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## *SAREP Technical Series – Volume 5*

# Mid-Term Review and Gap Analysis of the Okavango Delta Management Plan



**December 2013**

This publication was prepared for review by the United States Agency for International Development, the Permanent Okavango River Basin Water Commission (OKACOM), and the Directorate for Infrastructure and Services – Water Division of the SADC Secretariat. It was prepared by Chemonics International.



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## ABBREVIATIONS AND ACRONYMS

BOBS	Botswana Bureau of Standards
BTO	Botswana Tourism Organization
CA	Conservation agriculture
CAAB	Civil Aviation Authority of Botswana
CBD	Convention on Biological Diversity
CBNRM	Community Based Natural Resources Management
CBO	Community Based Organization
CHA	Controlled Hunting Area
DAHP	Department of Animal Health and Production
DDC	District Development Committee
DEA	Department of Environmental Affairs
DFRR	Department of Forestry and Range Resources
DLUPU	District Land Use Planning Unit
DoT	Department of Tourism
DVS	Department of Veterinary Services
DWA	Department of Water Affairs
DWMPC	Department of Waste Management and pollution Control
DWNP	Department of Wildlife and National Parks
EIA	Environmental Impact Assessments
EMP	Environmental Management Plans
FMPOD	Fishery Management Plan for the Okavango Delta
FPIC	Free Prior and Informed Consultations
GIS	Geographic Information System
GOB	Government of Botswana
HATAB	Hospitality and Tourism Association of Botswana
HEC	Human/elephant conflict
HWC	Human/wildlife conflict
ICMM	International Council on Mining and Metals
ISO	International Standards Organization
IT	Information Technology
IUCN	International Union for Conservation of Nature
IWMP	Integrated Wetland Management Plans
KCS	Kalahari Conservation Society
LAC	Limits of Acceptable Change
M&E	Monitoring and Evaluation
MEWT	Ministry of Environmental Wildlife and Tourism
MMEWR	Ministry of Minerals, Energy and Water Resources
MoA	Ministry of Education
MOMS	Management Oriented Monitoring System
MTIWAT	Ministry of Trade, Industry, Wildlife and Tourism
MtR	Mid-Term Review
NAP	National Action Plan
NBSAP	National Biodiversity Strategy and Action Plan
NCSA	National Conservation Strategy Agency
NDP	National Development Plan
NGO	Non-Governmental Organization
NTDP	Ngamiland Tourism Development Plan
NWDC	North West District Council
NWPS	National Wetland Policy Strategy
ODMP	Okavango Delta Management Plan
ODRS	Okavango Delta Ramsar Site
OFA	Okavango Fisherman's Association

OFMC	Okavango Fisheries Management Committee
OKACOM	Okavango River Commission
ORI	Okavango Research Institute
OWMC	Okavango Wetland Management Committee
PAC	Problem Animal Control
PAs	Protected Areas
PILUP	Participatory Integrated Land Use Plans
SAP	Strategic Action Plan
SAREP	Southern Africa Region Environmental Program's
TDA	Transboundary Diagnostic Analysis
TLB	Tawana Land Board
TLIMS	Tribal Land Information Management System
UNDRIP	United Nations Declaration on the Rights of Indigenous People
UNESCO	United Nations Educational Scientific and Cultural Organization
VDCs	Village Development Committees
VGB	Village Growth Boundaries
WMA	Wildlife Management Areas

# EXECUTIVE SUMMARY

## Overview: The ODMP and the Review Process

The Okavango Delta Management Plan is an integrated plan that serves as an overarching planning framework for the sustainable use, conservation, and management of the resources of the Okavango Delta Ramsar Site. Blending 12 contributing components, the ODMP, approved in 2008, has as its overall goal: *“To integrate resource management for the Okavango Delta that will ensure its long-term conservation and that will provide benefits for the present and future well-being of the people through sustainable use of its natural resources.”*

*The Review Process* - The ODMP mid-term review assessed the overall performance of the plan with regard to its stated objectives, set targets, and expected outcomes, with a view to updating of the plan with modifications to some original recommendations of the ODMP and new recommendations as needed. Recommendations were developed to ensure effective, efficient plan implementation, based on a management-oriented implementation strategy. Additionally, the review included a monitoring framework with well-defined indicators.

The review comprised a four-stage process – inception, scoping/gap and situational analysis, report drafting and review, final report – that drew heavily on stakeholder inputs throughout. Stakeholder workshops were organized into thematic areas according to processes and activities as follows:

- Tourism, Agriculture, and Mining Thematic Areas Workshop;
- Land Use and Socio-Economic Thematic Areas Workshop;
- Biodiversity, Hydrology (and Mining) Thematic Areas Workshop.

*ODMP Implementation Approach* - The implementation strategy for the ODMP was initially project-based. The ODMP Coordination Unit was set up in Maun and worked with sector line ministries during formulation of the plan. (The ODMP Coordination Unit was later transformed into the Department of Environmental Affairs-Maun.) During formulation, key advisors were placed within the ODMP Coordination Unit and others were outsourced. The advisors interacted with the line ministries, private sector, resource users, and communities to define the ODMP strategy. Stakeholders considered this approach effective, as they noted that projects embedded in government bodies often function poorly.

*Sustainability Approach* - The ODMP was the first of its kind developed for Botswana wetlands following the Ramsar Convention Guidelines, meant to guide the balancing of conservation and socio-economic development goals. Other key wetlands in Botswana include the Makgadikgadi, and the Chobe-Kwando-Linyanti. ODMP formulation failed to document a clear, pragmatic approach to replicate the ODMP in other of Botswana’s wetland systems and others in the region. Sustainability was supported by integrating implementation costs within sector budgets in government, and by securing long-term commitments from the private sector. However, beyond these actions no sustainability plan was formulated for the project, and stakeholders said component reports had no common environmental threads around which sustainability planning could be done. Stakeholders consulted also widely agreed that the ODMP paid little attention to regional, sustainability-related issues of population growth and overall economic development, especially given the ODRS’s vulnerability to development pressures and changes. Accordingly, there is a need for an ODRS-specific regional development strategy that factors in key driving forces such as population growth and movement, demographic change, the increasing number of households, transportation and other infrastructural needs, economic changes, climate change, and their spatial implications.

## Key Findings in Thematic Areas

*Biodiversity* - The majority of biodiversity-related action items in the plan have not been implemented. Consensus among stakeholders consulted was that ODMP’s focus on biodiversity was

too narrow - restricted mainly to a few species with no integrated biodiversity program - and that the plan's approach to biodiversity conservation in a flood pulsed system such as the Okavango is not helpful. Additionally, it was noted that the ODMP did not focus enough on key issues and processes that would enable the ODRS to be maintained and wisely used as a functional ecosystem. (The emphasis would more usefully be placed on securing higher-level processes that drive the system and target management on system-level threats/issues to biodiversity such as poaching and veld fires.) In addition, until recently there has been a lack of focused work on the impacts of climate change, habitat shifting and alteration, and possible dynamics of biodiversity. Poor community engagement and wildlife management were also cited as shortcomings in this thematic area.

*Hydrology* - The hydrology component has contributed in developing the hydrological modeling capabilities required for ODMP implementation. Regarding water pollution, the government of Botswana, through the North West District Council, has adopted a Waste Management Strategy within the ODRS and stakeholders expressed determination to make tourism operators in the Delta responsible for the strict control of effluent from their facilities into groundwater and into open water. However, overall progress in all other areas, including the ODMP-identified threats from climate change, seismic activity, large-scale water development, and pollution, was seriously delayed or found lacking.

Most recommendations, especially priority research and monitoring, in this thematic area have not been implemented per the ODMP. (It was observed that individual research agenda have thus far been pursued, rather than coordinated research programs that would be more focused and comprehensive.)

*Land Use* - With the Tawana Land Board (TLB) as the lead institution, an Integrated Land Use and Land Management Plan was developed for the years 2005-2029 as a component of the ODMP. The plan was developed around key stakeholder and community aspirations "to strengthen capacities for improved and better land use and land management practices, as well as wise and sustainable utilization of the ODRS's land and other resources during the plan period." The mid-term review found that the plan remains largely unimplemented and that there appears to be no concerted effort to overcome the key problems hampering the plan's implementation (lack of stakeholder buy-in, poor enforcement, lack of awareness of regulations, inflexible regulatory framework, and coordination among planning authorities, among others). Stakeholders consulted agreed that land management is a major obstacle to achieving sustainable development in the ODRS. The review noted that in spite of efforts and investments to improve the functioning of the TLB and subordinate land boards, sufficient measures (as originally prescribed in the Integrated Land Use and Land Management Plan) have not been taken to directly address issues contributing to poor land management in the ODRS. The TLB remains plagued by problems typical of poor manual land management information and record-keeping systems, as use of modern geo-information systems at TLB is still in its infancy, and suffers due to the inherent shortcomings of these systems. These problems have been identified as a serious 'dysfunction' in land use/land management decision-making across ODRS in this mid-term review.

*Tourism* - Despite challenges and notable delays in the implementation of some key action items in the tourism thematic area, findings of this mid-term review and views of stakeholders consulted show that, in comparison with other ODMP components, the tourism component has made great strides toward achieving its strategic objectives and critical activities as set out in the ODMP action plan. Almost all stakeholders consulted agreed that impacts of tourism activities on the ODRS ecosystem are being addressed, through requirements for environmental impact assessments and management plans, establishment of the Botswana Tourism Organization (BTO), and other means. Most tourists to the Okavango Delta pay a premium to visit the area, under Botswana's high-income, low-volume tourism development strategy. However, there is currently no means of ascertaining the environmental credentials of operators, nor are ecological risks (oil spills, waste disposal) well defined, and issues remain around citizen participation, waste management, carrying capacity, setting

eco-tourism standards, and limits of acceptable change. Climate change and its impacts on tourism and the ODRS as an ecosystem were completely ignored or omitted by the ODPM.

*Agriculture* - Agriculture was not treated as a thematic area in the ODMP project, and the importance of the sector has been downplayed in the ODRS. But several themes in the ODMP action plan related to agriculture were grouped together to form the agriculture thematic area for the mid-term review of the ODMP: Overgrazing by livestock; the risk of tsetse re-infestation; and livestock/wildlife interactions and maintenance of veterinary fences. Though some progress was noted in these three areas, the review noted a serious gap in the ODMP through the omission of arable agriculture in the action plan, on which a large part of the rural population in the ODRS depend for their livelihood. Conservation agriculture, which entails minimum or no tillage, can contribute to sustainable agriculture and rural development through improvement of efficiency in the use of inputs, increasing farm income, improving or sustaining crop yields, and protection and revitalization of the soil. For an environment such as the ODRS, where the protection of the environment and conservation are major goals, the omission in the ODMP of conservation agriculture was also noted as a major gap.

Under the action issue of overgrazing by livestock, the critical activities as per the ODMP action plan relate to carrying capacities. With regard to the reduction of the risk of tsetse fly re-infestation, the critical activity was for the Department of Animal Health and Production (DAHP) to dialogue with Angola, Namibia, and Zambia to create a Tsetse Free Zone. Because livestock diseases do not respect international boundaries, the countries of have established a regional tsetse eradication initiative called the Kwando-Zambezi Regional Tsetse Eradication Project. Through this initiative, a Tsetse Trans-boundary Free Zone has been established.

Another action item of the ODMP with an agriculture theme is reduction of livestock-wildlife interactions, with the critical activities being improvement of veterinary fence maintenance; public awareness campaigns on livestock disease control strategies; and assessment of the feasibility of providing livestock watering points in the sand veld areas. Presently, besides devising strategies for controlling problem animals, DWNP is also developing an elephant management policy. This mid-term review has noted that to foster co-existence between people and wildlife, the government instituted a compensation policy whereby farmers receive payments for damage caused to their properties. With regard to increased public awareness on livestock disease control strategies, DAHP is doing this through the sensitization of the public on the importance of vaccination programs. In effect, this critical activity in the implementation of the ODMP is being executed.

*Mining* - The Okavango Delta Management Plan also down played the issues surrounding mining in the ODRS. Of particular concern is that the concept of biodiversity offsets, as a method of compensating for unavoidable harm to biodiversity caused by mining and similar development projects, is not mentioned in the ODMP. Two additional issues are of particular concern. The first relates to the lack of planning, statutory, and other means of sterilizing of ODRS's mining reserves (if any) and delineating areas in the ODRS where mining should be discouraged to avoid significant impacts on biodiversity. Mining cannot take place in a World Heritage Site, and the Delta in all probability will soon be listed as a World Heritage Site. This issue is seen as a major obstacle in the ODRS. The second issue relates to environmental impact assessment procedures for mining. It appears that presently an EIA is only required for mining rights and not for prospecting. This could, in some cases, permit activities to go ahead which have significant impacts on biodiversity in the ODRS.

*Socio-Economic Aspects* - The mid-term review of the ODMP shows that while considerable progress has been made in implementation of recommended socio-economic programs and projects, several have not been implemented. Consultations with stakeholders revealed widespread consensus that activities under this strategic objective have not met the set targets, including preparation and implementation of guidelines for mainstreaming of HIV/AIDS, gender, and poverty into the ODMP implementation process. The capacity building action item (to enable communities to effectively apply community-based natural resource management, CBNRM) first required a capacity needs assessment of communities. To date, this has not been implemented. Though the Department of

Wildlife and National Parks - through its CBNRM office - has conducted workshops on natural resources management and training members of community trusts and their boards on a Management Oriented Monitoring System (MOMS), it is the view from the thematic area workshops that capacities among communities to manage their resources have not yet been fully built. Stakeholders consulted agreed that CBNRM's community enterprise investments have not generally been successful and the delivery of social services is often not sustained.

The plan recommended that in as much as the natural resources in the ODRS are an endowment for the whole country, the communities who depend directly on them for their livelihoods should be given some measure of control over who harvests these resources. The concern raised at the thematic area workshops was that access to some of these resources are open, which in itself poses threats to their sustainable use. The majority of stakeholders consulted felt that the regulations governing the exploitation and use of these natural resources are lax. To begin addressing these issues in the fisheries sector, the Okavango Fisheries Management Committee (OFMC) was formed through facilitation by the BiOkavango Project and the Department of Wildlife and National Parks, to facilitate co-management of fisheries between government and users. (The OFMC has also developed a code of conduct for the fisheries sector to address conflicts.)

*Institutional Aspects* - The institutional thematic area is one of the three original thematic areas of the ODMP, with its strategic goal being: "To establish viable institutional arrangements to support integrated resource management in the Okavango Delta at local [level], district level, national level and international (River Basin) level". The Department of Environmental Affairs (DEA) Regional Office has been established in Maun to lead coordination and monitoring of implementation of the ODMP. Stakeholders said that the DEA/Maun Regional Office is under-resourced in terms of staff and equipment to carry out this mandate and its other duties, and the objective of strengthening capacity within the DEA/Maun office has not been realized. Multiple government departments are responsible for respective implementation of ODMP's complex mandate, and responses from interviews suggest that the present arrangement limits integration and fosters an issue-driven approach to the implementation of the ODMP on a department-by-department basis. There is also general agreement that this state of affairs results in duplication of effort and overlapping of functions, which invariably have implications for time and financial resources.

A major staffing challenge, as noted from stakeholders, is that officers stationed in Ngamiland are frequently transferred when their acquired experience and knowledge would be most valuable. The review showed that, in general, most of the recommendations within the various ODMP components were unrealistic based on available resources and capacity within Ngamiland. DEA and other institutional structures put in place have no powers to enforce most of the ODMP's provisions. That responsibility remains with the sector institutions and departments over which the ODMP coordinating body (DEA) has no control. Through OKACOM, the opportunity exists to improve institutional arrangements as it has the capacity to take responsibility for management of the ODRS resources.

*Research and Monitoring Framework* - The ODMP included plans for monitoring changes in the various thematic areas together with tools for data/information gathering; sources of information; means of verification; and indicators. ODMP development was supported by construction of a simple but integrated GIS-based information system (ODIS), but despite significant efforts in introducing ODIS, the situational survey revealed that the use of enabling information system technologies has not yet reached the "ODMP's core business processes". Due to shortcomings in data collection and the absence of detailed (up-to-date) baseline data on biodiversity, status of ecology, and physical functions, results of studies conducted as components of the ODMP framework do not have the depth or the breadth for more comprehensive integration of biodiversity, physical functions, and sustainable use of the Delta's resources. Because the relevant data are not always available, planning and/or management decisions in the ODRS are sometimes made using fragmentary, superficial, or outdated information. Stakeholders are also aware that ODMP's Research and Monitoring

Framework implementation will facilitate crossing of organizational barriers where opportunities for collaboration, data, and resource sharing are not yet effectively resolved and/or established.

*Community Participation and Ownership* - DEA and Okavango Research Institute (ORI) lead the community participation effort for the ODMP. DEA holds ongoing participatory meetings and consultations with communities on topical issues affecting the ODRS to ensure continued meaningful participation in the ODMP implementation process. Stakeholders note that ORI no longer has a budget for this activity, and is no longer playing its role in enhancing community participation. There are many socio-economic problems wedded to the participation/ownership issue, notably poverty levels that increasingly push people toward unsustainable practices (poaching, over-harvesting).

*Information Dissemination (Public Outreach)* - Information on the progress of ODMP has been disseminated among stakeholders mainly through the reporting framework, and through stakeholders and community workshops. A brochure outlining the objectives and outputs of the ODMP has been produced, and an ODMP (ODIS) project website is maintained within ORI. The website was (and still is) an excellent source of information, including project documents, GIS, and related attributive data, internal reports, proceedings of meetings, and other information.

Despite the availability of information on the ODMP Project, many stakeholders consulted did not know much about the ODMP's progress and achievements outside their own area of interest. Consultations revealed that most of those not personally engaged in the ODMP knew little or nothing about it. A comprehensive communication strategy was developed as a part of the ODMP, but no position was identified to continue to implement this strategy. The DEA Regional Office Coordinator currently undertakes this task in addition to his other duties.

## **Findings in Other Areas**

*Cultural Identity Support* - Issues surrounding cultural identity were not addressed comprehensively in the ODMP. The plan primarily refers to the survival of a vital body of traditional ecological knowledge, which allows community leaders and members to understand key management and protection issues and needs, in relation to the ODRS's land and resources.

*Youth Empowerment* - The ODMP did not include strategies or recommendations on how to mainstream youth and their empowerment in ODMP formulation or implementation.

*Alignment With Relevant Plans* - The ODMP was not properly aligned with the District Development Plan and National Development Plan in terms of timeframes, projects, and programs. This has resulted in recommended projects and programs of the ODMP not being budgeted for in the NDP. This has affected successful implementation of the ODMP.

## **Lessons Learned**

*Reality check from plan to implementation.* An important lesson of the mid-term review came through observation of disparities between plan description as contained in the ODMP document and the reality as implementation moved forward. In particular, it was noted that action items and projects were clearly defined and articulated, but were often allocated short, inadequate timeframes for deliverables that left little flexibility for realities on the ground. Most of the action items and projects of the ODMP needed more time to secure stakeholder buy-in.

*Organize research/information from local to regional level.* Understanding the complexities of the Delta system requires investment in focused research and monitoring. Technical information needs to be translated and communicated through appropriate tools to avoid misconceptions and improve understanding on the part of all stakeholders. At the local level, however, communities and other private sector stakeholders know and understand a lot about different aspects of the Delta system that directly impinge on their existence and operations. We can, and should learn from them.

*Put practicality first for planning and institutional capacity.* The mid-term review revealed that most of the ODMP's challenges are institutional in nature, and relate to awareness, legislative and policy inadequacies, and capacity limitations, as opposed to the more technical and science-oriented issues. Ultimately, recommendations of the ODMP should be more practical and less of a wish list. Most importantly, the recommendations should be based on the availability of capacity to implement.

### **Monitoring Framework and Monitoring Matrix**

The mid-term review identified insufficient institutional capacity and fragmented and uncoordinated monitoring efforts as major drawbacks. Most institutions that are statutorily mandated to develop and implement monitoring programs within the ODRS have limited capacity to do so. This mid-term review recommends a monitoring framework using pooled resources. The recommended framework defines an integrated, multidisciplinary monitoring team, drawing participation from relevant departments' mandates to monitor specific parameters within the ODRS through periodic rapid assessments. The framework recognizes local communities as major stakeholders within the ODRS, and recognizes the potential for monitoring that exists within tourism companies in the ODRS. As tourism facilities are widely spread throughout the Delta, they have opportunities for a wider spatial coverage of monitoring sites. The proposed framework is further supported by the fact that a number of tourism companies doing business within the ODRS have been conducting monitoring for some time.

This report also presents monitoring matrices for biological indicators, hydrology and water-related parameters that can be monitored to determine the health of different ecosystems within the ODRS, and socio-economic indicators.

# INTRODUCTION AND BACKGROUND

## INTRODUCTION AND OVERVIEW

The Okavango Delta Management Plan (ODMP) was prepared after the Government of Botswana’s ratification of the convention on wetlands - The Ramsar Convention – 4 April 1997. With the ratification, Botswana became a contracting party to the Convention and, consequently, the Okavango Delta was listed as the world’s largest Ramsar wetland of international importance, as per Article 2 of the Convention. Article 3 of the Convention reiterated the need for the conservation and wise use of the Okavango Delta’s resources, and the need for a management plan for the Okavango Delta Ramsar Site (ODRS) became compelling. The Department of Environmental Affairs (DEA), formerly the National Conservation Strategy (Coordinating) Agency (NCSA), was given the responsibility for ensuring that a management plan was prepared for the ODRS.

The Okavango Delta Management Plan was conceived as an integrated overall plan that draws together all components of the ODMP project into an overarching planning framework for the sustainable use, conservation, and management of the resources of the Okavango Delta Ramsar Site. Consequently, sector components were established which together contributed to the overall ODMP. Further, structures were established to coordinate and see through the preparation of the ODMP, including the Project Management Group, the ODMP Project Steering Committee, and the ODMP Project Secretariat in Maun. The Department of Environmental Affairs, as the Botswana focal point for the Ramsar Convention, had overall responsibility for the development of the ODMP.

**Table 1: The 12 Sector Components of the ODMP**

Component	Lead Agency
Policy, Planning, and Strategy	NCSA (now DEA)
Research, Data management, and Participatory Planning	HOORC (now ORI)
Hydrology and Water Resources	DWA
Wildlife Management	DWNP
Sustainable Tourism and CBNRM	DOT
Fisheries Management (and Animal Health)	DAHP, (DWNP)
Vegetation Resources Management	DCPF and ARB, (DFRR)
Physical Planning	DTRP
Land Use Planning and Land Management	TLB and DLUPU
Local Authorities services’ Provision	NWDC
Waste Management	NWDC
Sustainable Livestock Management	DAHP

The Okavango Delta Management Plan, an overarching plan that incorporates the recommendations of various sector components, was finalized in 2007 and approved in 2008. The ODMP has as its overall goal: *“To integrate resource management for the Okavango Delta that will ensure its long-term conservation and that will provide benefits for the present and future well-being of the people through sustainable use of its natural resources.”*

Following from the overall goal, the plan included three strategic goals, each with several strategic objectives for the ODMP. The strategic goals are as follows:

- To establish viable institutional arrangements to support integrated resource management of the Okavango Delta;
- To ensure the long-term conservation of the Okavango Delta and the provision of existing ecosystem services; and
- To sustainably use the wetland resources of the Okavango Delta for the long-term benefit of all stakeholders (Okavango Delta Management Plan, 2008).

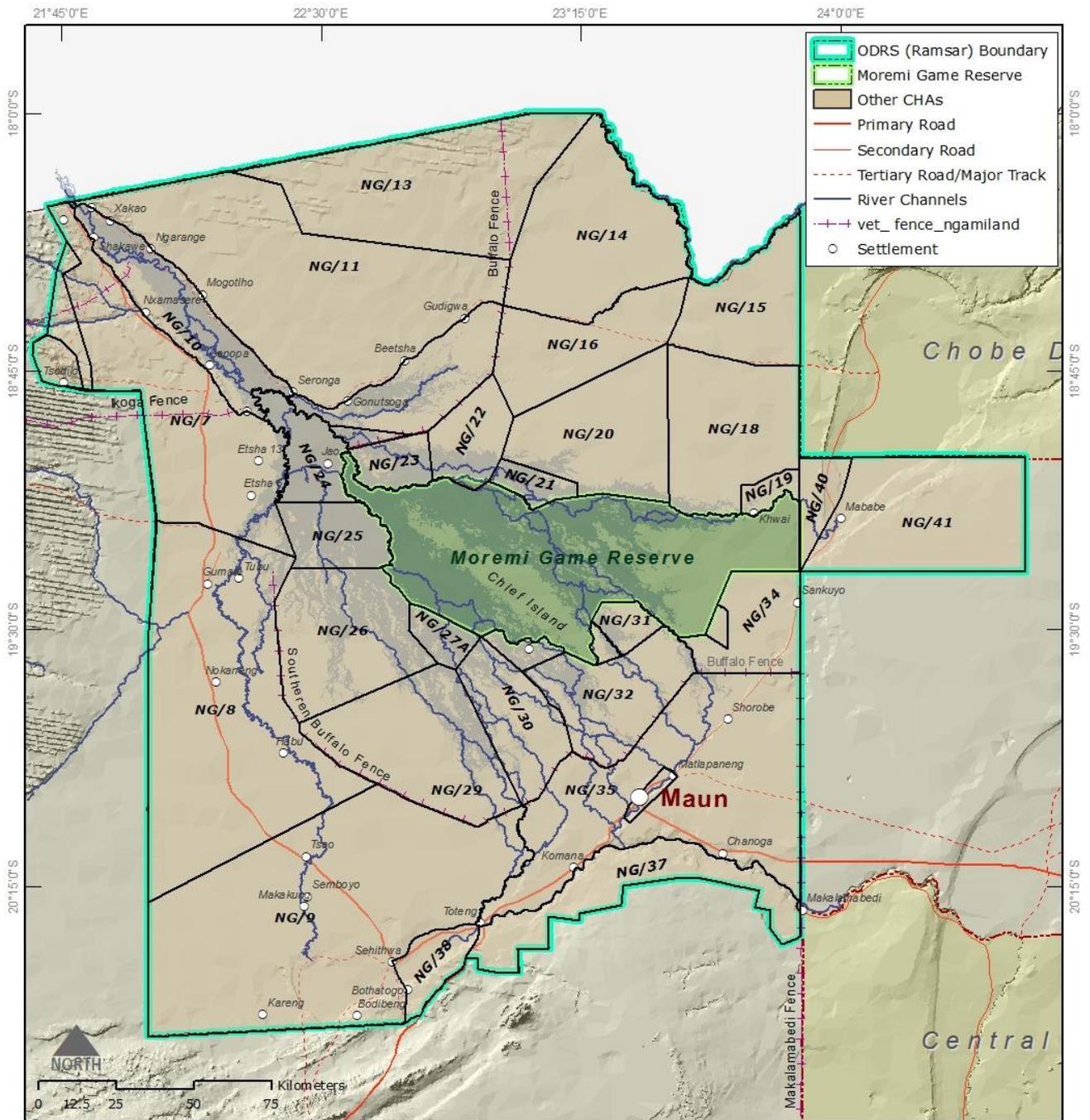
The ODRS sits at the northernmost edge of the Kalahari Sandveld of Botswana, below the Caprivi Strip in Namibia. Namibia borders the ODRS to the Northwest where the Okavango River enters Botswana from Namibia, although it originates in the Bie plateau of Angola. The Kwando-Linyanti river system also falls within the boundary of the Ramsar site to the northeast. Geographically the area lies between coordinates 210 31` 36`` E and 240 31` 48`` E and 180 00`00``N and 200 41` 24``N.

The ODRS covers an area of approximately 55, 374 km<sup>2</sup>, which falls entirely within the Ngamiland District. The ODRS covers 50.9 percent of the district's land area of 109, 130 km<sup>2</sup>. A very high percentage of the district's total population resides within the ODRS, and derive their livelihoods largely from the resources of the delta. This population distribution further underscores the need for and importance of a management plan for the site. Ninety-two settlements, gazetted and ungazetted, are located within the ODRS.

The ODRS consists of the Botswana section of the Okavango River itself, known as the "Panhandle", the entire seasonal and permanent wetland parts of the Delta proper, including Lake Ngami, and parts of the Linyanti-Kwando river systems linked to the delta through a now dry channel known as the Selinda Spillway. Three main features characterize the Ramsar Site: The Okavango River, the Kwando-Linyanti river systems, and the intervening and surrounding dryland areas (ODMP Project Proposal, 2002). Notably, the inland delta wetland system is in what otherwise is a semi-arid region. This unique situation, combined with annual variations in inflow and changing seasons, have led to a rich diversity in flora and fauna in ODRS. Map 1 shows the Okavango Delta Ramsar Site.

## **PURPOSE AND OBJECTIVES OF THE ODMP MID-TERM REVIEW**

A mid-term review is a stage in the planning process aimed specifically at enhancing a plan's responsiveness to changes in the planning environment through identification of opportunities for improving plan performance. Within the timeframe/planning horizon of a plan, new challenges emerge, and our understanding of old premises and conditions upon which the recommendations of the plan were made often change. These conditions call for appropriate interventions, one of which is mid-term review and gap analysis of plans.



**Map 1: Okavango Delta Ramsar Site Boundary**

The ODMP mid-term review exercise aimed at assessing the overall performance of the plan with regard to its stated objectives, set targets, and expected outcomes. Specifically, the mid-term review of the ODMP serves the following purposes:

- Ascertaining the extent to which the plan’s recommendations have been implemented and achieved thus far;
- Identifying implementation constraints and factors responsible for non-implementation of key recommended strategies, programs, and projects;
- Identifying emerging sector-specific issues, problems, and challenges given the highly dynamic nature of the very fragile ecosystem of the Okavango Delta;
- Determining if critical recommendations and implementation measures were missing in the ODMP and its component reports.

For all practical purposes, the mid-term review of the ODMP is viewed as a stock-taking and updating of the plan, whereby modifications to some original recommendations of the ODMP and

new recommendations will be made. One objective of the ODMP mid-term review exercise is to inform clear recommendations that ensure effective, efficient plan implementation, predicated on a well-developed, management-oriented implementation strategy. Another important objective of the review is to develop a monitoring framework with well-defined indicators.

Table 2 presents the purposes and objectives of the mid-term review. Specific objectives of the review exercise are matched against key relevant questions to be addressed.

**Table 2: Summary of Objectives of the ODMP Mid-term Review**

KEY ISSUES	KEY QUESTIONS
<b>Relevancy of the ODMP</b>	<p><b>Is the ODMP design appropriate to the current situation?</b></p> <p>To what extent are the objectives of the ODMP still valid?</p> <p>To what extent does the ODMP respond to priority issues?</p> <p>Are there any major issues, risks or threats currently not being taken into consideration?</p> <p>Do stakeholders value the project and believe it makes sense?</p> <p>Does the ODMP have the most appropriate strategies?</p>
<b>Impacts and Effects of the ODMP</b>	<p><b>Is the ODMP contributing to long-term positive effects?</b></p> <p>What are the positive effects of the project on people and the environment?</p> <p>Is (and how is) ODMP making a difference?</p>
<b>Efficiency and Effectiveness in the Implementation of the ODMP</b>	<p><b>Are the ODMP implementation processes seen to be efficient?</b></p> <p>Is the overall action plan used and up to date?</p> <p>Are there capacity gaps (within the ODMP team/ stakeholders) which are impeding progress toward the achievement of ODMP's goals and objectives?</p> <p>How are working relationships within and between ODMP key stakeholders?</p> <p>Is there adequate capacity for planning, monitoring, and coordination of the ODMP's programs?</p> <p>Is there any deliberate focus on capacity building within ODMP as a prerequisite for improving effectiveness in the management of the Delta?</p> <p>What development strategy/policy documents (or pieces of legislation, if any) have been put into effect after the ODMP was conceptualized and approved?</p>
<b>Achievements of the ODMP</b>	<p><b>What are the major achievements of the ODMP to date in relation to its stated objectives and intended outputs or results?</b></p> <p>What has been achieved, quantitatively and qualitatively?</p> <p>What is the significance / strategic importance of the achievements?</p> <p>What is the likelihood of future achievements?</p>
<b>Sustainability of the ODMP</b>	<p><b>Is the project getting the required support and acceptance from stakeholders at different levels?</b></p>

Is the project addressing stakeholders' priority issues?

What is the social and political environment/acceptance of the project?

Is the project operating at a sufficiently large scale to bring about desired, long-term impacts?

Is there evidence of the ODMP activities being scaled up by organizations/partners/communities?

Does the ODMP enable implementing agencies to rationalize information, policies and prescriptions into simple planning and area management outcomes?

Are there any doubts in the reliability of the biodiversity and other analysis?

**Lessons Learned and the Way Forward**

**What are the key lessons learned?**

(What went well, what went badly, what were the causes, and how to address the gaps.)

**What will be the way forward and future plan of the project?**

What will be the areas of focus?

What key issues are to be addressed?

Who will be the key stakeholders/partners and implementers?

What strategies and approaches are to be used to improve efficiency and effectiveness in the implementers of the plan?

**REVIEW PROCESS AND METHODOLOGY**

The process and methodology for the mid-term review and gap analysis of the ODMP followed a four-stage process in terms of outputs and deliverables in the manner set out below. Plantec Africa, GISPLAN, and Fameventures worked as a consortium to develop conduct the stakeholder consultations and GIS mapping exercises required for this assessment.

**Stage 1**

This stage entailed the production of an **Inception Report** that confirmed the following: the understanding of the project; the methodology for executing the project; a work program; personnel and task assignment schedule for the project team members. The report concluded with a presentation of some anticipated difficulties and possible mitigation measures during project execution.

A post-report **Inception Workshop** brought together stakeholders to inform them about the mid-term review exercise. Importantly, the workshop defined the areas of focus and elicited participants' input about what they perceived to be the issues and challenges to be addressed regarding the overall performance of the ODMP under the various thematic areas. The workshop also came up with possible ways forward for the ODMP mid-term review exercise and suggestions on how to address key issues raised at the workshop.

**Stage 2**

This stage of the ODMP mid-term review process entailed the preparation of a Scoping and Gap Analysis Report, primarily focused on the aspects of review and gap analysis of the ODMP. The logic behind this approach is to do a situational analysis of the various thematic areas as a foundation

for the Draft Report and subsequently the Final Report. This way, the findings of the Scoping and Gap Analysis Report in terms of the overall performance of the ODMP, with regards to achievement of set targets of the action plans for the various thematic areas will inform the following, which will be presented in the Draft Report:

- The making of new recommendations and/or modifications to the original recommendations;
- The development of a management-oriented implementation strategy backed by an appropriate institutional structure/arrangement to manage and coordinate the implementation of the reviewed/revised ODMP;
- The development of a monitoring framework with well-defined monitoring indicators.

Methodology at this project stage followed a logical sequence, with the team having noted that there are numerous original ODMP component reports with sector-specific recommendations. The reports had no appropriate framework to enable the different components to effect sustainable environmental management. The ODMP mid-term review exercise integrated the various components into more concise thematic areas of biodiversity, socio-economics; land use; tourism; agriculture; and hydrology.

An additional seventh component, mining, has been included within the mid-term review, though it was not part of the initial plan. Since completion of the ODMP, the mining sector has expanded its explorations within the ODRS and is surely going to impact the fragile ecosystems of the ODRS. For this reason, mining is included as a new thematic area within the ODMP review and entails a new body of work to be done in the mining sector scope of work. There are also clear crosscutting themes that affect and influence the above-mentioned thematic areas. These include governance and policy, and to aid the process of integration these crosscutting themes are clearly addressed in each of the seven thematic components.

The methodology adopted for the ODMP mid-term review comprised the following:

- *Desktop studies* of the Okavango Delta Management Plan itself; ODMP component Reports; OKACOM Trans-boundary Diagnostic Analysis and the related Botswana Action Plan; Ngamiland Integrated Land use Plan (2009) and the KAZA Integrated Development Plan; and other reports and documents deemed relevant to the ODMP mid-term review exercise. The desktop studies aimed to identify the goals and objectives of the respective plans, issues addressed by them, and importantly, recommendations made in the ODMP and the other ODMP component reports. Noting the implementation structure/arrangements and strategies recommended by the ODMP was also important during the desktop studies.
- *Workshops for stakeholders in the respective thematic areas.* Due to the high degree of overlap in terms of crosscutting issues, for the purposes of organizing the workshops, the thematic areas were grouped into three according to processes and activities as follows:
  - Tourism, Agriculture and Mining Thematic Areas Workshop;
  - Land Use and Socio-Economic Thematic Areas Workshop;
  - Biodiversity, Hydrology (and Mining) Thematic Areas Workshop.

The workshops provided a consultative process for dialogue with stakeholders and for eliciting information regarding the performance of the ODMP along the lines of thematic area components. Additionally, workshops were opportunities to get stakeholder buy-in and consensus on the underlying causes of non-implementation of key recommendations of the ODMP. To aid deliberations at the workshops, key objectives and set targets of the ODMP were defined and matched against respective relevant questions to be addressed by the mid-term review under thematic areas. Preliminary/draft findings of the ODMP review and gap analysis were discussed for validation and stakeholders buy-in. The

questionnaire designed for the ODMP mid-term review (MtR) was also used as a tool for information gathering at the workshop.

- *Person-to-person interviews* – This activity entailed interviewing officers from stakeholders’ departments one-on-one, using a set of specifically designed questions to elicit relevant information geared toward achieving the ODMP mid-term review objective.

Activities at this project stage culminated in the production of the **Scoping and Gap Analysis Report**. This report is a situational/status report on the ODMP and its components, which presents the findings according to the thematic areas on the following:

- The current status of the implementation of the ODMP in terms of:
  - The extent to which ODMP goals and objectives have been attained and achieved;
  - Whether the ODMP is being implemented according to set targets as contained in the action plans and monitoring plans;
  - Which specific recommendations, programs, and projects of the ODMP have been implemented? For those not implemented, what are the constraining factors?
- The recommendations made by the ODMP regarding institutional arrangements and issues of governance for ODMP implementation. This aspect captured, among others, the following:
  - The structures already in place and their level of effectiveness. (Do they have the capacity to coordinate and monitor the implementation of the ODMP and if not, what are the reasons?)
  - Are their roles and responsibilities well defined?
  - The working relationships, in terms of coordination, between key implementation stakeholders and whether there is any duplication of functions.
  - The level of awareness of the ODMP, and capacity building among communities in the ODRS, for improving effectiveness in the management of the Delta.
- Gaps in the ODMP in terms of:
  - Critical recommendations that were not made by the ODMP; and
  - How adequate the ODMP integrated/incorporated the recommendations of the component reports.
- Monitoring frameworks in terms of:
  - Whether the monitoring plans of the ODMP are being implemented and also if monitoring data is being collected, stored, and used for adaptive management as intended.

The Scoping and Gap Analysis Report also presents the achievements of the ODMP thus far, as part of the mid-term review exercise, as well as the impacts of the ODMP on the management of the delta. The report concluded with a presentation of the lessons learned in the course of the managing the ODRS with the ODMP as an implementation tool.

The outcomes and findings of the mid-term review and gap analysis of the ODMP thus largely inform all the recommendations presented in the **Draft Report**.

### **Stage 3**

This stage of the mid-term review of the ODMP entails the production of the **Report**, a combination of the Scoping and Gap Analysis Report and the recommendations based on the findings of the mid-term review exercise. The recommendations aim at the improvement of the efficiency and effectiveness of the ODMP's implementation and management of the ODRS, the establishment of an appropriate monitoring framework, and institutional and governance structures for driving the implementation of the ODMP. These recommendations fed largely from the findings of the Strategic Environmental Assessment of the Okavango Delta, which details various thresholds, or points at which further human activity and ecological interference present adverse, and potentially irreparable, impacts on the delta.

### **Stage 4**

Stage 4 comprises **Final Report** production. The report will be a refinement of the Draft Report, with all comments from the Project Steering Committee incorporated.

## ODMP MID-TERM REVIEW AND SITUATIONAL ANALYSIS

This section reviews the current status of the ODMP along thematic lines to identify critical issues in the various thematic areas; the level of implementation of recommendations and action plans of the ODMP; the effectiveness of the existing institutional arrangement for implementing the plan; the constraints to effective implementation of the plan, and evaluates the existing monitoring framework. As a situational/status analysis of the ODMP, the findings below will greatly inform the recommendations of the whole review exercise. Importantly also, the information presented draws heavily on inputs from stakeholders through a consultative process.

### PROJECT DESIGN/FORMULATION

The ODMP project was well resourced at the formulation stage. The project design provided a clear situational analysis of the socio-economic context; threats to biodiversity and water resources and their root causes; stakeholder characteristics; and the policy and legislative environment.

#### Conceptual Model

The ecosystem approach adopted during formulation is particularly appropriate in the dynamic context of the pulse-flooded watershed system of the Okavango, with stakeholders already being aware of their dependence on natural processes of change. The formulation of the ODMP took into account that sustainable development requires achievement of both conservation and socio-economic goals. However, it seems there was a challenge in communicating this concept effectively to stakeholders during the formulation phase and therefore during the implementation phase. This challenge is particularly important because the concept of balancing conservation and socio-economic development always carries potentially weak assumptions, which could have far-reaching impact on the success of the ODMP.

Conservation practitioners and development specialists recently have reached a high level of consensus on the key elements for achieving a balance in conservation and socio-economic development goals. For this to happen, pre-conditions, stimuli, and implementation mechanisms must be in place. Balancing these goals, however, was not fully explored during the formulation/design of the ODMP or later used to communicate special aspects of the Okavango context. Table 3.1 shows three prerequisites, stimuli, and implementation mechanisms for achieving balanced conservation and socio-economic development goals.

**Table 3.1: Prerequisites for Achieving Balanced Conservation and Socio-Economic Development Goals and Examples**

Pre-Conditions	Stimuli	Implementation Mechanisms
Democratic and accountable governance (well developed in Botswana)	The threat of resource decline	Implementing bodies/structures:
Awareness and knowledge (Is the value of the ODRS well recognized at all levels?)	Improved governance	Effective communication
Organizational and institutional capacity (Are institutions well resourced with relevant skills and financial resources, policy and legal frameworkss etc.?)	Socio-economic incentives	Strengthening institutional capacity Enabling legislation and policy

#### Country Relevance

The ODMP's vision aligns well with the national vision enshrined in Botswana's Vision 2016 document, whose principles serve as the basis and foundation for all development planning initiatives. The ODMP considers relevant themes contained in the five pillars of Vision 2016, including the following:

- The need for poverty reduction in the ODRS through various programs and projects of the ODMP (Pillar No.2: "A just and caring society");
- Creating awareness about the ODMP and its programs, implementation, and benefits among the communities through communication and education, which formed aspects of the ODMP design/formulation. This is in line with Pillar No.3: "An informed and educated society";
- The formulation of the ODMP embraced the national vision pillar of "An open democratic and accountable society" through a consultative process at the project formulation stage;
- Other themes found in Vision 2016 which run through the ODMP include sustainable development, protection of the environment, and conservation of natural resources.

ODMP project design and formulation tried to ensure ownership of the plan by community members (both at community and district level) whose lives would be affected by recommendations and programs of the plan. Communities and stakeholders were engaged at the project/plan formulation stages through consultation, and the extent to which ownership has been achieved will be determined by the review exercise.

The ODMP was endorsed at the regional/trans-boundary level by strong involvement of OKACOM, which continues to play a critical role in the definition of the Strategic Action Plan (SAP) for the Okavango Basin and the National Action Plan (NAP) for the Botswana Part of the Basin. Lessons learned from ODMP formulation and implementation will continue to feed into the OKACOM program implementation, providing both guidance and replication (in the wider basin).

### **Implementation Approach**

The implementation strategy for the ODMP was initially project-based. The ODMP Coordination Unit was set up in Maun and worked with sector line ministries during formulation of the plan. The ODMP Coordination Unit was later transformed into the Department of Environmental Affairs-Maun, which continued the coordination role during the implementation process. During formulation, key advisors were placed within the ODMP Coordination Unit and others were outsourced. The advisors interacted with the line ministries, private sector, resource users, and communities to define the ODMP strategy. Stakeholders considered this approach effective, as they noted that projects embedded in government bodies tend to function poorly - in part due to capacity limitations and in part because they are often tied to a single sector's mission (a barrier to effective cross-sector integration.) However, in Botswana, NGOs suffer somewhat similar capacity and sector limitations as found in government departments. Stakeholders also noted that the NGO community is not particularly strong.

Mechanisms for capacity building and function transfer included training courses and the development of manuals and guidelines, reviews of key issues (policy and legislation) by specialized consultants, field demonstration and pilot projects, information management and sharing, and building community-based and cross-sector networks.

### **Sustainability**

The ODMP was the first of its kind developed for Botswana wetlands following the Ramsar Convention Guidelines, meant to guide the balancing of conservation and socio-economic development goals. Other key wetlands in Botswana include the Makgadikgadi, and the Chobe-

Kwando-Linyanti. However, project formulation failed to document a clear, pragmatic approach to replicate the ODMP in other of Botswana’s wetland systems and other localities in the region. The envisaged replication approach for the ODMP should be based on lessons learned in the implementation of the ODMP and its related outputs, such as knowledge sharing innovations, training courses, handbooks, and the broader use of institutional and human capacity development processes.

Sustainability was supported by integrating implementation costs within sector budgets in government, and by securing long-term commitments from the private sector. Beyond these actions, it seems a sustainability plan was not formulated for the project.

## BIODIVERSITY THEMATIC AREA

The framework for actions relating to biodiversity in the Okavango Delta Ramsar site is set out in the ODMP and its Action Plan. It is worth noting that during the whole process of the ODMP formulation and preparation, there was no specific component and/or theme referred to as biodiversity. However, several components (as framed during ODMP preparation) and institutions could be grouped together to form the biodiversity thematic area of the ODMP (see Table 3.2 below). In addition, some aspects of these biodiversity-related components listed in the table are socio-economic in nature e.g. aquaculture, human-wildlife conflicts, predator-livestock conflicts, and others.

**Table 3.2: Biodiversity-Related ODMP Components and Institutions**

ODMP Component	Lead Institutions	Objective of Component	Outputs/Reports	Other Institutions
Wildlife Management	DWNP	Sustainable management of the Delta's wildlife populations, particularly in relation to the well-being of communities and interactions with the livestock sector and tourism industry.	<ul style="list-style-type: none"> <li>– Report with recommendations for reduced human-elephant conflict in and around the Delta.</li> <li>– Buffalo Survey Report with recommendations and maps</li> <li>– Slaty Egret Survey Report with recommendations and maps.</li> <li>– Predator - Livestock Conflict Report with recommendations and maps.</li> <li>– Rare species Survey Report with recommendations and maps.</li> <li>– Training and Capacity Program.</li> </ul>	BirdLife Botswana
Sustainable Fisheries Utilization and Management	DWNP (Fisheries Division),	Sustainable management of the Delta's fisheries resources to secure livelihoods which are dependent upon fisheries and conserve the biodiversity of fisheries within the Delta system	<ul style="list-style-type: none"> <li>– Report on status of the fish stock</li> <li>– Fisheries Socio Economic Study Report</li> <li>– Fishery Frame Survey Report</li> <li>– Fishery Creel Survey Report</li> <li>– Fisheries Management Plan</li> <li>– Capacity Building and Training Program.</li> <li>– A Report and maps on Carrying Capacity and Stocking rates</li> </ul>	Okavango Fishers Association Okavango Fishers Management Committee
Vegetation Resources Management	DFRR	Sustainable management of vegetation resources and resolution of management conflicts by determination and use of accurate ecological data and information on local user demands, as well as	<ul style="list-style-type: none"> <li>– A report and maps on carrying capacity and stocking rates</li> <li>– Vegetation profiles and maps (types, composition, and condition)</li> <li>– Vegetation Resources Management Plan</li> <li>– Fire Management Plan</li> <li>– Training and capacity building</li> </ul>	Department of Crop Production Agricultural Resources Board

		through localized management structures.	programs	
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While the detailed review of progress made in the implementation of the biodiversity-related ODMP action items is listed in Table 6, this section summarizes the level of progress made generally in implementing the biodiversity- and conservation-related components across the ODRS.

On the whole, this mid-term review of the recommended biodiversity-related action items of the ODMP indicated that the majority of them have not been implemented. Subsequently, one can conclude that the ODMP biodiversity action items have been more of a “wish list” rather than a set of activities to meet the set objectives. Moreover, there seems to be a widespread consensus among stakeholders consulted that the ODMP’s focus on biodiversity was too narrow, restricted mainly to a few species with no integrated biodiversity program. Additionally, it is noted that the ODMP did not focus enough on key issues and processes that would enable the ODRS to be maintained and wisely used as a functional ecosystem. Almost all stakeholders were of the opinion that the ODMP’s approach to biodiversity conservation in a flood pulsed system such as the Okavango is not helpful at all. The emphasis should instead be on securing higher level processes that drive the system and target management on system level threats/issues to biodiversity. In addition, until recently there has been a lack of focused work on the impacts of climate change, habitat shifting, and alteration and possible dynamics of biodiversity.

Based on consensus among all stakeholders consulted, this MtR generally revealed that the ODMP has not been successful in influencing and channeling a persuasive cultural shift toward protecting biodiversity in the ODRS by all stakeholders and communities involved. Recent research has suggested declines in wildlife population numbers across northern Botswana in the past few decades. Specifically, Dr. Michael Chase (2011) indicated that there were potentially significant declines in 11 mammal species in the Okavango Delta, including giraffe, kudu, red lechwe, tsessebe, and wildebeest. However, large mammal species (elephants and hippo) were shown to have stable populations. The elephant population in northern Botswana is estimated to be 128,000, with densities of 8 elephants /km<sup>2</sup> in Chobe and 5 elephants/ km<sup>2</sup> in Moremi. Giraffe population declined by 8 percent in Moremi, while the red lechwe population shows a 60 percent decline in Ngamiland. The tsessebe population shows a decline of 16 percent per annum in Ngamiland and Moremi. Other species such as zebras showed a stable population over the years. Furthermore, the 1997 and 2005 frame surveys (ACP Fish II, 2011) indicate that the number of fish has also decreased, while recent reports have highlighted increased vegetation clearance, especially harvesting of Kalahari and Miombo woodland hardwood trees which hold significant ecological value in the ODRS (Chase, 2011).

Table 4 below highlights the state of biodiversity in the Okavango wetland system. It shows important indicators and their status according to the International Union for Conservation of Nature (IUCN) Red Data List.

**Table 4: Important Indicator Species for the Okavango Delta Wetland System**

Indicator species	Status
Dragonflies: Good indicator species for the status of wetlands	100 species red listed 1 species threatened 3 species data deficient
West African dwarf crocodile: Crocodiles in general are excellent indicators of the status of main river channels and their banks/sandbanks	Vulnerable
Okavango mud turtle: Indicator for river banks and fine sediments	Data deficient

(Source: [www.iucnredlist.org](http://www.iucnredlist.org))

In addition to the above, the most recent Cubango-Okavango River Basin Trans-boundary Diagnostic Analysis (OKACOM 2011) has also suggested that the biodiversity and biological productivity of the Okavango Wetland System is under pressure and changing (OKACOM, 2011).

Key contributing factors to biodiversity pressures and decline in the ODRS, as noted from stakeholder consultations during the ODMP review, are summarized below.

### **Lack of Coordinated Research in Biodiversity Trends**

Almost all stakeholders agree that much research has been done on species distribution and numbers in the ODRS, but findings often conflict. Consequently, this could be sending confusing information to the policy makers who are loath to act on inconclusive information. It is also noted that there is still uncertainty about ODRS's biodiversity status and trends, especially regarding biodiversity decline. Generally, a major contributor to this uncertainty is a lack of detailed (long-term) baseline knowledge on the current and evolving state of biodiversity in ODRS.

Nearly all stakeholders consulted agree that the apparent lack of in-depth understanding of the status and trends of wildlife species/population in the Okavango Delta present a major management challenge. In this regard, it is noted that besides Birdlife Botswana's baseline surveys of salty egret and African skimmer populations, as well as ongoing wild dog monitoring, through NGOs in parts of the Okavango Delta, no ground monitoring surveys for keystone species have been initiated since ODMP's approval. It is further noted that several wildlife research projects have also been carried out in the Delta, but all of them seem to be short-term research (PhD) studies lacking continuity.

The same applies to the distribution of vegetation resources and their quantities in the ODRS, which are difficult to ascertain. To date, no detailed and continuing monitoring/mapping of vegetation resources in the Delta has been done and/or carried out on a consistent basis. This includes the issue of sustainable use of vegetation resources in the ODRS, which stands out as one of the prominent action items in the ODMP Action Plan not being executed.

### **Poaching**

It was noted during the thematic area consultation workshops that poaching figures in the ODRS are staggering. According to some stakeholders, it presents one of the major factors causing wildlife (biodiversity) decline, in addition to human activity encroachments and deforestation across ODRS. It was further indicated that in the WMAs, the number of poachers caught on a monthly basis are relatively high. Poaching is mainly for meat consumption. However, the emerging Asian markets for products such as lion bones significantly encourage poaching.

Nearly all stakeholders agreed that the one of the causes of the poaching problem lies in weak legislation, prosecution, and enforcement processes, as most of the poachers who are caught are released on bail and end up poaching again while on bail. One reason indicated as contributing to inadequacy in prosecution is the requirement to undertake an affidavit to verify the wildlife products. As there is a shortage of trained personnel, the products end up spoiling and poachers are released for lack of evidence. Another factor that encourages poaching is the price of wildlife meat compared to the price of beef. (At present, the price for beef is relatively higher, hence pushing the demand for lower-cost wildlife meat.)

*Lack of coordination between communities and governmental departments.* The rate at which poaching is occurring in the ODRS should be a concern to the members of the communities who earn a living from biodiversity. However, this seems not to be the case. One of the widely-cited reasons why communities are not concerned is the lack of coordination and involvement of members of the communities. Many stakeholders agreed that communities have not been adequately involved in the biodiversity planning and decision making. Even though there is CBNRM where the communities are expected to be actively involved in the management of the natural resources, the policy does not provide guidelines on what is expected from the communities in terms of their involvement and roles.

Some of the stakeholders consulted commented that communities in the ODRS may be economically discouraged from relying on sustainable practices and wise-use of the Delta's resources. According to them, hunting (poaching) is still a profitable activity for many community members and it is difficult for sustainable practices to compete. Many community members may indeed be sensitized about the Delta Wetland System and knowledgeable about sustainable practices, but nonetheless they continue to practice poaching. This negligence could arise from community members' lack of true commitment to the issue, or from their perception that poaching is necessary for their survival. In this regard, it is a widely held view that poverty levels and the absence of alternative income opportunities for communities in the ODRS increasingly push people towards unsustainable practices, including poaching.

## **Veld Fires**

With regard to veld fires there is a consensus among stakeholders consulted that they play an important role in the ecology of the Okavango Delta Wetland System. Three concerns were identified as follows:

- Fire regimes in the ODRS, which appear to have changed significantly in recent times.
- Ecological impacts of fire are largely not understood due to lack of quantitative studies. Specifically, baseline data on wildfires do not exist and there are currently no programs to monitor the effects of fire on the Delta's biodiversity. It is, however noted, that although the greater ecological implication of those fires are still not well understood, there is evidence to suggest that they have positive ecological impacts on the fauna and flora in the ODRS, primarily when they occur naturally.
- The negative impacts of veld fires (both in timing and extent) on the biodiversity of the ODRS. In this regard, it was noted, that fire is a commonly used management tool by rural people, and under the present conditions of open access, large areas of wetland are burned every year, despite a total ban on the practice. No one takes responsibility for final outcomes or makes attempts at control. It was also noted that veld fires have negative consequences on reptiles such as slow-moving tortoises or ground nesting birds such as the sand grouse, which nests during the dry season. With regard to this, there is a widespread concern that frequent fires throughout the Delta may shift dominance toward more fire-tolerant species over the long-term, and possibly cause the loss of fire-sensitive species.

Furthermore, all stakeholders agree that the Fire Management Plan for the Okavango Delta Ramsar Site, prepared as a component of the ODMP project, though very relevant has not been entirely followed and implemented. This especially relates to the Fire Management Plan's prescriptions for reducing the impact of veld fire, as well as their frequency and intensity (including the exceptions). The following are also noted:

- The Department of Forestry and Range Resources (DFRR) is keeping and maintaining firebreaks to minimize the extent of fire-burned areas.
- Community Fire Management Plans have been prepared for most community areas but capacity to implement them is lacking.

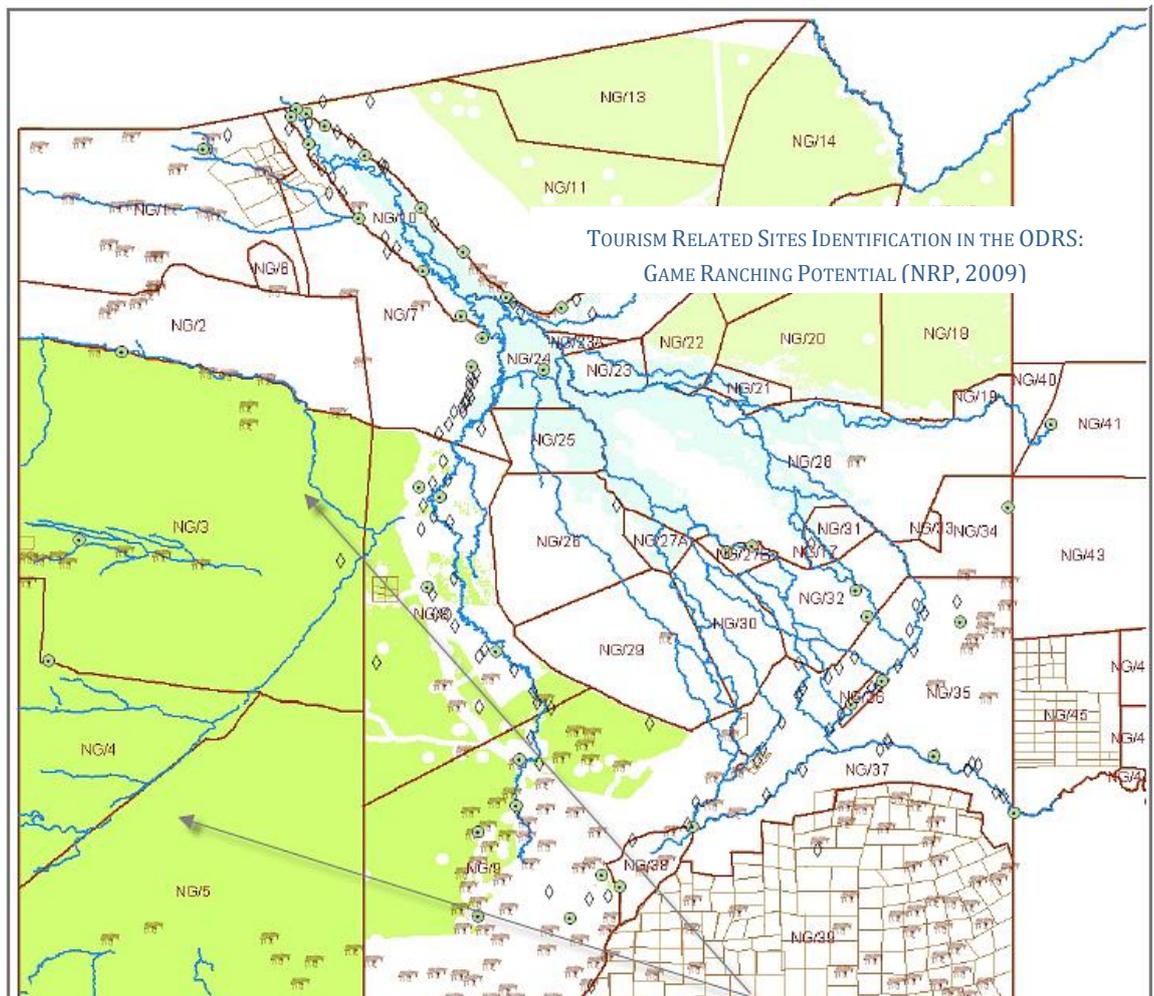
## **OVERGRAZING, LIVESTOCK, AND HUMAN/WILDLIFE CONFLICTS**

Overgrazing, livestock, and human/wildlife conflicts have been highlighted as other factors negatively affecting the habitat for wildlife and biodiversity in the ODRS at large. The following concerns were highlighted during the thematic areas consultation workshops:

- More cattle and small stock are maintained across the ODRS by an increasing human population, thus creating continuing pressure on biodiversity through bush

encroachment and irreversible rangeland degradation, especially around livestock water points. Many stakeholders consulted questioned the adherence to the “eight kilometers spacing rule” throughout the ODRS, which limits the development of any new borehole to a periphery not less than 8km from any existing borehole to control overgrazing. In addition, rules and/or regulations to control the number of livestock permitted per borehole in the ODRS have also been questioned, because they contributed to the appearance of piospheres (concentric circles of vegetation change) which develop around boreholes / water points and are caused by the impacts of overgrazing and the trampling effects of animals in close proximity to the borehole, resulting in the development of a sacrifice zone (0-400m from the borehole) with little biological productivity; a nutritious grass zone (200-800m); a bush encroachment zone (200-2000 m) and a grazing reserve area.

- Although the main strategy of fencing to minimize contact between livestock and wildlife has proven successful, there are still problems of regular maintenance along the fences to ensure prompt repairs. The challenge facing the Department of Animal Health and Production, responsible for veterinary fence maintenance, is that elephants damage fences, requiring both the Department of Animal Health and Production (DAHP) and Department of Wildlife and National Parks (DWNP) to work together and solve the problem. While construction of fences cannot stop the movement of elephants, it has been reported that it takes a long time to repair the fences. Another challenge facing the DAHP is that poachers who carry buffalo meat from within the fence into livestock areas introduce the risk of foot and mouth disease into these areas. Map 2 illustrates areas within the Ngamiland region and west of the Okavango Delta that are suitable for the potential expansion of game farming
- There is a consensus among stakeholders consulted that human-wildlife conflicts are increasing across ODRS. This was considered a direct result of expansion and intensification of human activities around ODRS’s core area, (i.e area that constitutes the bulk of the wetland, primarily WMA and PA and declared as a livestock-free



**Map 2: Areas of potential game farming expansion west of the Okavango Delta**

zone). Problem Animal Control (PAC) measures applied in ODRS's core zone to reduce or minimize human/wildlife conflicts (predation of livestock, crop damage, etc.) have so far not been successful. In addition, increasing numbers of elephants in Northern Botswana is also seen as a threat to biodiversity in the ODRS.

- ***One recommended strategy for reducing human/wildlife conflicts is intensification of game ranching.*** According to the Botswana Wildlife Producers Associations (2005), game ranching is a more viable land use option, as game ranchers can sell game for hunting, and use their ranches for photographic safaris, game viewing, education, and tourism to conserve some endangered wildlife species. Furthermore, because hunting has decreased, poaching has been on the increase. Game ranching is suggested as an option to help reduce poaching because people would see the benefit of wildlife. In this regard, ***almost all stakeholders consulted agreed that game ranching and game cropping should be considered as permitted land use activity following the recommendations of the Ngamiland Integrated Land Use Plan (2009), Tourism Development Plan (2007), and the study on Sites Identification in the Okavango Delta Ramsar Site (ODRS) prepared as ODMP project components.***
- The assessment study on the feasibility of providing livestock watering points in the Sandveld areas to reduce livestock and wildlife interactions in the ODRS has been executed as originally envisaged by the ODMP. The study concluded that a detailed and comprehensive field study is required to enable a cost benefit analysis for the project. This would include the possible opportunity costs of increased predation as a result of wildlife behavioral change to this new resource. This comprehensive study has not been carried out. It appears, as confirmed by many stakeholders, that the access to surface water still ties the livestock sector to the floodplain pastures.
- The ODMP prescribed a need for biomass assessment as a critical activity in efforts to reduce overgrazing in the ODRS. It is, however, noted that this assessment was not carried out due to lack of human and financial resources. Specifically, the government department responsible for the execution of this action item (i.e. DAHP) has only two officers who are supposed to cover the whole Ngamiland District, and thus it is seriously understaffed to carry out these assignments. The department is further constrained by inadequate vehicles to discharge its duties effectively. The department has also indicated that due to lack of financial resources it could not (and still cannot) update an old map (from 1978) for range-carrying capacities.

## Wildlife Management

The Botswana government presently appropriates a sum of approximately US \$15 million/annum to cover recurrent costs of the DWNP, of which a significant portion is specifically for PA management, including the ODRS. While this amount is significant, the investment is proving to be inadequate in terms of assuring the management effectiveness of the PA system in the country, as necessary to abate threats. Almost all stakeholders consulted agreed that the erstwhile PA management paradigm is characterized by a statist approach, with limited stakeholders buy-in and involvement. ***It was strongly pointed out that opportunities for cultivating broader stakeholders support (e.g. private sector, communities) for PA management have not been adequately and effectively tapped.*** It is only now that the government is acknowledging and recognizing that the top-down (centralized) PA management approach is not yielding satisfactory results given the prevailing environmental and socio-economic conditions. The system is proving to be costly to administer for the government, and of limited effectiveness in mitigating threats (biodiversity loss seems to have continued to rise). Moreover, it was noted that DWNP still lacks capacities/expertise that were considered key constraints to be addressed as part of the ODMP formulation. There are constraints in capacities related to wildlife counts, quota setting, and endangered species monitoring, as well as capacity constraints in the provision of guidance and advice to Community Based Organizations

(CBOs), undertaking of research projects, biodiversity inventories, and conservation, and tourism management.

***The review of the Wildlife Conservation Policy of 1986 and associated instruments highlighted weaknesses in the country's PA management approach, which include the following:***

- Very limited involvement of the communities in wildlife management;
- No encouragement of the private sector to invest in wildlife management;
- No promotion to enhance the education of local communities regarding the economic value of wildlife; and
- No encouragement of a participatory approach with local communities.

In addition, ***it was also highlighted that the current programs and incentives appear inadequate in signaling the importance and value of the ODRS to the wider community in a number of ways.*** Particular issues include:

- Low levels of awareness of, and participation in, conservation schemes;
- Reliance on government intervention;
- A belief that alternatives (compensation) arrangements and programs for conservation efforts are inadequate; and
- Low levels of confidence in CBOs and heavy reliance on the delta's natural resources as a livelihood strategy.

Factors seen as necessary to improve the above include sharing risk, enhancement of the current CBNRM program, improvement of marketing, financial management, and business planning, and management capacity of CBOs for development of tourism-based conservation business enterprises. Greater information sharing and education of the wider community were also considered essential.

## **Vegetation Resources**

Although the distribution and quantity of different vegetation resources in the ODRS cannot be ascertained in great detail, there is evidence that the area supports a healthy population of important plant species. Moreover, using abundance, distribution, and presence as the main indicators of vegetation status within ODRS, one can say that vegetation is still in good condition. However, the following problems and/or threats have been highlighted by nearly all stakeholders consulted:

- Veld fires which were blamed for being responsible for changing vegetation composition, structure and biodiversity;
- Overutilization (due to browsing, overgrazing, and harvesting);
- Vegetation destruction by large herbivores such as elephants (changing vegetation structure, composition and landscape);
- Population growth: expanding demands for more land leading to conflict among resource users;
- Introduction of small stock animal species and donkeys such to sustain rural pastoral livelihoods, following the mass slaughter of all cattle within Ngamiland to control the outbreak of Contagious bovine pleuropneumonia (CBPP) in 1996, thereby increasing animal densities and changing herbivore patterns.”
- Spraying against tsetse fly, which may lead to the encroachment by livestock owners in the former tsetse infested areas, where no livestock are present;
- Introduction of invasive weed species due to motorboats (e.g. Salvinia weed) or changes in the flood regime and drying of the channels and islands.

The vegetation component of the ODMP is a mandate of the Department of Crop Production and Agricultural Resources Board under the Ministry of Agriculture. Capacity constraints in these two departments were identified as follows:

- Insufficiency of skilled manpower e.g. rangeland ecologists, botanists, computer modeling specialists, and managers;
- Inadequate technical resources, e.g. GIS equipment, software, and remote sensing facilities;
- Shortage of staff to support the programs;
- Staff transfers and discontinuity of available expertise;
- Lack of coordination and collaboration, leading to overlaps in projects, programs, and use of resources or facilities;
- Dependence on foreign assistance, human resources, or capital;
- Insufficient financial resources and mechanisms.

Nearly all stakeholders consulted during this MtR commented that controls on vegetation resource use are inadequate, suggesting that heavy and/or premature harvesting for subsistence and/or commercial purposes can go unnoticed. It was pointed out that the vegetation resource base in the Okavango Delta is very dynamic and depends strongly on flood regimes. Conflicts and/or threats appear to stem partly from lack of appreciation of this situation by resource users, and opportunities for gearing up for the coming season get lost for similar reasons. It was strongly highlighted *that the supply of information on past and prospective flooding and implications to resource users should be promoted. This especially includes the issue of sustainable use of vegetation resources in ODRS, which stands out as a prominent action item in the ODMP Action Plan not being executed.* As already mentioned, *until now, no detailed and continuing monitoring/mapping of vegetation resources in the Delta has been done and/or carried out on a consistent basis.*

A lack of regulations controlling harvesting of mature trees for the production of poles and wooden canoes has also been observed. *There seems to be widespread agreement that deforestation and vegetation clearance in the ODRS for agricultural and other purposes pose serious threats to biodiversity in the ODRS.* Participants highlighted *the need for greater attention in understanding what defines and constitutes 'sustainable farming' as a basis for the future uptake of more appropriate 'conservation agriculture' practices by the wider community.* The initiative to designate a Forest Reserve in the ODRS (NG/13 – Chase, 2011) has also echoed an attempt to stem harvesting and land clearance by farm encroachment.

## Fish Resources

As documented in the ODMP, Okavango fishing comprises a multi-species fishery (71 species) ranging widely in size from the largest fish species, sharptooth-catfish with a maximum length of 1.4 m, to sickle-fin barb, with a maximum length of 3.2 cm. The resource is presently exploited by three principal fisher groups; artisanal or subsistence fishers (approximately 3000), commercial fishers (40 to 50), and recreational fishers (20-50 fishermen/day, HOORC 2007). Comparisons between the 1997 and 2005 frame surveys suggest that, overall, the number of fishers in the Delta has decreased (GoB 2011). At the present level of fishing, ODRS fish stocks are not in danger of being over-exploited. Monitoring done by the Division of Fishery (DWNP) in collaboration with Okavango Research Institute (ORI) has suggested no significant changes in species diversity, or species composition in the fish community in ODRS in general and the Delta's Panhandle in particular. *Based on these and other observations, there is a consensus among all stakeholders consulted that the ODRS's fishery resource is in a healthy condition, and that the current fishing regime is not adversely affecting the stock status.*

Nearly all stakeholders consulted agreed that the DWNP's Fisheries Division's policy context and management objectives are not yet clearly articulated. Daily management operations lack a clear policy direction and are based on the outdated Fish Protection Act (1975) and the more recent Fish Protection Regulation (2008) which addresses very specific technical issues. The result is a somewhat mechanistic operational approach, and a lack of resources to creatively address government policy objectives and realize the socio-economic potential of fisheries. Additionally, management requirements identified through the Biokavango Project have yet to be formalized into a holistic Fishery Management Framework with defined operational and resource requirements. There seems to be widespread agreement that ***the recent conclusion of the Fishery Management Plan for the Okavango Delta (FMPOD) has been a timely and appropriate intervention, which will potentially empower the Fisheries Division in carrying out its mandate more effectively.*** Consistency of the FMPOD with the format applied by the ODMP allows the FMPOD to be seen as an extension of the fishery component of the ODMP. In terms of policy, proposed FMPOD interventions and/or prescriptions align with draft wildlife and CNBRM policies. Equally, the Trans-Boundary Fisheries Plan draws from the FMPOD.

In addition to the above, there is a consensus among nearly all stakeholders consulted that the DWNP's Fisheries Division is ***relatively well resourced in terms of the number of personnel that are employed.*** The division is responsible for all levels of fisheries management in the Delta, with the primary tasks of granting fishing permits, compliance monitoring, collecting and collating 'catch per unit effort' data from the commercial fishers, experimental surveys, fisheries survey work, and extension work. ***Considerable financial and human resources are currently allocated to the monthly research surveys that are not informing management per se.*** Consequently, there is a need to assess the rationale for their continuation in terms of optimizing resource allocation within the Division.

***Staff training is clearly an issue, given that there are few (if any) trained fisheries scientists stationed in the Delta.*** The Division operates under some financial constraints that limit its ability to carry out its mandate. Most notably, the lack of suitable transport to support compliance operations appears to be an issue. The potential to develop linkages with NGOs, ORI, and other government departments to assist in compliance and community/fisheries-related issues should be considered.

With regard to the ODMP's action item to develop and implement a fish stock monitoring program, the objective of setting up a program was achieved and is ongoing. At present, the Fishery Division carries out fish stock monitoring four times annually in selected areas of the Okavango Delta and Panhandle. However, it has been reported that there are logistical difficulties in collection, which results in poor data quality. ***Accordingly, there is a need for the DWNP's Fishery Division to reassess and possibly modify the data collection and monitoring program and incorporate it into the Fishery Management Plan for the Okavango Delta,*** and the Trans-Boundaries Fish Management Plan.

All stakeholders consulted are of opinion that there is a fair institutional forum for all stakeholders involved in the fishery sector. While the Okavango Fisheries Management Committee (OFMC) provides a suitable forum for government agencies to interact with the fisher community, the Okavango Fishermen Association (OFA) provides a forum for all fishery stakeholders to discuss their issues and resolve conflicts. It also provides a formal representative vehicle through which fishers can present their issues to government agencies. In recent years, the OFA has been financially supported and mentored by the Biokavango Project. In terms of sustainability, it is strongly emphasized that the closure of this forum is not advisable, and that OFA is likely to require additional financial and mentorship assistance in the future. ***There seems to be a widespread agreement that OFA represents the primary vehicle with which to resolve conflicts and promote co-management in the Delta's fisheries sector, and every attempt should be made to support the organization and ensure its sustainability.*** In this regard, one of the core operational activities of the Fisheries Division should be stakeholder institutional building.

## **Bird Issues/Threats in the ODRS**

Preparatory work for the execution of the ODPM's action item related to declaration of Lake Ngami as a Bird Sanctuary is ongoing. The process is spearheaded by a committee led by the Botswana Tourism Organization, with representation from community based organizations (trusts), the private sector (tour operators), NGOs (BirdLife Botswana and Kalahari Conservation Society), government departments and others. The proposal, it was reported during the review, is currently awaiting ratification by the relevant government authority.

With regard to the ODMP's action item to protect the existing and potential breeding sites for slaty egret, some sites have been identified, but not all of them. No protection status has been extended to the identified sites as yet.

Threats to bird species in the ODRS in general and Lake Ngami in particular, it was reported, are increasing due to poisoning and fishing pressures. Birdlife Botswana has indicated cases of mass bird poisonings with potentially serious impacts on internationally and nationally endangered species.

## **Tsetse Fly Control**

Aerial spraying of insecticides within the Delta to prevent tsetse fly spreading to livestock areas has been ongoing for several decades. The northern and southern halves of the Delta were sprayed in 2001 and 2002. Short-term monitoring helped establish the impact of Delta methrin on the targeted biota. Aquatic invertebrate families declined by 25 to 46 percent immediately post spraying, although recovery was recorded as good in 2003, except for shrimp. Terrestrial invertebrates (e.g. beetles) declined by up to 60 percent. These taxa appear to have made a generally good recovery in 2003. The spraying program was designed to eradicate the fly (that is, a "one-off" event), and so far appears to have been successful.

The Kwando Zambezi regional tsetse eradication project was originally launched in June in 2009 in Namibia. The Botswana government has done its part in the control of tsetse and it attended the launch to provide technical advice. The Tsetse Transboundary Free Zone was established through this initiative. There are financial challenges facing especially the countries of Namibia, Angola, and Zambia. These countries have approached the African Development Bank for financial assistance.

## **HYDROLOGY THEMATIC AREA**

Hydrology was one of the 12 components comprising the Okavango Delta Management Plan project. Hydrology falls under the biophysical thematic area, and its strategic goal as captured by the ODMP is "to ensure the long-term conservation of the Okavango Delta and the provision of existing ecosystem services for the benefit of all organisms dependent on it." In line with this strategic goal, the immediate strategic objectives of the hydrology component are, "improved water resources planning, as well as maintenance or restoration, monitoring and evaluation in the Okavango Delta, based on an enhanced capacity of the Department of Water Affairs." Realization of these strategic objectives requires a comprehensive knowledge (data) base, comprising the following:

- Existing climatic, hydrologic, surface water, ground water, and sediment data for the Delta,
- The improvement and expansion of the ODRS monitoring network;
- A digital topographic model for the Delta, accompanied by an integrated hydrologic model and
- Enhanced capability of DWA to maintain and operate the model.

Overall, during this MtR, it was noted that the hydrology component has made contributions in developing the hydrological modeling capabilities required. However, the progress in all other areas has been seriously delayed or found lacking. No actions were taken in addressing some of the most potentially critical threats to the Delta. A majority of the recommendations, especially priority research and monitoring, have not been implemented as per the ODMP recommendations. Research is still undertaken in a random manner within the ODRS. The delay seems to be mostly attributable

to “standard issues” of funding and capacity constraints. It was also noted during this MtR that different researchers in the area seem to be using different models, modeling codes, assumptions, and approaches. Almost all stakeholders consulted were in agreement that, though it may be understandable that the modeling codes be tailored toward achieving a particular study goal, it is desirable to adopt a single code (or approach) for the Delta and the Basin as a whole, to ensure that the model matures over time and can be reliably used to make informed water resources management decisions within the Delta.

The general progress, challenges, and issues of the hydrology component following the operational objectives and/or practical management prescriptions as set out in the ODMP are discussed below.

### **An Integrated Hydrologic Model for the ODRS**

The integrated hydrologic model was developed and completed by DHI between March 2004 and March 2005, with involvement of personnel from the Department of Water Affairs Modeling Unit. The model was developed to assist in understanding the hydrologic processes in the Okavango Delta, as well as in assessing of the impacts of various water resource-use scenarios. The model was transferred to DWA for future use, including a series of water resource application scenario analyses to support implementation of the ODMP. However, the use of the integrated hydrologic model (including required continuing updates) has not been consistent and successful. The root cause of this failure relates to lack of skills. Specifically, DWA’s personnel who were trained as a part of the development of the integrated hydrologic model have either left the department or have been transferred to other divisions. Consequently, there remains a need for continuous training of personnel to ensure sustainability and continuity of the DWA’s Modeling Unit.

### **Increasing Knowledge about the Biophysical System**

For the hydrology and water resources components that fall under the ODMP’s biophysical thematic area, the operational objective is that the DWA has to improve the monitoring of water quality and sedimentation. Critical activities include increasing the frequency and the number of water quality monitoring points in the ODRS and initiating sediment transport measurements at key locations. Thus far, the water quality monitoring component is partially addressed by the Bio-Okavango project on persistent organic pollutants, though the questions of continuity of long-term monitoring remain open. On the other hand, systematic sediment transport monitoring is not being undertaken by DWA, save for four locations by a Ph.D. student in 2006.

It should, however, be noted that DWA is establishing a water quality monitoring system which will be based at eight water quality monitoring sites in the Delta. A consulting company has been contracted and the report is expected to be available shortly (sedimentation monitoring, as required by the ODMP, will not be included).

It is important to call attention to some of the highest priority hydrological research topics identified in the Okavango Research Strategy, facilitated under the ODMP project. Though not explicitly captured in the main report, these highest priority hydrological research topics include:

- Establishing factors that affect flood distribution and frequency;
- Establishing the validity of the existing hydrological models of the Delta;
- Conducting inflow stream requirement studies at key points in the Delta which links hydrology to ecology;
- Establishing flooding patterns and flooding trends to help in the development of specific response action plans.

***It is, however, observed that until now very few or none of the recommended hydrologic research topics are being pursued.*** It is expected that the “The Future Okavango Project” (OKACOM 2011) will address some of the issues.

In addition to the above, the Okavango Research Strategy has also outlined the following areas where research is limited:

- Understanding of the different ways in which the Okavango/Cubango River Basin responds to change (climatic and hydrological) and how these affect ecological and social processes;
- A thorough understanding of the physical, chemical, ecological, socio-economic, and political factors that influence the interactions within and between society and ecosystem components;
- Directed management-oriented research that answers focused ‘cause and effect’ questions.

As highlighted in the Botswana National Action Plan (OKACOM, 2011) these areas are crucial for enhancing the understanding of the Okavango Delta and for the formulation of appropriate management interventions. *It has, in this regard, been observed that individual research agenda have thus far been pursued, rather than coordinated research programs that would be more focused and comprehensive.* Accordingly, the added value of having a coordinated approach to research in the area needs to be addressed.

### Monitoring of the Biophysical System

The ODMP recommended that a monitoring program with clear protocols be put in place in order to ensure that the biophysical system is functioning within its operational limits. Putting these protocols in place has been delayed.

It is worth-mentioning that the TDA (OKACOM 2001) has also highlighted the limitations of available data and monitoring protocols in giving a comprehensive picture of the current status of especially water quality in the whole basin, including the Okavango Delta. As is noted, only a few parameters are well known and even though pollution is often acknowledged, the exact nature, source, and location of the pollution are not always defined. The Strategic Action Program (SAP), (OKACOM 2011) highlighted this as one of the most critical gaps within the TDA.

### Establishment of Water Quality Guidelines for the Okavango Delta

The ODMP recommends that a water quality standard for the Okavango Delta be defined in terms of the goals for water use. This standard would be applied when renewing or issuing permits for different water uses. The different water uses could include water supply (domestic, agriculture) and maintenance of habitats. *Although the Botswana Bureau of Standards has established standards for to which drinking water and effluent discharge must adhere, standards for other uses have not yet been established. It is also important to take into consideration the unique water quality of the Okavango Delta when setting these standards.*

### Sustainable Use of Water Resources

Water is the principal driver of Okavango Delta ecosystems. Variability in flooding regimes, which lead to different temporal saturation states of the system, i.e. flood extent, duration and timing of flooding, leads to the high habitat variability that characterizes the system. This variability makes it difficult to be definitive on how much water could be removed from the system without negatively affecting the functioning of the Delta (ODMP, 2008). Under current conditions, the impact of water resource use and management such as abstraction, dredging, and channel clearing is minimal. However, increasing socio-economic pressures (development needs) will result in competing water requirements for the system, which need to be delicately balanced, to ensure the long-term survival of the Delta. The strategy is for Botswana to be conscious of potential impacts of any water resources management intervention either nationally within the Okavango Delta or by upstream riparian states (ODMP, 2008). The strategy should be based on the precautionary principle of ecosystem

management. This principle implies that when there are threats of serious or irreversible damage to a particular environment, lack of scientific certainty should not be used to prevent taking cost effective measures in order to avoid environmental damage (OKACOM, 2011). This strategy has been recommended for adoption in the National Action Plan for Botswana (OKACOM, 2011).

### The Hydrological Role of Riparian (or Wetland) Fringe

During this MtR, the important hydrological role of *the riparian (or wetland fringe) woodland in the Delta was strongly highlighted as a critical issue in maintaining a thin layer of fresh groundwater and island soils and preventing the ODRS from becoming a “salt pan”*. As recently highlighted (McCarthy et al, 1994), this is the result of transpirative pumping of groundwater by trees, which keeps the highly saline bulk water table at sufficient depth to prevent toxic salt build-up in surface soils. Stakeholders interviewed generally agreed that land use practices that affect the ability of the fringe wetlands to fulfill this role threaten the very ecological fabric of the Delta. If all the riparian woodland was removed, groundwater levels would rise, and surface salinities would quickly reach toxic levels that would effectively prevent the re-establishment of new woodlands. *Over-harvesting and destruction of vegetation by high elephant, livestock, and human populations are seen as potentially major threats to the Delta’s biodiversity, by virtually all stakeholders consulted. Increasing demands due to settlement growth, coupled with premature and indiscriminate harvesting of vegetation resources, have led to unprecedented pressure on the vegetation resources.* There are no data on the effects this pressure is having on Delta habitats.

### Channel Clearing

One of the action items prescribed by the ODMP includes the need to manage channel blockages to sustain the communities’ access to livelihood activities. *Nearly all stakeholders consulted agreed that it was fortunate that this action item was delayed and not accomplished.* As strongly noted, channel clearing to maintain navigable passages is an activity that interferes with ecological processes, including, significantly, channel aggradation and avulsion processes which drive ecosystem renewal (McCarthy et al, 1992). This affects flood distribution within the Delta, and may result in localized species extirpations (e.g. this may remove habitat for certain species that require still water or which breed in submerged vegetation tangles). It also has unquantified effects on the distribution of sediment and flood water through the distributary system.

### Potential Threats and Implementation of Related Action Items

The ODMP and the recent TDA (OKACOM, 2011) have found that the Okavango Basin, including the Delta, is still in a relatively pristine state, which is remarkable, compared to other river basins of its size in the world. This has afforded the opportunity to develop a Water Resources Management and Development Plan that should allow for sustainable use of the Okavango Delta water resources. Water, as expected, is the main driver of ecosystem diversity within the Delta. The key is to maintain the delicate balance between competing water uses, while at the same time ensuring ‘its long-term conservation and its continued provision of benefits for the present and future well-being of the people, through sustainable use of its natural resources.’ The ODMP has, in this regard, identified the major potential threats to the long-term conservation of the Delta, in terms of water resources as:

- Climate change
- Seismic activities
- Large-scale water development
- Pollution

### Climate Change

Scenario simulations based on integrated hydrological modeling showed that climate change has potentially the greatest impact on the Okavango River Basin and the Okavango Delta, reducing both inflows from upstream and rainfall over the Delta. It is believed that climate change in Southern Africa will result in decreased rainfall and increased temperatures in the long term, leading to reduced inflows and high evaporation rates (ODMP – Water Resources Scenarios, 2006). The ODMP has recommended that “the sectors such as tourism, agriculture, subsistence and commercial use of vegetation resources, water, and fisheries which are likely to be affected by the impact of climate change, initiate the development of coping strategies.” These coping strategies, as observed during this MtR, have not been implemented yet. Moreover, nearly all stakeholders consulted said that the climate change issue is very ambiguous, bearing in mind that there were no attempts and/or elaboration (prescriptions) of what mechanisms, such as coping strategies, might entail.

### **Seismic Activities**

The Okavango Delta is located in a tectonically active zone that is an extension of the East African Rift Valley System. In terms of tectonic events, various researchers suggest that these events have the potential to profoundly impact the functioning and dynamics of the Okavango Delta. Small-scale seismic activities are believed to affect the flooding patterns, while large ones will have far reaching consequences. ***The ODMP recommended that predictive model(s) that can be used to inform responsive action be developed. It was, however, observed that this recommendation has not been implemented yet.*** During the Maun Groundwater Development Project Phase 1 (1995), seismic stations were installed in various locations within the ODRS by DWA and handed over to the Department of Geological Survey for monitoring. As observed during this MtR, these stations have since fallen into disrepair.

### **Large-scale Water Development**

As indicated above, the Okavango Delta and the Okavango River Basin as whole is presently in a near pristine state. Present-day water abstractions (surface and groundwater) still have minimal impact on the Delta as whole, though local impacts may be significant. ***The integrated hydrological model of the Okavango Delta indicates that while the present surface and groundwater abstractions are minimal, amounting to only 0.25 percent of the inflows, the potential for upstream developments, such as irrigation developments in Namibia and Angola, are likely to reduce the permanently flooded areas by 38 percent if not more*** (ODMP – Analysis of Water Resources Scenarios, 2006). As a mitigation measure for this scenario, the ODMP recommended that Botswana should continuously engage the other two riparian states of the basin, Namibia and Angola, through the OKACOM to protect her interests. ***This recommendation is currently being implemented through OKACOM initiatives.***

### **Pollution**

In terms of pollution, the Okavango River Basin and the Delta as whole is still relatively undisturbed, except potentially at local scale close to major urban centers (ODMP, 2008). Although large-scale agricultural practices are a potential source of pollution in the Okavango River Basin, through nutrient discharge, mainly nitrogen and phosphorus and toxic substances such as pesticides and herbicides into the Delta system, their current use is still limited. Stakeholders consulted are of the view that continuous efforts should be made to limit the use of such substances in the Core Delta.

Another pollution source of concern is the large number of lodges and camps in the Delta. To address the issue of potential pollution in the Delta, the Bio-Okavango project, supported by the Botswana government, undertook some water quality monitoring in several locations in the Delta. The principal reason for this water quality monitoring program was to establish the (baseline) current water quality of the Okavango Delta, as well as future spatial and temporal trends in water quality. The stakeholders involved in this water quality monitoring project are DWA, Northwest District Council, and commercial tourism (safari) operators in various locations within the ODRS. The

project also supports ORI in undertaking water quality monitoring at Boro Buffalo fence, Lake Ngami, Toteng, Maun Old Bridge, and Tsanakona (Bio-Okavango project, 2006 to 2010). It is unclear what will happen at the end of the water quality monitoring project. Continuity needs to be maintained.

It was also observed that the government of Botswana, through the North West District Council, has adopted a Waste Management Strategy within the ODRS. In addition, a strong sense of determination among stakeholders to make tourism operators in the Delta responsible for the strict control of effluent from their facilities, both into groundwater and into open water, has also been noted.

## LAND USE THEMATIC AREA

As a component of the ODMP, with Tawana Land Board as the lead Institution, an Integrated Land Use and Land Management Plan (shown below) was developed for the years 2005-2029. This Plan was developed around the key stakeholders' and communities' aspirations "***to strengthen capacities for improved and better land use and land management practices, as well as wise and sustainable utilization of the ODRS's land and other resources during the plan period.***"

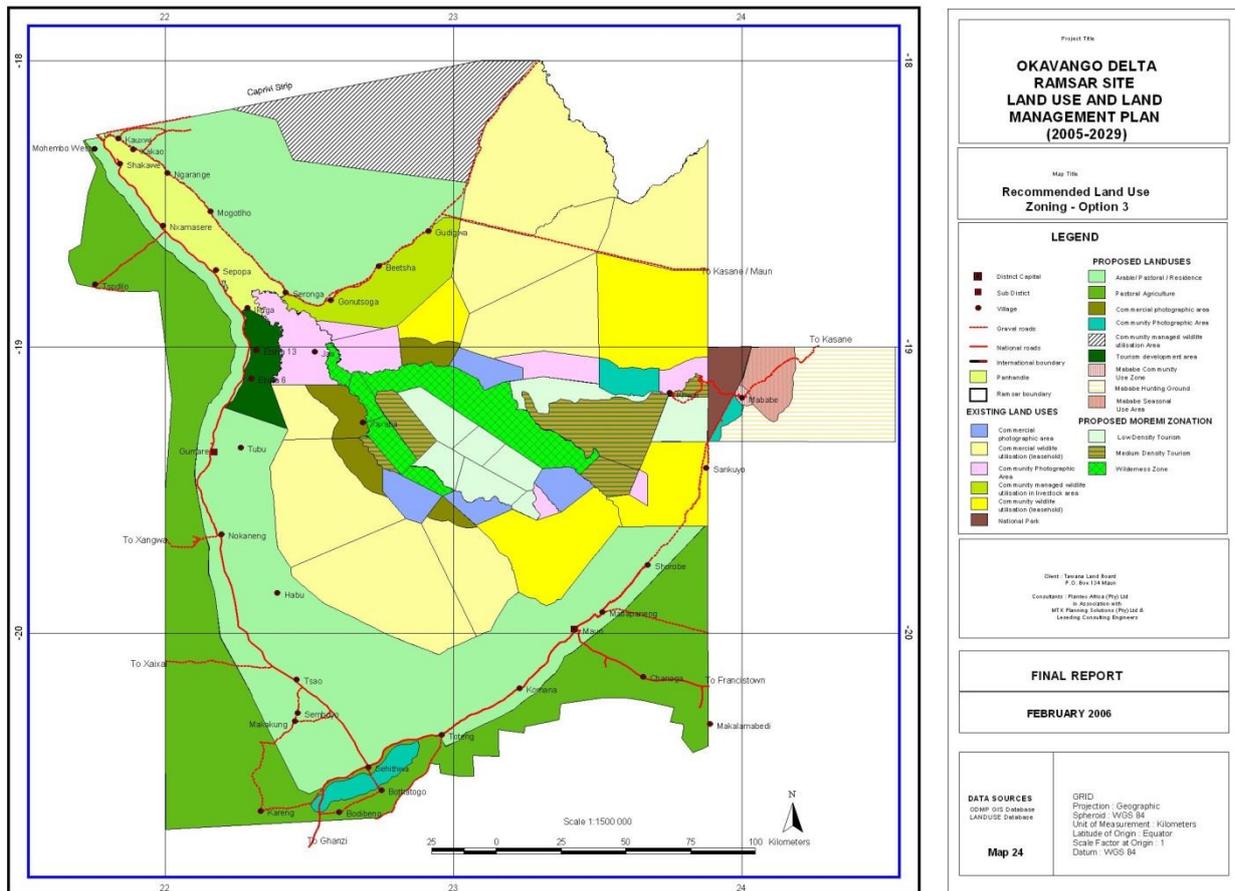
Consultations with the key stakeholders involved in the ODRS's Land Use and Land Management revealed that ***little progress has been made regarding implementation of the plan.*** It is noted that the plan is largely unimplemented and, what is even more important, ***there appears to be no concerted efforts to overcome the key problems that have hampered (and continue to hamper) the plan's implementation.*** The mid-term review of the proposed implementation framework of the plan and consultation with the concerned officials revealed the impediments discussed in the following sections.

### Lack of Stakeholder Buy-in

It is a widely held view that the ODRS Integrated Land Use and Land Management Plan failed to ensure an all-embracing stakeholders'/community buy-in. Judging by the current land use and management practices within the ODRS, there is little evidence that the plan is actively informing the work of other government departments and parastatals. The MtR has in this regard, revealed inconsistencies. For example, while the ODRS Integrated Land Use and Land Management Plan makes a strong case against "mushrooming of settlements", the extent to which development patterns and sprawling have changed on the ground remains in dispute.

There is no doubt that the fragmentation of policy and implementation and the lack of stakeholder buy-in has created the perception that growth in the entire ODRS continues without any overall umbrella development strategy. One of the consequences of this has been a history of poorly coordinated development, with investments in infrastructure or facilities sometimes out of sync with spatial development requirements. The Land Board and sub-land boards do not adequately consult the District Council, the Tribal Administration and Village Development Committees before allocating land, while central government departments at district level tend to operate as separate entities and report directly to their respective departmental headquarters. Moreover, this MtR has revealed that local authorities are not always fully aware of the development programs of utility providers.

It was also noted that divergences in policy objectives pursued by different stakeholders have resulted in sectoral land or resource use conflicts. In the ODRS, these land use conflicts are prominent between wildlife, livestock, arable land, tourism, natural resources conservation, and scattered settlement expansions, as well as between subsistence use (gathering of veld products, fishing, and hunting wildlife) and the need for conservation and sustainable resource use.



**Map 3: Okavango Delta Ramsar Site Land Use and Land Management Plan – Recommended Land Use Zoning – Option 3**

### Poor Enforcement of the Plan’s Provisions

There seems to be a consensus that the greatest challenge in improving land use and land management practices is the enforcement of the provisions contained in the ODRS Land Use and Land Management Plan. This MtR revealed the following issues:

- Following the plan’s recommendations, the government opted for selective implementation, retreating from the more far-reaching proposals to declare the entire ODRS a planning area (as per the provisions of the Town and Country Planning Act, 1977). The absence of this executive declaration exposed a wider strategic deficit in ODRS land use planning and control that relates to the legality of the plan. This has impacted negatively on the effectiveness of the plan as a tool for the control of development. There is a widespread agreement that the non-declaration of the ODRS as a planning area has made it very difficult for land use planning and control processes to operate effectively and fairly. Specifically, the Town and Country Planning Act is not yet formally applicable to the ODRS, hence the ODRS Land Use and Management Plan and all subsequent plans of lower order, are only advisory to the implementing organizations. This means that they are not legally binding, and therefore the communities and implementing authorities are not necessarily obliged to adhere to and implement the plan’s guidelines and recommendations.
- This MtR has also revealed that contrary to the Land Use and Land Management Plan’s prescriptions to prepare development plans for all settlements in the ODRS, at present only three settlements, namely Maun, Gumare, and Shakawe have their development plans prepared and approved. Two of these plans (Gumare and Shakawe) are advisory (non-statutory) plans, while the Maun Planning Area Development Plan is statutory, meaning that the provision of the Town and Country Planning Act and subordinate pieces

of legislation are applicable in the area. All other “gazetted” settlements within the ODRS have neither development plans nor any simple land use structure plans, as originally recommended. Much evidence on the ground proves that the absence of settlement development plans, regulating settlement boundaries and growth directions, have resulted in settlement sprawl and unwise use of land. Given the sensitive nature of the ODRS, this issue cannot be, by any means, overemphasized. Moreover, a trend has also been spotted which is the “mushrooming” of un-gazetted settlements along the edges of the ODRS and along the main arterial roads that service the eastern and western parts of the Delta. There are now incessant calls for “gazettment” and provision of services to such “settlements”, which is not a cost efficient and rational use of land or land management in the ODRS.

It is worth mentioning the initiatives of the Southern Africa Region Environmental Program (SAREP) in facilitating the development of Participatory Integrated Land Use Plans (PILUP) for selected villages within the ODRS. The PILUP can best be described as the process of designing, evaluating, and proposing village land use plans, as well as optimal uses of natural resources, in order to improve the living conditions of villagers. Though it is not clear whether this SAREP initiative is being implemented under the umbrella of the ODMP, the *PILUP initiative is undoubtedly a positive response in creating opportunities for more beneficial changes and environmentally sound land use and control practices at the village level.*

### **Lack of Awareness of Regulations**

In examining the degree of compliance with and enforcement of the recommendations of the Land Use Plan and related low-level plans in the ODRS, it is noted that they have been (and still are) comparatively high only in the major settlements currently covered by the development plans (Maun, Gumare, and Shakawe). In all other areas, compliance with the existing regulatory framework and enforcement of the plan’s prescriptions are still problematic. Nearly all stakeholders consulted agreed that the extent to which people in the ODRS are aware of the existence of the Land Use Plan and related regulations is rather low (again with the exception of the major villages in the area). It is a widely held view that the recommended sensitization of communities through increased public education campaigns on the existence and importance of development plans has not been either successful or executed effectively. Closely related to this is the factor of general ignorance of the plan and related regulations among the poor population (self-allocations or changes of land use without reference to the relevant authorities etc.).

It was also noted that community based organizations and trusts lack the requisite management skills for effective land management in their respective areas.

### **Inappropriate and Inflexible Regulatory Framework**

It is important to note the agreement among key stakeholders consulted during this review exercise that the present land use regulatory frameworks and the planning instruments available are contextually irrelevant to the realities of the ODRS. In other words, the Land Use and Land Management Plan lacks an ODRS-specific development control code that would act as the cornerstone for guiding development within the ODRS in line with the area’s sensitivities and current socio-economic realities. Many stakeholders consulted are of the opinion that the current plan lacks the specificity needed to guide decisions and, as such, is difficult to implement.

Land use planning practice in the ODRS is yet to incorporate environmental sustainability (or smart growth policies) into its regulatory framework to deal with environmental/biodiversity problems and Ramsar site’s sensitivity directly.

## Political Interference

Political interference is not an uncommon phenomenon and contributing factor in the non-enforcement of the provisions contained in the ODRS Land Use and Land Management Plan. *There is a consensus among stakeholders consulted that politicians have on many occasions become stumbling blocks to successful enforcement of recommendations of land use plans and policy implementation in the ODRS, by turning a “blind eye” to violations (self-allocations, squatting etc.) or tolerating damaging activities of self-interest.* The discussions revealed cases when councillors and other powerful government officials are afraid to lose community (voters’) support, if they take a stringent stance on issues of conservation, especially with regard to ungazetted communities residing within the Core Delta.

## Weak Financing and Manpower Enforcement Machinery

Almost all government officials consulted said that enforcing the provisions of the Land Use Plan in the ODRS other than in major settlements of Maun, Gumare, and Shakawe, is a very big challenge. *The unavailability of funding support and inadequate manpower numbers and skill levels to enforce the land use plan’s guidelines and regulations throughout the whole of the ODRS are still the most critical issues.* It appears that little has been done in building and strengthening capacities within TLB, subordinate land boards, and the NWDC Physical Planning Unit as originally prescribed by the ODRS Integrated Land Use Plan. Nearly all stakeholders consulted agreed that the functions of spatial planning and professional roles of spatial planners are still not adequately given priority, especially in TLB and subordinate land boards. Consequently, they still lack full planning powers in meeting the challenges of undertaking the complex duties of land use planning and development control in the whole ODRS. An analysis conducted by the BiOkavango Project confirmed that there are deficiencies in the operations of the Tawana Land Board and subordinate land boards, especially with regard to their capacity to effectively manage land in the district. These deficiencies can be summarized as:

- Limited appreciation of policies that give Tawana Land Board and subordinate land boards the powers to manage land and its natural resources;
- Limited capacity for mainstreaming biodiversity management into main and subordinate land boards’ day-to-day operations; and
- Tawana Land Board and subordinate land board members do not have the skills to guide the implementation of programs that promote sustainable development.

As part of the overall capacity building effort, a training manual for the integration of sustainable development and environmentally sound decisionmaking (biodiversity mainstreaming) into Tawana Land Board’s operations has been developed by the BiOkavango project. The manual aims at improving the decisionmaking capacity of Tawana Land Board for land management by means of:

- Enhancing the understanding by Tawana Land Board members of the policy and legislative framework that governs land, natural resource and biodiversity planning and conservation in the District, and
- Introducing Tawana Land Board members to concepts and procedures of sustainable land management and how to mainstream biodiversity conservation into their day-to-day operations.

*There is however, no evidence that this training is being vigorously implemented.*

## Integration and Implementation of Management Plans

Even though some site-specific management plans' proposals and zonation have been integrated into the Integrated Land Use and Land Management Plan (i.e. Moremi Game Reserve Management Plan, Okavango River Panhandle NG/41 Management Plans), they continue to pose challenges to implementing authorities (TLB, NWNP) in terms of ensuring compliance to regulations and guidelines as prescribed by these management plans. This especially relates to the *Moremi Game Reserve Management Plan for which implementation seems to have been seriously delayed*.

## Coordination Among Planning Authorities

The ODRS Integrated Land Use and Land Management Plan strongly recommended the streamlining of DDC, TLB, the NWDC Physical Planning Unit, DLUPU, and DWNP and bringing them under the umbrella of one standing coordinating body. It was prescribed that the DDC should be strengthened and accorded the status of a permanent institutional structure, operating full time with its own secretariat. Another option presented by the plan will be for the Okavango Wetlands Management Committee to assume this role, while also being represented in the DDC. It was genuinely believed that this arrangement would provide the much needed land management coordinating structure to promote cooperation and linkages among the various institutions dealing with land management and land use planning matters in the ODRS.

This mid-term review and appraisal of land use planning practice in the ODRS revealed that the coordination between key stakeholder involved in land use planning, land management, and development control at the local (ODRS) level has been enhanced substantially in recent years. It is, however, observed that the DLUPU (though operating on an ad-hoc basis) has contributed to this more than the DDC, as originally recommended by the Land Use Plan. In this regard, there appears to be no concerted effort to strengthen the DDC as the permanent facilitator of inter-agency coordination.

Although substantially enhanced, the coordination between key stakeholders involved in land use planning, land management, and development control still lacks the capacity to act as the “whole-of-ODRS” umbrella with the necessary degree of decision-making authority in efforts to coordinate land use planning, land management, and development control in the whole ODRS. In this regard, almost all stakeholders interviewed felt that a disconnect still exists between central government and local planning and land management authorities that have sometimes different or competing priorities. They claimed that up until now, very little seems to have been done in developing an institutional understanding of the ODRS's planning and land management issues and needs so that influential partners in government are willing to play a role in providing leadership and support in facilitating cooperation and agreement.

It was also noted that decentralization of planning and land management functions as prescribed in the Land Use and Land Management Plan in the form of devolvement of some of the functions of the main land board to the community-level subordinate land boards has not been effectively accomplished yet. It was pointed out that this decentralization requires statutory authorization through amendments of the Tribal Land Act, which are at present (as noted by relevant stakeholders) in a preparatory phase.

In summary, despite a complex and inefficient legal framework, with a multiplicity of development-related pieces of legislation, policies, and guidelines prepared by different government departments, inter-agency collaboration and evolution of institutional arrangements at the local (ODRS) level is proving to be one of the most important areas where improving land use, land management, and development control would yield real dividends.

## Settlements in the Delta Swamps

Consultations during the mid-term review exercise revealed that land use planning and land management authorities have not yet fully addressed mushrooming of un-gazetted settlements along the edges of the ODRS, and also issues of (non-gazetted/gazetted) villages in the Delta such as Khwai, Xaxaba, Jao, and Ditshiping. ***Sentiments were echoed during the thematic area workshop that the planning and land management authorities have thus far failed to effectively control (limit and rationalize) village expansion in the Core Delta; enhance their cleanliness and visual appreciation; and provide for basic services that would be appropriate for communities in a Ramsar site environment.*** In other words, there seem to be no genuine efforts so far from authorities to cope with these issues and establish control mechanisms that would ease implementation of recommendations contained in the Land Use and Land Management Plan. These prescriptions call for no new settlements and stringent restriction of the growth and expansion of the existing ones in the Core Delta. Several issues and challenges relating to settlements in the Delta came to the fore during the thematic area workshop. These include:

- Relevant planning authorities have failed to delineate ***growth boundaries of villages in the Core Delta*** (i.e. zones where development can be encouraged as opposed to land outside growth boundaries, where development must be discouraged and stringently controlled).
- The serious issue of land allocation and its control in non-gazetted settlements which is still in the hands of the traditional local authorities. ***Almost all stakeholders were in agreement that local planning authorities, (including land boards) should consider getting statutory authorization for gaining more control over developments in these villages.*** This may even require actualization of the declaration of the whole ODRS as a planning area in terms of the Town and Country Planning Act (1977).
- Almost all communities in the Core Delta pose concerns with regard to environmental quality and aesthetics. These are concerns in the sense that they present pictures that do not enhance visitors' experiences of the area in a positive way. In many villages there are no basic facilities and services as they are not recognized (gazetted) as villages. One of the consequences of this is the failure of villages in the Core Delta to unlock their tourism potential as cultural attractions in the area. ***Many stakeholders were of the opinion that the villages in the Core Delta are presently regarded more as "obstructions to a place marketed as a 'pristine wilderness'" rather than "cultural attractions".*** It is also noted that almost all of these villages are made up people from different areas, with different norms, values, and practices. This directly affects their viability to function as communities.
- Some stakeholders noted local authorities' (DLUPU's) initiatives in identifying concerns and suggesting remedies for more effective control of all (gazetted and non-gazetted) villages in the Core Delta. ***These remedies revolve around the idea of voluntary resettlement of communities, subject to approval by the Tawana Land Board and endorsement by the relevant central government authorities.*** The Cases of Xaxaba and Khwai village were mentioned in this regard. Sentiments were, however, echoed by some stakeholders who emphasized that the local authorities' initiatives seek to break the relationship between the local tribal communities and the Delta ecosystems in the name of tourism development and wildlife conservation. They were of the opinion that the relevant authorities (in this case TLB) need to make an effort and assess possibilities of avoiding the physical and economic resettlement of people and integrate them and their land use zones into the management of the Core Delta. Where such cohabitation is not viable, the authorities need to negotiate with the community to establish "free, prior, and informed resettlement action plans" in line with best practices and international standards

(such as the World Bank policy of involuntary resettlement) and implement them in a timely and comprehensive manner.

***There is a widespread agreement among all stakeholders that whatever solution and remedy may prevail, the issues of communities in the Core Delta need to be eventually addressed and resolved.***

### **Land Management, Monitoring, and Development Tracking in the ODRS**

The issue of land management has been labelled by almost all stakeholders consulted as a major stumbling block in achieving sustainable development in the ODRS. In this regard, it is observed that while effort and investments have in the recent past been made to improve the functioning of the Tawana Land Board and subordinate (Gumare and Shakawe) land boards, sufficient measures (as originally prescribed in the Integrated Land Use and Land Management Plan) have not been taken to directly address issues contributing to poor land management in the ODRS.

During this MtR it was also noted that Tawana Land Board's jurisdictional area is not only extensive (being only second to Ngwato Land Board's), but also the most complex in terms of land use issues. These include management of a wetland ecosystem, allocation of concession areas, managing land in game reserves and controlled hunting areas (CHAs), and dealing with the normal allocations of land for residential and commercial uses etc. Besides well-staffed and functional organizations, efficient performance of these functions also requires development of effective and functional (GIS-Based) land information and record-keeping systems for TLB. This system is considered as a crucial element in improving wise use of land and management practices in the ODRS.

This review revealed that the usage of modern geo-information system at TLB is still in its infancy. It is characterized by the limited collaboration and/or disconnection (or digital divide) across TLB's program areas. While the survey unit managed to automate to a certain extent the existing workflow, all other units seem to be lagging behind. It is noted that TLB is still plagued by problems typical of poor manual land management, information and record-keeping systems, and suffers on due to the inherent shortcomings of these systems. A summary of the problems still inherent in the current land management practices in the ODRS are as follows:

- Incessant complaints of missing records of land uses (rights are issued, but records are not kept in good order);
- Double allocations and disputes over land rights;
- Poor monitoring of development covenants, including difficulties in repossession and re-allocation;
- Land allocated by chiefs not documented;
- Land speculation and illicit "sale" of tribal land (appearance of land market)
- Self-allocation of land
- Unlawful land sub-divisions and change of land uses;
- Haphazard and unregulated land developments; and
- Land degradation and loss of biodiversity across ODRS.

The above mentioned problems have been identified as a serious 'dysfunction' in land use/land management decision-making across ODRS, and are articulated in this MtR as a widespread concern regarding TLB's capabilities of "tightening up" the control over sustainable use of land across ODRS. At this juncture it is important to point out TLB's expectations from the Tribal Land Information Management System (TLIMS) to provide the basis for more appropriate land and records management. TLIMS was intended to automate land allocation at the land board level. Functionalities included land use planning, processing plot divisions, sub leasing/subletting, control and compliance monitoring, acquisition and compensation, adjudication, and land board review. Part

of its aim was to facilitate data sharing between the main land boards and subordinate land boards as well as other government departments. With regard to TLIMS, many (if not all) officials, and stakeholders consulted have expressed skepticism that TLIMS in its current form would ever succeed, given the poor state of the paper records, which should have provided input to the system. It was noted that the LAPCAS project (Improvement of Land Administration Procedures, Capacity, and Systems in Botswana) could eventually be a realistic solution in providing effective and transparent land management services in future.

Besides land information and record-keeping systems, the MtR also revealed that local planning and land management authorities (notably TLB), have no uniform or consistent method of monitoring and tracking development across ODRS. The process seems to be neglected. The stakeholders' consultations in this regard revealed the lack of accurate and up-to-date information that would provide the basis for a "proactive" approach to diagnosis, situational (re)appraisal, and prompt improvements in the ODMF's and its component plans' provisions. It is noted that the relevant local authorities (notably TLB and subordinate land boards) not only lack a consistent monitoring framework, but also the key development indicators that would serve as a basis for periodic validation of all assumptions, forecasts, and objectives of the land use and land management strategies. In discussing challenges and opportunities for more effective development tracking and proactive anticipation of issues, the following were noted:

- The land management authorities should strengthen their statutory role in monitoring land use changes in the ODRS through centralization of most of the data required for appraisal of situations and decision-making support at all levels;
- A systematic approach to monitoring and development tracking in the ODRS, including the establishment of appropriate instruments (such as the use of indicators) is urgently needed;
- Because monitoring and development tracking is inherently a locational problem (i.e. gathering data on a geographic basis), the deployment of geo-information technologies is seen as an evolving and relevant approach.

Some stakeholders consulted (including MtR members) said that the strengthening of TLB and subordinate land board capacities must be accompanied by a thoughtful restructuring of TLB and the subordinate boards. In this regard, that there will be a need to transform main and subordinate boards into "development" organizations, as opposed to one-dimensional, reactive "deliverers of services". ***Many of the stakeholders consulted were of the opinion that TLB need to qualitatively broaden its function through introduction of mechanisms which would encourage "the desired type of land development" as opposed to merely 'controlling (regulating) the use of land and providing services'.*** Based on best practices in neighboring countries and elsewhere, the term "desired type of land development" as advocated above includes the following activities:

- The regulation of land use changes;
- The regulation of "green fields" land development, i.e. development of previously undeveloped land;
- The regulation of subdivision and consolidation of plots;
- Leasing control and compliance monitoring;
- Repossession of undeveloped but allocated land;
- The regulation of upgrading processes in the existing built up areas' biodiversity conservation; and
- The facilitation of land development through more active community participation in the land development process.

While the first six of the aforementioned activities correspond with the existing land development regulations and practices, the last one is different in that it requires from TLB a more proactive

approach in land development, one that moves well beyond control of development and service provisions, toward:

- Investment promotion by means of introducing (to the largest possible extent) different land use management instruments to either protect biodiversity or attract certain types of investment, and
- Provision of incentives to promote a type of proposed land development at selected (strategic) locations.

To achieve these objectives, TLB is likely to have the challenging task of formulating well-coordinated (i.e. a single "wall-to-wall") land use planning and management processes across its jurisdictional areas. This is expected to be difficult given the present organizational and administrative realities. Internally, it will involve the complex process of managing changes, including information technology and land management capacity building. Externally, it will require establishment of institutional understanding to formalize relationships and provide a workable framework for statutory authorization of the changes.

## **TOURISM THEMATIC AREA**

***Despite the challenges and notable delays in the implementation of some of the key action items of the tourism thematic area, findings of this mid-term review and views of stakeholders consulted show that, in comparison with other ODMP components, the tourism component has made great strides toward the achievement of its strategic objectives and critical activities as set out in the ODMP action plan.***

The following section presents progress made thus far in the implementation of action items in the tourism thematic area.

### **Addressing Possible Impacts of Tourism Activities**

The ODMP stipulated that there should be guidelines for tourism operators to ensure that tourism sites and related businesses are operated and managed according to internationally accepted principles and practices of responsible tourism. It is prescribed that these guidelines be effectively disseminated to all appropriate, interested, and affected parties in the tourism industry of the Ngamiland, and placed on the Internet for public access. The ODMP also recommended the expansion of the Tourism Monitoring Program to include monitoring of the impacts of tourism activities and infrastructure on the tourism resource base. Finally, the ODMP suggested the establishment of a relevant authority with appropriate powers and authority to enforce legislation in the protection of the biophysical and socio-economic aspects of the ODRS. It is prescribed that appropriate legislation and regulations should be developed to empower and authorize the implementing authority to effectively manage the development and activities in the area. Such legislation and regulations were expected to be developed as a matter of priority – i.e. within two years of the ODMP's approval. ***In summary, all the aforementioned relate to the need to uncover and make public the environmental impacts of tourism as a driver for change. Most tourists to the Okavango Delta pay a premium to visit the area, under Botswana's high-income, low-volume tourism development strategy. However, there is currently no means of ascertaining the environmental credentials of operators, nor are ecological risks (oil spills, waste disposal) well defined.***

***In response to the above, nearly all stakeholders consulted agreed that impacts of tourism activities on the ODRS ecosystem are being addressed.*** The Botswana Tourism Organization (BTO) has since been established and has a regional office in Maun. One of BTO's key mandates is to ensure and market responsible tourism developments in the ODRS. The Department of Environmental Affairs (DEA) has also been established and has a regional office in Maun. DEA's

mandate includes that of ensuring that tourism activities in the ODRS do not negatively impact the ecosystem. DEA is armed with the EIA Act of 2005 and a number of other guidelines, such as those of EMP, to enforce regulations on responsible and sustainable tourism development in the ODRS. Specifically, the following have been implemented:

- **Developing ways to address issues of waste management** - The BiOkavango project partly sponsored by the Botswana government, developed studies and made recommendations on how issues of waste management in tourism accommodation facilities can be addressed. The project recommended septic tanks and soak ways, wetland systems, and high technology plants to mitigate against liquid waste from tourism facilities.
- **Development of Waste Management Guidelines** – The NWDC through the ODMP has since developed waste management guidelines for the ODRS. The guidelines known as the Waste Management Strategy are aimed at ensuring that all the tourism facilities and operators in the ODRS adhere to the principle of sustainable tourism development.
- **Incorporating Waste Management Guidelines in Management Plans** – The Okavango Delta is sub-divided into small land units known as controlled hunting areas (CHAs). Each CHA or concession area is required to develop an Environmental Impact Assessment (EIA), Environmental Management Plan (EMP), and a management plan. All these requirements ensure that issues of waste management, as well as the sustainable use of the ODRS ecosystem are maintained.
- **Observing Carrying Capacity and Limits of Acceptable Change** - The development of management plans for each CHA ensures that operators observe carrying capacities and limits of acceptable change (LACs). For example, management plans recommend the number of beds and vehicles in each concession. In this regard, issues of carrying capacity and limits of acceptable change are observed in the ODRS with respect to tourism development. While this is the case, the CHAs NG/12, NG/19 and NG/41 are noted to be facing enormous pressures in terms of social development, with the expansion of communities living within these CHAs; Seronga, Khwai and Mababe villages respectively, which are not regulated or controlled through the carrying capacities and LACs outlined within the ODMP.
- **Ecotourism Standards** – Though voluntary, BTO has since developed ecotourism standards for implementation in the ODRS. The standards are meant to promote responsible tourism based on international standards in the ODRS. All operators are expected to observe these standards. The standards have been placed on the BTO website so they can be viewed by any operator who may need to consult them.

## Community Participation in Tourism

*The ODMP confirmed the widespread perception that while tourism is the mainstay of the the Ngamiland District economy, empowering Batswana to enter the industry remains a huge challenge.* Barriers obstructing greater participation by the citizens of Botswana include a shortage of skills, insufficient or inappropriate financial instruments, deficiencies in government regulation, and a perception of deliberate exclusion of citizens from the tourism industry. In addition, CBNRM projects and community trusts are also run by local elites for which the benefits (e.g. employment) are not equitably distributed within the local communities. *The ODMP Action Plan in this regard thus recommended that the level of citizen participation in the tourism sector needs to be improved* as follows:

**Operational Objectives:** DOT to develop and implement strategies to enhance citizen participation in the tourism sector.

*Critical Activities:*

- Determine strategies for citizen empowerment in the tourism sector;
- Review CBNRM program with the view of enhancing citizen participation;
- Implement the citizen empowerment strategies and improved CBNRM program.

This mid-term review noted that the CBNRM Action Plan has been developed to empower local communities. However, information from the stakeholders' workshop indicated that the plan is not being implemented. This is partly because the personnel at NWDC are new and have little information about the plan, as does the public. There are also manpower issues in the district, financial resources are limited, and communities are not well organized to drive the plan. In this regard, local participation in tourism remains a challenge in the ODRS.

The ODMP recommended establishing an appropriate financing mechanism that provides citizens with capital for investment in the tourism industry. Existing facilities aimed at encouraging citizen investment, such as those offered by the Citizen Entrepreneurial Development Agency (CEDA) were found to be not wholly appropriate to the sector needs of the tourism industry. As a result, a recommendation was made that there should be an autonomous statutory agency that would be responsible for the establishment and management of a tourism development fund, for providing financial assistance to Batswana who would like to venture into the tourism sector. The basis for this recommendation stemmed from concerns about the failure of financial assistance schemes to benefit the tourism sector in Botswana and particularly the participation of Batswana in the sector. **However, this fund was never established.** This was supposed to have been a national level intervention that is required to enable the conditions for increased citizen ownership, not just in the ODRS but throughout the tourism industry of Botswana. With the lack of a fund directly providing assistance to citizens wanting to venture into tourism development, the tourism industry, especially in core areas of the ODRS remain monopolized by foreign tourism companies.

*Limited to insignificant citizen participation in tourism development.* - The stakeholder workshop argued that citizens are not participating in tourism development in the core zone of the ODRS. The concern was that the core zone remains as it was before the ODMP was adopted and it is likely to remain as it is for the next 30 years or more. Stakeholders argued that most of the foreign tourism companies in the core areas of the ODRS have long-term leases which run for 30 years or more. This therefore hinders any form of citizen participation in the tourism industry. **Stakeholders argued that while there has been little citizen involvement in tourism development in the ODRS, it is limited to peripheral and marginal parts of the ODRS like NG/4.** In this regard, accommodation facilities and services in these areas operated by citizens are 3-star or lower when compared to 4- or 5-star facilities and services in core zones of the ODRS owned by foreign companies. There was also concern that the statistics used by the Department of Tourism in categorizing ownership - citizens, foreign, or joint venture partnerships - is misleading, as most of the citizen tourism companies are registered but not operational. The stakeholder workshop also noted that even though some of the citizens have access to tourism land, they rent it to foreign tourism companies so citizens so do not directly participate in tourism development.

*Monopoly of tourism companies.* – Stakeholders noted that the ODRS is slowly falling into the hands of one or two companies. These companies are slowly buying out small tourism companies and putting them out of business. For example, Okavango Wilderness Safaris owns and manages a total of 22 lodges in the ODRS. The concern was that having one or two companies monopolizing tourism development automatically bars citizen participation and creates a fragile reliance on a limited number of firms.

### **Diversification of the Tourism Product**

The ODMP recommended the establishment and implementation of a mechanism to encourage and assist with product diversification. That is, consultants should be regularly appointed to identify mechanisms and incentives that may be offered to private sector operators to diversify tourism products to include cultural and historical tourism activities. There should also be monitoring of the

effectiveness of product diversification mechanisms and incentives programs and, finally, there should be the implementation of remedial actions to ensure effectiveness of programs. The key issue is for DOT to diversify tourism products away from being wildlife-based.

Generally, there is diversification of the tourism product by the different operators in the ODRS. For example, cultural tourism is being developed and marketed in the ODRS. Particular attention is paid to the San culture at Tsodilo Hills, Qcibaba Caves, mekoro safaris, and basket production. While this is the case, much has not been done, particularly needed revisions to the Tourism Policy of 1990, which was intended to provide direction in product diversification not only in the ODRS but in Botswana as a whole. The process of reviewing the Tourism Policy started almost four years ago but remains incomplete. (A draft revised policy still has to go through parliament for adoption.) As such, even with this limitation, the mandate to develop and market Botswana's tourism is now the responsibility of the Botswana Tourism Organization (BTO). Through its Act of 2009, BTO has embarked on an aggressive drive to develop and market the different types of tourism products in the ODRS. This, as indicated above, includes cultural products (e.g. baskets, San culture at Qcibaba Hills etc.). The challenge is that BTO and Botswana as a whole do not have a documented tourism marketing strategy, but only working guidelines developed for in-house operations by BTO.

### **Declaration of Lake Ngami as a Bird Sanctuary**

Lake Ngami is a rich ecosystem in terms of having some of the most rare bird species. Consequently, the key issue was the need for it to be declared as a bird sanctuary, with DWNP playing the lead role in facilitating the declaration. This mid-term review notes that Lake Ngami has not been declared a bird sanctuary and the local community has not been engaged on the subject.

### **Waste Management**

The ODMP recognized that improper management of solid and liquid waste in the ODRS presents two types of risks. The first and more obvious one is the public health risk from transmission of pathogenic organisms from waste to humans. The second and perhaps less obvious one is the environmental risk from contamination by waste and waste by-products. The ODMP acknowledged that in recent years, the human population in the ODRS has grown significantly due to growth in the tourism industry. This population growth has resulted in an increase in both waste quantity and variability. However, these increases have not been accompanied by corresponding improvements in waste management infrastructure and practices. As a result, the ODMP recommended the development of a solid and liquid waste management strategy for the ODRS to improve waste management practices and minimize potential environmental impacts. Specifically, the key issue is that solid and liquid waste collection services within the ODRS must be improved. The operational objective for the NWDC was to improve solid and liquid waste collection within the ODRS. Critical activities include:

- Engaging the private sector to collect and dispose of solid and liquid waste in settlements;
- Ensuring that tour operators comply with provisions of waste management as contained in their lease agreement;
- Operationalizing Maun Landfill site through procurement and installation of outstanding equipment;
- To construct a landfill in Gumare;
- To increase temporary storage facilities in all settlements; and
- Increasing operational technical staff from six to eight by rationalizing existing positions.

In addressing issues of waste management in the ODRS, several guidelines have been prepared. These are Solid and Liquid Waste Strategy for the ODRS developed as a component of the ODMP, the BiOkavango Assessment of Liquid Waste Systems of Tourism Establishments, and the recently

approved Guidelines for Liquid Waste Management in the Ngamiland District. ***It was noted that an effort must be made to align these guidelines into a “whole-of-ODRS” Waste Management Guideline***

The overall objective of the aforementioned strategies and guidelines is to improve management of solid and liquid waste to minimize their current and potential harm to the ODRS environment. However, indications are that the private sector has so far been engaged by individual institutions within Maun to collect liquid and solid waste. The NWDC still collects waste in the villages. There has been no private sector engagement to collect waste in other settlements within the ORDS. Some operators within the ODRS engage private waste collection companies to bring waste from the wetland to the dumping site in Maun. ***In this regard, this activity can be said to be outstanding or not carried out.***

Most of the tour operators are complying with the provisions of waste management as contained in their lease agreements. That is, most of the lease agreements recommend that liquid, clinical, and solid waste should be collected from the various parts of the ORDS and be disposed of in appropriate areas in and around Maun, Gumare, or Shakawe. However, some of the old lease agreements are generic, leaving it up to the operator to determine how they would dispose of their waste. In addition, the majority of the tourism companies were found not to be adhering to the necessary and recommended methods of waste disposal, especially liquid waste (Aqualogic, 2009). Most of them still use a septic tank system which is not recommended for particular sites. Materials used in the construction of such sites do not adhere to those recommended by the ODMP. ***In this regard, the objective is partially achieved.***

For the bulleted objective above to operationalize the Maun Landfill site through procurement and installation of outstanding equipment: ***This recommendation has also not been implemented.***

***The landfill site in Gumare has since been constructed.***

The objective for NWDC to increase temporary storage facilities in all settlements ***has not been done***, due to shortage of funds caused by the economic recession.

The main institutions responsible for solid and liquid waste in the ODRS are the Environmental Health Department (EHD) and the Water and Wastewater Department (WWD) of the North West District Council. ***These institutions are under-resourced in terms of waste management skills.*** There is a disproportionate distribution of staff between the two sub-districts of the North West District Council (Okavango and Ngami), with the majority of staff stationed in Ngami Sub-District. ***Finally, the proposal to increased operational technical staff compliment and the rationalization of existing positions have not been carried out.*** Informal interviews with respective units indicate that the Water Unit within NWDC has all positions frozen, pending the transfer of the Unit to the Water Utilities Cooperation. The assumption is that there has been no increase in operational technical staff to achieve the goals of ODMP in this sector.

**Table 5: Achievement/Failures of ODMP's Tourism Sector**

Achievements/Failures of ODMP's Tourism Sector	
Achievements	Failures
<p>Implementation of some components of the Ngamiland Tourism Development Plan (NdtP):</p> <ul style="list-style-type: none"> <li>– Adherence to the goal of not tempering or increasing any tourism development in the core tourism development zone. (Stakeholders argued that the prescribed number of beds in this zone is being observed by operators. In this regard, the integrity of the fragile ecosystem of the Okavango Delta will be maintained).</li> <li>– Maun and main villages such as Gumare were demarcated as mixed tourism zones. Stakeholders noted that mixed tourism development in these zones is being implemented. Stakeholders argued that there is a diversification of the tourism product at Gumare and in Maun. Several tourism projects especially by citizens such as guesthouses and lodges, have been on the increase in Maun, Gumare, and other villages.</li> </ul> <p>Establishment of the Botswana Tourism Organization (BTO) to develop and market tourism in the ODRS –</p> <ul style="list-style-type: none"> <li>– Stakeholders noted that the establishment of BTO as an institution to develop and market the tourism product within the ODRS has been successful. BTO is noted for having achieved the goal of placing the ODRS as a world class tourism destination through its marketing strategies. While this is the case, stakeholders argued that marketing of the ODRS is concentrated on marketing tourism products as developed by the private sector, which caters for up-market clientele. In this regard, other tourism categories and market clientele have not been marketed well by BTO.</li> </ul> <p>Financing of citizens to participate in tourism</p> <ul style="list-style-type: none"> <li>– Stakeholders noted that financial institutions such as CEDA, Youth Fund, and commercial banks have been made available for citizens to participate in tourism development in the ODRS. However, there is need to develop a broader citizen participation policy which was noted to be in the process of being developed.</li> </ul> <p>Implementation of EIA Act and EMP</p> <ul style="list-style-type: none"> <li>– In relation to ensuring whether tourism development does not have adverse effects on the ODRS ecosystem, stakeholders noted that enforcement of EIAs and EMPs as well as management plans for particular tourism projects has been done. The enforcement of these regulations is being observed by most tourism companies. This therefore means the strategic goal of ensuring sustainable use of environmental resources in the ODRS is being achieved.</li> </ul> <p>Botswana Ecotourism Certification System Standards developed by BTO.</p> <ul style="list-style-type: none"> <li>– The standards conclude the Botswana National Ecotourism Project that commenced with the strategy adopted in 2002, the manual completed in 2008, and a feasibility to determine the need for certification.</li> </ul>	<p>Lack of implementation of the Ngamiland Tourism Development Plan (NTDP)</p> <ul style="list-style-type: none"> <li>– The Ngamiland Tourism Development Plan is a long-term (30-year) strategic plan. The Plan is formatted as a Tourism Development Manual that includes more detailed development plans for a number of Tourism Development Areas (TDAs). Stakeholders at the workshop argued that progress in the Plan's implementation has despite its good intentions/goals been significantly delayed. This seems to be attributable to the key Plan's implementing authorities (notably Department of Tourism and TLB) which have failed (and still fail) to take the lead and ensure the Plan's implementation. Generally, most of the stakeholders were found to be unfamiliar with the existence of such a plan.</li> </ul> <p>Lack of Implementation the Limits of Acceptable Change (LAC)</p> <ul style="list-style-type: none"> <li>– The stakeholder workshop observed that LAC are generally not being observed especially in NG/19, NG/12, and NG/41. As a result, the aforementioned, as well as other areas not covered by a management plan are at risk of slowly losing their ecological and tourism value.</li> </ul> <p>Lack of monitoring</p> <ul style="list-style-type: none"> <li>– One of the key goals of the ODMP is that of effectively monitor the impact of tourism on the Okavango's tourism resource base through time. While tourism companies were credited for observing environmental management practices particularly those related to waste management, stakeholders observed that there is lack of monitoring in the various camps in the ODRS. Moreover, regulations which apply to management of lodge sites and CHAs such as the WMA regulations and other requirements of lease documents are not rigorously enforced. This is partly a result of the lack of capacity at DEA and NWDC.</li> <li>– As a result, stakeholders argued that the goal of establishing an independent institution (independent from government) to implement waste management goals has not been implemented. It is also noted that the existing tourism industry associations (HATAB, BOGA) perceive their major role predominantly as being of promotion and marketing, not as a forum for encouraging members to comply with voluntary industry standards.</li> </ul> <p>Lack of data inventory</p> <ul style="list-style-type: none"> <li>– The ODMP notes that it is essential that the relevant implementing authorities have access to timely and reliable data in order to be able to manage the area and to enforce regulations. A knowledge-based approach to monitoring is proposed to provide the required data and information to the relevant implementing authorities to make decisions based on credible information. In addition, the ODMP notes that there should be an inventory of data on tourism</li> </ul>

*The production of the standards encouraged the implementation of biodiversity-friendly tourism practices in the ODRS and demonstrated the BTO's strong commitment to environmentally responsible tourism.*

*statistics visiting the ODRS, data on tourism satisfaction etc.*

- *Stakeholders noted while data on tourist's numbers and satisfaction may exist, this data is scattered across various institutions and not integrated (housed) under one institution such as ORI, as initially recommended by the ODMP. In this regard, when data is scattered all over in the various institutions, it does not serve any purpose and is often not readily accessible or available to researchers and planners in the district.*

## **AGRICULTURE THEMATIC AREA**

Though agriculture was not treated as a thematic area in the ODMP project, and thus the importance of the sector was downplayed in the scheme of things in the ODRS, there are several themes in the ODMP action plan which are related to agriculture and can be grouped together to form the agriculture thematic area for the purpose of this mid-term review of the ODMP. These include the following action issues:

- Overgrazing by livestock;
- The risk of tsetse re-infestation;
- Livestock/wildlife interactions and maintenance of veterinary fences.

It is noted that a serious gap exists in the ODMP through the omission of arable agriculture in the action plan, on which a large part of the rural population in the ODRS depend for their livelihood. For an environment such as the ODRS, where the protection of the environment and conservation are major goals, the omission in the ODMP of conservation agriculture, which will provide farmers a viable and ecologically sustainable option to grow crops, is also noted as a major gap.

Under the action issue of overgrazing by livestock, the critical activities to be carried out as per ODMP action plan are the carrying capacities. It is noted by this mid-term review that a biomass assessment has not been conducted, due to lack of human and financial resources. It emerged from the thematic area workshop that DAHP, which is charged with implementing these activities, has only two officers who are supposed to cover the whole district, thus the department is seriously understaffed to execute the action items. Furthermore, the department indicated that due to lack of financial resources, it has not been able to update a 1978 map for range carrying capacities.

With regard to the reduction of the risk of tsetse fly re-infestation, the critical activity was for DAHP to undertake dialogue with Angola, Namibia, and Zambia to create a Tsetse Free Zone. Nagana is a livestock disease with economic implications, as cattle are a key resource for livelihoods for many communities in the ODRS. Because livestock diseases do not respect international boundaries, the countries of Angola, Namibia, and Zambia dialogued and established a regional tsetse eradication initiative called the Kwando-Zambezi Regional Tsetse Eradication Project. Through this initiative, a Tsetse Trans-boundary Free Zone has been established.

Another action issue of the ODMP with an agriculture theme is reduction of livestock-wildlife interactions, with the critical activities being to improve maintenance of veterinary fences; mount public awareness campaigns on livestock disease control strategies; and assess the feasibility of providing livestock watering points in the sand veld areas. Stakeholders consulted agreed that livestock-wildlife interactions give rise to conflicts in the Okavango Delta. Some wild animals such as elephants cause damage to farmers' crops, while some carnivores kill farmers' livestock. Generally, DWNP has identified hotspots for human-elephant conflicts in the ODRS. The hotspots include areas in the Panhandle, especially around Seronga. In an attempt to mitigate the elephant problem, DWNP is promoting the use of chili pepper around the crop fields to scare elephants away

from crop fields. Presently, besides devising strategies of controlling problem animals, DWNP is also developing an elephant management policy.

This mid-term review has noted that to foster co-existence between people and wildlife, the government instituted a compensation policy whereby farmers receive payments for damage caused to their properties. Farmers have been decrying the low compensation rates relative to the damage caused (Kgathi et al, 2012; Mmopelwa and Mpolokeng, 2008). Discussions in the thematic area workshop revealed that a consultant was engaged to develop veterinary fence maintenance programs and that the Department of Animal Health and Production continues to carry out veterinary fence maintenance. Nonetheless, elephants continue to damage these fences. However, it was also revealed that the challenge facing the department is that elephants continue to damage the maintained fences. Another challenge facing DAHP is that poachers who carry buffalo meat from within the fence into livestock areas introduce foot and mouth diseases into these areas. With regard to the mounting of public awareness on livestock disease control strategies, this is being done on a continuing basis by DAHP through the sensitization of the public on the importance of vaccination programs. In effect this critical activity in the implementation of the ODMP is being executed.

This mid-term review of the ODMP noted that an assessment of the feasibility of providing livestock watering points in the sand veld areas as a means of reducing livestock-wildlife interactions has been carried out. Some of the recommendations of the feasibility study include:

- Location of boreholes in strategic areas to avoid the concentration of livestock in few watering points to avoid damage and destruction of the ecosystem around watering points; and
- Formation of water management committees in such areas to monitor and maintain the use of boreholes and maintenance of boreholes.

As mentioned earlier, the ODMP final document did not come out strongly or clearly on arable agriculture in its action plan. The mid-term review of component sector reports however revealed that the Land Use and Land Management Plan component made recommendations for arable agriculture in the ODRS. This observation highlights the inadequacy of the level of integration of recommendations of ODMP component reports into the final overarching ODMP document. This is another gap in the ODMP.

Based on a soil suitability map developed by the Land Use and Land Management Plan, the plan noted that in terms of fertility, areas around the villages of Nokaneng, Tubu, Habu, Tsau, Makakung, Sehithwa, Maun, and Matlapaneg have high to moderately fertile soils. Consequently, the plan formally zoned land around the settlements for arable agricultural development. This recommendation was not adequately integrated in the final overarching ODMP. In addition, the mid-term review of the ODMP showed that the issue of flood recession agriculture (Molapo farming) was downplayed by the final ODMP document, even though the Land Use and Land Management component of the ODMP project recommended the continuation of Molapo farming along the banks of the river, with a 200 meter development free zone from the banks of Okavango River along the Panhandle. This is another case of inadequate integration of recommendations of component reports into the ODMP. According to stakeholders consulted there are a number of constraints faced by Molapo farming. Farmers cultivating Molapo fields do not have de jure property rights to these fields and as such do not qualify for free or subsidized production inputs, such as seeds, from the government, as those farmers who own dryland fields do.

It was further noted from stakeholder consultations that crop damage by wildlife in Molapo fields are not compensated as are those in dry lands fields. It is a widely held view among stakeholders that while it has been found that higher crop yields obtained under Molapo farming can contribute to household food security, it appears that the government does not support Molapo farming. Stakeholders agreed that while government may not support Molapo farmers by providing them inputs such as fertilizers, it should at least provide them with inputs such as seeds and compensate them for crop damage by wildlife. In the same vein, the sentiment echoed by stakeholders consulted,

is that while government may not issue farmers with certificates for Molapo fields, it should carry out assessments of areas that are suitable for Molapo and then advise accordingly where Molapo farming can be carried out in the ODRS.

## **SOCIOECONOMIC THEMATIC AREA**

Socioeconomic action items/issues and critical activities are as set out in the ODMP action plan. The mid-term review exercise of the ODMP shows that while considerable progress has been made in terms of implementation of programs and projects as recommended by the plan, quite a number have not been implemented.

The development of socioeconomic opportunities to improve the livelihoods of the Okavango Delta stakeholders is key to the realization of the strategic objective of the ODMP. However, consultations with stakeholders revealed that there is a wide spread consensus that this strategic objective have not been fully achieved to the set target levels. This, according stakeholders consulted, include the fact that a number of conditions/actions need to be met and carried out which to a very large extent have not been accomplished. These include the preparation and implementation of guidelines for mainstreaming of HIV/AIDS, gender, and poverty into the ODMP implementation process. For this to happen, mainstreaming tools and guidelines for their implementation were supposed to have been prepared by DEA, as well as the holding of workshops for sectors for use of the tools.

Responses from interviews and outcomes of stakeholder consultations indicate that more needs to be done in terms of mainstreaming poverty into the implementation of the ODMP. The consensus is that poverty is a threat to conservation in that it drives residents of communities in the Okavango Delta to poaching and exploitation of natural resources in an unsustainable manner. This is because most rural communities in ODRS lack financial capital and depend on natural resources for livelihoods. While arable and livestock farming are important livelihood activities for improving economic conditions at the household level, they are prone to shocks such as outbreaks of diseases, drought, flooding, etc., which affect poor rural communities adversely due to their limited economic strength. The poverty reduction measures that are already in place were questioned as they do not seem to be yielding the desired results of improving livelihoods of rural communities. The consensus from stakeholders was that while mainstreaming of poverty into ODMP will be beneficial to the people of the Delta, new policy directions should be explored to enhance the socio-economic well-being of the people. This will be elaborated at the Draft Report stage when recommendations are made.

The thematic area workshop noted with emphasis that with the high rate of HIV/AIDS in Ngamiland District, poverty is further exacerbated. HIV/AIDS affects productivity levels in a negative way in the sense that those members of the communities who are afflicted with HIV/AIDS cannot meaningfully engage in economically beneficial activities. Mainstreaming of gender into the ODMP implementation process, it was generally agreed by stakeholders, should be a deliberate policy decision and, where possible, this should be achieved through affirmative action. Gender mainstreaming was accorded very high importance by all stakeholders, so much so that sentiments were expressed that it should be applied to all sectors of the national economy. All the above stem from the widely held view by stakeholders that women are treated unequally compared to their male counterparts. It was the general feeling that women are often more adversely affected by negative phenomena such as disease, poverty, unemployment, poor levels of education, etc.

Stakeholder workshops for sectors on the use of mainstreaming tools has not been done, due largely to the fact that the mainstreaming tools have not been fully prepared.

### **Capacity Building among Communities to Manage Community-Based Natural Resources Management Programs (CBNRM)**

This implementation action item first required a capacity needs assessment of communities. To date, this has not been implemented. However, the Department of Wildlife and National Parks through its CBNRM office has been conducting workshops on natural resources management and training

members of community trusts and their boards on a Management Oriented Monitoring System (MOMS). Some of the products of these capacity building initiatives include the development of tourism-related enterprises. However, it is the view from the thematic area workshops that capacities among communities to manage their resources have not yet been fully built. A major challenge in building capacities in communities to manage their natural resources with a view of deriving economic benefits while at the same time using these resources sustainably has been the lack of capacity in terms of manpower at the lead institution, the North West District Council, to develop skills. Additionally, it came out clearly from stakeholders' consultations, that with a multitude of supporting institutions, there is lack of coordination in the way and manner capacity buildings efforts are being carried out.

All stakeholders consulted agreed that the CBNRM Policy (approved in the year 2007, i.e. after ODMF's proposal and formulation stages) is a sustainable (and effective) solution in giving communities incentives to engage in conservation activities and poverty reduction. With regard to this, there is a consensus among stakeholders consulted that opportunities for income generating activities under the CBNRM programs implemented so far in the ODRS have to a certain extent contributed to evidence of human-wildlife co-existence together with signs of responsible natural resource use, management, and policing by communities involved.

It was also observed that though the CBNRM policy is very relevant as a planning and development approach, there is a gap between policy intent and implementation. This is primarily the consequence of insufficient institutional capacity and know-how (GOB, 2003: Government of Botswana, 2003-National Development Plan (NDP) 9, 2003/4-2008/9, Mid-term Review Report, Ministry of Finance and Development Planning, Gaborone). As stated by the relevant stakeholders consulted, CBOs lack appropriate skills and mechanisms to manage funds and undertake cost/benefit analyses of proposed investments in enterprises or social services. Furthermore, they lack expertise in identifying investment opportunities, performing feasibility analyses, project implementation, and monitoring their business performance. It was observed that communities in CBNRM program have a tendency to engage in the same types of projects in different areas. In this regard, it is not uncommon for most CBOs to establish campsites, and hence fail to diversify their enterprises.

There is an agreement among stakeholders consulted that CBNRM's community enterprise investments have not generally been successful and the delivery of social services is often not sustained. However, this problem can also be attributed to conflicting government policies (for instance, the National Settlement Policy does not allow development and servicing projects to be undertaken in "ungazetted" settlements). In addition, it is a widely held view among the stakeholders and community members consulted that the income from the CBNRM initiatives has failed (and still is) to make an impact at the household level. This results in perceptions that the only people benefiting are CBNRM/trust employees and committee members through sitting allowances. It was highlighted that the present CBNRM's enterprise/trust model promotes resource conflicts and denies economic interest groups and other community members access to CBNRM resources. The need for a new CBNRM mechanism that would improve management of CBOs and distribution of benefits to households was highly emphasized. Such a new mechanism would promote joint venture partnerships and other enterprise models, where the risks and benefits of commercial investments can be shared. It is noted that such mechanisms exist but the political will to sanction their adoption and use is needed. (Johnson, 2008)

There seems to be agreement among all stakeholders consulted that community members in the Delta (especially the poorest ones) remain concerned that their access to natural resources was reduced without giving them a suitable alternative means of making a living. The following are worth mentioning;

- As a result of conservation laws, as well as the establishment of the Moremi Game Reserve and private concession areas neighboring the communities in the Delta, the residents of these communities find themselves cramped into smaller areas of land that cannot accommodate

seasonal mobility and hunting and gathering as a means to cope with resource scarcity and as a livelihood strategy.

- The withdrawal of the Special Game Licenses (introduced by the DWNP to legitimize subsistence hunting by the poorest members of the population) has had a profound effect on the food security of many households, as they no longer have direct access to subsistence hunting. This encourages illegal activities, i.e. poaching.
- The commercial safari operators in the Delta give preference to non-community members for employment, and have no legal obligation to improve the livelihoods of surrounding villages. In this regard, it is a widely held view that the communities do not benefit as much as they could from tourism.

### **Access, Regulation, and Monitoring of Natural Resource Use**

Local communities in the ODRS depend on the natural resources of the site as part of their livelihood strategies. The concern raised at the thematic area workshops was that access to some of these resources are open, which in itself poses threats to their sustainable use. Furthermore, it was the view of the majority of stakeholders consulted that the regulation governing the exploitation and use of these natural resources is lax. The Land Use and Land Management Plan component of the ODMP noted that natural resources in the vicinity of villages and settlements could be harvested by anybody from anywhere in the country, without the express permission of the concerned communities, which results in unsustainable harvesting of these resources and untimely depletion of natural resources in the ODRS. The plan recommended that in as much as the natural resources in the ODRS are an endowment for the whole country, the communities who depend directly on them for their livelihoods should be given some measure of control over who harvests these resources. This will require a permit and quota system for those who come from outside the communities, with the village structures playing the necessary supervisory roles.

Still on the issue of access, regulation, and monitoring of natural resource use in the ODRS, it was noted from the thematic area workshop, that in the fisheries sector, there has been a long-standing conflict between commercial fishers and tour operators. As a result, the Okavango Fisheries Management Committee (OFMC) was formed through facilitation by the BiOkavango Project and the Department of Wildlife and National Parks, to facilitate co-management of fisheries between government and users. It was further noted from the workshop that the OFMC has developed a code of conduct for the fisheries sector as a means of addressing conflicts. The government has also developed the Fish Regulations of 2008. As per these regulations government issues fishing licenses (P200/license), but does not use the number of licenses issued to monitor fishing in the Delta. This means that any number of licenses may be issued without regard to the fish stock of the system. Furthermore, fishers fish from any site as the fishing license does not indicate where fishing should be carried out. It was also noted that uncontrolled fishing at Lake Ngami drives away bird tourists. It was the general feeling of stakeholders at the workshop that:

- The Government should start using the number of licenses issued to monitor fishing at various sites.
- Licenses should contain information about the fishing sites.
- The government should consider the use of fishing quota for monitoring purposes.
- Commercial fishing or professional fishing should operate as businesses or profitable enterprises as this would help in the regulation or monitoring of fishing

With regard to forestry resources, stakeholders consulted revealed that the Department of Forestry and Range Resources (DFRR) issues resource harvesting permits (the P2/permit and the P15/permit for dealers). The challenge facing the department is that there is no limit to the quantities or amounts of harvestable resources for the permits. This, the stakeholders pointed out, may lead to over-harvesting and environmental degradation. There is also the problem of illegal harvesting driven by

the available market for these resources (e.g. high demand for poles and reeds for construction). Stakeholders consulted were of the view that achieving sustainable use of resources required the following:

- Review of legislation controlling the use of these resources with an eye toward increasing the license fees and matching the fees commensurate with quantities of resources to be harvested;
- Enforcement by the DFRR of the revised legislation by checking if the users of resources harvest the resources as stipulated in their permits;
- Implementation by DFRR of common property management regimes (community policing) in the use of forestry resources.

## **INSTITUTIONAL THEMATIC AREA**

The institutional thematic area is one of the three original thematic areas of the ODMP, with its strategic goal being: “To establish viable institutional arrangements to support integrated resource management in the Okavango Delta at local [level], district level, national level and international (River Basin) level”. This was translated into three strategic objectives, the first being: “To establish viable management institutions for sustainable management of the Okavango Delta”. On the face of it, institutional structures for driving, coordinating, and monitoring the implementation of the ODMP, geared toward the sustainable management of the ODRS and its resources, have been established. The Department of Environmental Affairs (DEA) Regional Office has been established in Maun to lead coordination and monitoring of implementation of the ODMP. The consensual view that came from stakeholders at the thematic area workshop is that the DEA/Maun Regional Office is under-resourced in terms of manpower and equipment to successfully carry out this mandate.

In essence, the objective of strengthening capacity within DEA/Maun office has not been realized. This has had a telling effect on the overall implementation status of the ODMP. This is highlighted when considering that the ODMP project is a huge one, with diverse sector action plans for implementation. The burden of entrusting the coordination and monitoring of such a plan to an under-resourced, capacity deficient institution like the DEA becomes overwhelming. The generally held view by stakeholders is that apart from strengthening capacity at DEA, there should be a designated senior officer at DEA who should be multi-disciplinary in training, charged with and accountable for the coordination and monitoring of ODMP’s implementation. Such an officer should be the focal point of leadership in this regard. This view obviously stems from the fact that the DEA Regional Coordinator/Manager is presently charged with a multiplicity of duties, which do not allow him/her to give full-time commitment to assignments pertaining to the ODMP. Moreover, because the staff capacity in the office is constrained, it fails to comprehensively and speedily carry out its other mandates such as reviews of EIAs and environmental management plans.

Other institutional structures involved in the implementation of the ODMP are the Okavango Wetland Management Committee (OWMC), District Land Use Planning Unit (DLUPU), and ORI. Though these bodies play significant roles in the implementation process of the ODMP, their status of being more advisory and supporting bodies is seen as a limiting factor in driving ODMP’s implementation. This is made worse by the fact that OWMC and DLUPU meet on an ad-hoc basis to deliberate on issues relating to the Okavango Delta. While the roles of OWMC and ORI are well defined where the ODMP is concerned, they need a good measure as strengthening in capacities to adequately meet their mandates, particularly in the areas of funding. DLUPU does not have a clearly defined role with regard to the implementation of the ODMP.

It is further noted that in the implementation of the ODMP, a multiplicity of government departments have responsibilities for the implementation of various programs and projects in ODMP’s action plan. While this arrangement has some advantages, responses from interviews suggest that the present arrangement limits integration and fosters an issue-driven approach to the implementation of the ODMP on a department-by-department basis. In addition, under the arrangement whereby stakeholder departments are responsible for implementation of sector programs and projects in the

ODMP action plan, participants at the thematic area workshop pointed out that departments are not accountable to each other. This does not augur well for coordination and cooperation in the implementation of the ODMP. It was also the general agreement that this state of affairs results in duplication of efforts and overlapping of functions, which invariably has implications for time and financial resources.

A general challenge that repeatedly came up during the consultation process was the paucity of financial resources at DEA, stakeholder government departments, and other bodies involved with the implementation of the ODMP. While funding for the ODMP is project-based, it is also centralized and financed from the central government coffers and tied to budgetary allocations in line with projects as contained in the National Development Plans (NDPs). This arrangement constrains funding of ODMP implementation in that ODMP projects and programs are not implemented with set delivery dates, due to funding and budgetary constraints largely due to those funding arrangements mentioned above.

Several national policies and pieces of legislation and their provisions are applicable and relevant to the management of ODRS. It was therefore one of the strategic objectives of the ODMP action plan to harmonize legislation and policies applicable to the ODRS to aid and facilitate easy implementation of the ODMP. The leading agency in this regard is the DEA. What has emerged clearly from the thematic area workshop and desk studies of these relevant documents is that provisions of many policies and laws/legislation overlap and in other cases there are divergences in policy objectives and/provisions dealing with the same sector. This situation has resulted in confusion in the ODMP implementation process among respective stakeholder departments who use these pieces of legislation and policies as guiding implementation tools.

For effective and efficient management of the ODRS and its resources, there needs to be continuity in terms of tenure of officials who over the years have acquired knowledge and experience in matters pertaining to the Delta. The situation, as noted from stakeholders, is that officers stationed in Ngamiland are frequently transferred when their acquired experience and knowledge would be most valuable. Situations like these create knowledge vacuums as newly posted officers have little or no experience with the issues of the Okavango Delta and the ODMP itself.

The mid-term review exercise generally showed that one of the militating factors against the effective implementation of the ODMP is that most of the recommendations within the various components were unrealistic based on available resources and capacity within Ngamiland. Much still remains to be done by way of planning for and executing implementation of the ODMP. As already highlighted above, although it became clear during planning that most environmental problems are caused by lack of institutional capacity the ODMP process did not take the opportunity for necessary institutional restructuring in natural resources management (L. Mangole 2009). Inter-departmental collaboration and evolution of institutional arrangements at the local (ODRS) level is proving to be one of the most important areas where improvement of ODRS management would really yield dividends.

It is still not clear what the roles of non-government stakeholders, especially communities, are and/or will be. The capacity and power of the coordinating department is also under question. Firstly, the DEA has many other responsibilities apart from coordinating the management and use of the Delta resources. (L. Mangole 2009). More work remains to be done in developing institutional understanding of the ODMP management issues and needs, to a level where influential partners in government are willing to play their leadership and support roles in facilitating cooperation and agreement.

The DEA/Maun Regional Office also has gross human resource shortages and has faced long-term financial constraints. What is a more severe problem is that the DEA, as well as other institutional structures put in place (OWMC, DLUPU, among others) have no powers to enforce most of the ODMP's provisions. That responsibility remains with the sector institutions and departments over which the ODMP coordinating body (DEA) has no control. Through OKACOM, the opportunity

exists to improve institutional arrangements as it has the capacity to take responsibility for management of the ODRS resources (L. Mangole 2009).

## RESEARCH AND MONITORING FRAMEWORK

The ODMP included plans for monitoring changes in the various thematic areas together with tools for data/information gathering; sources of information; means of verification; and indicators. The critical question at this point is whether the monitoring plans are being implemented and also if monitoring data is being collected, stored, shared and used for adaptive management as intended.

It has already been acknowledged that ODMP development was supported by construction of a fairly simple but integrated GIS-based information system (ODIS) that combines available data and allowed cross-disciplinary issues to be more readily examined by stakeholders. However, despite significant efforts in introducing ODIS, the situational survey revealed that the use of enabling information system technologies has not yet reached the “ODMP’s core business processes”. Several mutually related facts that hamper planning and management practice in the ODRS are in this regard noted as follows:

- Stakeholders agreed that the ODMP formulation process was an effective way of providing the initial multidisciplinary outlook needed for the management of the ODRS. However, *due to shortcomings of data collection and the absence of detailed (up-to-date) baseline data on biodiversity, status of ecology, and physical functions, development of the results of studies conducted as components of the ODMP framework were bound not to have the depth or the breadth for more comprehensive integration of biodiversity, physical functions, and sustainable use of the Delta’s resources.*
- *Because the relevant data are not always readily available, planning and/or management decisions in the ODRS are sometimes made against backgrounds of fragmentary, superficial, or outdated information.* Often there are pressures for decisions to be taken at a given time and so formulation of planning proposals must be limited to data which are available or which can be specially gathered within a reasonable time for the overall program and schedule.
- Acquisition of baseline data/maps on the current and evolving state of biodiversity, and ecological, hydrological, and biodiversity maps and their refinement to make them useful for spatial planning is yet another problem. In some instances, baseline maps and related attribute data are either unavailable or not as per specifications required for a particular level of detail (site/zone). For this reason, planners/decision-makers sometimes must compromise with on quality parameters such as scale, content, completeness, currency, spatial accuracy, and presentation. In this regard, *there is a common opinion that ‘planning in the ODRS sometimes lags behind the realities on the ground’* putting the credibility of the planning/decision making process at risk.

Nearly all stakeholders consulted said that while there have been considerable efforts made to collect and share data relevant on the formulation of the ODMP, an overall data-gathering framework that coordinates and harmonizes data gathering and formatting processes (as envisaged in the plan) is still not available. Such a monitoring and evaluation framework and data harmonization procedures have been established and agreed in the Research and Monitoring Strategy Report, which was part of the ODMP’s Research and Data Management Component. It was to help establish standard monitoring and evaluation frameworks to enable comparisons between sites within the ODRS, as well as produce indicators for monitoring of long-term changes in biodiversity, ecological, hydrological, and resource stocks in the ODRS.

In addition to the above, this mid-term review of ODMP implementation practices revealed that data collected by government departments, non-governmental conservation and research organizations on physical functions/resources use, and the biodiversity/hydrology/environment in the Delta are largely fragmented, inconsistent, and incomplete. The following points were also revealed:

- None of the monitoring efforts, including those being carried out within ORI's Okavango Delta Information System (ODIS) are adequate to provide a comprehensive assessment and to draw accurate conclusions on the Delta's ecosystem and biodiversity status and trends;
- There is a lack of disaggregated data suitable for site (large-scale) level planning and management within the ODRS;
- Although a wealth of data and information may be available, it takes time to find them among the many data collectors and to ascertain the scope and reliability of the data. Data must then be compiled into a usable format that is consistent and meaningful before data analysis can be initiated.

This situation has greatly contributed (and still is) to uncertainty in the ODMP's implementation and decision-making processes. ***The key problem at this point relates to the prevailing decision-making process that lacks an appropriate data/knowledge base*** capable of:

- Supporting implementation of the adaptive management process (as originally envisaged and agreed in the ODMP) through monitoring of activities and increasing knowledge on the current status and trends in the Delta;
- Rationalizing complex information into simple planning and management outcomes that can be applied to small pieces of land and/or zones within the ODRS to ensure accountability in the conservation of biological (and cultural) resources in any proposed changes of land-use;
- Highlighting areas of potential conflicts between three sets of mutually related factors - locations, development actions, and environmental effects - and draw conclusions for immediate conservation action or, in the longer term, for adjustments in land-use planning that incorporate environmental/hydrological/resource use or biodiversity conservation requirements;
- Increasing understanding of the Delta ecosystem and biodiversity and making informed decisions on the root causes of threats to ODRS sustainability.

In summary, there is widespread agreement among stakeholders consulted that the absence of strong baseline data on biodiversity, status of ecosystem, and physical functions in the ODRS have contributed to delays in the implementation of critical activities of the ODMP's Research and Monitoring Action Plan, which is a crucial element of the ODMP implementation process.

The survey also revealed full stakeholders awareness that ODMP's Research and Monitoring Framework implementation will be a difficult task requiring a great deal of coordination and crossing of organizational barriers where opportunities for collaboration, data, and resource sharing are not yet effectively resolved and/or established. This inevitably calls into question the sustainability of the Monitoring and Evaluation Framework as originally envisaged in the ODMP's component report. Strong support for the improvement of ODIS, capacity development and eventual conversion of ODIS into an overall ODRS data-gathering and analysis framework would also play a crucial part in creating opportunities for more effective management of the ODRS.

## **COMMUNITY PARTICIPATION, INVOLVEMENT, AND OWNERSHIP**

One critical activity supporting ODMP implementation is the continuous engagement of stakeholders through participatory methods and, through this process, raising public awareness, enhancing knowledge and creating platforms for information exchange and learning about the ODRS. Even though all relevant government departments are involved in fostering community participation and involvement in the ODMP process, DEA and ORI lead this effort. This mid-term review exercise revealed that DEA has been holding participatory meetings and consultations with communities on topical issues affecting the ODRS to ensure continued meaningful participation in the ODMP implementation process. These consultation meetings are ongoing.

ORI also plays important support role in applying participatory methods to ensure community involvement in the ODMP process. It was noted from the stakeholders' workshop that ORI no longer has a budget for this activity, and therefore is no longer playing its role in enhancing community participation as it ought to.

Communication with communities is important on all matters than affect them. This should not be viewed simply in terms of negotiating for community access to natural resource use rights. Such consultation should also focus on issues of conservation and sustainable use of resources of the ODRS. Communication with communities by DEA should of necessity focus on building trust. Communities' ability to manage the Delta sustainably can be seriously undermined by communication break downs and transmission of incorrect information.

The situation in the ODRS is far too complex to believe that recognition of traditional land and resource rights is going to solve conservation problems in the Delta. There are many socio-economic problems wedded to this issue, notably poverty levels that increasingly push people toward unsustainable practices (poaching, over-harvesting).

## **INFORMATION DISSEMINATION (PUBLIC OUTREACH)**

There is a consensus among stakeholders consulted that effective communication and information dissemination is essential to the ODMP to keep the key stakeholders informed and committed, and to inform other interest groups and the wider community. Information on the progress of the project has been disseminated among stakeholders mainly through the reporting framework, and through stakeholders and community workshops. A brochure outlining the objectives and outputs of the ODMP has been produced, and an ODMP (ODIS) Project website is maintained within ORI. The website was (and still is) an excellent source of information, including project documents, GIS, and related attributive data, internal reports, proceedings of meetings, and other information.

Despite the availability of information on the ODMP Project, it appears that many stakeholders consulted did not know much about the ODMP's progress and achievements outside their own area of interest. Consultations revealed that most of those not personally engaged in the ODMP knew little or nothing about it. Few stakeholders consulted had visited the ODMP/ODIS website. This may reflect high staff turnover, but does indicate the need for a more active communication effort. Surprisingly, some stakeholders consulted claimed that they did not frequently use the Internet for their information requirements (sometimes because of poor connectivity), indicating a greater need to promote its use.

It is a widely held view that the ODMP is regionally (internationally) important, and should be widely reported and promoted. While a comprehensive communication strategy was developed as a part of the ODMP, no position was identified to continue to implement this strategy and the DEA Regional Office Coordinator has had to undertake this task in addition to his other duties.

## **KEY FINDINGS OF THE ODMP MID-TERM REVIEW AND GAPS IDENTIFIED**

### **Gaps Identified**

Below are presented gaps or omissions in the ODMP in terms of critical recommendations not made by the ODMP and/or issues not addressed by the plan. It also includes an assessment of how adequately the ODMP integrated recommendations of the component reports.

### **Lack of a Shared Regional Development Strategy**

Ngamiland District in general and the ODRS in particular have a history of rapid population growth. Despite the substantial resource commitment over the decades to growth management, the

fragmentation of policy and implementation process across many organizations have created the perception that growth in and around the ODRS continues largely unchecked and without any overall strategy. It is a widely held view among stakeholders consulted that the ODMP paid little attention to the issues of population growth and overall economic development, especially given the ODRS's vulnerability to development pressures and changes.

Accordingly, there is a need for an ODRS-specific regional development strategy that factors in key driving forces such as population growth and movement, demographic change, the increasing number of households, transportation and other infrastructural needs, economic changes, climate change, and their spatial implications. Furthermore, it is noted that on an environmental level, there is no common sustainability thread across all component reports that could have been used to pull them together in a more cohesive manner.

### **Narrow Focus on Biodiversity**

As already emphasized, there seems to be a widespread agreement among stakeholders consulted that the ODMP's focus on biodiversity is too narrow, i.e. restricted mainly to a few species with no integrated biodiversity program. Additionally, the ODMP did not focus enough on key issues and processes that would enable the ODRS to be maintained and wisely used as a functional ecosystem. Almost all stakeholders said that the ODMP's approach to biodiversity conservation in a flood pulsed system like the Okavango is not at all helpful. The emphasis should instead be on securing higher-level processes that drive the system and target management on system level threats/issues to biodiversity, as well as how this higher-level process will affect planning and management at all levels.

### **Biodiversity Research and Data**

In the ODRS, gaps remain in native vegetation, threatened species, and other core biodiversity research and data. Research to fill existing vast biodiversity data gaps and data networks to openly share key information between stakeholders is vital to inform government policies and legislative changes to protect the ODRS's biodiversity. Sharing of biodiversity information across and within government agencies, NGOs, the private sector, and communities is poor and remains a key issue which needs to be addressed.

### **Climate Change, Land Use, and Biodiversity**

As discussed above, little work has been done on the impacts of global climate change on the Delta's water inflow and biodiversity. Ongoing work at ORI suggests that global climate change is expected to significantly magnify the impacts of changes in human interventions on the water resources in the delta. The Initial National Communication Strategy (2001) also suggested that Botswana is highly vulnerable to the impacts of climate change. Temperatures are predicted to rise by 1 degree C to 3 degrees C during the next 100 years due to greenhouse gas emissions. Rainfall models for Botswana are less consistent; however, an overwhelming majority of the models seem to suggest a general decrease in rainfall for Botswana.

It is also considered worth mentioning that characterizations of more complex relationships between climate change, land-use, and biodiversity in ODRS are missing and they are currently limited by a lack of process understanding, data availability, and inherent scenarios uncertainties. Given the importance of both climate change and land-use changes in influencing biodiversity, studies that include only one or the other driver are likely to inadequately assess impacts.

### **Effects of Climate Change on Tourism Development**

Globally, tourism development, particularly the business side of it, is affected by climate change. Climate change impacts natural resources that are the key products of nature-based tourism

development in the ODRS. However, climate change and its impacts on tourism and the ODRS as an ecosystem were completely ignored or omitted by the ODPM. The ODRS is subject to climate variations, for example, in the past five years those it has witnessed in flooding patterns. This invariably has effect on the tourism business identity. However, such issues were not addressed by the ODMP.

### **Impacts of Climate Change on Livelihoods**

There is little understanding of how climate change (desiccation of river channels or flooding) is going to affect water dependent livelihoods, such as fishing. There is also limited understanding of how households have been coping or are likely to cope with the impacts of climate change and what implications this might have on achieving the objectives of the ODMP. These are important issues and questions that ought to have been addressed by the ODMP, but were left out.

### **Hydrology and Water Resources Component**

Although several threats to the Okavango Delta were identified in the ODMP's Hydrology and Water Resources Component Reports, these are not explicitly captured in the ODMP Action Plan. For instance, under the action plan for Strategic Goal 2, the only key issues captured are that DWA has to improve water quality and sediment transport monitoring, while there is no action plan for issues such as seismic activity, climate change, and potential large-scale abstractions particularly in upstream areas of the Delta. One of the major limitations identified during calibration of the Integrated Hydrologic Model of the Delta was the lack of continuous good quality time-series data on hydrology and climate change with good spatial coverage within the Delta. The ODMP lacks an action plan for data collection for other elements of the hydrology component, save for water quality and sediment monitoring. The danger is that as plan implementation moves forward, these might be left out.

### **Impacts of Potential Large-Scale Water Abstractions in Upstream Areas of the Delta**

At the time of formulation of the ODMP, consideration was given to the possibility that political stability will return to Angola and, with that, there will be increased use of water for development purposes from the Angolan rivers, including the Cubango. This scenario will subsequently lead to a reduced flow of water to Botswana. The ODMP did not consider the impacts of large-scale water abstractions in upstream areas of the Delta and offer strategies/options for dealing with such impacts or situations. This is a serious gap.

The implications of the impacts of reduced water flow into the Okavango Delta are clear, considering that water supply to Botswana is a trans-boundary ecosystem service and that water flowing from the country of Angola contributes to the freshwater reserves of Botswana (Gumbrecht et al, 2004). Further, riparian households collect water directly from the river; catch fish; harvest edible and medicinal plants; and practice flood recession farming in the Delta. The Delta also supports a large tourism industry and a huge ecological biodiversity. The Okavango River also provides a medium for traditional transport and communication, primarily through the use of boats.

According to OKACOM (2011), the government of Angola proposes to have large-scale irrigated agriculture schemes whereby, in the medium term, about 270,000 hectares of land are proposed for irrigation along the Cubango Catchment with an estimated water requirement of 3510 Mm<sup>3</sup>/annum. However, this should be seen as a worst case scenario not a given. An additional three large irrigation schemes, proposed in the long term, will bring the total irrigated land to 490,000 hectares, with a total requirement of nearly 6,400 Mm<sup>3</sup>/annum (OKACOM, 2011b). These schemes will definitely lead to considerably reduced flow of water to Botswana.

For a continued flow of water that drives economically important activities in Botswana, the Botswana government must consider instituting Payment of Ecosystem Service (PES) for the supply of water. PES is defined by Wunder (2005) as 'voluntary transactions where a well-defined

environmental service, or land use likely to secure that service, is being bought by at least one environmental service buyer from at least one environmental service provider, if and only if the environmental service provider secures the environmental provision'. The principle behind PES is that individuals, communities, corporations or NGOs should be compensated for undertaking certain actions or land use practices that increase the provision of ecosystem services at the local, regional, or global levels (Jack et al, 2008). The modality of payments would normally be worked out by the two countries.

### **Area-Specific Land Use Regulatory Framework: ODRS Development Control Code**

The ODRS Integrated Land Use Plan has a strong focus on the “traditional master planning approach” which aims at controlling land use and development through a zoning system and regulations. Essentially, it is concerned with the location, form, amount, and harmonization of land development required for various uses. The planning emphasis was on the preparation of a land use plan that prescribes the physical use of land in the desired final situation. It is a widely held view, expressed during stakeholders’ consultations that this land use planning approach has proven to be inadequate to deal with the present situation in the ODRS. Specifically the plan has been criticized as being inflexible in allowing land use changes or special development projects at locations where opportunities are evident (on the issue of game ranching, for example). It was also noted that strategies and/or policies for increasing flexibility of land use designations suggested that flexibility works best if it grows out of thoughtful regulations that emphasize the connectivity and links among uses. Otherwise, results may be haphazard if authorities simply enable multiple uses without providing area-specific standards and guidance on the desired range/mix of uses.

It is also a widely held view that the national Development Control Code and Urban Development Standards (on which the ODRS Land Use Plan and related plans of lower order rely) in their current forms cannot be responsive to present day complexities and peculiarities of the ODRS. They do not include details and land use regulations that address the ODRS zones’ specific peculiarities, and as such they are not capable of assisting or guiding the relevant authorities in determining whether a development will be consistent with zones’ sensitivity or with the nature of future development sought for each zone in the ODRS. A sensitivity map is required to guide sustainable physical developments in the ODRS.

In order to provide for flexibility, clarity, consistency, and ease of use, it is proposed that ODRS-Specific Guidelines or a Land Use Regulatory Framework (Local Development Control Code) be developed as a means of implementing the Land Use Plan and related plans of lower order in the ODRS, to address and regulate zone-specific peculiarities. Higher order plans, for example Settlement Development Plans for Maun, Shakawe, and Gumare, should have their development proposals informed by SEA. It is suggested that ODRS-specific guidance (a Land Use Regulatory Framework) should contain standard templates for different ODRS land use zone provisions. Each template would include zone-specific land use standards (zone intent/objectives, permitted activities, etc.), with the opportunity for the plan’s implementing authorities to add a range of additional objectives/standards that relate to unique characteristics of the zone. It is also proposed to embed a section into each template that would enable the plan’s implementing authorities to include some specific principles of development control based on planning studies. These would include provisions related to unique characteristics or unique parts of the zone that are not satisfactorily addressed by the standard provisions (for example, conservation, subdivision design, minimum impact development standards, access management, and comprehensive water/wetland resource protection requirements.)

### **Conservation Agriculture**

The Okavango Delta Management Plan down played arable agriculture during the planning process as it sustains a large part of the rural population. Most subsistence agricultural production in the ODRS and in most of Botswana adheres to the principles of conventional agriculture that involves

exposure of the soil to the forces of soil erosion. Conservation agriculture, which entails minimum or no tillage, can contribute to sustainable agriculture and rural development through improvement of efficiency in the use of inputs, increasing farm income, improving or sustaining crop yields, and protection and revitalization of the soil (Dumanski, et al. 2006). According to Dumanski, et al. (2006), the combined social and economic benefits gained from combining production and protecting the environment, including reduced input and labor costs, are greater than those from production alone. Because the overall objective of ODMP entails sustainability and conservation of resources, conservation agriculture should be part of sustainable farming systems in the ODRS.

The revival of sustainable farming practices in the ODRS, through introduction of policy measures and proper training in conservation agriculture, is seen as a more effective way to ensure the long-term viability and wise-use of the ODRS. The knowledge gap concerning the environmental effect of conservation agriculture calls for immediate preparation and implementation of education/training programs specifically designed to address the educational needs of rural population in the ODRS.

### **Mining in ODRS**

The Okavango Delta Management Plan also down played the issues of mining in the ODRS. Two issues are of particular concern. The first relates to the lack of planning, statutory, and other means of sterilizing of ODRS's mining reserves (if any) and delineating areas in the ODRS where mining should be discouraged to avoid significant impacts on biodiversity. It is noted therefore that mining cannot take place in a World Heritage Site. This should be a serious concern as the Delta in all probability will soon be listed as a World Heritage Site. This issue is seen as a major stumbling block in the ODRS. The second issue relates to a concern about environmental assessment procedures for mining. It appears that presently, an EIA is only required for mining rights and not for prospecting. This could, in some cases, permit activities to go ahead which have significant impacts on biodiversity in the ODRS.

Of particular concern is the concept of biodiversity offsets as a method of compensating for unavoidable harm to biodiversity caused by mining and similar development projects. Though much hesitation surrounds the feasibility of this concept, it is observed that it has no mention in the present ODMP. It is important to embark on a better understanding of mining and biodiversity issues and management methods together with best practices in the ODRS.

### **Hazardous Waste Materials**

While hazardous waste materials are mentioned in the ODRS's Liquid and Solid Waste Strategy, the management of hazardous materials is not mentioned at all in the ODMP main document and in the ODMP Action Plan. It is therefore possible that this kind of waste can be overlooked by tourism operators and stakeholders within the ODRS.

### **Tourism Competitiveness of ODRS**

Measurement of the competitiveness of the ODRS as a world class tourist destination is not being carried out. *The need to measure competitiveness of the Okavango Delta as a world class international tourist destination was suggested in the ODMP, but this action item has been delayed. As a result, there is need to appoint market research consultants who will:*

- Periodically measure the competitiveness of the Okavango Delta as a world class international tourist destination over time;
- Ensure remedial interventions are implemented;
- Ensure competitive advantage and positioning of the Okavango Delta as a premier tourist destination.

*Visitor satisfaction studies have also not been conducted in the ODRS.* As a result, the ODRS is being developed and marketed as a world class tourism destination with little information on the level of visitor satisfaction.

### **Compilation of Detailed Inventory of Tourism Resources and Attractions in the ODRS**

There has been no compilation of a detailed inventory of tourism resources and attractions in the ODRS. The ODMP recommended that a *tourism monitoring program be established to identify, describe, and detail all tourism resources and attractions in the ODRS.* The tourism monitoring program should keep this inventory current and made freely available to all interested and affected parties. There should be assurance that the program is functional, that all data fields are effectively captured, verified, and kept current, and that an effective data dissemination system is in place and functional. Such a monitoring program does not exist in the ODRS. As a result, impacts of tourism activities and infrastructure development on the tourism resource base cannot be stated with certainty.

### **Cultural Identity Support**

Issues surrounding cultural identity were not tackled comprehensively in the ODMP. The plan primarily refers to the survival of a vital body of traditional ecological knowledge, which allows community leaders and members to understand key management and protection issues and needs, in relation to the ODRS's land and resources. "Cultural identity" also implies keeping alive community values and institutions, and encouraging a sense of pride in the communities about what they are and the heritage they have.

Revitalization and strengthening of traditional knowledge is another key strategy that must be addressed in the ODMP to strengthen links between the people and the Delta. This can be done in multiple ways, but the fundamental principle is to ensure inter-generational transmission of knowledge about the ODRS and its resources. Indeed, there is evidence of a breakdown in the inter-generational transfer of local knowledge and skills (mekoro, game tracking, crafts) in the ODRS, making it also one of the critical issues that may affect the community's cultural continuity and appreciation of the Delta in the long run. As most of young children spend time away from home in boarding schools, they cannot participate in daily chores and learn the skills appropriate for local livelihood strategies.

### **Youth Empowerment**

The ODMP did not include strategies or recommendations on how to mainstream youth and their empowerment in ODMP formulation or implementation. This is considered important, given the fact that youth constitute more than half the population of the ODRS and this human capital is seen as one of its greatest assets. There was, therefore, the need for the ODMP to have addressed such issues as youth unemployment and entrepreneurship in its socio-economic themes.

### **Other Gaps**

Another major gap identified in the mid-term review and gap analysis of the ODMP, was that there was no appropriate assessment of capacity within the Ngamiland District departments or among stakeholders to implement the various recommendations of the ODMP. As it has turned out, this MtR has revealed that capacity is lacking in most of the implementing stakeholder departments, in terms of staff and funding. This situation has contributed in no small measure to the non-implementation of most of the ODMP recommendations.

Additionally, the ODMP was not properly aligned with the District Development Plan and National Development Plans in terms of timeframes, projects, and programs. This has resulted in recommended projects and programs of the ODMP not being budgeted for in the NDP. This has affected successful implementation of the plan.

## SYNTHESIS OF FINDINGS

This section synthesizes the mid-term review of the ODMP and presents, in a tabular form, the implementation status of the ODMP action item by action item.

It must be acknowledged that the ODMP project is large, complex, and ambitious in its scope. Based on the findings of the mid-term review of the plan, and the general feelings conveyed by stakeholders consulted, it can be concluded that the performance of the ODMP and its implementation thus far, has largely been inefficient and ineffective.

There is a consensus, however, among stakeholders consulted that the ODMP has helped to bring key stakeholders together and build support, especially with regard to propagating the ecosystem-based approach and wise use and management of the resources of the ODRS. Several interviewees stated that the aspect of mutual learning fostered by the ODMP projects and programs, improved stakeholders' cooperation (especially at the district level) and inspired all stakeholders to continue working closely together. For example, joint events (OWMC, DLUPU, and other stakeholder meetings) and other coordinated activities such as the Biokavango Project, represent good examples of cooperation within the ODMP framework.

An appraisal of the situation on the ground revealed that progress toward achieving the overall goal of the ODMP, which is, "To integrate resource management for the Okavango Delta and ensure its long-term conservation and sustainable use of its natural resources" and its strategic objectives, have not been very significant. Although the ODMP set out sound action plans/items for implementation, nearly all stakeholders consulted are of the view that the plan has not moved forward adequately enough into the operational phase. There is, in this regard, strong stakeholder feeling that the ODMP is losing momentum and stakeholder support built up during the formulation and approval stages.

A major implementation drawback of the ODMP is the failure to ensure that the agreed projects/action items were reflected in relevant government stakeholder department budgetary allocations.

Table 6 below is a summary of ODMP's implementation status in terms of each action item as set out in the action plan.

**Table 6: Summary of the ODMP's Implementation Status: Action Item By Action Item**

Action	Stakeholder(s) Responsible	Status/Impact
<b>Biodiversity Related Action Items</b>		
<b>Manpower capacity of the fisheries division needs to be addressed</b>	DWNP	<p><b>(Implementation Ongoing)</b></p> <p>As of now, the Fisheries Division in the DWNP appears to be relatively well-resourced in terms of the number of personnel that are employed.</p> <p>Staff training is clearly an issue, and while some of the staff at the regional offices have degrees in the biological sciences, there are currently no trained fisheries scientists stationed in the Delta. Staff training at all levels in fisheries management and extension would greatly increase the efficacy of the organization.</p> <p>It is evident that the Division operates under some financial constraints that limit its ability to carry out its mandate. Most notably the lack of suitable transport to operate effective compliance operations appears to be an issue. In this regard, the potential to develop linkages with NGOs, the Okavango Research Institute and other government departments to assist in compliance and community/fisheries related issues could be considered</p> <p>The above-discussed problems, specifically training, remain unresolved, and have been further analyzed and recommendations made in the Fisheries Management Plan.</p>
<b>The long-standing problem of fisheries conflicts need to be resolved</b>	DWNP	<p><b>(Steady Progress Evident)</b></p> <p>Introduction of Fish Protection Regulations (May 2008), though not vigorously enforced</p> <p>Introduction of fishing licenses and permits, and a closed fishing season, which is being observed</p> <p>Revival of the Okavango Fishers Association for different sectors to discuss issues of concern (stakeholder platform)</p> <p>Development and approval of the Fisheries Management Plan for the Okavango Delta (2012)</p> <p><u>Action required:</u></p> <p>There is a need to review the current regulatory framework and develop inputs to the new Wildlife Management Act including issue of fishing grounds zoning and access rights</p> <p>Boat sizes only partially regulated (fisheries officers not able to enforce the regulation due to political influence)</p>
<b>Lake Ngami needs to be declared a bird sanctuary</b>	DWNP in collaboration with DEA, Birdlife Botswana, Communities	<p><b>(Implementation Ongoing)</b></p> <p>Preparatory work is ongoing to declare Lake Ngami a bird sanctuary.</p> <p>The process is spearheaded by a Committee led by the Botswana Tourism Organization, with representation from community-based organizations (trusts), the private sector (tour operators), NGOs (BirdLife Botswana and Kalahari Conservation Society), government departments, and others.</p> <p>It is reported that the proposal is currently awaiting ratification by the relevant government authority</p> <p>Active engagement of local communities in the area is required</p>

Action	Stakeholder(s) Responsible	Status/Impact
<p><b>There is need to carry out baseline surveys on keystone species</b></p>	<p>DWNP in collaboration with ORI, Birdlife Botswana, researchers, private sector</p>	<p><b>(Limited Progress)</b></p> <p>A baseline survey of the Slaty egret was carried out by BirdLife Botswana during ODMP formulation (in 2007). Following the baseline survey, BirdLife Botswana has been monitoring (through transect surveys and sitings) the Slaty egret population, and reports are produced on an annual basis.</p> <p>African skimmers population is also monitored in parts of the Okavango Panhandle and Delta. Key breeding/foraging sites for key bird species (Slaty egret and African skimmer) have been identified in the Okavango, but nothing concrete is being done to protect such sites.</p> <p>Wild dog monitoring is ongoing through NGOs in parts of the Okavango Delta. The wild dog is endangered, and monitoring results from 1995 to 2008 show a population decrease while the period 2008 to 2011 show an increase. These dynamics (increases and declines) in wild dog population could be attributed to decreases or increases in availability of resources (prey species), which themselves are dependent on the variation in floods and frequent fires of the Okavango.</p> <p>No other ground monitoring surveys for keystone species have been initiated since ODMP's approval.</p>
<p><b>The existing and potential breeding sites for Slaty egret need to be protected</b></p>	<p>DWNP in collaboration with DOT, DFRR, Birdlife Botswana, tourism sector, communities</p>	<p><b>(Implementation Delayed)</b></p> <p>It has been indicated that sites have been identified (though not all of them)</p> <p>No protection status has been extended to the identified sites as yet</p>
<p><b>The inadequacy of baseline data on fish stocks in the ODRS needs to be addressed</b></p>	<p>DWNP in collaboration with ORI, fishing community, Ministry of Fisheries and Marine Resources, Namibia</p>	<p><b>(Some Progress Made)</b></p> <p>The objective of setting up a fish stock monitoring program has been achieved and is ongoing.</p> <p>Fish stock monitoring is carried out by the Fishery Division of DWNP 4 times annually in selected areas of the Okavango Delta and Panhandle.</p> <p>There is no comprehensive baseline data on fish stocks of the Okavango Delta and Panhandle. It is therefore unclear whether the fish stocks of the Okavango Delta and Panhandle are declining or increasing. A fisheries biologist at ORI is soon to publish a stock assessment analysis on the fisheries resources in the Delta.</p> <p>There is need to review the DWNP's long-term monitoring program of the Delta fisheries for incorporation in the existing Fisheries Management Plan.</p>

Action	Stakeholder(s) Responsible	Status/Impact
<b>There is need to reduce the impact and frequency of uncontrolled veld fires</b>	DFRR in collaboration with ORI, DWNP, DOT, tourism sector, NWDC	<p><b>(Some Progress Made)</b></p> <p>The ODMP's Fire Management Plan's prescriptions for reducing the impact of veld fires by reducing their frequency and intensity (including the exceptions) have not been enforced consistently.</p> <p>The DFRR is keeping and maintaining firebreaks to minimize the extent of fire-burnt areas.</p> <p>Community Fire Management Plans have been prepared for most community areas, but capacity to implement them is lacking.</p>
<b>DWNP to assess and mitigate the impact of large herbivores on sensitive habitats</b>	DWNP in collaboration with ORI, DFRR, independent researchers	<p><b>(Limited Progress)</b></p> <p>This has not been done except for elephants in the Okavango Delta.</p>
<b>Overgrazing by livestock needs to be addressed</b>	DFRR in collaboration with TLB, NWDC, DEA, DWNP, DAHP	<p><b>(Action Item Delayed)</b></p> <p>This is the responsibility of the DFRR.</p> <p>Biomass assessments and monitoring structures have not been initiated yet.</p> <p>As a result, rangeland carrying capacities are not known or implemented</p>
<b>The risk of tsetse re-infestation needs to be reduced</b>	DFRR in collaboration with DEA, Angola, Namibia, Zambia	<p><b>(Implementation Ongoing)</b></p> <p>Aerial spraying of insecticides within the Delta to prevent tsetse fly spreading to livestock areas has been ongoing for several decades.</p> <p>A Tsetse Trans-Boundary Free Zone has been established between Botswana, Angola, and Namibia.</p>
<b>Sustainable use of vegetation resources need to be addressed</b>	DFRR in collaboration with DOT, NWDC, DWNP, TLB, private sector, CBOs, communities	<p><b>(Action Item Delayed)</b></p> <p>Vegetation resource use is presently inadequately controlled, suggesting that premature and/or over harvesting for subsistence and/or commercial purposes can go unattended.</p> <p>Up to now, no detailed and continuing monitoring/mapping of vegetation resources in the Delta has been done and/or carried out on a consistent basis.</p> <p>Although the Forest Policy was developed by DFRR and approved in 2011, regulations controlling harvesting of mature trees for the production of poles and wooden canoes are still questionable.</p>

Action	Stakeholder(s) Responsible	Status/Impact
<p><b>Human/wildlife conflicts continue to be a problem and need to be addressed</b></p>	<p>DWNP in collaboration with DAHP, DFRR, TLB, DOT, NWDC, DEA, communities, private sector</p>	<p><b>(Implementation Ongoing)</b> Human-elephant hotspot identification is ongoing through the Government of Botswana/World Bank/GEF human-wildlife co-existence project, under implementation by the DWNP. Mitigation measures partially undertaken (DWNP pepper project only implemented in some parts of the human/elephant conflict area - Mohembo- Gudigwa stretch - due to limited resources). Human-wildlife conflict remains high, as very few farmers have adopted/ know about the chilli pepper strategy. More farmers exiting arable agriculture and falling into poverty (e.g. abandoning of fields after elephant raids)</p>
<p><b>ODMP Research &amp; Monitoring Plan: Highest priority biodiversity research topics :</b></p> <ul style="list-style-type: none"> <li>-Detailed knowledge of elephant populations</li> <li>-Impacts of fire</li> <li>-Impacts of poaching activities</li> <li>-Aquatic invertebrates</li> <li>-Important vertebrate species</li> <li>-In-stream Flow Requirements (IFRs)</li> <li>-Biodiversity indicators</li> </ul>	<p>UB/ORI in collaboration with relevant government /non-government departments, international research and donor organizations</p>	<p><b>(Limited Progress)</b> Individual research agendas have thus far been pursued, rather than coordinated research programs that would be more focused and comprehensive. Accordingly, the added-value in having a coordinated approach to research in the area needs to be realized. All monitoring programs originally prescribed in the ODMP Research strategy are yet to be developed</p>
<p><b>Climate Change:</b></p> <p>The ODMP has recommended that “the sectors such as tourism, agriculture, subsistence and commercial use of vegetation resources, water, and fisheries which are likely to be affected by the impact of climate change initiate the development of coping strategies.”</p>	<p>UB/ORI in collaboration with relevant government /non-government departments, international research organizations</p>	<p><b>(Action Delayed)</b> The coping strategies, as observed in this MtR, have either not been prepared or not implemented. Nearly all stakeholders agreed that the climate change issue in the ODMP is very vague, bearing in mind that there were no attempts and/or elaboration (prescriptions) of what mechanisms such as adopting coping strategies might entail related to anticipated climate changes.</p>

Action	Stakeholder(s) Responsible	Status/Impact
<b>Hydrology-Related Action Items</b>		
<b>Development of Integrated Hydrologic Model</b>	DWA	<p><b>(Limited Progress - Activity Shelved)</b></p> <p>An integrated hydrologic model was developed and completed by DHI in 2005 with involvement of personnel from the Department of Water Affairs Modeling Unit.</p> <p>Based on the MIKE SHE modelling framework, the model provides an efficient management tool for answering “cause-and effect” questions about the interactions between the hydrological, ecological, and socioeconomic functioning. In addition, the hydrological model will have very important implications for Instream Flow Requirement (IFR) studies at key points in the Okavango Delta, providing essential information for ecologists.</p> <p>This model has not been finalized and adopted for routine management and its use (including continuing updates that have been required) seems to be shelved. The root cause of this failure is related to lack of skills and resources.</p>
<b>Establishment of Water Quality Guidelines for the Okavango Delta</b>	DWA/BBOS	<p><b>(Action Item Delayed)</b></p> <p>It is recommended by the ODMP that a water quality standard for the Okavango Delta should be defined in terms of the goals for the utilization of the water for domestic, agriculture, and maintenance of habitats.</p> <p>Although the Botswana Bureau of Standards has established standards for drinking water and effluent discharge which have to be adhered to, standards for other uses have not yet been established. It is also important to take into consideration the unique water quality of the Okavango Delta while setting these standards.</p>
<b>Water quality and sedimentation monitoring needs to be improved</b>	DWA	<p><b>(Implementation Ongoing with Some Activities Postponed)</b></p> <p>DWA is in process of establishing water quality monitoring system which will be based on eight (8) water quality monitoring sites in the Delta. The consulting company has been contracted and the Report is expected to be available shortly</p> <p>Systematic sediment transport monitoring is neither included in the aforementioned monitoring system nor being undertaken by DWA, save for 4 locations by a PhD student in 2006.</p> <p>The water quality monitoring component is also partially addressed by the Bio-Okavango project on persistent organic pollutants. The questions of continuity of this monitoring still remain open.</p> <p>TDA (OKACOM, 2011) has highlighted the limitations of available data and monitoring protocols in giving a comprehensive picture of the current status of especially water quality in the whole basin, including the Okavango Delta. Only a few parameters are well known and even though pollution is often acknowledged, the exact nature, source, and location of the pollution are not always defined.</p> <p>The Strategic Action program (SAP, OKACOM 2011) has highlighted this as one of the most critical gaps within the TDA.</p>

Action	Stakeholder(s) Responsible	Status/Impact
<p><b>The need to manage channel blockages to sustain communities' access to livelihood activities</b></p>	<p>DWA in collaboration with DEA, government departments, communities, private sector</p>	<p><b>(Action Item Delayed/Abandoned)</b></p> <p>Nearly all stakeholders agree that it was fortunate that this action item was delayed and not accomplished. As strongly noted, channel clearing to maintain navigable passages is an activity that negatively interferes with ecological processes, including, significantly, the channel aggradation and avulsion process which drives ecosystem renewal.</p>
<p><b>The highest priority hydrological research topics identified in the ODMP's Research Strategy are:</b></p> <ul style="list-style-type: none"> <li>-Flood distribution and frequency</li> <li>-Validity of the existing hydrological models</li> <li>-Conducting inflow stream requirement</li> <li>-Establish flooding patterns and flooding trends</li> </ul>	<p>UB/ORI in collaboration with relevant government /non-government departments, international research and donor organizations</p>	<p><b>(Limited Progress)</b></p> <p>Up until now very little or none of the recommended hydrologic research topics are being implemented. Individual research agendas have been pursued, rather than coordinated research programs that would be more focused and comprehensive.</p> <p>All monitoring data collection programs originally prescribed in the ODMP Research Strategy are yet to be developed. It is expected that the "The Future Okavango Project " (OKACOM 2011) will address these issues.</p>
<p><b>The ODMP has recommended that predictive seismic model(s) that can be used to inform responsive action be developed</b></p>	<p>DGS/DWA</p>	<p><b>(Activity Delayed/Shelved)</b></p> <p>It is observed that this recommendation has not been implemented yet.</p> <p>During the Maun Groundwater Development Project Phase 1 (1995), seismic stations were installed in various locations within the ODRS by DWA and handed over to the Department of Geological Survey for monitoring. As observed during this MtR, these stations have since fallen into disrepair</p>

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<p><b>The ODMP's Research Strategy has also outlined the following area of research:</b></p> <ul style="list-style-type: none"> <li>-Understanding of the different ways in which the Okavango/Cubango River Basin responds to change (climatic and hydrological) and how these affect the ecological and social processes</li> <li>-A thorough understanding of the physical, chemical, ecological, socio-economic, and political factors that influence the interactions within and between society and ecosystem components</li> <li>-Directed management-oriented research that answers focused 'cause and effect' questions</li> </ul>	<p>UB/ORI in collaboration with relevant government /non-government departments, international research and donor organization</p>	<p><b>(Limited Progress)</b></p> <p>The Botswana National Action Plan (OKACOM, 2011) highlighted that these research issues are crucial for enhancing the understanding of the Okavango Delta and for the formulation of appropriate management interventions.</p> <p>It is observed that up until now very little or none of the recommended hydrologic research topics are being implemented. Individual research agendas have been pursued, rather than coordinated research programs that would be more focused and comprehensive.</p> <p>All monitoring/data collection programs originally prescribed are yet to be developed</p>

Action	Stakeholder(s) Responsible	Status/Impact
<b>Land Use/Land Management -Related Action Items</b>		
<p>All land use and management practices should conform to the proposals and recommendations of the ODRS Land Use and Land Management plan (2005-2029).</p> <p>This entails the declaration of the entire Ramsar Site as a Planning Area in terms of the Town and Country Planning Act (1977) and the consequent statutory requirement for a Development Plan.</p>	<p>NWDC,TLB, DTRP/MLH</p>	<p><b>(Activity Delayed/Not Implemented)</b></p> <p>The absence of this executive declaration exposed a wider strategic deficit in the ODRS land use planning/control related to the legality of the Plan.</p> <p>References have been made to the lack of any statutory Protected Area status for the Okavango Ramsar Site. Specifically, it is noted that while the Ramsar Convention creates no automatic expectation that a Ramsar Site of international importance - as in the case of the ODRS - should be legally protected, there is an expectation that the government being signatory of the Ramsar Convention should have in place some mechanism for detecting and responding to actual or potential change in the ecological character of designated sites.</p> <p>There is a widespread agreement that the non-declaration of the ODRS as a Planning Area has made it very difficult for land use planning and control processes to operate effectively and fairly.</p>
<p>For the orderly growth and development of settlements in the ODRS, settlement development plans shall be prepared for all settlements.</p> <p>For small rural communities, simple land use layout plans should be initiated by the VDCs and assisted by council and land board officials for their preparation. All land use and development in villages will therefore be guided by such simple land use layout plans.</p>	<p>TLB and subordinate land boards, NWDC Physical Planning Unit</p>	<p><b>(Limited Progress/Activity Delayed)</b></p> <p>At present only three settlements, namely Maun, Gumare and Shakawe have Development Plans prepared and approved. Two of these plans (Gumare and Shakawe) are advisory (non-statutory) plans, while the Maun Planning Area Development Plan is statutory.</p> <p>Evidence on the ground shows the absence of Settlement Development Plans regulating settlement boundaries, and growth directions have resulted in settlement sprawl and unwise use of land. The “mushrooming of un-gazetted settlements along the edges of the ODRS and along the main arterial roads that service both the eastern and western parts of the Delta have been spotted. There are now incessant calls for “gazetment” and provision of services to such “settlements”, in the ODRS.</p> <p>Initiatives of Southern Africa Region Environmental Program’s (SAREP) in facilitating the development of Participatory Integrated Land Use Plans (PILUP) for selected villages within the ODRS is undoubtedly a positive response in creating opportunities for more beneficial changes and environmentally sound land use and control practices at the village levels.</p>

Action	Stakeholder(s) Responsible	Status/Impact
<p><b>Due to the presence of fault lines in the ODRS and the probabilities of seismic activities, foundations for buildings should be well reinforced, with building plans duly approved by Council Engineering Department.</b></p>	<p>NWDC, TLB and subordinate Land boards</p>	<p><b>(No Progress)</b></p> <p>ODRS represents a special case in respect to development planning because of seismic risk. Specifically, various seismic investigations pointed out the Maun – Toteng area as potentially the most active seismic zone within the Delta. It was also indicated that significant seismic activity (similar to the 6.7 magnitude earthquake of 1952) is possible in the future, posing a potential seismic hazard to any major engineering works, as well as to residents of the Delta in general and Maun Planning Area in particular.</p> <p>There is lack of appropriate and comprehensive micro-seismic zoning of the ODRS, which prevents the preparation of a more detailed assessment of threatened areas and the development of measures that should be employed to avoid or mitigate earthquake hazards. In this regard, various studies and geotechnical investigations in Maun carried out in the ODRS have strongly recommended the following:</p> <ul style="list-style-type: none"> <li>• Long-term seismic observations and specialist studies should be undertaken to prepare a proper micro-seismic zoning in the Planning Area and introduce building/engineering codes that would call for the specifications of special precautions in foundations and structural designs.</li> <li>• While waiting for an appropriate micro-seismic zoning, the entire ODRS should be placed in category 3k of the Geotechnical Classification - 100 year maximum probability of &gt;8 Modified Mercalli intensity. Designs of any development scheme must, in this regard take cognizance of the high level of seismic risk.</li> </ul>
<p><b>The Integrated Land Use Plan recommends a guideline of 200 meters from the river bank in the Panhandle within which no plots should be allocated or land development activities are to take place.</b></p>	<p>TLB and subordinate land boards, NWDC</p>	<p><b>(Implementation Ongoing/Enforcement Questionable)</b></p> <p>Relying on the Okavango River Panhandle Management Plan, the Integrated Land Use Plan imposes rigorous restrictions on arable and other land use in the Panhandle Zone. The expansion of the area used for arable farming (dryland, molapo, and irrigation farming) is generally not recommended.</p> <p>The allocation guidelines of the Land Use Plan state that no arable plots should be granted between the river and the road on both sides of the Panhandle nor within the riparian woodland zone or within 200 meters of the river and also that no pristine areas should be cleared for cultivation at all. Instead, the plan suggests the consolidation of existing arable lands.</p> <p>At the same time, the plan recognizes that all the fertile areas located either in the inter-dune valleys or near the river are already occupied. With all these restrictions and the existing distribution of occupied plots, most new allocations would have to be through enforcement of the existing regulation to repossess undeveloped plots and reallocate fields that have not been used for more than 5 years.</p> <p>Almost all government officials consulted were of opinion that enforcing the provisions of the Land Use Plan in the ODRS other than in major settlements of Maun, Gumare, and Shakawe, is a very big challenge. The lack of funding support and inadequate manpower and skill levels to enforce the land use plan’s guidelines and regulations throughout the whole of the ODRS are still prominent and the most critical issues.</p>

Action	Stakeholder(s) Responsible	Status/Impact
<p><b>No new settlements should be allowed to develop in the Delta, while the growth and expansion of existing settlements should be stringently restricted. This is aimed at reducing the pressures on land and other natural resources to ensure conservation at sustainable levels.</b></p> <p><b>Apply the provisions of the Development Control Code to all settlements in the Ramsar Site.</b></p> <p><b>No further expansion of those settlements like Ditshiping, Khwai, and Jao should be allowed</b></p>	<p>TLB and subordinate land boards</p>	<p><b>(Limited Progress/Implementation Unresolved)</b></p> <p>The ODMP mid-term review shows that the planning and land management authorities have thus far failed to effectively control (limit and rationalize) village expansions in the Core Delta (for instance, it is noted that there has been an increase in the allocation of plots ever since Khwai became a gazette village;</p> <p>There is the serious issue of land allocation and its control in non-gazetted settlements which is still in the hands of the traditional local authorities. It was noted that local planning authorities, (including land boards) should consider getting statutory authorization for gaining more control over developments in these villages.</p> <p>Almost all communities in the Core Delta pose concerns with regard to environmental quality and aesthetics. It is a widely held view that the villages in the Core Delta are presently regarded more as “obstructions to a place marketed as a ‘pristine wilderness’” rather than “cultural attraction”.</p> <p>It was noted that local authorities’ (DLUPU’s) initiatives in identifying concerns and suggesting remedies for more effective control of all (gazetted and non-gazetted)” villages in the Core Delta are on-going. These remedies revolve around the idea of “voluntary resettlement of communities, subject to approval by Tawana Land Board and endorsement by the relevant Centered Government authorities.</p> <p>Sentiments were echoed by some stakeholders who emphasized that the local authorities’ (DLUPU) initiatives seek to break the relationship between the local tribal communities and the Delta ecosystems in the name of tourism development and wildlife conservation.</p>
<p><b>Streamline all structures involved in land use and land management with an umbrella coordinating body with a fulltime secretariat. This could be the DDC or the Okavango Wetland Management Committee</b></p>	<p>TLB and subordinate land boards , DDC, NWDC Physical Planning Unit, DLUPU, DWNP</p>	<p><b>(Implementation Ongoing/Limited Progress)</b></p> <p>This Mid-term review revealed that the coordination between key stakeholders involved in land use planning, land management and development control at the local (ODRS) level has been enhanced. It is, however observed that basically DLUPU (though operating on an ad-hoc basis) has contributed to this more than the DDC, as originally recommended by the Land Use Plan.</p> <p>Land management and development control in the ODRS still lacks the capacity to act as “whole-of-ODRS” umbrella that has the necessary degree of decision-making authority;</p> <p>Until now, very little seems to have been done in developing institutional understanding of the ODRS planning and land management issues and needs, to such a level that influential partners in Government are willing to play an important role in providing leadership and support in facilitating cooperation and agreement.</p>
<p><b>To further lessen the burden on TLB, given its vast area of jurisdiction, it is prescribed that some of the functions of the Main Land Board be devolved to the subordinate land boards, who are closer to the communities</b></p>	<p>TLB and subordinate land boards</p>	<p><b>(Limited Progress)</b></p> <p>This decentralization of planning and land management functions as prescribed in the Land Use and Land Management Plan, has not been effectively accomplished yet. It was noted that decentralization requires statutory authorization through amendments of the Tribal Land Act, which are at present (as noted by relevant stakeholders) in a preparatory phase.</p>

Action	Stakeholder(s) Responsible	Status/Impact
<p><b>Capacities within TLB, NWDC Physical Planning Unit and all other structures involved with land management in the Ramsar Site should be strengthened through recruitment of adequate numbers of trained and experienced staff, while at the same time building the capacities of existing staff through continuous training.</b></p>	<p>TLB and subordinate land boards , DDC, NWDC Physical Planning Unit, DLUPU, DWNP</p>	<p><b>(Implementation Ongoing/Limited Progress)</b></p> <p>Not enough has been done so far in building and strengthening capacities within TLB and subordinate land boards, NWDC Physical Planning Unit as originally prescribed by the ODRS Integrated Land Use Plan.</p> <p>It is a widely held view that the functions of spatial planning and professional roles of spatial planners are still not adequately given priority, especially in TLB and subordinate land boards. Consequently they still lack full planning powers in meeting the challenges of undertaking the complex duties of land use planning and development control in the whole ODRS.</p> <p>An analysis conducted by the BiOkavango Project confirmed that there are deficiencies in the operations of the Tawana Land Board and subordinate land boards, especially with regard to their capacity to effectively manage land in the district</p>
<p><b>Enhance land management in the ODRS and develop an effective and functional land database management system.</b></p>	<p>TLB and subordinate land boards</p>	<p><b>(Implementation Seriously Delayed)</b></p> <p>Use of modern geo-information system at TLB is still in its “infancy”. It is characterized by the limited collaboration and/or disconnection (digital divide) across TLB’s program areas. It is noted that TLB is still plagued by problems typical of poor manual land management, information and records keeping systems and as such suffers on account of all the inherent shortcomings of these systems.</p> <p>The TLB’s expectations from the Tribal Land Information Management System (TLMS) to provide the basis for more appropriate land and records management have not been achieved. Many (if not all) officials, as well as stakeholders consulted have expressed skepticism that TLIMS in its current form will ever succeed, given the poor state of the paper records, which should have provided input to the system.</p> <p>It was noted that LAPCAS project (Improvement of Land Administration Procedures, Capacity and Systems in Botswana) could eventually be a realistic solution in providing effective and transparent land management services in future.</p> <p>There is a lack of accurate and up-to-date development tracking information that would provide the basis for a “proactive” approach to diagnosis, situational (re)appraisal, and prompt improvements in the ODMP and its component plans’ provisions</p>

Action	Stakeholder(s) Responsible	Status/Impact
<b>Agriculture-Related Action Items</b>		
<b>Overgrazing by livestock needs to be addressed (DAHP to reduce overgrazing in the ODRS)</b>	DAHP	<p><b>(Implementation Delayed)</b></p> <p>By this mid-term review the biomass assessment has not been conducted, due to lack of human and financial resources. DAHP is seriously understaffed to execute the action items.</p> <p>DAHP has also indicated that due to lack of financial resources, it has not been able to update a 1978 map for range carrying capacities.</p>
<b>Improve maintenance of veterinary fences</b>	DAHP	<p><b>(Implementation Ongoing with Varying Results)</b></p> <p>Although the main strategy of fencing to minimize contacts between livestock and wildlife has proven to be successful, there are still problems of regular maintenance along the fences to ensure that damaged portions of the fences are promptly mended.</p> <p>The biggest challenges facing the Department are that elephants continue to damage the maintained fences. While construction of fences cannot stop the movement of elephants, it has been reported that it takes a long time to repair the fences.</p> <p>Another challenge facing the DAHP is that poachers who carry buffalo meat from within the fence into livestock areas introduce risk of foot and mouth diseases into these areas.</p>
<b>Mount public awareness campaigns on livestock disease control strategies</b>	DAHP	<p><b>(Implementation Ongoing/Progress Evident)</b></p> <p>The mounting of public awareness campaigns on livestock disease control strategies is being done on a continuing basis by DAHP through the sensitization of the public to the importance of vaccination programs.</p>
<b>Assess the feasibility of providing livestock watering points in sand veld areas</b>	DAHP in collaboration with DWA, DGS	<p><b>(Further Implementation Delayed)</b></p> <p>The assessment study on the feasibility of providing livestock watering points in the sand veld areas to reduce livestock and wildlife interactions in the ODRS has been executed as originally envisaged by the ODMP.</p> <p>The study concluded that a detailed and comprehensive field study is required to enable cost benefit analysis to be done for the project. This would include the possible opportunity costs of increased predation as a result of wildlife behavioral change to this new resource.</p> <p>It is not known whether the required study has been carried out and to what extent in the field the livestock sector has moved away from the Delta to the dry sand veld areas, as prescribed by the ODMP and its component reports. It appears, as confirmed by many stakeholders, that the access to surface water still ties livestock sector to the floodplain pastures.</p>

Action	Stakeholder(s) Responsible	Status/Impact
<p><b>Molapo farming along the banks of the river bank to continue, with a 200 m development free zone from the banks of the Okavango river along the panhandle</b></p>	<p>TLB and subordinate land boards</p>	<p><b>(Action Delayed/Unresolved)</b></p> <p>While it has been found that higher crop yields obtained under Molapo farming can contribute to household food security, it appears that the government does not support Molapo farming.</p> <p>Stakeholders were therefore in agreement that while Government may not support Molapo famers by providing them inputs such as fertilizers, it should at least provide them with inputs such as seeds and compensate them for crop damage by wildlife in Molapo fields.</p> <p>In the same vein, the sentiment echoed by stakeholders consulted, is that while government may not issue farmers with certificates for Molapo fields, it should carry out assessment of areas that are suitable for Molapo and then advise accordingly where Molapo farming can be carried out in the ODRS</p>
<p><b>Tourism-Related Action Items</b></p>		
<p><b>There is need to address the possible impacts of tourism activities on the ODRS ecosystem. (DOT to monitor and mitigate the impact of tourism in the ODRS)</b></p>	<p>DOT in collaboration NWDC, DFRR, DWNP, DEA</p>	<p><b>Implementation Ongoing/Progress Evident)</b></p> <p>Impacts of tourism activities on the ODRS ecosystem are being addressed. The Botswana Tourism Organization (BTO) has since been established and has a regional office in Maun. One of BTO's key mandates is to ensure and market responsible tourism developments in the ODRS.</p> <p>The Department of Environmental Affairs (DEA) has also been established and has a regional office in Maun. DEA's mandate includes ensuring that tourism activities in the ODRS do not negatively impact the ecosystem.</p> <p>BiOkavango project developed studies and made recommendations on how issues of waste management in tourism accommodation facilities can be addressed.</p> <p>The NWDC through the ODMP has since developed waste management guidelines for the ODRS.</p> <p>The development of management plans for each concession area in the ODRS ensures that operators observe carrying capacities and limits of acceptable change;</p> <p>Though voluntary, BTO has since developed ecotourism standards for implementation in the ODRS. The standards are meant to promote responsible tourism based on international standards in the ODRS.</p>

Action	Stakeholder(s) Responsible	Status/Impact
<p><b>The solid and liquid waste collection services within the ODRS need to be improved.</b></p> <ul style="list-style-type: none"> <li>-Engage private sector to collect and dispose solid and liquid waste in settlements</li> <li>-Ensure tour operators comply with provisions of waste management as contained in their lease agreements</li> <li>-Operationalize Maun landfill site through procurement and installation of outstanding equipment</li> <li>-To construct a landfill site in Gumare</li> <li>-To increase temporary storage facilities in all settlements</li> <li>-Increase operational technical staff complement from 6 to 8 by rationalizing existing positions.</li> </ul>	<p>NWDC in collaboration with TLB, DoT, DWNP, private sector, communities, and associated structures</p>	<p><b>(Implementation Ongoing with Varying Results)</b></p> <p>In addressing issues of waste management in the ODRS, several guidelines have been prepared. These are Solid and Liquid Waste Strategy for the ODRS developed under the ODMP Project, the BiOkavango Assessment of Liquid Waste Systems of Tourism Establishments, and the recently approved Guidelines for Liquid Waste Management in Ngamiland District. It was noted that an effort must be made to align these guidelines into the entire ODRS Waste Management Guideline.</p> <p>With regard to private sector engagement in solid and liquid waste collection and disposal, there are indications that it has not been so far implemented as originally prescribed in the ODMP's Solid and Liquid Waste Strategy for the ODRS.</p> <p>Most of the tour operators are complying with provisions of waste management guidelines as contained in their lease agreements by means of collecting waste and disposing it in appropriate areas (landfills, dumping sites) in and around Maun, Gumare, or Shakawe.</p> <p>It is however, observed, that tourism companies having facilities in the Delta's core areas, otherwise described as a "Difficult Sites", are not always compliant with recommended methods of liquid waste disposal.</p> <p>Operationalization of Maun Landfill site through procurement and installation of outstanding equipment has been delayed. Currently, this waste disposal facility functions more like a dumpsite, rather than a sanitary landfill, with separation of solid waste as originally prescribed by the ODMP.</p> <p>Gumare landfill has been constructed, while increase of temporary storage facilities in all ODRS settlements has been seriously delayed by NWDC, due to shortage of funds.</p> <p>The main institutions responsible for solid and liquid waste in the ODRS are under-resourced in terms of waste management skills.</p> <p>There is a disproportionate distribution of staff between the two sub-districts of North West District Council (Okavango and Ngami), with the majority of staff stationed in Ngami Sub-District.</p> <p>There is no evidence that the ODMP's proposal to increase operational technical staff has been implemented.</p>
<p><b>Tourism products need to be diversified from being wildlife based to other areas, DOT to develop and implement strategies for tourism product diversification</b></p>	<p>DoT, NWDC in collaboration with DFRR, TLB, DEA, DWNP, private sector, CBOs, communities</p>	<p><b>(Implementation Ongoing)</b></p> <p>Diversification of tourism products by the different operators in the ODRS has been observed. Particular attention is paid to the San culture at Tsodilo Hills, Qwhohaba Caves, mekoro safaris, and basket production.</p> <p>The ongoing revision of the Tourism Policy of 1990 aiming to provide direction in product diversification not only in the ODRS but in Botswana as a whole has been seriously slowed down. The process of reviewing the Tourism Policy started almost 4 years ago, but it has not been completed. A Draft Revised Policy still has to go through parliament for adoption</p> <p>The enactments of the Tourism Act of 2009, the Botswana Tourism Organization Act of 2009, and the Botswana Tourism Organization Regulations of 2010 are signs of government commitment to improve the regulation and management of the tourism sector. The mandate to develop and market Botswana's tourism is now the responsibility of Botswana Tourism Organization (BTO).</p>

Action	Stakeholder(s) Responsible	Status/Impact
<p><b>The level of citizen participation in the tourism sector needs to be improved. (DOT to develop and implement strategies to enhance citizen participation in the tourism sector.)</b></p>	<p>DoT, NWDC in collaboration with DFRR, TLB, DEA, DWNP, private sector, CBOs, communities</p>	<p><b>(Limited Progress)</b></p> <p>Citizens are not participating in tourism development in the core zone of the ODRS. The concern was that the core zone remains as it was before the ODMP was adopted and it is likely to remain as it is for long time due to long-term concession leases.</p> <p>Citizen involvement in the tourism industry seems to be limited to peripheral and marginal parts of the ODRS.</p> <p>There was also concern that the statistics used by the Department of Tourism in categorizing ownership based on citizens, foreigners, or joint venture partnerships is misleading, as most of the citizen tourism companies are registered but not operational.</p> <p>A monopoly concern has also been noted, underlining the danger of having the ODRS tourism facilities in the hands of a few companies, hence further endangering citizens involvement.</p> <p>Community Based Natural Resource Management (CBNRM) Policy introduced to promote community participation in tourism is not yet fully implemented. CBOs are still largely disempowered to negotiate for an equitable stake with the private sector players in the tourism industry, as there is no protection through policy.</p>
<p><b>Develop and Implement Ngamiland District Tourism Plan</b></p>	<p>DoT, NWDC in collaboration with DFRR, TLB, DEA, DWNP, private sector, CBOs, communities</p>	<p><b>(Implementation Seriously Delayed with only Few Components Respected)</b></p> <p>The Ngamiland Tourism Development Plan is formatted as a Tourism Development Manual that includes more detailed development plans for a number of Tourism Development Areas (TDAs). Progress in the plan's implementation has been significantly delayed.</p> <p>There have been achievements in implementing some of the strategic goals and aims of the plan. This especially relates to adherence to the goal of not tempering or increasing any tourism development in the ODRS Core Tourism Development Zone, as well as adherence to the plan's prescriptions of implementing Mixed Tourism Development Zones in Maun and Gumare.</p> <p>Sentiments were echoed that the implementation of Ngamiland District Tourism Plan should be encouraged.</p>

Action	Stakeholder(s) Responsible	Status/Impact
<b>Socio-Economic Related Action Items</b>		
<p><b>NWDC to strengthen the capacity of the communities in the management and sustainable use of natural resources</b></p> <p>-To assess the capacity of communities to manage CBRNM programs</p> <p>-Develop and implement capacity building programs</p>	<p>NWDC in collaboration with NWDC DoT, DFRR, DWNP, DEA ,TLB, Tribal Administration</p>	<p><b>(Implementation Ongoing/Limited Progress)</b></p> <p>The capacity needs assessment was not carried out. The Department of Wildlife and National Parks through its CBNRM office has been conducting workshops on natural resource governance and training members of community trusts and their boards on management oriented monitoring system (MOMS).</p> <p>CBOs lack the appropriate skills and mechanisms to manage funds and undertake cost benefit analysis of proposed investments in enterprises or social services. Furthermore, they lack expertise in identifying investment opportunities, feasibility analysis, project implementation, and monitoring their business performance</p> <p>CBNRM's community enterprise investments have not generally been successful and the delivery of social service is often not sustained. However, this problem can also be attributed to conflicting government policies (for instance, the National Settlement Policy does not allow development and servicing projects to be undertaken in "ungazetted" settlements.)</p> <p>The income from the CBNRM initiatives has failed (and still is) to make an impact at the household level. The need for a new CBNRM mechanism that would improve management of CBOs and distribution of benefits to households was highly emphasized.</p> <p>Community members in the Delta (especially the poorest ones) remain concerned that their access to natural resources was reduced without giving them a suitable alternative means of making a living.</p>
<p><b>ORI to provide participatory services to the ODMP implementing institutions</b></p> <p>-(Engage stakeholders on a continuous basis through participatory methods)</p>	<p>HOORC in collaboration with all government ministries and departments, private sector, and communities</p>	<p><b>(Implementation Ongoing/Progress Slowdown)</b></p> <p>The DEA has been holding yearly participatory meetings of stakeholders on topical issues to ensure that there is continued meaningful participation in the implementation process of the ODMP.</p> <p>The Okavango Research Centre (ORI) is playing an important supportive role as defined in the action plan. The ORI, however, no longer has a budget, and therefore is not playing its role as it is supposed to be.</p> <p>From those participating in the implementation of the ODMP, the following problems were encountered: no handing over of activities from those who were retiring from the civil service and hence a loss of continuity in activities; in some cases those who started the activities were transferred, going away with relevant information for the project; directors who are instrumental in the implementation process were changed.</p> <p>There should have been regular reporting to the coordinating agency (DEA) by all departments on the activities undertaken and a record of these activities kept to be available for the incoming officers.</p>

Action	Stakeholder(s) Responsible	Status/Impact
<p><b>Carryout assessment of non-use values</b></p> <p><b>Carryout further assessment on direct and indirect values</b></p>	<p>DEA in collaboration with DoT, DWNP, DAHP, DWA, FRR, NWDC, DFCP, TLB</p>	<p><b>(Implementation Delayed)</b></p> <p>DEA has not yet commissioned a study on the assessment of non-use values due to lack of financial resources</p> <p>Study on economic value of the ODRS, and implications for management has been done as one of the component reports, further direct and indirect value assessment is not being carried out.</p>
<p><b>DEA to prepare and implement guidelines for sectors to streamline HIV/AIDS, gender, and poverty during ODMP implementation</b></p> <p>-Prepare mainstreaming tools</p> <p>-Hold stakeholder workshops for sectors on use of the tools</p> <p>-Monitor the implementation of the guidelines</p>	<p>DEA in collaboration with all government departments</p>	<p><b>(Limited Progress)</b></p> <p>The development of socio-economic opportunities to improve the livelihoods of the Okavango Delta stakeholders is a key to strategic objective of the ODMP, noted that this strategic objective has not been fully achieved to the set target levels.</p> <p>More needs to be done in terms of mainstreaming poverty into the implementation of the ODMP. The consensus is that poverty is a threat to conservation, in the sense that it drives residents of communities in the Okavango Delta to poaching and exploitation of natural resources in an unsustainable manner.</p> <p>Mainstreaming gender into the plan process was a one-off activity. The delivery date for the preparation of mainstreaming tools for HIV/AIDS and poverty was as per the plan date.</p> <p>Mainstreaming tools and guidelines for their implementation were supposed to have been prepared by DEA, as well as workshops for sectors for use of the tools. However, they seem to be delayed.</p>
<p><b>Institutional Related Action Items</b></p>		
<p><b>DEA to strengthen the capacity of the ODRS DEA office to coordinate and monitor implementation of the ODMP</b></p> <p><b>DEA to ensure that the common and shared vision of the ODRS guides the planning and programs in the ODRS during the ODMP implementation</b></p>	<p>DEA</p>	<p><b>(Implementation Ongoing)</b></p> <p>DEA Regional Office has been established in Maun to lead to coordination and monitoring of implementation of the ODMP. It is, however noted that DEA Maun Regional Office is under-resourced. Accordingly, the objective of strengthening capacity within DEA Maun Office has not been fully realized.</p> <p>Institutional structures which are involved in the implementation of the ODMP are the Okavango Wetland Management Committee (OWMC), District Land Use Planning Unit (DLUPU), and ORI. In term of their status they are more of advisory and supporting bodies with no powers to enforce most of the provisions of the plan.</p> <p>It is noted that through OKACOM the opportunity exists to improve institutional arrangement that has the capacity to take responsibility for management of ODRS's resources.</p>

Action	Stakeholder(s) Responsible	Status/Impact
<b>DEA to facilitate the process of harmonizing legislation and policies applicable to ODRS</b>	DEA in collaboration with all government departments	<p><b>(Limited Progress)</b></p> <p>The present legislative and regulatory framework crosses many sectors and as such is fragmented and operational through a number of pieces of legislations, policies, and guidelines.</p> <p>There is no overarching (unifying) legislation (or regulatory framework) under which the various pieces of legislation can operate, so that all the sectors are well coordinated in addressing environmental, tourism management, biodiversity and conservation objectives in the ODRS.</p> <p>Inter-departmental collaboration and evolution of institutional arrangements at the local (ODRS) level is proving to be one of the most important areas where improving land use, land management, and development control would really yield dividends.</p> <p>More is yet to be done in developing institutional understanding of the ODMP management issues and needs, to such a level that influential partners in government are willing to play their roles in providing leadership and support in facilitating cooperation and agreement.</p>
<b>DEA to facilitate approval of the Draft National Wetlands Policy and Strategy</b>	DEA	<p><b>(Implementation Ongoing)</b></p> <p>DEA has facilitated preparation of a National Wetland Policy and Strategy. At present, the Policy in Final Draft form is awaiting ratification by the Cabinet.</p> <p>The policy provides the contextual and institutional framework for management of the country's key wetlands.</p>
<b>DEA to promote effective communication among stakeholders</b>	DEA in collaboration with all government departments, private sector, and communities	<p><b>(Implementation Ongoing)</b></p> <p>The DEA has awareness programs that cover aspects of ecosystem services/benefits provided by wetlands.</p> <p>The ODMP has a communication strategy that includes information on benefits accrued from wetlands. The strategy was prepared as a part of the ODMP.</p> <p>Though the existing communication practices have promoted pro-environmental behaviors and attitudes in the ODRS, more efficient inter-departmental coordination in communication and awareness programs promotion is needed. It is currently constrained by human resource shortages, as well as recent resource cuts.</p>

Action	Stakeholder(s) Responsible	Status/Impact
<p><b>DEA to facilitate engagement of Angola and Namibia through the OKACOM process</b></p>	<p>DEA in collaboration with DWA, International Water Right Unit, Namibia, and Angola</p>	<p><b>(Implementation Ongoing)</b></p> <p>ODMP products used in the development of the basin trans-boundary diagnostic analysis (TDA)</p> <p>Technical collaboration between OKACOM countries continues through specific programs/projects</p> <p>Full Cubango-Okavango River Basin TDA has recently been developed. Overall, the TDA presented a 'tool' intended to inform Botswana, Namibia, and Angola about the problems, priorities, and opportunities within the context of immediate and long-term sustainable management of the Okavango/Cubango River Basin.</p> <p>The Cubango-Okavango Strategic Action Program (SAP) is supported at national level by the respective National Action Plan (NAP) of each basin state. Botswana has in this regard, developed and approved a National Action Plan (2011). It is regarded as a critical tool for the implementation of SAP priority actions at national level and the integration of trans-boundary and basin concerns into national legislative, policy, and budget decision-making processes.</p>
<p><b>Monitoring &amp; Research Related Action Items</b></p>		
<p><b>HOORC (ORI) to implement the recommendations of the Research Strategy</b></p> <p><b>HOORC (ORI) to improve accessibility and updating of data and information for resource planning and management</b></p>	<p>ORI</p>	<p><b>(Progress Substantially Delayed)</b></p> <p>The ODMP development was supported by construction of a simple but integrated GIS-based information system (ODIS) that combines available data and allowed cross-disciplinary issues to be more readily examined by stakeholders. However, despite significant efforts in introducing ODIS, it has been observed that the use of enabling information system technologies has not yet reached the "ODMP's core business processes.</p> <p>None of monitoring efforts, including one being carried out within the ORI's Okavango Delta Information System (ODIS) sample intensively enough in ODRS to provide a comprehensive assessment and to draw accurate conclusions on the Delta's ecosystem and biodiversity status and trends.</p> <p>An overall data-gathering framework that coordinates and harmonizes the data gathering and formatting process (as envisaged in the ODMP) is still not available. Such framework has been establish and agreed in the Research and Monitoring Strategy report and related Action Plan. Both documents were parts of the ODMP's research and data management component.</p> <p>There is a widespread agreement that lack of strong baseline data on biodiversity, status of ecosystem and physical functions in the ODRS contributed to a deferral of the ODMP's Research and Monitoring Action Plan, which has been endorsed as a crucial element of the ODMP implementation process. Individual research agendas have thus far been pursued, rather than coordinated research programs that would be more focused and comprehensive.</p>

## BEST PRACTICES AND LESSONS LEARNED

During the process of the mid-term review of the ODMP the review team learned many best practices concerning the formulation and implementation of Protected Areas Management Plans with similar ecosystem environments with the Okavango Delta Ramsar site. Importantly also, crucial lessons were learned in project management and implementation and technical aspects as they relate to the ODMP. All these will be important in shaping the recommendations made in this mid-term review, which are geared toward improvements in the design, scope, implementation, and monitoring framework of the ODMP. The lessons learned from this mid-term review could serve as useful guides for application in the formulation of similar plans in the future.

### Best Practices

In terms of best practices, the following were noted:

- A sound understanding of the biodiversity and ecosystems of protected areas is the foundation that underpins effective protected area management.
- Recruitment of qualified staff in adequate numbers and with good knowledge of wetlands ecosystems and their management, improves implementation effectiveness and efficiency. In this regard, the disciplines of plant and animal ecology, hydrology, and aquatic biology become very relevant.
- Building stakeholder understanding of the ecosystem environment is critical for positive management outcomes. When stakeholders truly understand threats to protected area ecosystems, they undertake their own management interventions to mitigate threats.
- Success in management of protected areas depends, to a large extent, on key political stakeholders and public support. Mechanisms to secure these must be considered in the formulation of management plans for protected areas.
- Prioritization of project activities over the timeframe of a plan is important in terms of timely delivery of outputs and budgetary considerations.
- Apart from periodic reviews of such plans as the ODMP, regular progress reports - predicated on continuous, qualitative monitoring and evaluation of implementation - help identify weaknesses and gaps and support taking of remedial actions.

Best practices for plan implementation indicate that good plan implementation systems:

- Clarify plan details from the outset to facilitate comprehension
- Ensure that plans are formulated from a sound collaborative process
- Provide implementers with the authority and jurisdiction to make decisions necessary to achieve success
- Clearly define stakeholder roles and responsibilities
- Foster the support of all the stakeholders
- Ensure that implementation is led by individuals with strong collaborative and managerial skills
- Exist within a policy environment that is supportive of implementation and plan objectives
- Provide a regulatory framework that enhances the legitimacy and strength of implementation actions and mechanisms
- Provide implementers adequate financial and human resources
- Equip implementers with the flexibility to accommodate new or changing conditions
- Use a monitoring process that is effective, accountable, transparent, and facilitates timely information flow

- Involve stakeholders comprehensively throughout the implementation process
- Use effective mitigation measures

## Lessons Learned

*Reality check from plan to implementation.* An important lesson came through observation of disparities between plan description as contained in the ODMP document and the reality as implementation moved forward. In particular, it was noted that action items and projects were clearly defined and articulated, but were often allocated short, inadequate timeframes for deliverables that left little flexibility for realities on the ground. Most of the action items and projects of the ODMP needed more time to be delivered or fully implemented to get buy-in of all stakeholders involved. It was also learned that to coordinate and bring together the diverse interests of so many stakeholders in the implementation process of the ODMP was a bigger task than anticipated. For example, stakeholder consultation meetings were often rescheduled to ensure as much participation as possible. This kind of situation represents one of the contributing factors to delays in meeting delivery targets of ODMP action items.

*Organize research/information from local to regional level.* Understanding the complexities of the Delta system requires investment in focused research and monitoring. Where information exists, it is not well organized or accessible, making informed planning and decision-making difficult. Further, the mid-term review revealed that there is no adequate mechanism for data sharing among stakeholders. Technical information is often locked up in its own jargon and needs to be translated and communicated through appropriate tools to dispel misconceptions and improve understanding on the part of all stakeholders. At the local level, however, communities and other private sector stakeholders know and understand a lot about different aspects of the Delta system that directly impinge on their existence and operations. We can, and should learn from them.

*Put practicality first for planning and institutional capacity.* Finally, it was learned from this mid-term review that most of the ODMP's challenges are institutional in nature, and relate to awareness, legislative and policy inadequacies, and capacity limitations, as opposed to the more technical and science-oriented issues which can be addressed through research, models, and simulations. This means that ultimately, recommendations of the ODMP should be more practical and less of a wish list. Importantly also, the recommendations should be based on the availability of capacity to implement.

## RECOMMENDATIONS

### Introduction

The mid-term review and gap analysis of the ODMP that precede this chapter has shown that the performance of the ODMP and its implementation thus far has significantly not been efficient and effective. The need for wise and sustainable use of the Okavango Delta's resources, with the ODMP as a management and implementation tool, cannot be over emphasized. The Okavango Delta is one of the largest Ramsar Sites and of international importance. The area is endowed with a rich diversity of fauna and flora, diverse and dynamic ecosystems, and pristine wilderness. The ODRS is waiting to be formally listed as a World Heritage Site under the United Nations Educational Scientific and Cultural Organization (UNESCO). For these reasons, the requirement for an ODMP that will serve as a management and regulatory tool for activities in the ODRS - geared toward ensuring the sustainable use and management of resources - is compelling. In recognition of the fundamental ecological functions, in terms of ecosystem services and goods the ODRS provides, as well as its economic, scientific, cultural, and recreational values, the ODMP has as one of its key functions maintaining all these for future generations.

The mid-term review and gap analysis of the ODMP was meant to identify recommendations that will serve as inputs to enable DEA to produce a revised ODMP. Accordingly, a number of management strategies for the ODRS and recommendations for implementing the ODMP were developed in response to the outcomes of the review, as well as an assessment of risk to the values of the Okavango Delta Ramsar Site. In summary, the recommended management strategies and implementation/institutional frameworks have been designed to:

1. Address risks that are having or likely to have an adverse impact on the ecological character of the ODRS;
2. Highlight strategies and priority actions consistent with wise use principles;
3. Improve the performance and implementation of the ODMP through:
  - Improved management approaches and guidelines derived from the established thresholds, necessary for improved efficiency in the functioning of the ODRS in an environmentally sustainable manner;
  - Improved operational guidelines and standards. These relate to such aspects as waste management, management of fires, use and management of natural resources, and mining among others;
  - A more efficient and effective implementation strategy and monitoring mechanisms; and
  - Recommendations aimed at addressing issues and challenges identified in all the thematic areas.

These recommended management strategies and other recommendations are summarized in the sections that follow and are grouped under related Issues/Problems and/or Strategic Directions Statements.

## **PROVIDE A BROADER PERSPECTIVE**

### ***Strategy 1: Ensure coordinated and sustainable long-term development in the ODRS.***

Ngamiland District in general and the ODRS in particular, have a history of rapid population growth which has tripled in the past 30 years. Despite the substantial resource commitment over decades to growth management, the fragmentation of policy and implementation across many organizations have created the perception that growth in and around the ODRS continues largely unchecked and without any overall strategy. ***This MtR review has revealed that the persistence of the existing trend, of further excessive growth and piecemeal sector approaches in directing development actions across the District, work against the requirements of sustainable and wise use of the resources of the ODRS and could ultimately lead to serious resource depletion.***

The results arrived at through this MtR point to the need for establishing a long-term balance between the socio-economic development and best use of limited, valuable natural resources in the ODRS- ***a problem that must be accorded high priority by planners and decision makers in Ngamiland District.***

The experience from work done in other similar regions worldwide suggests that to achieve a sustainable pattern of development, ***a largely improved (ODRS-specific) Long-term Eco-Regional Economic Development Strategy is needed.*** The strategy should aim at improving coherence and synergy between the district's programs and projects while also guaranteeing the sustainable supply of

the ODRS’s ecosystem services. It is also noted that such a strategy is required to avoid ODRS residents from falling into poverty as a result of resource degradation. The key challenge is to combine the protection of important and vulnerable biodiversity with sustainable economic development in the District.

***The added value of a Long-term Eco-Regional Economic Development Strategy lies in its ability to address priority policy themes in an integrated, regionally holistic manner. The long-term approach is also vital as it implies the strengthening of the quality and resilience of the ODRS.*** Though the ODMP was expected to fulfill this role, it has not, because of piecemeal sector development, rapid population growth, extensive use of land, poverty, climate change, and the loss of biodiversity, all of which are intricately related. In this regard, the formulation of the aforementioned Long-Term Development Strategy is considered crucial not only for improving coherence and synergy between the district’s economic development programs and reduction of poverty, but also for ensuring conservation of biodiversity and continued provision of ecosystem services on which livelihoods in the ODRS are based.

Action/Recommendation		Priority	Lead Agency
A.1	Prepare Ngamiland District Long-Term Eco-regional Development Strategy	High	NWDC, DDC
<ul style="list-style-type: none"> <li>– Formulate strategy for a long-term economic development harmonized with the capacities, values, and comparative advantages of Ngalmiland district and the ODRS</li> <li>– Formulate and improve coherence and synergy between regional development programs together with targeted institutional and human capital reinforcement intervention in critical areas of Ngamiland district’s economy</li> <li>– Articulate long-term spatial development framework, including population dynamics and distribution</li> <li>– Formulate a long-term natural resource use strategy, including measures to mitigate or eliminate negative consequences of current practices</li> <li>– Define the key challenges and long-term strategy with respect to sustainable water resource abstraction and management</li> <li>– Articulate long-term strategy for energy supply and construction of infrastructure systems</li> <li>– Formulate strategy for poverty reduction, capacity building, reduction in inequalities, and promotion of productive and gender-sensitive employment strategies</li> </ul>			

## PREVENT THE ISOLATION AND FRAGMENTATION OF THE ODRS ECOSYSTEM

### ***Strategy 1: Strengthen connectivity in maintaining or restoring the ODRS’s biodiversity***

This MtR review of the ODMP revealed that there is a danger that the ODRS’s area inside the “buffalo fence” (i.e area which constitutes the bulk of the wetland and is primarily WMA and PA and declared as a livestock-free zone) could become isolated ‘islands’ of rich biodiversity surrounded by areas of extended low-density development. Specifically, it was noted that extended low-density development and land clearance practices around the ODRS’s core area causes rapid transformation of its natural environment into a vast man-made environment. More important, this phenomenon sets into motion continuous demands for more resources for building, agriculture and livestock rearing, triggering the isolation of ODRS’s core area. In addition, an increase in Botswana’s veterinary fences has added extra barriers to some major wildlife movement and migration routes. There seems to be a widely held view that the inundation of floodplains and the lack of mobility to alternate wet season sand veld

grazing areas, due to veterinary fences, has resulted in the declines of many key ungulate wildlife populations.

The process of increased habitat isolation of the core Delta and fragmentation of the wider area are bound to threaten biodiversity, increase human-wildlife conflicts, and ultimately diminish the ODRS’s capacity to sustain a healthy native wildlife population.

It is also noted that connectivity is one of the key elements needed for the ODRS’s biodiversity conservation framework. Therefore, removal of barriers to wildlife movements, i.e. identification, protection, and maintenance of the important wildlife movement corridors around the ODRS, can help reduce many of the ecological and other impacts of habitat isolation and fragmentation, including human-wildlife conflict mitigation. It is recommended that a more pro-active preservation of the landscape’s permeability should become an integral part of the overall land use management strategy in the ODRS. For this purpose, planning measures should be reinforced to prevent further unnecessary habitat fragmentation (and/or loss), and include modification of biodiversity disturbance regimes. The core of the ODRS should be viewed as the bridgehead for recovery in the wider countryside. There are a number of ways to maintain and strengthen the “connectivities” (ecological networks, corridors, and buffer zones that link biodiversity rich sites). Community development plans should zone such areas to protect them from inappropriate development.

It was also noted that a bottom-up approach, taking into account the interests of and involving directly involved communities in the conservation of wildlife corridors and maintenance, can create an effective mechanism to optimize agreed policies. Successful experiences of wise-use and sustainable management of Ramsar Sites are based on the realization by communities that conserving wildlife habitats and corridors results in benefits for the entire community. Collective commitment can be sustained in the long term if everybody is certain of such benefits.

It was observed during this MtR that communities in the ODRS understand fairly well that the array of benefits for the whole community and for individuals can bring protection and sustainable management of wildlife habitat and corridors. However, there are also many potential benefits that communities may not necessarily be familiar with. Supporting active community involvement in the conservation and sustainable use of the ODRS’s resources (including the protection of wildlife corridors) implies helping them identify and obtain a wide array of benefits. This is an urgent need, which involves both resource requirements for effective management and tangible collective and individual benefits to the communities.

Action/Recommendation		Priority	Lead Agency
A.1	<b><i>Carry out a Regional (Trans-boundary) Wildlife Connectivity/Corridors Study (as a part of the revised ODMP)</i></b>	High	OKACOM, KASA, DWNP, DEA

The Study is expected to:

- Prepare (through spatially explicit, species-specific analyses) and agree upon a map depicting core habitats and wildlife corridors to be preserved and maintained within the ODRS.
- Address and resolve issues of commercial ranching, disease-control, and other fencing policies in the ODRS, including removal and/or realignment of existing fences where applicable (realignment of the northern buffalo fence that runs along the southern boundary of NG/13, removal of the western section of the Setata fence, which would improve wildlife mobility between the Kalahari sand veld system and the ODRS, realignment of the southern buffalo fence to include area north of Maun into wildlife zone – i.e. Maun Ecotourism Park)
- Address and resolve issues of international border cordon fencing which currently disrupts the spatial linkage of the Delta wildlife, especially elephant population to Namibia and Angola, limiting their dispersal out of the ODRS
- Address and resolve the issue of ecosystem fragmentation and habitat isolation resulting from pressures inherent

from the increase in settlements, agriculture, and livestock rearing in the area along the northwestern end of the Southern buffalo fence and west of the Delta Panhandle. This implies mapping and protection of the remaining movement pathways and corridors along that area.

- Ensure that existing wildlife connectivity between the ODRS core and the surrounding Kalahari sand veldt and/or Zambezi woodland habitat and the neighboring wetlands i.e. Savuti-Mababe, Selinda-Kwando-Linyanti, and the Chobe systems are maintained and uninterrupted.
- Ensure proper maintenance of the re-established migratory route between the ODRS and the eastern Boteti area of the Makgadikgadi National Park, as a result of the removal of the decommissioned Nxai Pan buffalo fence
- Safeguard connectivity and wildlife habitat by re-examining the viability of rezoning Controlled Hunting Areas (notably NG/11 and NG/13) into WMA due to high wildlife densities.
- Reappraise the road link proposals as originally envisaged in the Ngamiland District Tourism Plan (Maun – Kasane and Sherobe to Pandamatenga via Sankuyu along the south of the Chobe National Park links) from the point of view of landscape permeability and barriers to wildlife movement.
- Formulate and agree upon a toolkit of approaches (regulatory and/or non-regulatory) needed to successfully implement a wildlife movement strategy and carry out broad outreach initiatives to government stakeholder organizations and communities who can use the tools

A.2	<b><i>Ensure that all local (community) land use plans respect the identified core habitats and agreed wildlife corridors to protect them from inappropriate development</i></b>	High	TLB, NWDC, DWNP, SAREP
A.3	<p><b><i>Identify/secure collective and individual benefits for communities directly involved in conservation/ maintenance of the agreed wildlife corridors by means of restricting inappropriate land uses, and providing for meaningful wildlife-based CBNRM activities.</i></b></p> <p><b><i>Communities should be given wildlife user rights to help instill a sense of ownership and improve the economic benefits and conservation management in their respective areas.</i></b></p> <p><b><i>Uphold and implement all recommendations made within the CBNRM component of the Ngamiland District Tourism Plan report to help ensure that communities receive greater benefits from the use of wildlife resources.</i></b></p>	High	NWDC, CBNRM
A.4	<b><i>Ensure that no new fenced commercial ranches or disease-control fences are erected – unless the aforementioned Wildlife Corridors Study and/or EIAs that would be required show that they will not impact biodiversity significantly.</i></b>	High	DAHP, DWNP, TLB
A.5	<p><b><i>Ensure that effective monitoring of wildlife corridors is in place to determine on-the-ground barriers and other issues that cannot be assessed using GIS and remote sensing technologies.</i></b></p> <p>It would be necessary to find out which species do and do not use the area and why, to inform corridor planning and implementation. More information about likely impacts of climate change on wildlife and habitat, and some of this could be acquired through literature searches and knowledge of experts. How could habitats change, and how will those changes affect wildlife? How quickly will these changes occur? Are we likely to lose or gain some species, no matter what we do? Which wildlife species are most at risk, and how can we improve their chances of survival? These are some of the crucial questions that should be answered by the revised ODMP.</p>	High	DAHP, DWNP

## MITIGATE ALARMING ELEPHANT POPULATION INCREASES AND RELATED CONFLICTS

### *Strategy 1: Reconsideration of the concept of sustainable wildlife management as opposed to wildlife conservation*

This MtR of the ODMP revealed that HWC levels in ODRS are serious, and that approaches to mitigate them require serious reconsideration. It was indicated that DWNP currently allocates around 35 million Botswana pula, or roughly 4 million USD, of its annual recurrent budget to HWC issues. The government's total commitment to HWC would also have to take into account other departments', such as MOA, commitment of time and resources dealing with HWC issues and contagious livestock diseases (Bowie, 2009).

It was noted that an increasing elephant population in northern Botswana in general and the ODRS in particular, presents one of the country's greatest wildlife management challenges. In this regard, there is a consensus that the elephant population (currently estimated at around 130,000) has reached alarming levels, exerting pressure, on some sensitive and important functional habitats. This especially relates to riparian woodlands, which have a critical hydrological role in maintaining a thin layer of fresh groundwater and island soils and preventing the ODRS from becoming a "salt pan". The high density of elephants and related over-harvesting and destruction of vegetation are seen as potentially major threats to the Delta's biodiversity and its wetland ecosystem resilience. Inactivity would, in this regard, result in an unacceptable loss of vegetation, as well as, significant habitat modifications and threat to other (vulnerable) wildlife species.

It was also noted that the increasing number of elephants is causing huge pressure on a growing population and their resources. Presently, farmers especially in the Okavango Panhandle, as well as other stakeholders (notably DWNP's PACs) are looking for a sustainable solution to human elephant conflict, as it has become one of the crucial constraints in enhancing the living conditions of the communities in the ODRS. It was observed that all the traditional methods used to mitigate crop and other damage caused by elephants have had a limited impact (use of chili bombs/hot fences, growing chili papers, use of scaring devices, lighting fires at the edge of the fields, guarding fields, digging trenches and filling them with water, shooting elephants). Communities affected by human/elephant conflict (HEC) indicated that fires and shooting elephants were the only mitigation methods that seem to have reportedly worked (GOB, 2009), though chili pepper trials have revealed varying results. While a number of farmers are positive that these measures have protected them from raiding by elephants, in other areas the trials were not implemented (and/or maintained) properly, preventing objective judgment of the method's success rate.

Given the present magnitude of the problem, there is an urgent need for the review of the umbrella strategies used so far in controlling elephant population and mitigating human/elephant conflicts in the ODRS. Several issues (suggestions) have surfaced during the mid-term review.

No single mitigation method works in isolation, but rather combinations provide the best chance of success. ***For this reason the prescriptions of the updated Draft Elephant Management Plan should be upheld and implemented, specifically those that address both human/elephant conflict and population pressure, as well as the habitat conversion issue.***

Perhaps the most important suggestion relates to the necessity to reconsider the current wildlife conservation policies in the country, by promoting a concept of "sustainable wildlife management by and for communities on the ground and not in spite of them". Central to this concept is the need to grant control and responsibility over wildlife resources to communities best placed to carry out management activities in the various ODRS's zones. This is best achieved by:

- Transferring implementation of the management strategies (where viable) to the local communities that are affected by human/elephant conflict. Communities will be tasked to

develop a community-based HWC mitigation plan, delineate wildlife movement corridors, and relocate livelihood activities to avoid conflicts. In addition, communities should be assisted to prepare participatory land use management plans.

- Allowing non-destructive (consumptive) ways to control elephant populations. It was suggested that, consumptive wildlife utilization, i.e. PAC combined with elephant trophy hunting quotas, to generate income from the shooting of targeted problem animals could be considered as a viable option in the control of elephant population in the ODRS. Local communities should be allowed to participate in these activities with the DWNP playing a supervisory role to ensure no quota manipulation. It was also strongly emphasized that revenue generated from safari hunts must be returned to the communities in the areas where they are shot.

It was also noted that human-wildlife (elephant) conflict is likely to be an eternal problem in the ODRS, but its very existence is cause for optimism. Specifically, as long as there is wildlife (elephants) to conserve, there are opportunities for income generation and local management of the costs and benefits, including conflict management. It is unlikely that there will ever be a widespread remedy, but rather each area and problem will need to be tackled independently, locally, and on an appropriate scale through adaptive management. (GOB, 2009)

Action/Recommendation		Priority	Lead Agency
A.1	Implement the Updated Elephant Management Plan	High	DWNP
A.2	Formulate the most appropriate strategy for reducing the huge elephant pressures and human/elephant conflict in the Okavango Panhandle area  Assess sustainability and affordability of electrifying buffalo fence in an effort to reduce HEC in the Panhandle area	High	DWNP
A.3	Formulate the most appropriate strategy for combining (and allowing) PAC with elephant hunting quotas to control elephant population, as well as generate income from the shooting of targeted problem individuals  Devise an effective monitoring system to ensure that there is no manipulation of community quotas and that revenue generated is returned to communities.	Medium	DWNP
A.4	Initiate pilot project(s) that will implement community-based elephant trophy hunting quotas combined with PAC to control elephant populations and generate income from the shooting of problem animals  Pilot projects to be initiated in 1 or preferably 2 to 3 sites in the Okavango Panhandle area under close supervision by DWNP	Medium	DWNP
A.5	Consider diversifying the range of legally permissible wildlife-based land use options and/or activities, which would provide direct benefits to local communities  Communities and/or individuals should be allowed to carry out game ranching, game cropping, and similar activities, especially within the 5 km buffer zones surrounding “buffalo fences”  Develop the ODRS-specific game ranching/cropping land use guidelines as an amendment to the exiting ODRS’s Land Use and Land Management Plan	High	DWNP

A.6	Analyze possibility of rezoning NG/13 as a forest reserve  (NG 13 has the potential to act as an important wildlife corridor, facilitating the natural dispersal of elephants out of the Okavango Panhandle into Namibia and Angola, but currently this management option for reducing elephant numbers naturally is compromised by expanding agricultural activities and fences. If the region continues to be settled by people, the opportunity to realign the Caprivi Border Fence along the southern boundary of NG 13 will be lost, and pose serious problems.(Chase 2010))	High	TLB, DFRR
A.7	Prepare/update HWC mitigation techniques "handbook" that captures information across the African region so that communities in the ODRS spend significant time learning from failures at their project site, rather than learning from the failures elsewhere	High	DWNP

## CREATE A STATUTORILY BACKED PROTECTED AREA STATUS

### *Strategy 1: Ensure protected area status for the whole of the ODRS*

The ODRS (with the exception of its core area) lacks any statutory PA status. Specifically, while the Ramsar Convention creates no automatic expectation that the ODRS be legally protected, there is an expectation that the central government should put in place a mechanism capable of detecting and responding to actual or potential change in the ecological character of designated sites.

The non-declaration of the ODRS as a PA (as originally envisaged by the ODMMP) has made it very difficult for land use allocation and control processes to operate effectively and fairly. Specifically, the Town and Country Planning Act is not yet formally applicable to the ODRS, which means that any spatial development plan is not legally binding, and therefore the communities and implementing authorities are not necessarily obliged to adhere to and implement the plan's guidelines and recommendations. There is much evidence on the ground that the absence of statutory PA status of the ODRS, has resulted in settlement sprawl and unwise use of land. Given the sensitive nature of the ODRS, this issue cannot be over-emphasized. Consequently, there is a widespread agreement that statutory PA status of ODRS should be given serious consideration. Three recommendations and/or initiatives are worth-mentioning;

- ***Ministry of Land and Housing should ultimately consider the option of declaring the whole of the ODRS as a Planning Area in terms of the provisions of the Town and Country Planning Act of 1977.*** Such a move will strengthen development controls and land management in the ODRS. Furthermore, it will give statutory backing to the Okavango Delta Management Plan, meaning that all the plan's proposals, guidelines and regulations will be legally binding and enforceable. (The only alternative would be the enactment of a new regulatory instrument that will equally provide regulations and guidelines for land development and land use control in the ODRS, without necessarily declaring the area a PA as per the Town and Country Planning Act. However, given the current situation this regulatory framework would not be legally binding and enforceable.)
- ***Plans to get the Okavango Delta listed as a UNESCO World Heritage Site are well under way.*** A committee comprising Bird Life Botswana, government departments, the Okavango Research Institute, and the Botswana Tourism Organization is producing an extensive dossier that outlines why this unique region qualifies as being of "outstanding universal value". In the course of this preparation, members of the committee have been consulting with communities in the Delta and in neighboring Angola and Namibia. It is hoped that enough support will be

garnered to achieve a serial listing of the entire Okavango Basin, as is happening with the inscription of the Great Rift Valley in East Africa. ***Inclusion and listing of parts of the ODRS as a World Heritage Site are likely to help give the ODRS appropriate statutory PA status.***

- ***There is also a need to speed up ratification of the National Wetland Policy and Strategy by the Cabinet.*** The policy provides the contextual and institutional framework for management of the country’s key wetlands including the ODRS.

Action/Recommendation		Priority	Lead Agency
A.1	Consider declaring the ODRS as a Planning Area in terms of TCPA of 1997	High	MLH, DTRP, NWDC
A.2	Ratification of the Draft National Wetland Policy by Cabinet	High	DEA
A.3	Continue with the plan to get the ODRS listed as a UNESCO World Heritage Site	High	National Museum and Monuments

## DEVELOP AN APPROPRIATE LAND USE REGULATORY FRAMEWORK

### ***Strategy 1: Promote smart settlement growth policies and regulatory framework appropriate to the peculiarities of the ODRS***

Low-density developments that characterize the ODRS have been increasingly depleting the space within the ODRS, regardless of the value and fragility of its biodiversity and resource base. From a spatial planning perspective, the key problems revolve around:

- Failure to effectively control (limit and rationalize) expansion of “gazetted” and “un-gazetted” villages in the Core Delta; enhancement of their cleanliness and visual appreciation; and provision of basic services that would be appropriate for communities in a Ramsar Site environment
- Haphazard residential and other land use allocations, which are in many cases not predicated on any detailed layout plan and/or referenced to any larger (rational) spatial organizational system. The ultimate results are “mushrooming” of settlements along the edges of the ODRS and along the main arterial roads that service the eastern and western parts of the Delta. The forms of these settlements are in many cases highly inefficient, wasteful in terms of land, and almost impossible to service effectively.

It was also noted that the Development Control Code and Urban Development Standards in their current forms are not responsive to the complexities and peculiarities of the ODRS. Generally, they do not include details and land use regulations that address the ODRS zones’ specific peculiarities, and are not capable of assisting or guiding the relevant authorities in determining whether a development will be consistent with zone sensitivity. Land use planning in the ODRS is yet to incorporate environmental sustainability (or smart growth policies) into its regulatory framework, to deal with environmental/biodiversity problems and the Ramsar site’s sensitivity directly.

Action/Recommendation		Priority	Lead Agency
A.1	Develop an ODRS-specific Land Use Regulatory Framework (Local Development Control Code) to implement the current land use plan and related plans of lower order in the ODRS, through addressing and regulating its specific wetland site peculiarities	High	MLH, DTRP, NWDC
<p>The Land Use Guideline (or regulatory framework) should:</p> <ul style="list-style-type: none"> <li>Formulate standard templates for different ODRS's land use zone provisions. (Each template would include zone-specific land use standards (zone intent/objectives, permitted/prohibited land use activities etc.), with the opportunity for the implementing authorities to add a range of additional objectives/standards that relate to unique characteristics of a particular zone.</li> <li>Adopt structural wetland setbacks and required wetland buffers for different ODRS's zones to maintain the important natural functions of wetlands including fluctuating hydrologic regimes, water quality, erosion control, preventing invasive plant species, providing food, shelter and breeding areas for wildlife species, and more.</li> <li>Define buildable area (settlement) standards to provide implementing authorities (NWDC, TLB, and subordinate land boards) with the discretion to deny planning applications (development proposals) that do not meet ODRS's wetland-dependent criteria and/or are inconsistent with the biodiversity conservation needs and ODRS's ecosystem services provision.</li> <li>Formulate and adopt ODRS-specific subdivision and other use standards for agricultural, game ranching/cropping, and other non-urban land use activities.</li> <li>Address the linkage between land use and transportation facilities in a more comprehensive way and in line with ODRS's peculiarities in general and ODRS's different zones in particular.</li> <li>Introduce alternative subdivision designs, such as conservation subdivisions – i.e. residential and other developments in rural settings characterized by compact plots and common open space, where the natural features of land are maintained to the greatest extent possible. This would particularly be relevant for the ODRS's areas where preservation of wildlife corridors would be required.</li> <li>Adopt provisions that encourage the Delta wetland ecosystem restoration and expedite restoration permit approvals.</li> <li>Endorse a set of design principles which would serve as a regulatory basis (framework) to be followed by and incorporated into local development plans and other detailed layout plans and site plans prepared for different areas/zones/settlements in the ODRS.</li> <li>Assess viability of deploying (and regulating) techniques for managing development and rehabilitation of existing (disordered) settlements in the ODRS. One of these is "Land Readjustment" which is a technique implemented worldwide by many communities facing similar problems. The process primarily takes the ill-defined built up areas, whereby a group of separate plots are assembled and reorganized in a more effective way with respect to urban development standards requirements and public and private needs.</li> </ul>			
A.2	All "gazetted" settlements in the ODRS should have spatial plans for their areas of jurisdiction.	High	NWDC, TLB, sub land boards, VDC
<p>Given the vastness of the Ramsar Site, and present funding and planning staff constraints, attempts should be made to prioritize settlements, commencing with larger ones.</p> <p>For small rural communities, spatial plans should not attempt to be comprehensive. They could take the form of a "sketch plan" which identifies the minimum public actions necessary to achieve the objective of the plan. The spatial dimension must, however, have sufficient clarity of logic to guide decision-makers on development applications. These plans should be initiated by the VDCs and assisted (financially and technically) by Council and Land Board officials for their preparations.</p>			

<p>It is suggested that Participatory Integrated Land Use Plans (PILUPs), and community mapping and community-based zonation for all settlements across the ODRS be widely promoted as an effective approach to the required spatial planning of the ODRS's villages.</p>			
A.3	<p>For villages outside of the ODRS's core area awaiting PILUP preparation, Village Growth Boundaries (VGBs) should be delineated before any future allocations to safeguard against village sprawl and encroachment on valuable land resources.</p>	High	TLB and subordinate land boards, NWDC, VDC
<p>Settlement development opportunities (residential and other village developments) outside of the VGB will not be supported unless compelling reasons are presented to the relevant land authority. TLB and subordinate land boards are seen as the key players in preventing further piecemeal development, spatial fragmentation, and unnecessary loss of valuable land resources in the ODRS.</p> <p>VGBs should be delineated to avoid detrimental impacts on the Delta water bodies (floodplains, permanent swamps, and river channels). Where there are manageable impacts, erosion and sediment control measures and means to mitigate nutrient and other pollutants should be provided within the development site and be excluded from areas set aside for protection of natural attributes (riparian zones, habitat corridors, etc.)</p> <p>The design and location of VGBs should protect riparian zones and their ecological and hydrological functions. They should also recognize the value of lands such as wildlife corridors and seek to maintain the structure and composition of native vegetation within these areas.</p> <p>VGBs and new developments in ODRS villages should be located and designated to avoid detrimental impacts on the Delta Ramsar Site biodiversity. Accordingly, decisions regarding the location and design of VGBs should recognize that conservation of biodiversity in the ODRS is dependent on maintaining landscape permeability and connectivity.</p> <p>VGBs and new developments should also be planned to include veldt fire management measures relative to the associated fire risk in the locality.</p> <p>Growth boundaries of settlements should be identified early in the development process so that they may be given priority treatment by the relevant local and central government authorities with respect to the provision of infrastructure, social services, and amenities, thereby satisfying the needs of the future population.</p>			
A.4	<p>All new TLB and sub land boards' allocations within VGBs should be (as much as possible) in conformance with the detailed layout plans to avoid any further haphazard and uncoordinated development patterns.</p>	High	TLB and subordinate land boards, NWDC, VDC
A.5	<p>The relevant authorities should seek to reduce the incidence of squatting by eviction, relocation, and by regularization and upgrading where necessary.</p>	High	TLB and subordinate land boards
A.6	<p>Land in each settlement in the ODRS has to be inventoried, and vacant or underused plots (properties) that can potentially be intensified must be identified. (The underlying premise of this recommendation is to combat further sprawling by studying every vacant and underused plot within settlements in the ODRS.)</p>	Medium	TLB and subordinate land boards
A.7	<p>All ("gazetted and "non-gazetted") settlement within the Core Delta (i.e. the area inside the "buffalo fence") will require an urgent spatial planning intervention which will entail:</p> <p>Delineation of the extent of area currently settled by the community (VGB);</p> <p>Rationalization (limitation of) any further spatial expansion of these settlements;</p> <p>Enhancement of settlements' cleanliness and visual appreciation and;</p>	High	NWDC, TLB, subordinate land boards

	Provision of infrastructure that would be appropriate for a Ramsar Site environment.		
A.8	<p>Immigration to the Core Delta settlements should be strongly discouraged. This particularly relates to discouraging non-community members (i.e. persons who were hired from outside the area to settle in villages after their contracts with tour operators end).</p> <p>It is important to reiterate that many (if not all) of the Core Delta settlements are at present made up of people from different areas with different norms, values, and practices. This directly affects viability of these settlements to function as communities.</p>	High	TLB, NWDC, TA, VDC
A.9	<p>TLB and other relevant central and local government authorities involved in ODRS planning and land use management should seriously consider getting statutory authorization for gaining control over land allocation and developments in the “non-gazetted” villages in the Core Delta (which is presently a serious problem).</p> <p>This may even require actualization of the declaration of the whole ODRS as a Planning Area in terms of the Town and Country Planning Act (1977).</p> <p>Alternatively, authorities should consider strengthening and providing more active support to the traditional (tribal) authorities which are now in control of land allocation and development.</p>	High	TLB, NWDC, TA, VDC
A.10	<p>Relevant central and local government authorities need to make an effort and assess possibilities of integrating communities and their habitats and livelihoods into management of the Core Delta.</p> <p>Where such cohabitation is not viable, the authorities need to negotiate with the communities to establish “free, prior, and informed consultations resettlement (FPIC) action plan” in line with best practices and international standards (such as the World Bank policy of involuntary resettlement) and implemented in a timely and comprehensive manner.</p> <p>FPIC negotiations are presently envisaged for two communities in the Core Delta, namely, Xaxaba and Khawi.</p> <p>FPIC is enjoying widespread acceptance in many processes as an effort to provide an opportunity for people to participate in decisions which affect them and enabling rights bearers to assert their rights. It is included in the ILO 169, the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), the UN Convention on Biological Diversity (CBD), the guideline on mining and biodiversity of the International Council on Mining and Metals (ICMM) and has been recognized by many other organizations.</p>	Medium	TLB, MLH, NWDC, TA
a.11	For all settlements in the ODRS, authorities must plan and set minimum standards, and priorities for provision of infrastructure services appropriate for a Ramsar Site environment. This should, as much as possible, occur prior to development rather than as a reaction to development.	Medium	NWDC
a.12	To manage waste safely and within the acceptable standards, it is recommended that procedures, systems, and guidelines developed by the ODMP, Biokavango Project, and North West District Council, including the recently approved Guidelines for Liquid Waste Management in Ngamiland District, shall apply in all settlements across the ODRS.	High	NWDC, DWMPC

	It is also strongly recommended to consider (as much as practicable) appropriate drainage (storm water) infrastructure within settlements' VGBs and exclude them from zones set aside for the protection of natural attributes (i.e. riparian areas, wildlife corridors, etc.)		
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**STRENGTHEN AND EXPAND SPATIAL PLANNING AND LAND MANAGEMENT CAPACITIES**

*Strategy 1: Strengthen and expand spatial planning and land management authority*

The issue of land use planning and land management has in this MtR of the ODMF been labeled as one of the major stumbling blocks in achieving wise use and sustainable development in the ODRS. While efforts and investments have recently been made to improve the functioning of Tawana Land Board (TLB) and subordinate land boards, sufficient measures have not been taken to address staffing requirements for administration of planning and development control activities in the ODRS. This also relates to introduction and use of modern geo-information technologies and creates a large field of opportunities for development of new approaches for more effective planning, land management, and development control.

This MtR also revealed that planning, land management, and development control processes in the ODRS are still plagued by problems typical of traditional management and manual record keeping systems (haphazard and unregulated land allocation and development, self-allocations of land and squatting, double allocation, and disputes over land rights). These and many other problems have been identified as a serious 'dysfunction' in land use/land management decision-making across ODRS.

Issues that seriously impede chances of relevant authorities to “tighten up” control over sustainable use of land across the ODRS rest very much on the problem of managing changes. Specifically, there is a widespread concern that local authorities (notably TLB and subordinate land boards) are failing to communicate plans and a clear vision of “where they want to go in future”. Evidence on the ground shows that persistence of “business as usual” land allocations, coupled with the absence of settlement development and/or detailed land use plans have resulted in settlement sprawl and unwise use of land. A trend has also been spotted regarding the “mushrooming” of un-gazetted settlements along the edges of the ODRS Core and along the main arterial roads that service both the eastern and western parts of the Delta. There are now incessant calls for “gazettement” and provision of services to such “settlements”, which is neither cost efficient nor rational land use/management.

With regard to the above, one can say that TLB (including subordinate land boards) is under pressure to shift its current direction and business focus or risk losing much of its relevance in spite of sound regulatory backing. Perhaps the most significant change of direction relates to the following:

- Strengthening the currently very weak land use planning function,
- Accelerating the use of modern geo-information technologies in improving operations and business processes,
- Strengthening horizontal (inter-agency) coordination between key stakeholders involved in land use planning, land management, and development control at the district/ODRS level,
- Strengthening monitoring and development tracking capabilities, and
- Transforming itself into a “development” organization, as opposed to the hitherto one-dimensional, reactive "**deliverer of services**".

Action/Recommendation		Priority	Lead Agency
A.1	Expand TLB and Subordinate Land Boards' Spatial Planning Capability	High	TLB and sub land boards, NWDC
<p>It is the considered view of the ODMP MtR team that the spatial planning capability within TLB and subordinate land boards should be expanded to address settlements' (and detailed layout) planning requirements across ODRS, as well as to assist communities in physical plan preparation and enforcement.</p> <p>The current TLB and subordinate land boards' situation, in terms of spatial planning (technical) capability merits immediate consideration, as it may negatively impact effective implementation of recommended actions envisaged to "tighten" development control and prevent further piecemeal development, spatial fragmentation, and unnecessary loss of valuable land. There is a consensus that it may be considerably less expensive to build capability at TLB rather than engage consultants. It may also be rational to look into the possibility of transferring/merging NWDC's spatial planning units and capabilities with TLB or vice versa.</p> <p>With regard to funding, there needs to be an explicit commitment by TLB and NWDC to provide the necessary funding for all local physical planning activities across the ODRS as stipulated above. The physical planning activity framework needs to be integrally linked to budgetary and financial planning cycles in the country.</p> <p>Given the number of settlements in the ODRS for which local spatial plans have to be prepared, donor-funded assistance similar to that provided by SAREP, should also be considered as a viable way forward in regulating and managing the ODRS.</p>			
A.2	Improve inter-sector integration and cooperation among key stakeholders involved in land use planning, land management, and development control in the ODRS	High	NWDC, TLB
<p>There is a sense of urgency to further strengthen inter-agency (inter-sector) integration and the organizational and infrastructure framework to allow effective communication, data/information dissemination, and sharing among all organizations/agencies responsible for land use planning and land management in the ODRS. It was noted that while sector divisions in all government spheres is more or less inevitable to deal with ongoing operational issues, the danger, particularly in relation to settlement planning, is that different sector divisions pursue their own agenda and are not always fully aware (or concerned) about others' programs. One of the consequences of this has been a history of uncoordinated development across the ODRS, with investments in infrastructure or facilities running sometimes out of sync with spatial development requirements. Achieving intra-agency integration (and synchronization) is therefore essential. To improve it, the following should occur at different stages:</p> <p>Setting of procedures to facilitate information sharing between line-function structures to improve synchronization and sector decision-making. This also includes looking into the potential of the existing government-wide internet infrastructure in streamlining the process and improving the flow of information from the line organizations. Accommodation (exchange and dissemination) of geospatial data is no exception, even though constraints persist on bandwidth and transmission speed;</p> <p>Streamlining and coordinating planning time frames among sectors;</p> <p>Developing a more efficient inter-sector planning process and linking integrated development plans to budgets across all spheres of government;</p> <p>Building institutional understanding of ODRS planning and land management issues and needs, so that influential partners in government are willing to play their roles in providing leadership and support in facilitating cooperation and agreements.</p>			
A.3	TLB, subordinate land boards, and NWDC Physical Planning unit should accelerate and expand the use of geo-information technology across all their program areas	Medium	TLB and subordinate land boards, NWDC

The emerging GEO-ICT business climate requires that all relevant authorities proactively respond to the trends and opportunities for improving their operations and business processes, leveraging existing resources, and ultimately increasing their ability to operate efficiently in a “digital” environment. To adapt to these changing conditions they are expected to:

Accelerate and expand the use of geo-information technologies across all TLB and subordinate boards' program areas and align them with TLB's business objectives;

Streamline (re-engineer) core business processes while maintaining realistic and actionable plans and programs;

Recognize the potential of the Internet and available government-wide network infrastructure to underpin major improvement in data/information management and dissemination with a view to improving the cross-functional capabilities of the department and extend those capabilities outside the organization to effectively and efficiently reach other stakeholders and the general public.

Respond to the need for comprehensive in-house capacity building to raise its staff's ability to support and operate efficiently within the emerging “digital” landscape in the country.

Embark on gradual organizational adjustments (if required) and ability to adapt to and manage changes in the business process.

A.4	TLB should develop monitoring and development tracking capabilities	High	TLB
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There is also a sense of urgency for TLB to strengthen its development tracking capabilities, which is (at its most basic) the measurement of change in land use brought about by human development. Quantifying this change is essential to determine potential impacts, and to inform policy that will help optimize future decisions to encourage the wise use of land in ODRS. TLB as the key stakeholder currently has no uniform and consistent method of capturing this change across its jurisdictional areas, including the ODRS. Development tracking is expected to deal with two issues:

*Land Allocations Tracking* - This includes the tools to update a database for all land allocations, inclusive of approved subdivisions, changes of land use, and details of conditional / temporary use permits,

*Imagery-Derived Tracking of Land Use/Land Cover Change at the ODRS Level* – This will contain tools for using a wide array of imagery sources for development tracking. The sources include conventional aerial photography, ortho-photography, and a growing array of satellite-acquired imagery with improved resolutions that make them useful for development tracking at the ODRS level.

In discussing challenges and opportunities for developing effective development tracking capabilities the following are concluded and/or recommended:

TLB should strengthen its statutory role in monitoring land use changes in the ODRS by centralizing most of the data required for appraisal of situations, and decision support at all levels.

At present, availability and flow of information within TLB and subordinate land boards, as well as between local/central government authorities responsible for plan/policy implementation, are the weakest points requiring considerable attention in the foreseeable future. (There is widespread agreement that uniformity and regularity in the flow of development tracking information among all stakeholders involved at all stages be established.)

The focus on monitoring and provision of related information requires careful strategies and appropriate technologies. Because monitoring and development tracking is inherently a location problem (i.e. gathering data on a geographic basis), the deployment of GIS and related technologies is seen as an evolving relevant approach.

There is also a common opinion that the deployment of geo-information technologies in building an appropriate system for monitoring and development tracking would be a challenging task, as it is not only a technology issue but must take into consideration the present organizational and administrative realities. Internally, it will involve the complex process of managing changes, including capacity building. Externally, it requires establishment of institutional understanding between TLB and all other stakeholders involved in planning, land management, and development control. They are likely to be encouraged to formalize the relationships and provide a workable framework for data capturing and exchange. This also

includes the issue of inter-operability (the necessity to bring all stakeholders to the level of automation that would be required).

Before any development tracking system can be developed, TLB needs a study which would prioritize a data gathering framework and determine the most useful and cost-effective approach to development tracking in the short term.

A pilot project should test the feasibility and efficiency of the selected development tracking solution. This project would include a small number of villages and test the approach (solution) selected, data management techniques, and mobilization of human resources necessary to collaboratively capture and maintain this planning resource

A.5

TLB should eventually transform itself into “development” organizations, as opposed to a one-dimensional “deliverer of services”.

High

TLB

It was noted during this MiR that the strengthening of TLB and subordinate land board capacities must inevitably be accompanied by a thoughtful restructuring of TLB and the boards. Many of the stakeholders consulted said that TLB needed to qualitatively broaden its function through introduction of mechanisms to encourage “the desired type of land development” as opposed to merely controlling (regulating) the use of land and providing services. Based on best practices in neighboring countries and elsewhere, the term “desired type of land development” as advocated above includes the following activities:

- The regulation of land use changes;
- The regulation of "green fields" land development (development of previously undeveloped land);
- The regulation of subdivision and consolidation of plots;
- Leasing control and compliance monitoring;
- Repossession of undeveloped but allocated land;
- The regulation of upgrading processes in the existing built-up areas;
- Protecting and restricting development in areas designated for biodiversity conservation; and
- The facilitation of land development through more active community participation in the land development process.

While the first six of the above activities correspond with the existing land development regulations and practices, the last one is different in that it requires from TLB a more proactive approach in land development, one that moves well beyond control of development and service provision toward the following:

- Investment promotion by introducing (to the largest possible extent) different land use management instruments to either protect biodiversity or attract certain types of investment to certain areas,
- Provision of incentives to promote a specific type of land development at selected (strategic) locations.

TLB is likely to have difficulty formulating well-coordinated (i.e. a single "wall-to-wall") land use planning and management processes across its jurisdictional areas given the present organizational and administrative realities. Internally, it will involve the complex process of managing changes, including in IT and land management capacity building. Externally, it requires establishment of institutional understanding to formalize the new relationships and provide a workable framework for statutory authorization of the changes.

## GRADUAL DIVESTMENT FROM CENTRALIZED CONTROL AND MANAGEMENT IN THE ODRS

### *Strategy 1: Reinforce the concept of co-management*

Relying on the initiatives that have proved successful elsewhere in Africa, it is suggested that the central government authorities embark on a process of its gradual divestment from the present centralized control and management of the ODRS. It is important to emphasize that the Botswana

government presently appropriates a sum of approximately US \$15 million annually to cover the recurrent costs of the DWNP, of which a significant portion is specifically for PA management, including the ODRS. While this amount is significant, the investment is proving to be inadequate in terms of assuring the management effectiveness of the PA system in the country needed to abate threats. Additionally, opportunities for cultivating broader stakeholder support (e.g. private sector, communities) for management of the ODRS have not been adequately tapped. It is only now that the government is acknowledging that the predominantly centralized management is not yielding satisfactory results. The system is proving to be costly to administer for government and of limited effectiveness in mitigating threats (biodiversity loss seems to have continued to rise). Moreover, it is noted that DWNP still lacks capacities/expertise that were considered key constraints to be addressed by the ODMP. There are constraints in capacities related to wildlife counts, quota setting, endangered species monitoring, the provision of guidance and advice to CBOs, undertaking of research projects, biodiversity inventories and conservation, and tourism management.

There is a consensus that central government should more seriously embark on the process of devolving control and management of the resources of the ODRS to communities (CBOs), concessionaires, and other stakeholders best placed to carry out management activities. This is expected to increase the self-interest of stakeholders in managing resources and in the case of communities, raise the current low tolerance of wildlife in village surroundings. The role of the central government (MEWT/DWNP) as a custodian of public (government) interests would still subordinate the roles of communities/stakeholders to the public (country) interests in managing ODRS resources sustainably, and entitle the central government authorities to intervene in situations where the communities’/ stakeholders’ activities threaten biodiversity.

Given the present situation, it is clear that devolvement of control and management of ODRS resources would be a long-term process requiring substantial efforts and investments in:

- Recognizing local community rights and responsibilities to manage ODRS resources through community-based management and co-management arrangements;
- Identifying and securing collective and individual community benefits from conservation and sustainable use of resources;
- Identifying a range of biodiversity uses in community areas across the ODRS, as well as alternative (conservation-based) CBO income earning options;
- Devising/implementing community-based ecotourism development strategies;
- Capacity building, strengthening, and ensuring the integrity of local community institutions;
- Clarifying local institutions’ mandates and improving multi-sector collaboration in planning and implementation of the management needs of the ODRS;
- Implementing institutional innovations at the local level, which have proven elsewhere to be an important area in improving the Ramsar Site’s governance and sustainability; and
- Identifying concessionaires’ responsibilities in the management of the ODRS.

Action/Recommendation		Priority	Lead Agency
A.1	Continue strengthening communities, community institutions, and their involvement in the management of the ODRS	High	Central government, local government

It was observed during this MtR that the aforementioned divestment from the present centralized control over natural resources in the ODRS requires integrity of the local culture so that local communities and community institutions can perform their management duties based on the credibility, confidence, and support from the population. This is particularly important when it comes to formulating and enforcing resource use regulations.

Myriad organizations and structures have roles in land and other natural resources management, land development

initiatives, and community mobilization and empowerment. These include the VDCs, community trusts, NGOs, and CBOs. Though these bodies have different interests, there is need to coordinate their activities to avoid duplication of efforts. The challenge is clear: These organizations must be strong and dynamic enough to fulfill their tasks, including their internal obligations to communities and natural resource management, and also externally to serve as able interlocutors of the government and other stakeholders.

This MtR review revealed that the ODRS's communities and their institutions require political support and an improved CBNRM regulatory framework and guidelines to gain credibility among central government stakeholders and community members about their ability to take charge of resource management activities. This also includes issues such as gaining necessary skills in identifying investment opportunities, and obtaining and monitoring financial resources for management of their respective areas.

VDCs and community trusts in particular lack the necessary skills and basic knowledge to support plan initiation, implementation, monitoring, community mobilization, and financial management. Capacity building needs include training, support for the development of action plans, provision of equipment, and aid to improve communication between community authorities and the people, facilitation of contacts, and exchange with more experienced community organizations. This should be a continuing exercise, apart from what is being done in that direction under SAREP. While the creation of new structures at the community level for involvement in land management is not advocated, the recommended strategy is that of strengthening and empowering existing structures.

A.2	Strengthen community leadership and control over natural resource use	High	Local government, tribal administration
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Management and control over natural resources in the ODRS at the community level has become difficult given the fact that many communities currently comprise people from different areas with different norms, values, and practices. This cripples the resilience of traditional community institutions, as people who do not share common norms and values and kinship ties are grouped in one village and expected to function as a community. Consequently, there is a need to strengthen the community leadership. Two sets of actions have surfaced during this MtR in this regard; one directed at supporting traditional authorities and community structures, and one handling the needs of young leaders trained in dealing with external institutions and the broader society.

The first action offers the opportunity to widely use elders' knowledge and expertise to strengthen their authority. Externally, strengthening community leadership and traditional structures will provide effective control of community and/or non-community members accessing the area for the purpose of natural resource consumption. It was noted during this MtR that natural resources in the vicinity of villages and settlements could be harvested by anybody from anywhere in the country, without the express permission of the concerned communities, which results in unsustainable harvesting. Accordingly, in as much as the natural resources in the ODRS are an endowment for the whole country, the communities who depend directly on them for their livelihoods should be given some measure of control over who comes from where to harvest these resources. This will mean development of a permit and quota system for those who come from outside the communities, with the village structures playing the necessary supervisory roles.

The issue of uncontrolled land/woodland clearing and premature and/or over-harvesting of vegetation and other resources in the Delta was raised by stakeholders as paramount to the future sustainability of the ODRS. A key issue identified was the immediate need to continue strengthening enforcement of natural resources use regulations and to stop illegal activities. In summary, there will be the need for a clearer understanding of the legal framework, stakeholder responsibilities and empowerment of local communities to ensure that resources and livelihoods are protected. It will also be important to have community-developed rules endorsed by local government, to provide communities with a (regulatory and/or legal basis) to enforce them against outsiders and within their own community.

With regard to the training and preparation of young community members, the most important issue is formal education. It has, however been indicated that formal education could sometimes have adverse results for indigenous and traditional communities, in that it has undermined traditional institutions, has led to loss of traditional knowledge, or has introduced sets

of values different from those of the communities. However, best practices shown to be successful elsewhere indicate that sensitive, inter-cultural formal education is an asset for communities and young leaders. Working on this front is then a critical step in strengthening community leadership in the long-term.

A.3	Identify/secure collective and individual benefits from conservation and sustainable use of ODRS resources.	High	DWNP, DFRR, DEA, MOA
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It is a high priority to continue with the community awareness campaigns and CBNRM policy improvements to identify and secure collective (and individual) benefits from conservation and sustainable use of the ODRS's resources. It is urgently important to speed up implementation of all ODMP's actions items concerned with identification of all potential collective and individual benefits for communities from biodiversity conservation and wise-use of natural resources across the ODRS.

Communities in the ODRS understand fairly well that the array of benefits for the whole community and for individuals can bring protection and sustainable management of their lands and resources. However, there are also many potential benefits/situations with which communities may not be familiar. In this sense, supporting active community involvement in the conservation and sustainable use of the ODRS's resources implies helping them identify and obtain a wide array of benefits. This is an urgent need, which involves both resource requirements for effective management and tangible collective and individual benefits to the communities.

CBNRM programs must support diversification rather than usurping other livelihood strategies. CBNRM needs to be combined with other empowerment and development strategies, or be broadened to incorporate other resources communities use. In the ODRS, CBNRM programs are expected to work hand in hand with development initiatives that tackle the issues of low literacy and poverty levels

A.4	Encourage shifts in current livelihoods strategies of the communities in ODRS from "unsustainable practices" to livelihoods that value biodiversity and could create more sustainable forms of employment	High	DWNP, DOT, NGOs
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It was noted during this MtR that the sustainability of communities (or rather CBOs) in the ODRS is dependent on their success in generating sustainable livelihoods through activities that value biodiversity. This implies inclusive biodiversity management that relies on both traditional (local) knowledge and techniques from formalized science. Both elements should therefore be used in identifying the range of possible uses of lands and resources within the community areas to meet economic, social, and cultural needs of the communities while at the same time ensuring sustainability and maintenance of the protection standards.

Wise use of the ODRS's resources and successful biodiversity conservation in the ODRS entails use of various planning instruments at the community level. The most important of these are summarized as follows:

- Detailed resource assessments and integrated biodiversity management planning
- Development of a community-based HWC mitigation plan
- Creation of wildlife movement corridors and/or relocating livelihood activities to avoid conflicts
- Development of benefit sharing strategies
- Reinvestment of benefits to assist groups who bear the costs of wildlife
- Biodiversity performance monitoring to measure conservation results

A.5	Devise and implement community-based ecotourism development strategies	High	DOT, BTO, NGOs, CBOs
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It is safe to predict that communities in the ODRS will increasingly tend to integrate ecotourism activities, as it appears to be a convenient and tangible avenue for sources of income. Specifically, ecotourism is seen as an effective conservation and livelihood strategy through a strong economic incentive to protect the ODRS's biodiversity. Application of best practices in community-based ecotourism in the country and elsewhere would increase understanding of how benefits of this kind can be promoted and supported within communities.

There is a sense of urgency to review (and start implementing) the community-based ecotourism development strategies

and action items stipulated in the Ngamiland District Tourism Plan. The key objective of the review would be to re-examine whether the strategies and assessment model for community-based ecotourism development, as originally stipulated in the plan, could be considered best practice, realistic, and easy to understand and apply. In addition to this, community-based ecotourism development strategies and action items stipulated in the plan should be amended by means of:

- Considering whether community-based ecotourism would be an appropriate option within various ODRS areas/zones;
- Assessment of realistic potential linkages in each community, with particular reference to existing human resources, the potential for capacity building entrepreneurship for business development, physical resources for craft and food production, as well as demand;
- Assessing a number of possible livelihood activities resulting from ecotourism such as handicraft, agricultural production, and general job opportunities;
- Proposing viable community-based ecotourism projects;
- Developing marketing capability of a community-based tourism enterprise and linking it to the existing marketing system that reaches the local and foreign-based tourist markets. (The marketing system must be able to link tourism enterprises, at comparable quality levels, in multiple destinations to develop an itinerary for their tour. Without such a marketing arrangement in place it is questionable whether any community-based tourism enterprise will be commercially viable.)
- Identifying/strengthening collective and individual benefits to the communities and ensuring (as much as possible) the equal distribution of all benefits through clear benefits/income distribution guidelines.

A.6	Continue strengthening local culture, cultural identity, and values of communities in the ODRS	High	BTO, DOT, NGOs
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This MtR revealed that very many (if not all) communities across the ODRS are undergoing rapid cultural change, and younger generations in particular seem unlikely to take on their ancestors' attachment to cultural practices and links to the land and natural resources. There is much evidence of a breakdown in the inter-generational transfer of local knowledge and skills (mekoro, game tracking, craft making) as most young children spend time away from home in boarding schools. They do not partake in the daily chores and cannot learn the skills appropriate for local livelihood strategies

Communities in the ODRS need support in terms of strengthening the local culture so that their own values for protecting the land and natural resources are not lost in the process of on-going modernization and cultural change. Revitalization and strengthening of traditional knowledge is the key strategy to strengthen the links between people and the territory. Traditional knowledge and skills should be mobilized in diversifying tourism products in the ODRS by organizing cultural activities (festivals or other cultural events) where the people celebrate their cultures and show their pride in the land and beauty of their territories. These activities have strong impact internally, but also contribute to positioning the culture as a vital part of the national heritage. This will help in strengthening the role of the communities in managing their areas across the ODRS.

It was noted that technical and other assistance would be required to design a cultural product that reflects aspects of local traditions and can be packaged into an appealing product for the tourism market in the ODRS.

A.7	Identify/ensure alternative (conservation-based) community income earning options	High	NGOs, CBOs, central government
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There seems to be a widely held view that the best prospect pertaining to alternative, conservation-based livelihoods include non-timber forest products (honey, xeminia, mogongo nuts), wild-harvested natural products (reeds, thatching grass), crafts, and fisheries. While the proposed natural resource uses cannot generate incomes on the scale of the tourism sector, they serve to have the potential to contribute to the livelihood security of a much larger number of resource users (GOB, 2009).

The main barriers to livelihoods enhancement are market development and distribution. At present, production is generally tailored to meet local demand, which may include seasonal buyers coming from outside areas (reeds, thatching grass), or

irregular selling excursions to outside markets (fresh fish). A strategy is required for linking the ODRS's communities (CBOs) with more distant and consistent regional markets to expand demand. There is also a requirement for proper participatory planning exercises with various community resource user groups in ODRS (fishers, basket weavers, livestock owners, grass harvesters, firewood cutters etc.), to assess the resource situation in each area, and needs for their conservation and sustainable use. A pilot project (initiated in 2 to 3 ODRS sites), to test effectiveness of various conservation-based income earning options, is highly recommended

A.8	Identify/ensure active involvement of concessionaires in monitoring and controlling ODRS resource use	High	DWNP, DFRR, DWA
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It is recommended that all ODRS concession areas be divided into “Administrative” or “Concession” Zones within which concessionaires shall (through open tenders) be granted rights to:

- Conduct commercial activities as agreed in the concession (lease) agreements;
- Carry out all required biodiversity, ecosystem, and natural resource management activities outlined in management plans and/or as indicated and agreed to in the lease agreements;
- Carry out reasonable in situ monitoring of wildlife and biodiversity according to approved guidelines provided by the DWNP, DWA, DFRR and other relevant government authorities;
- Control/monitor access to their respective zones for the purpose of natural resource consumption or any other commercial purpose.

## REVISIT THE CBNRM SYSTEM AND ITS BENEFIT-SHARING STATUS

### *Strategy 1: Improve support to CBNRM projects and enable communities to earn tangible benefits from sustainable resource use and biodiversity conservation*

Community-Based Natural Resources Management (CBNRM) is an appropriate development approach in efforts by communities in the ODRS, to shift focus to livelihoods that value biodiversity, promote a sustainable-use approach, and generate income and employment. This MtR has revealed that there is a huge discrepancy between CBNRM policy intent and its application.

Community involvement, support, and efforts to execute plans and programs are crucial to the success of CBNRM system. The support of the community stands the best chance of being realized when communities are convinced that regulations are working in their best (collective and individual) interests. The review highlighted that CBNRM is still a relatively poorly understood policy. More worrying is the impression among some stakeholders that the GOB is not committed enough to CBNRM. This especially relates to the current CBNRM benefit sharing system that, according to many stakeholders, needs to be revisited across all ODRS's CBNRM-related community institutions (formal and informal). The aim is to improve CBNRM and ensure that every community member receives a just and equitable portion of the overall benefit. It was also pointed out that such mechanisms exist – it is just the political will to sanction their adoption and use that is needed. (S. Johnson, 2008)

Action/Recommendation	Priority	Lead Agency
A.1	Promote existing (and/or prepare new) practical guidelines for facilitating CBNRM programs in the ODRS	High DWNP, NGOs

As stated in the Ecological Thresholds Report (2012), a number of good practical guide manuals have been developed to help facilitate the CBNRM process. Specifically, USAID-funded Natural Resources Management Program (NRMP), together with DWNP produced the “Practitioners Guide” in 1999 and the NGO Pact/IRCE published the “Animator’s

Guidebook for CBNRM” in 2000. The latter in particular, has not lost its relevance. The “Animator’s Guidebook” helps community facilitators prepare a community for CBNRM; it outlines a variety of participatory assessment and planning methods and leads the community through an enterprise development planning cycle. The “Animators Guidebook” is currently used by BOCOBONET to train community facilitators (community members) in assisting their respective communities give shape to CBNRM. The “Practical Guide to Facilitating CBNRM in Botswana” by van der Jagt and Rozemeijer (2002) is intended to contribute to making CBNRM work in Botswana. It outlines a process, injects ideas and warnings, provides examples, and will hopefully encourage the reader to be creative - but cautious - and committed to the theory, but see things in perspective at the same time.

A.2	Continue promoting and improving CBNRM governance	High	DWNP, DFRR, NGOs
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Given the critical importance of having communities drive and manage the CBOs and CBNRM processes under their jurisdiction, it is essential that communities clearly understand the need for good governance. Merely improving the organizational management expertise of boards of trustees might still leave them open to abuse and corruption. The need for accountability is paramount.

The government has indicated its concern about the level of maladministration and abuse of community assets and funds by some CBOs. In an effort to develop a better CBO governance process, an ‘incremental devolution’ approach is proposed as most appropriate. It assumes that communities will be supported and encouraged to incrementally gain the capacity and autonomy to manage their CBO activities, based on performance. Communities with high levels of nontransparent or questionable practices are identified through financial audits. These CBOs are placed under some form of assisted management structure, supervised by an authority such as the District Commissioner. Other communities who are found to have generally fewer problems with management and use of community funds and assets are supported by having lesser forms of control placed upon them. (S. Johnson, 2008)

A.3	Realign conflicting government policies	High	GOB
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There is a need for realignment of government policies, notably NSP and CBNRM, to sustain delivery of social services in the respective community areas.

A.4	Ensure/strengthen proper capacity building to sustain CBNRM initiatives	High	DWNP, DFRR, NGOs
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Capacity building is a widely recognized need for effective, long-term management of the ODRS. On several occasions, communities themselves have repeatedly voiced their need for support on this front. The following are suggested:

A thorough re-assessment of communities’ (CBOs) capacity building needs in the ODRS, together with development of a comprehensive training program that would address weaknesses. This capacity building program is envisaged to be broad and systematic, to encapsulate sustainable use of the ODRS’s resources, and to instill a sense of ownership of community investments that includes transparency, accountability, and know-how in channeling benefits to community members.

The capacity building program should incorporate indigenous/traditional systems of local knowledge, natural resource use, and locally supported community structures to secure understanding and confidence of the community. It should involve co-option of traditional institutions to police resource use, with limited government intervention. It was noted that the failure to recognize and incorporate indigenous/traditional knowledge will result in the position of communities as partners in enterprises remaining weak and therefore CBNRM may fail to achieve its goals. As summarized in the Wildlife Conflict Management and Biodiversity Conservation for Improved Rural Livelihoods in Botswana Project (Bowie, 2009), the following training interventions would be required to build communities’ capacity to sustain CBNRM programs.

<b>Governance and Board Leadership Training</b>	Experience has shown that if community members do not have a basic grasp of the role and function of a board of trustees, then they will not necessarily support the organization’s activities. On the flip side, people who serve on boards and have exclusive knowledge about board functions and roles tend to use this to perpetuate
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		their positions. To address this problem, it is proposed that board leadership and governance awareness training should be extended to all members of communities. This approach will ensure that community trusts in the project areas adopt democratic governance practices and transparent reporting by their leadership.
<b>Community Economic Analysis</b>		This training course will impart knowledge about basic economic principles and local economic realities for each of the communities in the project areas. They will be introduced to a tool that they can use to identify additional economic opportunities that can be exploited in their localities to increase opportunities for more people.
<b>Financial Analysis and Budgeting</b>		To engender financial literacy, this training course introduces participants to financial analysis, management and budgeting. It trains participants on how to develop financial report unique to an organization's needs. It imparts learning in key areas of financial statements and audited financial statements, tools to analyze institutional finances, operational budgeting, and financial control. Given the lack of proper financial management and reporting procedures in the project areas, this training will be appropriate and will complement the governance and board leadership training by imparting skills and tools necessary for critical analysis of financial performance of community investments.
<b>Capacity Building for Community-driven Planning</b>		This training course can be used to introduce communities to concepts such as community organizing, mobilization, action and evaluation planning, and skill development to enhance community capacity for planning, self-management, sustainability, outreach, and development impact. The training would gradually reduce dependence on outsiders to plan and drive local development.
<b>Fundraising and Project Development Training</b>		To impart skills to key players in fundraising techniques and development of fundable project proposals to reduce dependency on intermediary organizations for project development support. The communities will be empowered to deal directly with potential sponsors of projects among donors and government departments.
<b>Enterprise Development Workshops</b>		Enterprise workshops are designed to develop capacity for participatory monitoring of performance of economic activities. Participants learn to measure business performance against set targets and analyze reasons for failure and success. This analysis helps inform remedial actions necessary to put the enterprises on course to meet set targets.

A.5	Ensure/strengthen technical assistance in sustaining CBNRM initiatives	High	DWNP, DFRR, DAHP, BTO, TLB
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Besides capacity building, it was also noted that there will be a need for resource allocations for technical assistance to communities and resource user groups in ODRS in their efforts to sustain CBNRM initiatives. As summarized in the aforementioned study (Bowie, 2009), communities will generally require technical assistance in the following areas:

- Land use planning
- Mapping wildlife corridors and conflict zones
- Development of community wildlife conflict management plans
- Development of and training in conflict mitigation and prevention measures
- Management of animal control buffer zones when they are set up as proposed by communities
- Feasibility and market assessments of alternative livelihoods proposals
- Development of management plans for proposed community investments
- Training in improved and alternative production systems
- Development of benefit sharing plans for CBNRM resources

- Development of community investment proposals for CBNRM resources
- Development of tourism activities like wilderness camps, cultural villages
- Negotiation of joint venture partnerships with tourism operators and safari companies

It is recommended that all of the above technical assistance will be required for skills transfer and in building the capacity of communities for the problem at hand. Technical assistance providers would be encouraged to work directly with community resource user groups, who would be responsible for implementing and monitoring the impacts of the developments, to the maximum extent possible (Bowie, 2009).

A.6

Ensure proper monitoring of CBNRM outcomes and benefit sharing

High

DWNP, CBOs

An essential ingredient for the success of any CBNRM program in the ODRS is ongoing monitoring of outcomes, including efficiency and transparency in channeling of benefits to communities and their members. There is a consensus that monitoring provides clear justification for the control of CBOs' assets and funds. Management and data collection helps determine whether targets and program objectives are being met. Ongoing monitoring of property (assets)-level processes and management practices across all ODRS's CBNRM related community institutions is still inefficient or nonexistent. A participatory monitoring and evaluation approach is recommended as a way forward to ensure that the affected CBOs and project stakeholders are kept abreast of progress toward achievement of targeted investment outputs and impacts. It is furthermore recommended that a monitoring framework be established for each investment. The framework would include periodic surveys of land use and wildlife conflict management plans and their impacts by a monitoring and evaluation (M&E) committee, using participatory techniques and qualitative indicators.

M&E committees would be independent and comprise CBO boards and VDCs and include stakeholders and investment beneficiaries. Remedial measures are expected to be proactively taken in activities of CBOs and VDCs. This arrangement will assist in providing regular feedback to community members who have complained about being excluded from decision making in the CBOs. External technical assistance evaluations should be commissioned to help add objectivity and to verify the work done locally by the community M&E committees.

A.7

Set up pilot sites that will be the basis of an expansion of government and/or donor-funded successful, innovative CBNRM programs

High

DWNP, CBOs

It was noted that national level policy review is necessary and necessarily a long-term process. Significant gains for biodiversity conservation and local livelihoods in the ODRS are possible in a shorter timeframe by focusing on the local level government or donor-funded CBNRM projects which, if compelling enough, can contribute to a community's shift from current livelihood "unsustainable practices" to livelihood strategies that value biodiversity and could create more sustainable forms of employment.

## MAINTAIN APPROPRIATE HYDROLOGICAL REGIMES IN THE ODRS

### *Strategy 1: Maintain ecological and hydrological conditions of ODRS catchments and address adverse processes and activities at all levels*

It was underlined in the OKACOM TDA (2011), and during this MtR that the ODRS's catchment area (i.e. the Cubango/Okavango River Basin) is a "losing system", in the sense that nearly all the water in the basin is generated upstream of the basin (the headwaters of the Cubango and Cuito in Angola), and water is then lost through evapo-transpiration and groundwater recharge, particularly in the upper catchment. This, as strongly emphasized in the TDA, leaves very little flow to the lower part of the system, making the Okavango Delta Ramsar Site extremely vulnerable and sensitive to hydrological changes and reduced flow.

According to the Integrated Flow Assessment of the Okavango/Cubango River Basin the higher water abstraction scenario is likely to cause reduced downstream inundation and an absence of flood flows,

thus triggering significant drying of the Okavango Delta (TDA, 2011). For myriad flora and fauna, this would lead to a lack of environmental cues that are vital to ecological processes within the Delta (e.g. bird breeding, fish spawning, and plant germination). These changes in flow regime are also likely to alter faunal habitat, leading to lower recruitment rates. Coupled with the impacts of vegetation clearing, these changes might also affect groundwater level rises, which in turn would have serious impacts on the water quality in wetlands (salinization). It was also noted that the impacts of change in flow regimes (and in that sense reduced flows and desiccation of floodplains and channels) are likely to result in myriad socio-ecological impacts, such as lack of water for domestic and agricultural use, reduced area for floodplain agriculture, and reduced fishing efforts, among others. (NAP, 2011).

The Okavango Delta is a flood-pulsed system, characterized by large natural variability at the multi-decadal time scale. With regard to this, it was suggested that shifts in inundation distribution (decadal wet and dry phases) contribute to the long-term maintenance of the ODRS ecosystem by preventing development of (less-productive) climax vegetation communities, facilitating release and recycling of nutrients, which would otherwise be stored (non-productively) in peat layers, and possibly maintaining the long-term capacity to de-salinate the system. (SAIEA, 2012).

With regard to the above, it was accentuated during this MtR that the issues of possible water abstraction, as well as human induced changes in hydrological flow regimes of the Okavango/Cubango River Basin, are priority concerns in the effort to preserve the ODRS's extremely sensitive wetland ecosystem.

It was also noted that the Okavango/Cubango River Basin and the Delta as whole, is still undisturbed in terms of water pollution, except potentially at local scale, close to major urban centers (ODMP 2008, TDA 2011). It was also observed that human activities in terms of human settlement sprawl, intensification of tourism, and agricultural and mining activities, are likely to introduce waste and other chemicals into the water that could render it unsafe. Lack of effective, transboundary collaborative management could have serious impacts on the ODRS ecosystem's resilience. The Strategic Action Program (SAP, OKACOM 2011) highlighted this as one of the most critical gaps.

Action/Recommendation		Priority	Lead Agency
A.1	Continue (through OKACOM), with proactive participation in catchment management, determine the appropriate ecological and hydrological condition and natural flow regimes of the Delta catchments and negotiate for its maintenance	High	DWA, ORI
<p>It has already been emphasized that the ODRS is the lower part of the Okavango/Cubango River Basin and as such it is extremely vulnerable and sensitive to hydrological changes and reduced flow. It has, in this regard become apparent that continuation of proactive participation by Botswana in the management of the Basin through OKACOM is critical. This is especially required for the process of negotiation of hydrological targets and thresholds considered most critical from the point of view of overall Okavango Delta ecosystem health. These targets are determined as follows: (SAIEA, 2012)</p> <ul style="list-style-type: none"> <li>• No significant human-induced change in the natural flood pulse peak (the extent of peak flooding that provides the maximum area of seasonal and occasional floodplain) or loss of permanent swamp beyond the lowest dry period flood level, recorded in 1995;</li> <li>• The acceptable level of water abstraction throughout the whole basin is presently estimated at a rather conservative level of 10% of flow recorded during the driest year (1996), which translates to 600 Mm<sup>3</sup>/year;</li> <li>• No upriver dams or other impoundments other than 'in-flow' hydro-electrical weirs that are designed to allow the flow of river with its sediment load and that pumps any excess sediment build-up down stream;</li> <li>• Sediment loads to be consistent with current levels to maintain habitat diversity.</li> </ul>			
A.2	Ensure that there are no changes to the operation of the distribution system, until	Medium	DEA

	proposed changes that have the potential to affect the ODRS are assessed for their environmental impact and a strategy is in place to ameliorate any impacts to protect environmental values.		
A.3	For a continued flow of water that drives economically important activities in Botswana, there is therefore the need for the government of Botswana to consider instituting Payment of Ecosystem Service (PES) for the supply of water.	Low	DEA
A.4	Undertake a strategic review of existing or potential future abstractions by various users at the ODRS level to provide a fuller context for the recommendations on water management in the Delta Ramsar Site (especially from the point of view of maintaining appropriate ecological and hydrological conditions)	High	DWA, ORI

Issues about potential impacts on the Delta from the water abstraction by different activities and proposals (mining, irrigated agricultural projects) have been seriously echoed during this MtR. However, these issues have been expressed more as a concern rather than a real threat given uncertainty about what may or may not happen. This point has emphasized the importance of taking a strategic view in temporal and spatial terms.

A.5	<p>Undertake and support setting of a coordinated long-term monitoring program (at a regional (trans-boundary) and ODRS levels) which would provide tools and baseline information required for:</p> <ul style="list-style-type: none"> <li>• Improved understanding of key factors that affect the flood distribution and frequency in the ODRS;</li> <li>• Establishing the validity of the existing hydrological models of the Delta;</li> <li>• Establishing flooding patterns and flooding trends to help in the development of specific response action plans and/or early warning systems in case of extreme events;</li> <li>• Determining and monitoring “the ODRS environmental water flow” (water regime) required to maintain the Delta’s ecosystems and its benefits where there are potentially competing water uses;</li> <li>• Monitoring the effects of climate changes on the flow regimes in the Delta and establishing adaptive management mechanisms for responding to changes;</li> <li>• Improved understanding of the inter-connectivity of the groundwater and surface water systems and quantifying usable groundwater potential;</li> <li>• Investigating the problem of saline aquifers and their interfaces with non-saline groundwater including recharge mechanisms in the basin;</li> <li>• Identifying the areas susceptible to flooding and develop strategies to mitigate potential damage.</li> </ul>	High	DWA, OKACOM
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Management responses to change in flow regimes need to be informed by comprehensive and up-to-date understanding of the causes of the changes (exogenic or edogenic) in the flow regimes. This requires an understanding of the system as a whole, and being aware of what changes have occurred upstream (within and outside the Delta) and their causes (OKACOM, 2011).”

A.6	<p>Ensure that the Okavango/Cubango River Basin in general and the ODRS in particular are managed with the aim of maintaining levels of water quality that conform to the relevant water quality standards.</p> <p>Particular considerations include minimizing catchment disturbance in terms of water regulation, deforestation, and land clearance to limit contamination of runoff, and minimizing damage to hydrologically sensitive landscape elements such as swamps</p>	High	DWA, DEA, basin countries
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	and stream bank environs		
A.7	<p>Undertake and support setting of a coordinated long-term monitoring program (at a regional (trans-boundary) and ODRS levels) which would provide tools, as well as baseline information required for:</p> <ul style="list-style-type: none"> <li>• Up-to-date understanding of the water quality situation in the Delta;</li> <li>• Identifying threats to catchment hydrology and develop strategies to minimize risks to ODRS ecosystems;</li> <li>• Monitoring and detecting changes in nutrient levels that may affect the overall productivity of the system , with the consequent risks of eutrophication;</li> <li>• Identifying pollutant sources and preparing feedback mechanism and pollution control strategies within the catchments.</li> </ul>	High	DWA, OKACOM
<p>It was noted in the NAP (OKACOM, 2011) that it would be necessary to formulate long-term and cost effective water quality monitoring programs that can be integrated into community programs and undertaken by semi-skilled personnel who can contribute toward a comprehensive understanding of water quality.</p>			
A.8	<p>Ensure that fire management policies take into account, the importance of catchment stability and implications for water yield and water quality. It is important to minimize risks of riparian (or wetland) fringe fires across the Delta bearing in mind the hydrological role of riparian vegetation in maintaining a thin layer of fresh groundwater and island soils, and preventing the ODRS becoming a “salt pan.”</p>	High	DWNP
A.9	<p>Prevent channel clearing to maintain navigable passages, as it is an activity that interferes with ecological processes, including the channel aggradation and avulsion processes which drive ecosystem renewal.</p> <p>Channel clearing affects flood distribution within the Delta and may result in localized species extirpations. It also has unquantified effects on the distribution of sediment and floodwater through the distributary system.</p>	High	DWA

## **ADEQUATELY MANAGE ECOSYSTEM SERVICES, NATURAL RESOURCES, AND WILDERNESS EXPERIENCES WITHIN THE CORE ODRS**

### ***Strategy 1: Maintain balance between tourism, wetland conservation, and pollution risk in the Core ODRS***

Managing and preserving the pristine, remote, and natural character of the ODRS Core Zone, so that it retains its “wetland wildness”, is a key management challenge. The primary objectives of this zone are:

- To allow natural processes to operate with minimal or no human interference;
- To use wilderness as a primary means of managing, protecting, and conserving the area’s natural values;
- To retain a largely intact natural setting as much as possible, for the support of high quality ‘wetland wilderness’ tourism experiences;
- To provide effective management inputs in the area of environmental protection, monitoring, and high quality tourism activities;
- To provide and maintain appropriate access that minimizes damage to the natural environment;

- To provide opportunities for solitude, through the exclusion of mechanical access, and to avoid where possible installation of intrusive infrastructure;
- To encourage motor boat users and aircraft operators to adopt the zone’s accessibility guidelines and a code of conduct, including appropriate routes and minimum flight heights.

During this MtR it was however observed that liquid waste management in the ODRS Core is becoming a potential concern (threat). Specifically, the majority of the camps/lodges in the Delta Core use soak away septic tanks for sewerage disposal which could have implications for underground water contamination. Field observations and research revealed that the problem is at present not pervasive, but points to the necessity to undertake measures aimed at minimizing sanitation concerns. The ground-water contamination risk in the Core Delta relates also to exiting villages, where water-borne sanitation facilities do not exist and where people use the bush. Grey water is usually spilled out onto the ground or used to water plants and/or hedges.

Unconfined motor boat access (including number of boats) has been noted as a potential contributor to congestion and disturbance that could affect the quality of the Delta Core and its wilderness appeal. Noise pollution from unconfined and/or increased motor-boat traffic has the potential to significantly diminish the area’s quality and lead to game disturbance. Unconfined vehicular access in the Delta Core, together with a number of user-defined trails and pathways, have also been identified as a concern that could potentially increase congestion of visitors and disturb wildlife. Nearly all of the identified trails or pathways exhibited vegetation trampling and soil compaction. Noise pollution from low flying small engine aircrafts and helicopter use have also been noted as a growing concern, requiring appropriate attention.

Action/Recommendation		Priority	Lead Agency
A.1	<p>Environmental Impact Assessment (EIA) should be required for any new tourist activities introduced or any new developments in the Delta Core to ensure that the likely benefits outweigh potential environmental risks and associated costs.</p> <p>Ecological management will focus on the conservation of biodiversity and the maintenance of the environmental stability and pristine character of the Delta Core.</p>	High	DEA BTO TLB
<p>There seems to be a widespread agreement that the sensitivity of the Delta Core and wildlife habitat significantly limit the potential for any new/future tourism facilities development. Tourism targets/threshold of maximum 700 beds has been set up for the Delta Core.</p>			
A.2	<p>All camps/lodges in the Delta Core should be encouraged to align with “green” level eco-tourism standards, developed by the Botswana Ecotourism Certification System (BECS).</p> <p>“Green+” and “Eco-tourism” levels will be additional advantages in rating concessionaires’ commitments to Delta Core biodiversity conservation, environmental management and interpretation of the surrounding environment to guests.</p>	High	BTO
A.3	<p>To minimize potential pollution risk to the Delta environment, all lodges/camps in the Delta Core will be required to determine the appropriateness of their wastewater treatment technology, following recommendations stipulated in the guidelines developed by the ODMP, Biokavango Project, and North West District Council, (including the recently approved Guidelines for Liquid Waste Management in the Ngamiland District) as well as guidelines for liquid waste developed by KCS.</p>	High	DWMPC TLB BTO

	<p>Tourism operators in the Delta Core will be required to avail themselves of the existing documentation of the prevailing site conditions, which will serve to justify the selection and usage of a particular effluent disposal technology.</p> <p>Specific provisions must be made in lease agreements for the strict control of effluent from the facilities into groundwater and into open water.</p>		
A.4	<p>To minimize greenhouse gas emissions and oil contamination risks, all camps in the Delta Core should be encouraged to gradually replace any existing diesel generator based power supplies with alternative power solutions such as solar panels.</p>	High	DWMPC
A.5	<p>On-site management of all camps in the Delta Core should be encouraged to ensure the following:</p> <ul style="list-style-type: none"> <li>• All solid waste is appropriately separated and stored within a covered area, with wildlife proof cage/storage area on concrete or solid floor to stop leakage and soil contamination while waiting to be taken to the landfill and/or recycling center;</li> <li>• All biodegradable waste from the facility is composted or removed;</li> <li>• All liquid waste from the kitchen, workshop, and laundry departments of the facility passes through a fat/grease trap before entering the grey/black water treatment system;</li> <li>• All fat/grease collected within the trap is regularly removed and stored in a large container for removal to the local municipal land fill;</li> <li>• Appropriate workshop/wash bay area for vehicle/boat mechanics, with concrete floor that reticulates water run-off; and</li> <li>• All fuels used for either vehicles, generators, or boats are appropriately stored within a concrete bonded area.</li> </ul>	High	DWMPC TLB TLB
A.6	<p>As per TLB policy, it should be compulsory that all accommodation facilities in the Delta Core be semi-permanent structures. Apart from tourism-related accommodation, this should apply to any structure built in the Core Delta.</p> <p>(Exceptions are workshop and maintenance areas, where concrete bonded floors for maintenance and parking shall be allowed. Above ground tanks that are well bonded with concrete to store fuel will also be allowed.)</p> <p>A phased approach to eliminating the existing permanent building structures (if any) from the Delta Core should be encouraged.</p>	High	TLB
A.7	<p>The maintenance, rehabilitation, and reconstruction of any structure in the Delta Core shall be accomplished using the minimum tool necessary for the job. This requires analysis of the impacts of the tools to be used on wilderness values. Issues such as duration and intensity of noise levels, means of transporting materials and tools to the job site, use of local materials versus materials brought to the site, etc. should be considered in the determination of “minimum tool”.</p> <p>The maintenance, rehabilitation, and reconstruction of any structure in the Delta Core should be subjected to the provisions of the Environmental Impact Assessment (EIA) Act and approved by the Tawana Land Board, Department of Environmental Affairs and any other relevant authority in the North West District (e.g. Department of Waste Management &amp; Pollution Control). Subjecting all construction of physical structures to an EIA process will further ensure environmental protection and sustainable use of resources in the concession area.</p>	High	TLB DEA

A.8	<p>To prevent detracting of the Delta Core's wilderness characteristics, including a sense of solitude and closeness to nature mechanized (vehicle) access and usage will be limited exclusively to:</p> <ul style="list-style-type: none"> <li>• Low intensity game viewing and transporting visitors to and from camp sites;</li> <li>• Scientific researchers where it is demonstrated that such vehicle use is necessary for undertaking approved research projects;</li> <li>• DWNP officers, law enforcement, and any other person delegated with management responsibility of the Delta Core Area, and then only where there are no feasible alternatives;</li> <li>• Service vehicles.</li> </ul>	High	DWNP
A.9	<p>Prevention of and protection from incidences of "mass tourism" of the Delta Core zone's wilderness experience would require vigorous control of the number of game drive vehicles per camp/lodge. In this regard it should be a requirement to:</p> <p>Restrict the number of game viewing vehicles to "game drive vehicle/land ratio" of maximum 10 km<sup>2</sup> per vehicle that still ensures marginal environmental impact.</p> <p>Allow no more than 3 game drive vehicles (carrying a maximum of 6 people per vehicle) at any of the zone's wildlife sites. This will ensure low group encounter rates providing opportunity for tourists to experience a sense of solitude, tranquility, and closeness to nature.</p>	High	BTO, DEA, TLB
A.10	<p>Environmental monitoring by tourism operators should be encouraged to ensure that the motorized game viewing thresholds are producing the desired results. The monitoring shall examine the amount, type, and location of visitor use, together with their effects on the changes in vegetation cover and threats to wildlife</p>	High	BTO DEA, tour operators
A.11	<p>There should be a requirement to rationalize trails, routes, and access points in the Delta Core to follow the existing (major) trails with minimum additions for currently inaccessible sites if required.</p> <p>The main purpose of the trail system shall be to keep the area in its natural state as much as possible, keep interaction between users to the lowest rate, and provide access to remote attractions and camps in designated sites.</p> <p>Wilderness standards shall be used to minimize the impact of human use. In the Delta Core, construction of trails or other structures to higher standards than necessary for wilderness experiences should not be encouraged.</p> <p>It shall be a requirement for all tourism operators to restrict the use of sensitive trails in the Delta Core during seasonal flooding events. If and when necessary, however, it will be preferable to construct channel crossings (using poles) rather than allowing vehicles to attempt to navigate through muddy terrain, which will cause more lasting and uglier scars.</p> <p>Design of pole bridges (channel crossings) to minimize the impact on the wilderness character should be encouraged, provided that:</p> <ul style="list-style-type: none"> <li>• No other route or crossing on upland areas to bypass the wetland is reasonably available;</li> <li>• The crossing cannot be crossed by vehicle safely;</li> <li>• Unacceptable bank damage will not occur from vehicle seeking a crossing;</li> </ul> <p>and</p>	High	DWNP TLB BTO

	<ul style="list-style-type: none"> <li>Floodwaters do not frequently destroy or damage less sturdy structures.</li> </ul>		
A.12	<p>With regard to motor boat operations and access management in the Delta Core , the following is recommended:</p> <ul style="list-style-type: none"> <li>It will be a requirement to establish proper access control mechanism in the Delta Core</li> <li>Internal combustion boat motor use should be restricted to 4-stroke models which use fuel more efficiently, produce cleaner exhaust, and run more quietly than traditional 2-stroke motor boat engines;</li> <li>Boats using electric motors should be strongly encouraged;</li> <li>No house-boat, jet-propelled boats, jet-skis and/or water bikes, should be allowed to operate in the delta Core;</li> <li>There is a need to designate channels which will (whenever possible) be used as freeways by mobile tour operators and other authorized motor boat users for the purpose of traversing the zone</li> <li>To minimize or avoid conflicts between different tourism activities, as well as to adequately protect water bird breeding areas, restrictions such as speed limits and slow no-wake zones, should be encourage as follows:</li> <li>No-wake restriction areas of 200 meters from camp sites with boat speeds not exceeding 8 km/h should be designated. Outside of the no-wake restriction areas, boat speeds above 20 (25) km/h during daylight hours shall be prohibited.</li> <li>During night hours (after sunset and before sunrise), the use of boats shall be prohibited.</li> <li>To adequately protect water bird breeding areas, a “buffer zone” of at least 200 m is recommended, in which all human activity shall be banned. Similar areas could be established for emergent or floating-leafed plant beds, which may be impacted by boats operating at any speed.</li> </ul>	High	DWNP BTO TLB
A.13	<p>With regard to aircraft operations and access management, it was suggested that aircraft overflights can cause impacts on wildlife, visitor experiences, and solitude and tranquility in the Delta Core. Of utmost concern are light, fixed-wing aircraft and helicopter activities related to tourism.</p> <p>Accordingly commercial and sightseeing operators are expected to adopt a Code of Conduct in terms of development of specific operating procedures which may limit hours of aircraft use and access and impose other conditions;</p> <p>Flight-free zones and flight restriction buffers should also be delineated within the Delta Core to reduce low-altitude over-flight impacts on the tranquil nature of the area and on wildlife, while still providing viable opportunities for air tours. Based on the formulated BiOkavango standards the following is suggested:</p> <ul style="list-style-type: none"> <li>A one kilometer “no-fly” zone should be delineated around all existing camps/lodges in the Delta</li> <li>The 5 kilometer ‘no flying below 1500 feet’ restriction buffer should be applied over the Delta. The only exceptions shall be when aircraft are moving between two camps or lodges that are within a 5 km radius of each camp i.e. 10 km from each other, or where aircraft operation limits might be exceeded i.e. heavily loaded on hot days.</li> <li>It is also expected that the flight-free zones and flight restriction buffer zone shall be promoted among air tour operators parallel to the enforcement of the</li> </ul>	High	CAA BTO

	existing regulations.		
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## PROPER MANAGEMENT OF FIRES

This MtR revealed that fires are common phenomenon and important management tool in the ODRS. Specifically, although the ecological implications of veld fires are still not well understood (due to a lack of quantitative studies), they seem to have positive effects on biodiversity in the Delta, primarily when they occur naturally. It is against this background that the fire management component of the ODMP (Trollope, 2006) recommended the use of prescribed burning under ecologically acceptable conditions.

It was also highlighted during this MtR that veld fires may have negative implications on the biodiversity of the ODRS. This especially relates to uncontrolled or human-induced burning of riparian woodlands which (as already emphasized) play a critical hydrological role in maintaining a thin layer of fresh groundwater and island soils and in preventing the ODRS from becoming a “salt pan”. Consequently veld fires are also seen as potentially major threats to the Delta’s biodiversity and its wetland ecosystem resilience. It was also noted that fire frequencies throughout the Delta may shift dominance toward more fire-tolerant species over the long-term, and possibly cause the loss of fire-sensitive species.

Action/Recommendation		Priority	Lead Agency
A.1	Long-term, systematic fire monitoring and research program to improve understanding of the fire ecology of the ODRS’s ecosystem should be undertaken and supported as a basis for adaptive fire management	Medium	DFRR
<p>This MtR recognizes adaptive management as a fundamental principle in reconciling the ODRS’s biodiversity conservation and fire protection management objectives. It was highlighted that systematic and long-term monitoring of post-fire recovery is an important strategy in improving understanding of the fire ecology of the ODRS ecosystem. This monitoring and research program is expected to take into account the following:</p> <ul style="list-style-type: none"> <li>• Ecosystem response to fire (including recovery, soil stability, biodiversity and water quality);</li> <li>• Impacts of planned and natural fires on the Delta ecosystem services;</li> <li>• Ecological effects of fuel reduction activities (in particular, prescribed burning);</li> <li>• Effects of fire on riparian and aquatic ecosystems;</li> <li>• The response of weeds and invasive species to fire and fire management activities;</li> <li>• Preferred fire regimes for species/communities, particularly those of conservation concern;</li> <li>• The effectiveness of hazard reduction strategies;</li> <li>• Mapping fire history for both prescribed and unplanned fires.</li> </ul>			
A.2	Incorporate fire regimes that maintain ecological processes and protect biodiversity in the ODRS into broader fire management strategies.	High	DFRR, DEA
<p>As already mentioned, veld fires have, during this MtR, been recognized as an important management tool that can be used to enhance biodiversity in the ODRS. Prescribed burning is expected to be used for the following purposes:</p> <ul style="list-style-type: none"> <li>• To reduce fuel loads in order to meet asset protection objectives;</li> <li>• To reduce fuel loads so that it is easier to control veld fires. (This may help to prevent large, uncontrollable bushfires that can be deleterious to ecosystem health and biodiversity and result in the destruction of important natural resources)</li> </ul>			

- To conserve biodiversity. As discussed previously, this requires an establishment of the aforementioned fire monitoring and research program as a prerequisite in assisting in the determination of fire regimes that support the creation of: (a) a diversity of vegetation composition and structure; and (b) suitable habitat for naturally occurring species and communities

In the absence of a proper fire monitoring and research program as summarized above, it was suggested that frequency and intensity of veld fires in the ODRS must be reduced. It is recommended that an area should only be burned once in 3-5 years, and preferably a cool burn. DEA must coordinate with agriculture authorities to develop a combined strategy to (a) sensitize farmers/villagers (b) coordinate law enforcement and (c) develop a burning regime.

While waiting for a recommended systematic fire monitoring and research program, the following is also suggested for fire management in the ODRS :

- Small scale controlled burning or patch mosaic can be used to enhance grazing resources that attract wildlife;
- Only natural and burned fire breaks shall be used to control the spread of fire in the Core Delta because fire breaks such as cut lines are ecologically unstable. Though this was recommended before and has not been implemented, it is still considered an appropriate fire management method.
- A controlled burning plan shall be developed by the communities and/or tourist operators in the ODRS with guidance from DWNP and DFRR;
- The controlled burning plan shall detail the conditions required for controlled burning. These conditions shall include fuel load, appropriate time of year, appropriate meteorological conditions (temperature, wind speed, wind direction, and humidity);
- Only cool fires of less than 1000 kJ/s/m which only affect the sward layer shall be allowed (Trollope 2006);
- Burning shall only be done when the grass swards are moribund and/or unpalatable as a means of restoring the vigor of the grass sward and allowing nutritious regrowth to occur. This condition occurs when the standing crop of grass is  $\geq 4000$  kg/ha (Trollope 2006);
- Permission to burn shall always be sought from DFRR;
- All natural fires shall be allowed to burn as long as they do not threaten a village or tourism establishment,
- Fire prevention campaigns shall be conducted by fire management teams under the coordination of Environmental Management Officers.

## **CAREFULLY TARGETED APPROACHES TO THE MANAGEMENT OF INVASIVE ALIEN SPECIES (IAS) IN THE ODRS**

With regard to invasive alien species (IAS), it was highlighted during this MtR that IAS is a problem which is gradually getting out of control in the Delta. There are many locations in the Delta where native vegetation is in the process of being wholly or partially replaced by IAS. IAS pose one of the higher priority risks which (if unattended) may potentially result in a significant loss of the ODRS's environmental values and ecological character.

With regard to the above, it was strongly suggested that one of the targets in achieving the sustainability of the ODR ecosystem is to tackle the problem of IAS more comprehensively by reviewing existing approaches and implementing enhanced measures to reduce the risk of introduction of new IAS, pests and diseases, and managing existing species that could threaten the Delta's natural ecosystems. A range of invasive alien species in the ODRS, their varying levels of threat to the Delta's ecosystems, and the cost and difficulty of controlling many species, mean that carefully targeted approaches to weed management would be required. The following suggestions/considerations were highlighted as relevant to the ODRS's situation:

- A coordinated, regional (if not trans-boundary) approach to IAS management is indispensable for the identification and control of weed spread, across different region/zones.

- Increases in the technical expertise for IAS exclusion, control, or eradication, coupled with local knowledge is required to devise cost-efficient strategies. It was emphasised that when new weeds are detected early they can be eradicated before they become naturalized. Complete eradication is difficult and costly after species become naturalized.
- Weed management requires persistence and is also resource-intensive. Management of existing infestations requires monitoring, mapping, and control measures which are currently patchy in the ODRS.

Action/Recommendation		Priority	Lead Agency
A.1	The weed control programs presently in place in the ODRS need to be reviewed and vigorously implemented. Specific attention also should be given to the review of high priority weed species, and weed infested areas that provide a source for spread to other areas, and invasion routes such as river channels, roads, tracks, and fire trails.	High	DWA DWNP DFRR
A.2	A best practice approach should be applied to weed control measures. This entails continuous improvement through monitoring, mapping of weed infested areas, use of new technologies where appropriate, and adequate training in control and detection of new species.	Medium	DWA DWNP DFRR
A.3	Urgent measures to minimize the introduction and spread of IAS by DWA and DWNP staff and other relevant stakeholders should be applied, that include: <ul style="list-style-type: none"> <li>• Installing boat and vehicle washing machinery at all access points to the Delta Core and other sensitive sites/zones within the ODRS;</li> <li>• Controlling livestock that spread seed and disturb soils;</li> <li>• Avoiding as much as possible, the introduction of materials into the Delta Core such as soil, fill, and gravel that are likely to be infested with seeds of weed species</li> <li>• Educating visitors, communities and all others about the potential for weeds to spread from fruit cores and on items such as socks, boots, gaiters, bicycles, and camping equipment</li> </ul>	High	DWA DWNP DFRR
A.4	Consider supporting community involvement in IAS control programs conducted within the ODRS.	Lower	DWA DWNP DAHP
A.5	Provide effective training for all stakeholders on the early detection of new invasive alien species, ongoing detection of weed spread, and control measures.  Provide education material that supports IAS control strategies and informs the communities about the programs conducted within the Delta	High	DWA DWNP DAHP

## IMPROVED UNDERSTANDING OF THE STATUS OF BIODIVERSITY IN ODRS

***Strategy 1: Foster more efficient inter-departmental coordination in facilitating biodiversity monitoring and research***

There is still uncertainty and a lack of knowledge about the status and trends of biodiversity in the ODRS, especially with regard to issues of biodiversity decline. There is an urgent need to develop scientific, technical, and institutional capacities, capable of providing basic understanding upon which to plan and improve appropriate conservation measures. It was, in this regard, strongly suggested to review (if necessary) and finally implement the ODRS Research and Monitoring Program as originally envisaged by the ODMP.

This MtR also revealed stakeholders’ awareness that the implementation of the aforementioned ODMP’s Research and Monitoring framework will be a difficult task, requiring a great deal of coordination and crossing of organizational barriers. Opportunities for collaboration and data and resource sharing are not yet effectively resolved and/or established.

	<b>Action/Recommendation</b>	<b>Priority</b>	<b>Lead Agency</b>
A.1	Devise a clear and coordinated inter-departmental system (framework) to facilitate biodiversity research and monitoring programs as originally envisaged in the ODMP Research and Monitoring Component Report	High	DEA ORI DWNP
<p>To facilitate inter-departmental coordination, there will be a need for the establishment of an inter-departmental working group supported by relevant ORI experts. The working group should also include the OWMC. The working group is expected to:</p> <ul style="list-style-type: none"> <li>• Ensure coordinated research efforts and knowledge sharing between departments and agencies, to maximize efficiencies and research efforts of direct relevance to the ODRS’s biodiversity status and trends.</li> <li>• Evaluate impacts and compatibilities and resolve conflicts between government policies and ODRS biodiversity objectives (targets) and current practices on the ground.</li> <li>• Identify more effective ways of integrating monitoring programs and knowledge from research on the ODRS biodiversity status and trends to facilitate evidence-based policy making.</li> <li>• Identify and suggest appropriate policy implementation tools to be used for biodiversity conservation and enhancement in the ODRS</li> </ul>			
A.2	Strengthen the coordination and dissemination of biodiversity data (including metadata)	High	ORI
<p>It has already been acknowledged that the formulation of the ODMP was supported by construction of a fairly simple but integrated GIS-based information system (ODIS) that combines available data and allowed cross-disciplinary issues to be more readily examined by stakeholders. However, despite significant efforts in introducing ODIS, the situational survey revealed that the use of enabling information system technologies has not yet reached the “ODMP’s core business processes”.</p> <p>Nearly all stakeholders consulted said that while there have been considerable efforts made to collect and share data relevant to the ODRS’s biodiversity status and trends, an overall data-gathering framework that coordinates and harmonizes the data gathering and formatting process ( as envisaged in the Plan) is still not available. In this regard strong support for the improvement of ODIS, capacity development and its eventual conversion into an overall ODRS data-gathering and analysis framework, has been widely advocated. The following specific measures are recommended:</p> <ul style="list-style-type: none"> <li>• Encourage integration of all existing biodiversity data resources, together with migration to and deployment of GIS data server at ORI. All stakeholder departments/organizations should have access to centrally located geospatial data.</li> <li>• Put in place a set of technical specifications (standards) that would guide an evaluation of fitness (quality) of the existing geospatial data and future automation.</li> <li>• Embark on inter-departmental inventory and preliminary fitness review of the existing geospatial data.</li> </ul>			

- Sharing and incorporation of data into ODIS protocols for data exchange and data sharing need to be developed.
- Put in place a consistent geospatial data maintenance process to eliminate the existing fragmentation and inconsistencies in data collection and storage.
- Embark on the preparation of an ODRS biodiversity data model. It should provide framework datasets capable of meeting targeted biodiversity research requirements and a clear concept on how the data will be organized and structured within a coherent data management environment.
- Standardize and agree on a biodiversity metadata format.
- Prepare a program of ODIS deployment to contain a set of investments in application tools. These applications are expected to facilitate the use of the data in specific biodiversity research and monitoring contexts and/or address specific problems.

A.3	Improve/strengthen inter-departmental infrastructure to facilitate stakeholders/community engagement in monitoring and biodiversity conservation in the ODRS	High	DEA DWNP
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It was noted that biodiversity conservation measures (and policy in general) in the ODRS are likely to fail without the active engagement of those whose livelihoods depend on the Delta’s natural resources. Specifically, it was highlighted that communities in the ODRS are, to a great extent, custodians of the natural environment and without their willingness and active participation in conservation management, plans and policies are unlikely to fully succeed.

Local people must be convinced that a direct connection to biodiversity protection works in their best (collective and individual) interests. This would be a sound basis for establishing community-based nature and environmental stewardship – with long-term benefits to ODRS biodiversity conservation and enhancement.

If properly trained and motivated, local people could serve as effective “wildlife watchers” - thereby reducing the number of government staff needed within the ODRS. In this regard, it was pointed out that community members could be trained to patrol their areas, educate other local residents, and discourage poaching by outsiders, at a fraction of the cost of stationing permanent DWNP and other government employees in the ODRS. Abuse of the system could be minimized by ensuring that local residents participate in planning from the outset and are held accountable to the local community and the government. A simple monitoring system could be established for tracking compliance and ensuring that the wildlife population remains stable or increases over the long term.

As a first step, it is recommended that a pilot community-based wildlife tourism and stewardship (monitoring) program be initiated in 1 or preferably 2 to 3 sites in the ODRS.

A.4	Devise a clear and coordinated funding mechanism to ensure that the most urgent biodiversity monitoring and research programs are delivered	High	DEA DWNP
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It was noted that the funding of ODRS-related biodiversity research is largely dispersed among various funding organizations and government departments that usually fund biodiversity related projects in their own field of expertise. Departments are often unaware of projects and that their outputs are being funded by other departments, which can lead to inefficiencies, overlap, and a lack of prioritized research funding. There is a need to establish a mechanism for coordinated research funding and dissemination of research results.

It was also noted that the development of an interdepartmental/agency group as summarized in A.1 above will be necessary to ensure that biodiversity monitoring and research is conducted in a prioritized manner. Additionally, a funding mechanism for the priorities agreed must be identified.

A.5	<p>Conduct systematic surveys and mapping of vegetation communities across the ODRS giving a high priority to the Delta Core areas.</p> <p>Assess where gaps exist in the current knowledge of the location and distribution of various ODRS habitats and their component species to facilitate targeted surveys.</p> <p>Ensure that vegetation surveys and mapping are consistent with the national</p>	High	DFRR DWNP
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	vegetation classification system (if any).		
<p>Despite the many research projects undertaken in the ODRS, much remains to be learned about the biology and ecology of ODRS fauna and flora and how to monitor and manage its ecosystems to ensure their conservation in perpetuity.</p> <p>It was noted that distribution of vegetation resources and their quantities in the ODRS are difficult to ascertain. To date, no detailed and continuing monitoring/mapping of vegetation resources in the Delta has been done and/or carried out on a consistent basis. This also includes the issue of sustainable use of vegetation resources in the ODRS, which stands out as one of the prominent action items in the ODMP Action Plan not being executed.</p>			
A.6	Devise (conduct) a systematic, coordinated monitoring program and support research that assists in identifying specific management requirements for vegetation species and communities, including responses to: (a) veld fire and frequency; (b) expected climate change; and (c) resilience to threats such as introduced species.	High	DFRR DWNP
<p>A key objective of this recommendation would primarily be the identification of ecological fire thresholds (minimum and maximum fire intervals and fire intensity required for biodiversity conservation) for vegetation communities and important species, with the aim of integrating fire management and biodiversity protection requirements, and using planned fire for biodiversity conservation purposes</p>			
A.7	Foster community stewardship and appreciation of the native vegetation of Ngamiland through community involvement in research and monitoring and communication and interpretation programs (see A.3).	High	DFRR
A.8	Maintain a wildlife species inventory to standards agreed in the ODMP's Research and Monitoring Component Report and ensure that it is regularly updated as new knowledge becomes available.  Implement a fauna research and monitoring program (as originally envisaged in the ODMP) to record the distribution, abundance, and other details of wildlife species, giving priority to sensitive, specialized, and threatened species, species of regional significance, and species that provide good indicators of change.	High	DWNP
<p>Nearly all stakeholders consulted agree that the apparent lack of in-depth understanding of the status and trends of wildlife species/population in the Okavango Delta is a major management challenge. It is noted that besides Birdlife Botswana's baseline surveys of salty egret and African skimmer populations, as well as on-going wild dog monitoring through NGOs in parts of the Okavango Delta, no ground monitoring surveys for keystone species have been initiated since ODMP's approval. Several wildlife research projects have also been carried out in the Delta, but all of them seem to be short-term research (PhD) studies lacking continuity.</p> <p>Surveys and monitoring are, therefore needed to establish the characteristics and condition of wildlife and habitats in the ODRS and the key factors influencing trends in animal populations. This information, together with the results of research conducted in the ODRS and elsewhere, is an essential foundation to sound wildlife management programs. They should be designed to:</p> <ul style="list-style-type: none"> <li>• Improve understanding of how ecosystems and individual wildlife species respond to environmental changes (such as fire, climate change and introduced species).</li> <li>• Improve understanding of the biology and ecology of animal species as a basis for managing habitat.</li> <li>• Minimize or eliminate threats to native fauna.</li> <li>• Provide the highest priority to conservation of species that are most vulnerable to change (including climate change), such as specialized and threatened species and those of regional significance.</li> <li>• Liaise with interdepartmental/agency groups as summarized in A.1 above to achieve coordinated research and monitoring programs and to encourage stakeholders to undertake appropriate faunal research in the ODRS.</li> <li>• Protect and manage the habitat of all declared threatened species and ecological communities according to</li> </ul>			

objectives and strategies specified in the ODMP Action Plans			
A.9	Ensure that viable populations of all existing native flora and fauna species and communities are maintained by protecting and improving habitats and managing key threats	High	DFRR DWNP
<p>It is important to reiterate that the protection of ODRS biodiversity is heavily dependent on knowledge of current management practices and their long-term impacts on ODRS ecosystem change and its resilience. Knowledge is also needed concerning the development of any alternative production systems that maximize environmental protection and make wider use of genetic resources that best match local conditions in agricultural, forestry, and other commercial systems in the ODRS. To fulfill this the following will be prioritized:</p> <ul style="list-style-type: none"> <li>• Investigations of innovative habitat restoration and conservation techniques within landscapes affected by anthropogenic factors to assess their effectiveness in terms of hydrology, carbon storage and sequestration potential, and biodiversity at the ODRS and local levels.</li> <li>• Targeted prescriptions that can be delivered through agri-environmental schemes that can address overgrazing.</li> <li>• Research to investigate the effectiveness of specific environmental measures and schemes such as conservation agriculture to ensure that these schemes protect and enhance the Delta’s biodiversity in accordance with best scientific knowledge for protecting biodiversity.</li> <li>• Mechanisms to ensure that all policy drivers of change (schemes, initiatives etc.) comply with the requirements of national legislation and international conventions.</li> </ul>			

In addition to all the above, the following targets as derived from the SAIEA threshold Report (2012) are recommended as part of efforts to conserve the biodiversity of the ODRS.

Action/Recommendation		Priority	Lead Agency
A.1	Reduce poaching to the barest minimum. CBNRM and law-enforcement are key tools in this regard.	High	DWNP
<p>Listed among the possible explanations for the recent estimated declines in the populations of some medium and large herbivore species (e.g. impala, tsessebe, zebra, kudu, giraffe, and lechwe) is increasing pressure from illegal hunting by inhabitants of villages and settlements in and surrounding the ODRS. At the very best, estimates of rates of illegal activities can only be derived from varied sources of evidence from limited reports, representing unknown proportions of the whole. Estimates from informed observers exist for many leasehold concession areas of Botswana, but these lack systematic methodologies addressing temporal and spatial sampling rates and consequently, fail to provide reliable estimates of bushmeat offtake frequency. Compiled reports of illegal hunting incidents, for example from government or privately funded anti-poaching units, only provide a minimum sample frequency and an unknown percentage of the total frequency. Cases of poaching in the DWNPs problem animal control records, for example, report a total of 9 kudu, 7 impala, and 4 elephants for the entire Ngamiland District between 2009 and 2011 (DWNP PAC records, Maun Office). These numbers compare with numbers recorded from NG26, which have recorded confirmed reports of 33 lechwe, 21 buffalo, 19 impala, 18 giraffe, 11 kudu, 4 wildebeest, 2 hippo, 1 zebra, and 204 incidents of illegal poaching activities in the past 2 years, an estimate of about 25% of what is really happening. NG26 is one of 12 concessions bordering the buffalo fence, which suggests a conceivable 4000 animals are being harvested illegally each year. Although the exact frequency of incidents of illegal hunting is not known, some studies have indicated that any further off-take of populations from some of the WMAs in the ODRS, could lead to serious population declines and render some areas unviable for certain herbivore and predator species. Using a population model of impala in the NG26 concession area, McNutt (unpublished) recently estimated that any additional off-take of the population, which has suffered a decline of 65% in the area from its 1996 estimate, would cause a crash in the populations of certain target</p>			

ungulate species and, consequently, result in significant declines in the areas of large predator populations. He, therefore, concludes that illegal hunting for meat may be the most significant factor to account for the recent declines in herbivore species in northern Botswana (Chase, 2011) and therefore needs to be prevented in order to maintain viable populations of targeted ungulates in the ODRS.

The anti-poaching division of DWNP should be strengthened until community benefits derived from ecotourism can be diverted to change local attitudes.

A.2	Existing fences should be removed wherever possible, especially in areas where wildlife migrations in and out of the Okavango Delta are required. No new fenced commercial ranches or disease-control fences should be allowed unless EIAs are undertaken and show they will not impact biodiversity significantly.	High	DWNP, DAHP
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According to Albertson (1998), an increase in Botswana’s veterinary fences has added extra barriers to some of the major wildlife movements and migration pathways. The addition of the Samuchima, Ikoga, and Setata fences on the western side of the Okavango and the extension of the Northern Buffalo Fence have sealed off vital wildlife habitat, terminating cross-border migrations and isolating the wildlife of the Okavango and Kwando ecosystems from their wet season dispersion range. Albertson adds that ill-placed veterinary fences prevent vital wildlife movements, fragment populations, and impose agonizing deaths from entanglement and dehydration. Fencing infrastructure is closely linked to the declines of Botswana’s wildlife by eroding the ability of populations to move in response to extreme climatic periods of drought or flood to seek alternative and life-saving resources elsewhere. The Namibian border cordon fence currently disrupts the spatial linkage of the Okavango Panhandle elephant population to Namibia and Angola, limiting the dispersal of elephants out of the panhandle (Chase & Griffin 2009), putting pressure on a growing population and their resources in the eastern panhandle. The fence is already being traversed by an increasing number of elephants. Chase (2011) identified 26 breakages along this fence close to elephant pathways.

A.3	No introduction of alien invasive species (especially plants and invertebrates). Invasive, exotic plants and animals pose a potential disaster to the systems biodiversity.	High	DFRR
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They may be introduced unwittingly and remain inconspicuous for a while before they spread out of control. Alien invasive species introductions are also extremely hard to manage and control. *Salvinia molesta* first appeared in the mid 1980s, but control measures conducted by DWA, including the manual removal of the plant and the introduction of the Brazilian weevil beetle *Cyrtobagous salviniae*, which feeds on the plant, have limited its spread. A variety of other alien plants, however, occur and are spreading through the Delta; jimson weeds (*Datura ferox* and *D. stramonium*), the burweed (*Xanthium starmonium*), *Mimosa pigra*, *Sesbania punicea*, and the exotic Syringa (*Melia azederach*). Some of these species cover large areas of disturbed ground and all may be doing so at the expense of natural vegetation and the system’s species diversity.

### Maintain viable populations of endemic, rare, and endangered species

With regard to actions to maintain endemic rare and endangered species, the Botswana Threatened Species Management Policy Implementation Strategy and Action Plan (UNDP, 2007) outlines some general recommendations that will slow any further declines in the populations of threatened species:

#### General Prohibitions;

- (i) No person shall kill, harm, harass, capture or take an individual of a faunal species that is listed on the Threatened Species List as a Critically Endangered, Endangered, or Vulnerable species, unless they possess a valid license pursuant to the Wildlife Conservation and National Parks Act, or unless the Coordination Committee has given its approval pursuant to Charter and mandate.

- (ii) No person shall gather, collect, pluck, cut, chop, uproot, damage or destroy any specimen of a floral species that is listed as Critically Endangered, Endangered, or Vulnerable on the Threatened Species List, unless they possess a valid license pursuant to the Forestry Act Veld Products Act or unless the Coordination Committee has given its approval pursuant to its Charter and mandate.
- (iii) The prohibitions in F.1 and F.2 extend to private landowners, and land-users and communal landowners. However, a private landowner may harm or kill an individual of a wildlife species that is listed as a Critically Endangered, Endangered, or Vulnerable species when acting pursuant to the WCNP Act, Damage Causing Animal provisions, the WCNP Act (Cheetahs) (Killing Suspension) Order (Section 90) (22nd April, 2005), WCNP (Lions) (Killing Restriction) Order, and the Predator Management Strategy for Botswana.
- (iv) To avoid the creation of significant hardship or the deprivation of the use of private land, the Threatened Species Technical Committee should establish the capacity to work with property owners and communities so that land development can proceed consistent with the protection or management of the species.

## PROMOTE SUSTAINABLE AGRICULTURAL PRACTICES IN THE ODRS

### *Strategy 1: Promote and embrace the concept of conservation agriculture*

It was noted during this MtR that more effort should be placed on changing the patterns of agricultural practices in the ODRS to a more sustainable pattern. ***The encouragement of sustainable farming practices and especially conservation agriculture (CA), is seen as more effective for the long-term viability of the ODRS.*** It was highlighted that CA is an attempt to promote a more comprehensive approach to natural resource management by integrating the environmental, technical, economic, and social dimensions. The move from conventional agriculture to CA is seen as a worldwide movement toward the restoration of natural resources, integrating biological considerations into the soil/plant/atmosphere continuum while responding to the challenges of climate change

It was also noted that the ***CA concept offers an appropriate technology not only to adapt to climate change but also fosters sustainable use of natural resources and, through agricultural intensification, also offers better economic prospects to small farmers.*** Labor reduction aspects of CA make it especially suitable for female farmers. The critical issues for a sustained success of CA remain the availability of seeds and equipment and maintenance and repair services.

It was also noted that CA is a complex technology and demands fundamental changes in agriculture. This requires a change in the mindset of farmers, advisors, scientists, and politicians. It requires also a thorough adaptation and site-specific development of a technology which is still evolving. Both take time and require a long-term development perspective. ***It is suggested that central government stakeholders (notably MOA and MEWT) give encouraging signals for mainstreaming CA in agricultural practice. Efforts should be made to address the issue of conflicting messages that continue to exist in this domain.*** While official agricultural policy positions in the country cannot be expected to change drastically in the short term, key ministries should spread CA expertise across relevant departments more aggressively by encouraging schools, agricultural colleges, and universities to embrace more CA topics in research and teaching. It is also noted that key research and implementing stakeholders in the country may need to identify new budgets to continue field research and farmers' adoption of CA.

The knowledge gap concerning the environmental effect of modern agriculture among rural populations in the ODRS calls for immediate action to implement education/training programs.

**Providing farmers with relevant information and education regarding the environmental effects of agriculture and the effects of their practices on the environment and resources must be placed higher in the conservation agenda.** Rural communities attending these training courses would be expected to become more environmentally knowledgeable and eventually change their behavior toward more sustainable practices. It is also expected that the relevant central government departments would promote, facilitate, and guide greater participation of rural communities in developing and applying more sustainable forms of land use.

Relying on experiences in agricultural development elsewhere in Africa, it was observed very clearly that successful adaptation and widespread adoption of new (CA) farming practices must emerge from within farming communities. Community-led and community-owned efforts are the best means of fostering technological changes. These efforts are most successful when communities show a willingness to vigorously identify, try, and evaluate new practices.

Action/Recommendation	Priority	Lead Agency
<p>A.1 Undertake an in-depth assessment of new technology development through preparation of an implementation plan for an Integrated Approach Based on Conservation Agriculture in the ODRS.</p> <p>The plan is expected to tackle the following 4 issues:</p> <ul style="list-style-type: none"> <li>• A full-scale CA development program that will be integrated into the ODMP;</li> <li>• An implementation plan to define and set up mid-term technical and financial programs that will redirect the ODRS toward CA;</li> <li>• Foundation training for key stakeholders and communities (training on all components of production systems and environmental safeguards); and</li> <li>• Setting up demonstration (pilot) sites as the basis of an expansion program for successful activities.</li> </ul>	Medium	MOA

**Strategy 2: Promote sustainable, productive arable agriculture practices in ODRS**

This MtR has noted that agriculture themes were down-played by the ODMP and, importantly, it was noted that arable agriculture was completely left out. The enormity of this gap becomes more serious when factoring in that a large part of the rural population in the ODRS depends on arable agriculture for their livelihoods. **Arable agriculture in the ODRS faces a number of challenges in terms of sustainability and productivity. These include poor soil fertility; human/wildlife conflicts; availability of water for irrigation; and rainfall regime among others.** Like in the case of the entire Ngamiland District, dryland and Molapo farming are the dominant arable agricultural practices in the ODRS, with settlement around the Etsha Villages and those on both sides of Panhandle being well known for dryland farming. Molapo farming is associated with communities around the southern parts of the Delta, where maize and sorghum are cultivated.

**Arable agriculture in the ODRS continues to be plagued by increasing elephant populations; increasing demands for water off-take for irrigation; frequent cycles of drought leading to high use of inorganic fertilizers and agro-chemicals; extensive removal of natural covers, which also affects wildlife habitat; and degradation of floodplains/riparian zones in the case of Molapo farming.** Though government has established a compensation scheme for farmers whose crops are damaged by wildlife, farmers complain that the compensation levels are not adequate. As a result farmers are not eager to intensify their arable farming practices.

Action/Recommendation		Priority	Lead Agency
A.1	Water off-take (for irrigation) should be limited to less than 600Mn3/year, so as not to compromise the ecological integrity of the wetlands.	High	DWA
A.2	HWC needs to be reduced by locating fields away from prime wildlife areas, including migration routes.	High	MOA DWNP
A.3	Reduce/control the levels of fertilizer and chemical inputs to minimize toxic inputs into return flows to surface waters or pollution of groundwater.	High	MOA
A.4	Promote and apply the principles of conservation agriculture to reduce habitat alteration and soil exposure while improving farming efficiency and crop yields.	High	MOA
A.5	Legalize Molapo farming.	Medium	MOA
Despite the fact that Molapo farming is not recognized by government, the produce from such fields is a valuable source of livelihoods to rural farmers. The legalization of these fields through the normal land board process should make the control of fertilizer and agro-chemical use, more acceptable to ministry of agriculture officials.			

## PROTECT ODRS ENVIROMENTS FROM THE IMPACTS OF MINING ACTIVITIES

***Strategy 1: Establish a good understanding of mining issues in a fragile ecosystem such as the ODRS, good management methods, and best practices***

Though sand mining and mining for construction aggregates have been going on in ODRS for some time, minerals prospecting and exploitation are recent developments. At the time of the formulation of the ODMP, mining issues were not addressed, but since then the mining sector has expanded its minerals prospecting/exploration activities in the ODRS region. This happened with the identification of the Botswana Copper Belt (Kalahari Copper Belt), which is a southern extension of the Central African Copper Belt of Zambia and the Democratic Republic of Congo and the Namibian Matchless and Damara deposits. The proximity of this belt to the Delta and the Panhandle and an upsurge in prospecting activities in the Kalahari Copper Belt have raised concerns about mining impacts in the ODRS. Specifically, a total of 124 mining licenses have been granted to mining companies, (of which some have started production, notably, the Discovery Metals Copper mining activity in Toteng,) in the ODRS.

The emergence of minerals prospecting and consequently, the actual mining of these minerals within the ODRS, are bound to have long lasting impacts on biodiversity, the natural, social, and economic environments of the ODRS. Participants at the thematic area workshop were unanimous in expressing concern that some minerals prospecting licenses have been granted in the ODRS, with some in very close proximity to the Delta and Panhandle. The challenge is therefore to fully establish a good understanding of issues associated with mining for minerals in a fragile ecosystem such as the ODRS and to come up with good management intervention/mitigation measures and best practices. (Attention must also be drawn to the probability that the Okavango Delta will soon be listed as a World Heritage Site under the United Nations Educational Scientific and Cultural Organization (UNESCO).) In this regard, it is important to note the following: ***Affolder (2007) observes that there is no express prohibition on all mining within World Heritage Sites in the Convention text. The world Heritage***

*committee has taken steps to address the uncertainty and lack of clarity with respect to mining and World Heritage Sites. Much of the work in this area has been done by the IUCN, which advises the committee on issues affecting natural heritage. IUCN's position outlined in a new World Heritage Advice Note is that mineral and oil/gas exploration and exploitation should not be permitted within natural World Heritage Sites. Mining and oil/gas projects that are located outside World Heritage Sites should not, under any circumstances, have negative impacts on these exceptional places. It is also to be noted that: In August 2003, a number of the world's largest mining companies and corporate members of the International Council on Mining and Metals (ICMM) issued a No Go Pledge, committing to not exploring or mining in World Heritage Sites.*

The Report on Threshold for Use in the Strategic Environmental Assessment of Okavango Delta Ramsar Site by SAIEA established targets/thresholds that must be met with regard to mining activities in the ODRS. These targets/thresholds, adopted and integrated in the recommendations of this mid-term review of the ODMP, are:

- (i) ***The issuance of prospecting and/or mining licenses should be discouraged within the Delta and the Panhandle;***
- (ii) ***No new prospecting and/or mining licenses should be issued within a buffer of 15 kms of the Delta and the Panhandle, as well as the seasonal floodplains and main channels and that existing licenses be withdrawn by the Government of Botswana, as soon as they are relinquished by the current license holder.***

This review of the ODMP adopts and integrates the management recommendations/actions by the Threshold Report, with some modifications/amplifications as follows:

Action/Recommendation		Priority	Lead Agency
A.1	Recognize environmental management as a high priority, notably during licensing processes and through the development of environmental management systems	High	DEA, DGS, DOM
<p>These are to include:</p> <p>Early and comprehensive Environmental Impact Assessments, pollution control and other preventive and mitigation measures, monitoring and auditing activities, and emergency response procedures</p> <p>Prospecting licenses to be issued only after approvals of EIAs and EMPs</p> <p>Regular inspections of prospecting sites to ensure compliance with good environmental practice</p>			
A.2	Carry out socio-economic impact assessments and social planning for all mining operations	High	DEA, DGS, DOM
<p>These are to include:</p> <p>Socio-economic impacts should be taken into account at the earlier stages of project development, and these should be in conformance with the World Bank Standards of environmental and social responsibility</p> <p>Changes in demographics caused by higher incomes in mining jobs that results in labor movements from one sector to another</p> <p>Positive and negative socio-economic impacts of mining activities in the ODRS should be properly documented</p>			
A.3	Gender issues should be considered at policy and project levels	Medium	Mining companies, DOM

<p>Mines should consider empowering women through procurement of supplies from them.</p> <p>There should be a deliberate policy of skills development among women in the mining industry.</p>			
A.4	Establish environmental accountability in the mining industry and government at the highest management and policy levels	High	Mining companies, DOM, DGS
<p>Mining companies must align their operations with established environmental standards that serve as the reference points such as appropriate certification by Botswana Bureau of Standards (BOBS) and International Standards Organization (ISO).</p> <p>Government to introduce a regulatory framework that will ensure accountability on the part of mining companies.</p> <p>Regular self-audits by mining companies should be part of their strategic plans.</p> <p>All mining companies should have operational safety, health, and environmental plans in place.</p>			
A.5	Ensure that mining company employees at all levels recognize their responsibility for environmental management and also ensure that adequate resources, staff, and requisite training are available to implement environmental plans	High	Mining companies, DOM
<p>Mining companies to carry out training needs assessment in order to identify skills needed for the implementation of environmental plans.</p> <p>Allocate adequate resources for training needs.</p>			
A.6	Ensure the participation of and dialogue with the affected communities and other directly interested parties on the environmental and social aspects of all phases of mining activities, and include the full participation of women and other marginalized groups.	High	Mining companies, communities
A.7	Adopt environmentally sound technologies in all phases of mining activities and increase the emphasis on the transfer of appropriate technologies that mitigate environmental impacts including those from small-scale mining operations.	High	Mining companies, DOM, DEA
A.8	Adopt risk analysis and risk management in the development of regulations and in the design, operation, and decommissioning of mining activities, including the handling and disposal of hazardous mining and other wastes.	High	DOM, DEA
A.9	Recognize the linkages among ecology, socio-cultural conditions and human health and safety, the local community, and the natural environment.	High	Mining companies
<p>Mining companies should adopt work ethics that recognize and respect community beliefs, cultures, and norms in all their mining operations.</p> <p>Community should be made aware of the dangers and negative effects of squatting on un-serviced land around mining areas.</p>			
A.10	Government to evaluate and adopt, wherever appropriate, economic and administrative instruments such as tax incentive policies to encourage the reduction of pollutant emissions and introduction of innovative technology.	Medium	GOB
A.11	Explore the feasibility of reciprocal agreements to reduce trans-boundary pollution.	Medium	DEA, AKACOM

## SUSTAINABLE TOURISM DEVELOPMENT AND ACTIVITIES IN THE ODRS

### *Strategy 1: Implement the Ngamiland Tourism Development Plan (NTDP)*

Tourism development in Botswana and in the ODRS is based on the sustainable tourism development framework. *This framework argues that there is a cumulative relationship between tourism development, the environment and socio-cultural and economic development in host regions such as the ODRS. This means that if tourism is to contribute to sustainable development in destination areas, it must be economically viable, ecologically sensitive, and socio-culturally appropriate.* The NTDP is built on the principles of sustainable tourism development. This was meant to drive sustainability in tourism development in the ODRS. The lack of implementation of the NTDP translates to the failure to address the principles of sustainable tourism development in a wetland environment like the ODRS. This situation is likely to have long-term negative effects on the ecology, economy, and socio-cultural aspects of the ODRS caused by tourism development.

Action/Recommendation		Priority	Lead Agency
A.1	Conduct annual seminars/workshops	High	BTO, DOT, DEA
<p>Most of the stakeholders (e.g. government, private sector, local communities, and NGOs) were found to be unfamiliar with the existence of the NTDP. There is therefore a need to hold annual seminars/workshops for all tourism stakeholders in the ODRS to familiarize them with those aspects of the NTDP recommendations that fall within the mandates of their organizations for implementation purposes. In this annual seminar/workshop, stakeholders should be made aware that the NTDP is a long-term (30-year) strategic plan that must guide all tourism development activities in the ODRS. Stakeholders should be made aware that the NTDP is formatted as a Tourism Development Manual that includes more detailed development plans for a number of Tourism Development Areas where some, if not all, of the operators happen to be operating in particular Controlled Hunting Areas (CHAs).</p>			
A.2	Government departments should facilitate implementation of NTDP	High	TLB, NDWC, DWNP, DOT, BTO
<p>Government institutions such as the Department of Environmental Affairs, Department of Tourism, Tawana Land Board, North West District Council, Department of Wildlife and National Parks, Department of Waste Management and Pollution Control, and the Botswana Tourism Organization should specifically be made aware of particular aspects which each of their organizations should implement within the framework of the NTDP. This is particularly a need when considering young officers who are often new in the field and require guidance. The Department of Environmental Affairs should take the lead in ensuring that other government departments implement aspects of the NTDP that directly fall within the mandates of their organizations on issues of tourism development in the ODRS.</p>			
A.3	Staffing and training of government officers	High	Central and local governments
<p>Staffing and training of government officers from the mentioned departments remain a key priority in ensuring the implementation of the NTDP within the framework of ORDS. Particular reference is made here to the Department of</p>			

Environmental Affairs, which is directly charged with the responsibility of coordinating the implementation of the ODMP. Presently DEA is short staffed and does not have an officer specifically responsible for ensuring that tourism development issues mentioned in the NTDP are addressed. As a result, staffing and training of this department is necessary to ensure the implementation of the ODMP's tourism component.

### ***Strategy 2: Ensure adherence to limits of acceptable change***

The NDTP recommended that the Okavango Core Tourism Development Area should be conserved as a low volume, low intensity, and high value wild tourism area while focusing tourism development in other tourism development areas on the periphery of the Okavango Core development area. It was also recommended that a maximum of 700 beds should be allowed in the Core Area. The scenario on the ground, however, indicates there are more beds than those recommended in the Core Zone of the ODRS. This therefore suggests that the carrying capacity and limits of acceptable change in the Core Zone of the Okavango Delta are not being adhered to. There is environmental pressure caused by more lodges and beds as well as tourism activities in the Core Zone of the ODRS. In this regard, the ecological integrity of the ODRS is threatened by tourism activities.

<b>Action/Recommendation</b>		<b>Priority</b>	<b>Lead Agency</b>
A.1	Prepare management plans for all CHAs	High	BTO, TLB
There is need for management plans for each of the CHAs in the Core zone to reduce the current high numbers of beds and tourism activities to desired capacities as recommended in the ODMP and the van Heiden Management Plan Report of 1992.			
A.2	Develop management plans for NG/19, NG/12 and NG/41	High	BTO, TLB
During the stakeholder workshop in Maun, stakeholders observed that LAC are generally not being observed in NG/19, NG/12, and NG/41. The lack of management plans in these areas has resulted in an increase in tourism activities and the allocation of plots to different individuals for various uses. Since these areas are not covered by management plans, they are at risk of slowly losing their ecological and tourism value. Stakeholders are worried that carrying capacities and limits of acceptable change are not observed in these CHAs. To remedy this situation, management plans need to be developed for these areas. In addition, villages/settlements such as Khwai in NG/19 and Mababe in NG/41 need to have clearly designed layouts/plans and village development plans to guide the allocation of land. All these activities should be carried out in such a way that they comply with the principles prescribed in the ODMP and NTDP.			
A.3	Freeze the allocation of lodges and sites for camps in the Core Zone	High	TLB
The TLB should avoid arbitrary allocation of new lodges and camps in the core Zone of the ODRS. Rather, TLB should encourage the allocation of lodges and camps, as well as other tourism businesses, in other tourism development areas outside the core zone. In addition, TLB should closely consider carrying capacities of tourism activities in all zones when allocating tourism businesses in the zones and CHAs.			
A.4	New allocations should take cognizance of the recommendations of the TLB study on identification of new tourism sites in the ODRS	High	TLB
This Tourism Sites Identification Report provides a systematic procedure for the identification, classification, and allocation of land within the Okavango Delta Ramsar Site suitable for tourism related activities, while taking into account biodiversity issues and a list of potential sites to either advertise or respond to requests for allocation. The report recommended that of the total number of tourism sites identified, only 23 do not have environmental or development condition(s) that need to be			

weighed prior to deciding to advertise or allocate. 16 sites in the Panhandle and Moremi Game Reserve are not recommended based on the absence of enabling conditions to ensure good visitor experience. 25 of the 37 remaining sites are located in the proposed tourism development zones, which should ensure that tourism and environmental considerations are planned to allow for the proposed approach of tourism-based biodiversity conservation.

### **Strategy 3: Address lack of monitoring of tourism development in the ODRS**

ODMP recommended an effective monitoring system of the impacts of tourism on the ODRS’s tourism resource base. The stakeholder workshop acknowledged that some tourism companies in the ODRS observe environmental management practices, particularly those related to waste management. However, stakeholders also observed that there is lack of monitoring in the various camps in the ODRS, especially by government. In addition, regulations that apply to management of lodge sites and CHAs such as the WMA regulations and other requirements of lease documents, are not rigorously enforced due to the lack of capacity at DEA and NWDC. Stakeholders also argued that where monitoring and inspections are done, they lack credibility, independence, and efficiency because they are done without prior notification of tourism operators. Stakeholders argued that none of the tourism operators are independently monitoring or recording tourism activities in their areas of operation. As a result, for monitoring to be effective in the ODRS it is critical to consider two particular aspects of how monitoring of tourism development in nature-based tourism destinations such as the ODRS should be done. These two aspects are:

- *Monitoring Visitor Impacts* through the tourism planning process for nature-based destinations. In this case, tourism and related objectives are defined and indicators developed. Through periodic measurement of indicators, data on visitor impacts are collected, analyzed and evaluated. TLB, DWNP, DoT do collect data on visitor numbers but there has been little monitoring of the impacts caused by visitors.
- *Monitoring Service Quality* by collecting, analyzing, and evaluating information about the fulfillment of needs and experiences of visitors. In the ODRS, BTO, TLB, DOT, NWDC, and DWNP usually field inspection teams to conduct this kind of monitoring.

<b>Action/Recommendation</b>		<b>Priority</b>	<b>Lead Agency</b>
A.1	Establish monitoring procedures and guidelines	High	ORI, DWNP, BTO
Monitoring procedures, guidelines, and regulations for tourism activities need to be developed and agreed upon by all the stakeholders working in the ODRS. DEA should facilitate and ensure that these procedures and guidelines are developed. The guidelines should provide information on who should do the monitoring and inspection, when and how often monitoring should be done, and where should monitoring data and reports be deposited.			
A.2	Establish a tourism monitoring and inspection organization	High	TLB, BTO
An independent tourism monitoring and inspection organization in the ORDS is recommended. The proposed organization should take the form of the Botswana Tourism Organization, be based in Maun, but operational in the ODRS. This independent organization should be able to provide guidance on who should do the monitoring and inspection, when and how often monitoring should be done, and where should monitoring data and reports be deposited. During the stakeholder workshop participants argued that the need for establishing an independent institution (independent from government) to carry out monitoring activities, especially in relation to waste management, is that the existing tourism industry associations perceive their major role predominantly as being that of promotion and marketing for their members, not as a forum for encouraging members to comply with tourism industry standards. It is from this perspective that an independent monitoring			

and inspection organization for the ODRS is recommended.

**Strategy 4: Develop a database/inventory**

The ODMP notes that it is essential that the relevant implementing authorities have access to timely and reliable data to be able to manage the area and to enforce regulations. A knowledge-based approach to monitoring is proposed to provide the required data and information to the relevant implementing authorities for them to make decisions based on credible information. In addition, the ODMP notes that there should be statistics on tourists visiting the ODRS, data on tourism satisfaction etc. While this is the case, stakeholders noted that while data on tourist numbers and satisfaction may exist, this data is scattered across various institutions and is not integrated (housed) under one institution such as ORI, as initially recommended by the ODMP.

	Action/Recommendation	Priority	Lead Agency
A.1	Establish a data storage and management mechanism	High	ORI
<p>The ODMP recommended that ORI should house all the monitoring data and should be recognized as an institution responsible for monitoring of tourism activities in the ODRS. While this is desirable, it has become evident that ORI researchers are specialized and collect data that relates to their field of interests. This in most cases does not address the two main aspects of monitoring noted above (i.e. monitoring visitor impacts and monitoring service quality). From this perspective, it is recommended that monitoring data can be stored and managed at the independent Tourism Monitoring and Inspection Organization suggested above.</p>			
A.2	Train quality and monitoring experts	High	ORI
<p>It is recommended that the proposed Tourism Monitoring and Inspection organization should be staffed with experts trained in monitoring visitor impacts and service quality. That is, training of quality and monitoring experts should be made a priority in dealing with issues of data inventory for the ODRS.</p>			
A.3	Establish a Tourism Research Unit to coordinate tourism data	High	BTO, ORI
<p>Within the Tourism Monitoring and Inspection organization of the ODRS, there is need to establish a Tourism Unit that will coordinate tourism data stored at the Department of Tourism, Botswana Tourism Organization, Department of Wildlife and National Parks, North-West District Council, Tawana Land Board, and from tourism operators and stakeholders. This unit should be staffed with tourism researchers and statisticians to coordinate tourism research. Particular data required for collection by this unit include: visitor numbers, service quality data, tourism impact data, type and number of tourism facilities etc.</p>			

**Strategy 5: Ensure participation in tourism development in the ODRS by local communities**

The participation of citizens in the tourism business in the ODRS is low. As a result, the ODMP recommended that citizen participation in tourism development in the ODRS should be enhanced. This concern was confirmed by the stakeholder workshop where participants argued that citizens are not involved in tourism development, particularly in the Core Zone of the ODRS. The concern was that the Core Zone remains predominately owned by foreign tourism companies as it was before the ODMP was adopted and it is likely to remain so for the next 30 years or more due to the length of leases favored by foreign firms. This therefore hinders any form of citizen participation in the tourism industry. Stakeholders argued that little citizen involvement in tourism development in the ODRS is

limited to peripheral and marginal parts of the ODRS like NG/4. Barriers obstructing greater participation by the citizens of Botswana include shortage of skills, insufficient or inappropriate financial instruments, deficiencies in government regulations, and a perception of deliberate exclusion of citizens from the tourism industry.

Action/Recommendation		Priority	Lead Agency
A.1	Reduce 30 to 50 year leases to 15 year leases	High	TLB
<p>Long-term leases covering 30 to 50 years especially those in the Core Zone of the ODRS should be discouraged. Instead, 15-year leases are recommended. This means that the existing long-term leases of 30 to 50 years should either be reduced at expiry date or be renegotiated or terminated with the goal of increasing citizen participation in the industry. This approach will reduce the duration and time period in which foreign-based tourism companies will occupy the Core Zone.</p>			
A.2	Increase shareholding of citizen tourism companies	High	BTO, DOT
<p>Tourism companies operating in the ODRS should have some reasonable percentage of citizen ownership for them to operate. These tourism companies should be licensed only if the percentage of citizenship shareholding is established. Increased shareholding of citizens in tourism companies has the potential to reduce the current wave of particular companies monopolizing the tourism business within the ODRS. For example, stakeholders at the workshop noted that the ODRS is slowly falling into the hands of one or two companies. These companies are slowly buying out small tourism companies and putting them out of business. The concern was that having 1 or 2 companies monopolizing tourism development automatically lowers citizen participation and increases risk for Botswana.</p>			
A.3	Improve CBNRM to encourage citizen participation	High	DWNP, DFRR
<p>The CBNRM program in the ODRS requires an improvement or revision such that it encourages greater citizen participation in the tourism industry. As it stands, CBNRM is carried out in marginal and peripheral areas that, in most cases, are not tourism prime areas. CBNRM villages and their CBOs should also have access to core areas to derive meaningful benefits and form true joint venture partnerships with tourism companies.</p> <p>Given that the ODRS is a very fragile ecosystem and that tourism is a major activity in the site, with the attendant concerns of tourism impacts on the fragile environment there is the need to ensure that appropriate management interventions are applied to address such concerns. In this regard, Botswana’s policy of low volume-high cost tourism should continue to apply in the ODRS. All tourism operations/camps in the ODRS should be encouraged to align their operations with the provisions of Botswana Ecotourism Best Practices Manual, which were prepared as part of the Botswana National Ecotourism Strategy. Facilities/accommodation in tourist camps/lodges made of permanent materials should be discouraged in the ODRS.</p> <p>Though considerable strides have been made in addressing issues relating to waste management in the ODRS, a number of critical activities have not been carried out. These include the engagement of the private sector to collect and dispose of solid and liquid waste in settlements in the ODRS; the operationalization of Maun landfill site through procurement and installation of outstanding equipment; and increasing the number of temporary storage facilities in all settlements. The North West District Council should therefore give these activities the highest priority. In addition, NWDC should improve staff capacities.</p>			

## **IMPROVED GOVERNANCE MODEL FOR THE MANAGEMENT OF THE ODRS AND THE IMPLEMENTATION OF THE ODMP**

### ***Strategy 1: Rethink the ODRS governance model***

Under the present institutional arrangements for implementing the ODMP, there is a multiplicity of institutions/bodies and structures involved in the implementation of the ODMP, with DEA/Maun

Regional office having the responsibility of coordinating and monitoring the plan’s implementation. The mid-term review exercise noted the challenges and problems faced by the current dispensation. These range from poor accountability among implementing departments and institutions to duplication of effort and overlapping functions to absence of integration. Management capacities are strongest at the policy level and weakest at local (implementation) level, where policies are operationalized and implemented. Local capacities of the government stakeholder departments to implement and enforce the regulatory framework as originally envisaged in the ODMP and related plans and policies are still weak, suffering from staffing and financial constraints.

Specifically, the appraisal of the current situation revealed that *all the institutional segments for supporting sustainable management in the ODRS, (institutional and organizational capacity, staffing, staff development and support) are still insufficient*. It has also been observed that the capacities of the institutions involved in the management of the ODRS to deal with climate and other environmental changes are also limited, due to absence of adequate and appropriate human resources, as well as their continuing training and capacity building. Finally, it was noted that stakeholders’ engagement in the management of the ODRS is still predominantly on an “informal basis” and therefore it is easy for those interests antagonistic to the ODRS conservation efforts not to participate in any of the formal or informal consultation processes. This, in turn, makes it more difficult to achieve consensus among stakeholder interests.

Given the need for effective coordination of the activities of all the implementing departments and institutions, there have been debates over whether an entirely new single structure should be established to take charge of the overall implementation process of the ODMP. Though this kind of arrangement might have its advantages (clear mandate, clear reporting line, easier coordination and ability to deliver and/or control delivery of the agreed action items), the view is that the introduction of a new plan of implementation agency will not be cost efficient, and lead to overlap and duplication with existing regional arms of government, making the current institutional system even more complicated.

*It is therefore the view that the more viable solution is to devise an ODRS governance model which would, as much as possible, retain the present institutional arrangements* but urgently address (through remedial actions) all the identified problems and challenges. This governance model is expected to:

- Ensure central government commitment in improving enforcement of the current legislative and regulatory frameworks relevant to the management of the ODRS;
- Ensure full cooperation and coordination between all the parties managing the ODRS and conservation of its natural resources;
- Ensure flexibility in implementation of national policies given the peculiarities of the ODRS;
- Provide solutions for involving (empowering) the key (non-government) stakeholders to act as partners to governmental authorities;
- Ensure that staff with necessary skills and experience are engaged;
- Given the identified uncertainties, provide for and strengthen institutional understanding and capacities for implementing the ODRS’s adaptive management and monitoring program.

Relying on best practices implemented elsewhere, it is also the view that the ODRS governance model should be based on following guiding principles:

Principle	Description/Comment
Clear Roles and Responsibilities and	Ensure that roles and responsibilities in ODMP action item delivery is clear (terms of reference for each stakeholder) Ensure that liaison, interaction and data exchange mechanisms between all government odies

Institutional Capacity	Relevant organizations exist and are effective Build on the expertise and technical competencies in existing organizations, rather than placing responsibilities on organizations with no capacity to deliver functions
Secure Resources	Streamline and coordinate planning time frames between sectors Develop efficient inter-sector planning processes and link integrated development plans to budgets across all spheres of government Receive and use government resources for operating the governance structure
Stakeholder Participation	Ensure that all stakeholders and communities are given a formal role in the consultative and decision-making process Build on the positive aspects of the current ODMP and its governance models
Wise (Sustainable) Use of the ODRS Resources are Understood and Defined	The status of the resource needs to be understood by stakeholders involved in the ODRS management and conservation The resources and their use need to be monitored When decisions are made about resource allocation and use the health of the resources and the sustainability of these, need to be taken account of at the decision-making level.
Adaptive Management	Strengthen adaptive management capacity of the stakeholders involved in the management of the ODRS Ensure liaison between all stakeholders in devising a monitoring program capable of supporting adaptive management efforts in the ODRS

Taking into account the aforementioned deliberations in improving and strengthening the ODRS management and sustainable (wise) use the following recommendations are made:

Action/Recommendation		Priority	Lead Agency
A.1	Devise an improved governance structure that will overcome the present problems and challenges in the management of the ODRS and its protection and conservation efforts	High	MEWT, NWDC, ORI

Based on the preferred model, its goals and guiding principles as summarized above, it is suggested that the proposed governance structure of the ODRS be composed of 4 primary groups:

- ODRS Consultative Council,
- ODRS Management Board
- ODRS Adaptive Management Working Group
- ORI Science Advisory Group

The ODRS governance structure proposed would essentially present an equal partnership between central and local authorities (departments) and non-government interest groups, including local community representatives. Ideally, it should be supported by the Cabinet, and established and approved per central government procedures. The arrangements proposed would also require funding commitment from the central government for running costs and the opportunity to raise funds and develop projects with funds from all available sources. The governance structure would have the key responsibilities of overseeing the implementation of the ODMP, coordinating and stimulating relations with all stakeholders, and being proactive in the sourcing, synchronization, and funding of projects.

While Figure 7.1 illustrates the proposed governance structure for the ODRS, the recommended roles and responsibilities of each working group proposed are described below.

#### The ODRS Management Board

As shown in figure 7.1, the proposed governance structure centers on the ODRS Management Board. The Board is envisaged to have both decision-making powers and ultimate responsibility for the implementation of the ODMP. The Board should be the single focal point of leadership and vested with the powers to make decisions necessary to achieve

success in the sustainable management of the ODRS. For all matters relating to the ODMP project, stakeholder implementing government departments will have to be accountable to the appointed Board. In Summary, the roles of the Board would be as follows:

- Oversee and coordinate implementation of the ODMP by all central and local government departments, and by other stakeholders and partners;
- Determine (and/or review) ODMP implementation priorities, taking into account the advice from the Consultative Council, as well as resource availability;
- Approve the Annual Work Program prepared by the ODRS Adaptive Management Working Group, monitor its implementation, and make any necessary adjustments;
- Oversee the implementation of training and capacity building programs for all central and local government stakeholders;
- Monitor the use of government (public) funds and other resources;
- Exercise oversight responsibility for the adaptive management process and direct responsibility for drafting broad policy changes. It is envisaged that it will schedule meetings as often as is necessary to fulfill its functions and responsibilities.

The Board is expected to comprise high-level government officials, non-government experts, and other members elected by the ODRS Consultative Council. The Board is bound to represent the diversity of interests.

The ODRS Management Board is envisaged to be supported by MEWT, which would provide the operating funds. Consequently, the Board would have a direct line of accountability to the MEWT. This would be achieved in the form of a contract between the two parties setting out the roles and responsibilities and the membership of the Board. The relevant ministry should approve the Terms of Reference of the Board and monitor its performance in relation to the implementation of the ODMP. It is also envisaged that the minister of MEWT would be invited to approve the appointments to the Management Board.

#### **The ODRS Consultative Council**

The activities of the Board are expected to be informed by the ODRS Consultative Council, which would provide the forum for stakeholders/community engagement and interaction on various issues of the ODRS and implementation of the Management Plan. It is also envisaged to be a “non- decision making and consultative” forum to generate suggestions and/or recommendations to be considered by the Board during the preparation of the ODMP’s annual implementation plans and programs , and during drafting of policy/thresholds and other changes revealed through the adaptive management process.

Council membership is also envisaged to represent the whole diversity of interests ranging from: (a) central government departments (represented by senior staff from their regional offices); (b) local government (through senior elected representatives and council professionals); (c) parastatal representatives to (d) non-government sector. Non-government sector representation is envisaged the be substantial and drafted from all relevant bodies representing local communities, agriculture, farming, natural resource interest groups, commercial mining, agriculture, fishery, tourism business interest groups and associations, and local and national environmental groups (NGOs).

With regard to accountability it is envisaged that the Council would have a direct line of accountability to the ODRS Management Board. Accordingly, the Board will monitor the composition of the Council’s membership to ensure that it meets the requirements of full stakeholder representation, periodically assess its performance, and seeks its advice on all key matters regarding the implementation and periodic review of the ODMP.

The Council would meet when there is opportunity for its contributions, such as during preparation of the Annual Work Plan or the periodic review of the Management Plan.

#### **The ODRS Adaptive Management Working Group (ODRS Executive Group)**

As illustrated in Figure 7.1, the Board is also expected to be supported by the ODRS Adaptive Management Working Group. The group would have executive functions and be responsive to the directions provided by the ODRS Management Board. Another ultimate objective of this executive group would be to coordinate adaptive management activities and on the basis of scientific information and/or expert advice provided by the ORI Science Advisory Group, draft and forward

ODRS thresholds and/or policy changes that may be required back to the Board.

The ODRS Adaptive Management Workgroup would comprise senior staff members of the key government and parastatal departments and/or organizations with responsibility (and powers) in ODRS management, as well as its natural resources and land use control. The organization of this group is expected to maximize the use of staff and resources available within existing government/parastatal/non-government organizations rather than adding new resources which might result in duplication and inefficient use of existing staff. The group is also expected to take advantage of organizational structures already in place. With regard to this, it is suggested that DLUPU be enlarged with additional key stakeholders (those originally not included), and successfully embrace the ODRS Adaptive Management Working Group.

As illustrated in Figure 7.1 the ODRS Adaptive Working Group should convene a Technical Working Group to be composed of technical representatives and information management coordinators from the key stakeholder departments and/or organizations. The main function of the working group would be to provide technical assistance to the ODRS Adaptive Management Work Group. However, the strategic charge of the Technical Working Group would be to conduct an assessment of information needs, data formats, data usage and storage, and hardware and software in use by the key government and other stakeholder departments and/or organizations involved in ODRS management and land use control. The Group is expected to work hand in hand with the ODRS Adaptive Management Group and ORI Research Advisory Group to develop recommendations for an integrated monitoring and development tracking information management system, to be hosted by ORI (monitoring) and TLB (development tracking information system).

The DEA Maun Regional Office should maintain its role and functions of coordinating activities concerning ODMF implementation, and serving as secretariat for the proposed ODRS governance structure. However, it is strongly recommended that a separate unit/division be established within the DEA Maun Regional Office to be solely responsible for providing full-time services to the proposed ODRS governance structure. A designated senior officer should be appointed for this unit/division, with requisite experience in the management of wetland environments such as the ODRS and be multi-disciplinary in training, with strong managerial skills. He/she would be appointed as the ODRS Management Board’s secretary.

**ORI Science Advisory Group**

Within the proposed ODRS governance structure, the ORI Science Advisory Group is envisioned to design and conduct research and monitoring activities to meet the needs of the ODRS Adaptive Management Work Group and the tenets of ecosystem science. The ORI would serve as the science center for the ODRS adaptive management program. It will lead the monitoring and research of the ODRS biodiversity and ecosystem services and facilitate communication and information exchange between scientists and members of the Technical Working Group and Adaptive Management Work Group. Other functions of the ORI group will be to:

- Advocate quality, objective science, and the use of that science in the adaptive management decision process;
- Provide scientific information about resources in the ODRS;
- Support the Adaptive Management Working Group in a technical advisory role;
- Develop research designs and proposals for implementing monitoring and research activities in support of information needs;
- Prepare and forward technical management recommendations and annual reports, as specified in the TOR to the Technical Working Group;
- Manage data collected as part of the Adaptive Management Program and serve as a repository of other information about the ODRS’s biodiversity and ecosystem;
- Develop, with the Technical Working Group, criteria and standards for monitoring and research programs;
- Develop, together with the Technical Working Group, the ODRS’s resource management questions (i.e., information needs); and
- Assist Adaptive Management Working Group in producing the State of the ODRS’s Biodiversity and Ecosystem Report, that may be requested.

A.2	Ensure proactive response to the need for more diverse capacity building which would raise stakeholders’ ability to manage the ODRS wisely and to respond to immediate or long-term impacts promptly	High	All government stakeholders
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Given the magnitude of the current pressures on the ODRS and alarming signs about ecosystem resilience, there is a widespread agreement that institutional capacity (together with an overall organizational framework) are critical factors in reversing these negative trends and enforcing wise use and sustainable management of the Delta.

Institutional redesign (i.e. structural changes) and investment in people - continuing training and maintenance of competent staff – are seen as the most critical requirements for leveraging the key government stakeholders’ readiness in the wise use and management of the ODRS. With regard to staff capacity building, special emphasis is expected to be given to knowledge development and operational management, which should not be complementary to the management of the ODRS, but an integral part.

All consulted for this review agreed that achieving desired capacity levels within all government stakeholder departments would require the following:

- Enhancing staff skills in using and managing the Delta wetland ecosystem wisely;
- Building departmental capacities to better adapt to expected climate and other environmental changes in the ODRS;
- Leveraging staff skills in modern GIS-enabled data management, automation, and monitoring techniques and technologies, including capacity building in geo-processing, mapping, and imagery interpretation and analysis;
- Enhancing staff experience, knowledge and information exchange of wetland management in both directions, namely top down (implementation) and bottom up (adaptation) process.

It was also the view that institutional capacity building generally has a steep curve and therefore continual (evolutionary) training, (followed by the appropriate on-the-job reactive support) must be at the heart of modernization and technology transfer processes within all government stakeholder departments. This evolutionary capacity building program should be developed to:

- Allow personnel to increase their technical expertise and stay abreast of rapid changes in the field of their expertise; and
- Provide a continual flow of new personnel into the training stream.

Government stakeholder departments must ensure that staff needs are recognized, regularly reviewed, and that steps are taken to determine appropriate capacity building plans and resource allocation. This also implies putting in place in-depth guidelines for formulating department capacity building plans. It should contain the following:

- Categorization of staff in the department, with regard to their role in the management and ODMP implementation;
- The competence framework (a list of skills that should be acquired to achieve and maintain the ODRS’s sustainability and wise use of the ODRS);
- Methods of training and/or learning that can be undertaken along with recommended scenarios and financial resource allocations.

A.3	Embark on preparation of the training and capacity-building needs assessment study for government and partner institutions involved in the management of the ODMP and conservation	Medium	ORI
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During this MtR it was strongly suggested to task ORI to conduct a comprehensive capacity building and training needs assessment study. The study is expected to:

- Identify gaps within the existing knowledge base at the ODRS and community levels;
- Assess the level and ranges of available skills and devise effective methods for sharing them;
- Determine the requirements for upgrading of skills; and
- Identify the requirement for acquisition of new and specialized skills.

The needs assessment is bound to be the foundation of a long-term strategy to develop and acquire the capacity for sustainable management of the ODRS at all levels. The study will also be expected to generate a comprehensive and long-term stakeholder training plan as a part of strategic planning and investment efforts to build the requisite skills for effective and sustainable management of the ODRS.

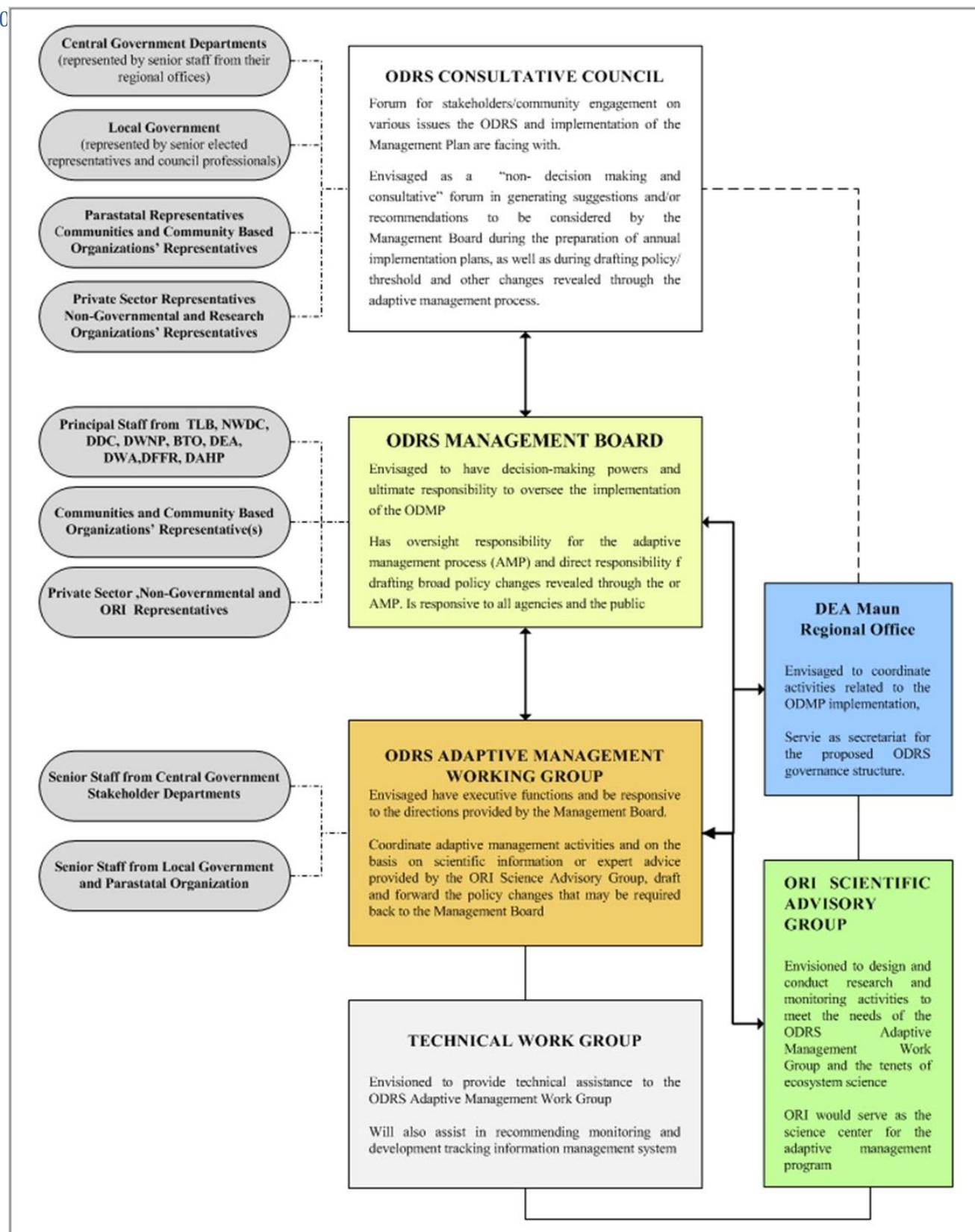


Figure 7.1: The Proposed ODRS Governance Structure

## Roles and Responsibilities in the Implementation of the ODMP

Apart from the governance model proposed in the above recommendations, specific implementation roles and responsibilities for implementing various recommended programs, projects, and action items of the plan must be clearly spelled out. Such roles and responsibilities will lie with stakeholder implementing government departments, relevant parastatal bodies, Tawana Land Board, local authority institutions/committees, OWMC, ORI, concessionaires, tourism operators, and community-based structures among others. Table 7 shows departments/institutions and other structures that will be involved with the implementation of the revised ODMP and their proposed implementation roles and responsibilities

**Table 7.1 Implementing Institutions/Structures and Their Proposed Roles and Responsibilities in the Revised ODMP**

CENTRAL GOVERNMENT DEPARTMENTS/ INSTITUTIONS	IMPLEMENTATION ROLES AND RESPONSIBILITIES
Department of Environmental Affairs Ministry of Environment Wildlife and Tourism	Overall responsibility for coordinating and monitoring the implementation of the ODMP. Establish a co-management framework for the implementation of the ODMP. Facilitate the harmonization of all legislation and policies relevant for the implementation of the ODMP and applicable to the ODRS. Raise public awareness about ODMP and conduct outreach and education programs for ODRS communities. Facilitate overall implementation of the ODMP by securing a centralized funding arrangement for all ODMP projects and programs. Provide policy direction and play a supervisory role over all other implementing institutions. Facilitate the approval of the ODMP as a statutory lan by Cabinet through statutory instrument.
Department of Wildlife and National Parks Ministry of Environment Wildlife and Tourism	To administer and enforce the regulations of the Wildlife Conservation and National Parks Act of 1992. Intensify anti-poaching activities in the ODRS. Ensure that all the guidelines relating to wildlife use and conservation are enforced and implemented by concessionaires and communities in ODRS. Assist in monitoring of biodiversity status. Empower communities in the control and management of wildlife resources. Address all issues of HWC through consultative approaches with communities.
Department of Tourism Ministry of Environment Wildlife and Tourism	Administer and implement the Tourism Act of 1992 in the ODRS, in terms of regulating tourism developments and activities of tour operators in the ODRS. Always liaise with BTO, DWNP, and TLB on all issues relating to enforcement of guidelines and regulations for tourism development. Work toward empowering communities for greater participation in the tourism industry. Implement those aspects of the NTDP that fall within the mandates of DOT regarding issues of tourism development.
Department of Water Affairs Ministry of Minerals, Energy, and Water Resources	Use and continually update the integrated hydrologic model for the ODRS in understanding the hydrological processes in the Okavango Delta. Establish a water quality monitoring system with water quality monitoring sites in the ODRS. Enforce the provisions of the Aquatic

	(control) Act of 1971 and ensure adherence to the guidelines for clearance of channel blockages and prevention of spread of aquatic invasive species in the Delta.
Department of Forestry and Range Resources Ministry of Environment Wildlife and Tourism	Be involved in implementation of all guidelines and regulations for use of vegetation resources (Agriculture Resources Conservation Act of 1974 and Agricultural Resources Board Policy 1975). Establish and empower Village Natural Resource Conservation Committees in ODRS communities. Regularly monitor their activities to ensure that they comply with guidelines. Review upward permit fees for commercial harvesting of woody vegetation. Control movement of plant materials. Develop program for endangered and threatened species. Manage fires.
Department of Animal Health and Production Ministry of Agriculture	The department will have the responsibility of driving and ensuring the implementation of all recommendations on arable and pastoral agriculture in the ODRS. Implement recommendations on cordon fences for disease control. Work closely with and empower farmers in the communities. Ensure that tsetse fly is completely eradicated from the Delta.
Department of Veterinary Services Ministry of Agriculture	Ensure livestock disease control in ODRS. Erect, align, maintain veterinary fences. Maintain wildlife corridors.
Department of Waste Management and Pollution Control Ministry of Environment Wildlife and Tourism	Administer and ensure adherence to the Waste Management Guidelines for the Delta by all concerned parties in the ODRS. Continuous monitoring of the levels of pollutants in the ODRS to ensure that they are within environmentally acceptable levels. Register, licence, and regularly inspect all waste management facilities in the ODRS to ensure that environmental standards and designs are compliant. Monitor the collection, disposal, and treatment of controlled waste. Monitor trans-boundary movement of hazardous waste.
Fisheries Division	Drive implementation of the recommendations of the Fishery Management Plan for the Okavango Delta. Issue fishing permits and monitoring compliance. Review upward the fishing fees contained in the fish protection regulations of 2008.
<b>DISTRICT (Local Government Institutions)</b>	<b>IMPLEMENTATION ROLES AND RESPONSIBILITIES</b>
Tawana Land Board	Exercise overall responsibility for land allocations in the ODRS in accordance with recommended guidelines of the ODRS land use and land management plan. Conduct regular inspection visits to concession areas, including camps and lodges, to ensure compliance with terms and conditions of lease agreements. Mainstream biodiversity management into its decision making process. Ensure sustainable land use management and settlement patterns.
North West District Council (NWDC)	Provide services to settlements in the ODRS.
North West District Council Physical Planning Unit	Receive and process all applications for land development in the ODRS. Ensure that land use planning standards and guidelines are met.

	Prepare Settlement Development Plans. Advise TLB on all land use/zoning matters.
District Land Use Planning Unit	Provide technical advisory assistance to TLB on a regular basis on all land use issues.
<b>Parastatal Entities</b>	<b>IMPLEMENTATION ROLES AND RESPONSIBILITIES</b>
Botswana Tourism Organization	Market tourism products in the ODRS. Grade and classify tourism accommodations. Prepare management plans for concession areas. Inspect camps and lodges.
Civil Aviation Authority of Botswana	Ensure aviation safety in the ODRS. License and inspect airstrips.
<b>Private Sector and Non-Governmental Organizations</b>	<b>IMPLEMENTATION ROLES AND RESPONSIBILITIES</b>
Tour Operators and Concessionaires	Manage concessions. Monitor biodiversity in concession areas. Undertake tourism development in accordance with prescribed guidelines.
Okavango Wetlands Management Committee	The OWMC consists of all stakeholders — government, civil society, private sector — in the Okavango Delta that are responsible for addressing wetland management issues. The Committee meets on an ad-hoc basis to discuss critical and p[ertinent issues of concern which require cross sector-coordination to ensure successful mitigation
The Permanent Okavango River Basin Water Commission (OKAKOM)	The Permanent Okavango River Basin Water Commission advises the three riparian states about the best possible use of the river's natural resources, and as technical advisor to the three riparian states, alerts the governments of the three countries about transboundary issues in the basin and facilitates an ongoing dialogue among the basin's stakeholders.
Hospitality and Tourism Association of Botswana	Provide and enforce code of conduct on all tourism business. Promote the tourism industry. Champion the business interests of its members through lobbying for a conducive legislative business environment.
BirdLife Botswana	Conserve bird species, breeding sites, and habitats. Prevent extinction of any bird species in the wild. Conserve biodiversity through birds.
Kalahari Conservation Society	Promote knowledge of ODRS's rich wildlife through education and publicity. Encourage and finance research into natural resource conservation.
Okavango Research Institute	Develop ODIS. Provide technical support for the implementation of the ODMP. Natural resource management and conservation research.
Non – Governmental Organizations	Building capacity among various communities in sustainable land and other natural resource use and management; Assistance in the formation and running of CBOs; skills development; and community mobilization for community projects.

Communities and Community-Based Organization	IMPLEMENTATION ROLES AND RESPONSIBILITIES
Village Development Committees	Play vanguard roles at the village level in implementing and monitoring all aspects of recommended guidelines and regulations for land use and management; natural resources use and management; initiation and execution of community development projects, with assistance from DLUPU, PPU, TLB, and other government departments; community mobilization for greater involvement in land use and natural resources use and management.
Conservation Committees	Implement the provisions of the Agricultural Resources Conservation Act, Agricultural Resources Board Policy, and Fish Protection Act, and monitor their implementation at village level; community mobilization; seek advice from officials of the Agricultural Resources Board, Department of Forestry and Range Resources and Fisheries Division on sustainable use and management of natural resources.
Community Based Organizations (trusts, CBNRM programs etc.)	Be involved in facilitating and implementing the recommendations of ODMP through their respective organizations; work closely with NGOs and government departments to build their capacities to implement community projects for income generation; working as joint venture partners with tour operators; and sustainable use of land and other natural resources.

# MONITORING FRAMEWORK

Effective management and conservation of the ODRS wetlands are hampered by the lack of baseline and short- and long-term monitoring data because few broad or in-depth sampling efforts have been made. There are several factors contributing to the lack of monitoring data in the ODRS. Chief among them are the limited financial and human resources, and the lack of an appropriate monitoring framework to guide development of monitoring plans. The mid-term review of the ODMP also identified insufficient institutional capacity and fragmented and uncoordinated monitoring efforts as major drawbacks.

Recent reviews (e.g. King 2011) conducted as part of the TDA of the Okavango River Basin and the SEA for ORDS (Ecosurv, 2012; Southern African Institute for Environmental Assessment, 2012) unanimously agreed that the ODRS wetlands are relatively undisturbed owing to its protected status. However, the reviews revealed that the ODRS faces enormous pressure from natural and anthropogenic forces such as climate change, agriculture development, tourism development, mining, and water development schemes. It is therefore obvious that the future of the ODRS hinges on scientifically informed adaptive management decisions, particularly at various political levels. Scientifically informed decision making rests on well-coordinated scientific research findings and the availability of long- and short-term monitoring data for decision-makers. Except for hydrological data collected at Mohebo (since 1933) and other strategic areas within the Okavango Delta, there is little or no monitoring data available for biodiversity and socio-economic parameters at play within the ORDS. Past monitoring efforts were fragmented due to poor planning and poor data management. This situation is largely due to the absence of a comprehensive monitoring strategy or framework for the ODRS.

## INSTITUTIONAL CAPACITY AND INSTITUTIONAL ARRANGEMENTS

The mid-term review observed that most institutions that are statutorily mandated to develop and implement monitoring programs within the ODRS have limited capacity to do so. For example, the DWNP has not been able to conduct wildlife aerial surveys since the year 2004 because of financial constraints.

This recommended monitoring framework recognizes that monitoring can be cumbersome, time consuming, and expensive. These issues can be resolved by pooling resources – human and financial resources at departmental/institutional level. This recommended monitoring framework proposes an integrated, multidisciplinary monitoring team, drawing participation from different departments' mandates to monitor specific parameters within the ODRS through periodic rapid assessments. The monitoring framework proposes engagement between government departments and the University of Botswana. There is immense potential to benefit from the human resources housed in institutions such as ORI and the Botswana College of Agriculture. Such institutional arrangements can be consolidated through memorandums of agreement between concerned institutions. For example, the University of Botswana and the MEWT signed a memorandum of agreement advocating for close collaboration in key strategic areas. Monitoring of various parameters within the ODRS should qualify as one of the strategic areas calling for collaboration between relevant University of Botswana structures such as ORI and the DWNP.

The proposed monitoring framework recognizes the potential for monitoring that exists within the companies conducting tourism business in the ODRS. As tourism facilities are widely spread throughout the ODRS, they have opportunities for a wider spatial coverage of monitoring sites. The proposed framework is further supported by the fact that a number of tourism companies doing business within the ODRS have been conducting monitoring for some time. The shortcomings of the monitoring conducted by tourism companies have been the use of unstandardized monitoring methods and the use of different indicators and the lack of statutory instruments to guide and regulate monitoring activities. Fortunately the recently reviewed Wildlife Management Areas (WMA) Regulations and Community, Wildlife and Natural Resources and Tourism Lease Agreements (2009) provide for the development of management plans with a strong monitoring component, thereby making monitoring a statutory requirement.

The monitoring framework recommended below recognizes local communities as major stakeholders within the ODRS. With proper coordination and guidance, local communities can contribute significantly to the monitoring agenda of the ODRS. The proposed monitoring framework embraces MOMS, an approach based on the principle of adaptive management (Martin, 2003). Unlike conventional systems of management, MOMS is designed around meeting the information needs of the local community. MOMS is a system which gathers and provides critical information to the person(s) responsible for local level adaptive practices and management. DWNP is currently implementing MOMS in all the protected areas (national parks and game reserves) and their immediate environs but with limited success due to resource constraints. Despite the limited success of MOMS, this framework proposes strengthening and up-scaling of the MOMS activities.

## **OBJECTIVES OF THE MONITORING FRAME WORK**

The objectives of the proposed monitoring framework for the ODRS are to:

- Provide a comprehensive framework for developing monitoring programs for the ODRS based on the IF-WIAM for the Ramsar Site (CoP 9, 2005).
- Provide basic monitoring matrices for different drivers of change and thresholds as identified by the SEA Scoping Report (Ecorsuv, 2012) and the Thresholds Report (Southern African institute for Environmental Assessment, 2012)
- Provide a cost-effective, scientifically-based mechanism for addressing key monitoring questions
- Provide a mechanism by which monitoring results can be incorporated in decision-making and adaptive management

## **THE MONITORING FRAMEWORK APPROACH**

This recommended monitoring framework takes into account all the realities on the ground with regard to human resources, funds, and institutional capacity. These will be dealt with in detail by monitoring plans to be guided by this recommended monitoring framework. The framework is largely guided by the Ramsar Handbook 13: Inventory, Assessment and Monitoring of Wetlands that provides an Integrated Framework for wetland inventory, assessment and monitoring (IF-WIAM). The commitments embodied in the Ramsar Convention further guide the recommended monitoring framework. Such commitments entail:

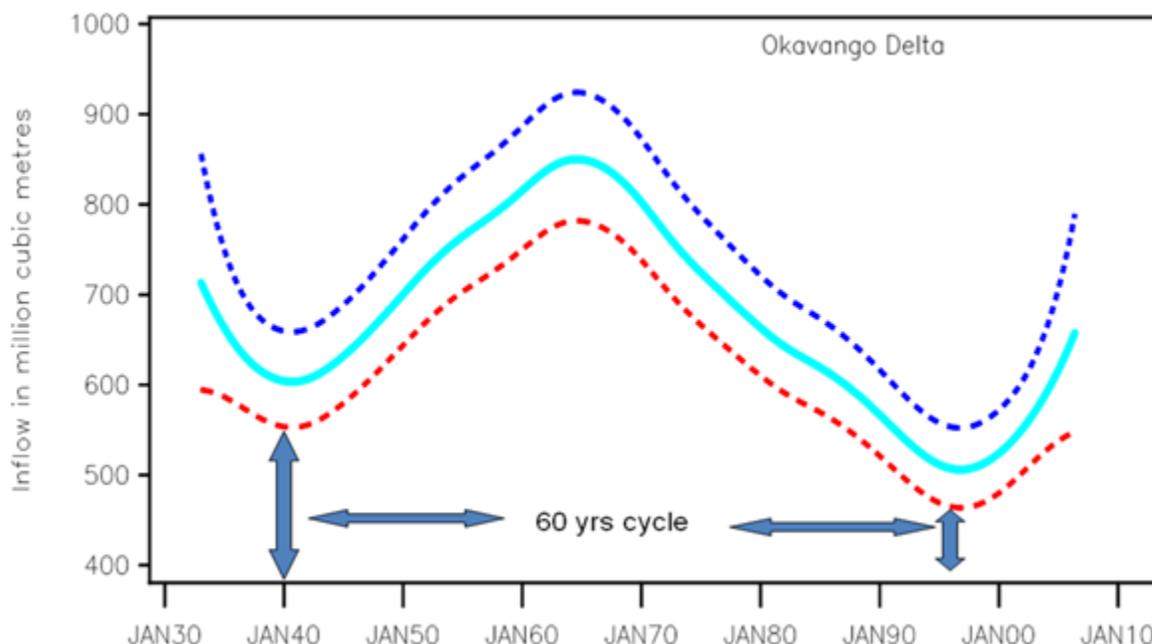
- Establishing the location and ecological characteristics of the wetland (**baseline inventory**);
- Assessing the status, trends, and threats of wetlands (**assessment**);
- Monitoring the status and trends, including the identification and reduction of existing threats and appearances of new threats (**monitoring**);
- Taking action (both *in situ* and *ex situ*) to redress any such changes causing or likely to cause damaging change in ecological characteristics (**management**).

The monitoring framework attempts to benefit from recently developed thresholds for use in the SEA of the ODRS developed by the Southern African Institute for Environmental Assessment. However, this framework appreciates the limitation of the Thresholds Report, particularly that it is difficult to develop clearly defined thresholds and targets for such a dynamic system as the ODRS with limited data at hand.

## WETLAND INVENTORY

The recommended monitoring framework is largely guided by the Ramsar IF-WIAM wetland inventory that refers to the collection and/or collation of core information for wetland management, including the provision of an information base for specific assessment and monitoring activities (CoP9). The framework recognizes that the location and ecological characteristics of the ODRS have been documented, but on a very coarse scale which is not valuable for management. Various authors (e.g. Ellery and Ellery 1997) have observed that fluctuations in hydroperiods bring about major changes in wetland biophysical characteristics of the Delta wetlands and influence socio-economic activities such as tourism, fishing, reed-cutting, and settlement patterns. It has been noted that flood pulses influence the distribution of floodplain wetlands, lagoons, and channels and their associated vegetation. The shifting of floodplains and other riparian zones is particularly important.

This monitoring framework therefore recommends a comprehensive baseline wetland inventory that documents the distribution of different ecological and hydrological zones, notably the permanent swamps, seasonal floodplains, secondary floodplains, and tertiary floodplains at a given flooding regime, taking into account the cyclical nature of the flooding patterns as presented in Figure 8.1.



**Figure 8.1: 10 years moving average of the inflow at Mohembo over the past 80 years (adopted from Bonyongo 2007)**

It is critical to fully consider that both biophysical and socio-economic factors are largely influenced by the pulsing cyclic floods. For example, vegetation and wildlife behavior observed during high floods (the mid-1960s) and low floods (the mid-1990s) will be completely different (Figure 8.1). The presence of dry and wet multi-decadal phases (Figure 8.1) in the ODRS requires due diligence in the planning of inventory programs, particularly the establishment of appropriate baseline data. It is highly likely that the spatial distribution and spatial extent of floodplains, channels, pools, swamps, and lagoons under the high floods (late 1950s to mid-1960s) (Figure 8.1) was significantly different. This recommended monitoring framework is being developed during a high flood regime, which suggests that the time is opportune for a baseline inventory of the ODRS wetlands under a high flood regime.

### **Wetland Inventory Questions**

The following general questions should serve to guide an inventory of the ODRS wetlands:

1. What is the spatial distribution of different components (active seasonal floodplains, occasionally flooded floodplains, permanent swamps, riparian woodlands) of the ODRS wetlands?
2. What is the present condition of the ODRS wetlands?
3. What flora and fauna species are present?
4. What is the spatial distribution of flora and fauna found in the ODRS?
5. What are the key characteristics of specific populations within the ODRS ecosystem?
6. What are the similarities and differences between changes in biological communities at sites of differing environmental conditions?
7. What are the current settlement patterns in the ODRS?
8. What are the key land use activities within the ODRS?

### **Wetland Assessment**

This framework recognizes wetlands assessment as a critical undertaking in the management of the ODRS. Wetland assessment is here defined as the identification of the status of, and threats to, wetlands as the basis for the collection of more specific information through monitoring activities (CoP9, 2005). The midterm review and gap analysis of the ODMP concluded that the ODRS remains relatively undisturbed, but noted threats of varying degrees which include agricultural development (both arable and livestock), tourism development, mining, fires, illegal hunting, conflicting land uses, and rapid population growth. Despite these threats, to date very few comprehensive assessments of the status of the ODRS have been conducted. Apart from three rapid assessments conducted in the years 2000, 2003, and 2007, assessments of the ODRS has remained fragmented and limited to localized assessments at the concession level as part of management plans for tourism businesses. This monitoring framework recommends a comprehensive assessment of the ODRS wetland with a view of deriving monitoring questions and their associated hypothesis.

In appreciation of the Ramsar IF-WIAM, this monitoring framework recognizes nine types of wetland assessment with each suited to and designed for specific purposes and situations. These include:

- Environmental Impact Assessment (EIA);

- Strategic Environmental Assessment (SEA);
- Risk Assessment (RA);
- Vulnerability Assessment (VA);
- Change (status and trends) Assessment;
- Species –Specific Assessment;
- Indicators Assessment;
- Resources (ecosystem benefits/services) Assessment;
- Assessment of various wetland benefits/services;
- Environmental Water Requirement (environmental flows) Assessment.

Detailed descriptions of the above types of assessments appear in the report of the 9<sup>th</sup> Meeting of the Conference of Parties to the Convention of Wetlands (Ramsar, Iran, 1971).

### **Rapid Wetland Assessment**

This monitoring framework embraces the rapid assessment approach recommended by the Ramsar IF-WIAM (CoP 9, 2005), which is generally cheaper and quicker. Rapid assessment is a synoptic assessment undertaken as a matter of urgency in the shortest timeframe possible to produce reliable and applicable results for its defined purposes (9th Meeting of the Conference of Parties to the Conversation on Wetlands, 2005). The rapid assessment will include review of available information (desk studies), expert group meetings (tour guides, tourism businesses, hunters, and photographic tour operators), environmental managers, community consultations (traditional leaders, community leaders), and field observations. Rapid assessment methods can be particularly useful in the assessment of natural and anthropogenic disasters such as wildfire, droughts, and excessive floods.

### **Wetland Assessment Questions**

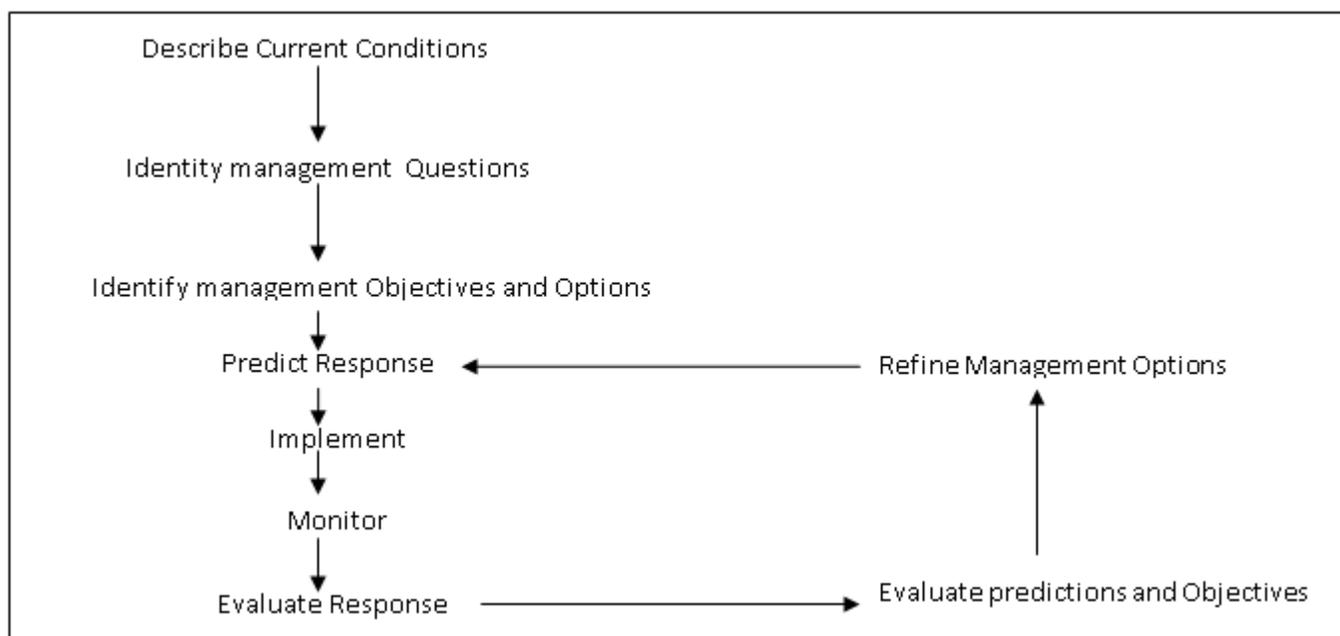
This framework strongly recommends that assessment should be based on a set of clear assessment questions as prescribed by the IF-WIAM for the Ramsar Site (CoP 9). Questions to be considered should include but not be limited to, the following:

1. What is the current status of the ODRS wetland?
2. What is the status of biodiversity in the ORDS?
3. What is the status of water quality in the ODRS?
4. What are the main drivers of ecosystem functioning in ODRS wetland?
5. What is the relationship between ecosystem components and ecosystem processes?
6. What parameters can be used to measure the effects of altered environmental conditions?
7. What are the threatening processes in the ODRS?
8. Is the ODRS wetland at risk?
9. What responses will ecosystem components and processes have to current or proposed management actions?
10. Do expected responses signify damage?

## Wetland Monitoring

This monitoring framework recognizes wetland monitoring as a challenging undertaking that requires diligent planning to avoid wasting resources and collecting meaningless data. This monitoring framework therefore draws inspiration from the working definition for the Ramsar IF-WIAM which recognizes wetland monitoring as the collection of specific information for management purposes in response to a hypothesis derived from assessment activities. This monitoring framework further recognizes monitoring as a process that generates information for management actions and judgments. Most importantly, monitoring should be able to detect and measure change in reference to a set of objectives (Baldwin, 2005) to allow adaptive management decision-making.

The ODRS monitoring framework adopts the adaptive management framework, which was modified from Tucker (2003) by Baldwin (2005) (Figure 8.2). It is essential that in designing an adaptive management-oriented monitoring framework that the monitoring objectives and questions are clearly articulated, and that the monitoring program is based on an agreed conceptual model of how the system functions.



**Figure 8.2: Adaptive Management framework- (Modified from Tucker 2003 by Baldwin 2005)**

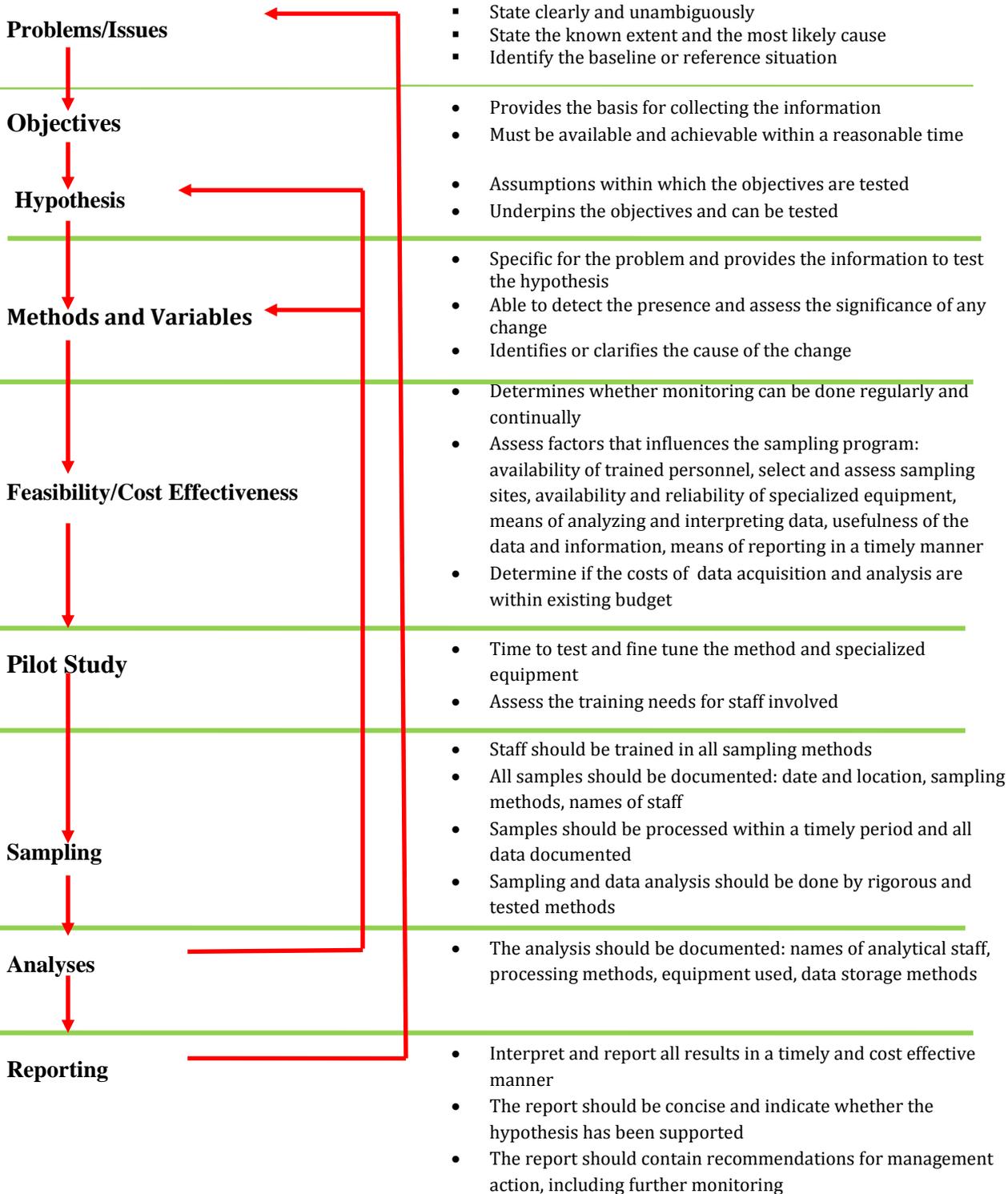
## Wetland Monitoring Questions

The recommended monitoring framework describes short- and long-term monitoring following the framework for designing a wetland monitoring program recommended by the Ramsar Wise Use Handbook (18, 4th Edition) (Figure 8.3). The advantage of this approach (Figure 8.3) is that the monitoring program is problem oriented, and preceded by clear problem definitions on which to base questions, objectives, and hypotheses (Figure 8.3). This approach guarantees the collection of appropriate, meaningful data that supports adaptive management of the ODRS. The approach also guarantees good quality data because it advocates for the development or selection of appropriate methods suited for a particular monitoring question (Figure 8.3).

The SEA Scoping Report (Ecosurv, 2012) and the Thresholds Report (Southern African Institute for Environmental Assessments, 2012) defined monitoring issues. Major management decisions and interventions that require monitoring have recently been made by the relevant authorities. A classic example is the change in hunting management by the Department of Wildlife and National Parks, which stopped hunting in all controlled hunting areas within a 25 km radius from national parks and game reserves. The implications of this change in hunting management are largely unknown, thereby calling for a monitoring plan for wildlife populations, wildlife behavior, and socio-economic activities, such as illegal hunting and poverty within communities that used to rely on game meat as part of their diet.

Other recent management decisions include the eradication of tsetse fly in the Okavango Delta and the erection of an electric fence separating livestock and wildlife in the Boteti area. Socio-economic and socio-ecological implications of these major interventions remain largely unknown, due to lack of monitoring data. This monitoring framework therefore strongly recommends that monitoring questions be developed for all recent and major developments. These questions should subsequently lead to the development of appropriate monitoring plans.

The SEA Scoping Report identified key drivers of change within the ODRS manifesting at different spatial scales: global drivers, regional drivers, national drivers, basin-wide drivers, and drivers within the Delta. The multi-scalar nature of the drivers of change calls for monitoring programs to recognize scale as a critical variable. Wetland monitoring, as with inventory and assessment, can be undertaken at discrete spatial scales, using different approaches and techniques, and monitoring questions should explicitly define scale.



**Figure 8.3: Framework for designing wetland monitoring program (from Ramsar Wise Use Handbook 13, 4<sup>th</sup> Edition)**

## **THE ODRS MONITORING MATRIX**

The recommended monitoring framework for the ODRS as influenced by the IF-WIAM for the Ramsar Site (CoP 9, 2005) is summarized in a matrix form (Table 8.1, Table 8. 2 and Table 8.3). It is critical to note that the matrices provide the bases on which detailed monitoring plans will be made by relevant stakeholder departments/institutions. Based on this framework, implementing institutions/departments will develop detailed monitoring plans following the conceptual frameworks. Detailed monitoring plans will define appropriate methods based on the problems, hypotheses, and objectives of the indicators and their associated variables (Figure 8.3). The methods will also define the frequency of monitoring, unpack the indicators and their associated variables, and define responsible personnel. The monitoring matrices draw significant guidance from the thresholds and drivers of change which were identified as part of the development of the SEA framework of the ODRS.

## **MONITORING MATRIX AND DRIVERS OF CHANGE**

Ecosurv (2012) identified biophysical and socio-economic drivers of change as critical driving forces governing the functioning of ODRS wetlands. Biophysical drivers here refer to the living (biological) and the nonliving (the physical) components of the environment (Foundation for Ecological Security, 2011) that can drive environmental changes, as well as respond to environmental changes. In the ODRS, critical biological drivers of change include wildlife, vegetation, and human beings. While wildlife and vegetation are considered drivers of change, they can also serve as indicators of ecosystem health. Socio-economic drivers of change identified by Ecosurv (2012) include arable agriculture, the livestock sector, tourism, and mining. These are socio-economic activities that can lead to environmental changes as well as respond to environmental changes. Based on the identified drivers of change, the Southern African Institute for Environment Assessment (2012) established thresholds and targets that can guide management and monitoring in the ODRS. This recommended monitoring framework therefore developed monitoring matrices based on the identified drivers of change and their associated indicators.

Table 8.1 presents the monitoring matrix for biological indicators, while Table 8.2 presents a monitoring matrix for hydrology and water-related parameters that can be monitored to determine the health of different ecosystems within the ODRS. The matrix for monitoring socio-economic indicators is presented in Table 8.3.

**Table 8.1 Matrix for Monitoring of Biological Parameters as Part of the ODRS Monitoring Framework**

Biological Drivers	Scale	Threats	Current Status and Management Issues	Indicators	Main Targets
<b>Fish &amp; Wildlife</b>	ODRS	<ul style="list-style-type: none"> <li>• Human induced habitat conversion</li> <li>• Unsustainable harvesting</li> <li>• Competing land use claims</li> <li>• Fires</li> <li>• Extraction of water</li> <li>• Climate change</li> <li>• Land use changes</li> <li>• Invasive species</li> <li>• Human induced habitat fragmentation</li> <li>• Fences</li> </ul>	<p>Previous assessments reported stable wildlife population except for recently reported declines in some large herbivore populations (Chase, 2011). A number of rapid assessments which were conducted across the Delta (2000, 2003 and 2007) did not identify any major ecological problems associated with aquatic diversity.</p>	<ul style="list-style-type: none"> <li>• Habitat availability</li> <li>• Habitat suitability</li> <li>• Habitat connectivity</li> <li>• Large herbivore movements</li> <li>• Wildlife population (carnivores, herbivores, birds, fish, amphibians)</li> <li>• Natural mortality</li> <li>• Demographic structure</li> <li>• Poaching incidences</li> <li>• Fire frequency</li> <li>• Incidences of livestock depredation</li> <li>• Legal hunting off-take</li> <li>• Fish stock</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced unsustainable and illegal harvesting</li> <li>• Maintain minimal anthropogenic habitat conversion</li> <li>• Reduce human wildlife conflicts</li> <li>• No introduction of alien invasive species</li> <li>• Maintain a viable population of rare and endangered species</li> </ul>
<b>Vegetation</b>	ODRS	<ul style="list-style-type: none"> <li>• Human induced habitat conversion</li> <li>• Unsustainable harvesting</li> <li>• Competing land use claims</li> <li>• Fires</li> <li>• Extraction of water</li> <li>• Climate change</li> <li>• Land use changes</li> <li>• Invasive species</li> <li>• Human induced habitat fragmentation</li> </ul>	<p>Aquatic and terrestrial vegetation biodiversity in most parts of the Okavango Delta is currently in good natural condition due to its protected status except in localized cases where fires and excessive harvesting have been observed.</p>	<ul style="list-style-type: none"> <li>• Plant species diversity (species richness, species composition, species abundance, and distribution)</li> <li>• Productivity</li> <li>• Prescience of endangered species</li> <li>• Presence of invasive species</li> <li>• Fire frequency</li> <li>• Flooding frequencies</li> <li>• Off-take (e.g. amount reeds harvested)</li> </ul>	<ul style="list-style-type: none"> <li>• Cover</li> <li>• Density</li> <li>• Species composition</li> <li>• Fire frequency</li> <li>• Fire scares</li> <li>• Invasive species</li> </ul>
<b>Fish and Macro-invertebrates</b>	ODRS	<ul style="list-style-type: none"> <li>• Water pollution</li> </ul>	<p>Currently water pollution levels within the ODRS are minimal except in high-density settlements.</p>	<ul style="list-style-type: none"> <li>• Presence/absence of toxicity</li> <li>• Sensitive macro invertebrates</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain good water quality suitable for all macro-invertebrates</li> </ul>

**Table 8.2. Matrix for Monitoring of Hydrological and Water Parameters as Part of the ODRS Monitoring Framework**

Hydrological Drivers	Scale	Threats	Current Status and Management Issues	Indicators	Management Targets
<b>Hydrology</b>	Basin-wide  Strategic sites within the ODRS	<ul style="list-style-type: none"> <li>Human-induced changes in natural flow</li> <li>Abstraction of water for irrigation (<i>agricultural development</i>)</li> <li>Development of hydroelectric power dams upstream</li> <li>Unsustainable tourism development</li> <li>Abstraction of water for industrial (e.g. mining) and municipal use ( e.g. Menongue)</li> <li>Groundwater pollution</li> <li>Land use changes</li> <li>Mining</li> <li>Climate change</li> </ul>	Currently there are no major human-induced changes in water flow although such plans have been proposed in the past. Notable ones include the Rundu Pipeline and the Popa Falls Hydroelectric dams which were both withdrawn following objection from various groups.	<ul style="list-style-type: none"> <li>Water abstraction (for domestic, industrial, and irrigation purposes)</li> <li>Acreage of flood recession farms</li> <li>Number of proposed dams upstream</li> <li>Sediment load</li> <li>Acreage of irrigation schemes</li> <li>Discharge/flow</li> <li>Environmental flows</li> </ul>	<ul style="list-style-type: none"> <li>Maintain current levels of sediment load</li> <li>No upper river dams</li> <li>Maximum off-take of 600Mm<sup>3</sup>/year</li> <li>No significant human-induced change in natural flood pulse peak</li> </ul>
<b>Water quality</b>	ODRS Basin-Wide	<ul style="list-style-type: none"> <li>Pollution from fishing camps</li> <li>Pollution from tourism camps (solid and liquid waste)</li> <li>Pollution from house boats and motor boats</li> <li>Pollution from villages near waterways (e.g. Shakawe, Tubu)</li> <li>Pollution from agricultural activities(fertilizers)</li> <li>Mining ( ground and surface water, solid waste, and liquid waste from mines)</li> </ul>	Currently the quality of water in the ODRS site has been reported to be in good standing except for few localized situations in high density settlement areas.	<p><b>Physical Parameters</b></p> <ul style="list-style-type: none"> <li>Water color</li> <li>pH</li> <li>TDS (total dissolved solids)</li> <li>Temperature</li> <li>Surface water flow</li> </ul> <p><b>Chemical Parameter</b></p> <ul style="list-style-type: none"> <li>Nutrient level (Na, Fe, K, P, Ca, Mg, N, Sulfate, carbonates)</li> <li>Oxygen level and use (DO ( dissolved oxygen), BOD (Biochemical Oxygen Demand ), COD (Chemical Oxygen Demand)</li> </ul> <p><b>Other Chemicals</b></p> <ul style="list-style-type: none"> <li>Arsenic</li> <li>Fluorides</li> </ul> <p><b>Biological</b></p>	<ul style="list-style-type: none"> <li>To maintain the current levels of water quality in undisturbed parts of the ODRS</li> <li>To reduce ground and surface water pollution</li> <li>To identify all sources of pollution in the ORDS</li> <li>To ensure that both solid and liquid waste are handled and disposed of in ways friendly to the environment</li> </ul>

				<ul style="list-style-type: none"> <li>• Water sensitive species (bryophytes, ferns,</li> <li>• Presence availability of fish and benthic macro invertebrates)</li> <li>• Fecal coliforms</li> </ul>	
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**Table 8.3. Matrix for the monitoring of socio-economic parameters as part of the ODRS Monitoring Framework**

Socio-economic Parameters	Scale	Threats	Current Status and Management Issues	Indicators	Management Target
<b>Poverty</b>	ODRS  Strategic sites within the ODRS	<ul style="list-style-type: none"> <li>• Lack of equity</li> <li>• Diseases (HIV/AIDS, foot and mouth and other livestock diseases)</li> <li>• Human Wildlife Conflicts (crop damage and livestock depredation)</li> <li>• Competing land use claims</li> <li>• Population growth</li> <li>• Climate change ( food security, livelihoods)</li> <li>• Unemployment</li> <li>• Ungazzeted settlements</li> <li>• Poor educational and skills level (capacity constraints)</li> <li>• Poor governance structures (e.g. CBNRM)</li> <li>• Unsustainable tourism activities</li> <li>• Disregard for indigenous knowledge</li> <li>• Inappropriate use of fires</li> </ul>	Currently communities living within the ODRS are among the poorest in Botswana. Human/wildlife conflicts in the form of crop damage by elephants and livestock depredation are widespread within the ODRS. CBNRM programs are susceptible to maladministration practices notably misappropriation of funds. Demand for agricultural land, both arable and livestock farming, is increasing. Wildlife diseases and HIV/AIDS related illnesses are common within the ODRS which affect productivity.	<ul style="list-style-type: none"> <li>• Levels of household income</li> <li>• Unemployment rate</li> <li>• Employment opportunities</li> <li>• Disease prevalence</li> <li>• Prevalence of human/wildlife conflicts</li> <li>• Incidence of land use conflicts</li> <li>• Population growth rate</li> <li>• Incidence of illegal hunting</li> <li>• Incidence of inappropriate tourism activities/practices (e.g. off-road driving, fires)</li> <li>• Rate of development of informal settlements and ungazzeted settlements</li> <li>• Prevalence of illegal hunting</li> </ul>	<ul style="list-style-type: none"> <li>• Promote and improve support to CBNRM and equity</li> <li>• Reduce human/wildlife conflicts</li> <li>• Ensure that communities living with wildlife realize significant benefits from wildlife and other components of biodiversity</li> <li>• Reduce fire frequency</li> <li>• Incorporate indigenous knowledge</li> <li>• Introduce and implement effective climate change adaptation strategies</li> <li>• Review and implement all management plans within the ODRS</li> <li>• Increase uptake of conservation messages</li> </ul>
<b>Agriculture</b>	ODRS	<ul style="list-style-type: none"> <li>• Livestock population</li> <li>• Molapo farming (flood recession farming)</li> <li>• Dry land arable farming</li> <li>• Livestock diseases</li> <li>• Inappropriate use of</li> </ul>	Within ODRS, livestock farming is recognized as a major livelihood activity for rural communities. This sector faces serious challenges mainly due to diseases, depredation by	<ul style="list-style-type: none"> <li>• Rate of increase in livestock numbers</li> <li>• Distribution of livestock population</li> <li>• Livestock off- take</li> <li>• Rate of increase in acreage of molapo farms</li> </ul>	<ul style="list-style-type: none"> <li>• Protect sensitive ecological zones from both arable and livestock farming by minimizing clearing of riparian vegetation and grazing along</li> </ul>

		<p>fertilizers</p> <ul style="list-style-type: none"> <li>• Inappropriate use of pesticides</li> <li>• Debushing of riparian vegetation of</li> <li>• Competing land use claims (livestock vs wildlife)</li> <li>• Irrigation</li> </ul>	<p>carnivores and competition for land with wildlife. Fences that separate wildlife from livestock have fragmented wildlife habitats and closed major corridors. Irrigation schemes are increasing, a development which is likely to compromise the integrity of riparian ecosystems if not controlled.</p>	<ul style="list-style-type: none"> <li>• Rate of increase in dry land farms</li> <li>• Types of fertilizers</li> <li>• Quantity of fertilizer used</li> <li>• Types of pesticides</li> <li>• Quantity of pesticides used</li> <li>• Rate of debushing for new arable lands</li> <li>• Water abstraction for irrigation</li> </ul>	<p>floodplains.</p> <ul style="list-style-type: none"> <li>• Promote conservation agriculture that will ensure maintenance of soil fertility</li> <li>• Minimize the use of inorganic fertilizers in flood recession farms</li> </ul>
<b>Tourism</b>	<p>ODRS</p> <p>Selected strategic sites within the ODRS</p>	<ul style="list-style-type: none"> <li>• Surface and ground water pollution from inappropriate handling of solid and liquid waste in tourist facilities in ORDS</li> <li>• Localized degradation caused by off-road driving and inappropriate disposal of solid and liquid waste in camp sites</li> <li>• Localized conflicts between stakeholders (e.g. conflicts between fishermen and lodge owners in the Panhandle)</li> <li>• Noise pollution from motor boats</li> <li>• Water pollution from oil spills</li> <li>• Creation of arterial water points</li> <li>• Extremely high floods (limit game drives and game viewing experience)</li> <li>• Lack of equity</li> </ul>	<p>Tourism has the greatest potential to exist in “harmony” with the natural ecosystem of the ODRS than any other land use. The low volume-high cost approach to tourism development and management has served the ORDS well, resulting in minimal impacts.</p>	<ul style="list-style-type: none"> <li>• Number of tourists visiting the ODRS per given time.</li> <li>• Number of new tourist facilities (e.g. lodges, campsites)</li> <li>• Number of aircraft flying over the Delta in a day</li> <li>• Road networks</li> <li>• Conflicts between key stake holders (e.g. fishermen and lodge owners)</li> <li>• Game sighting index</li> <li>• Amount of solid waste generated</li> <li>• Amount of liquid waste generated</li> <li>• Motor boat traffic</li> <li>• Number of beds</li> </ul>	<ul style="list-style-type: none"> <li>• Maximum of 700 beds in the core area</li> <li>• Improve equity</li> <li>• Improve sector diversification</li> <li>• Reduce conflicts between subsistence fishermen and lodge owners</li> <li>• Reduce noise pollution</li> <li>• Improve solid and liquid waste management</li> <li>• Reduce vehicle and motor boat traffic</li> <li>• Limit footprint of lodges</li> </ul>

<b>Mining</b>	<b>ODRS</b>	<ul style="list-style-type: none"> <li>• Land degradation ( soil erosion)</li> <li>• Air pollution</li> <li>• Noise pollution</li> <li>• Increased ground and surface water abstraction</li> <li>• Exploitation drainage patterns and flow</li> <li>• Leakages and spillages leading to soil and water pollution</li> <li>• Loss of biodiversity, habitat fragmentation, and disturbance of ecological processes</li> <li>• Displacement of people</li> <li>• Urbanization of rural areas</li> <li>• Environmental degradation (in case of poor waste and solid waste deposal)</li> </ul>	Currently mining activities are developing within the ODRS. A new copper mine at Toteng has been established	<ul style="list-style-type: none"> <li>• Number of prospecting licenses</li> <li>• Number of mining licenses</li> <li>• Types of minerals</li> <li>• Number of mines in the ODRS</li> <li>• Distribution of minable mineral deposits in the ODRS</li> <li>• Waste disposal mechanisms</li> <li>• Growth rate of population of mining towns/villages</li> <li>• Number of new roads</li> <li>• Number of people displaced</li> </ul>	<ul style="list-style-type: none"> <li>• To ensure that all mining companies fully implement effective environmental management strategies</li> <li>• No prospecting and/or mining licenses issued within the delta and the Panhandle</li> <li>• No new prospecting and/or mining licenses issued within a buffer of 15kms of the Delta and Panhandle</li> </ul>

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