Identification of HCV areas in Cabo Delgado, Mozambique

Summary of key findings

for Eco-Energia

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1. Overview

A number of areas within the project development area were identified as potentially containing HCVs. The coarse scale of the GIS data and the short time available for field work has limited the precision with which these areas can be identified in this study. But it is hoped that the findings will form the basis for more detailed planning at the project site level.

An analysis of the province in general and the *project area* in particular indicated that there were attributes that could be considered High Conservation Values. These were:

- Areas of woodland and forest supporting concentrations of threatened endangered or endemic species (HCV1)

- Areas of woodland and forest providing basic needs for local people in critical situations (HCV5)

- Areas of woodland and forest that support sites of critical cultural significance (HCV6)

Other parts of the *province* were also shown to be likely to contain large landscape level ecosystems (HCV2) and threatened ecosystems (HCV3) although no parts of the project area were thought to contain this value. No parts of the project area were thought to support the provision of ecosystem services (according to the definition of HCV4). However, more detailed survey of the area may well highlight areas that become important during seasonal changes in water availability, for example.

Where High Conservation Values are thought to exist, it will be necessary to ensure future land use change does not prevent the value from being *maintained or enhanced* within the project landscape. For the biological HCVs (species and ecosystem conservation) this will depend on ensuring certain parts of the natural vegetation are conserved. For the social HCVs (community use and cultural factors), this may depend on the maintenance of natural vegetation, but, in some cases, may depend on the provision of affordable alternatives to the basic needs currently satisfied from the area.

2. HCV identification and mapping

2.1. Biological/Ecological values

Mapping HCV1 areas

The objective of this part of the work was to produce an indicative map of areas of natural vegetation that are likely to contain biological HCVs. The inputs to this map

were derived from provincial GIS data sources and the field survey data for the project area.

The following parameters were defined for selecting HCV1 areas:

- Riverine forest areas (within 2 km of a seasonal stream)

- Containing good quality vegetation cover

- At least 5 km from centres of population

Applying these parameters to the province level data, produces the following indicative map (Figure 1). This is derived from coarse grained data, and so is indicative only, but serves as a guide for the areas that are likely to contain this HCV.
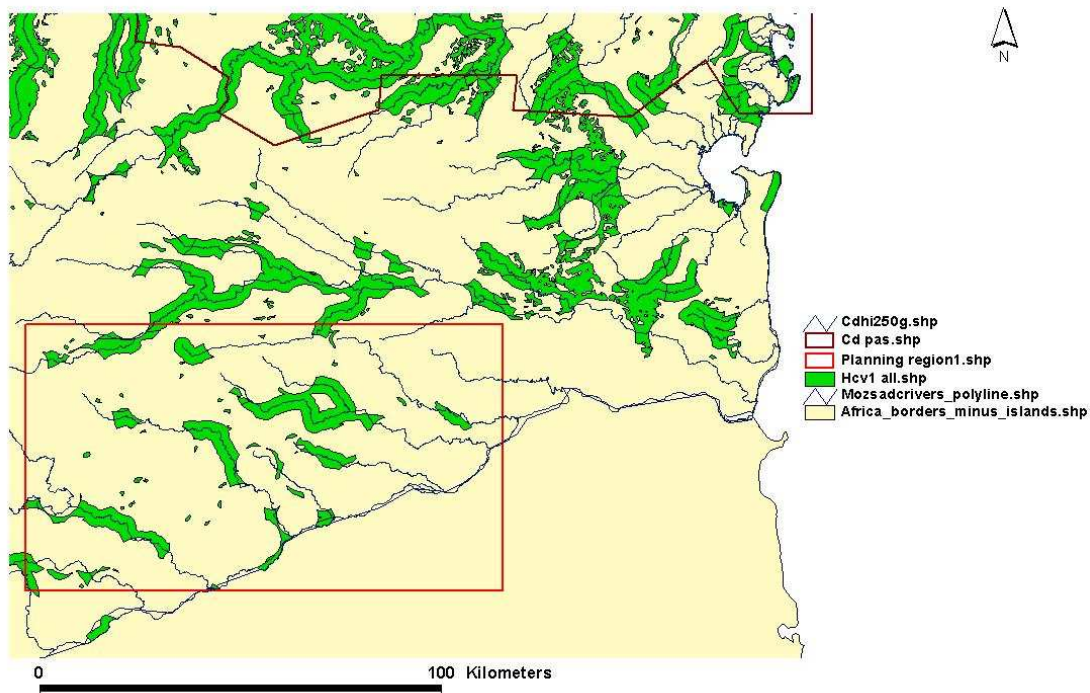

Fig 1. Indicative map of HCV1 areas

Incorporating the HCV map into a conservation plan

Using this map, we then used Marxan, an analytical GIS process, to produce a more detailed conservation map for the project area (Figure 2).

The Marxan programme divides the area into hexagons (each 50 ha). It then assigns each hexagon to a land use (production or conservation) based on certain parameters. In this analysis, the programme always assigned HCV areas to conservation.

However, in addition, it was asked to select a proportion of other forest/woodland habitats to ensure a representative sample of all ecosystems is conserved.

The programme used the HCV areas as a basis but assigned additional areas around these sites (e.g. as buffer areas) until a target of 20% of the each habitat type was

assigned to conservation. The programme searches for the optimum layout of non-HCV habitats by minimising the total boundary length of areas assigned for conservation. The outputs from this process are shown in Figure 2.
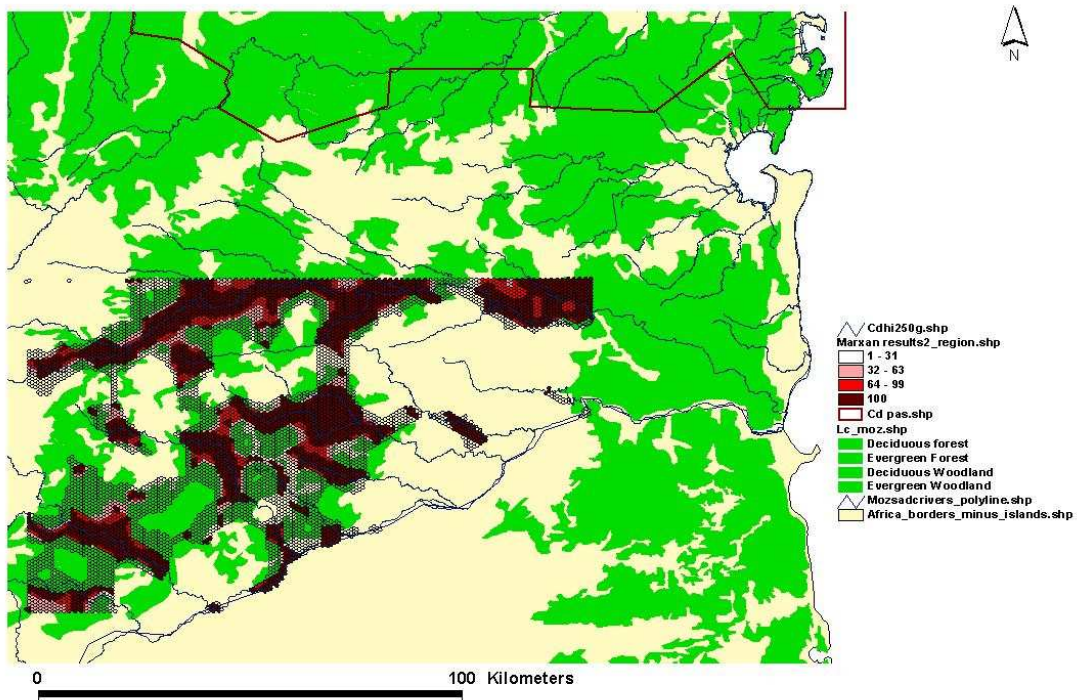

Fig. 2: Marxan outputs: Biodiversity conservation map

The map (Fig. 2) shows areas that have been identified by Marxan for a conservation end use combining both HCV and non HCV areas.

The final output shows the best layout of conservation areas that:

- Ensures all HCV habitats are conserved, and

- Optimises the layout of an appropriate proportion of non-HCV habitats

HCV habitats are shown as dark red on the map: they are always allocated to conservation by Marxan. Non-HCV habitats are allocated to conservation under some scenarios but not others. The more times Marxan allocates an area to conservation, the darker the colour. Hence the red areas represent non-HCV habitats that are 'more optimal' for conservation than the pink and grey areas.

Note: At the provincial level a 20% representation target was set for each habitat. The proportion allocated to conservation within the *project area* was according to the proportion of that habitat contained within the project area *relative* to its extent in the province. This means that if a similar approach was taken by all land owners in the province, the provincial 20% target would be reached.

EcoEnergia could decide to adopt a different approach and seek to conserve a representative portion of non-HCV habitats *outside* the project area.

However, it is recommended that the approach described here has a number of advantages, including the ability to create buffers around HCV habitats, and to create conservation units that are contiguous, connected, of more value to general biodiversity, and greater resilience in the face of climate change.

2.2. Social and cultural values

HCV 5 Basic needs:

Areas of natural vegetation (forest or woodland) where local people obtain basic needs such as fuel wood, building materials, or protein (meat and fish) and where they currently have no viable alternative could be considered HCV areas.

The livelihoods of the local people are basic, and these values appear to occur in all communities within walking distance from a woodland area. That is, the woodland or forest areas where these products are harvested would be considered HCV areas. Bamboo, sticks, straw, rope and timber were the products most frequently cited by local communities as obtained from the forest and woodland areas. The villagers surveyed for the study indicated that hunted meat was only a very small proportion of their protein intake, the majority coming from domestic animals.

Currently, the villagers have *no viable alternative* to the use of these goods and services in their daily lives. Therefore the maintenance of these goods and services is of critical value to the livelihoods of local people.

However, should cost effective alternatives be available, some villagers may prefer these alternatives to their current reliance on scarce natural products. In fact, the provision of alternatives (e.g. building materials) and improvements to current livelihoods (e.g. the more widespread use of energy efficient cooking stoves) may help to alleviate pressure on the woodland patches that are currently supporting the villagers' needs.

It is critical that villagers are enabled to participate in discussions about how to maintain these livelihood aspects, and are provided with free and real choices about the alternatives available. Guidelines on applying the principle of Free Prior Informed Consent are available from work carried out in the palm oil sector[1]. It is recommended that these be considered in this context.

It must be recognised that if alternative forms of livelihood are not identified and provided, displacement of people from agricultural areas, even with their consent, will result in additional pressure on the remaining forest/woodland areas. This pressure is likely to work against efforts to maintain biological HCVs. The potential for these indirect impacts on HCVs within the site needs to be:

- Recognised in development plans

- Addressed with specific measures aimed at improving livelihoods and increasing conservation measures in tandem

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[1] Forest Peoples Programme (2007) Making FPIC Work: Challenges and Prospects for Indigenous Peoples

It is strongly recommended that potential impacts of displacement on biological HCV areas is considered during future EIA investigations, and if and when development and re-settlement plans are drawn up.
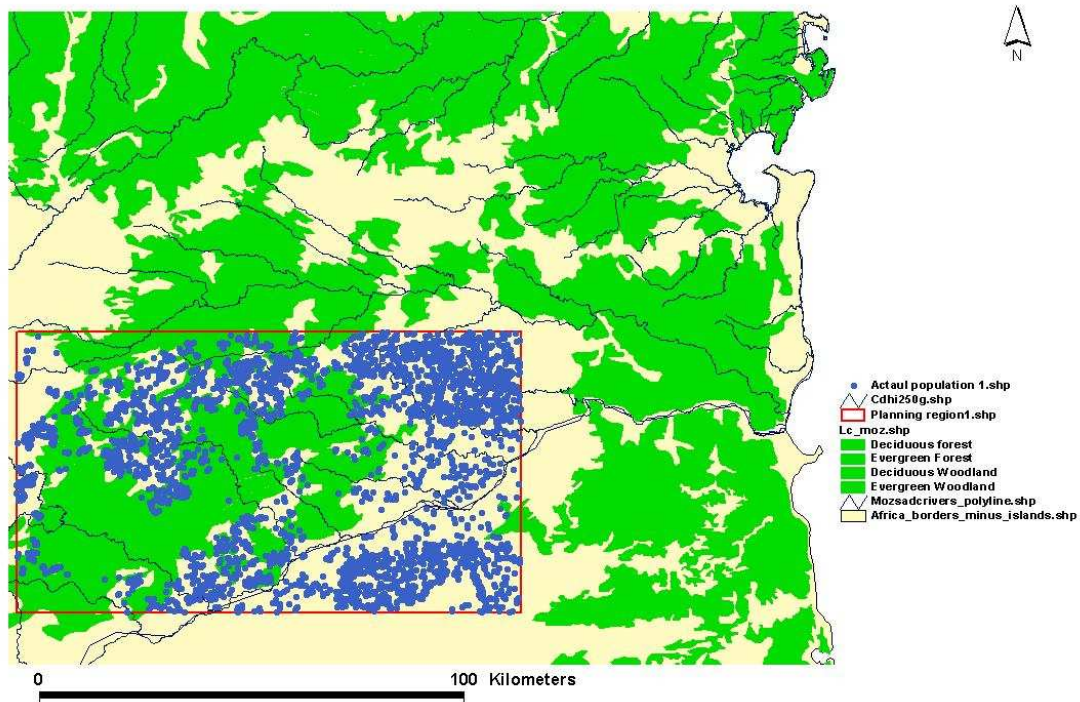

Fig.3: Map showing actual location of settlements within the project area (Settlement locations derived from Cenacarta maps).

HCV 6 Cultural values:

As with basic needs there is a need for detailed, case by case consultations concerning the whereabouts of cultural sites and features critical to local communities cultural identity.

Clearly, such consultations are already a part of legal processes for land acquisition and development by investors. It is, however, critical that investors retain sufficient flexibility in their development plans to allow for the identification and protection of cultural sites in *free and informed* consultation with local communities.

This study has indicated that cultural sites can be readily identified through interviews and consultations. The areas regarded as critical to traditions and cultural ceremonies can be defined and delineated in partnership with local communities.

The management of these areas also needs to be defined through a consultative process, so it is critical that enough flexibility is retained in development plans to be able to accommodate the protection of cultural sites. This is discussed further below.

3. Follow-up recommendations for Eco-Energia

3.1. Biodiversity conservation areas:

Use of Marxan including more detailed site-level data: It is recommended that the approach described here is used, but Marxan GIS is run a second time to produce a more detailed map for the project site. This could make use of more detailed, site level parameters that were not available to the project team at the time of the study. These could include include additional constraints, such as land suitability for crops, and land value to the local community, and the a more detailed map of community use areas.

Boundary delineation of biodiversity conservation areas: Even after this second, more detailed mapping exercise, the results from the analysis will still be provisional. The areas identified as important for conservation need to be checked on the ground. The map outputs (e.g. Fig 2) can be used to guide more detailed delineation on the ground. The boundaries of the areas to be conserved should be delineated on the ground based on the quality of the vegetation cover. Where areas of good quality, closed canopy forest remain within these areas, these should be included in conservation areas. No clearing should take place in these areas.

Management of conservation set aside areas: These habitats were identified on the basis that they provide important habitat for high densities of rare and endemic plant species and biome restricted birds. It is critical that these areas are managed for the purpose of maintaining these habitat conditions. The focus of management should be on maintaining closed canopy, relatively fire-resistant stands. Local communities who regularly collect and hunt in these areas are essential partners in their conservation. The population status of the typical large mammal fauna in these forests is not known, but anecdotal evidence from the local communities suggested most have been heavily depleted. Conservation efforts should focus on building populations of gazelle, antelopes and wild pig, through the collaborative management of hunting.

Elephant migration corridors: The possibility of elephant movements through wooded areas in the west of the project area were discussed with WWF Mozambique, but no data was available to indicate the potential routes of these migrations. It will be important for EcoEnergia to maintain close links with WWF on this issue, and to discuss the suitability of the biodiversity conservation areas set out in this report, for the conservation of elephant movements. Should additional data become available on populations and their movements, it will be important for EcoEnergia to factor these into their project design plans.

Consider scaling up conservation areas: Eco-Energia could target a higher level of protection for natural vegetation than the 20% used for this study. In light of climate change concerns and the likelihood of significant changes to rainfall patterns in the next 50 years Eco-Energia may wish to include larger set-aside areas to buffer for uncertainty.

Consider the *indirect* impacts of project development: If local people are to be moved from their existing land for the purposes of sugar cane/sweet sorghum production, it is important that this does not cause secondary impacts on areas set aside for biodiversity conservation. Re-settlement plans will have to consider the potential for increased pressure on the remaining areas of forest and woodland.

3.2. Social factors

Social surveys to include participatory mapping of resource collection: The village surveys for the project development must include a chance for the villagers to map out areas of the remaining woodland and forest that are important for the collection of forest products. These maps should include areas identified as culturally significant by the communities. Digital maps of these areas should be produced as part of the exercise and villagers should be consulted to check the accuracy of these maps. Records should be kept of all discussions. These maps will for the basis for important decisions about the thresholds of importance of the different products and services obtained from natural areas, and the potential alternatives to these.

Participatory discussion on resource reliance: Using the maps of resource use as a basis, community discussions can then be held on the provision of alternatives to the resources collected. It should be clear to the communities where project development plans currently conflict with resource extraction activities. Discussions should be held on what alternatives would be available in a landscape altered by the project, and what the project can provide as affordable alternatives. Records should be kept of all discussions.

Participatory discussions on sacred sites: Where project development areas are thought to overlap with sites identified as culturally significant to the communities, this needs to be made clear to the communities in question using maps. Decisions on the management of the sites identified should be made in collaboration with the affected stakeholders. Records should be kept of all discussions.