity. The resident islanders, particularly groups of women and children, exploited the lagoons within intertidal areas. However the greatest numbers of sea cucumbers were taken subtidally from near-reef areas, by teams operating from boats using SCUBA and snorkelling equipment. A large number of these teams were comprised of Tanzanian fishermen who were operating illegally within Mozambican waters.

3.1.4. Vertebrates[26]

Turtles
The status of turtle populations within the country are of international significance as the coastal waters of Mozambique have been identified as an area where at least five of the world's turtle species are known to breed. Three species were recorded within the Quirimba Archipelago.

[26] M.W. Whittington et al (1998)

According to statements of local people many of the islands' beaches have been used for nesting by turtles. But due to the presence of fishermen throughout the islands and the popularity of turtle eggs as a food item, successful nestings are rare events. There is also an apparent ignorance amongst many of the collectors that the activity is illegal. Given this situation, protective measures are urgently required to safeguard the turtle populations of the islands.
Turtles are considered within the archipelago as an edible resource to be exploited. There was no evidence that any of the fishermen specifically targeted turtles, most capture was done during normal fishing activities.

Sea Mammals
The older generation of islanders report that ***dugongs*** were once relatively common around the island, particularly during the wet season. They were a popular food item and there was a folklore surrounding the capture of these animals. The current levels of disturbance from fishing activity and boat traffic probably prevent the return of these timid animals in large numbers although the extensive sea grass meadows around the Quirimba islands would still provide a suitable habitat for dugongs.

Whales were observed close to the islands from June to August during their annual migration up the coast of East Africa. Humpback whales and Minke whales were sighted regularly.
Dolphins were common throughout the islands. Two species were identified, the Bottlenose dolphin and the Humpback dolphin.

3.1.5. Key Sites within the Quirimbas Archipelago[27]

Montepuez Bay
The Montepuez Bay contained extensive sea grass meadows (covering most of the bay area of 60km^2) and supported a large and diverse population of fish. Many of the fish species recorded within the bay were juveniles of reef-associated species, illustrating the important role of the area in the lifecycles of these species.

Mangrove of the 'Ibo Stand'
The 'Ibo Stand' is the largest single stand of mangrove within the Quirimbas (approximately 1700ha), and supported a rich variety of flora and fauna. Human impact on the stand (wood cutting) was of limited scale. Given the size of the stand, it is likely to greatly influence the adjacent sea grass meadow habitats of the Montepuez Bay and the reefs of Quirimba and Ibo islands. It could therefore be important in maintaining the overall levels of biodiversity for a large proportion of the Quirimbas Archipelago.

The coral reefs of the Quirimbas Archipelago
The coral reefs of the Quirimbas Archipelago support a rich and abundant biota. The reefs varied in type and structure, but most support well-developed coral growth and a high diversity of fish life. Due to minimal human impact, the reefs remain in a natural state and are some of only a few reefs in the East African region in this 'natural' condition. The islands' reefs can therefore be regarded as a habitat of both national and regional importance for biodiversity.

[27] M.W. Whittington et al (1998)

3.1.6. Key Sites under Threat[28]

The 'Quiwandala Stand' Mangrove, Quirimba Island
The unmanaged and large-scale cutting of trees in this stand poses a threat to the integrity of the mangrove habitat in this area and is already contributing to the significant coastal erosion problem along the shoreline of the north of the island. Urgent measures are required to prevent further degradation of the shoreline and mangrove habitat in this area.

The Montepuez Bay Fishery
The seine net fishery based in the sea grass meadows of the bay is putting the fish stocks under intense fishing pressure. Although the exact effects of this on the fish populations are not fully understood, it is thought that the current levels of exploitation are too high to be sustainable. Given the importance of the area as a source of vital protein for a large number of islanders and as a nursery ground for many fish species, management controls on the fishery are urgently required to safeguard its long-term sustainability.

The Curio Shells and Sea Cucumber Populations of the Southern Quirimbas
The intensity of collection and the apparent decline in the abundance and diversity of these resources in the more accessible areas indicates that a degree of overexploitation already exists. Urgent management controls are required to safeguard the conservation of these resources.

3.1.7. Management Considerations and Recommendations[29]

Traditional Resource Management and Environmental Education
The long period of civil war and the resulting movement of internally displaced people to the islands, together with the more localised movement of people in search of employment, has meant that much of the resident population of the Quirimbas are relative ***'new-comers'*** to the marine subsistence life. Consequently, the level of knowledge of many of the islanders with regard to the effects of their own activities and those of the itinerant fishermen on the islands' resources is limited. It lacks the significant body of local 'lore' present in many coastal subsistence communities and which often forms the basis for environmental education and resource management initiatives.

There is *little traditional management* of resource use activities and the attitudes of many of the islanders towards natural resources is often to regard them as largely unaffected by human actions. Suggestions of the possible effects of overexploitation are rarely taken seriously. Many of the fishermen have few traditional links with the island and say that they would return to terrestrial agriculture if they can not catch sufficient fish.

The level of *education* within the islands is very low with a significant proportion of the male islanders and the majority of female islanders not possessing conversational level Portuguese and far fewer able to read or write. This denies many of the islanders access to educational material.

Against the background of minimal traditional resource management, prevailing attitudes to human-induced impacts on the resources and the lack of environmental education, the

[28] M.W. Whittington et al (1998)
[29] M.W. Whittington et al (1998)
Take into account that this report was published in 1998 and there have been many changes (especially new laws) since then.

introduction of resource controls and resource management to the Quirimbas Archipelago is most likely to be problematic and requires a sizeable environmental initiative.

Administration within the Quirimbas Archipelago
As a result of the colonial Portuguese administration and the subsequent post-Independence government, the 'village council' style of local administration found in many island communities of East Africa has been replaced by appointees of the central and provincial government. The administration of the islands is organised by the provincial government and most of the islands' administrators are from mainland, non-coastal areas and consequently have little knowledge of the marine habitats.

The financial and logistical capacity available for the administration of environmental issues was very limited. In addition, when efforts were made by an individual administrator to initiate resource management, it was largely ignored by the local population. In other cases, the administration appeared to ignore the presence of large numbers of Tanzanians engaged in the illegal collection of curio trade shells and sea cucumber.

Management and environmental education initiatives for the islands need to include the administration and also provide the capacity for those involved to effectively manage and protect the islands' marine habitats.

3.2. Terrestrial Components

3.2.1. Vegetation[30]

The terrestrial vegetation in the Quirimbas National Park is a mosaic of bamboo, coastal thicket, very dry coastal forest, riverine forest, inselberg forest, miombo woodland, acacia woodland, dambo grassland, palm-savannah/woodland and a succulent-dominated inselberg flora. Mangroves also occur along the coast. There are extensive areas of each vegetation type, both within the park and stretching inland and to the north.
Within the park the wettest forest elements are along the edge of drainage features (seasonal streams and rivers) and at the base of inselbergs. In drier areas away from ground water sources there are extensive areas of vegetation types that follow changes in the soil, locally elevated water supplies, and the effects of disturbance. Extensive stands of bamboo dominated vegetation and typical miombo woodlands are found and these are deciduous in the late dry season. Various kinds of dambo grasslands in seasonally inundated areas were also found in the park. On the margins of these wetlands the vegetation is dominated by palm tree savannah, while in the wettest locations there are pure grasslands over black cotton soils. On the exposed rocky areas, particularly on the inselbergs, a desiccation tolerant flora was found.

3.2.2. Wildlife

In the area of the park the existing species are: elephant, leopard, lion, monkey, hare, wild pig, sable antelope, buffalo, kudu and various types of antelopes.
Most of the conflicts between the animals and human beings occur around water sources, where animals drink and humans grow their crops. Problems also arise when the human population invades grazing areas for animals in search of new agricultural land.
Some of the animals are threatened due to illegal hunting.

[30] http://www.tfcg.org/pdf/article_mozambique.pdf

Elephants

While the illegal trade in ivory remains a real threat, current concern for the survival of the African elephant centres around the reduction of their habitat. The rapid growth of human populations and the expansion of agriculture mean that large areas are now permanently off-limits for elephants. Often, elephants raid fields and destroy crops. Inevitably, loss of life sometimes occurs on both sides, as people get trampled while trying to protect their livelihood, and "problem" elephants get shot by game guards. As human populations continue to grow throughout the elephants' range, habitat loss and degradation will become the major threats to elephants' survival.[31]

During Mozambican civil war many people were displaced or fled their traditional lands. With the increased availability of land and fewer chances of contacts with humans, elephants began expanding and/or changing their range patterns to include the vacated areas. However, with the establishment of peace, refugees began returning home, thus coming into direct conflict with elephants in their newly established range.[32]

[31] www.worldwildlife.org/expeditions/mozambique/animals_elephant.htm
[32] The African Elephant Database 1998

4. Socio-Economic Context

4.1. Traditional Structures[33]

The social capital of communities in rural Mozambique is a capital that originates, grows and develops in a productive system exogenous to the laws of the modern state. It circulates in a stock exchange of social contacts and rests on group loyalties based on kinship, ethnicity, religion and, to a lesser extent, on political affiliation. The exercise of power of traditional chiefs, attending to their personal and to the interest of the community, is based on the process by which hereditary political power is constantly legitimised through actions and practices that satisfy community interest, which the community retributes in turn with a counter-provision of services. The latter refer to the respect, prestige and economic assistance (gifts and help in agricultural work for instance) that are granted to the chief by members of the community. This enables the customary leader to attain a higher status and receive social standing.
Part of the wealth accumulated by a few members of the community usually 'trickles down' in form of benefits to the needy, whether they are relatives (part of the lineage or a wider kinship unit) or not, following a principle traditional wealth redistribution and mutual assistance. This ensures that the community does not accuse the better-off members of the community of having achieved their economic gains through witchcraft. In order to meet basic needs without using money individuals have established relationships of interdependence that operate on the basis of kinship links, spatial and spiritual identity, around which mutual support groups are formed in agriculture and various community undertakings.

4.1.1. Traditional Authority

The theoretical and practical foundation of traditional authority is generally of a symbolic-religious nature, and is given legitimacy only by the communities themselves. They are thus 'grassroots institutions' that in effect have to negotiate their power day-by-day and therefore embody a degree of ***flexibility*** that may be extremely useful for the efficient management of natural resources. The physical closeness to their 'constituency' allows for the application of a set of rules and norms that will rarely be out of touch with the ecological reality and the management and conservation requirements of the resources in their territory.
Traditional chiefs act as mediators between a given ethnic group and its environment, and their relationship to the land is determined by the location of the burial spaces of the ancestors of a given lineage. The primary function of traditional authorities is to ensure peace and harmony in the rural communities within their territory.
To make land claims before the traditional authorities usually takes the form of oral testimony by credible witnesses. State institutions in charge of land administration are rarely approached for conflict resolution. In the perception of rural communities many administrative matters fall within the domain of the traditional chiefs and not within the domain of the political-administrative figure, the political secretary, because of their symbolism, such as in the case of land and of conflicts without bloodshed.
There persists an overlapping between the political secretary and various levels of traditional authority in terms of geographical space and political-administrative functions, which are: mobilising the population for taking part in local development activities, solving minor social disputes that arise in 'their' areas, notifying and channelling to the competent institutions

[33] www.fao.org/documents/show_cdr.asp?url_file=/docrep/006/ad721e/ad721e00.htm

problems they cannot solve and those outside their sphere of competence, passing on guidelines from the local administration to 'their' population, involving the population in agricultural production and many others.

4.1.2. Roles and Status: Existing Dimensions of Traditional Leadership

According to Lundin[34] traditional authority in Mozambique includes: persons who hold local traditional power- the traditional chiefs, lower lineage chiefs, and chiefs of social groups; those who hold spiritual power- spirit mediums and traditional doctors; herbalists; traditional midwifes; rain-makers; ironsmith etc.

In north-eastern Mozambique the *nyakwawa* (a member of the dominant lineage in the lineage territory where the population resides, with a history dating back to the period of the occupation of the territory) is the paramount representative of the population groups. It is the basic traditional political authority in the village, responsible for the well-being of the village. The *ankhoswe* is a small *nyakwawa* within the village whose tasks are restricted to his lineage. Delegated by the *nyakwawa*, he is in charge of all tasks to be carried out in the community. The *ankhoswe* is the first instance appealed to in case of land conflict, being the person who knows the traditional forms of resolution of these conflicts and the boundaries of the lineage-held lands best.
Below the lineage level we find the *erukulu,* which refers to the family unit or to the group, consisting of all the children of the same mother, a feature of the prevailing ***matrilineal social organisation.*** The father is the head of the family, but his authority over the children is limited by the brother of the mother of the children. The *makhulupale*, the elders of the social unit, constitute the council of elders, with the basic role of advising the group and of deliberating on its decisions.

Today the reality of rural Mozambique consists of local communities that identify themselves with the land within the territorial limits of the former colonial ***regulado***, which is usually a traditionally demarcated territory, where a chief exerts authority through the legitimacy conferred by the symbolic bond to the land.
There persists a perception of power that is consolidated from top to bottom by administrative directives.[35] This is in contrast with the process of building citizenship from the bottom to the top, which first guided the idea of decentralisation at the beginning of the 1990s. The principle was to decentralise in order to keep the national territory united and construct a citizenship with Mozambican nationality. The fostering of this citizenship is obviously endangered through the traditional leadership, based on regional-ethnic criteria, and the creation of chasms between national institutions and institutions of local power.

4.1.3. Conclusion

Lundin[36] draws two essential conclusions concerning traditional authorities in Mozambique:

"Traditional authorities in Mozambique have always been present in their communities of origin, acting often 'under cover' in community life. If anything has contributed to the reinforcement of their role, one could point the fact that the state has not yet managed to

[34] Lundin 1998, Traditional Authority in Mozambique, in: Decentralisation and Municipal Administation, F. Ebert Foundation, Maputo
[35] Lundin and Alfane 1999, "Análise Comparativa Das Estuturas Tradicionais Nas Políticas E Programas De Descentralização: uma leitura de realidade em Moçambique", CCEI, Maputo
[36] Lundin 1999, "Alguns comentários sobre o resultado de um estudo sobre autoridades tradicionais", communication to the Semianr "Rural Household Income Strategies and Interactions with the Local Institutional Environment", 26 July, Eduardo Mondlane University, Maputo, Mozambique

provide services to the rural areas, schools, hospitals, law and order and so on. However, even if the state will be able to eventually fulfil the role of facilitating development and market mechanisms to structure commercialisation, it is likely that traditional authority will persist in its capacity of community leader. It is an important part of the cultural universe of Africans; the structuring of the personality of an individual is in a certain way related to this authority. Thus, it is more likely that the role of traditional authority will be re-arranged within the social dynamics of community life, with greater, the same, minor, or even without contact to the modern state."

"[In Mozambique] a certain measure of integration at some sectoral levels exists already, for example in the case of agricultural extension, health and the work of the NGOs. But it is diluted in the personal attitudes of people and the attitude of the established power holders present in the different zones of the country. There exists no formalisation of this integration in laws, decrees, or sectoral directives. As far as such formalisation is concerned, any potential step to be taken in this direction should be carefully considered beforehand. Traditional authority is an institution that is legitimised in community settings, in the sphere of a community civil society of an agricultural base. In case that this instrument of legitimation is transferred from a civil to a state level, this authority would lose its intrinsic assets and would probably become frozen in time. It would thereby gradually lose its value of representation of civil society in the niches that it occupies at present, their representativity being its most important quality in interaction with the state, NGOs and so on."

4.2. Characteristics of Rural Mozambique[37]

4.2.1. Household Characteristics

The agricultural smallholders, who are cultivating more than 96% of the agricultural cultivated land, are often referred to as 'family farming households'. Smallholder farming is based on rain-fed agriculture, using slash and burn and shifting cultivation systems. Farmers are using fields for perhaps three years before the inevitable decline in soil fertility means that new fields must be cleared. While in the past population numbers have been low enough to allow this, the more populous districts are running out of land for new fields and chronic malnutrition and extreme food insecurity is the result.
The slash and burn and shifting cultivation systems are combined with intercropping techniques in the cultivation mainly of basic food crops, of which part is retained for consumption, part is sold in order to purchase non-food consumer goods.
The rural population traditionally depended on goat rearing, but loss of stock during the war means that goats are scare on the ground.

Productivity in the smallholder sector is low and the farmers are extremely prone to adverse climatic conditions. In order to cope with these they are apply a number of risk minimizing strategies such as the diversification of income sources and activities (collection of wild plants, hunting, fishing, handicraft production and paid labour).

The majority of smallholder farmers are women, who are the principal field managers, while men are the principal decision-makers. Generally men are in charge of cash crops, marketing and cattle, while women are responsible for food crops and care for small animal stock (chicken and ducks), for childcare and household related tasks, including the fetching of

[37] FRR Limited, Inception Report, Design and Monitoring of a Community Land and Natural Resources Support Program, Maputo, August 2004

water. Children play an important role in the agricultural production system, they work in the fields or they attend livestock.
23% of the holdings are female-headed, 77% are male-headed. Female-headed households are generally smaller and cultivate smaller areas. Illiteracy rates and education levels are lower in these households.

4.2.2. Poverty

In Cabo Delgado the poverty level is well above the national average and has increased from 57% in 1996/97 to 63% in 2004. This is mainly due to the isolation of the province, its remoteness from major national markets and low dynamic economic environment.
As population density is low there is a relative abundance of arable unoccupied land. Thus land isn't the major critical determining factor with respect to poverty levels and livelihoods, but access to labour, cattle, employment, agricultural inputs, credit and social and economic community services are.
Nevertheless it is important to consider that relative land scarcity and conflict over resource use occur in more densely populated areas such as the coastal zone, along transport corridors and in more productive areas.

4.2.3. Community Groups

Traditional community organisations are undergoing change due to the predominantly dispersed settlement, the war and resettlement of refugees following the peace agreement, rural-urban migration and other dynamics. Thus, communities often do not have a clear, shared perception of themselves, their neighbouring communities, their resources, their potential and their boundaries, nor are their legally recognised traditional authorities necessarily representing all the interest groups that comprise a community. In other words, the organisational level is still very weak in Mozambique.

4.2.4. Needs of Women

Women constitute the majority of smallholder farmers. Their rights to land are held largely as secondary rights through their marriages of family groups, their tenure security is particularly fragile and thus they should constitute a specific priority target group.

4.3. Livelihood Framework of the Rural Poor in Northern Mozambique[38]

Vulnerability Context
Vulnerability is due to shocks mainly from crop failure, human disease or failure of markets. Very low levels of savings, livelihood dependency on crop agriculture and weak health services compound these. Overall levels of poverty mean that community based safety nets have limited capacity. Cross-border interactions reduce vulnerability by improving market opportunities, increasing the availability of other livelihood strategies and giving access to improved health services.

Natural Capital
Most households have access to sufficient land and soil fertility levels are generally high. However, this situation should not be taken for granted. In Milange District in the 10km strip

[38] www.sarpn.org.za/CountryPovertyPapers/may2002/dfid/neighbours_develop_3.pdf

along the border, the land has been fully settled and cultivated for the last five years, with little spare for longer fallows. Farmers report falling fertility levels and shortages of resources, such as firewood, timber and better quality thatching grass. This situation is also encountered near to some towns and along some roads. In contrast, the interior of Milange, most of Southern Niassa and many other areas still has low levels of population; there is considerable uncultivated land and some communities were reported to be in favour of attracting settlers – to increase local production and make the area more viable for traders to operate in.

Human Capital
Household labour power is probably still the most important determinant of production capacity. There is some stratification, with some households able to store a surplus in the form of food or cash and use this to employ ganyu labour, and therefore increase production the following year. Skills levels are still concentrated on those crops traditionally grown in the area, but new crops are being tried. Although farmers have shown themselves very sensitive to market conditions they are keen to try new cash crops and new marketing arrangements. Institutional capacity to increase farmers' skills remains very low.

Financial Capital
Financial capital is extremely low. Keeping savings in cash form is difficult: banks or other institutional savings schemes are generally not available to the rural poor; cash income from crop sales may be a once-a-year event and be very insecure because of volatile prices and opportunistic commercialization activities. Cash obtained from crop sales generally goes to meet immediate needs or to increase physical capital – an early investment for many households is a bicycle. Savings in terms of livestock are generally low and converting these into cash can be difficult.

Physical Capital
Household level of physical capital is still extremely low, but is increasing. Infrastructure such as all-weather roads, schools, health posts and clean water supplies is still very inadequate, but is also increasing. Access to inputs, such as higher quality or different varieties of seed, is still very weak.

Social Capital
Key connections are through family and traditional leadership structures, through which land access, informal safety nets and ganyu labour is accessed. Stable relationships between farmers and crop buyers are very rare, but are increasing in some areas through associations. Rural markets supply an increasing range of consumer goods and sometimes provide an opportunity for sale of small quantities of farm produce, but they don't seem to be meeting the post-harvest crop sales needs of farmers. In some areas, particularly those influenced by Malawi, periodic markets have developed (often twice weekly) and enable a greater range of consumer goods to be bought.

4.4. Agricultural Development in Cabo Delgado Province

9% (1.5 million) of the country's population live in the province with a population density of 17 inhabitants per km^2. The population is to a high degree settled in villages as a result of pre-independence colonial 'strategic villages' policy and post-independence 'communal villages'

policy. Smallholder agriculture dominates in the inland and artisanal fisheries in the coastal area. Another important sector is logging.[39]
The province comprises two major agro-ecological zones, the less fertile sandy coastal soils and the vast fertile soils in the areas with higher altitudes off the coast. It is divided into different zones, which have very unequal levels of development:
Parts of the central area (Meluco) are the poorest as access is difficult and the population is little. But there are abundant hardwoods available. The northern area (Mueda plateau) has serious water problems, the road network is poor and distances are long. The coastal region has poor soils and access problems. The southern area is generally more developed and has a high population concentration. It has the greatest potential for agricultural development, with very good conditions for cotton production.

The low-technology subsistence farming produces mainly cassava, maize, beans, groundnuts, sorghum and millet. Maize and groundnuts are sold when possible. Cattle is lacking due to tse tse infestation. This affects technology levels and development in the smallholder sector.
The province's main cash crops are historically and presently cotton and cashew.
Land degradation has been provoked in some areas through high population densities associated with cotton production and the limited input of fertiliser. Furthermore, cotton prices have fallen over recent years, contributing to income decrease and in some cases withdrawal from cotton production by smallholdings.[40]

Although most of the people make a living from agriculture the production is too small to supply the population with enough aliments. Especially from December till April people are suffering from famine. Possibilities to sell agricultural products are very low as prices are very low, markets are distant and purchasing power in the district is weak. To make a living in another sector is very difficult. [41]

The most serious pests in 2004 were those already reported in previous years and include brown streak and mosaic viruses in cassava, odium in cashew, cassava mealy bug, leaf miner affecting groundnuts, and large grain borer in maize. The use of insecticide and fungicides to control these problems continues to be limited. In northern areas most serious pests were wild animals, in particular elephants, which caused substantial damage to crops. [42]

4.4.1. Changes in Land Management[43]

War dramatically disrupted the transmission of traditional knowledge from older to younger people, and financial limitations have meant that agricultural research and extension services remain limited.
Communities particularly often need support in order for village level management structures to function, including village leadership, village tribunals, or producer groups. Traditional structures suffered heavy damage during the various wars and the socialist era and land management will not occur without structures for decision taking, lawmaking, monitoring and enforcement.

Of great importance for the rural population was the ***Land Law of 1997***. For the first time in Mozambican history it guarantees in clear and simple language the legal rights of the rural

[39] For more information about logging in Mozambique see: http://www.cdainc.com/cep/publications/reports/Visit07Mozambique.pdf
[40] FRR Limited, Client Profile Report, Design and Monitoring of a Community Land and Natural Resources Support Programme, Maputo, August 2004
[41] Peter Bechtel 2001, Land Law and Agricultural Development in The Cabo Delgado Province of Mozambique and in Swaziland
[42] www.fao.org/DOCREP/007/J2679E/J2679E00.HTM
[43] Peter Bechtel 2001, Land Law and Agricultural Development in The Cabo Delgado Province of Mozambique and in Swaziland

communities over the land they use. It also acknowledges the role of traditional community leaders in land allocation and allows for the businessman to obtain a land use title for land to be used for business or commercial farming, though the businessman applying for land use title is obliged to obtain community approval if he wishes to occupy community land.

4.4.2. Fogão Africano[44] Analysis of Land Reform and Agricultural Development Efforts[45]

Three major points should be mentioned:
First, in Cabo Delgado land per se is not the hot issue, rights to timber and wildlife resources are. Most of the province is occupied by timber concessions, with timber exploration yielding little or no benefit to the local communities involved, and this despite the fact that timber resources are extremely rich. Licensing laws are such that no management takes place at all; Mozambican registered companies are granted short-term licenses which guarantee that short term interests rule. Foreign companies in principle receive long-term concessions, in practice they cut deals with government officials or with locally registered companies so they too can cut without any management input whatsoever.
Second, land for tourism purposes will become a critical issue in the future.
Lastly, the entire rural population can be said to live in extreme poverty. (Cabo Delgado posses 10.3% of the land surface of Mozambique and 8.5% of its population, but produces only 5.3% of the country's GDP. Live expectancy in the province is 37.8 years, while the under-five mortality rate is 295 per thousand.)

Land Tenure in Law and in Practice
The new ***Land Law of 1997*** outlined four ways to acquire land:

- All land used by local communities (including grazing lands and forests) was defined as community land with immediate effects. No processing or documentation is required. Community land is held in common and can only be occupied or sold by outsiders through recognised public consultation processes in the presence of relevant officials.
- Land may be given to individuals by local leaders, though local leaders were not defined in the law.
- Persons who have occupied a given piece of land in good faith for more than ten years receive a land use title by right of occupation.
- Land for business purposes may be acquired by investors, both national and foreign, through land use titles. A series of community consultations are mandated to insure that community lands are not occupied against community will.

There are a number of innovative aspects to this law. First, methods used to determine the extent of community lands are those of Participatory Rural Appraisal. By extension, local tradition about land occupation has also been recognised as legally binding. Second, community rights were seen as superseding all other rights. Third, no zoning was attempted. All land was available for all types of classification, based on local history and local decisions.

In reality, the new land law has not turned out quite as well as planned. While it does defend community land rights, it has not produced the close relationship between investors and rural communities that its designers envisioned. Instead of contracts spelling out ongoing financial

[44] See also page 7. This concept was first articulated by Gecorena. It links in a logical manner the land ownership issues, land use issues and land management issues.
[45] Peter Bechtel 2001, Land Law and Agricultural Development in The Cabo Delgado Province of Mozambique and in Swaziland

relationships between investors and communities, the practice of one-off indemnization payments continues, leaving community members with a short-term flush of cash and long term loss of their land.

Land use
The absolute poverty of rural people severely limits their options. Family sector agriculture uses no mechanisation, no purchased inputs and no animal traction. Fields are hacked from the forest, tilled with the short handled hoe, exploited until their fertility drops and then abandoned. Both food security and commercialisation of excess production are tenuous at best.

4.5. Tourism

The tourism industry has gradually evolved over recent years and is one of the areas with the strongest growth potential, mainly in the coastal region. Although all the tourism providers promote eco-tourism it is difficult to say whether they adhere to it or not. To some extent conservation seems to be used to assure the uniqueness and remoteness of the islands and thus to attract tourists.[46]

4.5.1. The Islands

Tourism development within the islands is growing and the potential is large. Tourists from South Africa and Zimbabwe are common visitors to the islands, having been attracted by the quality of sportsfishing and diving/snorkelling available.
Many beach resorts and lodges can be found on the islands, especially on Quilálea Island. The ***Quilálea Sanctuary*** was the first marine protected area in the Quirimbas Archipelago. It is considered by the WWF to be of worldwide importance for conservation. Within the sanctuary no fishing is allowed and local fishermen who used to have camps on Quilálea and Sencar (the other island that belongs to the sanctuary) agreed to remove their camps from the islands. Most of the locals started working in conservation and eco-tourism on the island.[47]
Another main island is the ***St Lazaro Bank***, a world-class game-fishing spot, 42 nautical miles off the coast. It is an important component for income generation from responsible nature-based tourism and leisure activities.

The potential for the islands to attract tourism based on their natural resources can bring much of the needed revenue and benefit to the islands and their inhabitants but the challenge is to balance the needs for development and the protection of the islands' rich habitats.

4.5.2. The Mainland

A couple of tourism providers operate on the coast but compared to the islands the area seems to be less developed and visited. Safaris and tours in the National Park are being offered by local or international travel agencies with accommodation in park lodges.

[46] Addresses of tourism providers are added in 6. Literature
[47] http://www.quilalea.com/

5. Conclusion

On the one hand the Quirimbas National Park exhibits remarkable marine and continental biodiversity that desperately needs to be maintained and conserved. On the other hand the natural resources are being threatened due to the unsustainable use by the local communities, who highly depend on them for their subsistence. The great advantage for the park and its management is that the communities seem to be willing to improve the management of their resources and support the creation and development of the National Park.

The area of the National Park shows two major potentials: Agriculture and Conservation/Tourism.
To improve smallholder agriculture it is first of all necessary to resolve the human/animal conflicts in the area and to sensitise the local communities for the problem of land and soil degradation. In other words attention must be paid both to the private and the community sector. The promotion of trade within the area and the enhancement of the cultivation of traditional crops such as sesame or cashew, which command a good price per weight in the marketplace, could bring about improvements in cash flow. This highlights the importance of the amelioration of agriculture not only for strengthening the households and thus the subsistence sector but also for the improvement and development of the economic ties within the area.
Tourism is the other big opportunity for the local communities due to their direct involvement in the park and its management. While the coastal parts and the islands are already rather developed[48] the main, still unused potential lies in the inland. The extraordinary flora and fauna of the park will attract many tourists as soon as a more reliable infrastructure will be established and cooperation with national or international travel agencies will be maintained.

For the local communities a combination of work within the agriculture and the tourism sector seems to be the best solution as shortages in agriculture could be compensated with a steady income from tourism and a certain bond between the people and their environment could be established, which would have an overall positive effect on the conservation of natural resources within the Quirimbas National Park.

The park management meets the great challenge to concentrate on the problems and the potentials in the area at the same time. Makeing use of the two major potentials agriculture and tourism will only be possible as soon as the problems of poverty and land/resource degradation will be solved.

[48] See also 3.1.7. Management Considerations and Recommendations

6. Literature

M.W. Whittington, C.M. Antonio, M.S. Heasman, M. Myers, D. Stanwell-Smith (1998): Darwin/Frontier-Mozambique Quirimbas Archipelago, Marine Research Program: Technical Report No. 6: Results summary and management recommendations.
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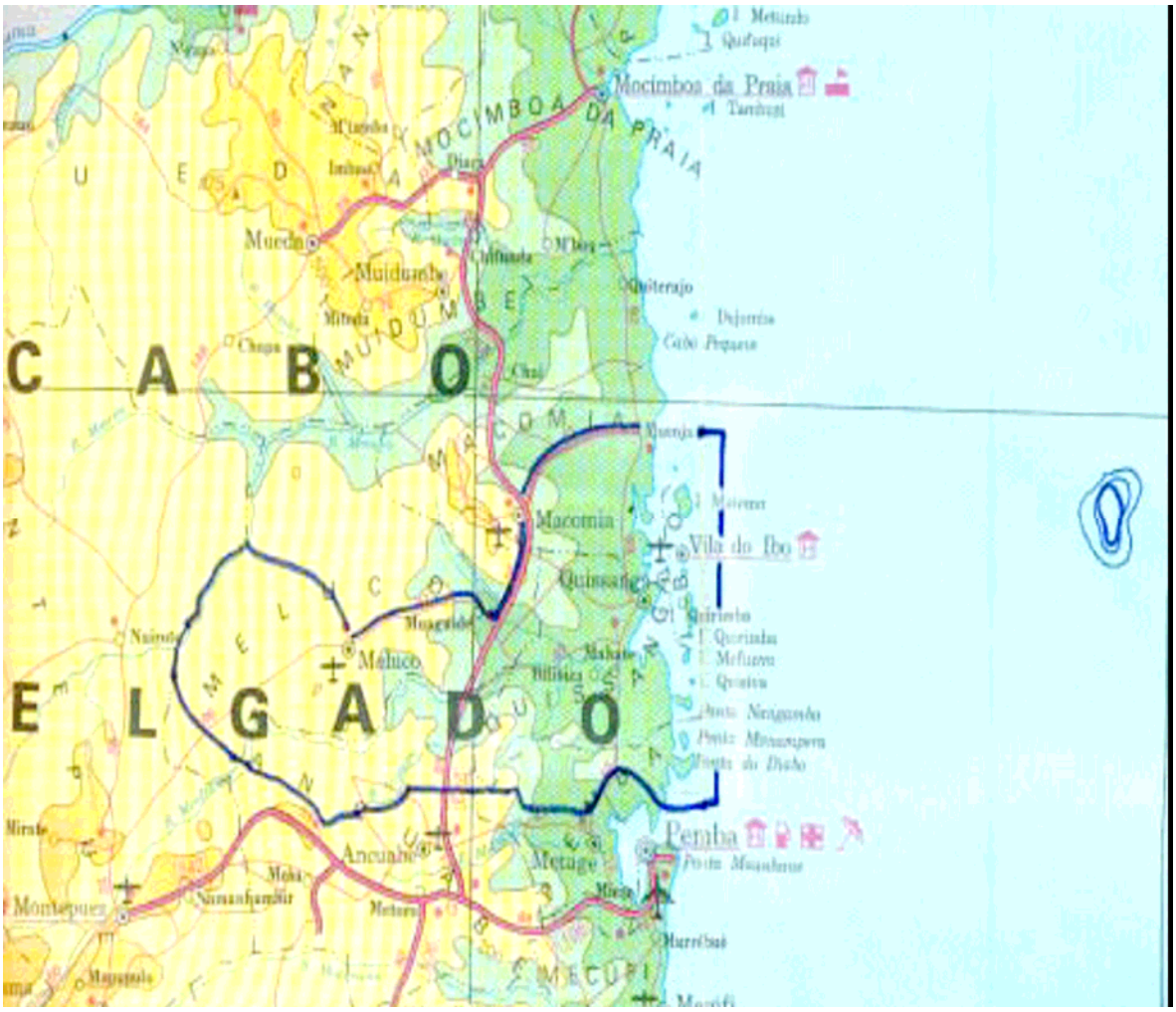
Annex A

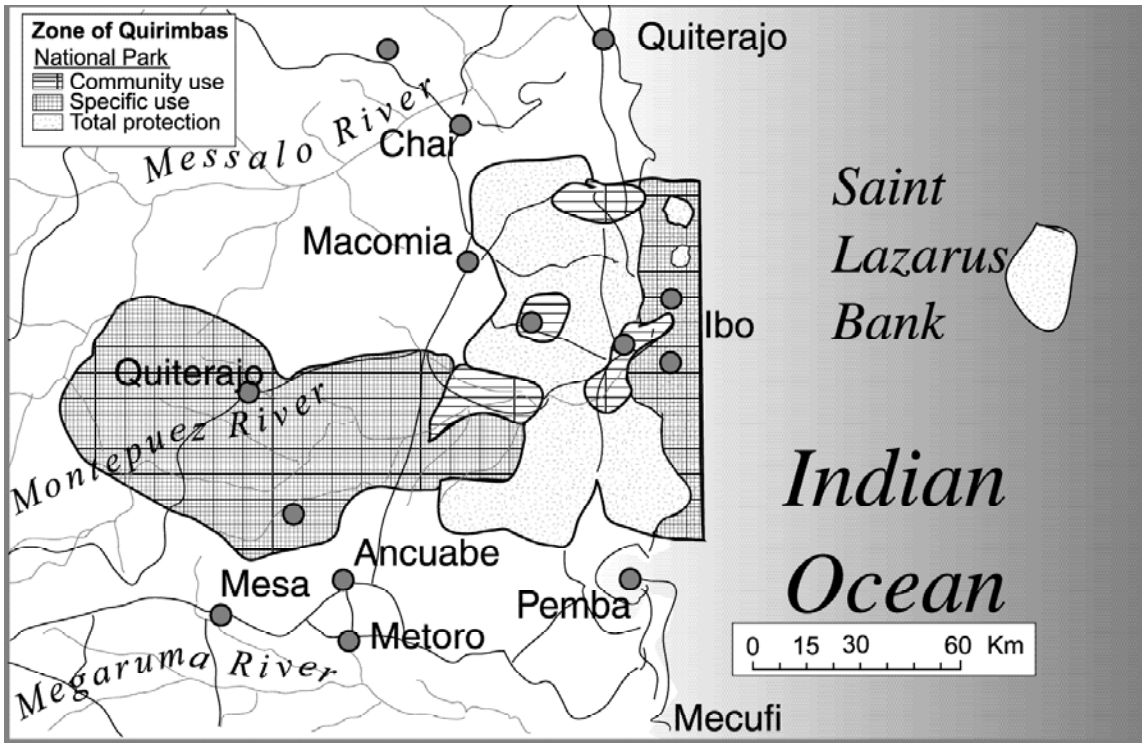
Map of the Quirimbas National Park



The blue lines show the area of the Quirimbas National Park.
Source: http://www.wwf.no/pdf/WWF%20MOZ%20-%20Quirimbas%20-%20map.pdf

Annex B

Map of the Zoning



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