



Ministry of Agriculture, Water and Land Reform

Appendix A

Strategic Environmental Management Plan (SEMP)



Harvesting of forest resources – Uuvudhiya Constituency (TEC, 2022)

Strategic Environmental Assessment (SEA) of the Integrated Land-use Plan for the Oshana Region, Namibia

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DOCUMENT INFORMATION

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ABBREVIATIONS

ECC	Environmental Clearance Certificate
EMA	Environmental Management Act
GIS	Geographic Information System
IRLUP	Integrated Regional Land Use Plan
LDN	Land Degradation Neutrality
LUPA	Land Use Planning and Allocation
MAWLR	Ministry of Agriculture, Water and Land Reform
MEFT	Ministry of Environment, Forestry and Tourism
NDP	National Development Plan
PLUP	Participatory Land Use Planning
SEA	Strategic Environmental Assessment
SEMP	Strategic Environmental Management Plan
SCIRLUP	Steering Committee for Integrated Land-Use Planning
TA	Traditional Authority
TEC	Tortoise Environmental Consultants

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1. Introduction

The Ministry of Agriculture, Water and Land Reform (MAWLR) is mandated to coordinate the development of Integrated Regional Land-Use Plans (IRLUPs) in the country. In that vein, MAWLR commissioned the development of an Integrated Regional Land Use Plan (IRLUP) for the Oshana Region. The objectives of the SEA are as follows:

- a) To promote sustainable development, through sound environmental and socio-economic development agenda, and integration into the regional decision-making platforms, and
- b) To obtain an Environmental Clearance Certificate (ECC) from the Ministry of Environment, Forestry and Tourism (MEFT).

The purpose of the SEA is to ensure that the proposed land uses in the IRLUP are environmentally, socially, and economically sustainable (MLR, 2015).

2. Strategic Environmental Management Plan (SEMP)

2.1. Definition

A Strategic Environmental Management Plan (SEMP) can be defined as the implementation and monitoring framework pertaining to the Integrated Land Use Planning (IRLUP) for the Oshana region.

This SEMP outlines how potential impacts (identified during the SEA process and presented in the SEA report) that may have significant impacts on social and environmental aspects are to be mitigated and monitored. In-addition, the SEMP accounts for cumulative impacts arising from a series of developmental activities, to ensure mitigation and long-term monitoring (DEAT, 2004).

3. Guidelines and Legal Framework

The SEMP is guided by the following framework:

- a) The Namibia Environmental Management Act No.7 of 2007 (MEFT, 2007)
- b) Guidelines for Strategic Environmental Assessment and Environmental Plan (MEFT, 2008).
- c) The 2006 Organisation for Economic Co-Operation and Development (OECD)'s Development Assistance Committee (DAC) Guidelines and Reference Series on Applying Strategic Environmental Assessments (OECD, 2006)
- d) The SEA Performance Criteria developed by the International Association of Impact Assessment (IAIA, 2019)

3.1. Environment vs Economic Development

Economic activities such as construction of roads, railway, housing, schools, hospitals and supermarkets are vital for development, and hence, activities such as sand mining are inevitable (cannot be avoided).

However, such developmental activities should be conducted in a thoughtful and forward-looking manner and should consider the future land use after such activity has come to an end. Therefore, to ensure that the land remains valuable for other land uses in the future, rehabilitation should be part and parcel of such developmental activity right from the beginning and throughout the project lifespan.

3.1.1. Trade-off and balancing

Development takes place on land (environment) and hence the quest for economic development requires a trade-off with certain parts of the environment in-order for the development to be realized. Striking a balance between economic development (e.g. sand mining) and environmental integrity can be a challenge. Therefore, environment and development sectors should work together in order to identify synergies.

The aim of SEMP is to guide developmental activities, to ensure that associated impacts are that would otherwise compromise the environmental integrity and future ecosystem benefits.

3.2. Compliance to the Environmental Management Act

Section 27 of the Environmental Management Act (Act No. 7 of 2007), also known as the EMA, and EIA regulations (Government Notice: 30 of 2012), provide a list of activities that may not be undertaken without an Environmental Clearance Certificate (ECC), known as Listed Activities.

Listed Activities are activities that have potential to cause significant environmental and social harm, and thus may not be undertaken without an Environmental Clearance Certificate (ECC). This implies that for all listed activities, an Environmental Management Plan – EMP (*for specific activities*) or Strategic Environmental Management plan – SEMP (*for high level strategic plans / programs*) is required.

3.3. Rehabilitation

Rehabilitation is the process of repairing mitigating environmental and social impacts, to make the land suitable for other uses or simply to beautify the affected area (e.g reforestation / refilling of borrow pits with the overburden).

3.4. Alternatives

Entails determining if an alternative site (different locality) or alternative project (different activity) would yield better environmental and socio-economic benefits.

4. SEA Impact Assessment Criteria

This section outlines the potential environmental and socio-economic impacts, risks and opportunities associated with the IRLUP as identified during the scoping phases of the SEA and IRLUP.

The full description of the impact assessment method is presented in section 8 of the SEA. The significance of impacts was obtained using the tables below. Only negative impacts with significance rating of Medium, High and Very High are considered for monitoring in the SEMP.

The impact matrix below is used to establish the significance of impacts.

Table 4:1. Criteria for assessing significance of impacts

	Magnitude (Severity of Impact)			
Likelihood	Low	Medium	High	Very High
Definite	Medium	High	Very high	Very High
Very Likely	Medium	High	High	Very high
Fairly likely	Low	Medium	High	Very high
Unlikely	Low	Low	Medium	Medium
Very unlikely	Low	Low	Low	Medium

Table 4:2. Interpreting Impact significance

Significance rating	Description <i>Impacts may result in either positive or negative, medium to short term effects, on the social and/or natural environment.</i>
Low	Acceptable impact for which mitigation is desirable but not essential. (Has little to no influence on the decision)
Moderate	Important impacts which require mitigation. Such impacts maybe insignificant by themselves, but in conjunction with other impacts, it may influence the decision/s.
High	Serious impacts which constitute major short / long-term changes to the natural / social environment and will result in severe effects or beneficial results. (Has influence on the decision/s)
Very High	Very serious impact, constitute major short / long-term changes to the natural / social environment and will result in severe effects or beneficial results. (Has influence on the decision/s). Such impacts may result in severe effects, or very beneficial results.

5. SEMP – Recommended Measures

5.1. Impacts on Forest Resources

5.1.1 Timber

Root Cause	Negative Impacts		Rating (significance)
Cutting trees: <ul style="list-style-type: none"> - To construct homesteads - Land clearing for crop fields - Fencing of crop fields and livestock kraals - Crafts and utensils (e.g Mahangu silos) 	<ul style="list-style-type: none"> • Deforestation= no soil protection = soil erosion = leaching of nutrients (loss of topsoil) = loss of primary productivity = desertification • Erosion, sedimentation and silting of river streams = increased flooding risk • Reduced carbon sink capacity to absorb CO₂ & oxygen production • Loss of natural habitats, biodiversity, ecosystem functioning, etc 	Very High (without Mitigation)	
		Moderate (with Mitigation)	
Mitigation Measures	Key Performance Indicator (KPI)	Implementation Target (2023 – 2025)	Responsible party
Use alternative construction materials for huts and homesteads such as Bricks (clay or cement), Corrugated iron, Artificial timber poles (from timber plantations), etc	Percentage (%) of new homestead construction activities using indigenous timber, versus alternative options (bricks, corrugated iron, artificial timber)	100% of all new homestead construction activities avoid using indigenous timber to prevent deforestation and use alternative construction materials	All inhabitants of the region, guided by RC / Constituency councillor, TA's, Churches, Schools, Forestry, NAMPOL
Conduct awareness raising on the value and importance of trees and, Promote sustainable harvesting practices (e.g. harvesting branches to allow regeneration as compared to cutting the whole tree)	Number of public awareness programs undertaken (radio, print, WhatsApp, Facebook, TV)	Quarterly (every 3 months) or Bi-annual – every 6 months)	RC / Constituency councillor, TA's, Churches, Schools, Civil Organisations, Forestry, NAMPOL
Initiate reforestation activities (tree planting)	Number and size (ha) of reforestation projects / initiatives	1 tree per household (annually) 5 trees per school (annually) 5 trees per church (annually) 5 trees per school (annually) 5 trees per constituency (annually)	Forestry to sponsor / guide and support Schools, Churches, Councillors, TA's

5.1.2 Firewood

Root Cause	Negative Impacts		Rating (significance)
Cutting trees for firewood for cooking and lighting <i>Approximately 80% of the region's population depends on firewood as the main energy source for cooking (NSA, 2017)</i>	<ul style="list-style-type: none"> • <u>Deforestation</u>= <u>no soil protection</u> = <u>soil erosion</u> = <u>leaching of nutrients</u> (loss of topsoil) = <u>loss of primary productivity</u> (grass and trees) = <u>desertification</u> • Excessive smoke exposure (inhalation), can become a health risk • Firewood is becoming increasingly scarce = women and children walk long distances and spend more time searching for firewood (effort + time) 		Very High (Without Mitigation)
			Moderate (With Mitigation)
Mitigation Measures	Key Performance Indicator (KPI)	Implementation Target (2023 – 2025)	Responsible party
Use alternative sources of energy for cooking and lighting (e.g solar cookers, energy efficient stoves that use less wood, gas cookers, bush blocks, biochar wood,)	Percentage (%) of households using wood as an energy source for cooking and lighting vs alternative sources (gas stoves, solar cookers, bush blocks, biochar wood)	50% of all households in the region use alternative energy sources for cooking and lighting	All inhabitants of the region, guided by RC/ Constituency councillor, TA's, Churches, Schools, NGOs, MME, MEFT/Forestry, NAMPOL
Conduct awareness raising on the value and importance of trees and, Promote sustainable harvesting practices (e.g. harvesting branches to allow regeneration as compared to cutting the whole tree)	Number of public awareness programs undertaken (radio, print, WhatsApp, Facebook, TV)	Quarterly (every 3 months) or Bi-annual – every 6 months)	RC / Constituency councillor, TA's, Churches, Schools, youth organisations, Forestry, NAMPOL
Implement rural electrification programs (connection to the grid, or solar energy)	Percentage (%) of rural households with access to electricity	30% of rural households in the region are electrified	Regional Council, constituency councillor, local authorities, schools, MME, NORED,

5.1.3 Grazing

Root Cause	Negative Impacts		Rating (significance)
<ul style="list-style-type: none"> • High population and livestock density • Limited grazing (Oshanas, Uuvudhiya and Okatyali) • Illegal fencing • Tragedy of the commons • Lack of markets and limited incentives to reduce livestock numbers • Overstocking (high number of livestock kept for pride, as a tradition) 	<ul style="list-style-type: none"> • <u>Overstocking = Overgrazing = soil erosion = leaching of nutrients (loss of topsoil) = loss of primary productivity = desertification</u> • Loss of perennial grass species (veld retrogression) • Poor grass productivity = poor livestock production • Grasslands in Uuvudhiya and Okatyali are at high risk of degradation due to increasing livestock numbers (overstocking) 		High (Without Mitigation)
			Low (With Mitigation)
Mitigation Measures	KPI	Implementation Target (2023 – 2025)	Responsible party
Determine/Establish livestock carrying capacity of grasslands (Uuvudhiya and Okatyali)	Carrying capacity calculated	Maintain livestock number below carrying capacity	MAWLR (DAPEES)
Limit livestock numbers in accordance with the legal framework (e.g CLRA, 2002)	Number of livestock at the grasslands	Number of livestock at grasslands should not exceed carrying capacity	Regional Council, Traditional Authorities
Create viable markets and develop incentives to reduce livestock numbers, to prevent overgrazing	Livestock selling incentives	Operationalisation of auction kraals and monthly livestock sales	MAWLR (DAPEES)
Maintain stocking rate at carrying capacity	Number of livestock at grasslands	Number of livestock at grasslands does not exceed carrying capacity	MAWLR (DAPEES)
Reserve grazing sites to save cattle in case of late rainfall / drought (back-up)	Number and size of reserved sites	At least one reserved grazing site for back-up	MAWLR (DAPEES), Regional Council, Traditional Authorities

5.1.4 Thatching Grass

Root Cause	Negative Impacts		Rating (significance)
<ul style="list-style-type: none"> Overharvesting of thatching grass for construction of huts Illegal fencing and privatisation of thatching grass communal sites (ponds) Mismanagement (tragedy of the commons) Soil erosion and sedimentation of thatching grass ponds 	<ul style="list-style-type: none"> Lack of thatching grass Common thatching grass fence in and privatised (inaccessible by all community members) Poor housing (particularly for those who cannot afford to buy thatching grass from other regions (Kavango) and corrugated iron) 		High (Without Mitigation)
			Low (With Mitigation)
Mitigation Measures	KPI	Implementation Target (2023 – 2025)	Responsible party
Provide awareness on the value and importance of thatching grass to preserve habitat (natural ponds / waterlogged areas) where it grows	Number of public awareness programs undertaken (radio, print, WhatsApp, Facebook, TV)	Preservation of thatching grass habitat (natural ponds – where it grows)	TA's, RC / Constituency councillor, Schools, MEFT/Forestry, NAMPOL
Preservation of thatching grass habitat (natural ponds – where it grows)	Number of thatching grass sites identified and protected	All known thatching grass sites identified and protected	TA's, RC / Constituency councillor, Schools, MEFT/Forestry, NAMPOL

5.1.5 Veld Fire (Grazing areas)

Root Cause	Negative Impacts		Rating (significance)
<ul style="list-style-type: none"> Overharvesting of thatching grass for construction of huts Illegal fencing and privatisation of thatching grass communal sites (ponds) Mismanagement (tragedy of the commons) Soil erosion and sedimentation of thatching grass ponds 	<ul style="list-style-type: none"> High fuel load = high fire intensity (uncontrollable) Lack of fire belts to limit fire spread and protect entire grazing area from burning at once Loss of valuable grazing Moribund material = Poor grazing quality 		High (Without Mitigation)
			Low (With Mitigation)
Mitigation Measures	KPI	Implementation Target (2023 – 2025)	Responsible party
Provide community awareness on integrated fire management	Number of public awareness programs undertaken (radio, print, WhatsApp, Facebook, TV)	Annually, before the dry season	TA's, RC / Constituency councillor, Schools, MEFT/Forestry, NAMPOL, MoD
Develop Fire Management Plan and Monitoring Program for grasslands (Uuvudhiya and Okatyali Constituencies)	Fire Management Plan (FMP) and Monitoring Plan (MP)	FMP and MP completed by end of 2023	Farmers, Conservancy, TA's, RC / Constituency councillor, MEFT/Forestry, MoD
Construct / maintain fire breaks / cut lines to limit fire spread from one grazing block to another and to enable firefighting during fire outbreaks	Number of Fire breaks / cut lines constructed / maintained	Existing fire breaks / cut lines maintained / cleaned and, or, new cut lines established (if necessary)	Farmers, Conservancy, TA's, RC / Constituency councillor, MEFT/Forestry, MoD
Demarcate fire management blocks and apply rotational early burning to reduce fuel load and stimulate new growth	Number of fire blocks demarcated	Fire blocks demarcated	TA's, RC / Constituency Councillor, Schools, MEFT/Forestry, NAMPOL, MoD

5.2. Impacts on Water Resources

5.2.1 Water Supply

Root Cause	Negative Impacts		Rating (significance)
<ul style="list-style-type: none"> High water demand (increases with population growth and food requirements (irrigation). Poor water distribution (access to water is a major issue and some communities (including livestock) walk long distances to the nearest water point) Climate Change (erratic, variable and un-predictable rainfall) 	<ul style="list-style-type: none"> Over abstraction Low water pressure (e.g Uuvudhiya pipeline) Water rationing Lack of water for irrigation (food production) 		High (Without Mitigation)
			Medium (With Mitigation)
Mitigation Measures	KPI	Implementation Target (2023 – 2025)	Responsible party
Strengthen ongoing water infrastructure projects to reach 100% target of safe water supply in the region (national pipeline)	Number of households with access to safe drinking water	100% of all households have access to safe drinking water	MAWLR (DWSS/RWS), Regional Council, Local authorities, NamWater
Rainwater harvesting (rehabilitation and construction of earth-dams)	Number of Earth dams rehabilitated or constructed	2 x earth-dams excavated per constituency	MAWLR (Rural Water Supply), Regional Council, NamWater
Regular rehabilitation and removal of mud and sediments from water bodies (earth-dams, canals, river streams, etc)	Action plan to remove mud and sediments from earth-dams, canals, river streams	Removal of mud and sediments from earth-dams, canals, river streams, before the rainy season	MAWLR (DWSS/RWS), Regional Council, Local authorities, NamWater
Explore alternative water supply sources to reduce dependency on the Calueque – Oshakati canal and pipeline, such as: <ul style="list-style-type: none"> ⇒ Groundwater (boreholes) and Desalination ⇒ Ohangwena aquifer¹ (est. @ 5 billion cubic meters, could supply the northern population for about 400 years (without recharge) 	Long-term Strategic plan for alternative water sources	Long-term Strategic plan for alternative water sources developed	MAWLR (DWSS/RWS), NamWater, Local authorities

¹ The Ohangwena aquifer resource is estimated @ 5 billion cubic meters. The rate of recharge would determine the sustainability of the water resource. without recharge, the aquifer could supply the Namibian northern population (about 800,000 people) for about 400 years.

5.2.2 Water Quality

Root Cause	Negative Impacts		Rating (significance)
Poor solid waste disposal presents a serious risk for water pollution (both surface and ground water), through: <ul style="list-style-type: none"> - Dumping of solid waste into water streams (oshanas) - Poor sanitation and wastewater discharge into water bodies (pit latrines and oxidation ponds) - Bathing and washing in the streams, both locally and upstream (Kunene River and the Oshanas) 	<ul style="list-style-type: none"> - Water contamination = deteriorating water quality - Bioaccumulation² and feeding on contaminated fish and frogs - Irrigation return-flows (chemicals – pesticides, herbicides, etc) - Waterborne diseases (e.g. Cholera³, Hepatitis E)⁴ 		High (Without Mitigation)
			Medium (With Mitigation)
Mitigation Measures	KPI	Implementation Target (2023 – 2025)	Responsible party
Prohibit waste dumping into river streams (Oshanas), or any other water body (ponds, earth-dams, canals, etc)	Changes (reduction) in volumes of solid waste dumped in water bodies	No dumping of solid waste in water bodies	MAWLR (Rural Water Supply), Regional Council, Local authorities, NamWater, schools
Regular monitoring of water pollution point sources and implement the polluter pays principle as punishment	Water pollution point source assessment report	Action plan for pollution prevention enforcement for identified point sources	MAWLR (Rural Water Supply), Regional Council, Local authorities,
Implement Solid Waste Management and recycling facilities (as guided by the National Solid Waste Management Strategy, MEFT 2018)	Number of recycling facilities and waste management facility established	Enhance Recycling facilities in all 3 towns (Ondangwa, Ongwdiva, Oshakati) and at least 1 waste SWM facility per constituency	MAWLR (Rural Water Supply), Regional Council, NamWater
Develop wastewater treatment infrastructure (other than use of oxidation ponds)	Wastewater treatment / containment infrastructure	All Wastewater infrastructure in urban areas upgraded	MAWLR (DWA), NamWater, Local authorities
Prevent irrigation return flows (fertilizers, pesticides) from polluting waterbodies through (EIAs, EMPs and Audits)	ECC and EMP for major irrigation activities	EMP Audits (bi-annual)	NamWater, MEFT (DEA), Local authorities
Education and awareness on impacts of water pollution	Public awareness programs undertaken (radio, print, WhatsApp, Facebook, TV)	Public awareness programs undertaken quarterly	RC / Constituency councillor, NamWater, Local Authorities TA's, Churches, Schools,

² Accumulation of substances, such as pesticides, heavy metals or other chemicals, in organisms and passed on along the food chain

³ Acute diarrheal illness caused by infection of the intestine caused by ingestion of food or water contaminated with cholera bacteria

⁴ Hepatitis E is a liver disease spread through drinking water that has been contaminated by fecal waste

5.2.3 Floods

Root Cause	Negative Impacts			Rating (significance)
<ul style="list-style-type: none"> - Oshana region is considered to be at high risk of flooding because it is located within Cuvelai drainage basin. Floods as a result of heavy rainfall upstream of the Cuvelai basin catchment (Angola) - High rainfall (local) 	<ul style="list-style-type: none"> - Displacement of people (flooded villages, homes, etc) - Infrastructure destruction (roads, buildings, etc) - Loss of crops, livestock and in severe cases, human lives - Restricted movements and limited access to essential services such as hospitals, schools and supermarkets (to buy food) 			Very High (Without Mitigation)
				Medium (With Mitigation)
Mitigation Measures	KPI	Implementation (2023-2025)	Target	Responsible party
Excavation of earth dams for water harvesting (rain and floods)	Number of Earth dams excavated	1 Earth dam excavated per constituency		OPM (DRM), Regional Council, Local authorities,
Improve town planning and prevent township establishment in flood-prone areas	Number of households severely flooded	Percent reduction in flooded households		Local authorities,
Revive / strengthen the flood early warning system (EWS)	Early warning strategy and Action Plan (Timely relocation of vulnerable people)	Early warning Action Plan (annually, before the rain / floods)		OPM (DRM) Regional Council, Local authorities, churches, schools
Development of infrastructure (e.g. bridges, dykes and culverts) to enable smooth passage of water (e.g Expansion, deepening of the Okandjengedi bridge and dykes in 2013) ⁵	Flood control infrastructure developed/upgraded	Flood control measures (annually)		MAWLR (DWA), NamWater, Local authorities, Roads Authority
Undertake vulnerability mapping of communities that are most at risk of flooding and devise strategies to enhance their adaptive capacity and resilience	Vulnerability risk mapping exercise	Public awareness programs undertaken (radio, print, WhatsApp, Facebook, TV)		MAWLR (DWA), NamWater, OPM (DRM) Regional Council, Local authorities

⁵ In 2013, the Okandjengedi and Ongwediva bridges were reconstructed and expanded to ensure the smooth flow of water to prevent flooding, and widened to dual carriageways with pedestrian walkways, to eliminate vehicle congestion between Ongwediva and Oshakati (especially during peak hours), and to improve pedestrian safety.

5.2.4 Drought (Meteorological, Agricultural and Hydrological)

Root Cause	Negative Impacts		Rating (significance)
Due to the highly variable climate in Namibia, Oshana region is vulnerable to increased frequency of droughts, poor agricultural production (crop & livestock), food insecurities and poor livelihoods	<ul style="list-style-type: none"> - Poor crop yield (food insecurity) - High cost of food imports - Livestock losses owing to lack of grazing and water - Water scarcity (domestic and livestock) - Increased levels of poverty and poor livelihoods (survival) 		Very High (Without Mitigation)
			Medium (With Mitigation)
Mitigation Measures	KPI	Implementation Target (2023-2025)	Responsible party
Excavation of earth dams to harvest water for use during the dry season (local rain and floods)	Number of Earth dams excavated	1 Earth dam excavated per constituency	MAWLR (Rural Water Supply), Regional Council, Local authorities,
Revive / strengthen the drought early warning system (EWS)	Early warning System Reviewed	Early warning Action Plan (annually)	OPM (DRM), Regional Council, Local Authorities
Implementation of National Disaster Risk Management Plan (NDRMP, 2011)	National Disaster Risk Management Plan reviewed	NDRMP Action Plan (annually)	MAWLR (Rural Water Supply), Regional Council, Local authorities, OPM (DRM)
Mainstream climate change adaptation (CCA), into all strategies at regional levels	National Determined Contributions (NDC's)	Action plan for National Determined Contributions (NDC's)	MEFT, MAWLR, Regional Council
Implementation of drought-adapted farming practices (e.g. drought-resistant crops, irrigated agriculture that uses water sustainably (drip-irrigation and hydroponics)	Percentage increase in sowing and harvesting of drought-resistant crops	Harvesting report	MAWLR, Regional Council
Undertake vulnerability mapping of communities that are most at risk of drought and devise strategies to enhance their adaptive capacity and resilience	Vulnerability assessment produced	Vulnerability maps / Action plan	OPM (DRM), MAWLR, Regional Council

5.3. Land Tenure

5.3.1 TA Jurisdictions, Land Allocation, Illegal Fencing, Enforcement (CLRA)

Root Cause	Negative Impacts		Rating (significance)
<ul style="list-style-type: none"> - Poor land administration / Poor land allocation (unfair / not equitable) - Illegal land occupation and poor enforcement of the Communal Land Reform Act (Act No.5 of 2002). - Individuals occupying large tracks of land at the expense of poor communities who solely depend on land for their livelihoods (blocked access to water points, grazing, firewood, etc). - Poor consultations on land allocation 	<ul style="list-style-type: none"> - Illegal fencing (rampant and un-controlled e.g. Blocking access to water points, grazing, firewood, etc) - Illegal land occupation (new homesteads without Land Board Approval) - Unclear TA jurisdictions and TA boundaries leading to double land allocations - Un-fair allocation of land (huge tracks of land allocated to one person at the expense of others (mostly poor community members)) 		Very High (Without Mitigation)
			Low (With Mitigation)
Mitigation Measures	KPI	Implementation target	Responsible party
Mapping of TA boundaries to reduce conflicts	Public awareness programs undertaken (radio, print, WhatsApp, Facebook, TV, settlement meetings)	Quarterly (every 3 months) or Bi-annual – every 6 months)	CLB's, TAs , Regional Council, NAMPOL
Enforcement of the CLRA Act No.5 of 2002 (Traditional Authorities, Namibian Police, Regional council, Civil Society, etc)	Number of customary land cases reported	% of cases resolved and cases pending	CLB's, TAs , Regional Council, NAMPOL

5.4. Infrastructure Development

5.4.1 Sand Mining

Root Cause	Negative Impacts		Rating (significance)
<ul style="list-style-type: none"> - Uncontrolled / uncoordinated - Illegal sand mining activities - Poor enforcement and lack of accountability (e.g Lack rehabilitation for Road Construction borrow pits) - Poor coordination among government institutions (national and regional levels), Land Boards, Traditional Authorities 	<ul style="list-style-type: none"> - Uncontrolled and illegal sand mining activities - Un-rehabilitated sand mining and gravel borrow pits, with steep edges and tipping point (serious safety risk to people and livestock) - High risk for drowning (particularly children and the elderly) - Gully erosion and sedimentation 		Very High (Without Mitigation)
			Low (With Mitigation)
Mitigation Measures	KPI	Implementation target	Responsible party
Enforcement of the EMA (Act. No7 of 2007 and EIA regulations)	% Reduction in illegal sand mining activities	Sand mining reports (bi-annual)	MEFT (DEA), Local authorities
Rehabilitation of sand mining borrow pits	Number of borrow pits rehabilitated	Rehabilitation report	MEFT (DEA), Local authorities
Zoning and mapping designated sand mining areas	Designated sand mining map	Designated sand mining map	MEFT (DEA), Local authorities
Regular monitoring of sand mining activities by MEFT to identify and halt unregulated sand mining activities	Sand mining Monitoring report	Sand mining monitoring report/s (bi-annual)	MEFT (DEA), Local authorities

5.4.2 Waste disposal and Waste Management

Root Cause	Negative Impacts		Rating (significance)
<ul style="list-style-type: none"> - Excessive littering (throw-away-culture) - Poor solid waste disposal and dumping of waste in the environment, including water streams (Oshanas) 	<ul style="list-style-type: none"> - Safety risks to people (exposure to dangerous objects such as broken glass in the water, used syringes, used tissues, etc) - Leachate (water contamination from heavy metals) - increases the cost of water purification - Blockage of water channels limits water flow and increases flooding - Faecal contamination from pit-latrines and poorly constructed oxidation ponds and high risk of waterborne diseases - Bio-accumulation (feeding on fish / frogs from contaminated water) - Unpleasant and unhygienic sights (eyesore) 		Very High (Without Mitigation)
			Low (With Mitigation)
Mitigation Measures	KPI	Implementation target	Responsible party
Enforcement of the EMA (Act. No7 of 2007 and EIA regulations)	Reduced volume of illegal dumpsites	Implement formalised solid waste collection and management systems in all constituencies	MEFT (DEA), Local authorities, Constituency Offices
Implement the Polluter-pays-principle through punishment / Fines	Number of fines issued to polluters	Report on fines issued to polluters (annually)	MEFT (DEA), Local authorities, Constituency Offices
Environmental awareness on the dangers of poor waste management	Number of Public awareness programs undertaken	Quarterly public awareness programs undertaken (radio, print, WhatsApp, Facebook, TV, settlement meetings)	MEFT (DEA), Local authorities, schools, NGOs

5.4.3 Displacement of people

Root Cause	Negative Impacts		Rating (significance)
Infrastructure development is associated with increased rural-urban migration. <ul style="list-style-type: none"> - More urban land required for the construction of townships (housing), transport systems (roads and rail), health facilities, education facilities, shopping malls and recreational facilities - Urban expansion into communal land and displacement of people who have to make way for urban developments (e.g Ondagwa, Ongwediva, Oshakati, Uukwangula and Eheke) 	<ul style="list-style-type: none"> - Displacement of people from their traditional homes - Disputed compensation rates for displacement - Loss of agricultural land (food insecurity) 		High (Without Mitigation)
			Low (With Mitigation)
Mitigation Measures	KPI	Implementation target	Responsible party
Timely communication of affected residents on potential displacement to allow them ample time to plan and search for new residential areas	Number of people displaced	Zero displacement of people (reduce hostility)	OPM (DRM), Regional Council, Local authorities, TA
Revise / consult affected communities regarding compensation	Revised Compensation rates	Annual compensation reports	Regional Council, Local authorities, TA
Formalization of existing informal settlement through the Implementation of the flexible land tenure system (in accordance with the Resolutions of the 2 nd Land Conference, 2018)	Number of informal settlements formalised in urban areas	Formalization and Town Plans	Local authorities, MURD
Reduce expansion and mushrooming of towns	Need assessment for town expansion / new establishments	Quantified need assessment	Local authorities, MURD

5.5. Socio-economic development

5.5.1 Employment Opportunities

Root Cause	Negative Impacts		Rating (significance)
<ul style="list-style-type: none"> - High level of unemployment in Namibia. According to the 2018 labour force survey, Namibia's unemployment rate stood at 33.4% with a youth unemployment rate of 46.1% - Unemployed graduates (Tertiary qualifications not matching the job market) 	High unemployment breeds: <ul style="list-style-type: none"> - Crime - Teenage pregnancies, drugs and alcohol abuse 		High (Without Mitigation)
			Low (With Mitigation)
Mitigation Measures	KPI	Implementation target	Responsible party
Initiate Youth employment and empowerment programs	Percentage reduction in unemployment rate	5% reduction in youth unemployment rate	Regional Council, MYSNS, MITSMED
Employment opportunities within the region should prioritise residents of Oshana, with exception of jobs requiring specialised skills (if not available in the region)	% New jobs created	Job creation report (annually)	Regional Council, MYSNS, MITSMED
Industrialization	Number of new industries developed	Report on new economic activities	Regional Council, MITSMED
Long-term paradigm-shift from consumers to producers	New production or manufacturing activities	Report (irrigation, backyard gardens, manufacturing)	Regional Council, MITSMED
Enhance capacity to create own employment	Number of SMEs established	Report on SME performance	Regional Council, MITSMED

5.6. Wildlife

5.6.1 Human Wildlife Conflict (HWC)

Root Cause	Negative Impacts		Rating (significance)
<ul style="list-style-type: none"> - Land use zones in proximity to ENP or the wildlife Core Areas of the lipumbu ya Tshilongo conservancy increases the risk of HWC. - Expansion of human activities closer to these wildlife areas (e.g. farmers seeking better grazing) increases interaction between human and wildlife and can result in loss of livestock by predators, retaliatory killing of predators. - With increasing cattle posts at the Ombuga grasslands, reduced grazing land will force farmers to move towards greener pastures close to wildlife core areas 	<ul style="list-style-type: none"> - Increased incidents of HWC particularly from lions and hyenas - Risk of damage to water infrastructural damage and crop field by elephants - Increased loss of livestock to predators - Cattle posts too close to the park fence (No buffer) - Risk of spreading of Foot and Mouth disease to wildlife (from livestock) 		Medium (Without Mitigation)
			Low (With Mitigation)
Mitigation Measures	KPI	Implementation target	Responsible party
Upgrade the boundary fence between ENP and the conservancy to keep predators inside the park	Length of ENP fence upgraded	xx km of boundary fence upgraded by 2023	MEFT (DWNP)
Awareness on the importance of the buffer zone between ENP and conservancy wildlife core areas	Number of HWC incidents reported near buffer zone	Zero cases of HWC along the buffer zone	MEFT (DWNP), IYT Conservancy
Improve compensation of HWC incidences	Review HWC Compensation Policy	Revised HWC Compensation Policy	MEFT (DWNP), RC

5.6.2 Poaching

Root Cause	Negative Impacts		Rating (significance)
<ul style="list-style-type: none"> - Land use zones in proximity to ENP or the wildlife Core Areas of the lipumbu ya Tshilongo conservancy increases the risk of poaching. - High levels of poverty and unemployment result in youth involvement in poaching syndicates - Traditional value - International markets 	<ul style="list-style-type: none"> - Increased incidents of poaching - Risk of damage to water infrastructural damage and crop field by elephants - Increased loss of livestock to predators - Cattle posts too close to the park fence (No buffer) - Risk of spreading of Foot and Mouth disease to wildlife (from livestock) 		Medium (Without Mitigation)
			Low (With Mitigation)
Mitigation Measures	KPI	Target	Responsible party
Regular patrols and monitoring by community game guards in the conservancy	Length of fence upgraded	xx km of boundary fence upgraded	MEFT (DWNP), IYT Conservancy
Regular patrols and monitoring by park rangers in ENP	Number of poaching incidents recorded	Zero cases of poaching	MEFT (DWNP), IYT Conservancy