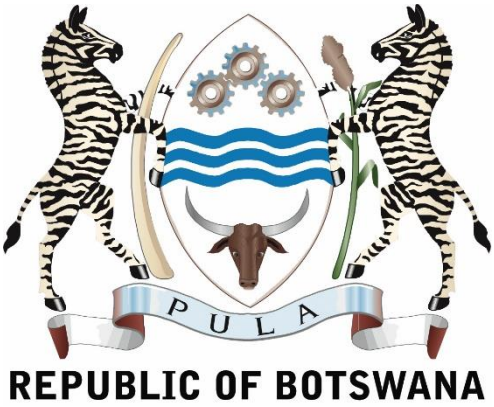
STATE OF CONSERVATION REPORT
OKAVANGO DELTA NATURAL WORLD HERITAGE SITE, BOTSWANA
(N1462)



BY THE GOVERNMENT OF THE REPUBLIC OF BOTSWANA
DEPARTMENT OF NATIONAL MUSEUM & MONUMENTS
MINISTRY OF ENVIRONMENT, NATURAL RESOURCES CONSERVATION & TOURISM

Report Developed by State Party of Botswana

MARCH 2020

Introduction

This report serves to address the issues and recommendations raised by the WHC Decision 42 COM 7B.89 and specifically paragraph 9 that requested Botswana to submit an updated report on the state of conservation of the property. Okavango Delta, located in north-west of Botswana was inscribed on the World Heritage list in June 2014 under natural criteria; (vii), (ix) & (x). The Okavango Delta Management Plan guides the management of the site.

Since the last state of conservation report submitted in November 2017, consultations have been held with key stakeholders among them; Department of Environmental Affairs (DEA), Department of National Museum & Monuments (DNMM), Okavango Research Institute (ORI) to address issues and recommendations raised by the WHC Decision 42 COM 7B.89.

As stated in the last state of conservation report, the State Party has continued to implement the Okavango Delta Management Plan in order to maintain the Outstanding Universal Value of the property. The State Party acknowledges the analysis and conclusion of the World Heritage Centre and Advisory Bodies (IUCN), which states that although the ODMP of 2008 provide a management framework for the area, it pre-dates the property's inscription on the World Heritage list. It further acknowledges that many of its prescriptions have not been implemented, and the institutional arrangements for its implementation have proved to be ineffective, hence the need to review the plan. The State Party has therefore started the process to review the plan and has made progress though there have been delays in awarding of the tender. The process is ongoing and currently it is at scoping phase. Funding towards the review of the plan has been provided through UNESCO International Assistance to the amount of USA Dollars 27, 080 (270,000 Pula). The State Party has availed funds amounting to USA Dollars 54,000 (540,000 Pula) towards the review. The State Party has secured more funding towards the review.

It is anticipated that some of the issues and recommendations raised by the WHC Decision 42 COM 7B.89 among them; integration of wildlife monitoring protocols in the systematic wildlife monitoring programme, management effectiveness, governance as well as access, cultural rights, and benefits will be addressed in detail in the revised management plan.

Through the OKACOM structures, the three riparian states of Angola, Botswana and Namibia are working closely to ensure that any proposed major developments within the Okavango watershed which may adversely impact the OUV of the property are subject to EIAs in conformity with IUCNs World Heritage Advice Note on Environmental Assessment. One of the important milestone in addressing this issue is the completion of the development of guidelines for 'Assistance to implement the SADC Protocol on shared watercourses by the Permanent Okavango River Basin Water Commission's Member States' Focus: Notification and Prior Consultation of Planned Measures According to Article 4(1) of the SADC Revised Protocol. Progress has also been made in addressing the World Heritage Committee request of preparing the Strategic Environmental Assessment (SEA) for the Cubango-Okavango River Basin.

The SADC Revised Protocol on shared watercourses (2000) legally guides the management of shared water resources in the region of Southern Africa, including the OKACOM member states of Angola, Botswana and Namibia. Article 4(1) of the SADC Revised Protocol on shared watercourses, addresses mandatory notification of planned measures undertaken in any riparian state in cases where such measures hold potential to cause 'significant adverse effects'. A coordinated mechanism of this nature to be applied at the basin-wide Cubango-Okavango scale will go a long way in ensuring the effective monitoring of major developments that have potential to impact on the OUV of the property. OKACOM is also in the process of developing a state of conservation report/study for the wider Cubango-Okavango river basin. This is very crucial in that understanding of the state of conservation of the wider Cubango-Okavango River basin gives more insight into the state of conservation of the property. Since these are ongoing developments, the State Party will update the World Heritage Centre and Advisory Bodies (IUCN) on progress made and continues to seek advice and guidance where necessary.

Regarding prospecting licenses in the core and buffer zone of the property, the State Party has made progress in addressing the issue. Currently there are no prospecting licenses in the core zone. Negotiations with companies holding prospecting licenses within the buffer zone have been concluded and the company Gcwihaba Resources (Pty) Ltd had agreed in principle to relinquish all the prospecting licenses in the buffer zone and others that are outside the buffer zone. Currently there are no prospecting licenses in the buffer zone. The State Party will continue to monitor prospecting and mining activities outside the buffer zone to ensure that they do not impact on the OUV of the property.

Despite all these efforts, the State Party still faces challenges of limited resources (Financial & human resources) for implementing conservation programmes as outlined in the ODMP and the Wildlife Conservation Research Strategic Plan and the National Biodiversity Strategy and Action Plan. However, the State Party is happy to inform the committee that it managed to conduct annual aerial surveys in 2019.

Introduction

This report serves to address the issues and recommendations raised by the WHC Decision 40 com 7B.89 and specifically paragraph 9 that requested Botswana to submit an updated report on the state of conservation of the property. The Okavango Delta, located in north-west of Botswana was inscribed on the World Heritage list in June 2014 under natural criteria; (vii), (ix) & (x). The Okavango Delta Management Plan guides the management of the site.

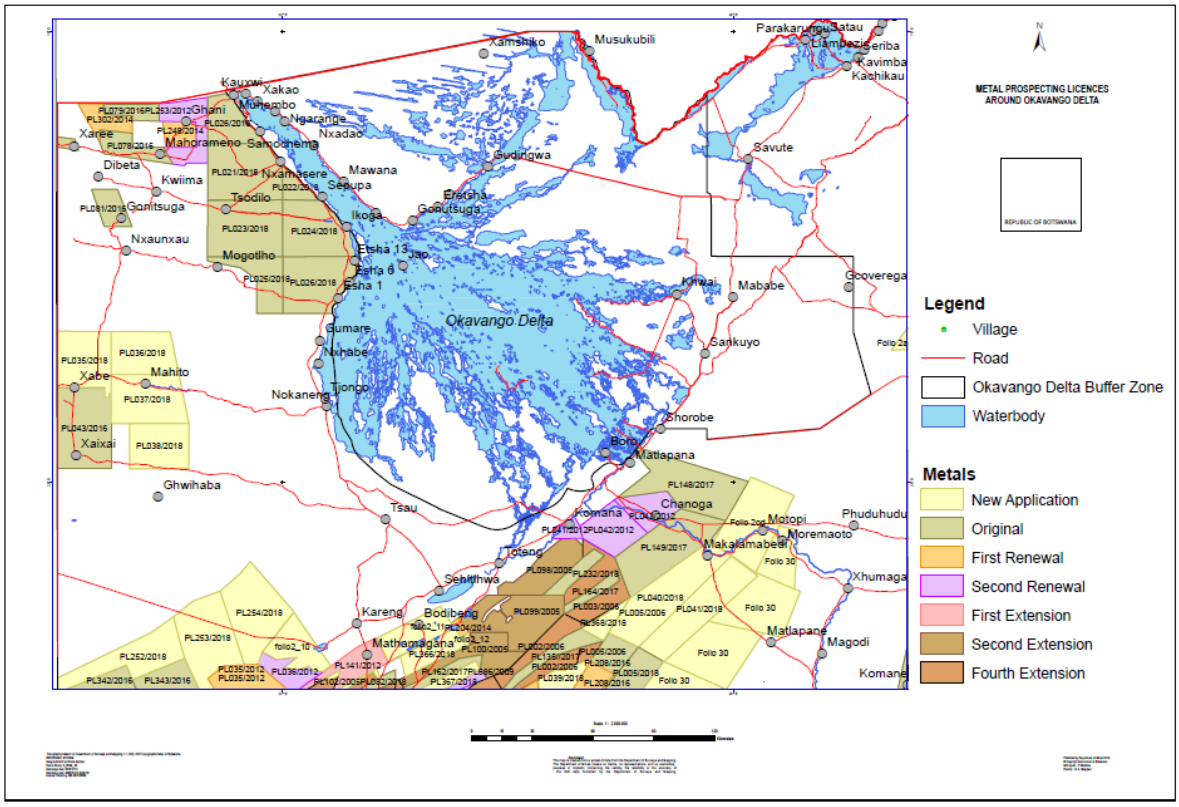
WHC Decision 40 COM 7B.89

Para 3: ***Welcomes*** ***the cancellation of all petroleum and metals prospecting licenses in the buffer zone and the State Party's commitment to continue monitoring the activities, but noting*** ***the location of the alternative licensing zones close to the buffer zone and the property,*** ***requests*** ***the State Party to ensure that an Environmental Impact Assessment (EIA), including an assessment of potential impacts on the outstanding Universal Value***

(OUV) of the property, is undertaken before any exploration activity is initiated, and submit it to the World Heritage Centre for review by IUCN.

As indicated in the State of Conservation report of November 2017, that effective January 2018, there will be no prospecting licenses in the buffer zone, the State Party has managed to cancel all the prospecting licenses in the buffer zone and are closely monitoring exploration activities of the alternative licensing zones close to the buffer zone.

Below is a map which shows the current status of prospecting licenses outside the buffer zone of the property,



Para 4*: **Appreciates** the collaboration between the State Parties of Botswana, Angola and Namibia through the Permanent Okavango River Basin Water Commission (OKACOM) to ensure any proposed major development within the Okavango watershed is subject to an EIA, and that there is a coordinated mechanism to notify each State Party of activities that can have transnational impacts;*

Para 5: ***Taking into account** the potential impact on the property's OUV of any development leading to water abstraction within the watershed and the complexity and the extent of the basin, **urges** the State Parties of Botswana, Angola and Namibia to assess impacts of any development at the strategic level and at the landscape scale through a comprehensive Strategic Environmental Assessment (SEA), in line with IUCN's World Heritage Advice Note on Environmental Assessment.*

The Permanent Okavango River Basin water Commission (OKACOM) member states, Angola, Botswana and Namibia have noted the importance of undertaking the Strategic Environmental Assessment (SEA) for the Cubango-Okavango River Basin (CORB). This is observed not only will it address the requirements of the World Heritage Convention but address the responsibility that OKACOM has in delivering its mandate related to the sustainable utilization of the resources of the CORB. Therefore, OKACOM has initiated a process to develop the CORB- SEA. The State Party of Botswana presented the proposal to the Okavango Basin Steering Committee (OBSC) which is a technical arm of OKACOM, in December 2019. As of December 2019, the Commission approved that this process be undertaken urgently. The OKACOM Secretariat has initiated the process with soliciting funds for the exercise. Since this is an ongoing process, the State Party will update the World Heritage Committee and Advisory Bodies (IUCN) on progress made and will continue to seek advice and guidance where necessary.

Para 6: ***Notes with appreciation*** ***the initiation of the review of the Okavango Delta Management Plan in order to reflect the property's World Heritage status, to improve the effectiveness of the institutional arrangements and to address outstanding conservation and management issues, and*** ***reiterates its request*** ***to the State Party to continue its efforts to:***

1. ***Expand and strengthen programmes, which accommodate traditional resource use for livelihoods, user access rights, cultural rights and access to opportunities to participate in the tourism sector, in keeping with the property's OUV,***
2. ***Address a range of other protection and management issues including governance, stakeholder empowerment, management planning, management capacity and control of alien invasive species.***

Despite the tourism industry in Botswana being the 'second largest foreign exchange earner, after diamond mining contributing about 10.4% of the GDP, generating about 25 000 jobs directly in 2016 and 27 000 in 2017, in hotels, travel agents etc. and the tourism activities mainly concentrated in the northern part of Botswana and within the Okavango Delta World Heritage Property, such activities have tended to exclude full participation of local citizens. Although tourism has contributed to employment generation, the challenge is that the jobs for citizens have been of general nature, poor quality and low payments. The other major gap is also observed in the minimal participation of locals in the tourism value chain, an area which has been used by many successful economies to create alternative opportunities for economic growth.

The Government of Botswana has therefore launched two initiatives aimed at empowerment of locals to having meaningful participation in the tourism sector. The two initiatives are part of the Government's National Transformation Strategy and the National Vision 2036, which espouses Prosperity for All Batswana. The two initiatives also represent the sector interventions on the Economic Diversification Drive (EDD) strategy.

Citizen Empowerment on the Tourism Sector Initiative: The initiative was created with a view to facilitate increase of citizen participation in the tourism sector through availing tourism land primarily to new entrants in the tourism industry especially, in prime areas of Botswana and throughout the rest of the country. The initiative aims at facilitating the inclusion of citizens through:

- Reservation of sites for allocation to citizens in the form of citizen companies, consortia, joint ventures and community trusts;
- Allowing use of Land allocated to citizens through tourism to be used as collateral by allottees to secure shareholding and or partnerships;
- Providing incentives to persuade existing concession operators to issue part of shareholding to citizens.
- Sub-divide larger concessions with a view to establishing new ones for allocation to citizens; and
- Facilitating preferential allocation through a set ratio to new entrants to the tourism sector and existing participants, respectively.

Cluster Development Initiative: The cluster initiative on the other hand is aimed at enhancing participation of citizens throughout the tourism value chain. The Okavango World Heritage Property has been used as proto-type development through a structure termed Makgobokgobo Cluster. The cluster specific projects include:

a. development of suppliers;
b. product development;
c. specialized marketing;
d. skills development and
e. Logistics and transport.

The overall aim is to create and support businesses' and also create employment for locals in the Okavango Delta World Heritage Property.

Since these two initiatives are still at planning stages, the State Party will update the World Heritage Centre and Advisory Bodies on progress made.

At regional level, OKACOM, through the UNDP and European Union support, is undertaking regional projects that address issues related to livelihoods improvement, conservation and monitoring of the resources of the CORB. These are guided by the OKACOM Strategic Action Programme that has four thematic areas of;

a. Livelihoods and Socio-Economic Development;
b. Water resources management;
c. Land Management; and
d. Environment and biodiversity.

Currently, OKACOM is developing a CORB Basin wide Environmental Monitoring Framework (CORB-EMF). This is to be informed by a series of joint basin-wide surveys that will establish a baseline. To date four (4) basin wide joint surveys have been conducted and the results are being used to develop the CORB-EMF. The joint surveys cover, hydro-meteorological Monitoring, water quality monitoring and environmental and biodiversity monitoring. In addition to this, member states are procuring relevant equipment and tools that will be uniform across the three states to facilitate similar monitoring using similar equipment and adopting similar approaches. A Data Sharing Protocol is at final stages of development to facilitate information sharing.

A series of livelihood enhancement demonstration projects are underway in all the OKACOM Member States. These includes community projects on Community based Fisheries management in Namibia and Angola; Community based tourism in Namibia;

Conservation Agriculture in Angola and Namibia; and Enhancing and linking local horticultural produce to higher markets in the Okavango in Botswana.

In implementing the land management component of the SAP, OKACOM has since identified two main delineated areas for focused land rehabilitation mainly in the upper part of the basin in Angola. The goals of OKACOM's Land Management activities are to address the drivers of land use degradation in the CORB, mitigating these drivers and threats with the implementation of viable, effective and sustainable interventions that are implemented through collaboration with national stakeholders and local communities. Prioritized activities should also lead to improved and potentially diversified livelihoods for the communities within the prioritized hotspots. This action is expected to take effect in 2020.

The process of reviewing the Okavango Delta Management Plan is in progress. The consultant, Okavango Research Institute is currently doing the scoping exercise (situational analysis). Consultations are ongoing with different stakeholders. Consultations took longer than anticipated due to the vastness of the area, complexity and multiple stakeholders. Despite the fact that the project delayed at the beginning, a lot of progress has been made and it is anticipated that the final report will be ready by end of August 2020. Progress reports will be provided to the World Heritage Centre and IUCN at the end of each phase. The scoping reports, Draft Management Plan and Draft Final Plan will be shared will be shared with World Heritage Centre and IUCN at the end of each stage for review and technical guidance.

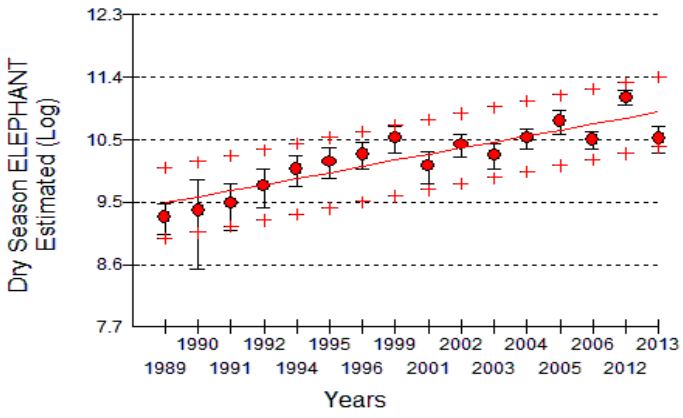
It is anticipated that the revised management plan will address the issues and recommendations raised on Para 4, section 1 and 2. However, the State Party at national and regional level through OKACOM has been working on some interventions to address among other things the expansion and strengthening of programmes, which accommodate traditional resource use for livelihoods and access to opportunities to participate in the tourism sector, in keeping with the property's OUV.

The recently completed Community Based Natural Resource (CBNRM) Strategy once implemented will also contribute in strengthening of programmes (CBNRM) which accommodate traditional resource use for livelihoods and access to opportunities to participate in the tourism sector by Community Based Organizations (CBOs).

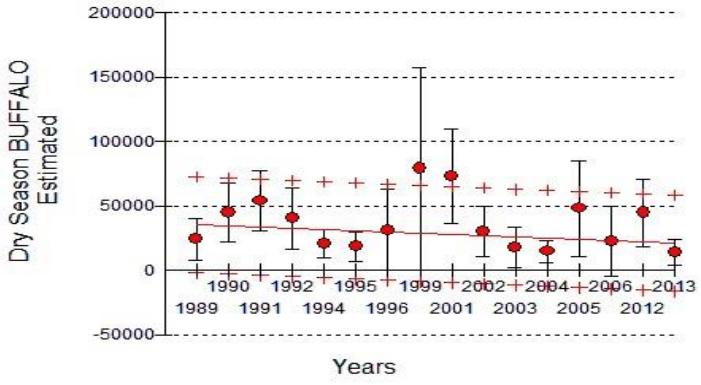
Para 7: ***Notes with concern that an EIA for the veterinary cordon fences and aerial wildlife surveys could not be undertaken due to financial constraints, and also requests the State Party to provide further financial support to the conservation of the property***

The State Party managed to conduct aerial wildlife surveys in 2019. However, below is an update on species population and trends as per the 2012 aerial wildlife surveys. The update for the 2019 species population and trends will be provided once it is concluded.

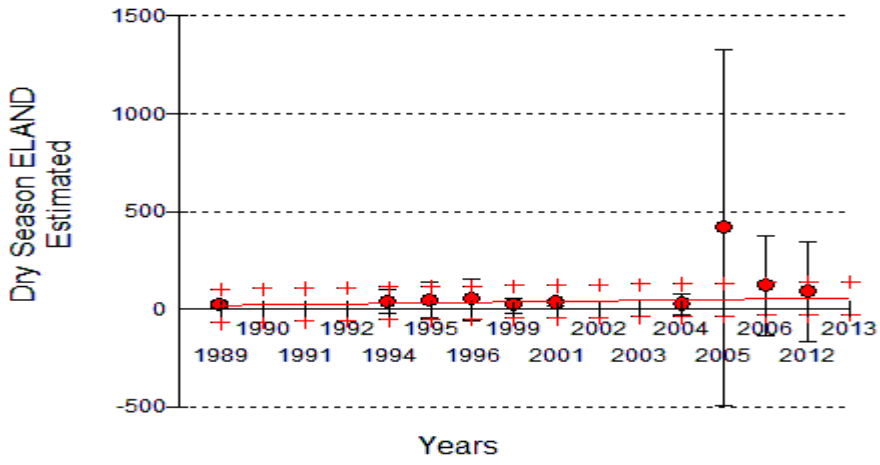
Update of Aerial Wildlife Surveys on species population and trends:



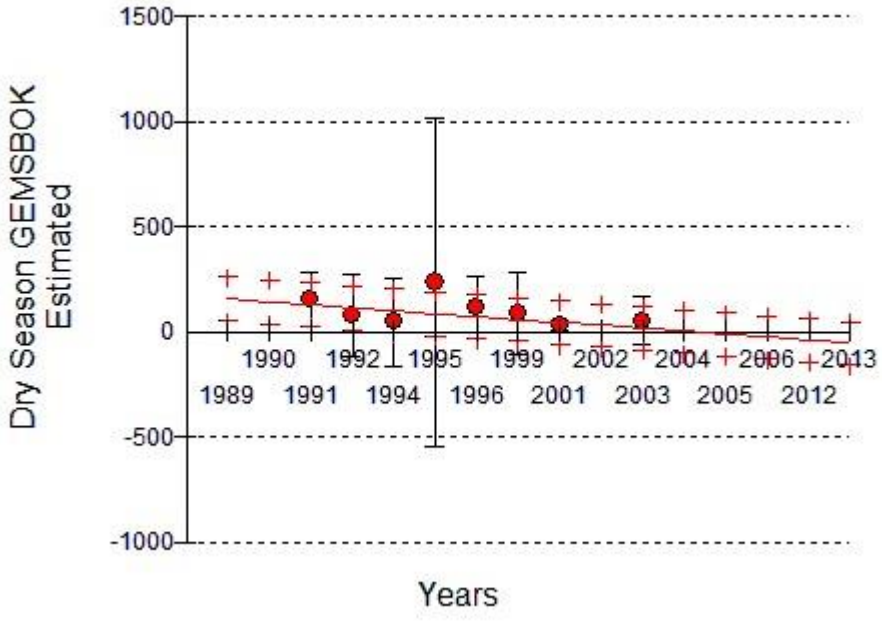
There was a gradual significant increase in the estimated number of elephants over the years. The elephant population has remained healthy with an exponential growth.



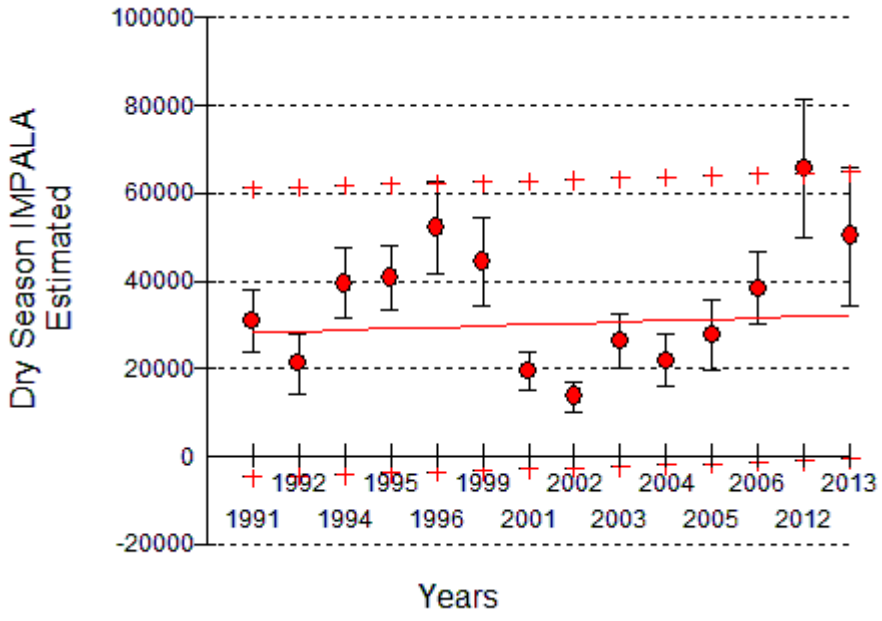
The change in population was not statistically significant. It shows that the population estimates were going down through the years as seen from the graph above.



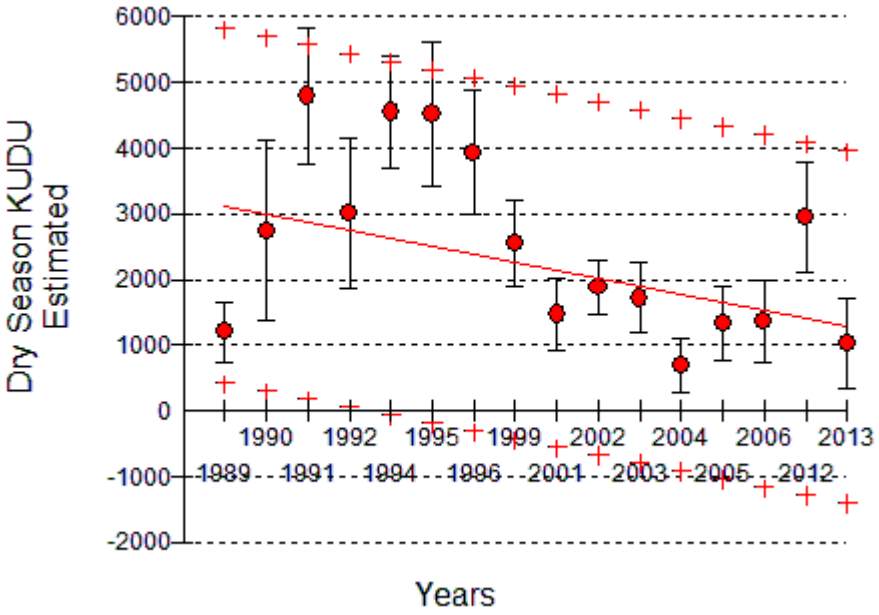
The eland population has remained low and/or constant throughout the years and there is no significant growth.



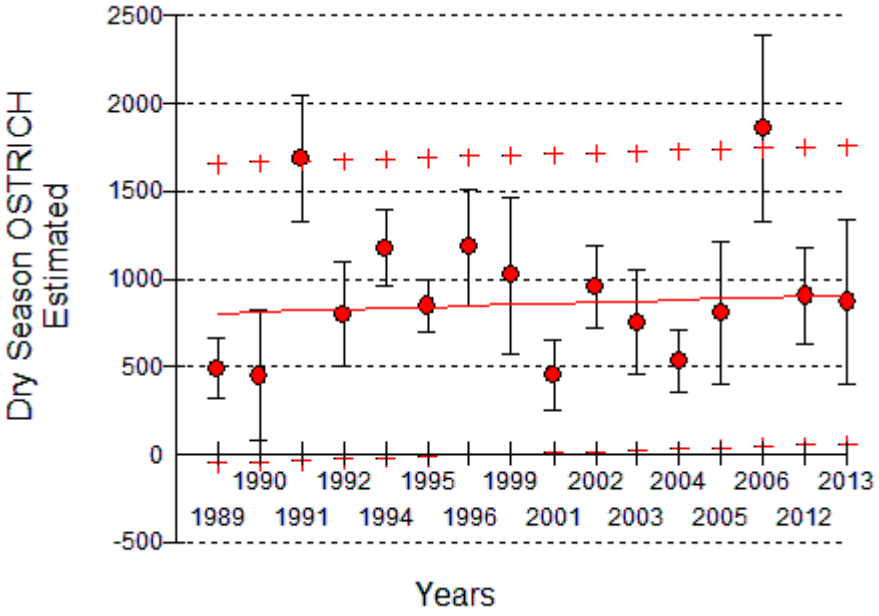
There was a slight decline in the population of gemsbok though not statistically significant.



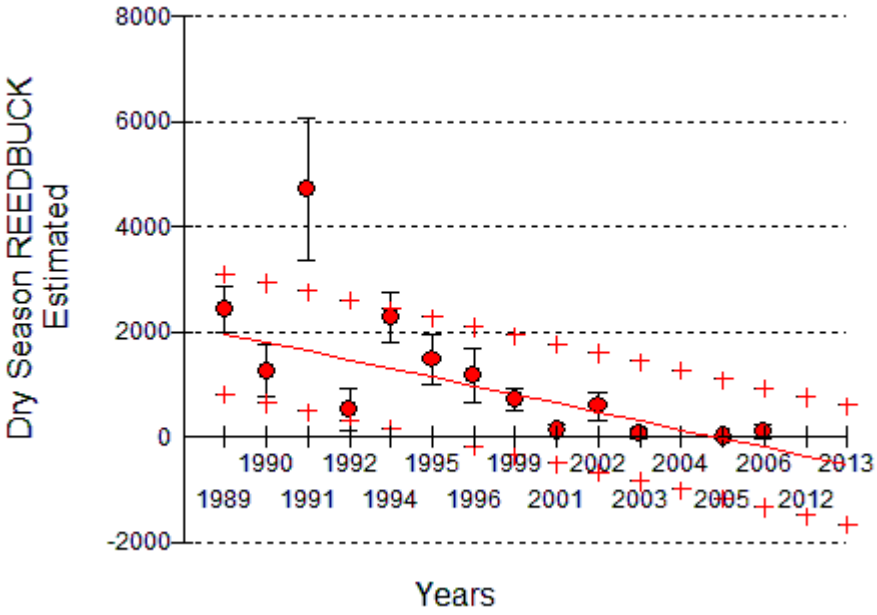
The population of impala has remained steady and/or constant with no statistical growth.



The kudu population has remained low with a slightly steep decline but not statistically significant to the overall population size.



The ostrich population has remained constant throughout the years as shown by the trend line.



There was an observable downward trend in the population, hence a cause of concern for the species.

Control of Alien Invasive Species

The control of alien invasive species is the responsibility of the Department of Water and Sanitation whose core mandate is to plan, assess, develop and manage the country's water resources in a sustainable way and achieve equitable distribution to all sectors of the economy. Therefore, it has responsibility to manage the Okavango Delta's water resources and this is currently achieved thorough hydro-monitoring, water quality monitoring, pollution control and control of alien invasive species salvinia, *Salvinia molesta* Mitchell through its length and breadth. This section of the report will therefore not only focus on interventions on the control of alien invasive species only, but will also speak to the hydro-monitoring, water quality monitoring and pollution control.

These activities supports the Monitoring section in the "Okavango Delta World Heritage Nomination Dossier" which clearly states that effective monitoring for the system requires a spatially distributed network to incorporate basic hydrological and water quality variables at important locations along each of the major distributary systems, the inflow (Mohembo) and all of the outflows with a representative climatic data and rainfall.

Hydrological Monitoring

There are a total of 129 hydrological stations in the Okavango Delta of which 87 stations are accessible and constantly monitored while the rest are either not accessible due to vegetation

blockages or abandoned as the stations are not strategically placed. The core zone of the World Heritage Site area has 67 stations across and 47 are operational. All these stations are in perennial riverine areas and being monitored for water flow discharges and water levels. The Mohembo inflow station is out of the core zone area and its daily inflows determines the wet and dry conditions of the delta (Figure 1). The scale of flooding in the delta influences water resource use for tourism and communities especially in the out flow rivers.

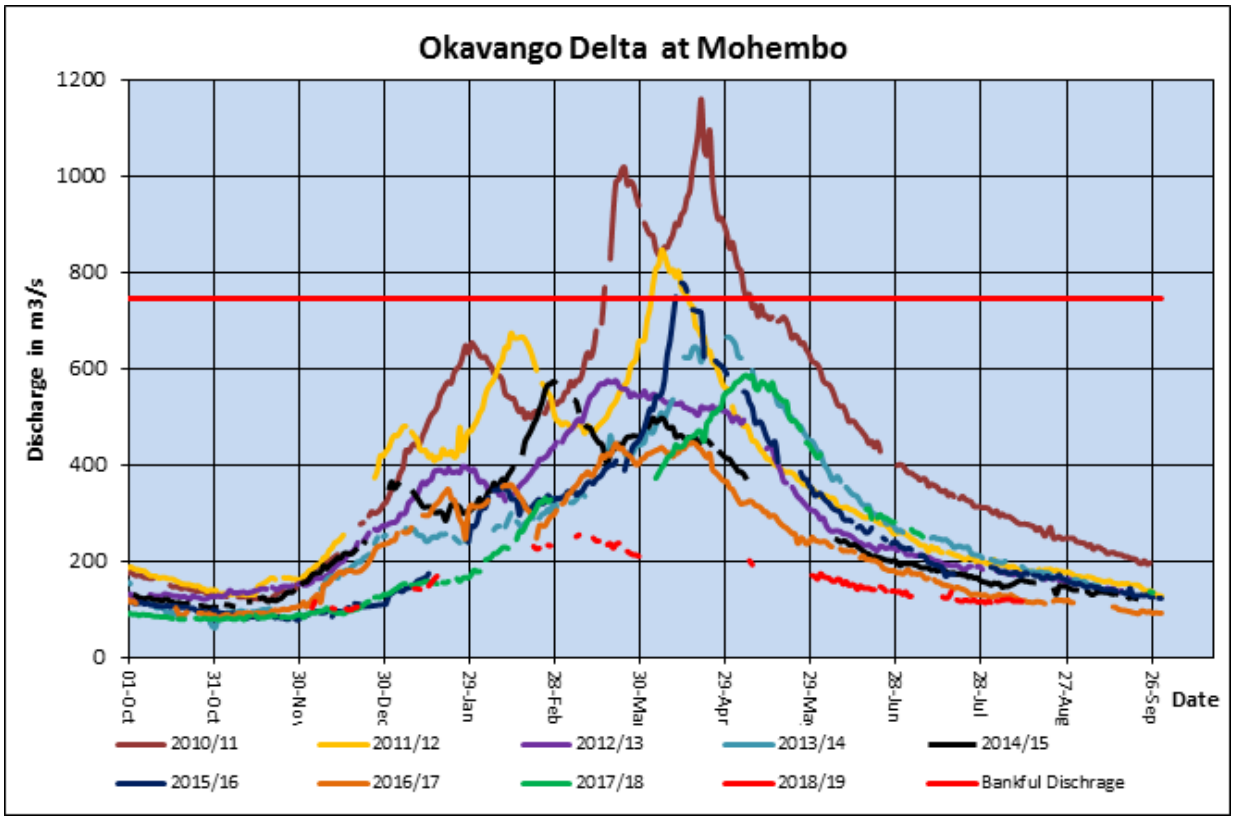


Figure 1- annual Discharge at Mohembo Hydro Station

Current Status

The Okavango Delta derives its water from the Angolan highlands at Huambo. The 2018/19 rainy season was one of the driest periods since 1981 in the central and western parts of the SADC region. The season has been characterized by below-normal rainfall due to delayed and erratic onset of rains.

As a result of below-normal rainfall during the 2018/19 hydrological year, the entire core zone area of the Okavango Delta experienced very low inflows and water levels resulting in the drying of the outflow rivers including the Thamalakane, Boro and Kunyere river systems. Even though the flows and water levels at Mohembo hydrological station started rising

gradually starting from the months of November/December 2019 due to the current rainy season, the system has generally experienced a decrease in water volumes over the past few years since 2010/2011 hydrological year to date, see Figure 1 above. As at mid-January 2020 the water levels at Mohembo are slightly below the 1 meter depth, at (0.860m) as compared to the same period of the previous year (0.665m).

Currently most of the Outflow Rivers which lies along the lower parts of the Okavango Delta remain dry except some patches of stagnant water which are visible along some sections of the rivers as a result of current rainfall.

Factors that led to the low flows/water levels

- Insufficient rainfall contribution in the Okavango Basin especially in Angola and Namibia during the past rainy season 2018/2019, hence less runoff.
- High temperatures in the region resulting in water loss through evaporation.
- Water loss through percolation resulting in reduced flows as the river beds were dry.
- The existence of many dried lagoons/pools and flood plains that had to be filled first resulting in the delaying of flows.

Alien Invasive Salvinia molesta

The mitigation measure for salvinia control has been in place in the form of the host-specific biological weevil, *Cyrtobagous salviniae* Calder and Sands. With established norms and policy, the Aquatic Vegetation Control Unit (AVCU) has been continuously assessing the salvinia control biologically as well as applying the physical control wherever is warranted. The array of activities involved monthly field new infestation surveys and biological control weevil establishment by sampling and assessment. There are 53 salvinia monitoring sites in the Okavango Delta. Salvinia control has been thoroughly established in all infested sites where the biological control is yet to be established to ecologically acceptable levels.

The aim of the biological control program is not to eradicate the weed, but to reduce abundance to the level where it no longer causes a problem. Small residual mats of salvinia will continue to harbor the weevils so that if regrowth of salvinia occurs as a result of favorable conditions with sufficient nutrients, control agents can build up rapidly to restore control.

The following are salvinia bio control sites where distribution and successful control of Salviniae molesta with its weevil Cyrtobagous salviniae in the Okavango Delta was established since 2016;

1. Abaqao River =1 site

2. Maunachira River = 8 sites
3. Khwai River = 15 sites
4. Bodumatau = 2 sites
5. Xini = 1 site
6. Mogogelo Rivers = 2 sites
7. Gomoti River = 2 sites
8. Santantadibe River = 10 sites
9. Matsibe River = 1 site
10. Boro River = 3 sites
11. Thamalakane River = 7 sites
12. Xudum River = 1 site

Total monitoring sites = 53 sites

Current Status

In May 2017 new salvinia infestation of significant nature was observed along Xudum River at Nxaraga area. Monitoring of the new infestation revealed that the biocontrol weevil has slowly established by the weevil-infested mat floating from the upstream and control has been achieved.

This clearly indicates that the weevil has been widely established well in most of the sites/areas of Moremi Game Reserve. All the other sites monitored in the core zone have abundant number of adult weevils as determined by scientific methods. Therefore, it indicates that biological control progress in the Salvinia infestations has been under constant progress and maintained in most of the core and buffer zones of the Okavango Delta.

Salvinia Control - Stakeholders

The ecotourism businesses and riparian communities have benefitted and secured enormously from the control of salvinia weed in the Okavango Delta. Complaints of difficulty in navigating the streams due to thick blockage of salvinia mats, for tourism recreation and other activities have been reported. But DWS's sustainable monitoring of salvinia has improved considerably and several pools and lagoons are accessible to wildlife for water use.

Training program of Tourist Guides in the Moremi Safaris and Camp Moremi (Desert & Delta), Sandibe (&Beyond) and Khwai River Lodge (Belmond) in the core zone was reviewed in 2018 to revitalise the delivery partnership in biological control of salvinia. The revised program includes assembling of new weevils breeding portable pools at specific sites

in the Delta and will be rolled out during 2020/2021 financial year. This program other than the control of Salvinia benefit some lodges as they now use it as part of sightseeing, environmental education and tourism marketing.

Okavango Kopano Mokoro Community Trust (OKMCT) has been involved in the physical control of salvinia and intermitted river vegetation blockages along Santantadibe River. This has allowed ease of navigation for their ecotourism activities which entails transporting tourists on canoes.

Water Conservation

The water conservation program continues to intensify the practice of water conservation and demand management in the delta. This is intended to significantly reduce the volumes of water abstractions and increase the utilization of alternative water resources including effluent and grey water recycling in the core zone area of the Delta. This is realized through education and awareness which forms part of the pollution inspections.

Pollution Control

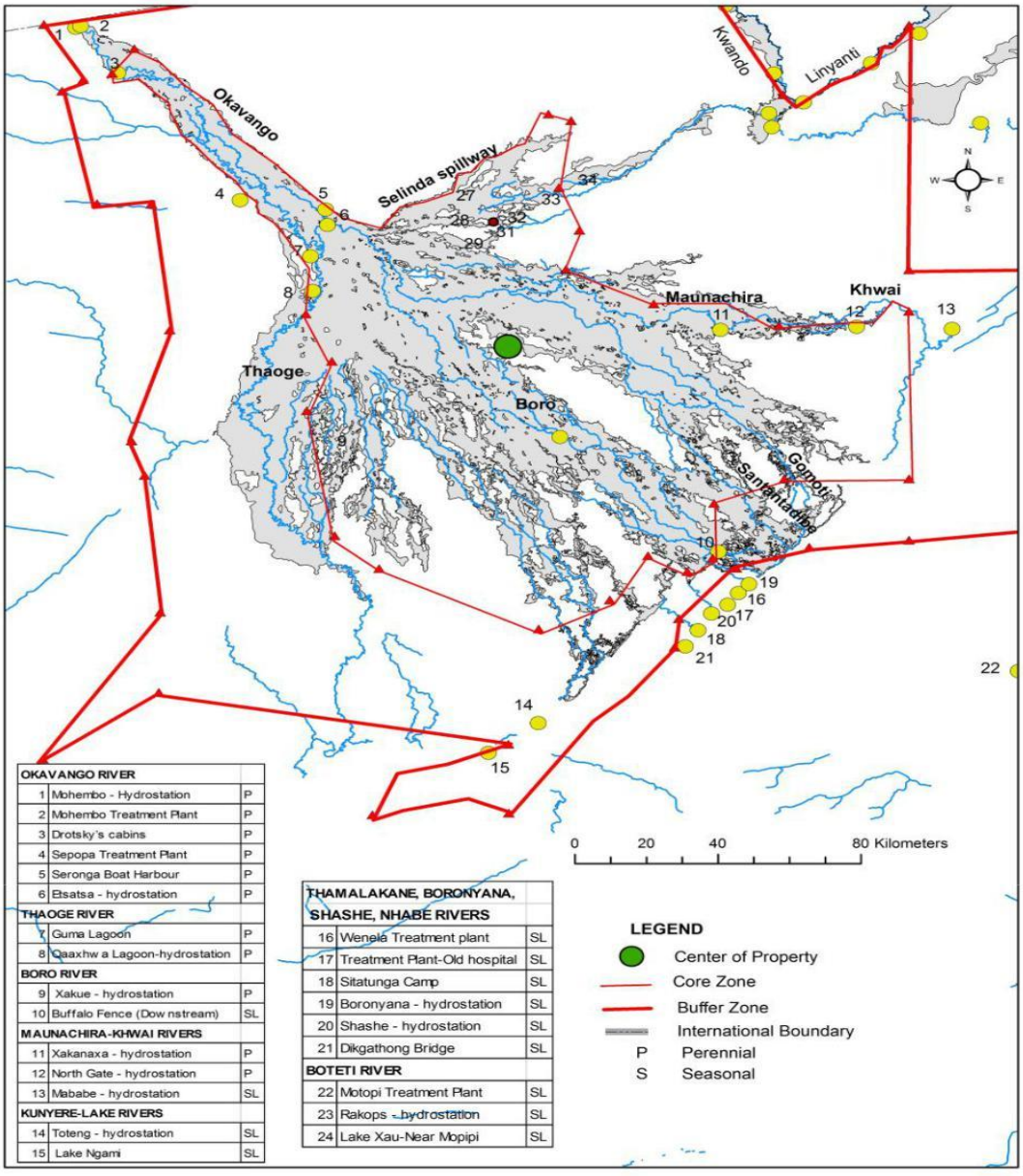
The surveillance of wastewater generating to abate pollution of the Delta currently targets fifteen (15) wastewater generating facilities across the breath of Okavango Delta. These facilities are checked for compliance to Botswana Standard (BOS 93:2012) for the discharge of wastewater in to the environment and general wastewater best management practices. Currently ten (10) facilities were inspected during the 2019/2020 inspection programme and none is in compliance. In the previous year (2018/2019) only five (5) of the total fourteen (14) facilities inspected were in compliance.

Majority of the facilities did not meet the above mentioned criteria either due to the quality of the effluent, poor infrastructure and mainly the use of soak away. The use of soak away does not provide for sampling of the effluent due to the nature of the technology. However, the use of soak away in the Okavango Delta violates the “Guidelines for waste management for development in a Wildlife Management Area in Botswana that may produce solid or liquid waste”. These facilities are continuously engaged through the surveillance exercise, environmental audits and education/awareness activities to encourage a shift to safer methods of effluent disposal.

Water Quality Monitoring

The overall aim of the monitoring programme is to ensure the long-term water resources management and protection of the Okavango delta and to determine the baseline condition of the delta.

DWS started a revised systematic water quality programme for the surface water component of the Okavango Delta between 2011 and 2012. Presently there are twenty four (24) sampling sites in the Okavango Delta (Annex 1) of which nine (9) are in the Core Zone. Sampling is done quarterly and the samples are analyzed for Electrical Conductivity, Dissolved Oxygen, total phosphate, Ca, Mg. Na, K, Fe, Mn, Cl, SO4, NO3, CO3, HCO3 to identify trends in the water quality over time and infer its influence on the ecosystem. Unlike other parameters, hydrocarbons are done on special cases only. The Okavango Delta is still in its pristine state in terms of its water quality.



OKAVANGO RIVER		
1	Mohembo - Hydrostation	P
2	Mohembo Treatment Plant	P
3	Drotsky's cabins	P
4	Sepopa Treatment Plant	P
5	Seronga Boat Harbour	P
6	Etsatsa - hydrostation	P
THAOGE RIVER		
7	Guma Lagoon	P
8	Qaaxhw a Lagoon-hydrostation	P
BORO RIVER		
9	Xakue - hydrostation	P
10	Buffalo Fence (Dow nstream)	SL
MAUNACHIRA-KHWAI RIVERS		
11	Xakanaxa - hydrostation	P
12	North Gate - hydrostation	P
13	Mababe - hydrostation	SL
KUNYERE-LAKE RIVERS		
14	Toteng - hydrostation	SL
15	Lake Ngami	SL

THAMALAKANE, BORONYANA, SHASHE, NHABE RIVERS		
16	Wenela Treatment plant	SL
17	Treatment Plant-Old hospital	SL
18	Sitatunga Camp	SL
19	Boronyana - hydrostation	SL
20	Shashe - hydrostation	SL
21	Dikgathong Bridge	SL
BOTETI RIVER		
22	Motopi Treatment Plant	SL
23	Rakops - hydrostation	SL
24	Lake Xau-Near Mopipi	SL

Figure 2: Systematic water quality monitoring sites in the Okavango Delta.

Para 8: ***Further noting*** ***that the construction of a cable-stayed bridge across the panhandle area of the property and hardening of the associated approach road has begun at Mohembo based on a 2009 EIA,*** ***considers*** ***that the measures identified in the EIA are insufficient as they do not take into account the property's World Heritage status, and*** ***further requests*** ***the State Party to revise the EIA, in line with the IUCN Advice Note, prior to continuing the work, in order to include an assessment of the potential impacts of the construction and use of the bridge and road on the property's OUV, and submit it to the World Heritage Centre for review by IUCN.***

The Government of Botswana (GoB) is implementing recommendations of an Environmental Impact Statement (EIS) which was developed for the project. Within the EIS there is an Environmental Management Plan (EMP), a plan developed to guide impact mitigation and monitoring. The EIS was considered adequate by the Department of Environmental Affairs (DEA) and was duly authorised in line with the Environmental Impact Assessment Act (2005).

While we appreciate the concerns by the Committee and their call for the review of the EIS for the Bridge, we have not been able to do so. Instead an environmental audit of the project was carried out in October 2018.This was meant to ascertain if the issues identified and the mitigation measures proposed in the report are relevant and if the EIS is adequate to guide the construction of the bridge. The audit afforded other technical department including the Department of Water Affairs and Sanitation, Water Utilities Corporation, Department of Forestry and Range Resources, Department of National Museum and Monument, Department of Wildlife and National Parks, Department of Waste Management and Pollution Control, Department of Mines and other regulators to participate in the compliance monitoring activities. The audit afforded the Department of National Museum & Monuments as the custodian of the convention, to include aspects which speaks to the impact on the OUV and integrity of the property as part of the audit protocol that was to be used for conducting the audit. The audit was carried out and a preliminary findings were shared with the consultant to address while awaiting a full report, which at the time of writing this report was not available.

Appendices

Appendix 2 – Okavango River Crossing Audit Protocol

Audit Date	14-16 August 2018
Audit Team Leader	Mr. Dikeme Kgaodi, DEA
Audit team members	DEA, DWMPC, Department of National Museum, Department of Occupational Health and Safety, DWA, DWNP, Labor, DHMTC- Gumare, Environmental Health

AUDIT ITEM	RECORDS TO BE CHECKED/EXAMINED EVIDENCE	COMPLIANCE WITH EMP		PERFORMANCE RATING (INTERMS OF IMPLEMATATION OF MITIGATIONS& EFFECTIVENESS)	FINDINGS/OBSERVATION
		Yes	No	0-5	
EMP Implementation • Verify if the EMP is readily available onsite. • Examine the EMP Authorization. • Who is responsible for implementation of the EMP? • Verify that there is budget for EMP implementation. • Verify availability of the Company's Environmental Policy. Does the policy recognizes the following environmental aspects: o Air emission o Waste management o Soil pollution o Natural resource usage o Hazardous and toxic material o Impact on wellbeing (e.g. noise, smell, dust) o Other environmental specific issues on site such	Examine the following records: • EIS/EMP • EMP Authorization letter • Environmental Officer Designation from HR • EMP Implementation Budget from the Project budget				

as housekeeping and safety. o Commitment to prevent pollution • Verify if employees have been inducted on environmental awareness.	• Records of awareness workshop (attendance register)				
AUDIT ITEM	**RECORDS TO BE CHECKED/EXAMINED EVIDENCE**	**COMPLIANCE WITH EMP**		**PERFORMANCE RATING** (INTERMS OF IMPLEMATATION OF MITIGATIONS& EFFECTIVENESS)	**FINDINGS/OBSERVATION**
		Yes	No	*0-5*	
<u>Contractor's Camp</u> **Staff Houses** o General upkeep o Signage o Containment of solid and liquid waste o EMP o Fire management equipment **Fuel Point Facility** o Permit from Department of Energy Affairs o Water/oil Separator o EMP o **Fire management equipment** **<u>Workshop &Maintenance areas</u>** • Inspect the general workshop areas and verify	• DEA clearance				

the following: o Signage at the workshop areas o General upkeep of the workshop o Containment of solid waste o Containment and management of used oil o Containment and management of metal off- cuts o Presence of oil-water separators o **Fire management equipment** o Expiry dates o Last date of maintenance	•				
• **Waste Management Plan** ▪ Verify if there are arrangement for waste collection ▪ Training and awareness on handling and management of hazardous waste ▪ Solid Waste Management ▪ Sewage management facility	• Records of awareness workshop (attendance register) • Minutes and attendance register • Records of Waste collector • Records of Waste collector • Evidence of recycling activities				

▪ Disposal method					
▪ **<u>Batching Plant</u>** ▪ General upkeep ▪ Signage ▪ Containment of solid and liquid waste ▪ EMP	• EIA clearance				

▪ **Environmental Management System** ▪ Establish if SHE monitoring Committees have been set up ▪ Constitution of the committee ▪ Check if there are clear roles and responsibilities for the committee	• • Minutes and records • Training and awareness plan				
<u>Ecology</u> **<u>Fauna</u>** ▪ Request for baseline report ▪ Establish if workers have been sensitized about wildlife and general conduct ▪ Verify if the working area is secured? ▪ Check the following: ▪ Areas where animals can access the site. ▪ List of all fauna species and their IUCN status ▪ Wildlife sightings o Human wildlife conflicts incidents **<u>Flora</u>** ▪ Request for baseline report for flora in on site (both terrestrial and aquatics) o Threatened and endangered species o Observe the area for any Invasive species	• Baseline report • Workshop/awareness reports and attendance register • Incidents Register (e.g. Wildlife mortality due to vehicle collisions) • Records of wildlife sightings • signage • inventory of				

	threatened and endangered flora species • report on species identification				

AUDIT ITEM	RECORDS TO BE CHECKED/ EVIDENCE	COMPLIANCE WITH EMP		PERFORMANCE RATING (INTERMS OF IMPLEMATATION OF MITIGATIONS& EFFECTIVENESS)	FINDINGS/OBSERVATION
		Yes	No	0-5	
▪ **<u>Fire</u>** Fire management strategy Dedicated staff for fire management	▪ Firefighting equipment ▪ Fire assembly point ▪ Records of fire drill/induction/ awareness ▪ Certificate of trained staff				
Archaeological Impact Assessment ▪ Availability of an Archaeological Impact Assessment and Clearance ▪ Awareness raising activities on identification of archaeological finds and the process ▪ Availability of an archaeological Consultant ▪ Was there any chance finds discovered during some project activities? ▪ What was the process followed during this encounter? What were the mitigation measures put in place to handle the	AIA report AIA Clearance Attendance register for awareness meetings Report on the awareness activity HR records on engagement of a consultant Notification to DNMM				

archaeological finds ▪ Awareness of the EIA process for World Heritage Sites ▪ Does the developer recognize or acknowledge the project area as World Heritage and Ramsar sites ▪ Staff awareness on the Ramsar and World Heritage Attributes/values and Criteria ▪ Identification of the values or attributes of the project site as a World Heritage and Ramsar site ▪ Availability of mitigation plan for assessing the impacts of the activities on the attributes ▪ Ramsar and World Heritage Criteria	Report on the chance finds Report on the adherence to the IUCN requirements World heritage nomination dossier and boundary maps ODRS information sheet Minutes and attendance register Compliance to the Ramsar and World Heritage Criteria Report on the values and attributes Mitigation plan for attributes				
<u>Water</u> **SURFACE WATER QUALITY MONITORING** ▪ Identify water quality sampling points ▪ Verify the baseline report for water quality monitoring and listed parameters ▪ Request for map of monitoring sites	• Baseline Report • Map • Weekly, Monthly Reports				

▪ Verify sampling points ▪ Establish in situ methods used ▪ Request for Analytical Results and compare with standard ▪ Check for compliance ▪ Verify if quarterly report are submitted to PECO and signed off ▪ Establish equipment used for onsite monitoring ▪ Establish criteria used for choosing the sampling points ▪ List of parameters monitored ▪ Frequency of sampling (weekly and Monthly) ▪ Protocol for sampling ▪ Methods of sampling ▪ Containers used for sampling ▪ Holding times for samples ▪ Storage for samples ▪ Transportation of samples • Onsite field sheets ▪ Determine methods used ▪ Laboratory analytical methods **STORWATER MANAGEMENT** • Request for the plan for storm water management ▪ Establish Destination for storm water discharge • Request monitoring records of the storm	• Signed quarterly reports • Protocols • Field sheets ▪ Plan ▪ Monitoring records				

water. • Check for compliance to BOS 93:2012 **HYDROLOGY** ▪ Establish site for monitoring the following; **cross sectional area,** **discharge** **water levels** Frequency of monitoring Methods used for monitoring • Verify monitoring data **GROUNDWATER MONITORING** • Establish the monitoring borehole sites **AQUATIC LIFE** ▪ Request for: ▪ Baseline reports for aquatic life ▪ List of species residing in the system ▪ Incidents reports on aquatic life ▪ Frequency of monitoring ▪ Awareness raising for staff working in the river ▪ Mitigations measures for impact on aquatic life	• Cross sectional diagram • Monitoring reports • Monitoring reports • Map • Baseline report • Incident report • Workshop proceedings • Attendance register				

▪ **<u>Soils</u>** ▪ Where is top soil stored? ▪ How it the soil stockpile maintained? ▪ Check the height of the stockpile. ▪ Inspect the stockpiled top soil and check for signs of erosion (Gullies). ▪ Verify if top soil has been stored separately from quarry waste material? ▪ Verify if impacted areas are being rehabilitated? ▪ Observe discoloration of earth material particularly around fueling points, generators, transformers, etc.	• Rehabilitation plan				
▪ **<u>Air quality</u>** ▪ Request for air quality baseline report ▪ Check air quality monitoring sites. ▪ Verify availability of dust suppression plan (showing frequency and methods) ▪ Establish if there are any public complaints	• Baseline report • Monthly Air quality monitoring reports • Complaints register				

AUDIT ITEM	**RECORDS TO BE CHECKED/ EVIDENCE**	**COMPLIANCE WITH EMP**		**PERFORMANCE RATING** (INTERMS OF IMPLEMATATION OF MITIGATIONS& EFFECTIVENESS)	**FINDINGS/OBSERVATION**
		Yes	**No**	**0-5**	
<u>Noise</u> • Request for noise baseline report • Verify availability of ambient noise monitoring sites. • Who undertakes noise monitoring? • Check conformance of noise monitoring to available standards. • Establish if there are no complaints related to the aspect	• Noise Baseline report • Monthly reports for Noise quality				

AUDIT ITEM	RECORDS TO BE CHECKED/ EVIDENCE	COMPLIANCE WITH EMP		PERFORMANCE RATING (INTERMS OF IMPLEMATATION OF MITIGATIONS& EFFECTIVENESS)	FINDINGS/OBSERVATION
		Yes	No	0-5	
Waste Management ▪ Specify where the different waste streams from the project are disposed. ▪ Has there been any waste awareness campaign conducted for workers? ▪ Is there evidence of waste separation at source? ▪ Verify if there are waste recycling/reuse initiatives? ▪ Ascertain measures put in place to reduce waste amount produced by the project. ▪ Are there measures to store general waste onsite? ▪ Is there evidence of general waste around the site? ▪ Is scrap metal stored in a properly constructed storage area? ▪ Is the storage area licensed as per the requirements of the DWMPC? ▪ Is used oil stored appropriately onsite? ▪ What is the final disposal for used oil? ▪ Observe the facilities for waste oil storage onsite.	Waste disposal certificates Waste Records Minutes and attendance register				

AUDIT ITEM	**RECORDS TO BE CHECKED/ EVIDENCE**	**COMPLIANCE WITH EMP**		**RATING** (INTERMS OF IMPLEMATATION OF MITIGATIONS& EFFECTIVENESS)	**FINDINGS/OBSERVATION**
		Yes	No	0-5	
<u>Socio- economic issues</u> ▪ Verify if there is a communication strategy available. ▪ Is the strategy detailed enough to involve a wide range of stakeholders? ▪ How many workers employed at the project are locals? ▪ Have locals been trained for required skills? ▪ How many locals have been trained? ▪ What is the procedure for hiring staff for different project operations? ▪ Are there deliberate measures for skills development of the employees? ▪ Are there any locals contracted to provide specific service for project?	• Communication strategy • Training records • Employment records				

AUDIT ITEM	**RECORDS TO BE CHECKED/ EVIDENCE**	**COMPLIANCE WITH EMP**		**PERFORMANCE RATING** (INTERMS OF IMPLEMATATION OF MITIGATIONS& EFFECTIVENESS)	**FINDINGS/OBSERVATION**
		Yes	No	0-5	
<u>Social Issues</u> ▪ Has there been any grazing land uptake by the project? ▪ Which components need to be fenced ▪ Have there been registered complaints by the nearby communities regarding grazing land uptake? ▪ Are there any private properties that were resettled? ▪ Describe how the individual household cattle posts/ploughing fields were resettled. ▪ Has the company upgraded any infrastructure? ▪ How are access roads to the sites maintained? ▪ Does the Company have a workplace Policy? ▪ Is the Policy being implemented?	Work place policy Complaints register Resettlement programme				
▪ **<u>Traffic Safety</u>** ▪ Are there observable road signage's along the access road to the borrow pits? ▪ Are there stipulated times for transportation of gravel material? ▪ Are these times being adhered to?					

▪ AUDIT ITEM	RECORDS TO BE CHECKED/ EVIDENCE	COMPLIANCE WITH EMP		PERFORMANCE RATING (INTERMS OF IMPLEMATATION OF MITIGATIONS& EFFECTIVENESS)	FINDINGS/OBSERVATION
		Yes	No	0-5	
▪ **<u>Environmental Health & Safety</u>** ▪ **Risk of fire occurrences** ▪ Check if areas with high risk of fire occurrence have been identified and profiled. ▪ Check availability of fire extinguishers. ▪ Check validity and adequacy of fire extinguishers. ▪ Check staff training on fire safety. ▪ Check for fire breakers especially for areas with highly flammable liquids. ▪ Check if fire extinguishers are appropriate for the type of fire to be extinguished.					
▪ **Risk of injuries** ▪ Check for incident report ▪ Check availability of first aid kit ▪ Check availability of trained personnel ▪ Check if there is a Health and Safety Management System and emergency plan in place					
▪ **Personal Protective Clothing** ▪ Check provision of PPE to all staff and frequency ▪ Check if there are measures in place to ensure effective usage of PPE ▪ Check if the PPE is appropriate for every operation					

AUDIT ITEM	RECORDS TO BE CHECKED/ EVIDENCE	COMPLIANCE WITH EMP		PERFORMANCE RATING (INTERMS OF IMPLEMATATION OF MITIGATIONS& EFFECTIVENESS)	FINDINGS/OBSERVATION
		Yes	No	0-5	
Sanitary Conveniences ▪ Check if the sanitary facilities provided are adequate (toilets, Showers and wash hand basins) ▪ Check the status of repair ▪ Check for proximity of the sanitary conveniences in all operation areas					

Audit team members

1. Mr Dikeme Kgaodi, DEA, Team leader
2. Mr. Jobe Manga, DEA
3. Paulus Matthys, DEA
4. Mr. Yamase Kabelo, DWMPC
5. Mr. Lesego Seakanyeng, DEA
6. Ms. Ivy Mogotsi, DEA

Appendix 2 – Preliminary Findings Letter

ENVIRONMENTAL AUDIT FOR THE OKAVANGO BRIDGE PROJECT

The above subject matter refers.

Following an environmental audit for the above mentioned event conducted by the Department of Environmental Affairs (DEA) from 14th to 16st August 2018 find below a list of preliminary findings (non-conformities) and recommendations by an audit team:

1. The EMPs and Authorizations are readily available onsite. However, there are no EMPs and authorizations for the Contractor's camp and Shakawe Burrow pit. This is a contravention of the Section 9 of EA Act for which the developer will be fined.
2. The environmental team responsible for implementation of the EMP is inadequate as evidenced by lack of specialists like Aquatic Biologist, Air quality, Hydrologist and Archaeologist e.t.c.
3. There is no Environmental Policy Statement.
4. No documentation of implementation of some EMP components.
5. Malfunction of the Waste Water Treatment Plant as evidenced by surrounding vegetation and overflowing plant.
6. Improper handling of chemicals as evidenced by chemicals stored on unbunded surfaces.
7. Lack of signage for designated areas.
8. The auditee has engaged unlicensed waste collection carriers for used cooking oil, scrap metal and clinical waste as evidenced by failure to produce licences.
9. There is no monitoring for flora and fauna. Most records presented under this aspect are questionable. E.g. quarterly reports for Jan- Mar 2018 signed by a newly appointed officer; Letter from DWNP dated 7th Aug 2018; Unsigned letter from DFRR.

10. Lack of staff induction and awareness raising conducted for archaeological chance finds and lack of chance finds reports.

11. Project activities are not aligned to International obligations, e.g. SADC Protocol, OKACOM (Strategic Action Plan), The Ramsar Strategic Plan 2016-2024 (ODMP).

12. Siting of some sampling points do not cater for possible pollution from project activities.

13. Results not presented in way that they are easy to interpret. Analysis of results done but lack interpretation.

14. Some key parameters not monitored, e.g. hydrocarbons, microbiology.

15. Inconsistency in sampling as evidenced by gaps in records, e.g. Nov- Dec 2017 and Jan 2018

16. Some vital environmental aspects/conditions not recorded in sampling as evidenced by absence of such in the Field sheet.

17. Most results in the water quality are above baseline but there is no deliberate action to investigate.

18. No baseline on cross section of the river. Water discharge also not measured (flow).

19. No Water levels gauges as evidenced by use of makeshift gauge.

20. No monitoring plan for sediment deposits.

21. Monitoring data is questionable as evidenced by recording of data in the presence of auditors.

22. Evidence of soil erosion from storm water trenches and there is no deliberate action to avert it.

23. Storm water drains into the flood plain without deliberate measures to trap sediments or test the water quality.

24. Monitoring station for BTEX impeded by soil stockpile.

25. Dust suppression plan unavailable.

26. Dust suppression done for some areas but lacks in key areas where there is heavy plant.

27. Lack of noise monitoring at source for noisy machinery. Monitoring reports unavailable save for May 2017.

28. Complaints registers kept but there are no complaints registered.

The audit team recommends that the following be undertaken;

a) Developer is instructed to submit a corrective plan for the malfunctioning WWTP within 7 days from today.
b) Developer should consider engaging the services of the following personnel for implementation of the EMPs (archaeologist, aquatic biologist, air quality specialist e.t.c)
c) Develop records management procedures to aid management of environmental management records.
d) Data must be analysed and interpreted.
e) There must be consistency in monitoring parameters
f) Developer must align project activities to multi-lateral agreements.
g) Commence aquatic life (flora and fauna) monitoring forthwith.
h) Engage licensed waste collectors for scrap metal, used oil and clinical waste and ascertain final disposal destination.
i) Undertake cross sectional survey and monitor the parameters.

Note the Department is working on the draft audit report which will be distributed in due course.

Thank you.