

SCOPING REPORT FOR AQUACULTURE FISH FARM PROJECT AT MACHITA COMMUNAL AREA, ZAMBEZI REGION

BOOPHALOW INVESTMENTS CC
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Windhoek
Namibia



Assessed by:

NYEPEZ Consultancy cc



Assessed for:

(Proponent) Boophalow Investment cc
(Boophalow Fish Farming)

April 2025

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EXECUTIVE SUMMARY

Proposed Land Use: Fish Farming

Total site area: 23.1 Hectares (10.2 hectares fish farm)

Brief Project Description

Boophalow Investment Fish Farm project is on 23.1 hectares of Land and is a semi functional farming project based at Machita communal area, situated about +- 40 kilometres from the town of Katima Mulilo in the Katima Rural Constituency and is still in the process of development and construction. The Fish farm project engages in different an activity that leads to its successful operations. The area where the site is situated is characterised by activities of traditional settlements and subsistence farming.

The past usage of the site was used as farming unit but due to persistence droughts and changes in climate, the land owner (Boophalow Investment cc) and the proponent of the project, decided to change and shift in the land use to invest in the construction and development of a fish farm. The proposed site has a total size of 23.1 hectors of which 10.2 hectares from the 23.1 hectares will be utilised for fish farm development. The remaining area will be used for crop farming and grazing.

The farming infrastructure building structures will consist of a small material building (where fish food & protective clothing will be kept), will consist of two (2) Standard Industrial Water Boreholes with overhead tanks and pipes laid for transporting water system, 4 production ponds, 2 breeding ponds, hatchery and small vegetation garden on the project area already cleared. Alternatively, it is recommended for the Company to construct a reservoir pond since the water source is boreholes and the water can be pumped to the ponds for aeration and elimination of possible dissolved gases

Justification

Boophalow Investment Close Corporation Fish Farming Company is designed to meet the requirements for the establishment of a Fish Farm Estate in

Machita Area, Katima Rural (constituency) Zambezi Region. The main economic significance of the farm is its contribution towards narrowing down the fish demand-supply gap deficit in Namibia as well as the supply of proteins and micronutrients for feeding the teeming population of Zambezi Region, mainly Katima Mulilo Township and Namibia at large. Boophalow Investment fish farm aims specifically at Table-fish size and Fingerling's production to boost the domestic fish supply in the country and for export purposes too. The estimated production per year is 135 tons of table fish and about 700,000 thousand fingerlings are realizable in one year of production cycle with a net profit of about N\$2,376,000 (million).

This implies that about N\$4,725.000 (million) will be realizable annually from two production cycles with a return on investment (ROI) of 100% which signifies that the project is very much Feasible, Viable and Profitable. History and location. The recent demand for fish consumption in the country and SADC region at large has motivated the fish farm to start as evidenced with the high demand of Tilapia fish within the region as highest. And priority issue is ensuring food security in the region and country, address crises of high unemployment among the youth in the in the Zambezi Region and entire Country.

EIA Objective

The objective of this Environmental Impact Assessment (EIA) is to carry out a detailed evaluation of the environmental issues of the project in accordance with the Environmental Management Act of 2007. The EIA highlights the implications of the project to the environment and also to inform the public and interested parties the project objectives, needs and constraints. This EIA also makes constructive suggestions on improving the environmental performance of the project.

- To minimize the impact of Boophalow Investment fish farm on the Environment, including natural resources, local residents and existing surrounding land uses;

- To ensure site selected for Boophalow Investment Farm is appropriate for long term operation and that farming methods are sustainable
- To enable the fish farm owner Boophalow Investment cc to apply for a licence from the Ministry of fisheries & Marine resources as per the aquaculture policy

In adopting this Development Control measure, Ministry of Environment & Tourism acknowledges the importance of the fish farm industry to Machita area and the surrounding district. It acknowledges the vital role the industry plays in employment, the agricultural sector, and indirect economic benefits generated from all levels of the fish farm industry.

MAIN FARM ACTIVITIES

The main farm would contain:

- Site preparations, Construction and installation of Two (2) Standard Industrial Water Boreholes with overhead tanks and laying pipes for transporting water to ponds.
- Construction of an Indoor Hatchery and feed storage compartment
- Construction of Two (2) Outdoor fish pond 12 x 15 and 1,8m deep deck for breeding
- Construction of 4 fish pond 20 x50 meter and 1,8 m depth for Production
- Construction and installation of a Feed store complex
- Construction of (One)1 Farmhouse for Staff, cool room storage area and other office supporting infrastructure
- Procurement of fish farming inputs, hatchery equipment and farm implements.
- Procurement of farm utility one vehicles
- Procurement an electric Solar System
- Procurement an electric Generator for backup
- Revamping of the access road to the Site

Potential Environmental Impacts and Mitigation

Environmental Impacts

The major impacts include the following:

- Land use change
- Impact on water quality as a result of wastewater and effluent discharges improper farm management
- Impacts on habitats through vegetation clearing
- Eutrophication
- Sedimentation

Mitigation Measures

Potential negative impacts can arise from poor farm design, construction activities, improper wastewater and effluent discharges and unqualified farm management. Management will take into consideration careful farm design, good site selection and construction of breeding ponds will minimize habitat impacts by avoiding delicate habitats and where disturbance is inevitable retaining as much vegetation as possible and replanting where necessary. Construction of settlement basins for water intake and sedimentation pond for discharge of waste water will enable control of pollution of water quality.

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The project will strictly adhere to good environmental practices. The project will ensure to do the following:

- Preserve aquatic ecosystems and protect the quantity and quality of fisheries resources, including genetic resources.
- Avoid dumping of fish processing wastes in water bodies.
- Protect artisanal fisheries and commercial fishing vessels and their gears from conflict with cage culture facilities.
- Protect small-scale farmers and local communities

Environmental Management Plan

The main objective of the EMP is to identify the project specific activities that should be considered as having significant adverse impacts, monitoring and required mitigation measures. It is therefore in the best interest of the Developer to ensure that the capacity of the ecosystem is sustained by mitigating environmental degradation that could potentially harm the enterprise.

The proposed management and mitigation measures, the environmental and social commitments that are supposed to be undertaken by the respective production managers and a framework for implementation of this management plan have been proposed and are for the protection of the environment and sustainability of the project and the fish industry.

Conclusion

The project, when implemented, will bring huge positives for the district of Machita and the entire Namibia. Both the primary, secondary and tertiary beneficiaries will be wide spread across Namibia but with the largest number and therefore more positive impacts in Machita Communal area and surrounding environs. The EIA process has allowed both the developer and other stakeholders to interact, openly identify positive and potential negative impacts both from a social-human environment and biophysical environment. Based on these interactions and also on other national and international practices, it is concluded that on the basis of the environmental and socio-economic assessment undertaken and based on a very wider consultation and the professional expertise employed, the positive impacts of Boophalow Investment's fish farm project far outweigh the negative impacts.

Boophalow Investment has followed the due process of the law on environment. The socio-economic impacts of the project are largely positive, while negative impacts are minimal. These impacts will be adequately avoided through best management practices and compliance. No family will be displaced by the project. In addition, a project impact management and monitoring framework has been proposed and therefore merits support.

The stakeholders more especially the communities of Machita are highly positively expectant of the fish farm project in Machitan communal area and want the project to start as soon as possible. Boophalow Investment therefore recommends that the project be allowed to be implemented due to its outlined benefits.

Table of contents

1.1	Background	11
1.4	Terms and reference	13
2.	POLICY AND LEGAL FRAMEWORK.....	14
2.1	Namibia through the MFMR cooperates with following regional and international fisheries organizations	14
3.	DESCRIPTION OF THE PROPOSED PROJECT.....	17
	21
3.2	Project Rationale	21
4.	DESCRIPTION OF SITE INVIRONMENT.....	23
4.1	Introduction.....	23
4.2	Location & Accessibility of the Site.....	23
4.4	Climate	28
4.5	Topography and Geology	30
4.6	Hydrology	30
4.8	Biodiversity	32
4.8.1	Vegetation.....	32
4.8.2	Birds.....	34
4.8.3	Wildlife.....	34
4.9	Socio Economic Profile.....	35
	▪ <i>Aquaculture production</i>	37
5.	DESCRIPTION OF THE PROJECT.....	38
5.1	The project activities will be implemented in the following stages	38
5.1.1	Construction phase activities	40
5.1.2	Operational phase activities	41
6.	ASSOCIATED INFRASTRUCTURE.....	43
6.1	<i>Water</i>	43
6.2	<i>Electrical Services</i>	44
7.	STAKEHOLDER AND COMMUNITY CONSULTATIONS.....	45
8.	MAJOR IMPACTS IDENTIFIED	45
8.1	Employment opportunities.....	46
8.2	Machita economic upliftment	46

8.3 Disposal of waste water from the fish ponds and the side effects.....	47
8.4 Strategy for distribution & selling of harvested fish	47
8.5 Water Use	47
8.6 Sustainability / Potential Appraisal.....	47
9. POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION.....	48
9.1 Assessment of Impacts	49
9.2 Construction Phase Impacts Prior to Mitigation	55
9.2.1 Negative Impacts of Low Significance for the construction phase prior to mitigation.....	55
9.2.2 Positive Impacts identified for the construction phase prior to mitigation	57
9.3 Operational Phase Impacts Prior to Mitigation.....	57
9.3.1 Negative Impacts of Low Significance for the operational phase prior to mitigation.....	57
9.3.2 Negative Impacts of Medium-Low Significance for the operational phase prior to mitigation	58
9.3.3 Positive Impacts for the operational phase prior to mitigation.....	59
9.4 Mitigation Measure	61
10. ENVIRONMENTAL MANAGEMENT PLAN.....	62
10.1 Objectives of the Environmental Management Plan (EMP)	62
11. THE IMPLEMENTATION OF THE ENVIRONMENTAL MANAGEMENT PLAN (EMP) 64	
11.1 Construction Phase Management Plan.....	65
11.2 Operational Phase Management Plan	65
11.3 Decommissioning and Closure Phase	65
12. DECOMMISSIONING PHASE	74
13. CONCLUSIONS AND RECOMMENDATIONS.....	76
13.1 Conclusion.....	76
13.2 Recommendations.....	76

1. INTRODUCTION

On technical level aquaculture is defined as “the farming and ranching of aquatic organism” but on popular level aquaculture sometimes is referred to as “fish farming”. Aquaculture may be categorised into two, marine aquaculture and inland aquaculture. Marine aquaculture includes structures trays, pens, enclosures, nets, etc that are located in, on or close to unaltered marine waters. Whereas Inland Fisheries Aquaculture includes on hand facilities and utilizes ponds, tanks, and enclosures that are dependent upon the culturist for maintenance of water quality, food supply, and waste removal. Aquaculture that involves both inland and marine components include hatcheries and recirculating systems.

Aquaculture is therefore a form of agriculture that includes the cultivation, propagation and marketing of aquatic organisms. Aquaculture shares many similarities in concept to many land-based agriculture industries such as cattle farming and many of the same management techniques are used in aquaculture. Like more traditional forms of agriculture, the goal of aquaculture is to maximize production at a minimal cost to maintain a profit margin. Aquaculture is poised as an important source of protein for the world's growing population. Aquaculture is and will become an important source of seafood products.

1.1 Background

Boophalow Investment cc is the proponent and developer that acquired a portion of communal land from Machita Subkhuta through Mafwe traditional authority (through the traditional administration of the Chief) and through the Namibia Communal Land Reform Act of 2007. Through this the Communal Land Reform Act, the proponent possesses a legal land right Customary Certificates, approved in the year 2020 by the Zambezi Communal Land Board.

The proponent has accessed funds from financial support entity, whereby part of the legal requirement to needed to approve the Capital Funds the Clearance Environmental Certificates, hence this application. The proponent wishes to

meet all legal requirements that will ensure the full registration and development of the proposed project and piece of land where green houses and fish ponds will be developed. The proponent was allocated 23.1 hectares for both crop farming and fish farming. The initial area for the fish farming project is only 10.2 Hectares. This 10.2 hectares is land already cleared as it was previously used for crop farming by the proponent. The site is partly developed and further construction development are being carried-out on the site. The project site is not vacant as its partly cleared for crop farming, partly cleared for ongoing fish farm establishment and construction or the fish farm.

The project site area is situated within Machita Communal area, located in the Katima Rural Constituency and situated about 2 kilometres from the Machita Administration area comprising of Schools, Business, clinics other Government offices) tarred road. The site is situated about +-40 kilometres East of Zambezi Region's Capital City (CBD) Katima Mulilo. The project site is partly developed, free of vegetations and not vacant. The land is zoned communal land suitable for both commercial business use, and customary land use.

1.2 Project Investment

The project's development concept is expected to cost the proponent an estimated cost of N\$ 2 million including land servicing and infrastructure development. In accordance with Namibia's Environmental laws, an Environmental Scoping study of the proposed development needs to be undertaken and an Environmental and Social Management Plan (ESMP) prepared for submission to MET in order to obtain environmental clearance for the development to proceed.

1.3 Rational for Environmental Scoping Assessment

The developer also the owner Boophalow Investment cc of the proposed Fish Farm Project appointed Nyepez Consultancy cc to conduct the Environmental Assessments and develop an Environmental and social Management Plan (EMP) and accompanying report for the proposed fish farm project. An Environmental Scoping Study was undertaken to identify key biophysical and

social concerns related to the project. During November 2024, the consultant conducted site visit and communicated with a range of stakeholders to determine these issues or concerns and this report contains such findings.

1.4 Terms and reference

The terms of reference for this Environmental Assessment are to determine the potential bio-physical and social impact emanating from the construction and operation of the proposed farming project. The aims and objectives of the assessment are:

- To establish and describe the known ecological baseline conditions for environmental, health and social conditions existing in the project area from secondary information and a reconnaissance site visit
- To conduct an environmental impact identification and assessment and to provide a description of the likely environmental impacts of the proposed project during the construction and operation phases
- To also demonstrate that the Environmental Assessment complies with the current and/or expected Namibian legislation requirements for environmental, social performance and health.
- To identify and draft actions for environmental and social management plan of the proposed fish farming project
- To identify and document mitigation measures to minimise identified adverse environmental impacts

Based on the above the EMP lists those management actions that are needed to ensure that undue or reasonably avoidable adverse impacts of the planning, construction and operations of the project are prevented and that the positive benefits of the project are enhanced or increased. It also gives responsibilities and will be used as a checklist to monitor compliance at the site.

2. POLICY AND LEGAL FRAMEWORK

Situation analysis Namibia is developing a coordinated approach to aquaculture development and regulation. Central to this effort must be the creation of institutional arrangements that promote aquaculture and coordinate the various agencies and other entities involved in regulation and support. Currently in place and in force are:

- Namibia's Aquaculture Policy Towards Responsible development of Aquaculture (March 2001)
- The Aquaculture Act (No. 18 of 2002)
- Aquaculture (Licensing) Regulations (3rd December 2003)

2.1 Namibia through the MFMR cooperates with following regional and international fisheries organizations

- **Southern African Development Community (SADC).** The SADC Protocol on Fisheries aims to promote responsible and sustainable use of the living aquatic resources and aquatic ecosystems within the SADC region.
- **INFOPECHE:** In 2001 Namibia signed a cooperation agreement with this International Fisheries Marketing Advisory Body to establish an INFOPECHE Unit in Namibia's capital, Windhoek. This Unit provides information and technical assistance in fish trade, marketing, processing and new innovations to INFOPECHE member states.
- **South East Atlantic Fisheries Organization (SEAFO):** establishes a management regime for conservation and sustainable utilization of fish, mollusks, crustaceans and other sedentary species in the high seas portion of FAO Statistical Area 47, but excluding those sedentary species that are subject to the fishery jurisdiction of coastal States and also tuna and tuna-like species because these fall under the jurisdiction of ICCAT. Namibia is host to the SEAFO Secretariat.

- **International Commission for the Conservation Of Atlantic Tunas (ICCAT):** The rapid development of a thriving domestic tuna fishery provided the impetus for Namibia to join ICCAT in 1999, becoming the 28th member of the Commission. Namibia welcomes and supports the considerable effort that ICCAT is making in developing comprehensive management tools to deal with, inter alia, IUU fishing in the Atlantic Ocean.
- **Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR):** As a member of CCAMLR, Namibia is committed to the management and conservation of the marine resources of the Antarctic. The Namibian fishing industry is interested in fishing in CCAMLR's waters and is ready to participate responsibly in the harvesting of fishery resources, especially tooth fish.
- **Inter-governmental Oceanographic Commission (IOC):** Namibia became the 129th member of the IOC became on 25 April 2001.

This section, in table format, describes the environmental framework of the project.

LEGISLATION/GUIDE LINE/POLICY	APPLICABLE CLAUSE/POLICY	COMMENTS
Namibia's Environmental Assessment policy (1995)	List of activities that require EA.	Tourism facilities need to be assessed in terms of the impact on the natural and social environmental and resources.
Communal Land Reform Act	List of activities that may not be undertaken without a clearance certificate: infrastructure development activities	Conduct a EA in terms of the Infrastructure development and submit to MET in order for a clearance certificate to be issued.
1994 White paper on tourism (MET 1994)	must provide direct benefits to local people and aid conservation.	Emphasis should be on local benefits from tourism.
1995 policy on wildlife, management, utilisation and tourism	To allow rural communities on state land to undertake tourism ventures and to	JV agreements with benefits to local communities should be negotiated between

in communal area (MET 1995a)	enter into cooperative agreements with commercial tourism organisations to develop tourism activities on state land.	developers and local conservancies.
Inland fisheries resources act,2003 and regulations	Promotion, sustainable utilisation and protection of inland fisheries resources. Restrictions by limiting number of nets, mesh, sizes, net length and damaging fishing methods.	A fishing licence need to be obtained from the regional office to engage in recreational fishing in any inland waters by means of any regulated fishing gear.
Communal land reform act (act no 5 of 2002)	Allocation of rights in respect of communal land –part 2-right of leasehold. A right to leasehold	Application for the right of leasehold in respect of communal land must be made in the prescribed manner to the CCLB. Right of leasehold granted for

LEGISLATION/GUIDELINE/POLICY	APPLICABLE CLAUSE/POLICY	COMMENTS
Forest act no 27 of 2004	The act affords protection to certain indigenous plant species and any intention to remove such species would have to be legalised through a permit from the forestry department: ministry of agriculture, water and forestry.	Protected trees species may not be removed without a permit. The following species that occur in the area are protected by forestry legislation. Acacia erioloba, Acacia sieberiana, Colophors permummopane Combretumimberbe Faid herbiaalbida Sclerocaryabirrea Ziziphusmucronata
National heritage act no 27 of 2004	Potential cultural and archaeological sites to be identified and protected/mitigated before development may continue.	Machita community need to advise the operator on any important cultural site in the vicinity of the site.

Revised SADC Shared watercourses systems protocol	Article 2: The utilisation of the resources of the shared watercourse systems shall include; agricultural/domestic, industrial, and navigational uses and should be in accordance with the principles contained in this protocol. Member states shall require any person intending to use the water of a shared watercourse system within their respective territories to first obtain a permit from the relevant authority within the state concerned. The permit shall be granted only after such state has determined that the intended discharge will not have a detrimental effect on the regime of the wastewater course system.	Since water abstraction will be for domestic use a letter to obtain a permit needs to be submitted to MAWAF. sustainable development principles should be implemented. apply for permit for a wastewater treatment system.
Convention on biological diversity (CBD)	Namibia is obliged under international law to conserve its biodiversity (Barnard ed.,1998)	Projects should refrain from causing any unnecessary damage to the country's biodiversity.
Legislation/guideline/policy	Applicable clause/policy	Comments
Convention to combat desertification	Namibia is bound to prevent excessive land degradation that may threaten livelihoods.	This is a general requirement to be considered in all projects.
Ramsar convention (1971)	Wetland conservation and wise use of, recognising wetlands as ecosystems that are extremely important for biodiversity conservation and for the wellbeing of human communities.	Preservation of the linyanti river as an important wetland system.

3. DESCRIPTION OF THE PROPOSED PROJECT

Boophalow Investments cc intends to develop an aquaculture tilapia farm with the capacity to produce 2,000 tonnes of annual harvest by 2026.

Boophalow Investment fish farming project is located \pm 40 km Eastern side of the Regional Capital City of Katima Mulilo. The project area located in Machita communal area. The site falls within traditional and customary land. From a distance the area is also located some 5 km from the main Machita Combined School. When fully implemented and operational the project will have a hatchery with 50 nursery and 20 breeding ponds to produce 6 million.

The project components will be implemented in three (3) phases that include:

- ***Preparation phase***

All the planning related to the project, including budgeting, establishing sales points, mobilising equipment, will be carried out during this stage. Additionally, Boophalow Investments cc will obtain permits or approvals from relevant government institutions and agencies which include MEFT, DoF and Mafwe Traditional Authority.

- ***Construction phase***

This phase will include erection of physical buildings/infrastructure such accommodation, offices, workshop, fish processing plant, hatchery, toilets, breeding ponds, nursery ponds, settling ponds and improving on existing road network that is already in the area.

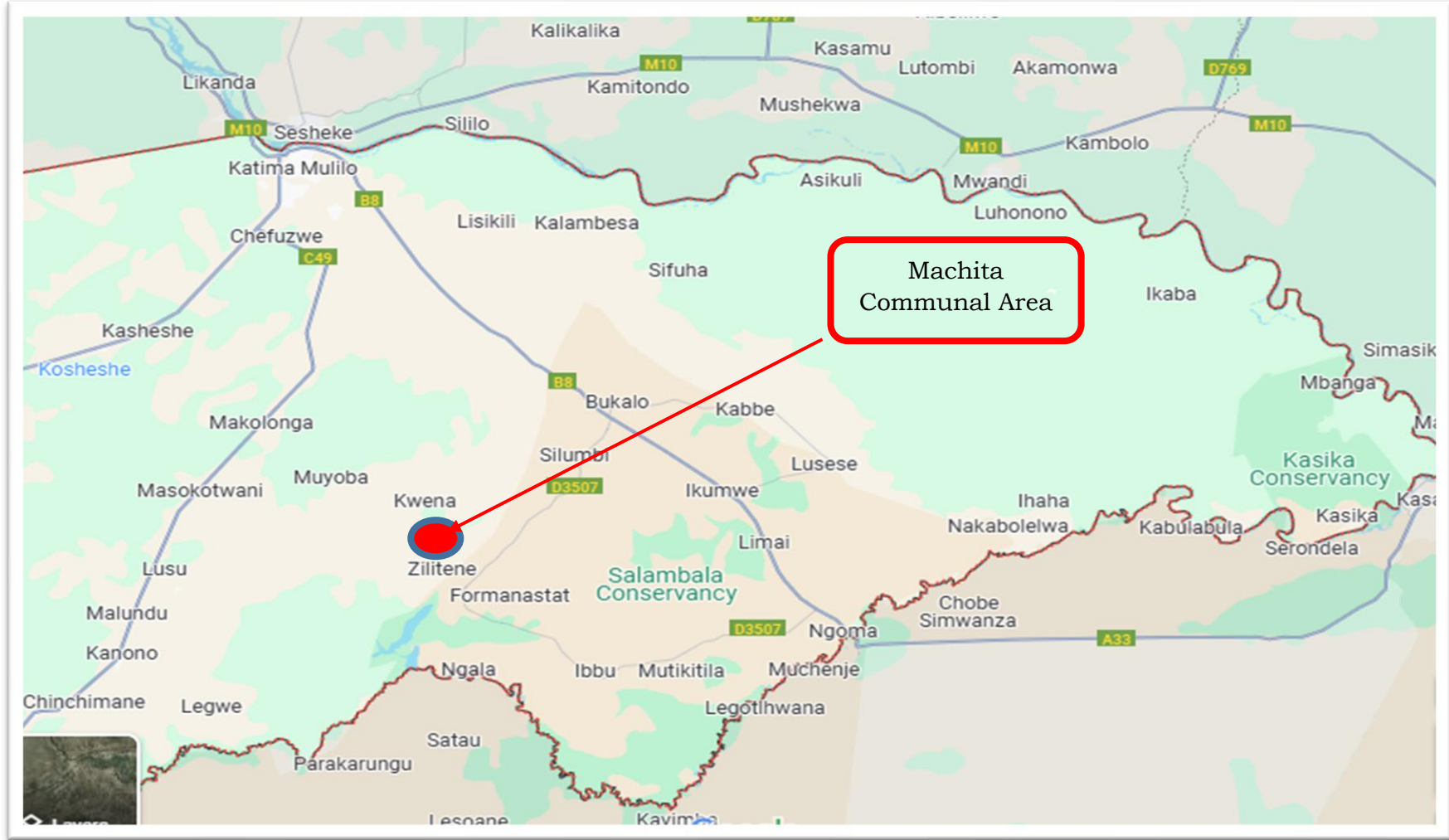
- ***Project Activities***

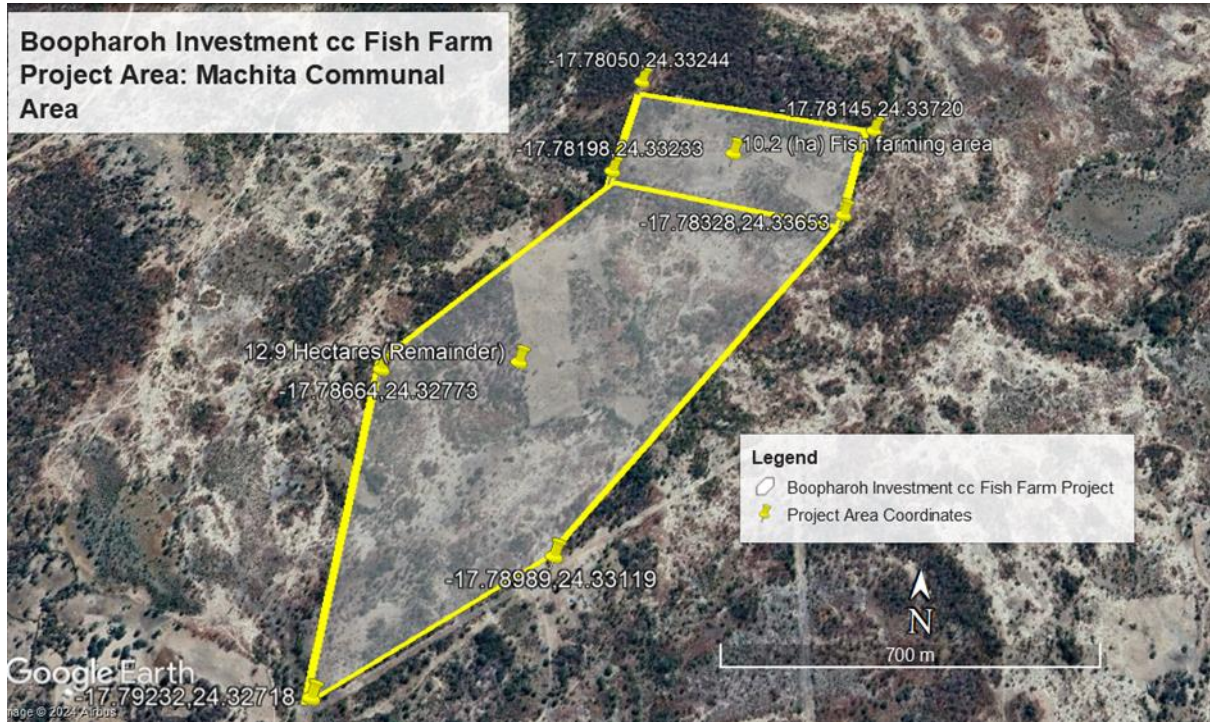
A phased approach will be taken on the On (1)one site, to ensure that all activities are implemented according to plans and with best practice. The project activities will include the following:

- Installing of two (2) Standard Industrial Water Boreholes with overhead tanks and pipes laid for transporting water system
- Constructed x 4 naturally modified Outdoor fish pond (12 x 15 and 1,8m deep deck for breeding)
- Construction of the farm house, equipment storage, cool room area to be integrated in one building for storing of farming inputs, hatchery equipment and farm implements activities
- Installation of water pump and solar panels

3.1 Locality

The proposed development of a farm is located \pm 40 km Southern part of the town of Katima Mulilo, located at Machita, communal area. The site falls within the communal land. From a distance the area is also located some 5km Site area for Boophalow's farming project at Machita communal area. The project site coordinates are Lat -17.78050, Lon 24.33244





3.2 Project Rationale

For many years Machita Communal area has suffered from a lack of development and investment by the Central Government, Local Government and the Private Sector. The Zambezi Regional Poverty Profile (2004) points out that the Zambezi region is the second-poorest region after Ohangwena and in terms of the Human Poverty Index (HPI) published by the UNDP for 2000. The

region has an HPI of 36.0, which is much higher than the average of 24.7 for the country as the whole. Hence this type of proposed business will therefore not only benefit Machita area and surrounding communities but shall bring long term quality of life and improve the living standard of local people in Machita area and the Zambezi region at large.

Aquaculture was therefore identified by the proponent as an ideal business development project in line with the National Development Goals and development objective in NDP-2. Sector-specific objectives relating to aquaculture are detailed in the Fisheries and Marine Resources Chapter of NDP-2:

- *Promote aquaculture activities in and around the productive unpolluted and nutrient rich waters off the coast of Namibia.*
- *Facilitate improvement of actual activities pertaining to aquaculture, by exploring the culture of other species, such as prawns, clams and other kinds of fish, whether in freshwater or seawater, depending on scientific advice.*

The Government foresees the role of aquaculture of freshwater species to enhance food security, generate incomes and improve rural livelihoods and investment. Freshwater aquaculture will be mainly a community-based, co-operative activity, using labour intensive methods. Production from freshwater aquaculture activities will be destined primarily to ensure food security in local communities, as well as for local, regional and international markets.

The Government foresees the culture of marine species through the use of intensive systems, requiring significant capital and technical expertise, producing high value species intended primarily for export markets. Consequently, there will be a major role and a great opportunity for foreign investors in the further development of marine aquaculture (Namibia's aquaculture strategic plan, 2004) & (White paper, 1995).

Boophalow Investment fish farming project therefore intends to set up a tilapia fish or Bream (*Oreochromis Niloticus*) project at Machita with a capacity to produce 70,000 thousand annual harvests by 2026 at the site with a net profit of about N\$2,376,000 (million). In addition, Boophalow Investment fish farm project intends to achieve the following:

- a) Provide employment to the community of Machita District and the entire region.
- b) Increase income and standard of living in the community by employing the local community.
- c) Show that unemployed and uneducated youths are not a problem to the Community and region but assets to the region.
- d) Mobilize youths, the local people to work together for common benefits

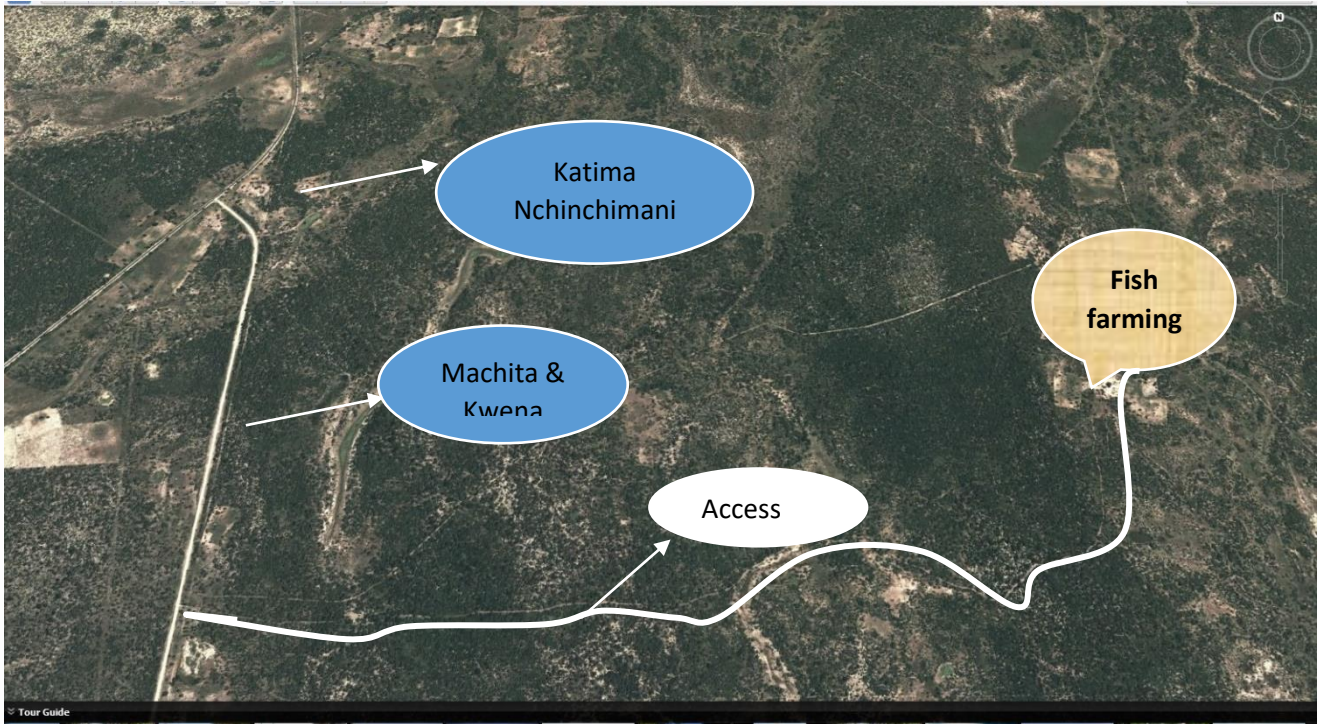
4. DESCRIPTION OF SITE INVIRONMENT

4.1 Introduction

In the following sections highlights the current biological, physical and socio-economic conditions of the study area are discussed and their sensitivities to change are considered

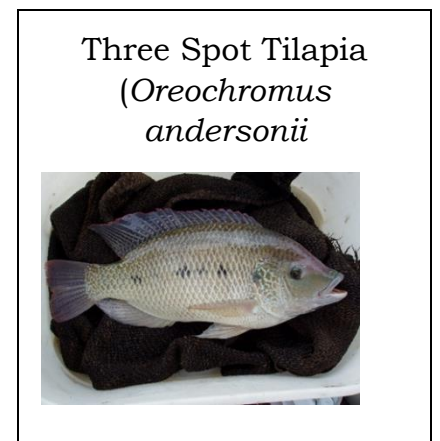
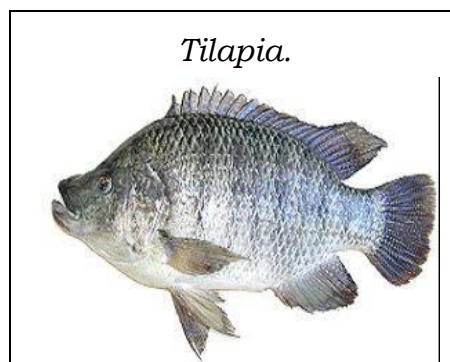
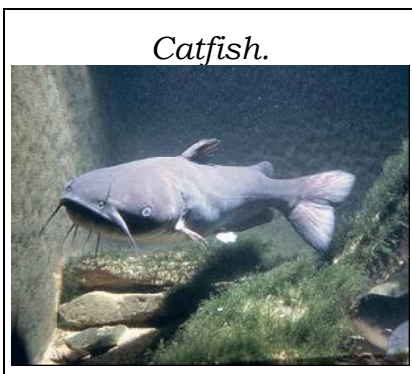
4.2 Location & Accessibility of the Site

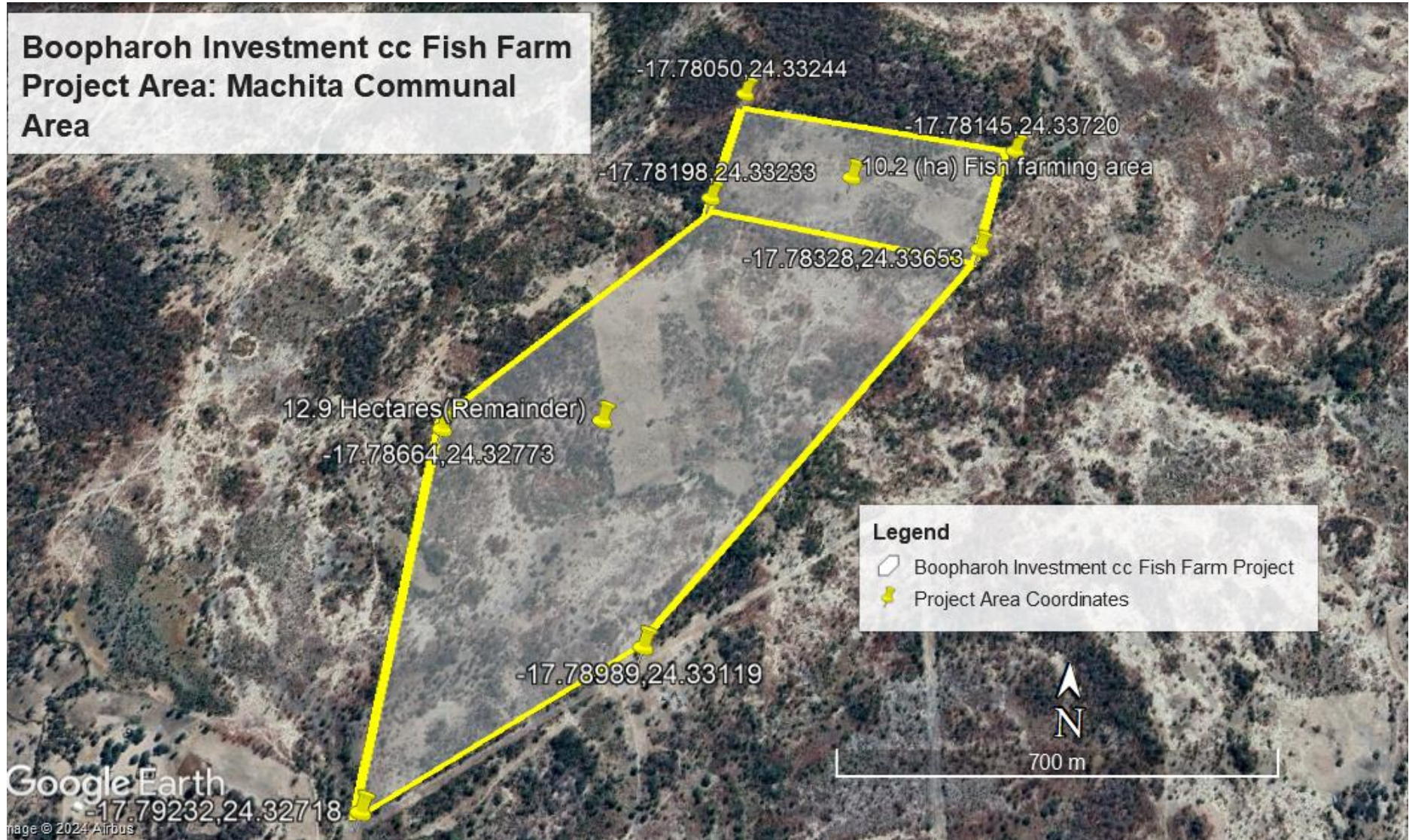
Boophalow Investment fish farm has only one site which is approximately of 23.1 hectors of which 10.2 hectares from the 23.1 hectares will be utilised for fish farm development. The remaining area will be used for crop farming and grazing. The site is under customary land ownership of Mr. Geofrey Simulya Mbeha also proponent and owner of Boophalow Investment cc. The project site is actively accessible as it located few kilometers to the operational gravel main road signifying that inputs can be transported to the farm easily with little cost while harvested farm product can easily be evacuated.

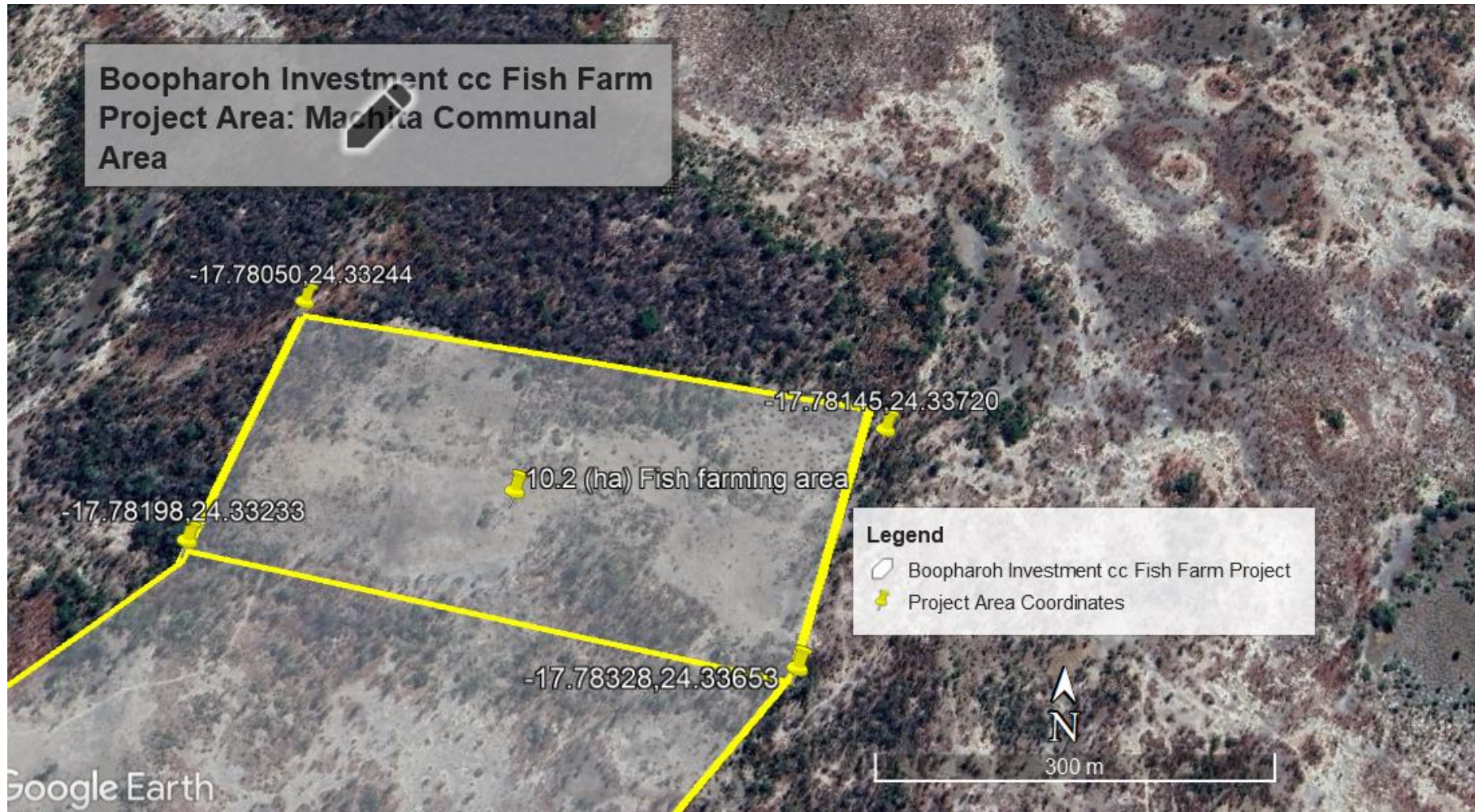


4.3 Fish species for fish farming

Boophalow Investments cc intend to engage in aquaculture fish farming by farming the listed fish species shown in the pictures below.



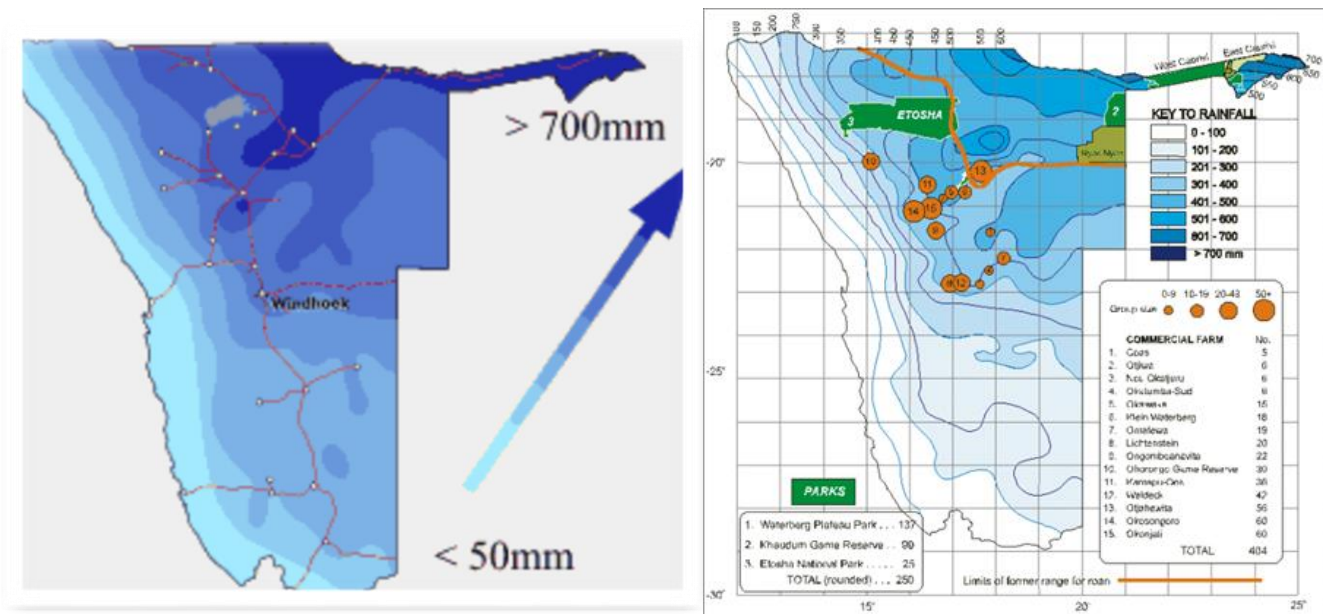






4.4 Climate

The climate of the area is fundamental in determining the availability of water and also reveals about the area's ecological sensitivity and resilience to change. The climate data below (table below) is typical for Southern part of Zambezi region and is expected to occur at the farming production site.



The site for the proposed project falls within the Agro-ecological Zone which is a hot and relative dry area with average rainfall of about 700mm per year but can be as low as minimum of 200mm. Average temperatures range between 25-35°C with maximum temperature of 42°C being recorded and minimum of 10-15° C.

According to the National Agriculture Policy (1995), scarce productive land and fragile soils, coupled with limited water resources and an erratic rainfall regime are the principal features of Namibia's agriculture. The country can be divided into four ecological zones:

- The desert region, comprising 22 per cent of the land area, where mean annual rainfall is less than 100 mm;
- The arid region, comprising 33 per cent of the land is, where mean annual rainfall varies between 100 and 300mm;

- The semi-arid region, comprising 37 per cent of the land area, where mean annual rainfall lies between 301 and 500 mm; and
- The semi-humid and sub-tropical region, comprising 8 per cent of the land area, where mean annual rainfall is between 501 and 700mm

Table 1: sensitivities and potential impact related to climate

Environmental feature	Description	Sensitivities	Potential impact of the project
Rainfall	<ul style="list-style-type: none"> • Highly variable thunderstorms • Two distinct seasons – a dry season April to November and shorter wet season from end of November to April – Rain peak in January & February • 550-600 mm per year • Tropical climate with less evaporation • Evaporation highest in September and October (Mendelsohn <i>et al</i> 1997) 	<p>Flooding (April – July).</p> <p>Risk of flooding very high</p>	The lodge will cause an increase in water demand
Temperature	<ul style="list-style-type: none"> • Average daily temperature vary between 20 in summer and 5°C in winter • Highest temp between Sept and Nov, with 	<p>High temperatures in summer.</p> <p>Contributes to high evaporation rate</p>	Health and safety of the workforce

	<p>maximums between 32 and 40 °c</p> <ul style="list-style-type: none"> • Frost is unusual • Coldest temperatures measured in July with an average daily maximum of 6°c (Mendelsohn et al 2009) 		
Wind direction	<p>Prevailing wind direction is South easterly but north easterly winds are also experienced</p>	<p>Dust generation during dry seasons due to soil texture</p>	<p>Increased dust</p>

4.5 Topography and Geology

The major feature of the Zambezi landscape is extensive forest, savannah sands with associated flood plains, channels and deposits which have resulted in producing different landscapes. The proposed site's geological formation is typically clay soil suitable for fish farming and pond construction. The geology is associated with open dry forest, with dry savannah grass, inclusive of plant species such as silver terminalia, Mopane trees and acacias. The utilisation of a site's natural topography may benefit Boophalow Investment fish Farm to avoid potential land use conflicts. This variation of the soil characteristics is expected in a conventional setting and does not pose any threat to fish farming

4.6 Hydrology

The location of the fish farm does not constrain any water bodies, wetlands or surface water systems. However during rain seasons, some seasonal swamps are formed from rain-water in other parts of the 23.1 hectares of the area. The area is not subject to flooding and have no potential to transmit

diseases to the farm flock. The hydrology of the Linyanti area of Namibia is influenced by the Kwando-Linyanti-Chobe system, which is a wetland area that connects to the Chobe-Zambezi systems

4.7 Air quality

The ambient air in the project area is good in terms of quality since the area is neither in an environment that compromises its quality. Some uncontrolled fires at times cause occasional smoke but it is insignificant to create pollution. Boophalow Investment cc Project owners will not entertain or tolerate burning on its property.

The sensitivities associated with surface and groundwater features as well as the potential impacts the project may have on these features are contained in Table below.

Table 2: sensitivities and potential impacts related to surface and underground water

Environment al features	Description	Sensitivities	Potential Impacts of Project on feature
Lake Lyambezi river system	Relatively large river that holds water permanently to Seasonal water	The Lyambezi Lake as a real catchment area and is fed from Zambezi & Chobe rivers. Slow flowing river. Can change direction east or west depending on inflow from Kwando – Linyanti. There is no information available on groundwater levels in the region. Shared water resource	No Surface water pollution. No Increase in abstraction from Lyambezi lake. No Pollution as there are no recreational activities. No Impact on wet land system
Groundwater hydrology	Underground water fairly abundant and	Pollution	Any affluent resulting from the development is likely to affect the

	flows in a south-easterly direction in a productive porous aquifer. Water reserves fairly close to surface, between 25-65 m. Water quality excellent (Mendelsohn et al 2002)		resources in the long term. Increased pressure on sustainability of water resources
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4.8 Biodiversity

4.8.1 Vegetation

The site lies in the savanna and woodland vegetation (Kalahari woodland) Mendelsohn et al. (2002), where vegetation is dominated by tall tree species. The site has distinct communities of *Burkea-Terminalia* woodland (Hines, 1997). However, according to Lushetile (2009) this vegetation class has reduced species richness in comparison to other vegetation classes. Figure below captures the site structure of vegetation cover.

The site comprises of disturbed area such as abandoned crop farming fields and therefore vegetation is in a disturbed state. The site does not have a fully functional ecosystem due to the disturbance by the farming activities and road which has fragmented the landscape. Therefore, destruction of vegetation will be not on a pristine landscape. The landscape can be enhanced with re-forestation with desired species after construction to create micro-habitats. A nested plot design was used to capture species occurring at the site. The results are captured below:

Table 3: Plant species on the project area

Tree species	Protection status
--------------	-------------------

Tree layer	
3 <i>Burkea africana</i> Hook.	Protected
11 <i>Terminalia sericea</i> Burch. ex DC.	None
1 <i>Strychnos spinosa</i> Lam.	Protected
1 <i>Philenoptera violacea</i> (Schinz) Schrire Rhus	Protected
1 <i>Piliostigma thonningii</i> (Schumach.) Milne	Protected
1 <i>Vachellia erioloba</i>	Protected
Shrub layer	
<i>Ochna pulchra</i> Hook.	Namibian Near-endemic
<i>Vachelia erioloba</i> E.Mey.	Protected
<i>Bauhinia petersiana</i>	Protected
<i>Ximenia caffra</i> Sond. var. <i>caffra</i> Zehneria <i>marlothii</i> (Cogn.) R.& A.Fern	None
<i>Terminalia sericea</i> Burch. ex DC.	None
<i>Opuntia ficus-indica</i>	None - Invasive species
Herbs	
<i>Annona stenophylla</i> Engl. & Diels ssp.	N/A
<i>Acrotome inflata</i> Benth.	
<i>Bauhinia petersiana</i> Bolle ssp. <i>petersiana</i>	
<i>Combretum collinum</i> Fresen. ssp. <i>collinum</i>	
Grass	
<i>Aristida adscensionis</i> L.	N/A
<i>Aristida stipitata</i> Hack. ssp. <i>Stipitata</i> ssp. <i>minuta</i>	
<i>Aristida meridionalis</i> Henrard	
<i>Cenchrus ciliaris</i> L.	
<i>Digitaria seriata</i> Stapf	
<i>Eragrostis rotifer</i> Rendle	
<i>Eragrostis porosa</i> Nees	
<i>Grewia flavescens</i> Juss. var. <i>flavescens</i>	
<i>Hermannia eenii</i> Baker f.	
<i>Heteropogon contortus</i> (L.) Roem. & Schult.	
<i>Hermbstaedtia fleckii</i> (Schinz) Baker & C.B.Clarke	
<i>Indigofera flavicans</i> Baker	
<i>Kyllinga alba</i> Nees	
<i>Lonchocarpus nelsii</i> (Schinz) Heering	
<i>Piliostigma thonningii</i> (Schumach.) Milne- Redh	
<i>Urochloa brachyura</i> (Hack.) Stapf	



Figure: *Terminalia sericea* with associated shrubs & a cleared area

Terminalia sericea was observed to be the dominant species at site. *T. sericea* can be invasive and its distribution is widespread. There is no protection for this species under current regulations. Wood from this species may be used as firewood after destructive activities on site. *Strychnos spinose* bears edible fruit and *Ochna Pulchra* makes beautiful ornamental trees. These can be uprooted and transplanted to a desirable position. *Opunti species* is a threat native vegetation and therefore should be destroyed immediately to avoid infestation of this alien species. The *Burkea africana* is a timber species. Trees of this species observed on the plot were all of less than 45cm in diameter, should a need arise for such trees to be removed the Directorate of Forestry should be informed. *B. africana* wood can be used for household items such as stool and pestles.

4.8.2 Birds

As a result of the unavailability or lack of surface water on the site, the area or the proposed site does not have abundance of bird species. Birds are mostly confined by the river side of the mighty Lake Lyambezi, Chobe, Kwando and Zambezi River.

4.8.3 Wildlife

The habitat of the area is not prone to wildlife corridors and or conservancy, thus the area does not have abundant wildlife species. There is only availability of few and small livestock's that graze around the area, as the area is vast with cleared crop fields and grazing land, therefore livestock have enough access to move from one place to another for grazing. The project will be fenced.

4.9 Socio Economic Profile

- *Population*

The 2023 Census report of Namibia shows that the population of Zambezi region stand at 142,373 inhabitants, Of which according to the Namibian statistics agency census report of 2024, the population of Katima Mulilo Rural Constituency in Namibia's Zambezi Region stands at 24,016. The population of Zambezi region continues to grow, not only it seems by natural growth but by the influx of “outsiders”, attracted to the town for seemingly economic and employments opportunities. A large proportion of the population (at the project site area) comprises of Mafwe and Subia speaking residents who have settled on the higher ground away from the flooded area of Lake Lyambezi in the late 1950s.

- *Economic activities*

The most important product and source of livelihood is harvesting and selling of grass and wood. About 88% of all the homes are constructed from wood, 78% of homes are thatched with grass or reeds and 96% of all households use firewood for cooking, Kraals and fences are constructed using timber harvested from local trees, mainly colophospermum Mopane and terminalia sericea (silver clustwer leaf).

As a result, the developer (Boophalow Investment cc) will pay a monthly rent as per the agreement to be put in place after the completion of the fish farming site, which is estimated to be a monthly rent of N\$ 4800.00 per year. Substantive contributions will also be given to support the community and

the local Machita Combined School on socio-economic matter as well as to support the local Machita sub-khuta as part of the benefits from the operation of the farm. The main source of income for most local residents in communities is relying on mainly on subsistence farming, livestock farming, art craftsmanship, fishing, tourism, informal businesses, poultry farming and wild fruit gathering.

- *Livelihoods*

Due to the lack of investment and the growing population and consequently few jobs, most people resort to subsistence farming such as crop and livestock farming, small stock farming (poultry, goat and pig farming) wood selling and artisanal fishing. Other sources of livelihood for communities in the region include art craftsmanship, fishing, tourism, informal businesses, and wild fruit gathering.

- *Proponent 's social responsibility*

As a result, the developer (Boophalow Investment cc) will pay a monthly rent as per the agreement to be put in place after the completion of the fish farming site, which is estimated to be a monthly rent of N\$ 4800.00 per year. Substantive contributions will also be given to support the community and the local Machita Combined School on socio-economic matter as well as to support the local Machita sub-khuta as part of the benefits from the operation of the farm. Further, the project will also create employment opportunity employing about 45 people as per the table below.

Table 3: Projected Percent of employment

Item	Skilled & Unskilled		Consultants	Duration
Construction: Fencing of 1.5 Kilometre, light vegetation cleared to pave way for Fencing	1	4		One month
Excavating for three Fish Pond	2	15	✓	Four month
Construction of the stand for 40000 litre tanks (6X6 squares meter and 3meter height)	1	7		Four days
light vegetation cleared to pave way for Fish Pond construction		6		One Month
Total	4	26	1	4 Month

However, a leasehold rental fee will also per paid to the Zambezi Communal Land Board as per the communal Land Reform Act No.5 of 2002. The month to the land board will be paid in the account opened by the GRN through the Ministry of Land Reform. As a result of the long-term mutual relationship between the owners of Boophalow Investment fish farm and Machita community will be born. Significant community empowerment initiatives such as training on fish farming, knowledge sharing on community gardening, assistance for education financial assistance will also be offered to the community as Boophalow Investment cc's social responsibility.

- *Aquaculture production*

Aquaculture commenced in the late 1800's with introduction of carp, bass and tilapia to state-owned and private dams. There was negligible production up to the mid-1980, then private sector interest increased. Prominent aquaculture experts from a number of countries conducted studies and indicated that Namibia's fledgling aquaculture sector has great development potential. Although culture of freshwater fish is in its infancy, excellent freshwater culture development potential exists along rivers such as the Okavango, Kunene, Orange and Zambezi, as well as lakes and dams. The production of Tilapia and crayfish in the brackish water resources in the Oshikoto Region can also be considered for future development.

The Ministry of fisheries was involved in developing pilot-based intensive freshwater aquaculture in the Caprivi, Kavango and Omusati Regions. The long-term strategy of this activity is to apply the lessons learned to other regions. Local species already adapted to culture requirements shall be the first priority (e.g. catfish and tilapia).

Reliable data on current production and employment in the freshwater aquaculture sector are not currently available. However, it is known that at least 15 tonnes of fish, primarily tilapia and catfish, are produced per annum by Eco Fish Farm at Hardap. Freshwater crayfish and prawn are also a potential still to be developed by the private sector.

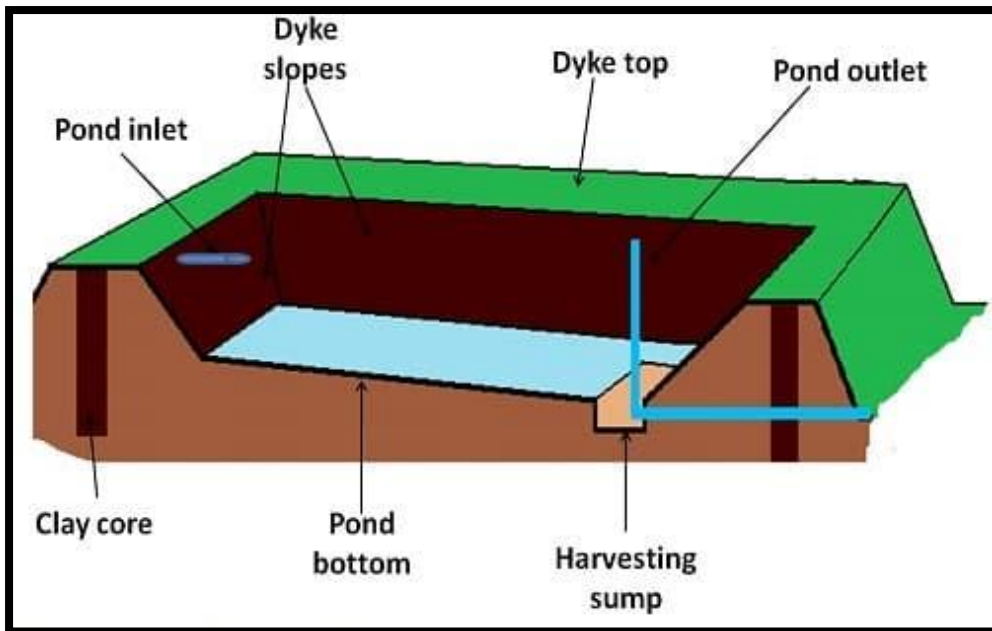
The rapidly growing domestic and international demand for aquaculture products offers great opportunities to Namibia through increased employment opportunities and job creation in the industrial sector including new and traditional spin-off industries that support aquaculture and seafood manufacturing. Spin-off opportunities include feed production, and pharmaceutical production, veterinarian services, processing, packaging and cold storage, transportation, equipment manufacturing (feeding machines, pumps, cages, nets, boats, etc) and marketing.

5. DESCRIPTION OF THE PROJECT

5.1 The project activities will be implemented in the following stages

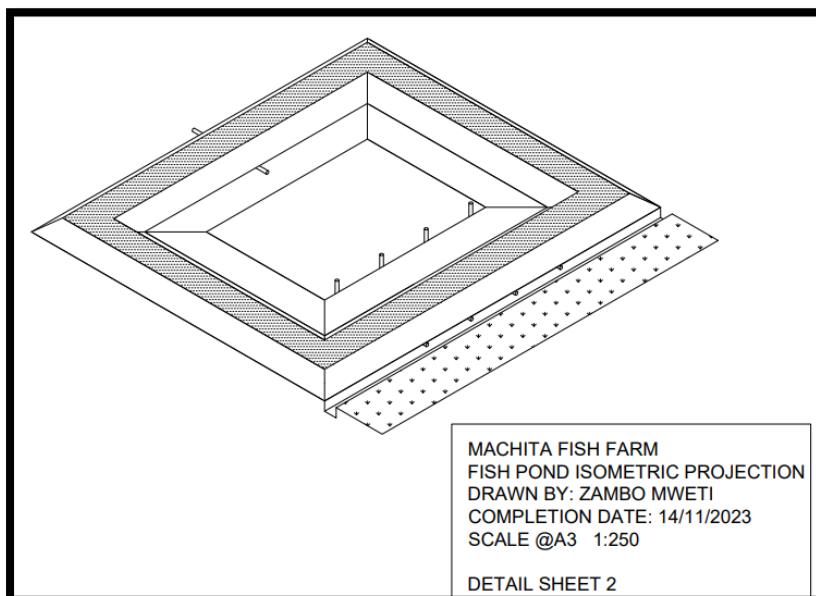
Preparation Phase

Approvals will be obtained from relevant wings of the government such as Ministry of Environment (department of Environmental Affairs). The preparation of the EIA report is being done to necessitate approval from these regulatory authorities. The mobilization of equipment and structure construction is also being carried during this phase.



Construction Phase

This phase will include erection of physical buildings/infrastructure such as offices, workshop, hatchery, toilets, breeding ponds, nursery ponds, settling ponds and production ponds.



Operation Phase

When fully implemented and operational the project will have small material building office (where fish food & protective clothing will be kept), will consist of 2 boreholes, 4 production ponds, 2 breeding ponds, hatchery and a small vegetation garden.

5.1.1 Construction phase activities

Breeding ponds: It is proposed to construct 2 breeding ponds of 10m x 12 m to grow 50 000 fingerlings. The fingerlings will then be transferred to nursery ponds for stabilization and the primary stages of growth.

Boreholes: The fish farm facility will be supplied with water through a boreholes water tank, whereby 2 boreholes are being and/or are still to be drilled at a 6-meter depth. Water will be pumped constantly from the underground to the water tanks which will then supply to the fish.

Office and farm house: There will be a small staff office building that will be built at the project site and the building will also serve as a farm house that will used to store feeds for fish, farm equipment and materials

The office building will contain one office for the staff and it shall contain one (1) toilet, and one (1) shower. As a result, one (1) septic tank for 18 000 L and will be installed to absorb the human liquid waste produced from the building. The building material for the office building is be made of concrete bricks and corrugated iron sheet.



X4, 10 000 L septic tanks to be installed

Stabilization swamps: The natural swamps which are shallow will be used for the treatment of waste water from the fish ponds. The discharge from these ponds will flow slowly over the ground surface to the open surface and the other will be directed to water the vegetable gardens on the farm. A major portion of the effluent will seep into the ground prior to reaching the area.

5.1.2 Operational phase activities

Feeding

Fish Feeds (which will be bought by the developer) will supply feed for the fish from local retail. The nutrient composition of commercial floating fish feeds which High Protein Foods (Z) Ltd Produces comprises of phosphorous and nitrogen as the main nutrients.

The main nutrient element of the fish feed is:

Raw Materials	Composition	Nutrient	Composition
Maize	9.0% - 12%	Phosphorous	0.8% - 1.1%
Soya,Beans/Guard Beans	40% - 55%	Nitrogen	3.5% - 4.8%
Wheat	5% - 10%	Calcium	0.3% - 1.0%
Fish meal	2% - 6%		

Fish Harvesting

The project is estimated to start-up with three ponds for production in year 1 (2025 and to be harvested in 2026) of which each pond to generate income of about (price*quantity*size of fish N\$3, 93750.00 Therefore total output will be calculated with the Net economic profit on investment:

- Total expected size at harvest in kg for all three-pond year 1 = 135,000 kg
- Total expected size at harvest in tone for all three-pond year 1 = 33.75 t

- Total Revenue (price*quantity*size of fish) for all three-pond year 1 = N\$ 1,181,250.00 Net economic profit on investment = N\$1,181,250.00 - 2% of fixed asset for depreciation - operational cost = N\$ 250,000.00 = N\$0000000



From the production of fry to fully grown fish, it will take approximately 8 months to produce fish for consumption. Fish will be harvested from the ponds, kept in cool room storage facility to be established onsite. The fish ponds will be harvested through the early mornings. The fish will be placed in boxes then taken to the cool room storage where commercial buyers will load them.

Processing

During harvest, fish will be sorted in sizes, weighed on-site, prize determined and packaged. this process includes activities of sorting fish sizes, weight, cleaning, quantity verification, then packed on ice for delivery to the distribution designated place. Personal protective clothing will be provided to all employees on a daily basis, when cleaning and parking of the fish on site.

Distribution

The farm owner Boophalow Investment cc will develop and put strategy product marketing mechanisms on the sales of the fish harvested and distribution hubs in the major town of Katima Mulilo.

Solid Waste removal

Less and/ or no solid wastes will be generated from the operations of the farm and the few will be transported and disposed to the nearest and designated Machita health centre dumping site of Machita administration area situated about 2 kilometres from the project site. The investor Boophalow Investment cc will take the full responsibility for the company to transport the solid wastes to the Machita health centre designated dumping site. Waste removal items such as wheel bins and garbage bins will be provided onsite for collection of the waste before transported.

6. ASSOCIATED INFRASTRUCTURE

6.1 Water

Water supply to the project farm will be connected through drilling of boreholes (page 31). The water is suitable for both fish, human & animal consumption. Based on the method used for water connection and the source of water, a water extraction permit will need to be acquired by the proponent from the relevant Ministry for drilling of the borehole. The permit to be acquired will provide the borehole specifications and restrictions where required. Installation of Two (2) Standard Industrial Water Boreholes with overhead tanks

- Each borehole (2) carries the following specifications
- BH 35m
- 6" 165mm OD PVC casing, 2.9m long 9.5mm wall thickness:
- 6 x Plain casing ea
- 5 x Slotted casing ea
- 10 x gravel bag (approx. 20m of gravel)



6.2 Electrical Services

Power to the project development will be supplied through the installation of S240kv Solar panels and power backup will be catered by a generator power supply. Moreover, Solar power is pollution-free and causes no greenhouse gases to be emitted after installation. It ensures the reduced dependence on foreign oil and fossil fuels.



7. STAKEHOLDER AND COMMUNITY CONSULTATIONS

Public participation forms an important component of the environmental Assessment process. It is defined by the Environmental Management Act (2007), as a *‘process in which potential interested and affected parties are given an opportunity to comment on, or raise issues relevant to specific matters’*.

Public participation notices were advertised in both local and national newspaper media. The advert was in the New Era newspaper of the April 2025 respectively.

Communication with stakeholders about the proposed fish farming production facility was facilitated through the following means: The stakeholders were identified in terms of relevance to the project and who could serve as a source of information. A public consultation meeting was scheduled to take place on the 27 May 2025. Thus, a public meeting was held where the business owner, investor and members of the Machita community attended. the venue of the meeting was at Machita combined school where matters and concerns, proposals surrounding the fish farm were discussed as well as proposals for mitigation. Different key stakeholders as per the attached attendance register were Invited to the meeting: a Total of 18 public members attended the public consultation meeting

A summary of the issues and concerns that were raised by the interested and affected parties were concerning prioritization of employment for the locals, and social responsibilities of the investor to Machita school and traditional authority. The purpose of presenting the issues raised by participants in this section is simply to:

- Ensure transparency regarding the concerns that have been expressed;
- Ensure that all issues raised are properly addressed in the EIA, ESMP and mitigation measures proposed.

8. MAJOR IMPACTS IDENTIFIED

A summary of the major impacts to be caused by the proposed fish farming project during its operations can be summarized as follows:

Potential Impact activities
Employment opportunities
Machita economic upliftment (School & community support)
Disposal of waste water from the fish ponds and the side effects
Strategy for distribution & selling of harvested fish
Water Use

8.1 Employment opportunities

According to the business fish farm owner Boophalow Investments cc, the proposed fish farm is intending to give employment opportunities to local residents of Machita as first priority. The project will only employ recruits from elsewhere when local residents are short of certain skills or expertise

8.2 Machita economic upliftment

The Boophalow Investment fish farm project is planning to give substantive contributions to support the Machita community and the local Machita Combined School on socio-economic matter through financial contributions, fish donations as well as training of fishing methods to local members of the communities, and Machita sub-khuta as part of the benefits from the operation of the farm.



8.3 Disposal of waste water from the fish ponds and the side effects

Some members of the community raised a concern over the effect of the water discharged from the fish ponds and its effect and wanted to know these effects from the Ministry of Fisheries representative. A representative and head of Aquaculture division in Katima Mulilo explained and informed the community that, the discharged water from the fish pond was healthy water and is not harmful to animals, as the feeds for fish are products produced from maize, wheat and soya beans, hence this water could still be used for irrigating a vegetable garden etc.

8.4 Strategy for distribution & selling of harvested fish

One of the main objectives of developing the Boophalow Investment fish farm is to promote economic growth and uplift the socio-economic and livelihood of communities of Machita and the entire Zambezi region. The developer or the owner of the fish farm explained that, priority will be made to conduct local sells of fish to local residents before the rest of the harvested fishing products are or can be taken to the storage for commercial markets in the town of Katima mulilo.

8.5 Water Use

An adequate supply of water is required for the fish farm. Water will be taken from surface or ground water resources. two (2) boreholes will be drilled and install to ensure the supply of sufficient water to the fish ponds. The discharged water will be flashed to the nearby swamp and some will be used to water he vegetable garden within the project site. Summary of the negative & positive impact of the raised matters

8.6 Sustainability / Potential Appraisal			
Impact on Ecological & Socio Economic	Level of Impact		Comments
	Positive	Negative	

Creation of Employment	High	None	Fifteen (15) permanent workers will be recruited during the operation phase and expected to employ about 30 casual workers during construction phase
Machita economic upliftment	High	None	Financial support to the local community, the Machita & Mafwe Traditional authority and fish donations to local residents of Machita
Disposal of waste water from the fish ponds and the side effects	High	None	The water from the ponds will be used to irrigate the vegetable garden and is also fit for livestock or animal consumption
Strategy for distribution & selling of harvested fish	High	None	Priority for selling of fish will be made to first consider local residents before the rest of the production is taken to other parts of the area and the region
Water Use	Limited	N/A	Sufficient boreholes (total of 2) will be drilled and installed to ensure the maximum supply of water to the fish ponds

Key Consideration Area

- Contribute to local economy
- Employment Creation
- Local level economic empowerment

9. POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION

9.1 Assessment of Impacts

The purpose of this section is to assess and identify the most prominent environmental impacts and provides possible mitigation measures that are expected from both the operational and the decommissioning for the activities of the Boophalow Investment fish farm project. The following component or section below summarizes categories of impacts identified, following the site visits that were undertaken at the site area and from other comments received from relevant stakeholders. The major impacts include the following:

- Land use change
- Impact on water quality as a result of wastewater and effluent discharges improper farm management
- Impacts on habitats through vegetation clearing
- Eutrophication
- Sedimentation

These identified impacts will be assessed and evaluated in different phases of the development. By subjecting each of the potential impacts to the criteria stipulated above, it is possible to establish the significance of each impact prior to implementing mitigation measures and then after mitigation measures have been implemented. Detailed descriptions of management actions in terms of mitigation measures are contained in the accompanying EMP. The process of assessing the significance of each of the possible impacts is contained in the above tables. It must be noted that the impacts described in these tables considers the nature of the potential impact before (pre) and after (post) mitigation as set out in the ESMP.

Although the significance rating of the most of the impacts can be reduced considerably to a “low significance” by implementation proper mitigation measures the proponent should however understand that a “low significance” impact still exerts pressure on the environment and therefore the proponent should intend to go above and beyond the prescribed mitigation and management measures provided in this report by aiming to improve the remaining environment. There are specific policies and guidelines that

address environmental issues related to the development. The policies and guidelines were referred to in the legal section.

Table 6: criteria used to describe impacts Description

Nature	Reviews the type of effect that the proposed activity will have on the relevant component of the environment and include “what will be affected and how”
Extent	Indicates whether the impact will be site specific: local (limit to within 15 km of the area); regional (limited to -100 km radius); national (limited to the coastline of Namibia); or international (extending beyond Namibia’s borders)
Duration	Reviews the lifetime of the impact, as being short (days, <1 month), medium (months, <1 year), long (years, <10 years), or permanent (generations, or >10 years).
Intensity	Establishes whether the magnitude of the impact is destructive or innocuous and whether or not it exceeds set standards, and is described as none (no impact); low (where natural/social environmental functions and processes are negligibly affected); medium (where the environment continues to function but in a noticeably modified manner); or high (where environmental functions and processes are altered such that they temporarily or permanently cease and/or exceed legal standard/requirements).
Probability	Considers the likelihood of the impact occurring and is described as improbable (low likelihood), probable (distinct possibility), highly probable (most likely) or definite (impact will occur regardless of prevention measures).
Degree of confidence in predictions	Is based on the availability of specialist’s knowledge and other information

The application of the above criteria to determine the significance of potential impact uses a balanced combination of duration, extent, and intensity/magnitude, modified by probability, cumulative effects, and confidence. Significance is described as follows.

Significance Rating	Criteria
Low	Where the impact will have a negligible influence on the environment and no modifications or mitigations are necessary for the given project description. This
Medium	Where the impact could have an influence on the environment, which will require modification of the project design and/or alternative mitigation. This would be allocated to impacts of moderate severity/magnitude, locally to regionally, and in the short term
High	Where the impact could have a significant influence on the environment and in the event of a negative impact the activities causing it, should not be permitted (i.e., there could be a no-go implication for the project, regardless of any possible mitigation). This would be allocated to impacts of high magnitude, locally for longer than a month, and/or of high magnitude regionally and beyond.

The FAO guidelines for fields projects (FAO, 2012) will be used during the assessment.

Table7: Environmental categories for FAO field projects

Environmental Category	Environmental and Social Impacts	Environmental Analysis or Assessment Required
Category A	Significant, or irreversible adverse impacts	Mandatory environmental impact assessment
Category B	Less significant adverse impacts that may be easily prevented or mitigated	Environmental analysis to identify more precisely potential negative impacts
Category C2	Minimal or no adverse impacts	No further environmental and/ or social analysis or assessment required

NB: Based on the above FAO's categories of field project analysis, the proposed development of Boophalow Investment fish farm project at Machita falls under category B, where there is less significant adverse impacts that may be easily prevented or mitigated. Environmental analysis is required to analysis to identify more precisely potential negative impacts. The following box below specify the type of projects under Category B, which according to FAO (2012) do not require a full EIA but will require further deepening of environmental or social considerations, depending on the expected magnitude of risks. In many cases, the analysis would aim at gathering additional information in sufficient detail so as to be able to discuss concretely how risks could be addressed and minimized (and possibly eliminated) in the project design.

According to Pastakia (1998) the Rapid Environmental Assessment method can be used to assess projects related to the Poultry development project and Pastakia's method will be used during the assessment. The ranking formulas area calculated as follows;

$$A=A1 \times A2$$

$$B=B1 +B2+B3$$

$$\text{Environmental Classification (ES)} =A \times B$$

Table8: Environmental Classification of Impacts according the Rapid Impact Assessment Method of Pastakia 1998

Environmental Classification (ES)	Class Value	Description of Class
108 to 72	5	Major positive change/impact
71 to 36	4	Significant positive change/impact
35 to 19	3	Moderate positive change/impact
10 to 18	2	Positive change/impact
1 to 9	1	Slight positive change/impact
0	0	No change/status quo/not applicable
-1 to -9	-1	Slight negative change/impact
-10 to -18	-2	Negative change/impact
-19 to -35	-3	Moderate negative change/impact
-36 to -71	-4	Significant negative change/impact
-72 to -108	-5	Major negative change/impact

Table9: Assessment Criteria

Criteria	Score
Importance of condition (A1) –Assessed against the spatial boundaries of human interest it will affect	
important to national/international interests	4
important to regional/national interests	3
important to areas immediately outside the local condition	2
important only to the local condition	1
No importance.	0
Magnitude of changes /effects (A2) –measure of scale in terms of benefits of an impact or condition	
Major positive benefits	3
Significant improvement in the status quo	2
Improvement in status quo	1
No change in status quo	0
Negative change in the status quo	-1
Significant negative disbelief or change	-2
Major disbelief or change	-3

Permanence (B1) –defines whether the condition is permanent or temporary	
No change/not applicable	1
Reversible	2
Permanent	3
Cumulative (B3) –reflects whether the effects will be a single direct impact or will include cumulative impacts over time, or synergistic effect with other conditions. It is a means of judging the sustainability of the condition-not to be confused with the permanence criterion	
Light or No cumulative Character /Not applicable	1
Modern Cumulative character	2
Strong Cumulative character	3

Table 10: Criterion for Impact Evaluation (Directorate of Environmental Affairs, 2008)

Risk Event	Description of the risk that may lead to an impact
Probability	<p>Refers to the probability that a specific impact will happen following a risk event</p> <p>Improbable (low likelihood)</p> <p>Probable (distinct possibility)</p> <p>Highly probable (most likely)</p> <p>Definite (impact will occur regardless of prevention measures)</p>
Confidence level	<p>The degree of confidence in the predictions based on the availability of information and specialist knowledge</p> <p>Low (based on the availability of specialist knowledge and other information)</p> <p>Medium (based on the availability of specialist knowledge and other information)</p> <p>High (based on the availability of specialist knowledge and other information)</p>

Significance (no mitigation)	<p>None (A concern or potential impact that, upon evaluation is found to have no significant impact to all)</p> <p>Low (any magnitude, impact will be localised and temporary. Accordingly the impact is not expected to require amendment to the project design)</p> <p>Medium (Impacts of moderate magnitude locally to regionally in the short term, accordingly the impact is expected to require modification of the project design or alternative mitigation)</p> <p>High (Impacts of high magnitude locally and in the long term and/or regionally and beyond. Accordingly the impact could have a ‘no go’ implication for the project unless mitigation or re-design is practically achievable)</p>
Mitigation	Description of possible mitigation measures
Significance (with mitigation)	<p>None (A concern or potential impact that, upon evaluation is found to have no significant impact to all)</p> <p>Low (any magnitude, impact will be localised and temporary. Accordingly the impact is not expected to require amendment to the project design)</p> <p>Medium (Impacts of moderate magnitude locally to regionally in the short term, accordingly the impact is expected to require modification of the project design or alternative mitigation)</p> <p>High (Impacts of high magnitude locally and in the long term and/or regionally and beyond. Accordingly the impact could have a ‘no go’ implication for the project unless mitigation or re-design is practically achievable)</p>

The following tables evaluate the identified impacts, both positive and negative of the farming project activities on the environment. This includes the social, economic and natural environment affected by the activities on the proposed site.

9.2 Construction Phase Impacts Prior to Mitigation

9.2.1 Negative Impacts of Low Significance for the construction phase prior to mitigation

NEGATIVE IMPACTS (LOW)	DESCRIPTION OF IMPACT
Hydrology: Storm water and drainage	The development will result in a low marginal increase in storm water run-off, especially where vegetation will be cleared for the construction of fish ponds, roads and associated infrastructure. This will require some management to prevent soil erosion.
Land transformation: Erosion	Exposed land might be susceptible to wind and water erosion.
Land transformation: Dust levels	The proposed development may not result in increased dust levels during the construction phase.
Land transformation: Noise levels	Increased noise levels due to earthmoving and construction equipment.
Land transformation: Visual impact	Land clearing and soil preparation could create a temporary visual impact.
Floral biodiversity	Vegetation will be impacted where earthmoving activities (vegetation clearing and bulldozing / disturbance of the topsoil) are necessary during the construction period. The development will however not result in a complete removal of this vegetation within the development site. The local loss of this vegetation type due to the proposed development on the Subject Land will have a small overall effect and will not endanger the future of this vegetation type.
Increased traffic volume	The transportation of construction equipment and materials to the site will increase traffic levels in the area.
WasteSewage/effluent/hydrocarbons	Little or no sewage will be generated during land clearing and construction. Spillage and/or leakage of hydrocarbons by construction vehicles and machinery may cause chemical contamination of soil and groundwater.

Waste – Building rubble and littering	There will not be a significant amount of building rubble generated during the construction phase. Construction workers might litter during this phase.
Heritage	The proposed development will not have an impact of great significance on archaeological or paleontological remains that might be encountered during implementation of the project.

9.2.2 Positive Impacts identified for the construction phase prior to mitigation

POSITIVE IMPACTS	DESCRIPTION OF IMPACT
Socio-Economic – upliftment of quality of life	Approximately 30 new employment opportunities will be created during the construction & operation phase. Approximately 75% of the expected value of these employment opportunities will be accrued to previously disadvantaged individuals.

9.3 Operational Phase Impacts Prior to Mitigation

9.3.1 Negative Impacts of Low Significance for the operational phase prior to mitigation

NEGATIVE IMPACTS (LOW)	DESCRIPTION OF IMPACT
Land transformation – Dust levels	The proposed development may not result in increased dust levels during the operational phase.
Land transformation – Noise levels	The farm is situated in a rural area and the farmers in the area should be accustomed to the sound of working machinery. The operation of fish farm itself will not generate any significant levels of noise during the operational phase.

	Some noise could arise in relation to the expected increase in traffic to and from the site, especially at the end of a production cycle
Heritage	The proposed development is not expected to have any significant impact on archaeological or paleontological remains during the operational phase.

9.3.2 Negative Impacts of Medium-Low Significance for the operational phase prior to mitigation

NEGATIVE IMPACTS (MEDIUM-LOW)	DESCRIPTION OF IMPACT
Hydrology – Storm water and drainage	The roofs of the office building will increase storm water runoff. Soft surface will absorb water flow into the ground.
Hydrology – Water supply	Water use for fish ponds and irrigation purposes.
Land transformation – Soil chemistry and fertility	Soil chemical properties and vegetation yield can however be negatively affected if large amounts of manure is applied over long periods of time.
Land transformation – Visual impacts	The proposed project is consistent with the existing agricultural land use of the property and surrounding areas. All buildings and associated infrastructure will be sited as unobtrusively as possible. A natural buffer zone will be maintained between the fish farm site and neighboring village. Indigenous trees and shrubs will be planted and maintained to reduce visibility from adjoining roads and properties.
Increased traffic volume	The transportation of fish to and from the site will increase traffic levels in the area.

Land transformation – Loss of ecological processes (Ecological Support Areas)	<p>The construction of roads and fence lines through the project site area will impact on Ecological Support Areas (ESAs) and the level of ecological connectivity (corridors) that they offer.</p> <p>No disposal or irrigation of grey water will occur within a few meters from any watercourse. Ablution facilities for farm workers will be placed in the building.</p>
Land transformation – Odour nuisance levels	<p>The fish farm and ponds will be located well away from any human settlements and the building will be cleaned and disinfected after every production cycle. Subject to good management of fish farming systems and waste disposal, odour should not present a significant impact.</p>
Faunal biodiversity	<p>Potential faunal habitat will be lost, transformed and fragmented due to the clearance of land and the construction of infrastructure.</p>
Floral biodiversity	<p>Approximately 2 ha natural veld will be cleared for the construction of fish ponds and associated infrastructure.</p>
Waste-Sewage/effluent/ hydrocarbons	<p>There are two potential sources of effluent – sewage from ablution facilities and grey water from fish ponds down procedures. Relatively small amounts of waste water are generated during the cleaning office building which occurs at the end of each production cycle.</p>
Veldfire	<p>Machinery and human activity will increase hellfire risk levels, especially during the dry seasons.</p>

9.3.3 Positive Impacts for the operational phase prior to mitigation

POSITIVE IMPACTS	DESCRIPTION OF IMPACT
<p>Socio-Economic: Economic upliftment</p>	<p>Approximately 15 permanent employment opportunities will be created during the operational phase. Approximately 60% of the expected value of the employment opportunities will be accrued to previously disadvantaged individuals.</p> <p>The proposed fish farm will make the farms economically more viable. The farm will be the main source of fresh fish meat since there are only 2 small scale fish farms in the Zambezi region</p>
<p>Socio-Economic: Food security</p>	<p>The local production and subsequent processing of fish at the Boophalow Investment fish farm in Machita communal area will boost the Environmental Management Programme Expansion of the fish farm on Farms and economy of Machita and surrounds, while aiding in securing the local availability and access to an additional food source.</p>
<p>Socio-Economic: Healthier food option produced in a more humane and sustainable manner</p>	<p>The demand for fish products is however escalating due to an increased demand for healthy living and an increased awareness regarding food welfare.</p> <p>Fish meat is a healthier food option compared to meat that is produced in the conventional intensive industry. The proposed farm will thus supply an alternative food source to the population that is produced in a more humane and sustainable manner. The Applicant proposes to base the proposed development on a permaculture system which is based on core values and ecological design principles that seek to develop sustainable agricultural systems.</p>

	The proposed development has the potential to set a positive precedent for sustainable agriculture in Zambezi region & Namibia as a whole.
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As depicted in the tables above, impacts related to the operational phase are expected to mostly be of medium significance but can mostly be mitigated to have a low significance. The extent of the impacts is mostly of low likelihood. An Environmental Management Plan (EMP) will ensure that the impacts of the operational phase are minimised and include measures to reduce the identified impacts during the operation of the fish farm project activities while ensuring that the local environment is rehabilitated and employees working on the guesthouse are suitably protected to avoid accidents and injuries.

9.4 Mitigation Measure

Potential negative impacts can arise from poor farm design, construction activities, improper wastewater and effluent discharges and unqualified farm management.

NB: Management will take into consideration careful farm design; good site selection and Construction of breeding ponds will minimize habitat impacts by avoiding delicate habitats and where disturbance is inevitable retaining as much vegetation as possible and replanting where necessary. Construction of settlement basins for water intake and sedimentation pond for discharge of waste water will enable control of pollution of water quality.

The project will strictly adhere to good environmental practices. The project will ensure to do the following:

- Preserve aquatic ecosystems and protect the quantity and quality of fisheries resources, including genetic resources.
- Avoid dumping of fish processing wastes in water bodies.
- Protect artisanal fisheries and commercial fishing vessels and their gears from conflict with cage culture facilities.

- Protect small-scale farmers and local communities

Summary of expected operational phase impacts prior to mitigation

BE=Biological/Ecological EO=Economical/Operational PC=Physical/
Chemical SC= Sociological/Cultural

Impact Category	Impact Type	Class Value
BE	Waste pollution	-1
BE	Ecosystem and Biodiversity impact	-1
EO	Fire	-2
PC	Groundwater, surface water and soil contamination	-1
SC	Skills, Technology and development	2
SC	Employment	2
SC	Cumulative	-2

10. ENVIRONMENTAL MANAGEMENT PLAN

10.1 Objectives of the Environmental Management Plan (EMP)

The main objective of the EMP is to identify the project specific activities that should be considered as having significant adverse impacts, monitoring and required mitigation measures. It is therefore in the best interest of the Developer to ensure that the capacity of the ecosystem is sustained by mitigating environmental degradation that could potentially harm the enterprise.

The proposed management and mitigation measures, the environmental and social commitments that are supposed to be undertaken by the respective production managers and a framework for implementation of this management plan have been proposed and are for the protection of the environment and sustainability of the project and the fish industry.

As a result, the objectives of an Environmental Management Plan are to ensure the following:

- ensure that the farm operations comply with acceptable environmental standards;
- ensure that compliance with environmental legal standards is achieved and maintained in the ongoing management of operations;
- Provide clear directives for personnel regarding the actions required to prevent and/or minimise adverse environmental impacts; promote sustainable development through minimising the adverse environmental impacts in the local environment and utilizing environmental resources responsibly; and promote good relationships with the communities within which the farm operates.
- To prescribe the best and practicable control methods to lessen the environmental impacts associated with the operations of the fish farm
- To monitor and audit the performance and of operational personnel to supply such control

The investor (Boophalow Investment fish farm) should implement an Environmental Management System (EMS) similar to the ISO 14001 system. An environmental Management System is an internationally recognised and certified management system that will ensure ongoing incorporation of environmental constraints. At the heart of an ISO 14001 EMS is the concept of continual improvement of environmental performance with resulting increases in operational efficiency, financial savings and reduction in environmental, health and safety risks. An effective EMS would need to include the following factors:

- A stated environmental policy which sets the desired level of environmental performance
- An environmental legal register
- An institutional structure which sets out the responsibility, authority, line of communications and the resources needed to implement the EMS

- Identification of environmental, safety and health training needs
- An environmental program, stipulating environmental objectives and target to be met and work instructions and control to be applied in order to achieve compliance with the environmental policy
- Periodic internal and external audits and reviews of environmental performance and the effectiveness of the EMS.

Accordingly, commitment of the owner to effective environmental management provides the channel whereby strategies are transformed from the documented form and implemented. For the fish farming project, the developer is committed to implementing a comprehensive environmental management programme. The project manager/developer and Operations Manager have ultimate responsibility for the achievement of environmental targets during the construction and operational phases, respectively. The environmental programme commits the Owner to allocation of sufficient resources, continuous improvement of environmental management practices in order to fulfil social and ethical responsibility and compliance with national and international standards.

The developer is responsible for the:

- Allocation of Resources
- Risk Assessment
- ensuring that the environmental policy is in place and communicated to all workers
- Designating role of staff members in EMP
- Appointment and monitoring of environmental management team

11. THE IMPLEMENTATION OF THE ENVIRONMENTAL MANAGEMENT PLAN (EMP)

Table 1 to table 2 outlines the management of the environmental elements during the planning and operational phases. Section 2 provides a brief summary of the management of the Boophalow Investment fish farm development project. Contents of these tables could be incorporated into a

HSEQ management system. The proponent who is also the investor or owner of the business (Boophalow Investments cc) would be responsible to assign the responsibilities and ensure that the tasks are executed.

11.1 Construction Phase Management Plan

The overall goal for the construction phase is to undertake the activities associated with the expansion of the free-range chicken farm in a way that:

- Ensures that activities are properly managed in respect of environmental aspects and impacts. Protects the natural environment from degradation and harm.
- Ensures the development achieves its positive socio-economic impact.
- Complies with legislation.

11.2 Operational Phase Management Plan

The key to successful fish farming is good land management. This applies to the nature of the land itself, the degree of shelter it offers, how it is fenced to defer predators and how pasture is managed and maintained. The overall goal for the operational phase is to undertake the activities associated with the fish farming a way that:

- Ensures that activities are properly managed in respect of environmental aspects and impacts. Protects the natural environment from degradation and harm.
- Ensures that the development is properly managed in terms of the required biosecurity measures.
- Ensures the development achieves its positive socio-economic impact.
- Complies with legislation, permits and authorizations.

11.3 Decommissioning and Closure Phase

At closure, all farm equipment will be removed. All the ponds will be buried and the standing structures demolished. The impacts associated with the

closure and post closure of the project are summarized below. The following connotations have been used in characterization of impact.

- a) Small positive impacts (SPI)
- b) Small negative impact(SNI)
- c) Moderate positive impact(MPI)
- d) Moderate negative impact(MNI)
- e) Large positive impact(LPI)
- f) Large negative impact (LNI)

S/N	Environmental Component	Environmental Impact	Nature and Significance	Management Action	Timing		Responsible Person
					Start	End	
Project Component: Construction Phase							
1	Land and soil Quality	Contamination of surface runoff from spills of oil and fuel from Farm equipment and breakdowns	MNI	All contaminated soils will be removed from site area and stored in old oil drums for removal. Oil contamination will be removed using various flocculants on the market or through bioremediation methods onsite.	2025	2026	Project Manager
2	Surface water	Contamination of surface runoff from spills of oil and fuel from Farm equipment and breakdowns.	MNI	All contaminated soils will be removed	2025	2026	Project Manager
3		Contamination of surface runoff from spills of oil and fuel from Farm equipment and breakdowns	SNI	Oil collection trays will be used when carrying maintenance and repair works	2025	2026	Project Manager
4	Flora and Fauna	Loss of habitat may occur as a result of clearing activities	LNI	Clearance of vegetation around the site will be restricted to only planned areas. No unnecessary	2025	2026	Project Manager

				Vegetation clearance shall be conducted.			
5	Air Quality	Localized air contamination may occur from construction activities.	SNI	A water bowser will be used to spray the access routes to prevent dust development	2025	2026	Project Manager
6	Noise/Vibration	Construction activities will generate localized disturbances	SNI	The surrounding vegetation and the remoteness of the site will screen the noise. It is therefore Important to prevent unnecessary clearance of the vegetation.	2025	2026	Project Manager
7	Safety	General safety of employees in the project areas.	SPI	Employees will be offered training in safety to prevent occupation health hazards.	2025	2026	HR Manager
8			SPI	Warning signs in English and local languages will be erected around the project site	2025	2026	Project Manager
Project Component: Operational Phase							
9	Safety	General safety of employees on the project site	SNI	Warning signs in English and local languages will be erected around the site to warn the employees and the locals of hazards	2026	Closure	Project Manager
10	Land and Soil	Degradation of the soils may occur through erosion on exposed surfaces	LNI	Clearance of vegetation around the project site will be restricted to planned areas.	2026	Closure	Project Manager
11				LNI	Clearance of vegetation around the project site	2026	Closure

	Quality	Erosion of cleared areas		will be restricted to planned areas and good soil management practices such as planting of vegetation on the pond dykes shall be employed that will prevent the loss of topsoil			
12	Aesthetics	Generation of waste from the project site	MNI	All employees shall be provided with appropriate personal protective equipment	2026	Closure	Project Manager
13	Surface Water	Release of nitrogen and phosphorous to surface water	LNI	Good feeding practices will be important to maintain water quality and to maintain a good amount of naturally occurring fish food available in the water	2026	Closure	Project Manager
14		Proliferation of algae	MNI	All the ponds will be aerated with floating paddle wheel aerators.	2026	Closure	Supervisor
15		Disposal of green water	MNI	Green water will be discharged into a settling pond before being released	2026	Closure	Project Manager
16	Fish diversity/ escape	The escape of non-native culture species could lead to interbreeding thereby altering the local gene pool of local fish populations - Non-native species could also lead to competition with native species - Diseases can also	LNI	Install screens on all inlet and outlet points in the fish farm to minimize the escape of fry, juveniles and brood stock <ul style="list-style-type: none"> • Filter screens in fish farm shall be designed to retain the smallest life stage present • Filter devices should be capable of screening all water 	2026	Closure	Project Manager

		be transmitted from escapees to wild fish - Competition can also alter or modify the pre-existing natural and fragile aquatic habitats and destroying some segments of aquatic environment		<ul style="list-style-type: none"> • Cages will be made of sturdy, non- corrosive material • Make through inspection of nets before they are deployed so as to avoid possible escapes from the cages • Follow protocols when transferring, changing nets or harvesting fish from the cages e.g. use of fish boxes • Divers or underwater cameras will periodically inspect cages for holes, rips 			
17	Fish diseases	Spread of diseases to wild populations and evolution of drug resistant fish pathogens	MNI	Practice good husbandry <ul style="list-style-type: none"> • Limit use of chemicals • Quarantine introductions 	2026	Closure	Project Manager
18	Fish mortalities	Bacterial action and autolysis of dead fish results in the excretion of ammonia in pond waters. Live fish preying on dead fish can result in the spread of diseases if the corpse died of a disease.	MNI	<ul style="list-style-type: none"> • Conduct a daily routine of collecting mortalities on the farm • All mortalities should be burnt at the incinerator 	2026	Closure	Project Manager

		Mortalities attract fish predators e.g. birds, in the farm and birds, crocodiles at the cages					
19	Predator/Pre-Interactions	Fish losses to predation	MNI	<ul style="list-style-type: none"> Putting nets over ponds to deter birds Putting predator nets around Cages 	2026	Closure	Project Manager
20	Air Quality	Dust blown off exposed surfaces on the farm may affect local air quality.	SNI	All the access roads and cleared areas will be sprayed with water to suppress the dust	2026	Closure	Project Manager
Project Component: Post Closure Phase							
21	Aesthetics	Improper decommissioning and closure practices can leave the site aesthetically intrusive	MNI	The area will be re-profiled to establish the natural drainage pattern.	Closure	3 years after closure	Project Manager
22			MNI	Salvage all reusable and recyclable materials and scrap of good value will be salvaged and sold off while office buildings may be let intact and used for other purposes.	Closure	3 years after closure	Project Manager
23			MNI	Carry out site levelling and re-profiling shall be done to re-establish the natural drainage pattern across the site, after which, the site shall be re-vegetated with indigenous grasses and trees	Closure	3 years after closure	Project Manager
24			MNI	Dispose of all materials and equipment that cannot be reused recycled or sold shall be	Closure	Within 1 year after	Project Manager

		Ensure that the final landform is hydrologically compatible with surrounding areas		disposed of at an approved non-hazardous disposal site.		closure	
25	Aesthetics		MNI	Re-profile all ponds and drainage channels with additional soil amendment material such as rock from elsewhere, previously stripped topsoil and organic matter and re-vegetated	Closure	3 years after closure	Project Manager
26			MNI	Carry out re-shaping and grading of the site to make slopes stable and less prominent	Closure	3 years after closure	Project Manager
27	Surface water	Discharge of green water from the pond may contaminate surface watercourses	LNI	Green water will be not be allowed to dry in the pond but will be used in re-vegetation activities	Closure	3 years after closure	Project Manager
28	Air Quality	Localized deteriorations in the air quality from dust generated from open areas.	MNI	Water will be used to suppress the dust and encourage natural colonization.	Closure	3 years after closure	Project Manager
29	Public Health and Safety	Un buried ponds will cause a physical and health hazard to the community	MNI	The ponds will be buried so that they will not be a breeding ground for mosquitoes	Closure	3 years after closure	Project Manager
30	Surface Water	Contamination of surface water from storm water contaminated by ponds material	MNI	Surface runoff around the ponds facility will be collected in perimeter drains and settled in a settlement pond.	Closure	3 years after closure	Project Manager

31	Air Quality	Local contamination from wind erosion on exposed surfaces of the project area	MNI	The surrounding vegetation will be maintained to act as a wind shield	Closure	3 years after closure	Project Manager
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The EMP will have specific targets for each year that will be evaluated by the annual Environmental audit. The audit can make recommendations which will necessitate Changes in the EMP. The EMP will be reviewed on an ongoing basis as new environmental challenges arise or targets/objectives are achieved. The Operations Manager will ensure that this review occurs in a timely manner.

12. DECOMMISSIONING PHASE

Developmental projects are usually temporary in nature and after a certain period of operation, the cages, ponds and associated infrastructures will be decommissioned and the sites closed. It will be important that activities during this phase are carried out in an environmentally sound manner, leaving as little impact as possible on the environment. To this end, a decommissioning and closure will be developed.

The main objectives of the plan will be to:

- Promote alternative economic activities in the area that are sustainable in the future;
- Ensure the safety of surrounding communities through public consultation and the erection of warning signs.
- Return the land to conditions capable of supporting the former land use, or where this is not practical, or feasible, an alternative sustainable land use; and
- Prevent potential significant adverse effects on adjacent environs.

Where possible, Boophalow Investments cc will ensure that progressive rehabilitation is undertaken so that the rate of rehabilitation is similar to the rate of borrow pit operations.

Fundamental criteria for closure

Issue	Closure Objectives
Physical stability	All remaining anthropogenic structures are physically stable
Chemical stability	The biological environment is restored to a natural, balanced ecosystem typical of the area, or is left in such a state so as to encourage and enable the natural rehabilitation and/or reintroduction of a biologically diverse, stable environment
	Closure aims at preventing physical or chemical pollutants from entering and subsequently degrading the downstream environment – including surface and ground waters
Geographical and climatic influences	Closure is appropriate to the demands and specifications of the location of the site in terms of climatic (e.g. rainfall, storm events, seasonal extremes) and geographic factors (e.g. proximity to human habitations, topography, accessibility of the mine)
Local sensitivities and opportunities	Closure optimizes the opportunities for restoring the land and the upgrade of the land use is considered whenever appropriate and/or economically feasible
Land use	Rehabilitation is such that the ultimate land use is optimized and is compatible with the surrounding area and the requirements of the community
Funds for closure	Adequate and appropriate readily available funds need to be available to ensure the implementation of the closure plan
Socio-economic considerations	Consideration will be taken of opportunities to communities whose livelihoods may depend on the employment and economic fallout from project activities. adequate measures made to ensure that the socio-economic implications of closure are maximized

13. CONCLUSIONS AND RECOMMENDATIONS

This environmental scoping report has addressed the key issues as identified in number 8 & 9 and no significant impacts have been identified.

13.1 Conclusion

The project, when implemented, will bring huge positives for the district of Machita communal areas, Zambezi region and the entire Namibia. Both the primary, secondary and tertiary beneficiaries will be wide spread across Namibia but with the largest number and therefore more positive impacts in Katima Mulilo town and surrounding environs.

The EIA process has allowed both the developer and other stakeholders to interact, openly identify positive and potential negative impacts both from a social-human environment and biophysical environment. Based on these interactions and also on other national and international practices, it is concluded that on the basis of the environmental and socio- economic assessment undertaken and based on a very wider consultation and the professional expertise employed, the positive impacts of Boophalow Investment fish farm project far outweigh the negative impacts. Boophalow fish farm project (lead by proponent) has followed the due process of the law on environment. The socio-economic impacts of the project are largely positive, while negative impacts are minimal. These impacts will be adequately avoided through best management practices and compliance. No family will be displaced by the project. In addition, a project impact management and monitoring framework has been proposed and therefore merits support.

The stakeholders more especially the communities of Machita & Masokotwani are highly positively expectant of Boophalow project in Zambezi region and want the project to start as soon as possible. NYEPEZ Consultant therefore recommends that the project be allowed to be implemented due to its outlined benefits.

13.2 Recommendations

Development related impacts must be prevented or mitigated by implementing strict monitoring and control. All permits and approval must be obtained from the relevant ministries or authorities for the operation of the fish Farm, such as business fitness certificates & certificates of operation from Ministry of trade. It is imperative that the mitigation measures as set out in the ESMP be implemented during the planning (layout design) construction and operational phases to prevent unnecessary damage to the natural environment.

The ESMP should be added to all contractors' agreements and be signed by such contractors. The recommendations made in this report places the developer under a legal obligation to ensure that all mitigation measures are implemented and followed through during construction and operation of the fish farm.

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Nyeppez Consultancy cc

Environmental Assessment Practitioner and Management Consulta

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