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Ministry for Tourism

National Directorate for Conservation Areas

Quirimbas National Park

TERMS OF REFERENCE

Terrestrial Vegetation Assessment of the Quirimbas National Park

1. INTRODUCTION

There is an urgent need to prevent in some areas habitat destruction by human impact, and the consequence loss of biodiversity. One of the strategies of the Mozambican Government to prevent biodiversity loss is the creation of conservation areas. The Quirimbas National Park created in 2002, located within the Cabo Delgado Province of Mozambique is one such example. The park is composed of a marine and a continental area. The marine area includes 11 islands of the Quirimbas Archipelago, while the continental area includes parts of the Macomia, Meluco, Quissanga, Ancuabe and Pemba districts. The park has a total of 750,639 hectares, of these 598,402 are located on the continental side.

The WWF Mozambique Coordination Office (MCO) has been mandated by the Ministry of Tourism to implement a project aimed at the establishment and development of the Quirimbas National Park.

To guide the establishment, management and development of the Quirimbas National Park, a General 5-year Management Plan was elaborated with the involvement of all relevant stakeholders and based on the results of an extensive research programme and consultation process. The Management Plan for the period 2004 to 2008, which was approved by Government of Mozambique in 2003, defines the overall planning and management of the Park, including its zoning and definition of priority

development areas. The General Management Plan outlines Park goals, objectives, strategies, desired results, activities, and indicators of achievement for the next five years.

The implementation of the Management Plan and the park administration of QNP is currently being supported by the French Development Agency, the French Environment Fund, as well as by the WWF.

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

2. BACKGROUND

The park contains four ecoregions of global importance according to the WWF Global 200. These are the southern Inhambane - Zanzibar Coastal Forest, East African Mangroves, Eastern African Marine and Eastern Miombo Woodlands and Savannah. A short work by Doggart and Burgess (2002) also reported “...the park contains a mosaic of bamboo, coastal thicket, very dry coastal forest, riverine forest, inselberg forest, miombo woodland, acacia woodland, dambo grasslands, palm-savannah/woodland, and a succulent-dominated inselberg flora.” According to the management plan, the terrestrial area is divided into the following zones: total protection zones, specified use zones, and community development and use zones.

The rainfall of the Park area ranges from 900-1000 mm annually, with a pronounced dry season in winter and slightly more precipitation inland than on the coast. The rainy season in the past has been clearly defined, with significant amounts of precipitation from December to the end of March (87-91% of the annual total rainfall occurs during this period). The average temperature varies very little throughout the year, with the average annual temperature between 25 °C and 26 °C. The lowest monthly mean temperatures recorded on the coast are 18 °C, and highest is about 31 °C. Climatologically, the area is classified as ‘humid semi-arid’ with rainfall equaling 50 to 75% of the potential evapo-transpiration. This evapo-transpiration lies in the

region of 1600-1800 mm per annum. The relative humidity averages higher than 75%. The soils of this area are freely draining and infertile deep red sands, sandy loams, and pale sandy loams, mixed in with fertile black alluvial clays along rivers and watercourses.

Very little information is known about the geology of the area, but areas of limestone and dolomite occur around the area.

Literally information on the vegetation of Cabo Delgado Province is scarce as the surveys made in the past rarely included the province (but see Wild and Barbosa, 1967, White, 1983). Recent reports such as the Livro Branco (União Europeia, 1996, Garnier. *et. al.* 1999) have attempted to address this problem. The two reports mentioned the severe absence of data available for the province. Detailed vegetation data for the province has mostly been requested for non scientifically purposes, environmental impact assessment studies, assessment of timber resources commissioned by the state (refer to references in União Europeia, 1996) which, means that they are not ideal for biodiversity/conservation purposes.

The União Europeia (1996) work undertaken on the whole Cabo Delgado Province identified a mere 224 plant species. This appears to be a low number when one considers the number, diversity of habitats and vegetation types present within the province. A short work (4 days) done by Doggart and Burgess (2002) did not record any rare or threatened species inside the park, however, a more detailed work done north of the Mucojo area (Garnier *et.al.*, 1999) revealed the presence of 14 endemic species, 5 of which were local. In addition, from the identified 14 species, 7 have been listed as rare, and one as vulnerable on the IUCN Red Data List. The level of endemism within northern Mozambique is not particularly high, with only 40 plants considered as endemic (Garnier *et. al.*, 1999) .This, low level of endemism is probably due to the absence of data. The Doggart and Burgess (2002) work was completed at the beginning of the rainy season. This work recorded new species expansion ranges, it also suggested that endemic species were likely to be present within the park borders. The likely occurrence of *Milicia excelsa* forest stands is encouraging, as this habitat contains at least 100 endemic plant species in southern Tanzania. The two works (União Europeia, 1996 and Garnier *et.al.*, 1996) described the vegetation communities within northern Mozambique. However, as no standard

method had been used, the vegetation communities were described according to the dominant vegetation type of the area, or in some other subjective manner chosen by the authors. Furthermore, the vegetation communities differed in their scale, which might have resulted in the same vegetation community being, attributed a different name. In order to avoid this type of situation in the future it is necessary to classify vegetation communities using maximum objectivity.

3. OBJECTIVES AND REQUIRED SERVICES

The Quirimbas National Park Management Plan (2004-2008) foresees the implementation of a number of studies and surveys in order to identify and understand the functional ecosystems present within the park borders. This is expected to be achieved after a comprehensive biodiversity assessment, and species of conservation importance and special interest are identified. This is most probable the first step to identify their roles in the ecosystem determined.

A biodiversity survey of the Quirimbas National Park will improve the knowledge of the biodiversity of Cabo Delgado, allow the park authorities to acquire baseline data for monitoring the flora and fauna, improve the ability to manage and protect the park and the areas determined by the zoning plan, and measure the tendency of long term ecological change.

The first step for the biodiversity assessment is to produce a comprehensive terrestrial vegetation survey and assessment (including the islands) of the QNP, with the following specific objectives

- Improve conservation and management decisions
- Identification of baseline data for future monitoring
- Assess the vegetation condition
- Identification of rare new and local endemic plant species
- Classification of vegetation communities
- Determination of species richness
- Conservation of genetic viable populations

- Identification of important habitats for other organisms
- Assessment of the biological importance of the area
- Identification of exotic plant species
- Protection and preservation of traditional knowledge
- Identification of important research topics

4. SCOPE OF SERVICES

In this context, the Quirimbas National Park wishes to contract an institution/individual/group/consulting firm to perform a comprehensive terrestrial vegetation analysis of the park.

The consultant is expected to produce the following outputs:

a) Identification of the vegetation types and their range within the Quirimbas National Park

The vegetation types of the park must be classified using current definitions available in the research community. The classification of these types and their species components must be done using statistical methods wherever possible, guarantying comparability, and standardized evaluation with other regions.

b) Identification of the main abiotic and biotic factors affecting the distribution and survival of species vegetation types within the Quirimbas National Park

In principle, the main factors to be considered are a combination of these: aspect, elevation, gradient, rainfall, soil type, water relations (depth of the water table, proximity to a river system), salinity, pH, climatic zone (maritime, continental, montane), disturbance events, herbivory, competition, mutualism, associations, human impact, however it is probable that other factors than the ones mentioned here affect species/habitat distribution and survival, also only some of this factors delimit the distribution of the vegetation types. It is also necessary to identify which factors are responsible for the current vegetation distribution of the Quirimbas National Park. These factors should be identified using maximum objectivity, and the strength of each factor on the vegetation distribution investigated.

c) Identification of all terrestrial plant species (including herbaceous and lower plants) of the Quirimbas National Park

Botanical keys must be used in species identification. The scientific, common, vernacular name and local use of the species must be provided.

d) Identification of plant species of special interest (rare, threatened, vulnerable, endemic, invasive), evaluation of threats affecting their survival, and definition of the management strategies to eliminate these threats

An evaluation of the status of these species will allow management to define immediate action.

e) Determination of species diversity and possible species abundance rating of each vegetation community

This type of ecological information concerning the respective habitats will allow the identification of vegetation communities that require special attention. Comparisons between habitats will be required

f) Proposal of priority areas of plant research necessary to the understating and functioning of the vegetation types within the Quirimbas National Park

g) Identification of invasive plants, factors affecting their success, dispersal mechanisms and evaluate their threat to the vegetation types

h) Identification of non timber forest products (including medicinal plants) and their uses

i) Assessment of current and future human/human related impact on the vegetation, and evaluation of these impacts

The most probable current direct human, and human related impact on the vegetation arises from agriculture, grazing logging, fire, spiritual activities, use of medicinal plants. The construction of infrastructures and roads by park management will also cause future disturbances.

j) Assessment of the importance of the vegetation of the Quirimbas National Park concerning its biodiversity, level of endemism, occurrence of plant species listed on the Red Data list on the international, regional, and local scale

k) Provision of hard copies of all literary documents and maps concerning the vegetation of the Quirimbas National Park area

5. METHODOLOGY

In order to ensure an adequate quality of the final report, enable a discussion process as well as an overall understanding amongst all involved stakeholders of the project, the implementation will be carried out according to the following guidelines:

Fieldwork must be undertaken in at least two periods. The first phase must be during the beginning/middle of the dry season, and the other phase must be during the beginning/middle of the rainy season. This will give the study a comprehensive range of situations to allow for identification of most species. The results and analyses of data must be obtained and presented using maximum objectivity.

In order to ensure good understanding between all stakeholders of the project the project was divided into 3 reporting phases:

Inception period: (1 month, after signature of contract agreement)

The consultant(s) is expected to prepare an inception report that will confirm or revise the detailed proposed work program, methodology of work, man/months of each involved expert, chronogram, proposed table of contents of report, report submission schedule.

Preliminary Report (11 months, after approval of inception report)

This preliminary report must include information of all defined outputs, and be presented in the form of a written report and, an oral presentation of the report. The presentation will be to the park administration and other involved key stakeholders, within the context of a workshop.

Final Report (1 month, after the workshop)

The final report will be produced based on preliminary report and the discussion and inputs of the workshop. Recommendations and collected information will be incorporated in the report.

6. LEVEL OF EFFORT AND DURATION

It is estimated that 12 man-months of consultancy personnel will be required for this consultancy service over the implementation period. The team must not spend more than 60 days undertaking fieldwork. The key personnel for this assignment should be knowledgeable in botany, ethnobotany, plant ecology, and biodiversity conservation. The consultant(s) should be experienced in vegetation surveys and evaluation of habitat degradation. The consultant(s) is expected to involve and train 2 local university students during the process.

Preferably, the vegetation assessment should be done by a group/institution/company composed by botanists (ideally with some taxonomical and ethnobotanical background) or plant ecologists. Teams with at least one Mozambican expert familiar with the vegetation of northern Mozambique, which is a full time employee at a national research institution will be considered strong candidates. The strength of the team should be enhanced by the presence of at least 2 Mozambican students (with a botanical background) currently enrolled at an institution of higher education. The students cannot receive any financial benefit from the project. The botanists/plant ecologists are only required during the fieldwork, identification, analysis, and reporting phases. The consultant shall work in close collaboration with local communities. The community interaction must be harmonized through the park research coordinator and management. The group will be expected to work in Portuguese, local languages and English during the duration of the project

Specific outputs

The report must at least include the following sections: introduction, a detailed description of the study area, the methodology employed (including sampling effort, coordinates of areas where fieldwork was undertaken, explanations where necessary

and other information deemed necessary by the group), results (including analyses, and if possible results must be presented in both tabular and graphical form, if maps lead to better understanding of the results these must also be provided), discussion, recommendations, conclusions and bibliography. Annexes containing the following information must also be included in the report:

- A list of all the vegetation types and a map of their range within the Quirimbas National Park
- A list of the main abiotic and biotic factors affecting the distribution of the vegetation types within the Quirimbas National Park
- A list of plant species (including its' scientific, common, vernacular names and uses) of the Quirimbas National Park
- A list of plant species of special interest (rare, threatened, vulnerable, endemic, invasive), and a map showing their location
- A list of local threats affecting plant species of special interest
- A list of possible management strategies for the conservation of species of special interest
- The species diversity and possible species density of each vegetation community examined
- A list of future areas of plant research necessary for understating the function of the vegetation types within the Quirimbas National Park
- A list of invasive plants, a map of their location and factors affecting their success
- A list of non forest timber products and their uses (including the frequency of use and availability)
- A list of species of cultural importance and their uses.
- A list of the current and future disturbances on the vegetation

The preliminary reports shall be produced in Portuguese (3 copies) or English (3 copies). The approved final report must also be provided in a soft copy (2 copies on CD in PDF format, and Microsoft Word with tables and data supplied in Excel format) and 5 hard copies in Portuguese or English.

The format of any documentation produced under this project shall be subject to prior approval by Quirimbas National Park Administration and the WWF Mozambique Coordination Office.

7. CONTENTS OF THE PROPOSAL

The technical proposal must include the CV of the experts, a description of their experience in their field and letters of recommendation. Additionally, to the CV the participation of the team members must be presented in table format containing, the name, qualification, institution, current profession, and responsibility within the working group as headings. The presented proposal must also include:

- The proposed methodology for fieldwork and the methodology for analysis of data (this must be detailed, and including a discussion of other methods available in the literature. A justification of why the chosen method is the ideal for this project must also be supplied), the minimum area to be sampled, and comments on the Terms of Reference
- description of the proposed team, their respective CVs , verifiable references, and letters of recommendation where necessary;
- A detailed work plan with schedules (specially of fieldwork), proposed areas of sampling (including sampling effort and the area to be sampled), and deadlines for the delivery of documents and reports;
- financial proposal, including a detailed budget.

In addition, a detailed estimated budget in US Dollars and Euros must be presented, specifying the payment schedule consultants fees and amounts per each field season, travel costs, administration costs, fieldwork costs, as well as other specific costs in accordance with the proposed project.

The separated technical and financial proposals should be submitted according to the deadlines established below to the following address:

The Research Coordinator
Quirimbas National Park
c/o WWF Mozambique Coordination Office
Rua Dom João I, 213
Maputo,
Moçambique

8. EVALUATION OF THE PROPOSAL

Technical and financial proposals will be assessed in the following way:

- 80% for the technical evaluation;
- 20% for the financial proposal.

⇒ The technical assessment will be made as follows:

- Experience in the area: 20 pts;
- Compliance with the Terms of Reference: 20 pts;
- Additional information to be provided than the requested one: 10 pts;
- Quality of the proposed team: 20 pts;
- Involvement of local institutions/students, including degrees: 10

⇒ Assessment of the financial proposal (FA):

FA=20 x value of lowest bid/value of bid

The evaluation of the proposals must be done in two phases :

- 1st phase : opening session of technical proposals and evaluation of technical proposals
- 2nd phase : opening session of financial proposals only for the technical proposals with a minimum technical score of 50 points on 70 points and proposal of awarding of the contract.

Proposals (P) will be ranked according to their combined technical (TA) and financial (FA) scores : $P = TA + FA$

9. LOGISTICAL SUPPORT

The Quirimbas National Park Administration will appoint a liaison officer through whom all requests for information, guidance, and assistance should be addressed (this is particularly important during community interaction). All reasonable assistance will be provided. However, the group must be as independent as possible from the park, this is particularly important during fieldwork. In addition, more specific support will be provided in the form of:

- One Single Cab Land Rover (including a Park Driver) for 3 days per week of field work
- Existing maps in possession of the Quirimbas National Park
- The Management Plan
- Facilitation of initial interaction with the communities

10. CONTRACT AGREEMENT

The consultant for the vegetation assessment will be required to enter into a formal agreement with the Quirimbas National Park. The agreement will include:

- The terms of reference
- Detailed work programme
- The maximum cost of the services to be provided
- A comprehensive breakdown of the costs including fees
- Letters of recommendation from the institutions where necessary
- Definition of property rights
- Conditions of report approval
- Conditions of payment
- Delivery of all literature available concerning the vegetation of the Quirimbas National Park

11. GENERAL

The work must be performed in accordance with generally accepted principles and standards of professional practices. The team scope of work is understood to cover all activities necessary to accomplish the stated objectives of this project, while adhering to the aforementioned principles and practices, whether or not a specific activity is cited in this ToR.

REFERENCES

- Dogcart N. and Burgess N. 2002. Field visit report to Quirimbas National Park, Mozambique 9th – 12th November. *Unpublished report*.
- Garnier J., Dunham K., Robertson E., and Murphree M. 1999. An Ecological and Social survey in Cabo Delgado Province, Northern Mozambique. *Survey Report and Recommendations*
- União Europeia. 1996. Livro Branco dos Recursos Naturais da Província de Cabo Delgado (Moçambique). *Vegetação e Recursos Florestais*. Volume 1. Pemba.
- White, F. 1983. The vegetation of Africa. A descriptive memoir to accompany the UNESCO/AETFAT/UNSO Vegetation Map of Africa (3 Plates, Northwestern Africa, Northeastern Africa, and Southern Africa, 1:5,000,000). UNESCO, Paris
- Wild, H. and L.A. Grandvaux Barbosa. 1967. Vegetation Map of the Flora Zambesiaca area. Flora Zambesiaca Supplement 1-71. Collins, Salisbury.