TECHNICAL REPORT

WORKSHOP

A contribution to Mozambique's biodiversity offsetting system: framework to assess the ecological condition of Miombo Woodlands

Maputo, April of 2019

Project COMBO: Conservation, Mitigation Hierarchy and Biodiversity Offsets in Africa

A contribution to Mozambique's
biodiversity offsetting system: framework
to assess the ecological condition of
Miombo Woodlands

Index

1 Background

Over the last decade there has been a significant increase in exploitation of natural resources in Mozambique including development of infrastructures, generally resulting in negative environmental and social impacts. There is an urgent need to find ways to reconcile the economic development of Mozambique with the conservation of biodiversity and ecosystem services, upon which the bulk of the population directly depends.

Offsets aim to ensure NNL or NG of biodiversity and this should apply to all components of biodiversity that are significantly impacted. To ensure this objective is achieved it is necessary to measure biodiversity losses from impacts and the gains from offsets in a practical and transparent way so that their equivalence can be compared.

However, measuring losses and gains in biodiversity is not straightforward due to their complexity and context related variability. To overcome problems of measurement, proxies and metrics are used that define biodiversity value so that the amount of biodiversity loss from impacts and the amount gained from offsets can be quantified and compared to establish if NNL or NG are achievable and achieved.

Drawing on a growing body of international experience, with an assessment of the main advantages and disadvantages of the different types of metrics, the COMBO project and BIOFUND aim to propose suitable metrics to support offsetting in Mozambique. This work will propose the best approach and criteria to apply to selected vegetation types and which may serve different situations where defined natural habitats are impacted.

Therefore, the COMBO Project, BIOFUND and a research team from the Faculty of Agronomy and Forest Engineering is developing a technical protocol (metrics) for the assessment of ecological condition in Miombo woodland in Mozambique which will inform how an appropriate metric for determining losses and gains in these vegetation types should be constructed.

The goal is to develop a pragmatic tool that allows for a quick assessment of Miombo condition supported by a scientific basis of evaluation. This will allow capturing reliable information and guiding the decision-making process on biodiversity offsetting in Mozambique.

2 Objectives

The aim of the workshop was to present the progress of the development process of the Miombo condition assessment tool, to discuss the miombo attributes selected as indicators, as well as, to analyze the feasibility of existing tools in other countries, in order to define a useful tool appropriate to the national context.

3 Methodology

The technical workshop on the development of metrics for assessing the ecological condition of Miombo woodland in Mozambique was held on the 22nd April 2019, at the Pedagogical Complex

of University Eduardo Mondlane, in Maputo according to the agenda in Appendix I (see Figure 1). This workshop is part of the expert consultation phase intended to integrate knowledge from experienced professionals in the country and abroad.

The workshop was co-organized by the COMBO project led by WCS in Mozambique, BIOFUND and the Centre for the Study of Agriculture and Natural Resources Management (CEAGRE). The meeting was attended by 13 participants (see participants list in Appendix II), among them flora and fauna expert, environmental impact assessment consultants, government representatives (Ministry of Land, Environment and Rural Development), and the International Union for Conservation of Nature (IUCN). The discussion was focused on the minimum necessary set of attributes (e.g. floristic composition and structure) and tools, and how they should be combined to measure Miombo woodland condition in Mozambique, from an environmental impact assessment point of view.
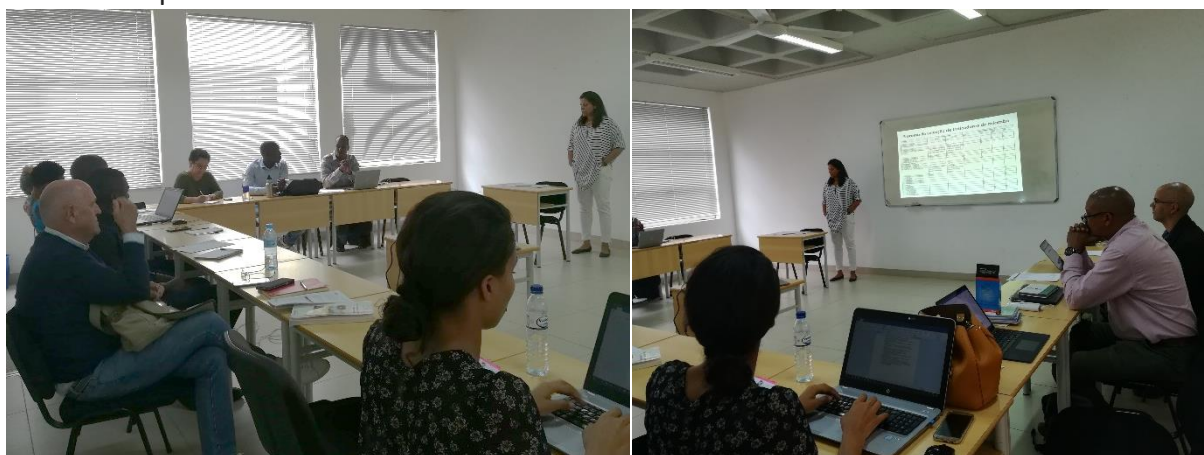

Figure 1. Technical workshop to assess the ecological condition of Miombo Woodlands, Maputo.

To achieve the objectives of the workshop, a combination of expository and participatory methods was used to provide information on the progress of the work and to gather contributions from the experts.

4 Results

4.1 Indicators

After the presentation of the indicators, the following points were noted:

- Regrowth by stumps can be ignored because it is already captured in natural regeneration.
- Density of Miombo woodland indicator species (N/ha) should be used instead of the Importance Value Index (IVI), due to the complexity of procedures for calculating the IVI.
- The use of 15% total tree density (N/ha) as a benchmark for the Miombo indicator species was accepted as potentially being adequate. However, it should be ascertained with further analysis using the National Forest Inventory data, as it could probably be well below the average.

- The height canopy (8-12 m) and the diametric class of large trees (DBH≥40 cm) should be re-evaluated, as these attributes depend on the type of Miombo/edaphic and climatic conditions of each region; Miombo with coastal elements could probably be dealt with separately.
- Species with a commercial value should be included in the index.
- The presence of fauna and organic matter (soil and litter) can be removed from the indicators, because, for the purpose of offsets, it would be better to work with the floristic structure and composition, ignoring the functional dimension, since it is already represented in the structure and composition.
- Replace frequency fire by density (N/ha) of burn indicator species (e.g *Diplorhynchus condylocarpon* and *Combretaceae*), because the calculation of fire frequencies is quite complex and requires knowledge of remote sensing and GIS as well as the use of historical data.
- The presence of mushrooms can be removed from the indicators, since they are very volatile, i.e their presence depends on the time of year (rainy season).

4.2   Tools

Four international methodologies assessed by the technical team were presented, based on the results of an initial screening phase, namely:

i.   BV - Germany Biotope Valuation;
ii.   BOE - Biodiversity Offsetting from England;
iii.   VQM - Victoria Quality Manual from Victoria, Australia;
iv.   FITA - Forest Integrity Assessment Tool Adjusted.

The following inputs from the discussion on the presented methodologies were obtained from the participants:

4.2.1   BV - Germany Biotope Valuation

- The scoring criteria needs to be adjusted to Mozambique.
- This methodology was considered too complex and with elements of rarity of species and ecosystem which are not directly applied to Miombo.

4.2.2   BOE - Biodiversity Offsetting from England

- Presents a quantitative approach and was considered as one of the most explicit and pragmatic methodologies. The remaining methodologies have subjective elements that can vary in relation to each implementer.
- Regarding to the performance, it makes a better evaluation between the Miombo of the Pomene National Reserve and the Miombo of the Niassa National Reserve. But it does not bring great differences between the disturbed and undisturbed Miombo. It seems like it

A contribution to Mozambique's
biodiversity offsetting system: framework
to assess the ecological condition of
Miombo Woodlands

captures what was observed in the field, where no large differences between disturbed and undisturbed Miombo were observed.

- It is a very simplistic methodology, which uses only 5 indicators to capture the complexity of Miombo structure and composition.

4.2.3   VQM - Victoria Quality Manual from Victoria, Australia

- The scoring criteria needs to be reviewed, especially the canopy health criteria. The canopy health was considered to be an indicator that does not apply to the reality of our country and perhaps could be removed from the analysis.

4.2.4   FITA - Forest Integrity Assessment Tool Adjusted

- The 2016 habitat mapping study could be used in order to define critical habitats in Mozambique.
- Rethink whether or not to include termite mounds as key habitats.
- Include swamp forest within miombo as key habitats in the FITA methodology scoring criteria.
- On the species with conservation value endemic species and commercial ones that are on the list of exploitation moratorium should be included.
- Add presence/absence of signals, e.g. excrements as an indicator of fauna. However it has been suggested to remove the presence of fauna as an indicator.
- This methodology combines a qualitative and quantitative approach.
- It is the only one that considers biomass and fauna in the scoring criteria.
- It gives objective field assessment and data analysis guidance and is probably more adjusted to the Miombo conditions.

5   Discussion

- The BOE and FITA methodologies were considered as the most pragmatic; to continue exploring them, these should be adjusted to the national context, but without losing consistency.
- It was suggested to the technical team to request the database of the National Forest Inventory, aggregate with the data of Niassa National Reserve and Pomene National Reserve to better draw conclusions about the benchmarks and the thresholds.
- The Pomene National Reserve might be not the ideal area to test and undertake the fieldwork for the validation process of the methodologies, because the Miombo Forest of Pomene is not be considered to be representative of the Miombo of Mozambique. Therefore, it was recommended to do the fieldwork in Zinave National Park.
- It was recommended to consult Wild & Barbosa map to identify patches of Miombo that are not representative of the Miombo in the country (e.g. Berlinia forests in Cabo Delgado). The manual should be clear that these specific Miombo should be treated differently.

- It was proposed to identify allometric equations according to each type of Miombo and consider using the threshold in the NFI as a benchmark, instead of a percentage.

6 Next steps

- Analyze and incorporate the inputs from the technical workshop.
- Preparation and planning of the fieldwork.
- Undertake the data processing and analysis of the National Forest Inventory, in order to obtain better conclusions about the benchmarks and test the feasibility and performance of the methodologies.
- Prepare the national workshop for June 2019.

Appendix I. Agenda

AGENDA		
22th April – Complexo Pedagógico, CPII-206		
8:30	• Participants arriving and registry	WCS
9:00	• Introduction	WCS/BIOFUND
9:15	• Presentation of selected indicators	Natasha Ribeiro
9:45	• Discussion on the indicators	All participants facilitate by WCS
10:15	• *Coffee break*	All participants
10:45	• Presentation of tools	Natasha Ribeiro
11:30	• Discussion	All participants facilitate by WCS
12:45	• End notes	WCS
13:00	• Finger lunch	All participants

A contribution to Mozambique's
biodiversity offsetting system: framework
to assess the ecological condition of
Miombo Woodlands

Appendix II. Participants list

Encontro técnico sobre o desenvolvimento de uma ferramenta de avaliação rápida do estado de
conservação das florestas de miomMaputo - Moçambique, 22 de Abril de 2019

Nome	Instituição	Telefone	Email
Denis Nicolau	BIOFUND	822962000	dnicolau@biofund.org.mz
John Hatton	Impacto	843093720	jh@impacto.co.mz
Amanjor Murrube	IMPACTO	843670370	amurrube@impacto.co.mz
Valério Macandza	FAEF UEM	827891230	vmacandza2001@yahoo.com
Maria Julieta Palma	IUCN	824778170	MARIA.MAIGDIANE@IUCN.org
Tereza Alves	IIAM - DARN	824854650	Tealves@gmail.com
Camila de Sousa	IIAM - DARN	824149500	sousa.camila9@gmail.com
Sérgio Cumbula	CEAGRE	844409693	sergiocumbula@gmail.com
Aristides Muhate	FNDS	824832570	aristides.muhate@fnds.gov.mz
Natasha Ribeiro	FAEF - UEM	826341215	joluci2000@yahoo.com
Hugo Costa	WCS /COMBO	842893091	hcosta@wcs.org
Naseeba Sidat	WCS /COMBO	825276029	nsidat@wcs.org
Roberto Zolho	FNDS	828947739	rzolho@gmail.com