

FINAL ENVIRONMENTAL MANAGEMENT PLAN FOR THE HARVESTING AND MANAGEMENT OF *PROSOPIS* SPECIES AT THE MARIENTAL PILOT SITE IN HARDAP REGION

CLIENT: Ministry of Environment, Forestry and Tourism



APRIL 2023







PROJECT INFORMATION

PROPONENT:	Ministry of Environment, Forestry and Tourism (Directorate of Forestry)	
PROJECT TITLE:	Harvesting and Management of <i>Prosopis</i> Species at the MarientalPilot Site in Hardap Region, Namibia	
PROJECT TYPE:	Environmental Management Plan	
PROJECT LOCATION:	Mariental, Hardap Region, Namibia	
COMPETENT AUTHORITY:	Office of the Environmental Commissioner (Ministry of Environment and Tourism)	
ENVIRONMENTAL	Nevunduko Consulting Services	
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ABBREVIATIONS/ACRONYMS

CBA	Cost Benefit Analysis
DoF	Directorate of Forestry
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
ECO	Environmental Compliance Officer
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
GEF	Global Environmental Facility
I&APs	Interested and Affected Parties
MAWLR	Ministry of Agriculture, Water and Land Reform
MEFT	Ministry of Environment, Forestry and Tourism
ORASECOM	Orange- Senqu River Commission
PPSC	Prosopis Project Steering Committee
SADC	Southern African Development Community
SAP	Strategic Action Programme
SMEs	Small and Medium Enterprises
UNDP	United Nations Development Programme
VMP	Vegetation/Forest Management Plan

1. INTRODUCTION AND BACKGROUND

The Ministry of Environment, Forestry and Tourism (Directorate of Forestry) with financial support from the Orange- Senqu River Commission (ORASECOM) intends to support a project at the Mariental Pilot Site that will include the sustainable harvesting of *Prosopis* species. Furthermore, the project will also advocate for the economic utilization of the harvested *Prosopis*. The sustainable utilization of the *Prosopis* vegetation is intended to enhance the flow of water in the Orange-Fish Basin where *Prosopis* is known to block water channels.

ORASECOM serve as the technical advisor of the Parties (four member states: Botswana, Kingdom of Lesotho, Namibia and South Africa) on matters relating to the development, utilization and conservation of the water resources of the Orange- Senqu River Basin. As part of its obligations, ORASECOM also from time to time avails resources and technical support to respective Governments to carry out projects aimed at promoting equitable and sustainable development of resources in the basin. This project, therefore, forms part of the support given by ORASECOM to member states.

ORASECOM, with support from United Nations Development Programme (UNDP), secured financial support from the Global Environmental Facility (GEF) to implement selected priority activities of the Strategic Action Programme (SAP). The UNDP-GEF project titled, Support to the Orange-Senqu River Strategic Action Programme (SAP) Implementation, the project will be implemented by UNDP and executed by ORASECOM.

It is against this background that the Proponent (Ministry of Environment, Forestry and Tourism) through ORASECOM has commissioned this EIA project to conform to the Namibia Environmental Management Act(No. 7 of 2007) and the Environmental Impact Assessment Regulations (Government Notice 30 of 6 February 2012) and obtain Environmental Clearance Certificate (ECC) for the proposed project.

According to the Environmental Management Act (No.7 of 2007) and the Environmental Impact Assessment Regulations the following activities may not be undertaken without an Environmental Clearance Certificate:

FORESTRY ACTIVITIES - The clearance of forest areas, deforestation, afforestation, timber harvesting or any other related activity that requires authorization in terms of the Forest Act,

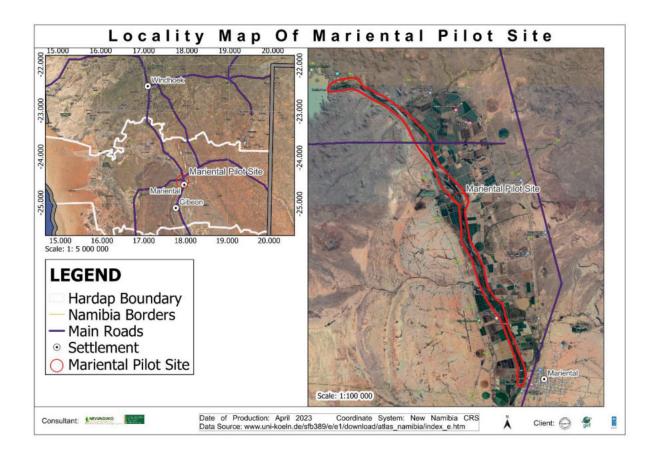
2001 (Act No. 12 of 2001) or any other law.

Nevunduko Consulting Services was appointed by ORASECOM, the financiers of the Environmental Impact Assessment (EIA) to carry out the EIA process.

Prosopis has become the dominant vegetation species along Fish River because of its high adaptive capacity and has resulted in the reduction of species diversity in the area. There is therefore a strong need to control the proliferation of *Prosopis* in the Hardap Region and the broader Orange-Fish River basin by harvesting it and replacing it with indigenous vegetation.

If it is not managed properly, *Prosopis* has the capacity to double every five years as the population expands at a rate of 18% per annum.

The project will be undertaken at the Mariental Pilot Site that is located in the Hardap Region of Namibia as shown in the figure below. The site at Mariental is 950 ha in extent.



Key project activities will include the following:

• Prosopis harvesting

All *Prosopis* plants, including saplings, in the demarcated compartment will be removed. Thepilot areas will be demarcated into compartments (operational land units). It is planned that thesite will be demarcated into blocks or compartments of 100m x 100m which will translate to 1 ha per compartment. A 15m wide access road will be established at the site that will be used for the transportation of harvested materials, equipment and personnel. The access roads will serve fire breaks for incidental fires, especially for the management of the revegetation.

This means the price quotes at the time of implementing this plan will be based on 1 ha harvested and the density (stocking) of the *Prosopis* and sizes of the trees being harvested.

• Harvesting methods

Many methods are available throughout the world with practical experiences from neighbouring South Africa. These include Mechanical, Manual combined with handoperated machines, Chemical applications, Biological and fire. The choice is based on many factors particularly on the objective of harvesting and in most applications the use of more than one of these methods needs to be deployed for effective results.

In the case of the Mariental Pilot area, the main objective of harvesting is to sustainably manage the *Prosopis* trees while promoting the regrowth and revegetation of indigenous tree species, which have been outcasted by *Prosopis*. To achieve this, the Project will use a combination of Manual with hand-operated machinery reinforced with the use of approved chemicals for killing the stumps.

However, the use of chemicals will be assessed and verified by this EIA process. Stumps are killed by either an approved chemical and saplings/regeneration are removed manually on an annual basis during the winter season, when the cambium tissue is not very active or growing. The removal of coppices in winter ensuresthat not much coppicing takes place from the same areas.

• Management of natural regeneration

The project will use the natural approach method for regenerating the harvested areas. This will start with ensuring that maximum care is taken to protect the indigenous trees found growing together with *Prosopis* during harvesting.

2. EMP OBJECTIVES

An Environmental Management Plan (EMP) describes the processes that the proponent (Ministry of Environment, Forestry) and associates will follow to maximize compliance and minimize harm to the environment. This plan will also help the Directorate of Forestry map out progress toward achieving continual improvements. The EMP comprises a list of actions needed to mitigate the potential negative environmental impacts identified in the EIA process.

The development of an EMP is a requirement for any EIA project as per Namibia's Environmental Management Act No.7 of 2007. Therefore, this EMP is a legal document that must accompany the EIA Report before an Environmental Clearance is issued.

The main purpose of this EMP is to:

- Minimize adverse impacts on the environment;
- Protect the environmental quality of the site;
- Meet the requirements of all national and local legislations;
- Outline guidelines for the *Prosopis* harvesting activities;
- Provide feedback for continual improvement in environmental performance; and
- Provide detailed specifications for the management and mitigation of activities that have the potential to impact negatively on the environment.

3. LEGAL REQUIREMENTS

As part of the implementation of this EMP, the proponent must comply with the requirements of various national legislations and municipal by-laws as outlined in the Scoping Report and as presented in the table below.

LEGISLATION	PROVISION	REGULATORY	APPLICATION TO THE
		AUTHORITY	PROJECT
The Constitution of the Republic of Namibia	Article 91 (c) and 95 (i) commit the state to actively promote and maintain the environmental welfare of all Namibians by promoting sustainable development	Government of the Republic of Namibia	The project should not pose a threat to the natural and human environment.
Environmental Management Act No.7 of 2007 and EIA Regulations (2012)	Provides a list of listed activities that may not be undertaken without environmental clearance	Ministry of Environment, Forestry and Tourism (Office of the Environmental Commissioner)	An Environmental Clearance will be required before the project Commences.
Water Act 54 of 1956	Control of disposal of sewage, the purification of effluent, the prevention of surface and groundwater pollution, and the sustainable use of water resources.	Ministry of Agriculture, Water and Land Reform (Department of Water Affairs)	Project activities should not pose a threat to water resources.
The Water Resources Act 24 of 2004	Control of disposal of sewage, the purification of effluent, the prevention of surface and groundwater pollution, and the sustainable use of water resources.	Ministry of Agriculture, Water and Land Reform	Project activities should not pose a threat to water resources.
Forestry Act No. 12 of 2001	The Act affords protection to certain indigenous plant species.	Ministry of Environment, Forestry and Tourism (Directorate of Forestry)	The provision of this Act must be observed during the harvesting of <i>Prosopis</i> spp.
Nature Conservation Ordinance no. 4 of 1975	Chapter 6 provides for legislation regarding the protection of indigenous plants	Ministry of Environment, Forestry and Tourism	Biodiversity at the project site must be protected as per the provisions of this ordinance.
Soil Conservation Act No 76 of 1969	Combating and preventing soil erosion, the conservation, improvement and manner of use of the soil and vegetation and the protection of the water sources	Ministry of Agriculture, Water and Land Reform	The proponent should ensure that soil erosion and soil pollution are avoided during the implementation of the project.
Atmospheric Pollution Prevention Ordinance No 45 of 1965	Part II - control of noxious or offensive gases, Part III - atmospheric pollution by smoke, Part IV - dust control,	Ministry of Health and Social Services	Atmospheric pollution should be minimized at all costs.

Table 1: Legal framework of the project.

			1
	and Part V - air pollution by		
	fumes emitted by vehicles.		
Local Authorities Act No. 23 of 1992	The Local Authorities Act prescribes how a town or municipality should be managed by the Town or Municipal Council.	Ministry of Urban and Rural Development	The harvesting of <i>Prosopis</i> within a municipal area must comply with provisions of the Local Authorities Act.
The Labour Act of 1992	Employees are subject to the terms of the Labour Act. The act also contains the Health and Safety Regulations.	Ministry of Labour, Industrial Relation and Employment Creation.	Given the employment opportunities presented by <i>Prosopis</i> harvesting compliance with the labour law is essential.
Public and Environmental Health Act of 2015	This Act (GG 5740) provides a framework for a structured uniform public and environmental health system in Namibia. It covers notification, prevention and control of diseases and sexually transmitted infections; water and food supplies; waste management; health nuisances; public and environmental health planning and reporting. It repeals the Public Health Act 36 of 1919 (SA GG 979)	Ministry of Health and Social Services	Project activities should not pose a threat to public health.
National Heritage Act, 2004 (Act N0.27 of 2004)	This Act calls for the protection, conservation and registration of places and objects of heritage Significance.	National Heritage Council of Namibia	Should any objects of heritage significance be found on the project site, the provisions of this Act must apply.
Atmospheric Pollution Prevention Ordinance (1976)	This Ordinance generally provides for the prevention of the pollution of the atmosphere. Part IV of this ordinance deals with dust control.	Ministry of Environment, Forestry and Tourism.	Atmospheric pollution should be minimized at all costs.
Plant Quarantine Act No.7 of 2008 & Plant Health Regulations	This Act and its Regulations provide for the preventing, monitoring, controlling and eradication of plant pests; to facilitate the movement of plants, plant products and other regulated articles within and into or out of Namibia.	Ministry of Agriculture, Water and Land Reform	The project must comply with the provisions of this Act and Regulation

4. ENVIRONMENTAL MANAGEMENT PLAN

4.1 EMP ADMINISTRATION

In order to successfully implement the provisions of this EMP, there is a strong need to clearly outline the roles and responsibilities of all stakeholders. There is also a need for the proponent and project managers/contractors to appoint an overall responsible person (Environmental Compliance Officer) to ensure the successful implementation of the EMP. The Environmental Compliance Officer (ECO) needs to be someone who has a basic understanding of EMP administration. Under the management actions, each action is allocated to a responsible entity to ensure that the specific action is managed and documented properly.

Furthermore, all key role players such as contractors who will be involved during the construction of the lodge must be informed about the contents of this EMP and activities to be undertaken to mitigate the potential impacts identified.

The table below outlines the key parties to this project and their responsibilities in terms of this EMP.

KEY PARTY	RESPONSIBILITIES
The Proponent (represented by Project Manager)	 Implement the final EMP after approval by MEFT and ensure the project complies with the conditions therein. Provide environmental training and awareness of the EMP to all contractors and employees of the project. Notify the Competent Authority (MEFT) and EAP of any proposed changes to the proposed project. Ensure that all contractors (SMEs) sign the EMP before the commencement of project activities. Ensuring that the necessary legal authorizations and permits have been obtained. Assist the contractors (SMEs) in finding environmentally responsible solutions to problems.

Table 2: Roles and responsibilities of key parties

	 To audit the implementation of the EMP regularly. Compile and submit Environmental Reports to the Authority. 	
SMEs involved in the harvesting	• Ensure all their workers understand and adhere to the provisions of this EMP through training in the employees' languages.	
	 To undertake their activities in an environmentally sensitive manner and within the context of this EMP. To undertake good housekeeping practices during the duration of their specific project activity. 	
Authorities	 Provide authorization for the project to commence. Conduct compliance monitoring and evaluation of the project's environmental performance. 	
Environmental Assessment Practitioner (EAP)	 the project's environmental performance. Submission of Environmental Reports to the competent Authority (MEFT). Provide information on this project to stakeholders. Provide training on this EMP on appointment by the proponent. Should be available to make amendments or additions to this EMP should it be required by the authorities. 	

4.2 TRAINING

All key stakeholders who will be involved during the harvesting of *Prosopis* must be informed about the contents of this EMP through structured training programs, this can form part of the regular site meetings. It is recommended that the EMP form part of the Terms of Reference for all stakeholders to be involved in the project.

4.3 ENFORCEMENTS: NON-COMPLIANCE AND PENALTIES

This document is considered a legally binding document upon the issuance of an Environmental Clearance Certificate for the project to commence. In cases of transgressions and non-compliance to the EMP, the transgressor should be liable to a penalty fine. Transgressions should be recorded in a dedicated register and should be submitted with the

biannual reports to the Ministry of Environment, Forestry and Tourism. The Proponent shall issue the penalties in terms of the severity of the environmental damages.

4.4 ENVIRONMENTAL RECORDS AND REPORTS

MEFT should initiate and maintain an updated filing system for the project whereby method statements, environmental incident reports, training records, audit reports and public complaints register. It is recommended that photographs of the site should be taken as a visual reference.

4.5 MANAGEMENT ACTIONS OF ENVIRONMENTAL ASPECTS

DESCRIPTION	The harvesting of <i>Prosopis</i> in areas where it is the dominant species might facilitate water and wind erosion as the natural regeneration of indigenous vegetation will take some years before it can play the role of stabilizing the riverbanks.
MITIGATION MEASURES	 Any indigenous vegetation found under the canopy of <i>Prosopis</i> should not be disturbed to promote the natural regeneration of indigenous vegetation and in turn, promote soil conservation. Limit vehicular movement to avoid disturbing the substrate.
MONITORING	 The riverbanks in the project area must be visually monitored for any signs of erosion monthly. Ensure that 100% of vehicular traffic in the project area is confined to designated tracks by visually monitoring tracks at the end of each harvesting day. Any non-compliance should be documented, corrective action taken and reported within the week of occurring.
RESPONSIBLE PARTY	Ministry of Environment, Forestry and Tourism

• Increased erosion

• Traffic disturbance

DESCRIPTION	The movement of vehicles to take harvesters to the site and collect the harvested biomass might cause disturbance to the environment.	
MITIGATION MEASURES	 Traffic must be confined to designated two-track roads. Limit speed in the project area to a maximum of 40 km/h to avoid the generation of dust and disturbance of the substrate. Limit movement of vehicles to daytime only. 	
MONITORING	 Ensure that 100% of vehicular traffic in the project area is confined to designated tracks by visually monitoring tracks at the end of each harvesting day. Ensure that no project activities are undertaken after sunset by ensuring that all vehicles leave the project area at the end of each working day. Any non-compliance should be documented, corrective action taken and reported within the week of occurring. 	
RESPONSIBLE	Project Manager and SMEs (appointed to do the harvesting).	
PARTY		

• Disruption of ecosystem services

	At the moment, <i>Prosopis</i> plants in the project area provide various ecosystem goods and services such as microclimate regulation, improvement of soil fertility, habitat and food to various animal species and provide income to local communities. Removal of <i>Prosopis</i> might reduce these goods and services as the natural regeneration of indigenous vegetation may not provide these necessary ecosystem functions in the short term.	
MITIGATION MEASURES	 Develop <i>Prosopis</i> Harvesting Protocols and train all personnel that will be involved in the harvesting on how to identify and protect indigenous vegetation during the harvesting process. Ensure that no indigenous vegetation is harvested 	
MONITORING	 Ensure that indigenous vegetation in the harvested areas is protected through visual inspection at the end of each harvesting day. Ensure that incidences of accidental cutting of indigenous vegetation are maintained at 0% and all offenders in this regard should be punished. Undertake an annual third-party audit of the project to ensure compliance with EMP provisions and environmental best practices. 	
RESPONSIBLE PARTY	Project Manager	

• Loss of livelihood opportunities

DESCRIPTION	Livelihood opportunities such as the collection of <i>Prosopis</i> pods for animal fodder and for sale might be lost if <i>Prosopis</i> is completely harvested.	
MITIGATION MEASURES	 Improve the marketing of harvested <i>Prosopis</i> products to generate an alternative source of income for the community that relies on <i>Prosopis</i>. Ensure the local community gets employment opportunities to harvest <i>Prosopis</i> during the project implementation. The Hardap Regional Council must promote investment in other economic sectors to create alternative business and employment opportunities for the residents. 	
MONITORING	• Keep records of the socio-economic benefits that emanate from the implementation of this project (records of the number of people employed, the quantity of biomass harvested, income earned from selling <i>Prosopis</i> products and other relevant statistics)	
RESPONSIBLE PARTY	Project Manager	

• Health and safety hazards

DESCRIPTION	Occupational health hazards are expected particularly concerning the workers who will be harvesting the <i>Prosopis</i> .
MITIGATION MEASURES	 Movement of the harvesters should be confined to the project site and block harvested at that time as far as possible to limit encounters with wild animals. First Aid kits should be kept on-site to attend to any injured workers. The workers that will be involved in the harvesting of <i>Prosopis</i> must be equipped with appropriate Personal Protective Equipment. Provide training to all stakeholders on potential occupational health and safety risks and how to mitigate them. Ensure that there is a safety representative who is equipped with first aid knowledge at the harvesting site. Keep fire extinguishers in all vehicles at the project site.

MONITORING	 Ensure that 100% of accidents on site are recorded and corrective measures undertaken with immediate effect. Ensure that 100% of the activities of the harvesters are confined within the project boundaries through visual inspections on an ongoing basis. Ensure that an adequately equipped First Aid Kit is available on site before work commences every day through the daily checklist and visual inspection. Inspect all workers daily for PPE compliance. Ensure that a safety training session is held once a month.
RESPONSIBLE PARTY	Project Manager in collaboration with SMEs involved in the harvesting.

• HIV/AIDS

DESCRIPTION	Projects that bring many people together such as the proposed harvesting of <i>Prosopis</i> , create an environment where workers have the opportunity to interact with the local community, a significant risk is created for the development of social conditions and behaviours that contribute to the spread of HIV/AIDS.	
MITIGATION MEASURES	 Hold HIV/AIDS Awareness sessions as part of the scheduled site meetings. Ensure that the workers have access to condoms and other forms of protection. Promote correct and persistent use of male and female condoms. Provide care and support for the infected and affected. 	
MONITORING	 Ensure that 100% of HIV/AIDS training sessions are conducted as agreed. Ensure that condom supply to the harvesters is always stocked through visual inspections weekly. Keep records of HIV/AIDS support provided to workers e.g. counselling is documented and follow-up action undertaken. 	
RESPONSIBLE PARTY	Project Manager and SMEs (appointed to do the harvesting).	

• Waste generation

DESCRIPTION	Various waste streams will be generated during the harvesting of <i>Prosopis</i> . This will include litter from the harvesters and biomass that cannot be utilized for economic purposes.	
MITIGATION MEASURES	 The harvesters must be equipped with refuse bags where they will put all their litter. The litterbags must be removed from the site and disposed of at an appropriate disposal site at the end of each day to avoid the bags being torn by wild animals. Biomass waste must be gathered and shredded as animal fodder or allowed to dry far from the river course. Any human waste on site must be properly covered. 	
MONITORING	 Ensure that 100% of waste is removed from the project site through daily visual inspection at the end of each harvesting day. Any non-compliance should be documented and corrective action taken within the same day to avoid litter that has been blown by the wind to other areas. 	
RESPONSIBLE PARTY	Project Manager in collaboration with SMEs involved in the harvesting.	

• Pollution from herbicides

DESCRIPTION	The use of herbicides that are not enviro-friendly will cause harm to the ecosystem and might pollute the valuable water resources of the Fish River.	
MITIGATION MEASURES	 Only registered herbicides should be applied to the stumps immediately after harvesting, to prevent further regeneration of the vegetation. The PSC must ensure that all the herbicides procured for this project are approved for use in Namibia. The following herbicides are recommended by the working for Water Programme for clearing the <i>Prosopis</i> 1. Turbodor 29 mpa 2. Astra 360 SL 3. Confront *360 SL 4. Gallon 480 EC 	
MONITORING	 Ensure that Project Manager must approve 100% of the herbicides used in this project. Conduct visual inspection daily to ensure that only approved herbicides are used to control <i>Prosopis</i>. Any non-compliance should be documented, corrective action taken and reported within the week of occurring. 	

RESPONSIBLE PARTY	roject Manager in collaboration with SMEs involved in the arvesting.	

5. EMERGENCY RESPONSE PLAN

The proponent should consider the following emergency plan during the implementation phase of the project.

ASPECT OF	RESPONSE PLAN	RESPONSIBILITY
DANGER		
Fire	 Use available fire extinguishers to fight the fire Call the Police (+264 (63) 293005) Call Mariental Municipality Fire Brigade (+264 (63) 240347) Call Project Manager Workers to assemble at a safe Fire Assembly Point 	Project Manager
Injuries or loss of life	 Apply First Aid Call the Police (+264 (63) 293005) Call for Ambulance Services (+264 (63) 242331) Call Project Manager 	Project Manager
Theft or Robbery	 Call the Police (+264 (63) 293005) Call for Ambulance Services (+264 (63) 242331) Call Project Manager 	Project Manager

6. CONCLUSION

The successful implementation of this EMP is dependent on the collaboration of all stakeholders who are involved at all levels of project implementation. The ultimate responsibility lies with the Project Manager, to ensure that all the contents of this document are clearly understood and implemented by all stakeholders. To ensure that it is legally binding to all parties, all agreements entered into by the project must incorporate the contents of this EMP.

The proponent is liable to submit regular (bi-annually) reports to the Ministry of Environment, Forestry and Tourism during the life span of the project, provide upts annually, and renew the ECC every three years.

Nevunduko Consulting Services believes that a comprehensive assessment of the proposed project has been achieved and that this EMP covers all pertinent components of the project that need to be mitigated. It is therefore recommended that the Environmental Clearance Certificate can be awarded to the project.