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Preliminary feasibility study to establish a Sustainable Use Conservation Area in the region of Palma and Nangade, Cabo Delgado

Draft Report

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EXECUTIVE SUMMARY

Palma and Nangade districts (Cabo Delgado Province), are located at the northeast corner of Mozambique, near the border with Tanzania, which is delineated by the Rovuma river. Both districts stand out by having a high ecological value, with great diversity of terrestrial and coastal habitats, namely coastal forests and miombo forests. Over the last 20 years, the coastal forests of Eastern Africa have been recognized as forming the most important part of a distinct ecoregion – the Eastern Africa Coastal Forests Ecoregion – and one with a particularly high level of species endemism (Pascal, 2011). Of particular importance are the dry forests, which are one of the 34 global biodiversity hotspots identified by the NGO Conservation International (Pascal, 2011).

The Rovuma basin is rich in both aquatic and terrestrial biodiversity with more than 110 lakes and lagoons and a large part of the basin is ecologically untouched, especially in Mozambique (Sweco, 2013, Augusto, 2016). Forests are present in a wide range of near pristine habitats including dense woodland, seasonal pans and the floodplain wetland of the Rovuma River. This mosaic of habitat allows the occurrence of great levels of species composition. Several flora species with a conservation status may occur, namely *Afzelia quanzensis (considered Near threatened* by Izidine & Bandeira, 2002*), Milicia* excelsa (considered *Near threatened* by IUCN Red List, *Dialium holtzii* and *Berlinia orientalis*, both considered vulnerable by IUCN Red List. In terms of fauna, species considered *Vulnerable*, as Elephant (*Loxodonta Africana)* Lion, Leopard and Hippopotamus also occur. African wild dog (*Lycaon pictus*), considered as *Endangered,* was also reported in the region as well as the Purple-crested turaco (*Tauraco porphyreolophus),* a threatened species and protected by CITES (MICOA, 2006; PDUTP, 2014; Livro Branco, 2005).

However, Palma and Nangade districts are not under any legal form of protection, being particularly threatened by the development of agriculture practices, harmful fishing activities, as well as illegal activities such as poaching and logging, among others (Clarke, 2011). Moreover, because these areas are near the border with Tanzania, they are more vulnerable to illegal trade as well as to illegal exploitation of natural resources. Also, part of this area is included in the potential exploration block of Oil & Gas "Rovuma Onshore".

For that reason, and because the area has a great potential for conservation and ecotourism that would benefit from being a protected area, it has been pointed out by civil society and several NGO, such as WWF, as a candidate for legal protection. Because the area is also extremely important for local communities, who depend on the goods and services provided by the existing ecosystems, WWF intends now to lead a process to promote the creation of a legally protected area in Palma and Nangade districts where the resources are used and managed according to sustainable practices, contributing to the achievement of the Rovuma Landscape Program (RLS).

At a National level the creation of this sustainable managed protected area can ultimately contribute to the National Strategy and Action Plan for the Biological Diversity of Mozambique (NSAPB), the Mozambican Programme of Work on Protected Areas (PoWPA) and Aichi Biodiversity strategic goals, A to E, with focus on target n. 11 for 2020 (Convention on Biological Society – CBD).

WWF started a feasibility study, visiting in first place the area to contact local government, communities and private sector, in order to evaluate the region and to get more information about the relation of local population with natural resources. Following that, WWF contracted Biodinâmica to prepare a participatory workshop in the 23rd June of 2016, that aimed to identify

the interest of local communities in creating a sustainable use conservation area in Palma and Nangade districts, and also what would be the preferential form of gazzetment. The workshop also aimed to promote synergies between local and provincial authorities, local communities, NGOs and private sector, with the goal of coordinating actions and assessing the potential interest among them to create the new Conservation Area.

This document represents the final report of the preliminary feasibility assessment of the process described above. The main objective of this assessment is to conduct a preliminary feasibility study to establish a Sustainable Use Conservation Area in Palma and Nangade districts. The following topics are presented: i) a characterization of Palma and Nangade districts, ii) critical evaluation of an old proposal to create Protected Area in Palma, elaborated by MICOA in 2006; iii) the analysis and integration of the results from the stakeholder consultation undertaken in the two initial field trips and the stakeholders workshop; iv) an examination of the existing legal framework relevant to conservation, and based on this, the proposal of recommendations of legal options for the creation of a Sustainable Use Conservation Area adequate to Palma and Nangade reality; and v) the main conclusions obtained from the stakeholders workshop and the proposed way forward for creating an Area of Sustainable Use of Natural Resources in the region.

The workshop event made clear that all the represented entities and representatives of the communities recognized the ecological and cultural value of the area. Moreover, they were aware of the existing problems and of what is threatening those values and the communities themselves. Participants identified 10 main natural and cultural/social/economical values of the region of Palma and Nangade, namely:

i. Lagoons & rivers;

ii. Forests of high value;

iii. Presence of wildlife;

iv. Migratory birds;

v. Hunting & fishing zones;

vi. Good agriculture zones;

vii. Areas with access to drinking water,

viii. Special landscapes to consider;

ix. Sacred forest (Cheli-Pundanhar)

x. Military cemetery.

The three values considered of most importance within the area were: *Forests of high value*, *Presence of wildlife* and *Good agricultures zones.*

As for natural and cultural/social/economical problems and threats, participants identified 11, namely:

i. Illegal exploitation of Natural Resources (Fauna and Flora);

ii. Human-wildlife conflicts

iii. Illegal hunting and fishing;

iv. Uncontrolled fires;

v. Deforestation

vi. Areas of floods

vii. Lack of potable water

viii. Lack of accesses

ix. Communities with lack of infrastructures

x. Climate changes

xi. Lack of knowledge by population about conservation of natural resources

The three problems considered of most concern within the area were: *Illegal exploitation of Natural Resources*, *Human-wildlife conflict* and *Illegal hunting and fishing*

In general, all the groups were in agreement about the most valuable features and the most serious problems and threats of the area, as well as about the location of those.

At the end of the workshop, all the participants were conscious of the importance of the area and showed the will to see the area gazzeted as a Sustainable Use Conservation Area, independently on the 3 potential selected types (Environmental Protection Area; Community Conservation Area and Sanctuary), where natural resources could be managed by the local communities in a sustainable manner.

As a global recommendation, the way forward should follow an update in the studies that describes Palma and Nanagade region, mainly regarding ecological values, aquatic habitats, distribution areas of fauna species as well as critical habitats for conservation. It should also follow the steps to propose a Protected Area category, to choose a Governance type, to carry on a consultation process and to propose a management plan, always involving local communities, including stakeholders and rightsholders in the planning and decision-making process.

LIST OF ACRONYMS

CBD - Convention on Biological Society

DPMAIP - Provincial Directorate of the Sea, Inland Waters and Fisheries

DPTADER – Directorate for Land, Environment and Rural Development

EPA – Environmental Protection Area

IUCN – International Union for Conservation of Nature

ITCZ - the Inter-Tropical Convergence Zone

MICOA – Ministry for Coordination of Environmental Action

MITADER – Ministry of Land, Environment and Rural Development

NGO – Non-governmental Organization

NSAPB - National Strategy and Action Plan for the Biological Diversity of Mozambique

PA – Protection Area

PDUTP – Land Use Plan Of Palma District

PDUTN - Land Use Plan Of Nangade District

PDN – Nangade District Profile

PoWPA - Mozambican Programme of Work on Protected Areas

WCPA – World Commission on Protected Areas

WWF – World Wide Fund for Nature

TABLE OF CONTENTS

1. Background 11
1.1. Scope 11
1.2. Objectives 12
a) Overall objective 12
b) Specific objectives 12
2. Methodology 13
2.1. WWF visits to Palma and Nangade region 13
2.2. Bibliographic review 13
2.3. Stakeholder Workshop 13
2.3.1. Introductory oral presentations 14
2.3.2. Exercise 1 - Natural and cultural values: identification and mapping 14
2.3.3. Exercise 2 - Problems / threats: identification and mapping 14
2.3.4. Exercise 3 - Consequences of the identified problems, if nothing is done during the next 20 years 15
2.3.5. Oral presentation on Sustainable Use Conservation Areas 15
2.3.6. Exercise 4 - Which Sustainable Use Conservation Area is the most appropriate to the area? 16
2.3.7. Exercise 5 - Expected barriers, difficulties and benefits in the implementation of a Sustainable Use Conservation Area 16
2.3.8. Exercise 6 – Vision 16
2.4. Recommendations and Way forward 16
3. Results and discussion 17
3.1. DESCRIPTION OF PALMA AND NANGADE DISTRICTS 17
3.1.1. Geology, topography and soils 17
3.1.2. Hydrography 17
3.1.3. Climate 18
3.1.4. Socio-economics 19
3.1.5. Land cover 19
3.1.6. Land use 20
3.1.7. Conservation areas 20
3.1.8. Biodiversity and Ecosystems 21
3.1.9. Most important areas 28
3.1.10. Problems and threats identified 31
3.1.11. Spatial Planning 34
3.2. Previous gazzetment proposal 35
3.3. New process for potential gazzetment 36
3.3.1. Resume of the new process 36

3.3.2. Visits to Palma and Nangade regions 36
4. Workshop 39
4.1. Workshop results 39
4.1.1. Exercise 1 - Natural and cultural values: identification and mapping 39
4.1.2. Exercise 2 - Problems / threats: identification and mapping 42
4.1.3. Exercise 3 - Consequences in relation to the previously identified problems, if nothing is done during the next 20 years. 45
4.1.4. Exercise 4 - Which Sustainable Use Conservation Area is the most appropriate to the area? 47
4.1.5. Exercise 5 – Expected barriers, difficulties and benefits in the implementation of a Conservation Area of sustainable use 47
4.1.1. Exercise 6 – Vision 48
5. Legal Framework 50
6. Conclusions 54
7. Recommendations 55
8. WAY FORWARD 58
9. References 64
10. Annexes 66
10.1. Annex I – Workshop Program 66
10.2. Annex II - Participants List 67
10.3. Annex III – Exercise 1 70
PRATICAL EXERCISE 1 70
10.4. Annex IV - Maps used for exercises 1 and 2 71
10.5. Annex V - Tables and maps of each group from Exercise 1 72
10.6. Annex VI –Exercise 2 74
IDENTIFICATION AND MAPPING OF CURRENT PROBLEMS AND THREATS IN THE AREA 74
10.7. Annex VII- Tables and maps of each group from Exercise 2 75
10.8. Annex VIII – Exercise 3 77
10.9. ANNEX IX – Posters from the exercise 3 78
10.10. Annex x - Practical Exercise 4 - Which Sustainable Use Conservation Area is the most appropriate to the area? 79
10.11. Annex 11 – Tables from Exercise 4 80
10.12. Annex XII - Final Outputs from Exercise 5 - Expected barriers, difficulties and benefits in the implementation of a Conservation Area of sustainable use 81
10.13. Annex XIII – Exercise 6 - Vision 82

LIST OF FIGURES

Figure 1 – Presentation of the results from exercises 1 and 2 by the groups. 15
Figure 2 - Approximated area for the feasibility study for the establishment of a Sustainable Use Conservation Area 18
Figure 3 - Southern edge of the Rovuma River floodplain looking south showing the sudden rise in landscape up to the Palma–Mueda–Pemba isocline *Source: Clarke, 2011* 18
Figure 4 - Land cover within the study area. Adapted from Marzoli, 2007 20
Figure 5 - Conservation areas around study area. Adapted from ArcGIS – World Database of Protected Areas. 21
Figure 6 - a) Scorodophloeus dry forest and b) Borassus palm savanna both near Hunter's concession at Pundanhar; c) young low miombo woodland in Nhica do Rovuma; d) Scorodophloeus fischeri and Guibourtia schliebenii dominated dry forest in the process of being cut at the edge of Chicamba village, Nangade e) Well-developed Brachystegia spiciformis forest near Lake Nhica; f) Well-developed mixed dry forest in Palma- Quissungule road. Source: Clarke, (2011); Pascal, (2011). 23
Figure 7 - a) Pans and b) Drainage line feeding into river Macanga, both near the village of Nhica do Rovuma; c) Aerial view over Palma area showing miombo woodland and flooded grasslands; d) riverine vegetation by backwater below Nhica do Rovuma; e) Samplings of Berlinia orientalis regenerating on a formerly cultivated; f) Impenetrable scrub forest near Nhica do Rovuma... 24
Figure 8 - a) The east coast akalat (*Sheppardia gunningi*) was firstly recorded in the northern region of Cabo Delgado during Pascal (2011) study ; b) The lacertid *Ichnotropis squamulosa* is not common in northern Mozambique; c) African wild dog recorded during Clarke (2011) study near Pundanhar. *Source: Pascal (2011) - a) and b); Clarke (2011) –c* 26
Figure 9 - Key forest blocks: yellow - Pundanhar (1); Nangade (2); pink - Rovuma Floodplain and Palma Pans (3). *Source: Clarke, 2011* 30
Figure 10 - Key forest block: Yellow – Manganha river (4); Cores: Green – Nhica do Rovuma (5); Macanga (6). *Source: Clarke, 2011* 30
Figure 11 - Loss of forest cover (red) between 2000 and 2014 in the study area. Source: Global Forest Change 31
Figure 12 - Gain of forest cover (blue) between 2000 and 2012 in the study area. *Source: Global Forest Change* 32
Figure 13 - Forest loss (between 2000 – 2013), Forest gain (2000 – 2012), Both loss and gain and Forest extent in the study area. 32
Figure 14 - Land Use Propose for Palma District. In yellow: - Tourism (yellow); Green - Community reforestation and conservation; Brown – Agriculture and in Red - Environmental conservation. *Source: PDUTP, 2014.* 35
Figure 15 - Map with the final results of the natural (a) and cultural/social/economical (b) values identified and mapped by all the groups 41
Figure 16 - Map with the final results of the natural (a) and cultural/social/economical (b) problems identified and mapped by all the groups. 44
Figure 17 – The 8 proposed steps to implement and manage the most adequate type of Sustainable Use Conservation Area for the region 61
Figure 18 – From left to right: Poster of Timber Business-Man group of the group representing *Game farms* 78
Figure 19 – From left to right: Poster of the group representing the Government and from the group representing a Community 78
Figure 20 –From top left to right: Tables from groups 1, 2, 3 and 4 regarding exercise 4 80
Figure 21 – Top scored conservation areas of sustainable use with the identified barriers/benefits (red post-it's) and benefits (green post-it's) for the implementation of these areas(left to right: Environmental Protection Area; Community Conservation Area and Sanctuary). 81

Figure 22 – Poster from group 1 82
Figure 23 – Poster from group 2 82
Figure 24 – Poster from group 3 83
Figure 25 – Poster from group 4 83

LIST OF TABLES

Table 1 – Thematic structure for the workshop approach..... 14
Table 2 - Ecosystems that can be found along the area, with the description, habitats and potentialities of those ecosystems..... 26
Table 3 – Main results from the first WWF visit to the region of Palma and Nangade..... 36
Table 4 – Main results from the second WWF visit carried out to Palma and Nangade regions 37
Table 5 - Natural and Cultural/social/economical values identified by all the groups..... 39
Table 6 – List of values and its ranking position according to the scores given by the groups. . 39
Table 7 - Natural and Cultural/social/economical problems identified by all the groups..... 42
Table 8 - List of problems/threats and its ranking position according to the scores given by the groups 43
Table 9 - Consequences identified by group 1, representing a community..... 46
Table 10 - Consequences identified by group 2, representing the Government. 46
Table 11 - Consequences identified by group 3, representing a game farm..... 46
Table 12 - Consequences identified by group 4, representing a timber business-man. 46
Table 13 – Barriers/difficulties and benefits identified by participants for implementation of the following types of conservation areas of sustainable use: Environmental Protection Area, Community Conservation Area and Sanctuaries..... 48
Table 14 – Visions of each group within 20 years from the present date, for Nangade and Palma region. 49
Table 15 – Description of the different types of Sustainable Use Conservation Areas according to Conservation Law (nº 16/2014) 50
Table 16 – Description of the three IUCN categories that match the Sustainable Use Conservation Areas types chosen by the workshop participants..... 59
Table 17 – Matrix classification for the projected protected areas comprising both categories and governance type. The three Protected area categories are the IUCN categories applied to Sustainable Use Conservation Areas chosen during workshop. 60

1. BACKGROUND

1.1. SCOPE

In the north-east of Mozambique, in the border with Tanzania, the final section of the Rovuma River basin, between Palma and Nangade districts (Cabo Delgado), presents high ecological value, with great diversity of terrestrial and coastal habitats, namely coastal forests and miombo forests. Palma district has the most extensive wooded area in East Africa, containing at least 11 endemic species, and storing large amounts of carbon (Clarke, 2011). The Nangade district contains some forest species that do not occur in Palma District being strongly dominated by *Scorodophloeus fischeri* and *Guibourtia schliebenii*, neither of which are found in Palma. It also worthy to highlight the high diversity of wildlife, including elephant, buffalo, hippopotamus, leopard, lion, antelopes, African wild dog and a significant avifaunal community (Clarke, 2011; Augusto, 2016).

Additionally, the Rovuma river is one of the few country-shared rivers that is hydrologically pristine with no significant water storage and/or river regulation infrastructure. The Rovuma basin is rich in both aquatic and terrestrial biodiversity with more than 110 lakes and lagoons and a large part of the basin is ecologically untouched, especially in Mozambique (Sweco, 2013, Augusto, 2016).

The area is already included in Rovuma Landscape program (RLS) supported by Coast East Africa (CEA), that has the following major objective "*till 2020, the illegal and unsustainable logging of forests, poaching as well as wood and wildlife trade, will be reduced*". However, both districts are not under any legal form of protection, being particularly threatened by the development of agriculture practices, harmful fishing activities, as well as illegal activities such as poaching and logging, among others (Clarke, 2011). Moreover, because these areas are near the border with Tanzania, they are more vulnerable to illegal trade as well as to illegal exploitation of natural resources. Also, part of this area is included in the potential exploration block of Oil & Gas "Rovuma Onshore".

For that reason, and because the area has a great potential for conservation and ecotourism that would benefit from being a protected area, it has been pointed out by civil society and several NGO, such as WWF, as a candidate for legal protection. In 2006 MICOA prepared a proposal to create a Protected Area in Palma, however the process didn't result in any form of gazzetment. WWF intends now to lead a process to promote the creation of a legally protected area in Palma and Nangade districts where the resources are used and managed according to sustainable practices, contributing to the achievement of the Rovuma Landscape program (RLS).

Considering the new Conservation Law (Law No. 16/2014, of 20 June) and the current reality, either in the region and in the country, WWF aims to propose a protected area management category which is, from its early beginning, adjusted to the social, ecological, economic and political environment. So, the proposed protection category should then integrate these four aspects, fitting the categories of Sustainable Use Areas, Article 18 paragraph 1 of Law No. 16/2014.

At a National level the creation of this sustainable managed protected area can ultimately contribute to the National Strategy and Action Plan for the Biological Diversity of Mozambique (NSAPB), the Mozambican Programme of Work on Protected Areas (PoWPA) and Aichi Biodiversity strategic goals, A to E, with focus on target n. 11 for 2020 (Convention on Biological Society – CBD).

To achieve that goal, WWF started a feasibility study, and its first activity was a site visit to the districts of Palma and Nangade between 4 and 8 April 2016, to contact local government, communities and private sector, in order to evaluate the region and to get more information about the relation of local population with natural resources. A second visit was undertaken between 12 and 14 of June 2016, in order to visit areas not visited before, to contact other actors who were not contacted during the previous visit, and to invite stakeholders to a workshop event.

Subsequently, WWF contracted Biodinâmica to prepare a participatory workshop in 23rd June of 2016, that aimed to identify the interest of local communities in creating a sustainable used conservation area in Palma and Nangade districts, and also what would be the preferential form of gazzetment. To achieve that, the community needed to be aware of the benefits that a Sustainable Use Conservation Area could offer them, in addition to the ecological benefits. The workshop also aimed to promote synergies between local and provincial authorities, local communities, NGOs and private sector, with the goal of coordinating actions and assessing the potential interest among them to create the new Conservation Area.

The info obtained from this preliminary feasibility study is intended to give clear indications on the main features of the area, the interest of local communities on having this area classified as a Sustainable Use Conservation Area and the way forward.

1.2. OBJECTIVES

This document corresponds to the final report of the preliminary feasibility assessment of the process described above. The general and specific objectives are described below.

a) Overall objective

Conduct a preliminary feasibility study to establish an Area of Sustainable Use of Natural Resources Management in Palma and Nangade districts

b) Specific objectives

The specific objectives of this report are to:

1. Characterize Palma and Nangade district, based on bibliographic review, concerning both biodiversity, socio-economic, land use and other relevant studies;

2. Examine and reevaluate the proposal to create Palma Protected Area elaborated by MICOA in 2006;

3. Analyze and integrate the results from the stakeholder consultation undertaken in the two initial field trips and the stakeholders workshop;

4. Examine the existing legal framework relevant to conservation and based on this recommend legal options for Sustainable Natural Resource Area adequate Palma and Nangade reality; and

5. Present the main conclusions obtained from the stakeholders workshop and propose a way forward (recommendations and following steps) for creating an Area of Sustainable Use of Natural Resources in the region.

2. METHODOLOGY

The following methodology was used to undertake the preliminary feasibility study:

i) Undertake two field trips by WWF to Palma and Nangade region;

ii) A bibliographic research on studies already done in the area;

iii) A stakeholder workshop with the facilitation of Biodinâmica;

iv) A final report integrating the obtained results and proposing recommendations and way forward.

2.1. WWF VISITS TO PALMA AND NANGADE REGION

WWF took two visits to Palma and Nangade, in order to get the involvement from local government, civil society organization, local population and private sector.

The first visit to the region was undertaken between 4 and 8 of April of 2016, with the participation of the Provincial Directorate of the Sea, Inland Waters and Fisheries (DPMAIP) and of the Directorate for Land, Environment and Rural Development (DPTADER).

The second WWF visit took place between the 12th and 14th of June 2016 and also counted with the participation of representatives of DPMAIP and DPTADER.

2.2. BIBLIOGRAPHIC REVIEW

In order to prepare the stakeholder workshop and to gather the existing information for Palma and Nangade area on biodiversity, vegetation, ecosystems, economy and political environment, the following studies were consulted: Clarke (2011); Sweco (2013); Augusto (2016); Kashaigili & Mbilinyi (2014), MICOA (2006), Pascal (2011), the Nangade district profile (PDN 2005), and the land use plans of Palma (2014) and Nangade (2016) districts.

2.3. STAKEHOLDER WORKSHOP

According to the scope of this feasibility study to establish an Area of Sustainable Use of Natural Resources in Palma and Nangade districts, WWF decided to promote a stakeholder workshop with the facilitation of Biodinâmica.

This workshop aimed to inform local communities on the ecological characteristics of the area, threats and opportunities, including sustainable land use and management options, and to assess their interest in including areas of the two districts in a Sustainable Use Conservation Area.

The approach for the workshop included the following structure (Table 1). Annex I shows the complete program of the workshop. The methodology is described below.

Table 1 – Thematic structure for the workshop approach

WWF strategy
Divulgation of studies in the area
Identification and mapping of natural and cultural values existing in the area
Identification and mapping of actual problems and threats in the area
Identification of consequences taking into account the existing problems and the potential threats if nothing is done in the next 20 years
Categorization of Conservation Areas according to the Biodiversity Conservation Law
What type of conservation area is most appropriate for the proposed area?
Obstacles, difficulties and benefits in implementing each of the conservation area selected types
Reflection exercice / Vision

2.3.1. Introductory oral presentations

After the opening session and participant's presentations, WWF presented two oral communications: one about WWF strategy, and how it fits in the study area, and the other to disclose the studies undertaken on the area.

The following sessions were mainly comprised of practical exercises. Participants were divided in 4 groups each of them with one moderator, and participants from the same or similar sectors, and from Palma and Nangade were distributed in way to get heterogeneous groups.

2.3.2. Exercise 1 - Natural and cultural values: identification and mapping

For this exercise, a sheet and two maps (one for consultation and other to draw on it), were given to the participants (exercise sheet and maps available in Annex III and IV, respectively). Participants were than invited to list on a table the main natural and cultural values they can identify for the area and to give them a score from 1 (less important) to 5 (most important). Then, each group draw the identified values on the map, while facilitators were making the overall ranking by calculating the mean of scores given by groups for each value.

2.3.3. Exercise 2 - Problems / threats: identification and mapping

This exercise followed the same method of the previous one. In this case the list (with the votes from *less concern* to *most concern*) (Annex VI) focused on the current problems and threats in the area, which were also drawn by each group in a map. The overall ranking was also calculated by the facilitation team, using the same method explained in the previous exercise.

For exercises 1 and 2, each of the groups presented their results and maps for the audience, as shown in the following pictures.


Figure 1 – Presentation of the results from exercises 1 and 2 by the groups.

2.3.4. Exercise 3 - Consequences of the identified problems, if nothing is done during the next 20 years

Problems/threats from the previous exercise were distributed by the 4 groups (3 problems to each) and they were asked to make a small poster with the consequences they could identify for those problems. Moreover, each group was representing an entity, and should think on the consequences according to the interests and individualities of it (table used during this exercise is available in Annex VIII). The entities distributed by the groups were: i) timber businessman, government, game farm owner and community. Each group presented the posters to the remaining workshop participants.

2.3.5. Oral presentation on Sustainable Use Conservation Areas

Before the following practical exercises, Biodinâmica proceeded with an oral presentation about the different types of Sustainable Use Conservation Areas that exist in Mozambique according to the Biodiversity and Conservation Law (No. 16/2014 of 20 June). During this presentation, the objectives, benefits and restrictions about each kind of conservation area were shared in order to continue with the following exercises of the workshop.

The Sustainable Use Conservation Areas presented were:

- Special Reserve
- Environmental Protection Area
- Official Game Area
- Community Conservation Area
- Sanctuary
- Game Farm

2.3.6. Exercise 4 - Which Sustainable Use Conservation Area is the most appropriate to the area?

Groups were asked to choose the three types conservation areas which they thought to be the most appropriate to the Nangade and Palma region (table used for this exercise is available in Annex X). A voting system was implemented and the overall top three were written in a poster and placed on the wall. A discussion about the selection was held at the end of the exercise.

2.3.7. Exercise 5 - Expected barriers, difficulties and benefits in the implementation of a Sustainable Use Conservation Area

Each of the groups identified the barriers and difficulties as well as the benefits that would be faced when implementing each of the top scored conservation area types resulting from the previous exercise. Red post-it's were used for presenting the difficulties/barriers and green ones for the benefits. The results were discussed by the participants and the facilitation team.

2.3.8. Exercise 6 – Vision

In the final exercise participants were invited to share of their vision on how they would like to see the area in question within a period of 20 years from now. Each of the groups wrote its vision and presented it to the workshop participants in a small poster. The visions were discussed by the facilitating team.

2.4. Recommendations and Way forward

Considering the data obtained from the bibliographic review, the results obtained from the workshop and the national and international policy and strategy for biodiversity, in particular, for protected areas, several recommendations and way forward were proposed. The national and international conservation and biodiversity policy reference documents used were the ones listed below:

- Plano Quinquenal do Governo 2015-2019 (2015)
- National Strategy and Action Plan of Biological Diversity of Mozambique (2015)
- Action Plan for Implementing the Convention on Biological Diversity's Programme of Work on Protected Areas – Mozambique (2012)
- Fifth National Report on the Implementation of Convention on Biological Diversity in Mozambique (2014)
- Global Biodiversity Outlook 4 (2014)
- Aichi Biodiversity Targets (2013)

3. RESULTS AND DISCUSSION

3.1. DESCRIPTION OF PALMA AND NANGADE DISTRICTS

The study area of this preliminary feasibility assessment is integrated in Palma and Nangade districts (Cabo Delgado Province), which are located at the northeast corner of Mozambique, near the border with Tanzania, which is delineated by the Rovuma river (Figure 2). Both districts stand out as the most heavily wooded area along the entire eastern African coast (Clarke, 2011). Forests are present in a wide range of near pristine habitats including dense woodland, seasonal pans and the floodplain wetland of the Rovuma River.

In total, 15% of the Rovuma River Basin is included in the Cabo Delgado province. This is an unexploited area with only 3% of the area classified as urban and 10% classified as cultivation, whilst woodlands and scrubland cover 35% and 44% of the area, respectively.

This area was partially depopulated during the wars that raged from 1964 until 1992, which has in turn led to a massively reduced human pressure on the vegetation.

3.1.1. Geology, topography and soils

The region presents a geological formation of sediments from Quaternary period, varying to the Mesozoic and Cenozoic era.

According to the Land Use Plan of Palma District (PDUTP) and the Land Use Plan of Nangade (PDUTN), soils are mainly sandy in both districts and reddish-brown sandy loam soils in the case of Palma and yellow to brownish-grey in the case of Nangade. In Palma most of the soils are also moderately deep and very deep in case of Nangade (PDUTP, 2014; PDUTP).

The area is mostly contained within a large sedimentary isocline that slopes upwards and westwards to Mueda whereupon the terrain falls steeply to the wide Lugenda River floodplain (Figure 3). This same isocline also ends abruptly along its north-western edge where it drops dramatically to the Rovuma River. Certain areas of the isocline are sufficiently flat on a local scale for drainage to be impeded. Seasonal pans have developed where clays have collected in the shallow depressions (Clarke, 2011).

3.1.2. Hydrography

The main water courses in Nangade region are the rivers: Rovuma, Melambue, Litingina, Luneque, Silundinde, Uncundi and Mutamba, and the lakes Nangade and Lidede.

In Palma, the most important river basins are Rovuma, Meronvi, Quibanda, Macanga and Mecumbi, being several lakes associated to these rivers (PDUTP, 2014 and PDUN).

The existence of several water bodies in this region is of great importance for local population, who depend on it to survive and are the habitat for fishing resources.

Figure 2 - Approximated area for the feasibility study for the establishment of a Sustainable Use Conservation Area

3.1.3. Climate

Palma and Nangade Districts receive a humid and sub-humid to dry tropical climate that is influenced by movements in the Inter-Tropical Convergence Zone (ITCZ). The average annual temperature is 25°C with two seasons per year, a cool and dry season (March to September) and a hot and humid season (October to February). The mean annual rainfall ranges from 800 to 1000 mm in Nangade and is around 1000 mm in Palma (PDUT of Palma, 2014; PDUT of Nangade; Clarke, 2011).

Figure 3 - Southern edge of the Rovuma River floodplain looking south showing the sudden rise in landscape up to the Palma–Mueda–Pemba isocline *Source: Clarke, 2011*

3.1.4. Socio-economics

With an extension of 3 576 km^2, Palma is divided in 4 administrative posts (Olumbe, Palma, Pundanhar and Quionga) composed by the following localities:

- Olumbe: Olumbe and Quissengue
- Palma Sede: Mute and Locality Sede
- Pundanhar: Nhica de Rovuma and Pundanhar
- Quionga: Quirinde, Quionga Sede

It is also composed by 63 villages (Government of Palma District, 2013 *in* PDUT of Palma, 2014).

Nangade, with a surface of 2 978,7 km^2, is divided in two administrative posts (Nangade and Ntamba), composed by the following localities:

- Nangade Sede: Litingina and Nangade Sede
- Ntamba: Itanda, Mualela and Nambedo.

Nangade is also composed by 40 villages (PDUT of Nangade).

According to INE (2012), the population of Palma is comprised of 51 438 inhabitants, while Nangade, according to PDN (2005), presented an estimated population of 63 029 inhabitants for the same year.

Population in this region lives in dependence of natural resources and is mostly comprised of subsistence farmers and fishermen, depending on the Rovuma River and its effluents for their livelihoods (PDN, 2005; PDUTP, 2014). Despite abundant water and other natural resources, poverty in the Rovuma River Basin continues to be a major setback to sustainable development: the poverty incidence for the Cabo Delgado province is estimated in 57% (NBS, Mozambique *in* Sweco, 2013).

Agriculture is the main activity and is practiced by almost all family aggregations, by traditional means. Cassava is one of the main crops, associated with leguminous as beans and peanuts. Production of rice is also important for population, and is produced in humid soils in floodplains of the main rivers (PDUTP,2014; Profile of the Nangade District (PDN) ,2005).

3.1.5. Land cover

According to the National Forest Inventory (Marzoli, 2007), there are 9 units of land cover within the area in question, namely: shifting cultivation with open to closed forested areas; natural water bodies; grasslands; field crops; closed to open forested areas with shifting cultivation; aquatic/regularly flooded open forest; aquatic/regularly flooded herbaceous vegetation; (semi-) deciduous forest and (semi-) deciduous open forest. In **Erro! A origem da referência não foi encontrada.** is possible to see that the main cover of the area are forests, although some of them are associated with shifting crops. Even tough, the area allows the availability of different kind of habitats, and thus great levels of biodiversity, existing also several water bodies associated with aquatic forests (mainly over Rovuma river). According to Clarke (2011) and MICOA (2006), during the wet season there's also the formation of numerous pans and seasonal lagoons within the area.

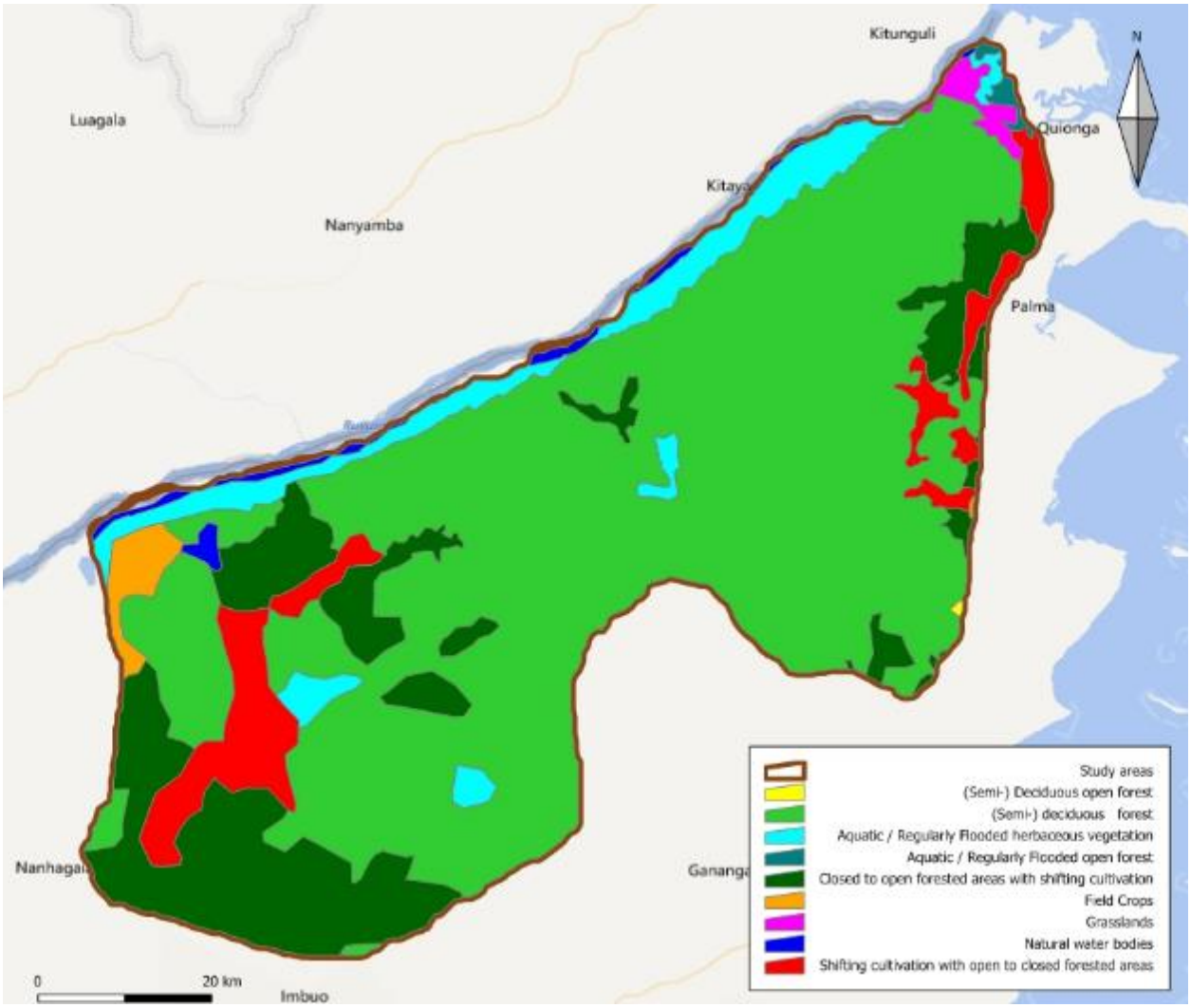

Figure 4 - Land cover within the study area. Adapted from Marzoli, 2007

3.1.6. Land use

The Rovuma River Basin is an unexploited area with only 3% of the area classified as urban and 10% classified as cultivation, whilst woodlands and scrubland cover respectively, 35% and 44% of the area (Sweco, 2013).

According to PDUTP (2014) the most predominant land use is *Forest* and also the non-classified use (which includes *open shrub*), which is expectable in a less developed area. Other uses include settlements, agriculture, tourism (as game farms), conservation areas and water bodies.

Till the moment there is no information on land use specifically for Nangade.

In case of settlements in the Rovuma River Basin, it consists of scattered rural village communities, a few small towns, market centers, commercial farms and estates. These are generally concentrated in river valleys, flood plains, along main roads and in the vicinity of towns and administrative centers (Sweco, 2013).

3.1.7. Conservation areas

The nearest Conservation Areas from Palma and Nangade districts are the Niassa National Reserve (at a 140 km from the study area) and Quirimbas National Park (160 km from study area) in Mozambique. In Tanzania side are: Kambona Forest Reserve (65 km), Msanjesi Game Reserve (130 km); Muhuwesi Forest Reserve (240 km), Lukwika-Lumesule Game Reserve (115 km), Sasawara Forest Reserve (280 km) and Mbangata Forest Reserve (80 km) (**Erro! A origem da referência não foi encontrada.Erro! A origem da referência não foi encontrada.**).

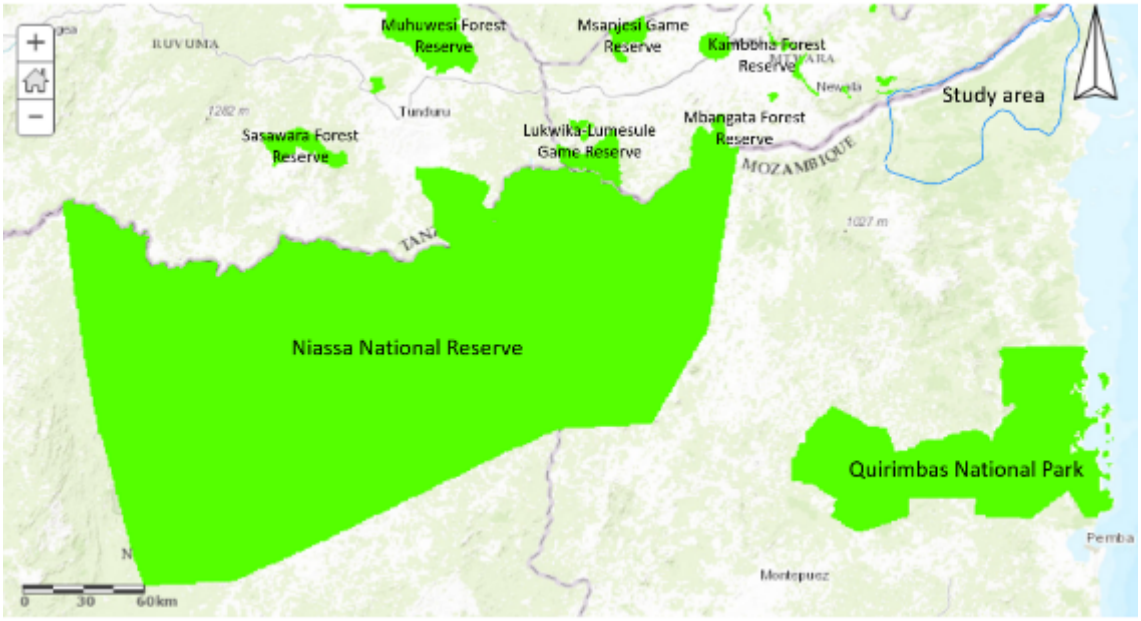

Figure 5 - Conservation areas around study area. Adapted from ArcGIS – World Database of Protected Areas.

3.1.8. Biodiversity and Ecosystems

Habitats/Ecosystems

The coastal forests of Eastern Africa, over the last 20 years, have been recognized as forming the most important part of a distinct ecoregion – the Eastern Africa Coastal Forests Ecoregion – and one with a particularly high level of species endemism (Pascal, 2011). Particularly, the coastal region of north-eastern Mozambique has long been recognized as a probable area of high biological diversity and interest (Barbosa 1968; Brenan 1978; Huntley 1978; White & Moll, 1978, *in* Pascal, 2011).

Nangade and Palma have thus, a very relevant and particular diversity of ecosystems, species and natural resources. The forests and dense woodlands are extensive, and together provide the highest wooded cover of the entire eastern African coast.

Of particular importance are the dry forests, which form part of the Coastal Forests of Eastern Africa. These forests are one of the 34 global biodiversity hotspots identified by the NGO Conservation International (Pascal, 2011). Most of the rare species found in this area are limited to this vegetation type (Clarke, 2011).

Yet despite their considerable extent, the forests are generally in poor conservation condition. Almost every site visited during Clarke study (2011), showed clear signs of having regenerated from relatively recent clearance/cultivation (within the last 60 years). Many of these forests are

widespread, while others reflect the previous vegetation type. The species *Berlinia orientalis*, which is of restricted distribution along the Eastern African coast, is surprisingly common in such areas.

As showed in the land cover map, the region stands out with the presence of mixed habitats and ecosystems (**Erro! A origem da referência não foi encontrada.** and **Erro! A origem da referência não foi encontrada.**). This includes forest ecosystems (moist and dry forests, miombo and similar woodland, scrub, termite mound forest/woodland, fallow and regenerating, dense and mixed forests); palm savannas and several ecosystems associated to the Rovuma river basin as river margins, lakes, seasonal and permanent lagoons (as Nangade and Lidede), and pans.

Woodland is ecologically distinguished from forest by the effect of fire. It is characterized by a fire-adapted understory of grasses with scattered shrubs. Tree crowns almost touch in some areas, but can be more widely spaced than forests (White 1983 *in* Clarke, 2011; Pascal, 2011).

Fallow and regenerating forests are characterized by areas where dry forest or woodland has been cleared for agriculture or by logging. Here a fallow vegetation is found reverting to forest, bush (scrub forest) or woodland due to the vigorous recolonization by trees and shrubs that are able to regenerate through coppice regrowth. (Pascal, 2011; Clarke, 2011).

Termite mound forest/woodland are described as patches of dense woodland verging on dry forest, which are commonly associated with large termite mounds, up to 20m across (Pascal, 2011).

Scrub forests are forests in the process of regeneration where the canopy has not yet reached the required 10 m lower cut-off to be properly classified as forest (White, 1983 *in* Clarke,2011).

Pans are near-circular and are associated to grasslands; filled with water during the rains, while the drainage lines only briefly contain flowing water. Such areas sometimes contain tree species that are typical of riverine/groundwater forests, such as *Sterculia appendiculata.*

Palm savannas are characterized by a wooded grassland dominated by *Borassus aethiopum* palms (Clarke, 2011; Pascal, 2011).

Riparian and lakeshore vegetation are characterized by a narrow fringe of woodland along these areas (Pascal,2011). Much of the vegetation along the Rovuma is influenced by the annual dynamics of flooding, drying out and burning. Fire-tolerant woodland is therefore found on most of the raised levies, and forest is only able to develop on high banks where the Rovuma or its tributaries reach the southern limit of the floodplain (Pascal, 2011).

This mixture of habitats is of great ecological importance, once besides ensuring water and soils quality, allows the existence of great levels of diversity of fauna and flora species. Indeed, forests located along the Rovuma River provide a dry season refuge for game animals, and are a key component of a wider wildlife ecosystem (Clarke, 2011).

Figure 6 - a) Scorodophloeus dry forest and b) Borassus palm savanna both near Hunter's concession at Pundanhar; c) young low miombo woodland in Nhica do Rovuma; d) Scorodophloeus fischeri and Guibourtia schliebenii dominated dry forest in the process of being cut at the edge of Chicamba village, Nangade e) Well-developed Brachystegia spiciformis forest near Lake Nhica; f) Well-developed mixed dry forest in Palma- Quissungule road. Source: Clarke, (2011); Pascal, (2011).

Figure 7 - a) Pans and b) Drainage line feeding into river Macanga, both near the village of Nhica do Rovuma; c) Aerial view over Palma area showing miombo woodland and flooded grasslands; d) riverine vegetation by backwater below Nhica do Rovuma; e) Samplings of Berlinia orientalis regenerating on a formerly cultivated; f) Impenetrable scrub forest near Nhica do Rovuma.

Flora

Some areas of forest comprise a mature overstore of enormous canopy emergent, which are no longer seen in any quantity elsewhere in coastal eastern Africa. It is usually composed by widespread deciduous species such as *Afzelia quanzensis* (considered Near threatened by Izidine & Bandeira, 2002), *Brachystegia spiciformis*, *Hymenaea verrucosa*, *Pteleopsis myrtifolia*, *Milicia excelsa* (considered Near threatened by IUCN Red List), but also include Swahilian endemics such as *Dialium holtzii* and *Berlinia orientalis*, both considered vulnerable by IUCN Red List (Clarke, 1995 in Clarke, 2011).

Some species found during Pascal (2011) expedition are considered as Endangered by IUCN Red Data, namely: *Guibourtia schliebenii*; *Hexalobus mossambicensis*; *Monodora minor*; *Scorodophloeus fischeri*; *Thespesia mossambicensis* and *Vismianthus punctatus*.

According to MICOA (2006), along the Rovuma river, the following important species also occur: *Adansonia digitata*, *Bombax rhodagnapylum*, *Khaya nyassica*, *Ronorea eliptica*, *Ficus* spp., e *Psophocarpus* sp.

Fauna

The region stands out for being rich in species composition. From the terrestrial mammals that occur in the area it is worth to note: Elephant (*Loxodonta africana),* Buffalo (*Syncerus caffer),* Lion (*Panthera leo*), Leopard (*Panthera pardus)*, Waterbuck (*Kobus ellipsiprymnus*), Sable antelope (*Hippotragus niger*), Eland (*Taurotragus oryx*), Greater kudo (*Tragelaphus strepsiceros*), Common Duiker (*Sylvicapra grimmia*), Natal Red Duiker (*Cephalophus natalensis*), Suni (*Neotragus moschatus*), Red River Hog (*Potamochoerus porcus*), shrews (*Petrodromus tetradactylus*, *Crocidura* spp.), several rodents and bats (MICOA, 2006; PDUTP, 2014; Livro Branco, 2005). During Clarke's expedition (2011), the African wild dog (*Lycaon pictus)* was observed between Palma and Pundanhar (**Erro! A origem da referência não foi encontrada.**).

Along water courses also occur Crocodiles (*Crocodylus niloticus*), Hippopotamus (*Hippopotamus amphibius*) and aquatic birds such as egrets, bitterns and gooses (Livro Branco, 2005; MICOA, 2006).

Elephant, Lion, Leopard and Hippopotamus are considered *Vulnerable* and in the case of African Wild Dog, it is considered *Endangered* by the IUCN Red List of threatened species.

Several other bird species occur such as Dickinson's Kestrel (*Falco dickinsoni),* Senegal Coucal *(Centropus senegalensis)*, Green-capped Eremomela (*Eremomela scotops*), the African golden oriole (*Oriolus auratus*), Lesser jacana (*Microparra capensis*), Black-bellied Bustard (*Eupodotis melanogaster*); Half-collared Kingfisher (*Alcedo semitoquata*), among others. The presence of the Purple-crested turaco (*Tauraco porphyreolophus),* a threatened species and protected by CITES (MICOA, 2006; PDUTP, 2014; Livro Branco, 2005) was also detected. Four species that are endemic to the Dry Coastal Forests of Eastern Africa were recorded during Pascal expedition (2011), namely the Eastern Green Tinkerbird (*Pogoniulus simplex*), the East Coast Nicator (*Nicator gularis*), Fischer's Greenbul (*Phyllastrephus fischeri*) and the globally Near-Threatened East Coast Akalat (*Sheppardia gunning)*, which was not previously recorded for the northern region of Cabo Delgado (**Erro! A origem da referência não foi encontrada.**a).

It is worth to note that during Pascal's (2011) expedition, more than 50 species found in Rovuma area were considered new records for Mozambique and about 15 of the species that were found, were probably new to science, in relatively well known groups: frogs, butterflies, orthoptera, dung beetles and cicindelid beetles. Also, from the same study, samples from the Nhica do Rovuma area represented about 30-35% of the reptiles that occur in Mozambique (about 170 species) but about 50% of those were known for northern Mozambique (about 100 species).

These results showed that even within these well-known groups, the surveyed area hosts an original fauna.

Figure 8 - a) The east coast akalat (*Sheppardia gunningi*) was firstly recorded in the northern region of Cabo Delgado during Pascal (2011) study ; b) The lacertid *Ichnotropis squamulosa* is not common in northern Mozambique; c) African wild dog recorded during Clarke (2011) study near Pundanhar. *Source: Pascal (2011) - a) and b); Clarke (2011) –c*

Table 2 presents a resume of the most relevant ecosystems that can be found along the area, as well as the habitats provided by them. This table has been prepared based on the following studies: Clarke, 2011; Pascal, 2011; Augusto, 2016; Sweco, 2013.

Table 2 - Ecosystems that can be found along the area, with the description, habitats and potentialities of those ecosystems.

	Forest Ecosystems	Ecosystems associated to the Rovuma basin	Savannas and wooded valleys ecosystems
Description	Dry forests; miombo forests, mixed forests; termite mound forest/woodland; moist forest; scrub forests; woodland; fallow and regenerating	Rovuma river margins; lakes; seasonal and permanent lagoons; drainage lines and pans	Clean areas with less trees, usually with watercourses or seasonal associated lagoons
Associated species	○ Presence of several flora species with 11 endemic species; *Scorodophloeus fischeri* and *Guibourtia schliebenii* only present in Nangade; ○ Presence of buffalos, elephants, lions, leopards, antelopes, several birds and a wide community of insects (termites.	○ Diversity of aquatic flora and fauna, with presence of several species of freshwater (30% endemic), permanent and migratory birds, hippos, crocodiles and other reptiles. Dominant species in each habitat:	○ Diversity of flora and fauna with presence of birds, antelopes buffalos, elephants and also African wild dog. ○ This ecosystem is part of wildlife corridors.

	Dominant species in each habitat: ○ **Dry forests:** *Guibourtia schliebenii Guibourtia schliebenii,* Dialium holtzii, Sterculia schliebeni and *Micklethwaitia carvalhoi*. ○ **Miombo forests**: *Brachystegia spiciformis, Julbernardia globiflora, Afzelia quanzensis* and *Berlinia orientalis.* ○ **Mixed forests***:* mainly *Manilkara sansibarensis, Ochna mossambicensis, Pteleopsis myrtifolia, Manilkara discolor, Diospyros verrucosa and/or Diospyros kabuyeana.* ○ **Termite mound forest/woodland***:* associated with large termite mounds. Flora species: *Hirtella zanzibarica, Hymenaea verrucosa* and *Berlinia orientalis.* Lianas are also common. ○ **Moist forests**: *Uapaca sansibarica, Berlinia orientalis and Brachystegia spiciform.* ○ **Scrub Forests**: *Brachystegia spiciformis* and *Berlinia orientalis.* ○ **Woodland:** *Brachystegia spiciformis, Uapaca nitida.* ○ **Fallow and regenerating:** *Berlinia orientalis;* bush species	**Pans**: *Brachystegia spiciformis* is the most common tree present, with a few *Berlinia orientalis* and old individuals of *Anarcardium occidentale.* Presence of termitaria around the edge of pans may occur.	Dominant species in each habitat: ○ **Palm savanna**: *Borassus aethiopum, Hyphaene compressa* and *Phoenix reclinata.* ○ **Grassland associated with pans**: *Parinari curatellifolia*, along with *Uapaca nitida* and *Pseudolachnostylis maprouneifolia.*
Ecological characteristics	○ Presence of significant forest patches still well preserved with great importance and interest to conservation. ○ Shrub forests protect tree forests from fires. ○ Dense woodlands protect communities from game animals and also have fire adaptions; ○ Some forest areas have the largest canopy of Eastern Africa coastal forest. ○ Existence of a forest community associated with a microclimate that protects the forest during intense periods of drought.	○ Some of the coastal forests more developed from Eastern Africa are associated to the Rovuma basin, with trees with rare dimensions and with several species; ○ Presence of fertile soils along the lakes, ponds and river banks, with capacity for rice production and other irrigated crops; ○ Pans as important areas for agriculture, without disturbances	○ Provide pastures during dry periods. ○ Presence of fertile soils and with potential production of food crops in second season; ○ Areas with high importance and interest for conservation ; ○ Possibility of development contemplation and landscape tourism projects;

	○ Mixed forests with indicator species of good forests conditions. ○ Existence of non-timber and profitable forest products as mushrooms, honey (bees), wild fruits and medicinal plants. ○ Presence of termites, which are the major agent of decomposition in the area and have an important influence on the ecology of these ecosystems. ○ Carbon storage.	for adjacent vegetation. ○ Possibility of creation of contemplation and landscape tourism projects ○ Freshwater fisheries and aquaculture; ○ To this ecosystem are associated coastal forests, which present greater availability of groundwater; ○ Areas with high importance and interest for conservation; ○ Provide refuge during dry season for game animals, and are a key component of a wider wildlife ecosystem.	

3.1.9. Most important areas

According to the table above and Clarke study (2011), along this area, it is possible to identify five key forest blocks, one of which contains two important cores (**Erro! A origem da referência não foi encontrada.** and **Erro! A origem da referência não foi encontrada.**). Its main values are listed below:

Pundanhar block (1):

- Mosaic of woodland and ca. 120 km2 of forest, some of which contains the rare forest dependant tree species *Scorodophloeus fischeri* and *Guibourtia schliebenii,* which indicate old-growth forest.

Nangade block (2):

- The vegetation to the immediate east of Lake Nangade is now reduced to a patchwork mosaic of just 5 km2 of near pristine forest dominated by *Scorodophloeus fischeri* and *Guibourtia schliebenii*, interspersed with recent cultivation.

- This is area is threatened with total clearance for cultivation in the near future. Conservation of a representative sample of these forests is an extremely high priority.

Rovuma Floodplain and Palma Pans Block (3):

- Unique pan landscape and major floodplain environments that are important for wildlife. Pans ringed in places by patches of *Berlinia orientalis* forest containing rare plant species.

Nhica do Rovuma – Macanga River Block (4):

- Covering some 280–300 km2, one of the largest contiguous blocks of Coastal Forest in eastern Africa – a vast and important store of carbon.
- Contains stands with some of the largest canopy trees seen for any Coastal Forest in eastern Africa.
- Almost unique eastern African lowland landscape with forest developed over the entire catena. It is a rare occurrence of forest so close to the coast

Nhica do Rovuma Conservation Core (5):

- Some of the best-developed Coastal Forest in all of eastern Africa is present here, despite evidence of past logging.
- This contains enormous hardwood timber trees of a size now rarely seen elsewhere in eastern Africa, and is the most diverse forest encountered in the Palma area.
- The forested hills surrounding Lake Nhica do Rovuma have a landscape value and present a future eco-tourism potential. Dry season wildlife refuge linked to the nearby pan ecosystem.

Macanga Core (6):

- Large area of forest with exceptionally big trees.

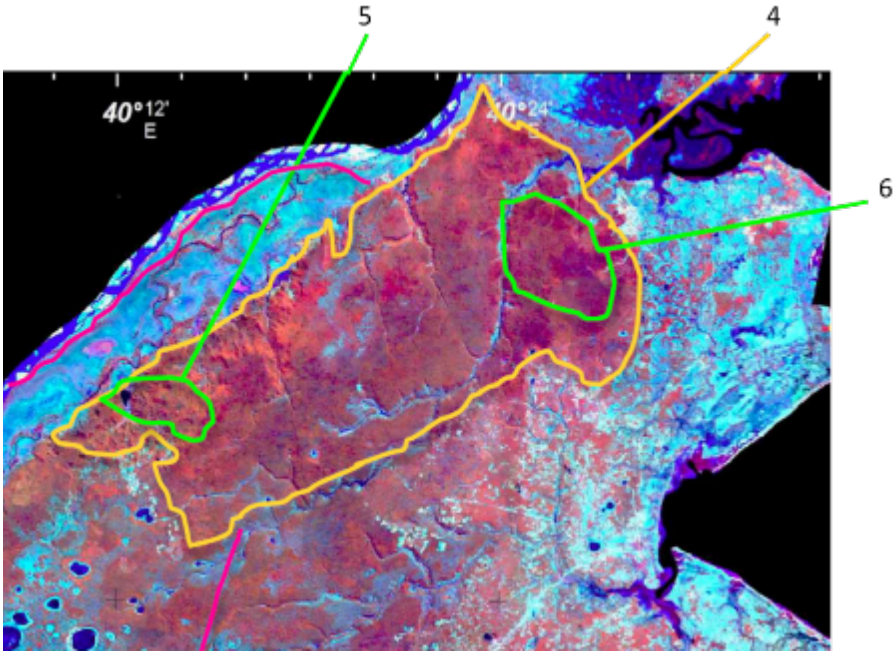

Figure 9 - Key forest blocks: yellow - Pundanhar (1); Nangade (2); pink - Rovuma Floodplain and Palma Pans (3). *Source: Clarke, 2011*

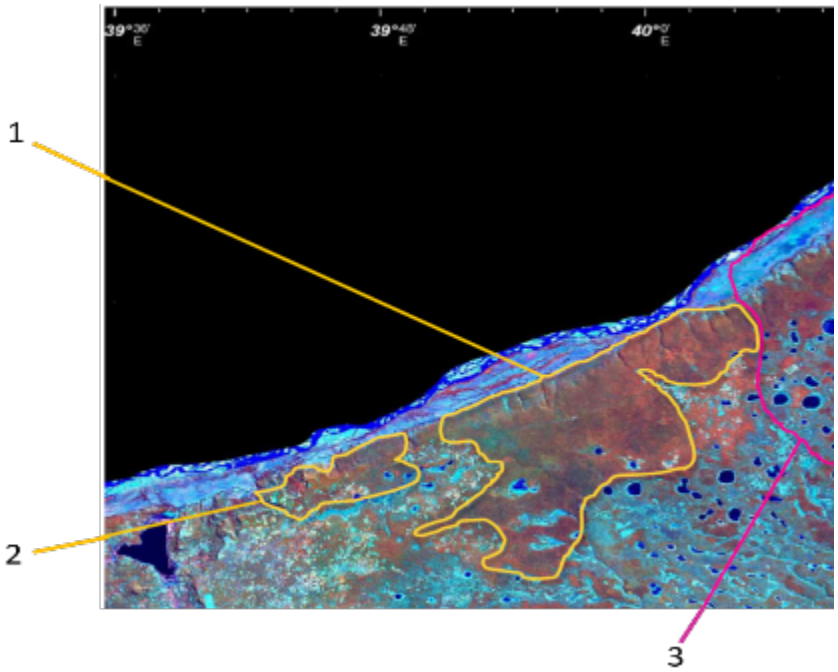

Figure 10 - Key forest block: Yellow **–** Manganha river (4); **Cores**: Green – Nhica do Rovuma (5); Macanga (6). *Source: Clarke, 2011*

3.1.10. Problems and threats identified

Most of the dry forest in the Palma District appear to have regenerated over the last 50 years from an earlier period of heavy disturbance. This may explain the relatively poor diversity in forest types encountered, as well as the absence of certain indicator species.

Kashaigili & Mbilinyi study (2014) revealed changes in land use and land cover with increased deforestation and degradation of woodland. According to the same study, in the Rovuma landscape (side of Mozambique), between 1990s and 2000s, 548 493 ha of closed woodland were converted to cultivated land between 2000s and 2010s, and 40 882 ha of closed woodland were transformed to bushes and grassland, while 280 186 ha of closed woodland were changed to agriculture and, 199.8 ha of closed woodland were changed to open woodland.

It is also important noting that 32 821 ha and 20 248 ha of natural forest were converted to cultivation, and bushland and grassland respectively (Kashaigili & Mbilinyi, 2014).

The local forests are being used by local communities and also for logging. Figure 11 presents the loss of forest cover between 2000 and 2014 in the area in question. It is possible to see three more intense patches in our area, between Palma and Nangade.

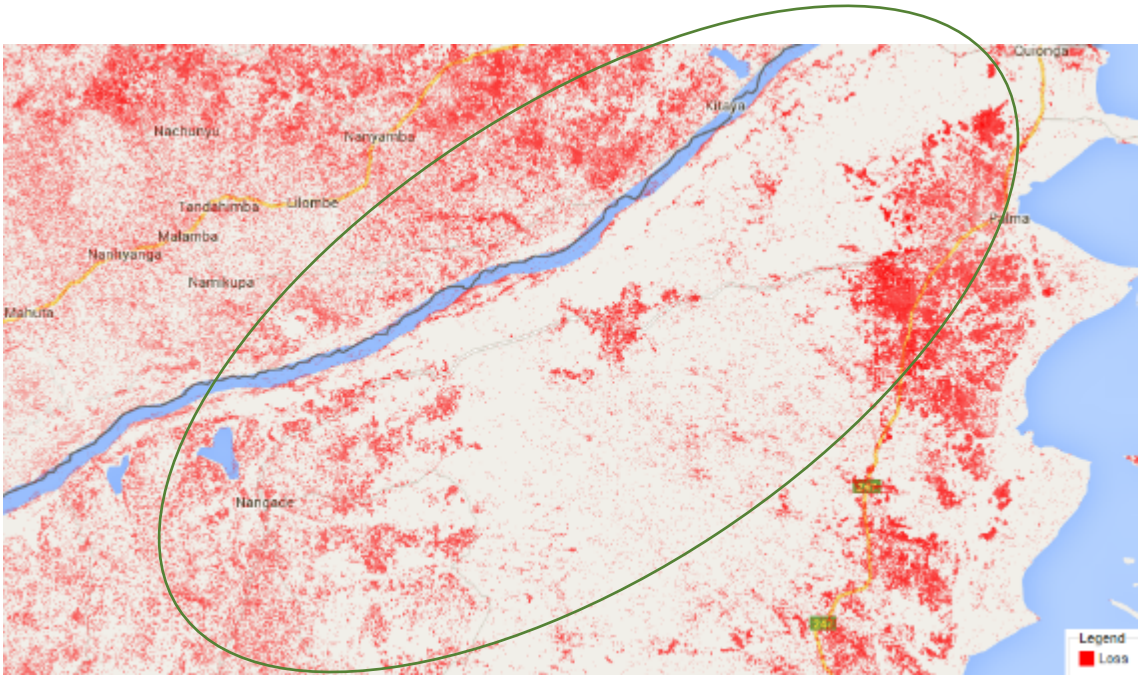

Figure 11 - Loss of forest cover (red) between 2000 and 2014 in the study area. Source: Global Forest Change

Figure 12 shows the gain of forest cover between 2000 and 2012. It is possible to see three more intense patches within study area which seems to be associated with the zones of loss of forest cover in **Erro! A origem da referência não foi encontrada.**. This could be explained by the vegetation regeneration, mentioned above.

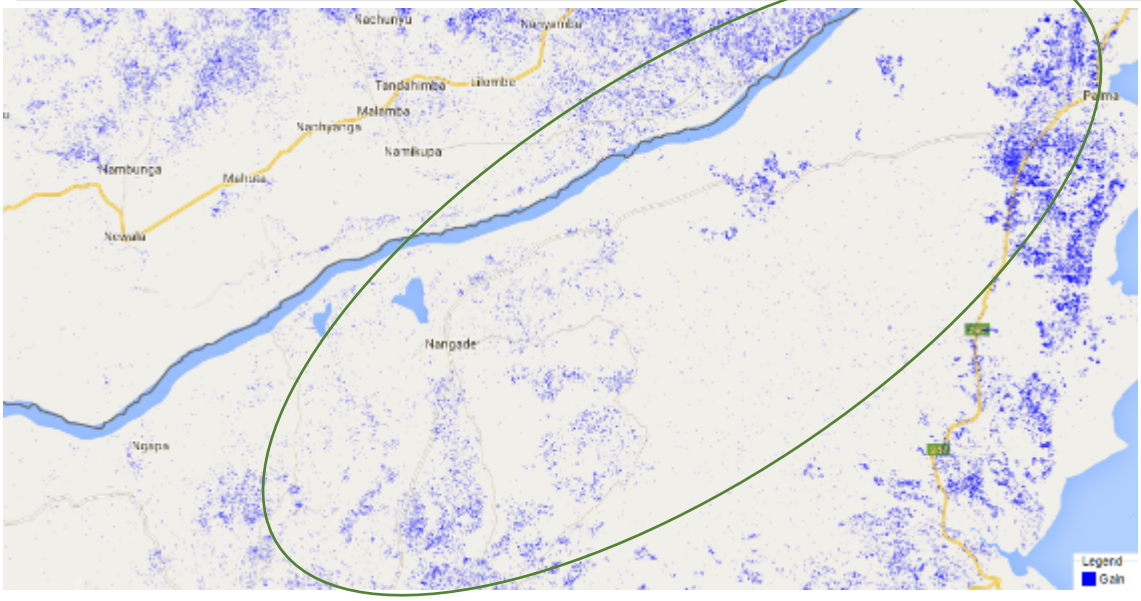

Figure 12 - Gain of forest cover (blue) between 2000 and 2012 in the study area. *Source: Global Forest Change*

Figure 13 shows both gain and loss of forest cover within the same area as well as the loss alone between 2000 – 2013 and the gain between 2000 and 2012. As it can be seen, pressure seems to occur mostly on the West and East ends of the area. The first corresponds to Nangade region, including the Nangade lagoon and Ntamba area, where the population is mostly using the land for cultivation as it can be seen in land cover map (**Erro! A origem da referência não foi encontrada.**). The second, corresponds to Palma region. The coast is where the population density is higher and where the harvest of resources is more intense. There also seems to be intense disturbance in the center North of the area, which corresponds to the village of Pundanhar.

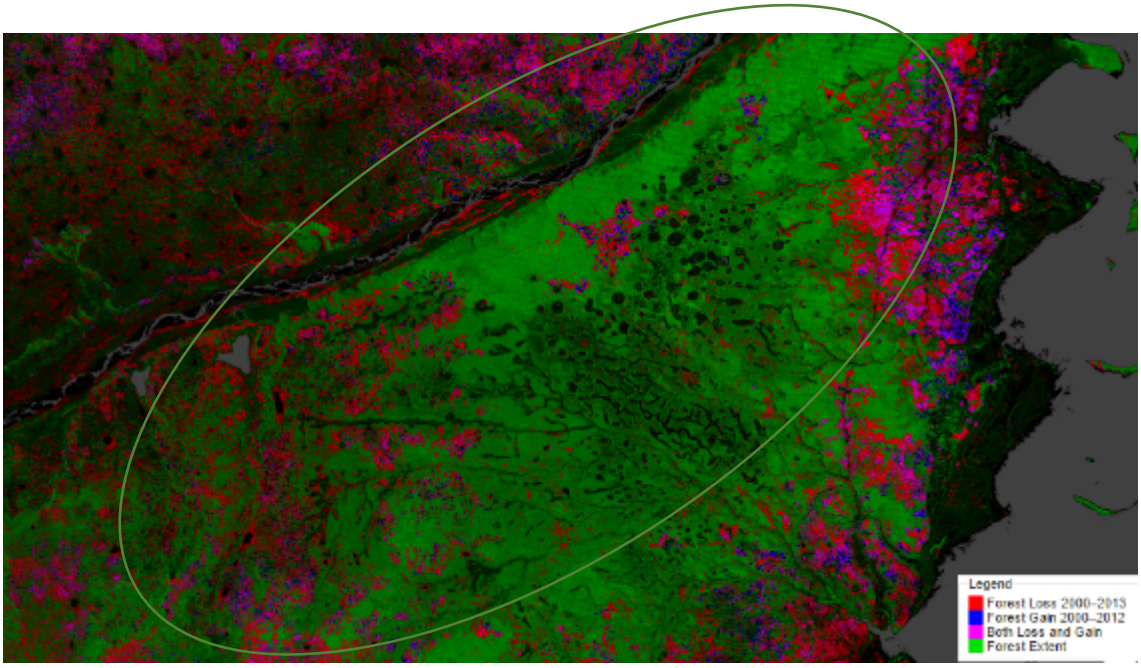

Figure 13 - Forest loss (between 2000 – 2013), Forest gain (2000 – 2012), Both loss and gain and Forest extent in the study area.

This loss of forest cover and forest degradation could be attributed to a number of causes. Additionally, the area is currently suffering from other problems and threats that are endangering ecosystems, biodiversity and natural resources. According to Clarke (2011); Pascal (2011) and Kashaigili & Mbilinyi (2014), the main problems, conflicts and threats identified for the area, are the following:

- Logging
- Shifting cultivation and uncontrolled agriculture and fires
- Charcoaling
- Settlement expansion
- Illegal boundary trade
- Human - animal conflict
- Unsustainable fishing practices (such as the use of dynamite and mosquito net) and illegal fish sales;
- Poaching;
- Natural events such floods and droughts;
- Improper and abusive use of land ownership, often without proper community consultations;
- Non-payment of taxes due to the state;
- Almost total absence of control and monitoring of fishing activity;
- Facilitation and hiding of illegal activities and foreigners entering in the country;
- Degradation of forests for instance to practice agriculture or oil exploration;
- Degradation of habitats from misuse of soil and water in rainy weather;
- Lack of reserves and access to clean water.

If the revealed pattern continues unabated, it is likely that most of the remaining woodlands and forests will continue to be cleared for agriculture, charcoaling or any other forms. There is therefore a need for enhancing expansion of protection of the remaining forest (Kashaigili & Mbilinyi, 2014).

These existing problems on the area may increase the risk of extinction of some species of fauna and flora, may break the connectivity to the movement of species, desertification, degradation and deforestation, impoverishment of communities and reduction of alternative livelihoods, worsening the effects of climate change, soil degradation, among others.

3.1.11. Spatial Planning

The PDUTP (2014) has proposed the following land uses for Palma district: i) environmental conservation, ii) industry, iii) agriculture, iv) forests, v) community reforestation and conservation, and vi) tourism.

It is worth to note the recent findings of natural gas in the Rovuma Basin, which according to the National Company of Hydrocarbons (2011) have put Mozambique among the 4 countries of the world with the biggest natural gas reserves. According to PDUTP (2014), this was of particular importance for the elaboration of the land use plan, once it represents an opportunity for development, ensuring a better sustainability.

The proposed land use plan for Palma (Figure 14) integrates:

- Around 33% of the total district area for environmental conservation and community reforestation and conservation;
- Around 12% for industrial use; 31% for tourism and 11% for forests;
- 77% of the total area for conservation in Palma, is located in the Administrative Post of Quionga;
- 54% of the total area reserved for industry is located in the Administrative Post of Palma;
- 73% of the area for agriculture in the district, is located in the Administrative Post of Palma;
- Almost all the area reserved for forest use is located in the Administrative Post of Olumbi;
- 65% of the area for community reforestation and conservation, is placed in the Administrative Post of Pundanhar, and;
- 31% of all the area for tourism in the district, is located in the Administrative Post of Pundanhar and 30% in the Administrative Post of Olumbi.

The localities mentioned before, are almost all placed within our study area, except the Administrative post of Palma, which is only partially inside.

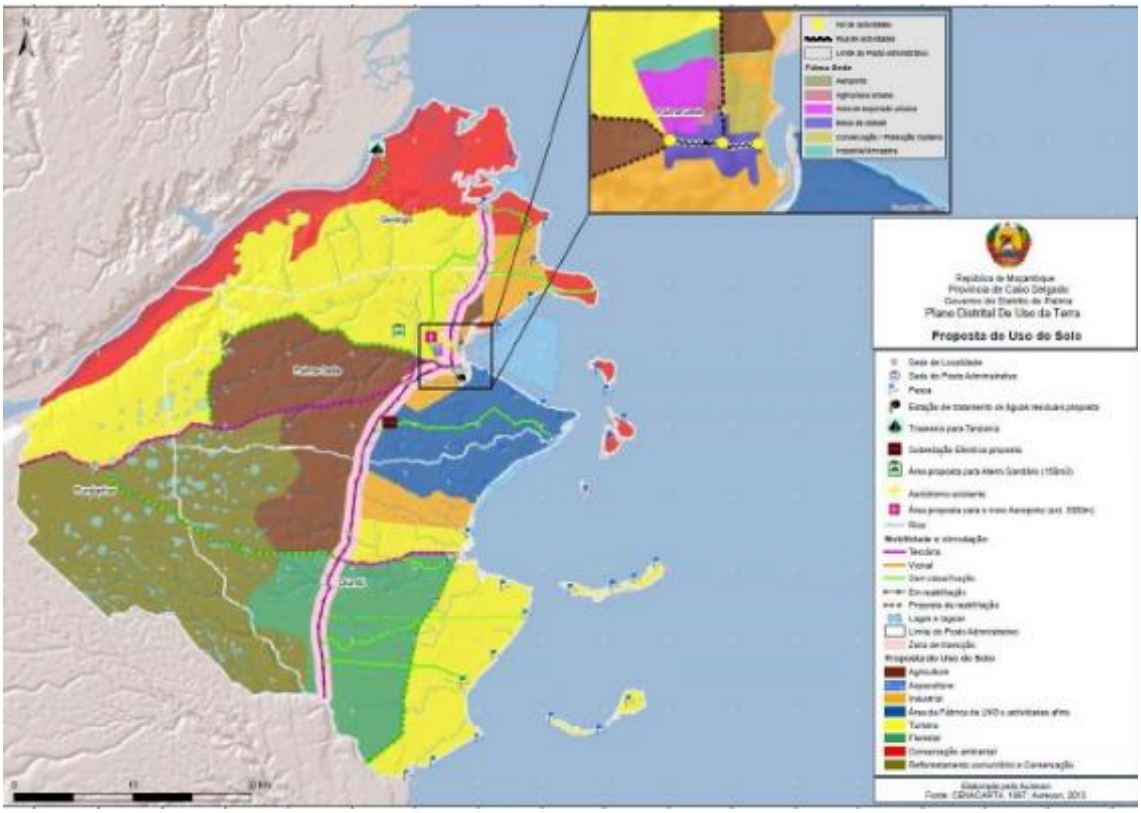

Figure 14 - Land Use Propose for Palma District. In yellow: - Tourism (yellow); Green - Community reforestation and conservation; Brown – Agriculture and in Red - Environmental conservation. *Source: PDUTP, 2014.*

Thus, the land use types proposed by the Palma Land Use plan inside the study area are the following ones, as it can be seen in Figure 14:

i) Tourism – occupies a considerable portion of the area

ii) Community reforestation and conservation – also occupies a considerable portion of the area

iii) Agriculture – Occupies a smaller portion of the area

iv) Environmental conservation – Occupies the smallest portion of the area, along river Rovuma

It was not possible to obtain information about the Nangade Land Use Plan.

3.2. PREVIOUS GAZZETMENT PROPOSAL

In 2006, MICOA presentd a gazzetment proposal to Palma as a National Reserve. This document assessed local biodiversity as well as the conservation aspects that should be considered in the region.

Some of the aspects documented in this proposal, were integrated in this report. However, the document was prepared 10 years ago, therefore not being representative of the area's current features. Within this period, the region suffered changes manly regarding land use and natural resources exploitation, which also affected land and vegetation cover.

On the other hand, legislation has also changed and the new Conservation Law (nº 16/2014) defined a new set of conservation areas categories which were not in place at the time the gazzetment proposal was done. For example, although MICOA's proposal considered relevant the participation of communities in the natural resources management, it didn't considered as an option that the governance and management of the area could be delegated in local communities. By that time Mozambique's conservation law didn't considered that, but the new one does.

Finally, this proposal did not integrate the adjacent area of Nangade, which is also considered of great ecological and socio-economical value, as mentioned and presented in this current report.

3.3. NEW PROCESS FOR POTENTIAL GAZZETMENT

3.3.1. Resume of the new process

WWF has been working in Mozambique for 15 years mainly in strategic zones of the country. The criteria used for the selection of these zones are related to high levels of biodiversity and availability of natural resources.

As referenced earlier in this document, Nangade and Palma integrate priority habitats and species, being a region with great potential for conservation. Therefore it fits perfectly the WWF strategy, namely the objectives of the Rovuma Landscape Program. Considering the new Conservation Law (Law No. 16/2014, of 20 June), WWF started a participatory process to undertake a preliminary feasibility study to establish an Area of Sustainable Use of Natural Resources in the Districts of Palma and Nangade, integrating social, ecological, economic and political aspects. It's gazzetment as a Sustainable Use Conservation Area would bring benefits not only for environment but also for the economy and local population, enhancing ecotourism and protecting natural resources, which people depend on

3.3.2. Visits to Palma and Nangade regions

During the first field trip, between 4 and 8 of April 2016, the team met with the District Services of Economic Activities (DGAE) from Palma and Nangade, and visited the administrative post of Pundanhar, the villages of Nhica do Rovuma and Mandimba and the company "Namoto Safaris" (in Quionga Administrative post). Table 3 presents the contacts and meetings and the main findings from the first WWF visit to the region.

Table 3 – Main results from the first WWF visit to the region of Palma and Nangade.

		Contacts and meetings	Findings regarding natural resources
Palma	**Aquaculture fields of Palma**	Director of the District Services of Economic Activities (SDAE); Community members; Aquaculture fields owner	Construction of aquaculture fields by community´s own initiative; good fish catches during dry season.
	Pundanhar administrative post	Chief of the administrative post	Presence of wildlife as buffalos, crocodiles, elephants, antelopes, lions and leopards; Existence of 113 lakes and lagoons; 9 with fishing activities; Existence of illegal activities like illegal fishing, poaching and logging.

		Contacts and meetings	Findings regarding natural resources
	Nhica do Rovuma locality	Locality chief; EPC Director, Secretary Chief	Existence of Man-fauna conflicts mainly with hippos, boars and elephants; Fishing control is made by community: fishing is forbidden during dry season; allowed to national fisherman during dry season.
	Quionga administrative post	Manager of *Namoto Safaris* company	Communities use the concession area (10.000 ha) for rice crops; Vegetation cover with good conditions within this area
Nangade	**Nangade**	Head of the Agricultural Extension network of Nangade; Aquaculture technician	Existence of illegal cross- border trading; Existence of an unsustainable use of natural resources; Degradation of some lagoons and rivers (specially Nangade lagoon and Rovuma river); Illegal logging, poaching and Man-Fauna conflicts.
	Mandimba village	Members of the community leadership structure	Forests, water and soils in good quality around the village; Existence of unsustainable exploitation of natural resources by Tanzanians; Main activities are dry and irrigated agriculture (mainly rice and maize); Community makes traditional ceremonies before any exploitation of natural resources.

The second visit was undertaken in the 12th to the 14th of June, 2016, and as for the April visit, the team met local governments of Palma and Nangade. To complement this, the team also met the Administrator of Palma district, the Chief of the Administrative Post of Pundanhare and the Chief of Nhica do Rovuma locality. They also met with community members and private sector.

Table 4 – Main results from the second WWF visit carried out to Palma and Nangade regions

Sector visited	Contacts and meetings	Findings regarding natural resources
Local governments		Man-fauna conflict and illegal exploitation of natural resources (also by Tanzanians) pointed as the main issues of the area; Elephants use the corridor Palma – Niassa Reserve; Illegal activities such as poaching, fishing, and logging (also mangroves) mainly by Tanzanians. Tourism is seen as a solution to ensure the sustainable use of natural resources.
Local communities/natural resources users	Management Committee of Natural Resources in Pundanhar Sede	Pundanhar Sede received an income of 20% of the exploration taxes of natural resources by a private company (GAK); Funds are managed by the Committee with the participation of the community leaders and the community itself;

		Uncontrolled fires were pointed as the main issues of the area.
	Village leader of Nhica do Rovuma community and a fishing group of Ntamba village	Community leaders and fishermen adopted a system in which between January and June is considered "inappropriate" to fish in Nhica do Rovuma lagoon; Fishermen outside the community are not allowed to fish in the lagoon; In Nangade lagoon any person is allowed to fish with any kind of instruments; Fishermen said that catches are becoming smaller as well as the fish size; It was mentioned the need to improve the management of natural resources as well as the reinforcement of surveillance.
Private sector	Namoto safaris; Hunters Mozambique and GAK, Lda.	The three entities agreed in the urgent need of more measures for a sustainable exploitation of natural resources; The three also reported that the main problems of the area are: poaching (mainly elephants), illegal logging (also mangroves), unsustainable fishing and crab catchments by Tanzanians, uncontrolled fires and unsustainable agriculture; In general authorized game farms in the area are still in development; According to Namoto Safaris, some local communities live or have agriculture fields within game farms limits, and around 1400 people of Quionga and Namoto will receive a monetary compensation for their resettlement. There is a co-management of the natural resources between GAK and communities of Pundanhar; They also reported several own initiatives to minimize illegal activities, however with no impacts as desired; The three have shown the will to work together as well as with local governments and communities, in order to fight illegal activities regarding natural resources. They highlighted the presence of elephants, hippos, buffalos and crocodiles, and also reported the observation of footprints of hyena and leopard.

During the visit, the team also discussed with the different institutions' representatives, the possibility of holding a workshop to share experiences and ideas regarding the current scenario of the area concerning to the use of natural resources. All the actors warmly welcomed this idea as a starting point to promote the sustainable development of the area in a cooperative way.

4. WORKSHOP

4.1. WORKSHOP RESULTS

The results of the workshop undertaken in Nangade are presented and discussed below.

4.1.1. Exercise 1 - Natural and cultural values: identification and mapping

For this exercise, all the groups showed knowledge ones along the area under assessment. A total of 10 different values was identified: 5 natural values and 5 cultural / social / economical values (Table 5).

Table 5 - Natural and Cultural/social/economical values identified by all the groups

Natural Values	Cultural/social/economical values:
Lagoons & rivers	Good agriculture zones
Forests of high value	Areas with access to drinking water
Presence of wildlife	Special landscapes to consider
Migratory birds	Sacred forest (Cheli-Pundanhar)
Hunting & fishing zones	Military cemetery

Values as *Forests of high value, Presence of wildlife* and *Good agriculture zones,* were identified by all the groups. On the other hand, the values *Lagoons & rivers, Sacred forest, Migratory birds and Military cemetery*, were identified by one group only.

According to the scores given by each group, the three values considered of most importance within the area were: *Forests of high value*, *Presence of wildlife* and *Good agricultures zones* (corresponding to the ones identified by all the groups). Tables with the values identified by each group as well as the respective scores, are available in Annex V.

Table 6 shows all the different values identified and the respective ranking position calculated according to the mean of scores given by the groups. The values with the same rank were the ones that had the same score.

Table 6 – List of values and its ranking position according to the scores given by the groups.

Values	Ranking
Forests of high value	1
Presence of wildlife	2
Good agriculture zones	2
Hunting & fishing zones	3
Areas with access to drinking water	4
Lagoons & rivers	5
Special landscapes to consider	5
Migratory birds	6

Values	Ranking
Sacred Forest (Cheli – Pundanhar)	7
Military Cemetery	7

After identifying the values, each group mapped them in the area, using a map provided by the facilitation team.

The following images (Figure 15) represent the final outcomes drawn by each group, where each value was mapped as an area. The maps elaborated by each group are in Annex V.

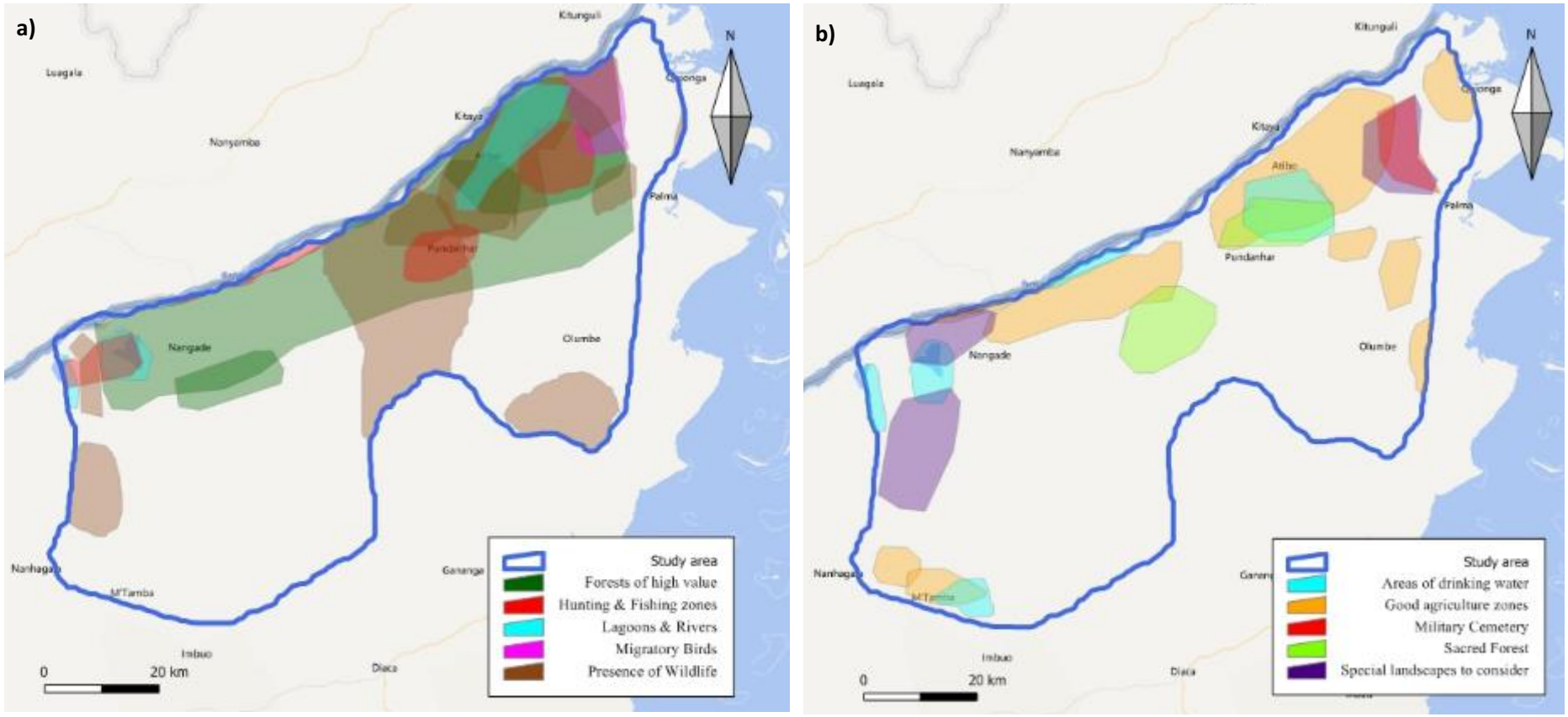

Figure 15 - Map with the final results of the natural (a) and cultural/social/economical (b) values identified and mapped by all the groups

The localities with more values identified were:

- Nhica do Rovuma, with presence of wildlife, forests of high value, lagoons, fishing & hunting zones and good agriculture zones;
- Mandimba, with forests of high value, accesses to drinking water and hunting zones;
- Pundanhar with presence of wildlife, fishing and hunting zones, forests of high value, lagoons & rivers and a sacred forest;
- Areas around Nangade lagoon and Rovuma river with presence of wildlife, special landscapes, hunting and fishing zones and good agriculture zones.

Regarding natural values identified on the map, it is clear the importance of the zones along Rovuma river and lagoons. It is worth noting the presence of a wildlife corridor in the center of the area, linking areas with water as the Rovuma river, to the southern parts of the study area.

For cultural/social/economical values identified on the map, it is also clear the importance of areas with presence of water, being the most valuable areas aggregated in the northern part of the study area.

4.1.2. Exercise 2 - Problems / threats: identification and mapping

As for the previous exercise, every group recognized the existence of different problems and threats all over the study area. In total 11 problems were identified: 5 considered as natural problems and 6 as cultural/social/economical problems (Table 7).

Table 7 - Natural and Cultural/social/economical problems identified by all the groups

Natural Problems	Cultural/social/economical problems
Illegal exploitation of Natural Resources (Fauna and Flora)	Areas of floods
Human-wildlife conflicts	Lack of potable water
Illegal hunting and fishing	Lack of accesses
Uncontrolled fires	Communities with lack of infrastructures
Deforestation	Climate changes
	Lack of knowledge by population about conservation of natural resources

The problems/threats of *Illegal exploitation of Natural Resources*, *Human-wildlife conflict* and *Areas of floods*, were identified by all the groups, while *Deforestation*, *Areas vulnerable to climate change* and *Lack of knowledge by population about conservation of natural resources*, were identified by only one group each. Tables with the problems/threats within the study area identified by each group, as well as the respective scores, are available in Annex VII.

Table 8 shows the problems and threats identified by the groups and the respective ranking position calculated according to the mean of the scores given by the groups. According to the scores given by each group, the three problems considered of most concern within the area were: *Illegal exploitation of Natural Resources*, *Human-wildlife conflict* and *Illegal hunting and fishing*. Problems with the same position in the ranking had the same mean score.

Table 8 - List of problems/threats and its ranking position according to the scores given by the groups

Problems / Threats	Ranking
Illegal exploitation of Natural Resources (Fauna and Flora)	1
Human - wildlife conflicts	2
Illegal hunting and fishing	3
Areas of floods	4
Uncontrolled fires	5
Lack of potable water	5
Lack of accesses	6
Communities with lack of infrastructures	7
Deforestation	8
Climate changes	8
Lack of knowledge by population about conservation of natural resources	8

After identifying the problems, each group mapped them in the area (Figure 16). Maps of each group are available in Annex VII.

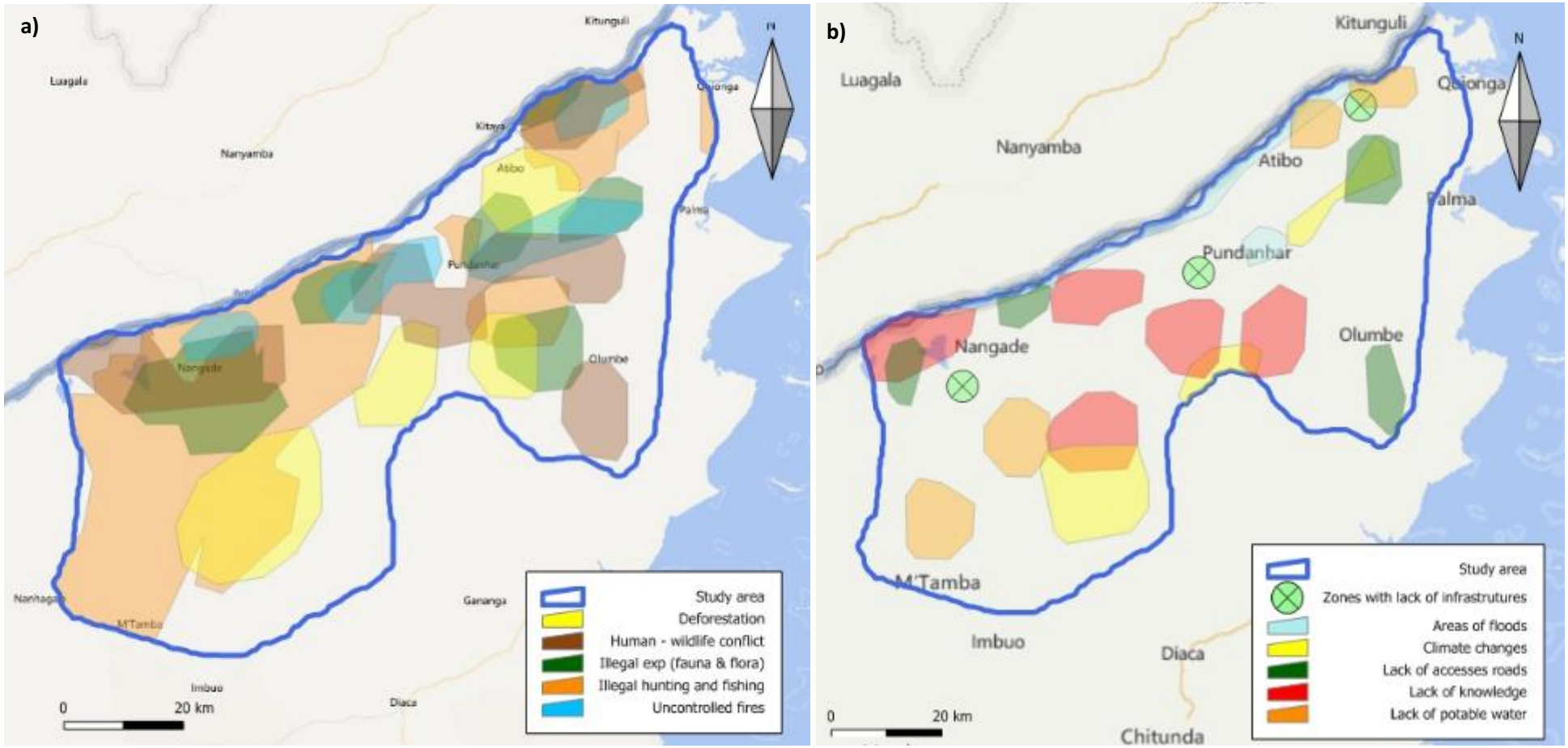

Figure 16 - Map with the final results of the natural (a) and cultural/social/economical (b) problems identified and mapped by all the groups.

In general, there was a consensus about the localities that have more problems/threats:

- Nhica do Rovuma, with presence of illegal exploitation of natural resources, illegal hunting and fishing, human-wildlife conflicts, areas of floods and with lack of accesses, lack of potable water and lack of infrastructures;
- Mandimba, with illegal exploitation of natural resources, uncontrolled fires, Human-wildlife conflicts, areas of floods and with lack of infrastructures;
- Nconga, with illegal exploitation of natural resources, Human-wilflide conflicts and with lack of accesses and potable water;
- Namiuni, with illegal exploitation of natural resources, deforestation and with Human-wildlife conflicts;
- Namoto with illegal exploitation of natural resources, human-wildlife conflicts, deforestation and floods;
- Pundanhar by having presence of illegal exploitation of natural resources; deforestation, Human-wildlife conflicts and areas of floods;
- Lichulo, with Human-wildlife conflicts, and with lack of accesses and lack of potable water;
- Mkonge with presence of illegal exploitation of natural resources; deforestation and with Human-wildlife conflicts;
- Areas next to Nangade lagoon with human-wildlife conflicts, with illegal hunting and fishing activities and with lack of accesses.

Other areas were identified, for instance Muna locality as an area of floods; Muia and 5th Congresso as areas with lack of accesses, and Chiduadua, Ntoli, Mualela and Muade as areas with lack of potable water.

Deforestation, Climate changes and *Lack of knowledge by population* were problems considered by one group only as mentioned before, and were mapped along the study area.

It is worth noting that the localities and areas with more relevant values are the same with more problems identified, thus being the areas with more threatened resources

4.1.3. Exercise 3 - Consequences in relation to the previously identified problems, if nothing is done during the next 20 years.

During this exercise, groups were invited to think about consequences for a certain sector/entity (1 per group) in a period of 20 years, considering three of the problems identified in the previous exercise. The groups were “Local community”, “Local government”, “Game Farm”, “Timber business-man”.

In general, all the groups were able to identify impacts which may occur and affect the entity who they were representing. Only the group representing a timber-businessman, identified more general consequences and not so specific for this sector.

The following tables represent the results by group for this exercise, each one representing one entity. Posters presented during the workshop by each group, can be found in Annex IX.

LOCAL COMMUNITY

Table 9 - Consequences identified by group 1, representing a community.

Problem / Threat	Consequences
Lack of knowledge by population about conservation of natural resources	Extinction of the current natural resources
Lack of potable water	Abandonment of communities by populations; Populations prone to diseases
Communities with lack of infrastructures	Increase of illiteracy rate; Loss of human lives by lack of medical assistance

GOVERNMENT

Table 10 - Consequences identified by group 2, representing the Government.

Problem / Threat	Consequences
Climate changes	Global warming; coral bleaching; Drought and low crop productions; starvation
Lack of access roads	Increase of poverty; rural exodus
Areas of floods	Loss of goods and agriculture products; starvation; death of populations

GAME FARMS

Table 11 - Consequences identified by group 3, representing a game farm.

Problem / Threat	Consequences
Illegal hunting and fishing	Decrease and extinction of species; reduction of income; reduction of jobs; disappearance of hunting tourism
Human - wildlife conflict	Migration of the animals from the farm; loss of human lives
Uncontrolled fires	Ecosystems degradation; animal deaths; disappearance of farms

TIMBER BUSINESS-MAN

Table 12 - Consequences identified by group 4, representing a timber business-man.

Problem / Threat	Consequences
Illegal exploitation of Natural Resources (Fauna and Flora)	Extinction of such resources
Deforestation	Climate change; lack of rainfalls; soils impoverishment

Problem / Threat	Consequences
Uncontrolled fires	Extinction of some fauna and flora species; soils impoverishment

4.1.4. Exercise 4 - Which Sustainable Use Conservation Area is the most appropriate to the area?

After an oral presentation given by Biodinâmica about 7 different *Types of Conservation Areas of sustainable use of natural resources*, according to the *Biodiversity and Conservation Law* (No. 16/2014 of 20 June), each group voted in the three types of conservation areas, which they considered the most appropriate to be applied in the area.

At this stage, each group discussed about the objectives, benefits and restrictions explained in the previous oral presentation. Based on this discussion, they gave a score (from 1 to 6) to select three of those areas. Pictures of the tables with the score given by each group are available in Annex XI.

The overall top-three voted *Sustainable Use Conservation Areas* (according to *Conservation and Biodiversity Law*) were:

1. Environmental Protection Area
2. Community Conservation Area
3. Sanctuary

Choices were similar between all the groups, which shows that all participants have similar opinions and goals in what should be preserved and protected to meet their interests and needs. All the groups have chosen Environmental Protection Area as the most appropriate. The other less voted types of Conservation Areas were Special Reserve and Game farms.

4.1.5. Exercise 5 – Expected barriers, difficulties and benefits in the implementation of a Conservation Area of sustainable use

There was a good adherence of the participants to the exercise, who were keen to place the red and green post-its on the panels. The results for the expected Barriers/difficulties and Benefits associated to each Conservation Area are presented below, in Table 13. Annex XII shows the pictures of the panels with the post-its placed by all the groups in each type of Conservation Area.

Table 13 – Barriers/difficulties and benefits identified by participants for implementation of the following types of conservation areas of sustainable use: Environmental Protection Area, Community Conservation Area and Sanctuaries

Type of Conservation Area of sustainable use of natural resources	Barriers/Difficulties	Benefits
Environmental Protection Area	- Non-acceptance by the population - Conflicts between community members - Lack of capabilities for control of the area	- Preservation of natural resources - Social gains - Right of use and benefit of land by the communities - Delimitation of areas for agriculture - Payment of exploration of natural resources by the operators to local communities - Tourism promotion - Increase of ecosystem services
Community Conservation area	- Lack of coordination between communities - Possible occurrence of activities which may comprise the objectives of the landscape protection. - Non-acceptance by communities - Land conflicts between communities	- Better control of conservation areas by communities - Gains with tourism promotion - More participation of the communities in sustainable activities - More DUAT areas for communities - Available resources in more quantities
Sanctuary	- Difficulties in the elaboration of the Management Plan - Interference with habitational areas - Need of a special license to explore natural resources - Non-acceptance by the population	- National and international touristic attraction - Species recovery - Total protection of threatened species, decreasing its risk of extinction.

All the groups were able to identify and recognize difficulties and benefits to implement each of these Conservation Areas types. In addition, it was clear that there is a concern about the relation of communities with natural resources, and a genuine interest on the potentialities of the area regarding environment, economy, culture and social characteristics.

4.1.1. Exercise 6 – Vision

As it was planned, the groups presented their Vision for the Palma and Nangade region within 20 years from the present date. Although each group presented their visions with different levels of detail, they all had common ground, which revealed the same concerns and goals to the region. Even in the case of group 2, despite the vision was very concise, it was very inspiring. Table 14 summarizes Visions of each group. Pictures of the posters presented during the workshop session can be found in Annex XIII.

Table 14 – Visions of each group within 20 years from the present date, for Nangade and Palma region.

Group 1	Group 2	Group 3	Group 4
• Increase of the natural resources (forest and fauna), and its sustainable management • Improvement of the infrastructures that exist in the communities • Higher level of communities participation in the natural resources management.	• The communities living in harmony with the environment	• Each community with its own zone of environment protection/ community conservation area and also a group for community management • End of poaching activities and illegal exploitation of natural resources • End of uncontrolled fires.	• Enrichment of Fauna and Flora on the forests so that communities can live on a sustainable way and that future generations may enjoy it • Achievement of the previous point through the creation of more conservation areas and reforestation activities, in order to enhance tourism promotion in the region. • Participation of local communities in the management of those areas.

5. LEGAL FRAMEWORK

The environmental, economical, social, cultural and scientifically importance of natural ecosystems in the provision of essential goods and services for the Mozambican society, justifies an establishment of adequate legislation which promotes the protection, conservation and sustainable use of the biological diversity, in benefit of humanity and Mozambican society in particular.

Considering the relation between communities and Nature, the establishment of a Sustainable Use Conservation Areas, is a way to preserve natural resources and provide more and better opportunities to community development, at a social and economic level, namely:

- Opportunity to involve local communities in decision-making and in sharing social and economic benefits from the conservation process;
- Creation of groups of interest and associations for local development (e.g. associations of fishermen, farmers and artisans);
- Development of sustainable fishing activities;
- Reinforcement of the communities' capacity to develop partnerships with government and private sector;
- Development of infra-structures, including road network, trade, drinking water availability, health and education centers;
- Access to extension services for agriculture, health, fisheries and other activities of community interest;
- Increase the income for the directly/indirectly involved families through: participation in development activities, stable employment, availability of means of work/communication, among others;
- Sharing conservation experiences with other programs/national and international projects

According to the nº 1 in the article 179 of the Constitution, in 2014 the Assembly of the Mozambican Republic approved the Conservation Law (nº 16/2014 in 20th June), in which, 7 types of Sustainable Use Conservation Areas were considered and are described below in Table 15.

Table 15 – Description of the different types of Sustainable Use Conservation Areas according to Conservation Law (nº 16/2014)

	Objectives	Description/benefits	Prohibition/restriction
Special Reserve	Protection a fauna/flora species	• Public domain of the state; • Protection of rare species, endemic, threatened or with	• Hunting or any forest, agricultural, mining or livestock exploitation;

		economic and cultural value; • Protection of water quality; • Protection of biodiversity and ecosystems; • Protection of cultural heritage.	• Activities that modify the vegetation and pollute the water; • Perturbations in ecological processes, in flora, fauna and in cultural patrimony.
Environmental Protection Area	Interaction between human and nature activities	• Public domain of the state; • Esthetics and ecological protection of, ecosystems, biodiversity and socio-cultural protection; • Production of ecological services for communities; • Soil use and building in traditional ways; • Encourage sustainable socio-economics activities and the preservation of cultural values; • Promotion of tourism and participation of local communities in the benefits of sustainable activities.	• Soil occupation forms; • Activities that harm the objectives of landscape protection.
Official Game Area	Hunting activities and protection of species and ecosystems	• Public domain of the state; • Use of forest and wildlife resources by communities in a sustainable way; • Allowed activities of repopulation of hunting resources.	• Right to hunt only by concession contract with the state; • Activities that compromise the objectives included in the concession contract; • The management of these areas may be done according to the management plan.
Community Conservation Area	Management of the area by one or more local communities	• Community public domain;	• Exploration of resources by third parties can only be

		• Right of land use by communities, destined to fauna, flora and natural resources conservation; • Protection of Sacred forests and other sites with historical, religious, cultural and spirit importance.	done with previous consent of local communities; • Management of natural resources according to the rules and traditional practices of communities (in agreement with the national legislation)
Sanctuary	Protection of fauna and flora species	• Public or private domain; • Area of reproduction, shelter, feeding and research of certain species of fauna and flora.	• Resources can be exploited by special license (except protected species); • Repopulation of species through the legislation and the management plan
Game Farm	Fauna and flora conservation	• Fenced area of private domain; • The owner can explore (in a balanced way) certain species for meat production and other products; • The owner can place animals in captivity, being responsible for them.	• The right to hunt is limited to the respective owner who has the right to use the land, or to those who get authorization from the owner; • Repopulation activities are allowed but in accordance with national legislation and the management plan.

The 7th type of conservation area was not considered for this study, once it is at a municipal level (Municipality ecological park), and thus no applicable to the study area.

According to the specifications of these types of areas of sustainable use and considering the features of the study area, the results of the workshop in "*Which Sustainable Use Conservation Area is the most appropriate to the area"* are in accordance with what would be the expected.

Participants chose the "Environmental Protection Area" as the first option, once it comprehends an interaction of Human activities and Nature, protecting natural resources without compromising communities, and it promotes ecological services for communities and preserves their cultural values. Moreover, this option allows the existence of other conservation categories within the area.

The second choice, "Community Conservation Area", shows that there is a concern about the local communities' interests, about their relation to nature and the importance of their

integration in the governance and management of natural resources. This type of area might even be included in the "Environmental Protection Area". Nevertheless, the EPA also makes possible the participation of communities in the preservation of natural resources and sustainable activities.

The third most voted area, "Sanctuary", also makes sense, once Palma and Nangade, as mentioned in this report, include certain areas very rich in terms of biodiversity, with important fauna and flora species. The conservation of some of those species may have economic benefits to the region, enhancing tourism and the interest for scientific researches.

The three options are valid options for the area, either individually or combined. However, it is worthwhile mentioning that at least 2 participants referred that implementing and managing a Conservation Area will be a tough task, so it would be better just to start with one type.

6. CONCLUSIONS

It is of general consensus that Palma and Nangade districts have a great ecological, economic and social value. Particular ecosystems exist in this area and are about to change due to the several problems and threats identified in this report.

None of the identified forests or freshwater resources are under any form of legal protection and the persistence of severe problems and threats may lead to serious environmental, social and economic consequences. The risk of extinction of some species of fauna and flora can increase and the connectivity to the movement of species may be broken. Desertification, degradation and deforestation, impoverishment of communities and reduction of alternative livelihoods, worsening the effects of climate change and soil degradation are among other potential problems that might occur in the area.

During the workshop it was clear that all the represented entities and representatives of communities recognized the ecological and cultural value of the area. Moreover, they were aware of the existing problems and of what is threatening those values and the communities themselves.

In general, all the groups were in agreement about the most valuable features of the area, as well as the location of these. This may show how valuable are the identified zones in the area for local communities and how they depend on it, regarding natural resources. The same is applicable for problems and threats identified by participants. The results were also similar between groups, showing general concern about preserving the quality of the region and also showing how real are these problems and threats over the area.

At the end of the workshop, all the participants, without exception, were conscious of the importance of the area and showed the will to see the area gazzeted as a Sustainable Use Conservation Area, independently on the 3 potential selected types, where natural resources could be managed by the local communities in a sustainable manner. The participants also suggested that the process should be done in a prudent way, to ensure the best protection of the area and that the local communities are duly informed about the process and are able to participate on it. ´

7. RECOMMENDATIONS

The development vision of the country, expressed in the 2025 Agenda acknowledges that the country is rich in terms of its biodiversity and that thanks to that, the country has an economic growth of about 7%, however, the future of the country depends on the value of the biodiversity and its sustainable use (MICOA, 2014).

The establishment of this sustainable managed protected area can contribute, at a national level, to the National Strategy and Action Plan for the Biological Diversity of Mozambique (NSAPB), the Mozambican Programme of Work on Protected Areas (PoWPA) and at an international level, to the Aichi Biodiversity strategic goals for 2020.

The Aichi targets for biodiversity conservation that have been defined for the period of 2011-2020, have brought new challenges for the integration of emerging biodiversity issues from both national and international levels. Thus, the government of Mozambique implements programs, strategies and sectoral plans whose goals are aligned with the global targets for biodiversity conservation for the same period.

Therefore, it is of extreme importance to consider the following national and international targets, when establishing the goals for the proposed Sustainable Use Conservation Area.

Regarding the Aichi Biodiversity Targets (CBD,2013), it provides ideas for preliminary national actions, identifying possible indicators to monitor progress and identifying further resources. From those targets, the following should be considered to the implementation of the Sustainable Use Conservation Area:

- **Target 5** - Habitat loss halved or reduced;
- **Target 7** - Sustainable agriculture, aquaculture and forestry;
- **Target 10** - Pressures on vulnerable ecosystems reduced;
- **Target 11** – Protected areas increased and improved. By 2020, at least 17 per cent of terrestrial and inland water areas and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascape.
- **Target 12** - Extinction prevented;
- **Target 14** - Ecosystems and essential services safeguarded;
- **Target 15** - Ecosystems restored and resilience enhanced;
- **Target 18** - Traditional knowledge respected.

Regarding the implementation of the NSAPB in the period of 2003-2010, there were 17 priority actions to consider. Only three of them were fully implemented during that period. The establishment of this Sustainable Use Conservation Area may contribute to the implementation

of the following actions, which were not implemented or were partially implemented during that time:

- To establish and manage a representative system of protection areas;
- To recover and rehabilitate degraded ecosystems and, where applicable, to develop species recovery plans;
- To promote the sustainable and integrated use of flora resources (timber and non-timber), ensuring the creation of benefits for all those involved in their exploitation, with an emphasis on local communities;
- To guarantee the sustainable use of agricultural resources with the aim of improving the living conditions of Mozambique's rural population, while avoiding aspects relating to the loss of the specific and genetic variability of the main crops;
- To guarantee the rational usage of wildlife, so that it can contribute to the well-being of rural populations and the development of the country;
- To promote the sustainable use of fisheries resources for the benefit of the population, prosperity of the economy, conservation of resources and maintenance of biodiversity;
- To ensure that the development of the tourism industry is based on respect and the sustainable use of biodiversity.

Additionally, the creation of a Sustainable Use Conservation Area in Palma and Nangade, could help achieving the following national targets included in the NSAPB for the period of 2015-2035:

- **Target 2** - By 2020, there should be a better understanding of the value (economic, social and ecological) of biodiversity, in order to allow a better integration in the decision-making and management;
- **Target 5:** By 2035, reduce by at least 20% the area of critical ecosystems, or that provide essential goods and services under degradation and fragmentation;
- **Target 6:** By 2025, have at least 30% of habitats of endemic and/or threatened flora and fauna species with strategies and action plans for their conservation in place;
- **Target 7:** By 2020, catalog/systematize, disseminate and promote sustainable management practices in agriculture, livestock, aquaculture, mining, forestry and wildlife;
- **Target 11A:** By 2025, evaluate and redefine 75% of current conservation areas, and include, formally, 100% of the afromontane endemism centers (altitude >1.500m) and up to 5% of marine ecosystems and mountain in conservation areas;
- **Target 11B:** By 2030, manage, effectively and equitably, 50% of the protected areas;
- **Target 12:** By 2030, rehabilitate at least 15% of the degraded ecosystems /habitats, restoring its biodiversity and ensure its sustainability, with a view to mitigating the effects of climate change and combating desertification;

- **Target 18:** By 2035, value and respect the knowledge and traditional uses of on biodiversity, in accordance with national legislation;

- **Target 19:** By 2035, strengthen the capacity of key stakeholders and improve the integration of gender issues, to enable the effective implementation of national targets.

Finally, the following targets integrated in the the Mozambican Programme of Work on Protected Areas (PoWPA) that are supposed to be achieved till 2020 should also be taken into account:

- Create buffer zones around Parks and Reserves to enable adaptation in areas surrounding conservation areas, otherwise PAs will become unsustainable islands;

- Train all park managers, field rangers and all staff at local level in other to strengthen their capacity to manage natural resources for climate resilience and adaptation, to communicate the value of ecosystems and protected areas in climate change resilience and adaptation and to incorporate climate issues into biodiversity management plans;

- Creation of Conservation Areas in the border between Mozambique and Tanzania;

- Create local management committees at site level

- Integration of Climate Change Aspects in the management plans

The achievement of these targets can only be met if the different sectors of the Mozambican society are effectively involved in the process, especially the government (central, province and district levels), NGOs, local communities, private institutions, international and regional organizations, etc. (NSAPB, 2015). The potential gazzetment of a Sustainable Use Conservation Area in Palma and Nangade Districts implies continuing the process that has been started by WWF involving all these stakeholders. It is mandatory that the category of Sustainable Use Conservation Area to be selected considers the adequate governance and management types.

Therefore, it is essential that the process is undertaken according to international best practice, which main steps are described below.

8. WAY FORWARD

According to the IUCN-WCPA's Best Practice Protected Area Guidelines, a protected area is "a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values".

The first step is to determine whether or not the site to propose meets this definition. It is also important to note that the conservation area to be created should aim to:

- Conserve the composition, structure, function and evolutionary potential of biodiversity;
- Contribute to regional conservation strategies (as core reserves, buffer zones, corridors, stepping-stones for migratory species etc.).
- Maintain diversity of landscape or habitat and of associated species and ecosystems;
- Be of sufficient size to ensure the integrity and long-term maintenance of the specified conservation targets or be capable of being increased to achieve this end;
- Maintain the values for which it was assigned in perpetuity;
- Be operating under the guidance of a management plan, and a monitoring and evaluation program that supports adaptive management;
- Possess a clear and equitable governance system.

And preferentially, also aim to:

- Conserve significant landscape features;
- Provide regulatory ecosystem services, including buffering against the impacts of climate change;
- Conserve natural and scenic areas of national and international significance for cultural, spiritual and scientific purposes;
- Deliver benefits to resident and local communities consistent with the other objectives of management;
- Deliver recreational benefits consistent with the other objectives of management;
- Facilitate low-impact scientific research activities and ecological monitoring related to and consistent with the values of the protected area;
- Use adaptive management strategies to improve management effectiveness and governance quality over time;
- Help to provide educational opportunities (including about management approaches);
- Help to develop public support for protection.

Once the area has been identified as a protected area according to the IUCN definition, the next stage in classification is to determine which category matches most closely the overall management objectives of the protected area. The categories system was introduced in large part to help standardize descriptions of what constitutes a particular protected area.

The acceptable International categories according to IUCN (2013) that corresponds to three Sustainable Use Conservation Areas types identified by workshop participants, are i) *Category IV: Habitat/species management area* (corresponding to "Sanctuary"); ii) *Category V: Protected landscape/seascape* (corresponding to "Environmental Protection Area) and; iii) *Category VI: Protected area with sustainable use of natural resources* (Community Conservation Area) (Table 16).

Table 16 – Description of the three IUCN categories that match the Sustainable Use Conservation Areas types chosen by the workshop participants.

	Category IV: Habitat/species management area (equiv. to Sanctuary)	**Category V: Protected landscape/seascape (equiv. to Protected landscape/seascape)**	**Category VI: Protected area with sustainable use of natural resources (equiv. to Community Conservation Area)**
General definition	Protected areas aim to protect particular species or habitats and management reflects this priority. Many category IV protected areas will need regular, active interventions to address the requirements of particular species or to maintain habitats, but this is not a requirement of the category	A protected area where the interaction of people and nature over time has produced an area of distinct character with significant ecological, biological, cultural and scenic value: and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values.	Conserve ecosystems and habitats, together with associated cultural values and traditional natural resource management systems. They are generally large, with most of the area in a natural condition, where a proportion is under sustainable natural resource management and where low-level non-industrial use of natural resources compatible with nature conservation is seen as one of the main aims of the area.
Primary objective	To maintain, conserve and restore species and habitats.	To protect and sustain important landscapes/seascapes and the associated nature conservation and other values created by interactions with humans through traditional management practices.	To protect natural ecosystems and use natural resources sustainably, when conservation and sustainable use can be mutually beneficial.

According to the lessons learned at a global level, the Government (central, provincial and district), communities, corporations and other entities must fully recognize, embrace and communicate the true value of conservation areas. The value of conservation areas must be looked as an effective and efficient long-term investment.

Collaborative partnership between the various stakeholders is of key importance to achieve the biodiversity targets. This requires adequate communication, education and public awareness. It also requires greater integration and sectoral collaboration. Multi-sectoral working groups are critically important at national, provincial, district and community levels.

In the situation of rural Mozambique, the effectiveness of conservation goals requires multiple approaches to human development and protection of the interests of local communities living within these areas. However, this should be done in a phased and coordinated manner. Financial commitment and political will is deemed for that. The Government will need to make full and strategic use of all available funding.

It is important so, to define the governance type that should be applied to the protected area, any of which can be associated with any management objective. IUCN (2013) recognizes four broad types of governance:

a) Governance by Government;

b) Shared governance;

c) Private governance

d) Governance by indigenous people and local communities.

Of these four types of governance, option d) was the one in which the participants of the workshop showed more interest and the one they thought would better meet their interests and help achieving a sustainable use of natural resources.

Table 17 – Matrix classification for the projected protected areas comprising both categories and governance type. The three Protected area categories are the IUCN categories applied to Sustainable Use Conservation Areas chosen during workshop.

	Governance by indigenous people and local communities.	
Governance type / **Projected Protected area categories**	**Indigenous peoples' protected areas and territories - established and run by indigenous peoples**	**Community conserved areas – declared and run by local communities**
Category IV: Habitat/species management area		x
Category V: Protected landscape/seascape		x
Category VI: Protected area with sustainable use of natural resources		x

Therefore, according to the results of the workshop, to the existing legal framework, and the international best practice, the following steps are proposed to implement and manage the most adequate type of Sustainable Use Conservation Area for the region:

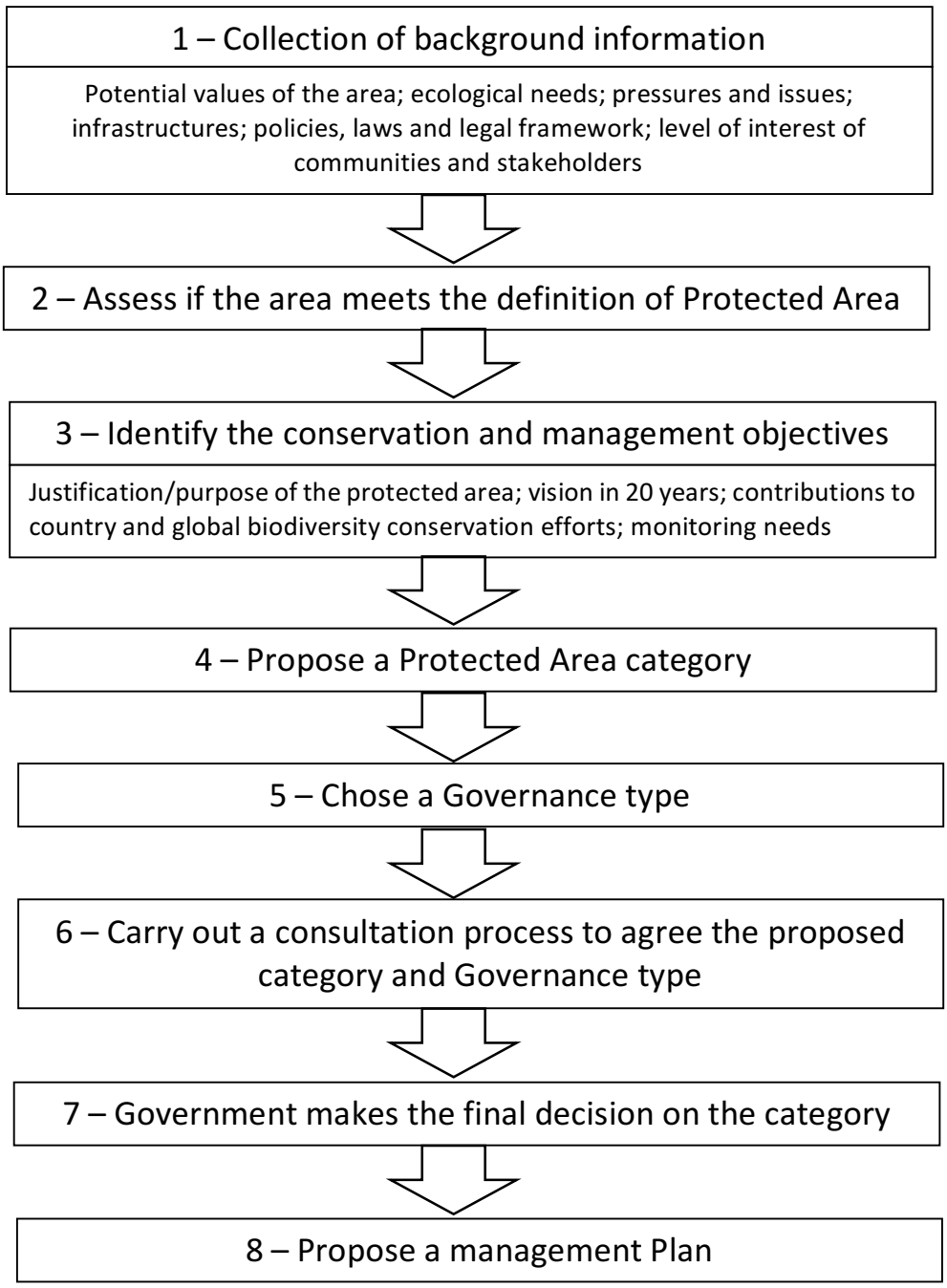

Figure 17 – The 8 proposed steps to implement and manage the most adequate type of Sustainable Use Conservation Area for the region

The three initial steps have already been preliminary assessed during the feasibility study (workshop included).

It seems however valuable at this stage, to identify and update complementary information to understand exactly which portion of the Palma and Nangade Districts should integrate this Sustainable Use Conservation Area.

Palma District is well described at a biological and physical level in its Land Use Plan. On the other hand, Nangade suffers from the absence of information, mainly regarding social and economic characteristics and land use, once an updated Land Use Plan is not available. Therefore, there is a need to describe the region, namely its most relevant ecological values, distribution areas of fauna species as well as critical habitats for conservation. For instance, participants at the end of the Workshop referenced that an update in the study of forests of the region is necessary as well as a survey in water availability all over the area, as it is the case of lagoons and pans. Moreover, it was mentioned that there has been a change in elephant's routes, which is now using older routes and that should also be assessed.

As mentioned before, the establishment of a Protection Area needs to include a management plan, which sets out the management approach and goals, together with a framework for decision making, to apply in the protected area over a given period of time. Management planning is a continuous process – a 'circle' with three main elements:

1. Preparation of a Management Plan
2. Implementation of the plan
3. Monitoring and review of the plan.

It is thus important to consider that the management plan should be developed at an early stage of the Sustainable Use Conservation Area creation and should include the following steps:

1. Pre-planning – decision to prepare a Management Plan, appointment of planning team, scoping of the task, defining the process to be used;

2. Data gathering – issues identification, consultation;

3. Evaluation of data and resource information;

4. Identification of constraints, opportunities and threats;

Previously done during "*Collection of background information*" and "*Identify management*

5. Developing management vision and objectives;

6. Developing options for achieving vision and objectives, including zoning;

7. Preparation of a draft Management Plan;

8. Public consultation on the draft Management Plan;

9. Assessment of submissions, revision of draft Management Plan, production of final Management Plan, submission analysis and reporting on the results of the consultation process;

10. Approval or endorsement of Management Plan;

11. Implementation;

12. Monitoring and evaluation;

13. Decision to review and update Management Plan; accountability considerations.

The process of developing a management plan helps protected area managers to identify natural and cultural resources, understand key threats to those resources, and develop plans and strategies for their long-term protection. Regarding point nº 6 from the process of management planning, namely "*Developing options for achieving vision and objectives"*, according to UNDP (2010), it is important to take in account the following plan strategies, which should be considered when developing the Sustainable Use Conservation Area proposed for Palma and Nangade:

1. Incorporate climate change into management planning;
2. Incorporate ecosystem services into management planning;
3. Incorporate sustainable livelihoods into management planning;
4. Focus research and monitoring efforts on key gaps related to climate change, ecosystem services, and sustainable livelihoods;
5. Account for issues related to climate and ecosystem services within management effectiveness assessments;
6. Incorporate climate change as an integral component of threat assessments;
7. Consider the needs, capacities and desires of local communities ;
8. Effectively engage stakeholders in issues related to climate change adaption and threat reduction, ecosystem services, and sustainable livelihoods;
9. Promote the widest possible array of protected area governance types (zoning);
10. Create sustainable protected area finance plans with diverse finance mechanisms (as taxes and surcharges from gas, oil, mining, coal);
11. Incorporate connectivity into protected area ecological gap assessments (Like biological corridors, stepping stones and buffer zones);
12. Incorporate social and economic benefits into connectivity corridors.

As a global recommendation, the way forward should follow the steps mentioned in Figure 17 always involving local communities, including stakeholders and rightsholders in the planning and decision-making process.

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10. ANNEXES

10.1. ANNEX I – WORKSHOP PROGRAM

WWF WORKSHOP PROGRAM RELATIVE TO THE VIABILITY OF ESTABLISHMENT OF A SUSTAINABLE USE AREA OF NATURAL RESOURCES IN THE REGION OF PALMA AND NANGADE, CABO DELGADO

June 23rd, 2016	Thematics	Speaker / actors
07:45	Participants reception	
08:00	Opening Session	Hon. Mr. Adm. Of Nangade, Hon. Mr. Adm. De Palma, Sr. Dir. Prog. Parents. Rovuma WWF
08:15	WWF strategy	WWF
08:30	Divulgation of studies in the area	WWF
08:45	Questions / comments	Participants
09:00	Identification and mapping of existing natural and cultural values in the area	Participants
10:00	*Break*	
10:30	Identification and mapping of current problems and threats in the area	Participants
11:30	Identification of consequences taking into account the existing problems and the potentials threats if nothing is done in the next 20 years	Participants
12:15	*Break for lunch*	
13:30	Categorization of areas to conserve according the biodiversity	Biodinâmica
13:45	What type of conservation area is most appropriate for the proposed area?	Participants
14:15	Obstacles, difficulties and benefits in the implementation of a conservation area	Participants
14:45	*Break*	
15:15	Reflection exercice/ Vision	Participants
15:30	Closing session	Facilitator (Biodinâmica), WWF

23rd of June, 2016

Nangade

10.2. ANNEX II - PARTICIPANTS LIST

WORKSHOP DA WWF RELATIVO À VIABILIDADE DO ESTABELECIMENTO DE UMA ÁREA DE DE USO SUSTENTÁVEL DE RECURSOS NATURAIS NA REGIÃO DE PALMA E NANGADE, CABO DELGADO

23 DE JUNHO, NANGADE

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PROGRAMA DO WORKSHOP DA WWF RELATIVO À VIABILIDADE DO ESTABELECIMENTO DE UMA ÁREA DE DE USO SUSTENTÁVEL DE RECURSOS NATURAIS NA REGIÃO DE PALMA E NANGADE, CABO DELGADO

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10.3. ANNEX III – EXERCISE 1

PRATICAL EXERCISE 1
IDENTIFICATION AND MAPPING THE CURRENT NATURAL AND CULTURAL EXISTING IN THE AREA

Each group should identify the existing natural and cultural values in the area. Each group element should associate to it a score (from 1 to 5)*.

NATURAL/CULTURAL VALUES	SCORE

Example: existing species of wildlife (ex: elephant, lions, leopards, buffalos, antelopes, hippos and crocodiles); Forests of high value; special beauty landscapes; Good agriculture zones, coal production and provision of essential resources to communities; hunting and fishing areas; Very important areas of access for drinking water; Zones with cultural and traditional value (e.g. sacred forests, sacred cemetery, etc.).*1 – Less important, 5 – Very important

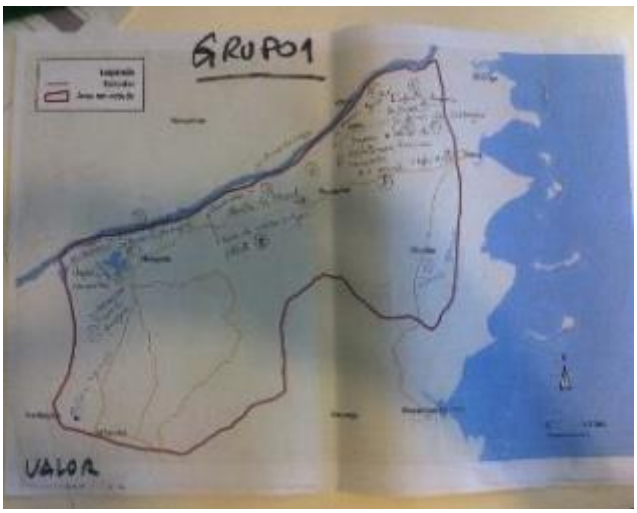
*
1 – Less important
5 – Very important

10.4. ANNEX IV - MAPS USED FOR EXERCISES 1 AND 2

10.5. ANNEX V - TABLES AND MAPS OF EACH GROUP FROM EXERCISE 1

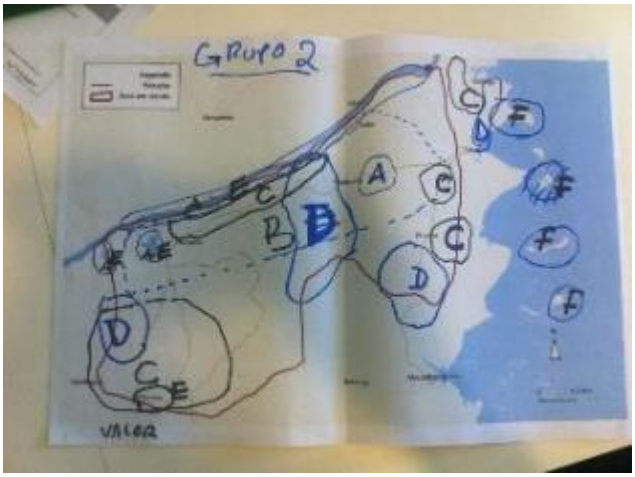
Group 1 - Exercise

Letter/Symbol	Value	Score
A	Elephant, Buffalo, Hippo and Crocodiles	5
B	Forest of high value	5
C	Special landscapes to consider	5
D	Good agriculture zones for production of essential products to communities	5
E	Hunting and Fishing zones and drinking water access	5
F	Most important zones	4



Group 2 – Exercise 1

Letter/Symbol	Value	Score
A	Fishing zones	5
B	Forest of high value	5
C	Goog agririan zonaes	4
D	Wildlife xpecies	4
E	Zones of drinking water access	5
F	Landscapes of special biuty	3



Group 3 – Exercise 1

Letter/Symbol	Value	Score
A	Elephant	5
B	Hippos	5
C	Forests of high value	5
D	Lagoons	5
E	Sacred Forests	1
F	Rivers	5
G	Cemetery	1
H	Leopards	5
I	Migratory birds	5
J	Production areas	5

Group 4 – Exercise 4

Letter/Symbol	Value	Sore
A	Elephant	5
B	Forests of high value	5
C	Good agriculture zones	5
D	Hunting and fishing zones	4
E	Most important zones of drinking water access	3

10.6. ANNEX VI –EXERCISE 2

PRATICAL EXERCISE 2

IDENTIFICATION AND MAPPING OF CURRENT PROBLEMS AND THREATS IN THE AREA

Each group should identify current existing problems and potential threats for the area. Each group should associate to it a score (from 1 to 5)*.

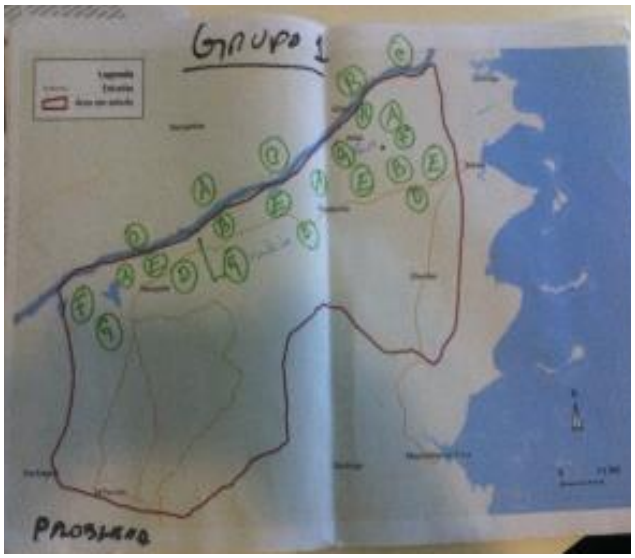
PROBLEMS/THREATS	SCORE

Example: Illegal hunting and Fishing; illegal exploitation of wood; zones of floods; human – wildlife conflict; areas of uncontrolled fires; zones with lack of accesses; zones with lack of infrastructures; zones with majors problems of drinking water access. *1 – Less concern; 5 – Great concern

10.7. ANNEX VII- TABLES AND MAPS OF EACH GROUP FROM EXERCISE 2

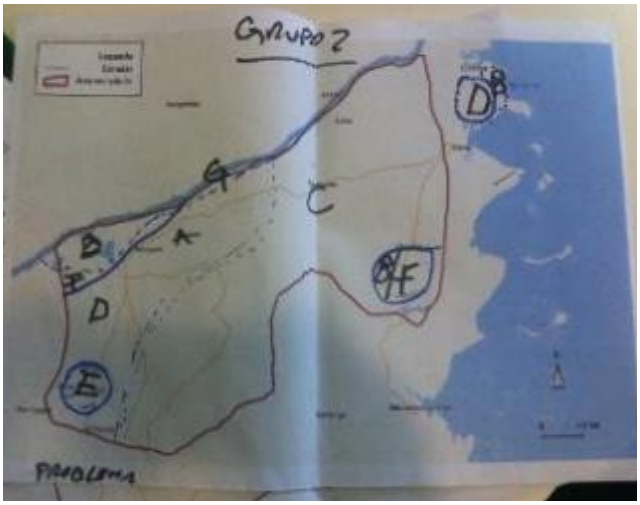
Group 1 – Exercise 2

Letter/Symbol	Problems/Threats	Score
A	Illegal hunting and fishing	5
B	Wood illegal exploration	5
C	Zones of floods	3
D	Human-wildlife conflict	4
E	Areas where normally make uncontrolled fires	5
F	Zones with lack of accesses roads	3
G	Village with lack of infrastructure	3
H	Zones with major problems of drinking water access	4



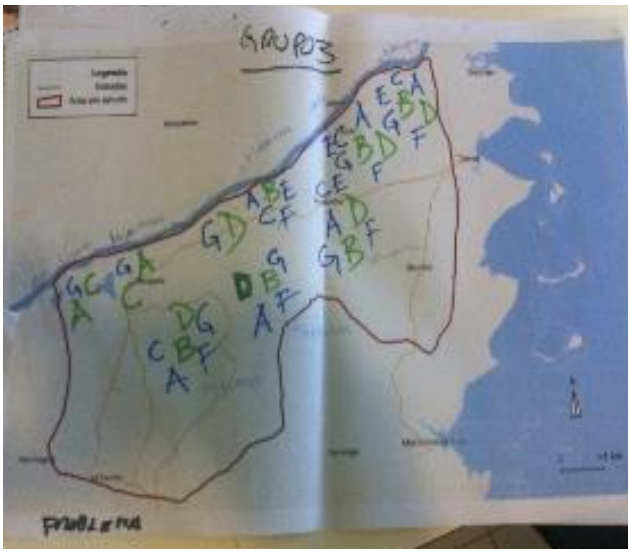
Group 2 – Exercise 2

Letter/Symbol	Problems/Threats	Score
A	Illegal wood exploration	5
B	Human - wildlife conflict	4
C	Uncontrolled fires	3
D	Illegal hunting and fishing	5
E	Zones with major problems of drinking water access	2
F	Zones with lack of accesses roads	4
G	Zones of floods	1



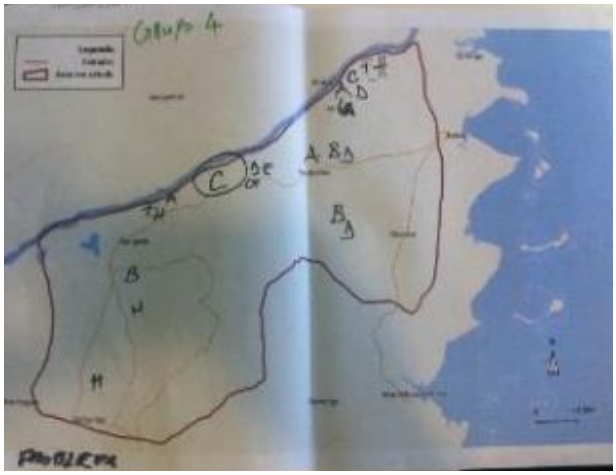
Group 3 - Exercise 2

Letter/Symbol	Problems/Threats	Score
A	Illegal exploration of forests and wildlife resources	5
B	Deforestation caused by itinerant agriculture and uncontrolled fires	5
C	Human – wildlife conflict	5
D	Lack of reforestation in areas under exploration	4
E	Floods	4
F	Climatic changes	5
G	Lack of perception of population about the importance of conservation and sustainable use of natural resources	5



Group 4 - Exercise 2

Letter/Symbol	Problems/Threats	Score
A	Illegal hunting and fishing	5
B	Illegal wood exploration	5
C	Zones of floods	5
D	Human – wildlife conflict	5
E	Areas where normally are made uncontrolled fires	3
F	Zones with lack of accesses roads	3
G	Existing of villages with lack of infrastructures	4
H	Zones with major problems of drinking water access	5



10.8. ANNEX VIII – EXERCISE 3

PRACTICAL EXERCISE 3

IDENTIFICATION OF CONSEQUENCES TAKING INTO ACCOUNT THE CURRENT PROBLEMS AND THE POTENTIAL THREATS, IF NOTHING IS DONE IN THE NEXT 20 YEARS

Each group will evaluate and identify the consequences of actual problems and potential threats in the study area (identified in previous point) representing one entity.

Representative group of: _____

IDENTIFIES PROBLEMS/THREATS	CONSEQUENCES DURING THE NEXT 20 YEARS

10.9. ANNEX IX – POSTERS FROM THE EXERCISE 3

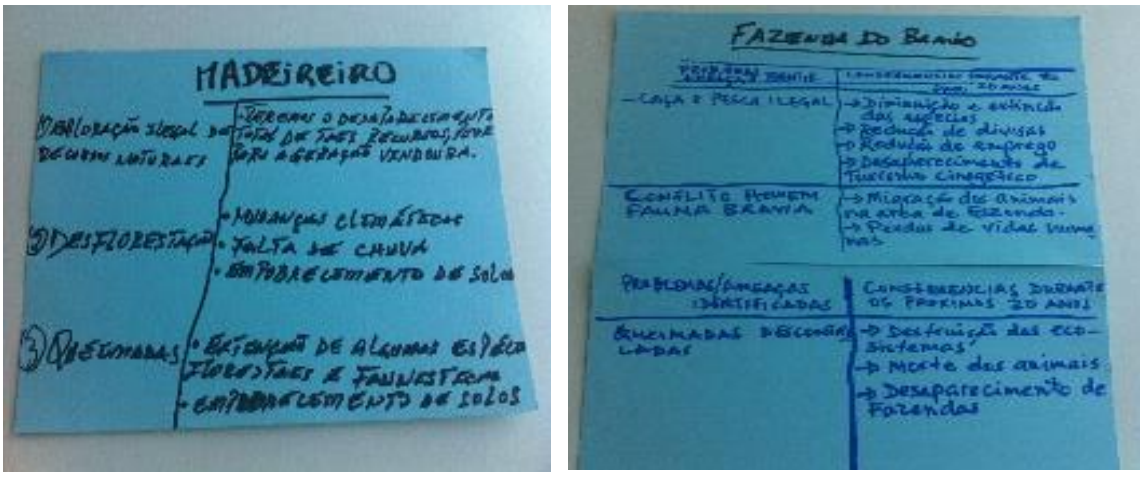


Figure 18 – From left to right: Poster of Timber Business-Man group of the group representing *Game farms*

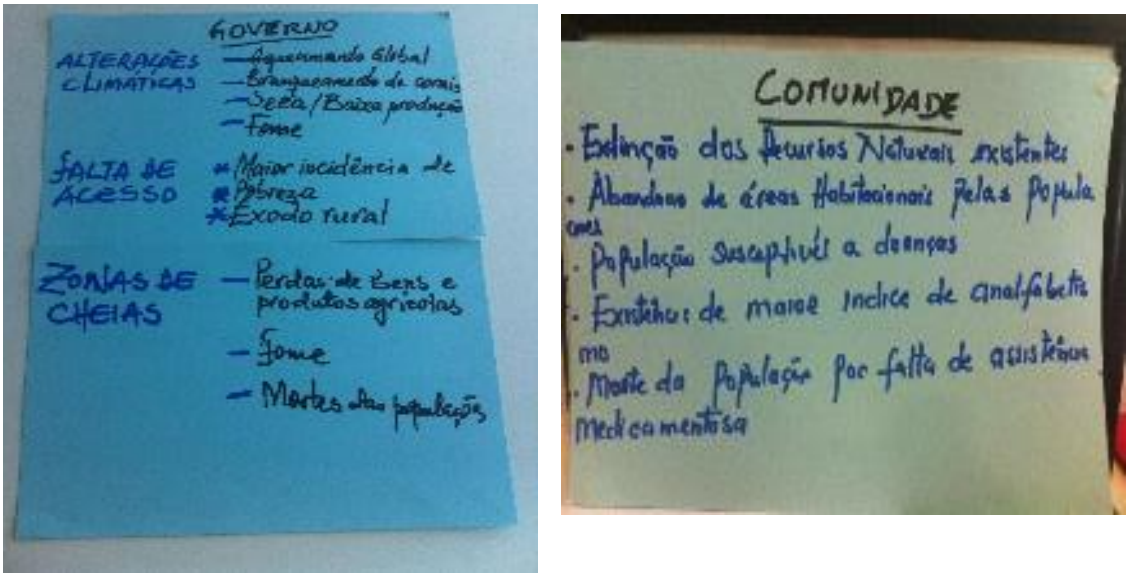


Figure 19 – From left to right: Poster of the group representing the Government and from the group representing a Community

10.10. ANNEX X - PRACTICAL EXERCISE 4 - WHICH SUSTAINABLE USE CONSERVATION AREA IS THE MOST APPROPRIATE TO THE AREA?

VOTING

WHICH SUSTAINABLE USE CONSERVATION AREA IS THE MOST APPROPRIATE TO THE AREA?

Participants should order from 1 to 3* the different types of Conservation Areas (from the less adequate to the more adequate), having in count information given and topics discussed during the workshop.

TYPE OF AREA	ORDER
Special Reserve	
Environmental Protection Area	
Official Coutada	
Community Conservation Area	
Sanctuary	
Game farm	

*

1 – Less adequate

3- More adequate

10.11. ANNEX 11 – TABLES FROM EXERCISE 4

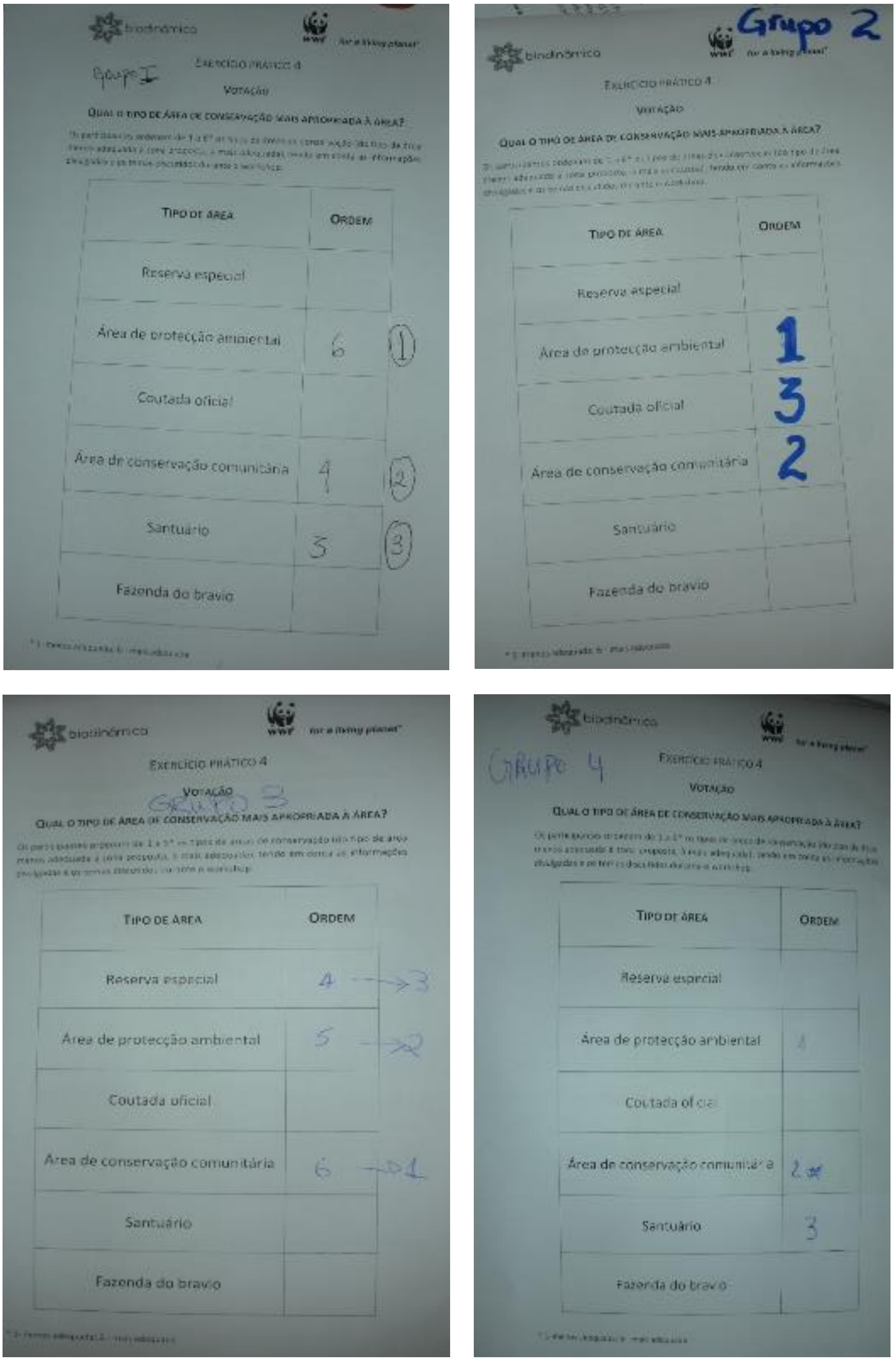


Figure 20 –From top left to right: Tables from groups 1, 2, 3 and 4 regarding exercise 4

10.12. ANNEX XII - FINAL OUTPUTS FROM EXERCISE 5 - EXPECTED BARRIERS, DIFFICULTIES AND BENEFITS IN THE IMPLEMENTATION OF A CONSERVATION AREA OF SUSTAINABLE USE

Figure 21 – Top scored conservation areas of sustainable use with the identified barriers/benefits (red post-it's) and benefits (green post-it's) for the implementation of these areas(left to right: Environmental Protection Area; Community Conservation Area and Sanctuary).

10.13. ANNEX XIII – EXERCISE 6 - VISION

The following tables represent the Vision (presented by each group by poster) of each group for the area in study, in a period of 20 years, in case the Conservation Area of Sustainable Use of Natural Resources would be implemented.

Group 1	
Vision in 20 years	Increase of forest and wildlife resources and managed sustainably
	Improvement of infrastructures in the communities
	Major investment of the communities in resources management

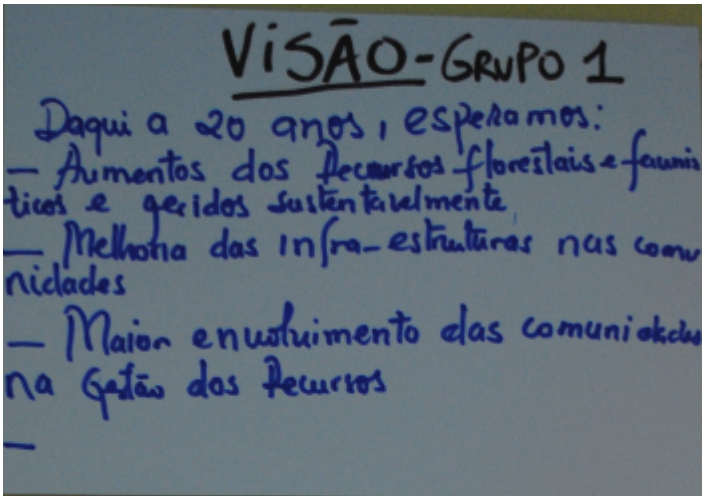


Figure 22 – Poster from group 1

Group 2	
Vision in 20 years	Communities living in harmony with the environment

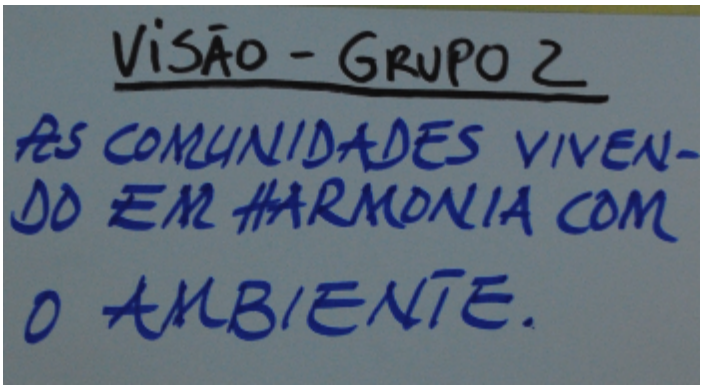


Figure 23 – Poster from group 2

Group 3	
Vision in 20 years	Each community has an area/zone of environmental protection and communitarian conservation.
	End with illegal hunting and illegal exploration of forest resources
	Free of uncontrolled fire practices

	Each village has a group of communitarian management

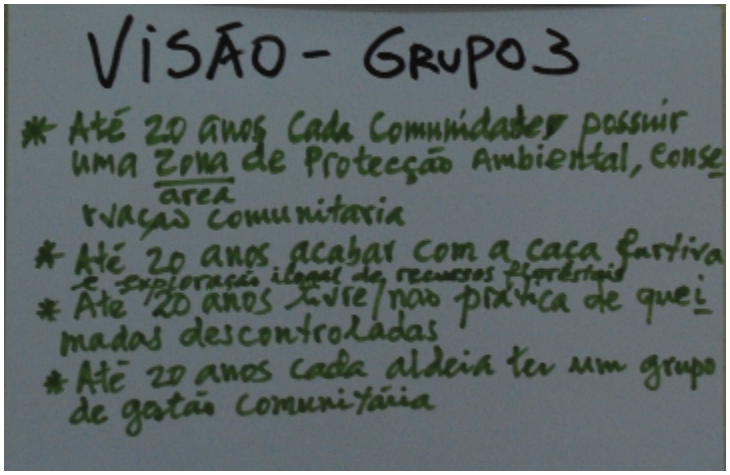


Figure 24 – Poster from group 3

Group 4	
Vision in 20 years	We would like that our forest be even richer in fauna and flora so that we have a sustainable life end our next generation can enjoy.
	Creation of more conservation areas and reforestation, other to promote the tourism in the region. And we are called to control these areas.

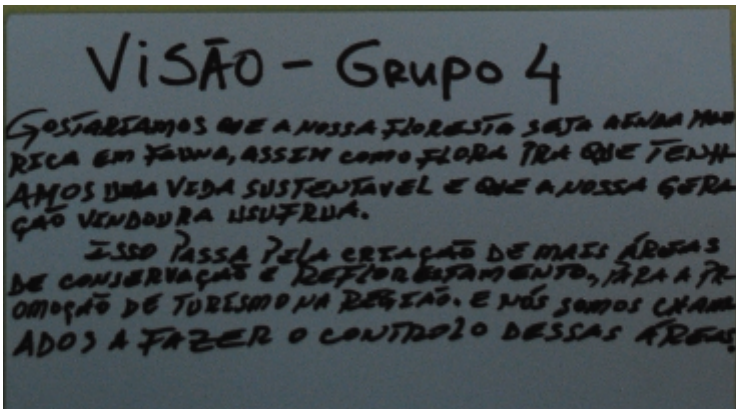


Figure 25 – Poster from group 4