

## **6. ENVIRONMENTAL MANAGEMENT PLAN FOR PORAD AGRICULTURAL PROJECT AT ONANKE VILLAGE- OSHIKOTO REGION (EMP)**

### **8.1. EMP Administration**

This section of the report serves to prescribe mitigation measures to reduce, limit, eliminate or compensate for impacts, to acceptable/insignificant levels. In setting mitigation measures, the practical implications of executing these measures must be borne in mind. With early planning, both the cost and the impacts can be minimized.

This section also outlines the roles and responsibilities of all stakeholders to ensure that the EMP is fully implemented. There is also a need for the developer that will be appointed by the PORAD management to establish the project to appoint an overall responsible person Safety, Health and Environmental officer (SHE Officer) to ensure the successful implementation of the EMP. The SHE officer needs to be someone who has a basic understanding of EMP administration.

### **8.2 Socio-economic impacts and mitigation**

The proposed agricultural project will support the socio-economic development of the surrounding villages by providing employment creation and providing training to small scale farmers. The project will also promote food security.

TABLE 1: ASSESSMENT OF IMPACTS ASSOCIATED WITH THE SOCIO-ECONOMIC DEVELOPMENT

Impact	Employment opportunities during the construction of the development. Capacity building programs of training for semi skills locals and provision of food
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Nature	The agricultural project will create a few job opportunities and this will have a positive economic impact on surrounding communities and food security for the people in the Onanke village and Omuthiya town.
Extent	Regional
Duration	Long term
Intensity	n/a
Probability	Highly probable
Status of the Impact	Positive
Significant rating before mitigation	Low
Timing	Construction and operation
Mitigation	<ul style="list-style-type: none"> <li>• Enhancing of Agricultural Productivity through provision of training to smallholder farmers.</li> <li>• Reducing of importation of basic essential food</li> <li>• Facilitating and contributing to government efforts of jobs creation</li> <li>• Promoting of food security, self-sufficiency in food production and quality improvement of food / nutritional value within Omulondo and beyond</li> <li>• Increasing household incomes and enhanced livelihood</li> <li>• Ensuring project's sustainability by: <ul style="list-style-type: none"> <li>a) Guaranteeing that there is a commercial component through which vigorous marketing and establishment of value chain is maintained</li> </ul> </li> </ul>

### 8.3 Water quality and mitigation

There may be possibility of surface water contamination resulting from water runoff containing chemical residues of pesticides and herbicides from the farming operation. On ground water will be affected since water for rural water supply or rely on rain water.

TABLE 2: ASSESSMENT OF IMPACTS ASSOCIATED WITH THE WATER POLLUTION

Impact	Water pollution
Nature	Petroleum handling at the agriculture project specifically the handling of diesel, oils spills, oils from farm machinery, vehicles and handling of used oil is likely to result into water pollution. The pesticides, herbicide, fuel and oil spills if not properly handled can be washed way in to oshana’s during the rainy season reducing the water quality.
Extent	Regional
Duration	long term
Intensity	Medium
Probability	Definite
Status of the Impact	Negative
Significant rating before mitigation	Medium
Timing	Construction and operation
Mitigation	<ul style="list-style-type: none"> <li>• There are no permanent water bodies near the project area however it is advisable to check and control the parameters for water quality during the rainy season.</li> <li>• An effective drainage system will be put in place to capture all waste water.</li> <li>• Oil spillages from vehicles and machinery will be avoided on site. Compliance with the Hazardous Waste Regulations will be priority.</li> <li>• A good and effective monitoring system will be put in place during operations. Regular surface water samples will be collected and analyzed and Bi-annual report will be submitted to the directorate of water affairs.</li> <li>• Drip trays will be used when removing used oils from equipment waiting servicing.</li> </ul>

## 8.4 Soil quality and mitigation

TABLE 3: ASSESSMENT OF IMPACTS ASSOCIATED WITH THE SOIL POLLUTION

Impact	<ul style="list-style-type: none"> <li>• soil pollution</li> <li>• Salination of soils</li> </ul>
Nature	Poor management of new and used oils will result in soil pollution. It is also possible that soil pollution may occur due to inappropriate handling of chemicals such as fertilizer, insecticides, fungicides and herbicides.
Extent	Local
Duration	Short term
Intensity	Medium
Probability	Definite
Status of the Impact	Negative
Significant rating before mitigation	Medium
Timing	Construction and operation
Mitigation	<ul style="list-style-type: none"> <li>• Application of appropriate cultivation method</li> <li>• Ensure that irrigated lands are not over water logged.</li> <li>• Cultivation of crops with salinity tolerance especially fruits</li> </ul>

## 8.5 Soil erosion and mitigation

Soil erosion may be caused by storm water and or high velocity winds. However, this impact will be local as it will be restricted to the proposed project site. Soil erosion will eventually result into poor soil fertility as the nutrients will be leached out.

TABLE 4: ASSESSMENT OF IMPACTS ASSOCIATED WITH THE SOIL EROSION

Impact	<ul style="list-style-type: none"> <li>• Loss of Soil Fertility and natural nutrients</li> <li>• Loss of cultivable land</li> <li>• Deterioration of water resources on cultivable land</li> </ul>
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	<ul style="list-style-type: none"> <li>• Flooding of valley bottoms and silting of dams, rivers and ponds.</li> </ul>
Nature	Poor soil management will result in loss of soil fertility.
Extent	Local
Duration	Permanent
Intensity	Medium
Probability	Probable
Status of the Impact	Negative
Significant rating before mitigation	Medium
Timing	Construction and operation
Mitigation	<ul style="list-style-type: none"> <li>• Avoid over watering and replace nutrients through crop rotation organic fertilizer application.</li> <li>• Avoid over watering and replace nutrients through crop rotation and organic fertilizer application.</li> <li>• Improved water, management, agriculture practices and control of inputs (chemical fertilizers).</li> <li>• Frequent checking and controlling the parameters for water quality and quantity.</li> <li>• Putting up of level-bunds on irrigated lands to ensure infiltration and reduction of run-off.</li> <li>• Regulation of water application to avoid over watering.</li> <li>• Create buffers of about 20 – 40 m width between cultivated land and the rivers, streams</li> </ul>

## 8.6 Noise pollution and mitigation

Farm vehicles and equipment when ploughing and tilling, transportation of materials noise levels might increase. Noise will also have an impact on animals like insects and birds that temporary migrate to other areas.

TABLE 5: ASSESSMENT OF IMPACTS ASSOCIATED WITH THE NOISE POLLUTION

Impact	Increase in noise levels
Nature	Noise and vibration can become a nuisance to construction workers, animals and nearby shops. The health of the workers is also at risk if they are subjected to continuous noise above 85 dh.
Extent	Local
Duration	Short term
Intensity	Medium
Probability	Definite
Status of the Impact	Negative
Significant rating before mitigation	Medium
Timing	Operation
Mitigation	<ul style="list-style-type: none"> <li>• Operation of machinery at the farm will have little impact on the local surrounding community as the noise levels to be emitted will be within the acceptable audible levels.</li> <li>• The settlements around the farm are at reasonable distances unlikely to receive destructive noise levels.</li> <li>• The machinery, trucks and tractors that will be used will be well serviced to avoid generating noise levels that are above the recommended limit.</li> <li>• Operations will be limited to day time only.</li> </ul>

### 8.7 Dust and mitigation

The movement of agriculture vehicle when ploughing and tilling, transportation of materials, will certainly generate appreciable amount of dust. The barren land being blown away by the wind and can create a dusty atmosphere.

TABLE 6: ASSESSMENT OF IMPACTS ASSOCIATED WITH THE DUST EMISSION

Impact	The health effect of dust to the farm workers, effect of dust on the ecosystem and nearby residents.
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Nature	High wind velocities may also result into dust generation from the bare land that has been cleared of its vegetation. This may happen even during off season periods of farming or when the land is idle during the window period of the rotation system that will be used at the agricultural project.
Extent	Local
Duration	Medium term
Intensity	Medium
Probability	Definite
Status of the Impact	Negative
Significant rating before mitigation	Medium
Timing	Operation
Mitigation	<ul style="list-style-type: none"> <li>• The farm shall have a water bowser which shall be used to suppress dust on the main road and other access roads and construction sites where there is dust.</li> <li>• Application of fertilizers, fungicides, pesticides and herbicides will be in accordance will the law and guidelines.</li> </ul>

### 8.8 Loss of biodiversity and mitigation

There is no protected plant species that was observed onsite and all the species present are woody shrubs like *Colophospermum mopane* and *Terminalia pruinoides* and grasses where observed and will be cleared to make way for the fields. The clearing of land will also destroy the habitat of other various forms of biodiversity in this area. However, the impact will be low due to the fact that only part of the land will be cleared. There is no plants and animal species that are endemic to the area. All plant species found here also occur in other areas of Namibia.

TABLE 7: ASSESSMENT OF IMPACTS ASSOCIATED WITH THE LOSS OF BIODIVERSITY

Impact	Loss of Biodiversity
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Nature	The clearing of land to make way for agriculture land will result in the destruction of fauna and flora, other forms of biodiversity.
Extent	Local
Duration	Permanent
Intensity	Medium term
Probability	Definite
Status of the Impact	Negative
Significant rating before mitigation	Medium
Timing	Preconstruction
Mitigation	The proponent should avoid unnecessary clearing of vegetation to minimise direct and indirect disturbance to the flora and fauna within the site and surrounding area.  The section/area dedicated for animal husbandry should not be cleared. The proponent should also consider planting indigenous tree within the vicinity.

## 8.9 Health and safety impacts and mitigation

The health and safety of the employees and the villagers should be taken into consideration during the operation of the agriculture project and therefore if not taken in to consideration with negatively affect the employees, villagers and the environment.

TABLE 8: ASSESSMENT OF IMPACTS ASSOCIATED WITH THE HEALTH AND SAFETY

Impact	Injuries to employees or other health risk associated with the use pesticides
Nature	The potential impacts on human health and safety resulting from project activities could include occupational accidents and injuries, vehicle accidents, dehydration, exposure to weather extremes, adverse health effects from dust generation, pesticides and fertilizer.
Extent	Local
Duration	Short term to medium term



Intensity	Low
Probability	Highly probable
Status of the Impact	Negative
Significant rating before mitigation	Medium
Timing	Preconstruction and operation
Mitigation	<ul style="list-style-type: none"> <li>• Danger” warning signage to be placed in different points along the boundary of the farm. Warning signs to be written in symbols, English and vernacular language.</li> <li>• Procedures for dealing with injuries or accidents must be in place and all contact details for emergency personnel available.</li> <li>• There should be a compulsory safety induction programme for all employees in place and rigorous awareness campaign to the community to avoid injury or death.</li> <li>• Number of construction workers provided with protective equipment such as helmets, safety shoes, gloves and eye glasses as appropriate.</li> <li>• Number of injuries, lost days, and fatalities of construction workers and others.</li> </ul>

### 8.10 Solid Waste and Hazardous Waste and mitigation

Domestic and Biomass waste will be generated during operational phase. This impact will be local. The domestic waste generation is negative while the biomass generation is a positive impact. The biomass may be used as fertilizer that may be considered by PORAD Association Incorporated.

TABLE 9: ASSESSMENT OF IMPACTS ASSOCIATED WITH THE SOLID WASTE

Impact	Solid waste and hazardous impact
Nature	Potential domestic waste like plastics, fertilizer bag boxes etc can end up polluting the environment. Biomass can be positive as it can

	be used as fertilizer therefore also doubling as a cost cutting measure for PORAD. Hazardous (used oil, paint cans etc.) waste will be generated during the construction and maintenance.
Extent	Local
Duration	Short term to medium term
Intensity	Low
Probability	Highly probable
Status of the Impact	Negative and positive
Significant rating before mitigation	Medium
Timing	Preconstruction and operation
Mitigation	<ul style="list-style-type: none"> <li>• Used oil and used batteries storage areas shall be constructed according to environmental guidelines. Lockable, concreted and bunded shed shall be constructed.</li> <li>• Cement empty bags and containers will be re-used or returned to supplier for re-use.</li> </ul>

### 8.11 Animal husbandry and mitigation

Animals like cattle's require large grazing areas and therefore trees need to be removed to make way for grass to grow since cattle are grazers, the remove of plants can cause soil erosion water bodies that are close to get polluted.

TABLE 10: ASSESSMENT OF IMPACTS ASSOCIATED WITH THE ANIMAL HUSBANDRY

Impact	Deforestation and water pollution
Nature	The clearing of land to make way for grazing for animals will result in the destruction of plants and water pollution.
Extent	Local
Duration	Permanent
Intensity	Low term
Probability	Definite
Status of the Impact	Negative

Significant rating before mitigation	Medium
Timing	Operation
Mitigation	Since the 200 ha will be divided in to two sections the animal husbandry part and the crop farm part the animal husbandry section will not be cleared and shall be left as is for animal grazing only. The proponent should also ensure that there is no overstocking of animals which can lead to overgrazing.

### 8.12 Human Wildlife Conflict and mitigation

The project site is falling within Onanke village which classified as a hotspot or Chronic Human Wildlife Conflict (HWC) zone. The project site is exactly about 900 m from Etosha Fence. According to the National Policy on HWC Management of 2018 (page 9), the Ministry of Environment, Tourism and Forestry has introduced approaches to minimize HWC through land use planning by settling people as far as possible from HWC chronic areas.

This is done to directly offset losses of farmers caused by wildlife to livestock and crops. Usually, the communities and farmers in such areas are faced to deal with HWC challenges of elephants and lions on the daily basis.

TABLE 11: ASSESSMENT OF HUMAN WILDLIFE CONFLICT (HWC) AND MITIGATION

Impact	Human Wildlife Conflict
Nature	The project area is identified by MET as a HWC chronic zone with high HWC incidents and is regulated to limit human settlement.
Extent	Local
Duration	Permanent
Intensity	Low term
Probability	Definite
Status of the Impact	Negative
Significant rating before mitigation	High
Timing	Operation

Mitigation	<p>There are no mitigation measures to eradicate HWC but the following mitigation measures can be developed to reduce the incidence of HWC;</p> <ul style="list-style-type: none"> <li>• PORAD should develop wildlife proof fence</li> <li>• MET to complete the ongoing construction of Etosha fence the project vicinity</li> <li>• Alternatively identify alternative site further away from the wildlife buffer zone</li> </ul>
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## 7. CONCLUSION AND RECOMMENDATIONS

### 10.1 Conclusion

The proposed PORAD Agricultural Project is an important project to the development goals and aspirations of the receiving communities of Onanke Village as well as to Namibia as whole. The project objectives are line with the Government action plan of the HARAMBEE Prosperity Plan (HPP), which calls for enhanced local agricultural production for food security, to eradicate poverty, create jobs and empowering of the local people at the grassroots level.

The project will also add value to local agricultural produce, empower local small scale farmers through the proposed dedicated capacity development programs and at the same time address the country's challenges of dependency on imported food products from South Africa. The proponents have also consulted through the proper traditional channels and are issued with the land papers at all traditional leadership levels of headman, district and Ondonga Traditional Authority.

However, when the project land was identified, there was no proper consultation done with the Ministry of Environment, Tourism and Forestry considering that the Project Site is falling within the HWC Chronic Zone. This will present a serious HWC challenge to both the proponent and MET.

### 10.2 Recommendations

Based on the environmental impact assessment of both the positive and negative impacts undertaken for the proposed PORAD Agricultural Project, the positive effects of this project significantly outweigh the negative effects. The mitigation measures are clearly detailed in the Environmental Management Plan and should be adhered to without compromise in order to minimize the negative effects as much as possible.

While impact on the environment might be minimal and can be mitigated, the serious challenge of Human Wildlife Conflict remain a serious challenge for the project.

It is therefore recommended **THAT THE PROPOSED PORAD AGRICULTURAL PROJECT BE ISSUED WITH THE ENVIRONMENTAL CLEARANCE CERTIFICATE BY THE MINISTRY OF ENVIRONMENT, TOURISM AND FORESTRY PROVIDED THAT BOTH THE MINISTRY OF ENVIRONMENT, TOURISM AND FORESTRY AND THE PROPONENT ARE PREPARED TO DEALING WITH THE HIGH HUMAN-WILD CONFLICT INCIDENTS IN THE AREA.** ALTERNATIVELY, AN ALTERNATIVE SITE SHOULD BE IDENTIFIED FURTHER FROM THE NATIONAL PARK.

The project will only start once the ECC is issued by the Environmental Commissioner and Business Success Consulting will carry out periodic environmental audits to ensure that the EMP is adhered to.

## 8. REFERENCES

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