

PERFORMANCE AUDIT REPORT

ON

FISHING INDUSTRY IN BOTSWANA

BY

FISHERIES DIVISION -

**DEPARTMENT OF WILDLIFE AND NATIONAL
PARKS**

AUDITOR : BOTHO ENTAILE

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ACKNOWLEDGEMENTS

The OAG would like to thank management and all Fisheries Division personnel who assisted in the conduct of this audit. The Fisheries Division personnel's expertise greatly assisted the audit. Our gratitude goes to fishers who cooperated and spared their valuable time for interviews during field visits.

ABBREVIATIONS AND GLOSSARY

DAHP:	Department of Animal Health and Production
DWNP:	Department of Wildlife and National Parks
FAP:	Financial Assistance Policy
Fish Stock:	“ A population of fish, including migratory species, which constitutes a coherent reproductive unit” (SADC Protocol on Fisheries)
Fishing Effort:	“Level of fishing, as may be defined, <i>inter alia</i> , by the number of fishers, amount of fishing gear, and time spent fishing or searching for fish” (SADC Protocol on Fisheries).
Habitat:	Place or type of place where an organism, population or community lives.
INTOSAI:	International Organisation of Supreme Audit Institutions
NDP:	National Development Plan
OAG:	Office of the Auditor General
SAI's:	Supreme Audit Institutions
Recreational Fishing:	“ Fishing done on a part-time basis for leisure and sport, including but not limited to angling, diving, collecting shells or lobsters and spear hunting” (SADC Protocol on Fisheries)”.
WUC:	Water Utilities Corporation

EXECUTIVE SUMMARY

The performance audit that the Office of the Auditor General conducted and assessed whether DWNP had adequate policy framework and operational mechanisms to manage and protect the fisheries industry. The audit also assessed the extent to which the Department measured the results achieved and the effectiveness of the implemented actions leading to sustainable use of the resource. The audit covered policy aspects, planning, fish stock assessment activity, fish and habitat protection controls, inspections, manpower and staff training and monitoring and reporting.

The audit was part of a call by the Working Group Environmental Auditing of the INTOSAI, which prompted the Supreme Audit Institutions (SAI's) to conduct the audit on the environmental issues. However the timing of this audit coincided with the period when the Fisheries Division, a division responsible for management of fisheries had just relocated to DWNP and still in transition. However, audit noticed some significant deficiencies as well as some strengths within the Division which were to improve the fisheries management system.

The significant observations made were in regard to policy aspects, planning, Daily Catch and Effort Record Forms, fish stock assessment, fish and habitat protection controls, manpower and training as well as monitoring and reporting.

Policy Aspects: The Fisheries Division had not developed a policy framework, which could have provided a direction and necessary guidance to address various aspects of the fishing sectors (Para 3.1.1).

- The Fish Protection Act of 1975 which had been in use for the last 29 years had become inadequate as it lacked necessary provision to account for present situation and did also not provide for the present situation and did not provide for all fishing aspects affecting management (Para 3.1.2)
- The overall objective of protecting fish had never been clearly articulated before in the DAHP 2002 - 2003 and in the DWNP 2002 – 2006 Strategic Plans respectively (Para 3.1.3)
- Despite the provision by the Act that the Fisheries Regulations be developed, this important document had not been developed until 2001 when the draft was sent to the Attorney Generals Chambers. This draft was still with the Attorney General Chambers at the time of audit (para 3.1.4).

2. Planning

- The management plans that could have been used to set “safe harvesting or yield levels, conservation and fishery regulatory measures and sustainable use of the resources” (NDP 7 and 8) had not been developed.
- The Regional Annual Plans that could have given direction and acted as an accountability tool for the Extension Officers were not prepared. In addition, the Annual Operational Plans prepared by Extension Officers were not time bound (para 3.2)

3. The Daily Catch and Effort Record Form

There was inadequate recording of catch landings, in that some fishers did not provide details of their operations, by filing in these primary source of data (para 3.3)

4. Fish Stock Assessment

The fish stock assessment activity that could have assisted DWNP management “to devise long term fisheries management and utilisation strategies that would consider conservative and fisheries regulatory measures and sustainable use of the resource” (NDP 7 & 8) was still not completed at the time of audit (para 3.4).

5. Fish and Habitat Protection Controls

There were no formal fish and habitat protection controls and mechanisms in place, but management adopted extension methodology of educating and encouraging fishers to practice good fishing methods. However, these initiatives lacked measurable targets and performance measures that fishers were expected to meet in order to protect the resource base and habitat in a sustainable manner (Para 3.6).

6. Manpower, Training and Development

- Out of the 71% of the entire staff manning the Extension Areas, 41.2% of them were Industrial Class Employees and covering a vast area with a radius of between 5 and 40 km per officer.
- 70.6% of staff had no fisheries certificates and lacked formal training in fishery discipline although they had skills (para 3.8).

7. Monitoring and Reporting

- Although the format of reporting was standardized reports from Extension Areas varied in presentation (para 3.9)
- The Division's Annual reports were work related and did not indicate that the initiatives in place for protecting fish and sustainable use of the resource were being achieved.

Improvements that had been made to efficiently manage the fisheries:

1. Fish Stock Assessment

The building up of fish database and the use of the PasGear, in order to hasten analysis of data for the fish stock assessment activity.

2. Fish and habitat protection Controls

- Formation of the Okavango Fishermen's Association as a management tool to discuss different fisheries issues with fishers.
- Encouragement initiatives and continuous training given to fishers to enhance their knowledge regarding protection of both fish and its habitat so that fish resource can be conserved.

The Division was also in the process of implementing the Okavango Delta Management Plan (fisheries component), which was a project coordinated by National Conservation Strategy Agency.

Overall Conclusion:

Except for the deficiencies that have been pointed out above, the OAG acknowledges and appreciates the efforts that the Division has made, irrespective of the high workload for the present staff (Headquarters and Region) with limited resources allocated to them to manage the national fishery resource. In this regard, it is the OAG's view, that the staff capacity be enhanced and increased to rigorously assist in providing scientific information that will lead to informed management decision making.

Recommendations:

Set below is a summary of recommendations to the findings:

- i. The DWNP should develop the policy that is specific to fisheries.(para 4.1.1)

- ii. The DWNP management should review the Fish Protection Act with a view to identifying any deficiencies and differences between the Act and the current operational requirement such as, environmental and related aspects. (para 4.1.2)
- iii. The DWNP management should establish clear objectives and targets for the managing and protecting fish and should also develop reliable mechanisms to track and report on the sustainable use of the resource. (para 4.1.3)
- iv. The DWNP should hasten to develop and implement the Fisheries Regulations. (para 4.1.4)
- v. Management should provide direction on the development of both short-term and long-term management strategies. (para 4.2.1)
- vi. Operational plans should be prepared at all levels, should indicate all the activities that will be performed and should be time oriented. (para 4.2.2)
- vii. The DWNP management should device alternative method to improve quality of data, for instance, increased inspections to obtain independent verification of information of the Daily Catch and Effort Forms and strengthen the education programme. (para 4.3)
- viii. The DWNP management should ensure that fish stock assessment data is analysed in a timely manner and that relevant reports are produced without delay, in order to allow for decision making at all levels. (para 4.4)
- ix. The protection encouragement initiatives should be regularly reviewed to determine their effectiveness and should be reported upon on an annual basis. (para 4.6.1)
- x. A comprehensive habitat protection strategy that includes clean up plans in order to deal with the polluted fishing sites and fish markets should be developed. (para 4.6.2)
- xi. DWNP management should ensure that the standard for consistency and quality of reports is met at all levels of the Division. (para 4.9)

CHAPTER ONE

1. INTRODUCTION

The Office of the Auditor General (OAG) carried out a performance audit of Fisheries Division, within the Department of Wildlife and National Parks (DWNP). The overall objective of the audit was to assess whether the Division had adequate policy framework and operational mechanisms to manage and protect the fishing sector. The main purpose was to evaluate efficiency with which fishing operations were undertaken along with examining and assessing their effectiveness.

1.1 Background

The Fisheries Division is one of Government's oldest organisations established prior to independence. The Division was initially under the Department of Animal Health and Production in the Ministry of Agriculture. As a result of Government Restructuring Policy, the Division was relocated to the newly formed Ministry of Environment, Wildlife and Tourism within the Department of Wildlife and National Parks (DWNP) with effect from April 2003, and physically moved to DWNP in October 2003. It is involved in the extension, fish production monitoring and research on the national fisheries resources. Its major activities include the promotion and the implementation of income generating and job creation projects in the fisheries industry. It is further involved in the assessment of the fisheries resource, its sustainable utilisation and the application of regulatory measures.

Fish represents a valuable resource in Botswana. According to the National Development Plans 7 and 8 the fisheries sub-sector has grown rapidly in recent years. The main beneficiaries of the fisheries programme are in the Ngamiland and the Chobe Districts. Recruitment of fishers using modern fishing gear peaked in the 1980's in the area of the Okavango Delta System. This was due to the utilisation of Financial Assistance Policy (FAP), provision of a market by the Government and improvement in the extension services was offered by the Fisheries Division, which the Division is pursuing even to date.

1.1.1 Policy Framework

The Government developed Government Paper No.1 of 1991, a policy that would ensure sustainable development of the entire agricultural sector including fisheries, as it was under the Ministry of Agriculture at the time. Although there was no mention of fisheries sub-sector therein the Division was expected to operate within that broad policy

framework. The overall policy was designed to fulfill the following objectives:

- i) To improve food security at both household and national levels.
- ii) To diversify the agricultural sector production base for more income opportunities.
- iii) To increase agriculture output and productivity.
- iv) To increase employment opportunities for the fast growing labour force.
- v) To provide secure and productive environment for those engaged in agriculture.
- vi) To conserve scarce agricultural and land resources for future generations.

1.1.2 Department's Vision, Mission and Objectives

The Fisheries Division is currently covered by the DWNP's vision, mission and objectives as follows:

- i. The Vision of the DWNP is stated as follows in their Revised Strategic Plan of 2002 –2006.
“ Our success will be determined by sustained fish and wildlife populations and their habitats in Botswana; a significant contribution by the fisheries and wildlife sectors to the economy; the beneficial participation of Botswana in sustainable utilisation of fish and wildlife resources; the delight of those who experience the natural assets of the country; staff satisfaction; the enthusiastic support of government and other stakeholders; and the demonstrated pride of the nation”.
- ii. The DWNP Mission statement is stated as follows:
“We, the Department of Wildlife and National Parks will effectively conserve the fish and wildlife of Botswana in consultation with local, regional and international stakeholders for the benefit of present and future generations. We will promote and facilitate sustainable utilisation of fish and wildlife resources through active participation of citizens. We place emphasis on partnership with the private sector to fully develop the potential of fish and wildlife resources”.
- iii. The Objectives of DWNP, which are relevant to Fisheries Division as specified in the Strategic Plan 2002-2006 include inter alia the following:

“ To determine biologically sustainable off take by conducting fish and wildlife surveys throughout the plan period”.

“ To have completed all outstanding policies, strategies and regulations by march 2006”.

“To issue permits, licences to regulate utilization and movement of live fish and wildlife and their products throughout the plan period”.

“ To have promoted awareness on the importance of fish and wildlife to at least 60% of the villages within the districts by the plan period”.

“ To have viable projects in at least 80% of the schools with environmental clubs by the end of the plan period”.

“To have maintained the existing fish and wildlife areas for posterity throughout the plan period”

“To monitor the quality and extent of fish habitat in the Okavango panhandle through fish stock monitoring by March 2006”.

“ To conduct courses on fisheries utilization by March 2006”.

“ To develop the Annual Training Plans”

“ To train staff in accordance with the training plan throughout the plan period”

Previously objectives relating to the Division as stated in the Department of Animal health and Production's Strategic Plan Document 2002-2004 were to:

“Develop Fisheries Regulations by 31/03/ 2003”

“Establish Fish hatchery at Letsibogo dam by 31/03/2003”

“Carryout fish stock assessment in the Okavango Delta by 31/03/2003”

1.1.3 Organisational Structure

The DWNP is headed by the Director who deals with day to day management of the Organisation. The DWNP is made up of 6 Divisions namely; the Department Management, Parks and Reserves, Management and Utilization, Community Extension and Outreach, Research and Fisheries, which is a Division responsible for the management of fisheries. This Division is headed by the Assistant Director. Under the Assistant Director is the Regional Fisheries Officer based at Maun and heading the Regional Office. The extension services are undertaken by Extension Officers stationed in (8) Extension Areas. They report indirectly to the Regional Fisheries Officer (Maun) and directly to Chief Technical Assistant based in Shakawe. The research is conducted by a team led by 2 Assistant Scientific Officers based in Maun. They report directly to the Regional Fisheries Officer. In addition, the Division has 2 Officers who are responsible for among

other things, the aquaculture. Most of the time they are dealing with issues pertaining to reservoir fisheries. They are stationed in Gaborone and Francistown.

As at the end of the financial year 2003/04, the Division had 10 permanent and pensionable staff, and 7 Field Assistants who also manned the Extension Areas. The Industrial Class Employees therefore occupied 41.2% of the posts.

1.1.4 Administrative Arrangements

The Assistant Director heads the Division – Fisheries, who is responsible to the Director of the Department of Wildlife and National Parks. The legislation, which contains administrative arrangements, enables the Division to operate at arms length from the Ministry. Although, the Minister is not involved in day-to-day fisheries operations, the accountability provisions of the legislation requires the Minister to make “regulations which will provide for more effectual control, protection and improvement of fish, the government and management of any specified area in which fishing may be carried out”. (Fish Protection Act of 1975)

1.1.5 Stakeholders

The stakeholders include, National Conservation Strategy Agency (NCSA), Land Boards, Harry Oppenheimer Okavango Research Centre (HOORC)- a branch of the University of Botswana (UB), Department of Tourism, Ministry of Agriculture-Water Development Section, Researchers, Fishers, Department of Water affairs, Water Utilities Corporation, Tshomarelo Tikologo, other Non Governmental Organisations (NGOs) and the Communities.

1.2. PROJECT MOTIVATION

In the wake of the growing international awareness on environmental issues, the Working Group on Environmental Auditing of the International Organisation of Supreme Audit Institutions (INTOSAI), prompted the Supreme Audit Institutions (SAIs) to work on this sector.

Furthermore there is a growing realisations that natural resources in Botswana including wildlife and fisheries are one of its greatest resources, and therefore

need to be preserved, protected and managed efficiently or else their interference will lead to their extinction.

In view of the interest of the Working Group, and OAG's concern on how these natural resources are protected and conserved, the Office of the Auditor General (OAG) decided to conduct a performance audit of this sector, particularly the fishing industry.

After the Preliminary Survey, the OAG realised that there was a compelling reason to select the Fisheries Division of the DWNP for review. The reason was that the audit wanted to determine how unregulated fishing activities, absence of policy framework and operational mechanisms, affected the fish sustainability and the environment.

1.3. AUDIT OBJECTIVES

The overall objective of the audit was to assess whether the DWNP (Fisheries Division) had adequate policy framework and operational mechanisms to manage and protect the fishing industry, and the sub objectives were the following:

1. To determine whether the division had a fishing policy framework with clear priorities and objectives.
2. To determine whether the exploitation of the fishing resources and the carrying out of any related activities were conducted in a manner that was consistent with the principles of fish sustainable development and protection, particularly the need to have regard to the impact of fishing activities on fish species and the environment.
3. To determine the extent to which information was being collected to devise long-term fisheries management plans and utilisation strategies that would account for, save levels, protection and fishery regulation measures and sustainable use of the resource.
4. To assess the impact at which the unregulated activities affect the ecology.
5. To assess the extent to which open fishing affected fish sustainability.
6. To determine the extent to which the Fisheries Division was adhering to the requirements of the protection of the aquatic environment as specified in the SADC Protocol on Fisheries ARTICLES NUMBERS 14 and 15.

7. To assess whether the Division was measuring results achieved and the effectiveness of the implemented actions leading to management, protection of the fish and the environment.
8. To determine whether the routine inspections were carried out.
9. To determine the extent to which monitoring was being conducted.

1.4. AUDIT DESIGN

1.4.1 Audit Object

The audit object is the Fisheries Division under the Department of Wildlife and National Parks.

1.4.2 Audit Scope

The focus of the audit was to assess whether the Fisheries Division within the Department of Wildlife and National Parks had adequate policy framework and operational mechanisms to manage and protect the fishing industry. The audit focused on these areas due to the fact that their efficiency and effectiveness are directly linked to the environmental issues.

The Fisheries Extension Areas are mostly in the Northern parts of Botswana in the Chobe and Ngamiland and the fishery potential is also found in the Water Utilities Corporation (WUC) dams. Therefore the audit covered Extension Areas from Ngamiland District (Okavango Sub- District). The Audit reviewed the data pertaining to three financial years namely; 2001/02-2003/04.

1.4.3 Methodology

This audit was conducted in accordance with the INTOSAI guidance on conducting audits of activities relating to the environmental aspects. In addition to this, the audit was also conducted in accordance with the OAG Auditing Standards.

The following methods were used to gather data during the audit:

1. Interviews

Interviews were conducted with:

Assistant Director Fisheries and Senior Scientific Officer based in Maun to confirm some gaps identified during the audit. 9 operational officers were interviewed to determine whether fishing activities were efficiently and effectively managed and also identified problems they encountered. 46 Fishers at all the visited Extension areas were also interviewed.

The purpose of interviewing Division's officers was to solicit basic information about the management and protection of fish resource, and the problems encountered. The purpose of interviewing the fishermen was to understand how they related with Fisheries Officers and to determine whether they understood the purpose of completing the Fisheries Daily Catch Forms and whether the Division's personnel sensitized them on the protection of fish and its habitat.

2. Documents Review

The following documents were further reviewed to establish how the Division was organized, staff compliment and their responsibilities, the number and caliber of staff developed to undertake fishing activities.

I. Legislation

- a. Fish protection Act of 1975
- b. National Policy on Agricultural Development
Government Paper No 1 of 1991.

II. Other Documents

- a. National Development Plan 7,8,9
- b. Vision 2016
Department of Animal Health and Production
Strategic Plan Document 2002- 2003
- c. DWNP Revised Strategic Plan
2002-2006

- d. Report of the United Nations
Conference on Environment and
Development –Agenda 21
Volume (II) and Conservation of Biological diversity
(Chapter 15)
- e. SADC Protocol on Fisheries.

The purpose of documents review was to acquire more information regarding the fishing industry and government policy on fish resource.

Fisheries Division's Annual Reports for period 2001/2002 to 2003/2004 were also reviewed to determine the Division's achievement and constraints.

3. Observation

The team visited all the 8 Extension Areas and 5 fishing points to get first hand information regarding environmental issues.

CHAPTER TWO

2. SYSTEMS, OPERATIONS AND PROCESSES DESCRIPTION

2.1 SYSTEMS DESCRIPTION

2.1.1 Research

The Fisheries Division established the Research Unit that conducts the research. Research includes the research by the Division, joint research with neighbouring countries that they share aquatic systems with and research undertaken by external experts.

1. Research by the Division

The Research Unit conducts research on fish in the entire country but currently is carried out at the Ngarange, Guma Lagoon and Seronga. The unit is developing main Fisheries database on the Okavango fish stock assessment as a basis for policy and management strategies. The Division is mandated to undertake the fish stock assessment in all the water bodies, but at the moment they are concentrating on the Okavango Delta. The reason for this is that the delta is mostly utilized and again it is the world heritage as it has been declared RAMSAR Site.

2. Joint Research

The Division undertakes collaborative research with its neighbouring countries with which they share aquatic systems. This is in recognition of the fact that fish do not respect political boundaries, hence a trans-boundary integrative management approach is promoted. According to the Division Management, a joint research has been conducted with Namibia in the Okavango Delta and another collaborative work on standardisation of fisheries research methodologies was carried out in the upper Zambezi River - Zambia by Botswana, Namibia, Zambia and Zimbabwe.

3. Research External/Foreign Experts

External researchers go through the Office of the President (O.P) to get approval to conduct the research. The O.P contact the division to seek their views regarding the relevance of the work to be undertaken. The Division then attaches the conditions such as the following; Staff participation in research, which should be a priority, getting the copy of the research report on completion. O.P then gives permits, which also have conditions, which the researchers should adhere to.

2.1.2 Aquaculture Services

I. Fish Farming

The Division encourages fish farming. They do offer service to stakeholders with interest, by way of assessment of proposal in terms of sites for potential use for example, water resources, land, fish feed and technology of skills of the promoters in Community Secondary Schools (education) environmental Wildlife Clubs and Agriculture. Extension officers give advice on the size of ponds to construct. They also assist farmers who construct dams in their properties with stocking. They train them in management skills on fisheries activities. They do fish testing research in these dams.

Commercial aqua – culture –Farmers bring proposals, which are evaluated by the division personnel and make comments and recommendations with specific requirements for example, importing of fish species from outside the country. They want fishers to use indigenous species rather than aliens/imported species.

The stocking for both fish farmers and schools' ponds is currently from previously stocked ponds for instance, schools (excess fish therein), and Water Utilities Corporation dams and from the wild that is; the Okavango and Chobe rivers.

2.1.3 Extension Services

The Senior Scientific Officer based in Maun heads the Extension Offices from Maun to Seronga and the Extension Officers and Field Assistants carry out extension activities. There are two types of extensions, namely; Aquaculture and Capture fisheries extensions.

The officers assist local communities to benefit from fish on sustainable basis. Encourage communities to undertake fish projects individually/groups. This involves training them on the use of modern equipments/nets and how to handle and preserve fish until it reaches the market. They assist them to acquire funding for instance, through Financial Assistance Policy. The community is trained to appreciate sustainable development and this is done through courses/demonstrations.

2.1.4 Capture - Fisheries Extension

Fish is captured from the Water Utilities dams or in the natural bodies and is captured by large-scale fishers for commercial and small-scale fishers for subsistence. The type of fishers is determined by fishing capacity and the fishing gear. Currently, fishers are not required to apply for any permit for them to fish except those fishing from the Water Utilities Corporation dams. Fishers are given Daily Catch and Effort Record Forms to fill for their catches.

2.2 OPERATIONS AND PROCESSES DESCRIPTIONS

2.2.1 POLICY FRAMEWORK

Since 1991, the National Policy on Agricultural Development, Government Paper No.1 had been used as national fisheries management policy, thus guiding the Division's management activities for the last 13 years. When the division relocated to DWNP, the provision in the policy fell off. Therefore, the relocation left the division without policy to refer to. In addition, the Division provides service to Government, fisheries industry and the public projects, under the Fish Protection Act of 1975. The legislative functions and powers vested on the Division includes among others; imposing and prescribing conditions for the regulations of fishing, regulating the description and form of fishing gear and prohibiting any manner detrimental to the

preservation or increase of fish and prevention of offences against the Act. During 2001/02 and 2002/03 the Department of Animal Health and Production's Strategic Plan Document guided the Division. The plan stated yearly 2-3 strategies, such as policy and legislation diversification and human resources management. It also stipulated objectives and time frames to achieve them. However, the DWNP management developed a 5-year Strategic Plan for period 2002-2006 which also included objectives for Fisheries Division.

2.2.2 Planning

In addition to the Strategic Plan, the Department prepares the Annual Performance Plans for each year for the entire Organisation. In that respect, Divisions prepare their Divisional Annual Plans, which will show time frames for achieving intended objectives.

1. Annual Operational Plans

The Extension Officers are required to prepare the Annual Operational plans for their Extension Areas and follow them. They prepare the plans giving details of activities that are going to be performed during the year. The activities that appear in almost all the plans are, Kgotla Meetings, demonstrations on fish smoking, net mounting and mending and fish weighing, Okavango Fishermen's Association Meetings, participation in Districts Shows, Monthly progress reports and Quarterly Meetings at the Regional Office in Maun and Creel surveys (collection of information on traditional fishing, that is, hook and line and basket fishing) at Extension Areas such as Kauxwii, Etsha 13 and Ngarange. These plans are submitted to the Shakawe Office, as the activities are coordinated from that Office. The Chief Technical Assistant consolidates these plans into a Quarterly Plan for onward transmission to the Regional Fisheries Officer for consolidation into Regional Plan.

2.2.3 DAILY CATCH AND EFFORT FORMS

The Daily Catch and Effort Record Forms, which are the main source of information, are used to record daily catch and effort by operation, and total weight for each species, that is, bream, barbell, silver barbell and tiger fish. All the remaining caught species are lumped into "others" category. As the Division is interested in the off take at any given time, the forms are given to fishers to fill on daily basis. Fishers are encouraged and trained to fill in the total number of catches, whether rotten or fresh. They are also to indicate their effort showing number of nets used per day, type of craft they used and the total number of nets they owned by mesh size, for each month. These forms are also to be filled at the bottom, as the information is required by the Research Officers. The forms are then collected monthly by the Extension Officers for onward transmission to Division's management at the Regional Office in Maun. The forms are then passed to the Research Unit staff for input into the PasGear (computer program). Basic edit checks are performed against the forms as the information is input.

2.2.4 FISH STOCK ASSESSMENT

The research component undertakes research work in an endeavour to understand the Okavango Delta fish stocks. The research is done through having the research team to go to the field for 10 days each month. In the field expedition, they sample 3 selected sampling locations namely; Ngarange, Seronga and Guma lagoon. Data collected regarding fish caught include, individual fish weight and length, fish species, gonadal maturation stage, water quality parameters and net types and sizes used.

In their endeavour to assess fish stock, the Research Unit Staff uses two types of gears to sample, that is, the Namibian multi filament and Botswana research net. Botswana type nets range from 50mm to 125mm. The Namibia type nets range from 22mm to 150mm. This range of mesh sizes is meant to sample a wider size and age range of various fish species.

In addition to this, there is research undertaken by fishers on behalf of the research team. The data they collect is based on number of species caught by each panel and the fish length. Data from fishers is therefore to supplement the Research team's

data. The reason for engaging fishers is that they fish more frequently and as such they provide more data for the Unit.

According to interview, the two types of data are recorded separately but in the final analysis the information will be combined to give a picture of the fisheries industry/resource. After data collection, data is input in the PasGear (computer program). This system shows the gear selectivity, biomass, catch composition, and catch per unit effort, changes in the catch rates both spatial and temporal and sex maturity of the fish stock in any given time. The reasons for fish stock assessment include inter-alia the following;

1. Assist to determine the population structure of the water body. This specifies the composition, which is then extrapolated to arrive at the fish stock status.
2. Assist in "devising long term fisheries management and utilisation strategies" (National development Plan 8).

So far surveys at the dams was done twice at Letsibogo in 2000 and 2002. In previous years the Division collaborated with external experts where they produced the reports. This collaboration was done at the Okavango Delta.

Prior to the current research, there was intensive sampling to establish database and come up with enough data to analyse trends in the Delta system. This was done 20 days a month and sampling was at Panhandle and Upper Delta. In addition to research by officers on monthly basis, the frame survey is conducted every 5 years.

2.2.5 INSPECTIONS

Projects monitoring is done by the Field Staff on daily basis at the sub-stations namely; Etsha13, Sepopa, Shakawe, Kauxwii, Ngarange, Mogocho, Seronga. These officers carry out day to day operations with fishers. They visit projects, advise fishers and collect data including Daily Catch Forms that are handed to the fishers to make daily catch recordings. During inspections, the Extension Officers/Agents encourage fishers to fill in the daily Catch and Effort Record Forms and collect them when filled or deliver new ones for completion. They check number of gillnets used and their sizes, that is, whether the mesh sizes range from

100mm to 125 mm as fishers are encouraged to use these sizes and not the smaller ones (63mm and 75mm as they are discouraged to use them). They also check the kind of equipment (canoes/boats) and methods (seining or passive fishing) fishers use to catch fish.

2.2.6 MANPOWER AND TRAINING

The Fisheries Regional Officer (Senior Scientific Officer) prepares Regional Training Plans indicating training needs of Officers within the Region. These are transmitted to the Assistant Director (Fisheries) for consolidation into a Divisional Training Plan and onward transmission to the Department's Administration Officer, who will then prepare a consolidated Departmental Training Plan.

2.2.7 MONITORING AND REPORTING

1. Monitoring

Monitoring is an essential complement to research. It involves the collection of data and observation of specific sites and fish species over a long period of time.

2. Reporting

Officers at the Extension areas write monthly reports to the Regional Office where the Fisheries Regional Officer compile them into a Regional monthly report and transmit it to the Head of the Station and Assistant Director Fisheries. On quarterly basis all Regional Office staff meet to present their quarterly progress reports. The Fisheries Regional Officer in turn consolidates a Regional Quarterly for transmission to headquarters. At the end of the year, the Assistant Director -Fisheries, compiles the Division's Annual Report using information emanating from the quarterly reports.

CHAPTER THREE

3.0 FINDINGS

3.1 POLICY ASPECTS

3.1.1 Policy Framework

The policy is a critical tool that guides all parties in specifying requirements and it also harmonises with the regulatory requirements of the Act. In addition, it is a central piece of an Organisation because it defines management's direction and commitment. However, the Fisheries Division had not developed a policy framework, which could have provided direction and necessary guidance to address various aspects of the fishing sector. OAG noticed that in absence of the policy framework, the environmental as well as the general aspects could not be addressed effectively. Some of the aspects that could have been discussed include, among others;

1. The extent to which environmental issues should be examined, this would include aspects such as:
 - i. Fisher's activities leading to increases in sewerage and resultant impact on ecology.
 - ii. Educational role with respect to breaches of fishing law.
 - iii. Circumstances under which the categories of fishing controls and protection of fish should be introduced and strengthened.
 - iv. The criteria to determine the fish species to be subject to close monitoring, for example bream, which seemed to be heavily harvested.
 - vi. Extent to which some fishing methods will be detrimental to the sustenance of the fish resource.

2. General policy issues such as the following could have been stated:
 - i. Limit of fishing effort
 - ii. Type of fishing gear
 - iii. Establishment of a conversion factor for smoked fish.
 - iv. Establishment of national fishing season
 - v. Research aspects and related information.
 - vi. Reporting on results achievement.

The absence of a fish policy framework contributed to non-existence of the fish protection controls. Sound policy decision pertaining to fishing will necessitate action to overcome:

i. A lack of awareness of the environmental costs incurred by fishing sector and hence threat to sustainability of the resource.

ii. Inadequacy of tools of analysis monitoring

3.1.2 The Fish Protection ACT

The Division had the Fish Protection Act of 1975, which was developed twenty-nine years ago. However, OAG observed that this Act had become inadequate as it lacked necessary provision to account for the present situation and did also not provide for all fisheries aspects affecting management. For instance, the Act did not mention the Environmental aspects.

Furthermore, interview with management, regarding fisheries systems and procedures revealed that division did not fully enforce the provisions of the Fish Protection Act of 1975, in that the activities that were stipulated as prohibited in the Act could not be controlled, except in WUC dams. The reasons were that:

i. There were no Fisheries Regulations formulated and implemented for fishing industry, and as such it was difficult to enforce the law.

ii. The Act did not clearly elaborate controls to be undertaken in the fisheries management, that is, the Act was shallow per se.

Non-compliance with the provisions of the Act implies that this legal advice is either inappropriate or insufficient to control the fishing industry and therefore needs to be looked into thoroughly to fill in the gaps.

Management Comment

We acknowledge that the Fish Protection Act (1975) needs to be reviewed. Indeed the Attorney General's Chambers also made this observation when they started work on developing Fisheries regulations. To be systematic in approach, it is envisaged that this matter will be addressed immediately after completion of the Regulations, since work on Regulations has already started.

3.1.3 Fisheries Objectives

The overall objective of protecting fish had never been clearly articulated before in the DAHP 2002-2003 and in the DWNP 2002-2006 Strategic Plans respectively. The fish protection objectives were formulated in general terms. For instance, according to Division's Management, the Government's overall objective was "to maintain healthy fish population to ensure that the fishery contribution to the nutritional, economic and social-well being of both present and future generations is sustained." Therefore in this regard, there were no specific objectives, which were possible to follow-up and there was lack of relevant information to permit the follow-up of fish protection. In their annual reports, the Division did not also provide information, which indicated the extent to which the resource was being protected.

Where there was lack of objectives, it was difficult to follow-up on fish protection activities. The follow-up had two important intents; Firstly to indicate to Parliament and the public the results the division has achieved with the funds provided and secondly to permit assessment to be made of the progress achieved in the fulfillment of the objective. Therefore, if the objectives are to

guide operations, they need to be clearly defined, made visible and followed-up in a meaningful way.

In their response, Management contended that, till recently the Okavango fishery was believed to be underutilized and that efforts were made to utilise the resource rather than preserve it. They further pointed out that increase in the fishing activities have contributed to the household food security of the community.

Management Comment

You advocate for the “overall objective of protecting fish” whereas we believe fish protection is an integral part of the management of the fisheries sub-sector. This has been stated as “ to maintain healthy fish populations to ensure that fishery contribution to the nutritional, economic and social well-being of both present and future generations is sustained” in the ongoing review of the wildlife conservation policy. This exercise is taking fisheries issues on board. When management determines areas that compel protection of species that are either threatened or at risk of extinction, then appropriate measures and associated objectives would be adopted.

3.1.4 Fisheries Regulations

The Fish Protection Act of 1975, required that the Fisheries Regulations be developed to “ provide for more effectual control, protection and improvement of fish, management and government of any specified area in which fish may be carried out”. However, interview with Division Management and examination of internal records, revealed that the Division had been slow in developing the Fisheries Regulations. The Division operated without Fisheries Regulation for the past 29 years until the draft regulations that was formulated and submitted to the Attorney General's Chambers and had been with them since 2001.

The Division could not meet the legislative responsibilities due to the contention that there were no regulatory measures developed and implemented. The other reason for delay to develop the regulations was the structure in which the Division was previously placed that is the DAHP, as the priority was given to livestock aspects rather than those of fisheries.

Furthermore absence of the Fisheries Regulations on the following activities could affect fish protection negatively.

- i. Lack of fishing capacity to be allowed into fishery in order to reach conservative approach.
- ii. Lack of controls in that there were no control measures for fishing effort on individual operations.
- iii. Open access fishing including sport/recreational fishing, commercial and subsistence fishing which might lead to depletion or extinction of some fish species. According to interview, even fishers who were not Botswana citizens could fish from our water bodies as long as they entered Botswana legally.
- iv. Fishing competition activities, which might end up, unnoticed if Fisheries' officers had not been informed of the event.

Activities such as catching fish using harmful fishing methods (drive fishing and seining), could not be prevented until the Fisheries Regulations were formulated and implemented.

Whilst we acknowledge the Division's effort to develop the Fisheries Regulations, it is the OAG's view that this regulatory document should have long been developed and implemented for the protection of the fish resource and its habitat.

If the above activities are not properly regulated they might lead to fish decline in the long run.

3.2 PLANNING ASPECTS

3.2.1 Management Plans

The achievement of fisheries activities is dependent upon the quality of the management strategy for the entire fishing activity. Even NDP 8, emphasized that these plans be developed so that they "take into account: safe harvesting or yields levels, conservation and fishery regulatory measures and sustainable use of the resource".

However, The OAG noticed that the management plans had not been developed, even after introduction of Performance

Management System in 2000. According to interview with the Division's management, the Management Plans were not developed due to the following reason:

There was lack of socio-economic understanding of the community as stipulated in the Okavango Delta Management Plan. For instance, they should have a better understanding of the characteristics/structure of the fishery, that is, what constitutes fisheries as listed below:

- i. The most fishing ethnic group
- ii. Type of gear used
- iv. Fishing methods
- v. Fishing season

It is the OAG's view that; if management plans are developed, they will include inter alia;

- vi. Description of the geographical fishing locations
- v. Fish species, fishing methods to be used together with the fishing capacity permitted for fishing.

They will also indicate the strategies that will be used to achieve the intended objectives as stated in the Strategic Plan for 2002-2006.

3.2.2 Operational Plans

According to interview with the Division's Management, the Fisheries Regional Officer was required to prepare the consolidated Regional Annual Plan on the basis of the individual Extension Officer's Annual Operational plans. However, it was noticed that this requirement had not been initiated at the Region Headquarters as such plans could not be produced on request. The reason given was that the Region lost files when the Regional Fisheries Officer's Office was struck by lightning during the rainy season.

In addition to that, the Operational Plans prepared by Extension Officers indicated no timeframes within which activities would be accomplished even after the introduction of Performance

Management System (PMS), which required that activities be time bound. Furthermore, activities indicated therein could not be all accomplished due to;

- i. Shortage of both water and inland transport
- ii. Shortage of manpower that inhibited the performance of the Division negatively
- iii. Vastness of the Extension Areas

If plans are prepared at the Regional level they will cascade down to the lower level and will enable management to effectively monitor officers activities and give feedback promptly.

Management Comment

In their response Management stated that, the Fisheries Division had never developed a sector strategic plan, either while still with the Department of Animal Health and Production or Wildlife and National Parks. As one of the mandates the mother departments, fisheries issues were being addressed by the goals and objectives formulated under the relevant key result areas. Furthermore, they stated that, staff individual plans had been less than adequate, but through the Government reforms including Performance Management System, they were being reviewed and improved through annual reviews, as it was the case across the entire Civil Service.

3.3 DAILY CATCH AND EFFORT RECORD FORMS

Fisheries Extension Officers are required to monitor fishers' catch and effort within their Extension Areas through use of the Daily Catch and Effort Record Forms. However, interview with the Fisheries Officers and an examination of both Monthly and Quarterly reports revealed that there was inadequate recording of catch landings in that, some fishers did not provide details of their operations by filling in the forms. The reasons given for this problem were that:

- i. Fishers were reluctant despite encouragements and training given to them to provide the required data, as it would be used in decision-making.

- ii. Some fishers were handicapped due to their illiteracy. This view was corroborated by the computation of data obtained from Extension Areas, which revealed that 29% of fishers were illiterates and were unable to fill in the forms.
- iii. Forms that had been distributed to fishers could not be collected, as it was difficult to access the fishing grounds, due to shortage of both water and inland transport.
- iv. Most areas where fishers fished were not easily accessible and in that respect catch forms could not be availed to them. The other reason was that Extension Officers might not know where fishers had gone to fish.

Where fishers filled in the forms and recorded their catch they would indicate weight after gutting and scaling, that is, not giving the correct weight. This view was corroborated by 17% of the fishers interviewed who confirmed this statement. In addition to that, fish that had been caught and never weighed but immediately smoked and rotten fish were not recorded therein.

Furthermore, it was a requirement by Research Unit that Extension officers should indicate the habitat description of the fishing area. The purpose of the habitat description was to enable researchers to determine fish distribution in relation to the types of habitat. However, this requirement had not been adhered to, as 26% of the examined forms were not completed where appropriate.

If the required information was provided it would be used for fisheries management activities, which include, among other things; management strategies and close monitoring. In addition to the above, non-completion of these forms could result in inaccurate information recorded when fish stock assessment process was being conducted.

Furthermore, if information on habitat description of the fishing area was provided it would have assisted in knowing which areas of the Okavango Delta had abundant fish. Therefore, this information was important for regulatory measures in the long run.

Management Comment

In carrying out extension, one is faced with several constraints, some of which are to deal with people who are slow or reluctant to adopt to change. It is impractical that an officer can be placed to monitor proper catch recording with every fisherman as a means of ensuring that the best data is collected. In other words one has to contend with a certain degree of error when data is being recorded by the elderly assisted by their family members. However,

this is a challenge that the Division constantly tries to improve upon through field demonstrations and tailor made courses for fishermen.

3.4 RESEARCH AND FISH STOCK ASSESSMENT

According to NDP 8, the Division was to acquire adequate information regarding the fish stock and fishing activity, "to devise long term fisheries management and utilization strategies that would consider conservative and fisheries regulatory measures and sustainable use of the resource". However, examination of the records and interview with Fisheries management revealed the following:

- i. The research activity was still at the development stage as the Unit responsible for undertaking the activity was still developing the Fisheries database. The data for the development of the database was obtained from the experimental fishing supplemented by Daily Catch and Effort Record Forms data. However, the data from fishers was not forthcoming and was incomplete. For instance, at Xhaxhaba Extension Area, during the Quarter ending March 2002, the Extension officer reported that fishers were not recording all species except the bream and reasons already given at paragraph 3.3.
- ii. The research officers handling and inputting data did not have the adequate techniques necessary to perform fishery data analysis activity.
- iii. There was no data in the database regarding the catch and effort of the traditional (hook line and basket fishing) fishing, recreational and competition fishing, which could be used to evaluate their contribution to the stock assessment activity. According to Management, although basket fishing was also their concern, this type of fishing occurred on the flood plains during receding water levels. In this regard, even if fish therein was not harvested it would still die.
- iv. Fish, which was never weighed before smoking and rotten fish was not captured in the Daily Catch and Effort Record Forms.
- v. According to interview with management, there were massive fish mortalities (quantity not known) in the Guma lagoon, which usually occurred during the flooding seasons and this was not part of the research data.

Furthermore, during 1999/2000 the Director of Animal Health and Production entered into a contract with the consultant to assist the Division in conducting the fish stock

assessment, which was conducted as a 3 - year project (September 1999 to September 2002). However, the OAG observed during the audit that the report for this fish stock assessment was still not produced. According to Fisheries management this was due to; backlog of fishers' data dating as far back as 1995 that had not been input until October 2003. This was exacerbated by shortage of manpower and data validation that took long than anticipated. For instance, at the time of audit there was the backlog of 347 fishers' data (Appendix B) that was not input at Maun Regional Office. This was due to the fact that officers concentrated on research activity, which suffered set back, during 2003/04 when they concentrated on data input. In addition, it took 9 months for the Division to employ staff on the positions that fell vacant due to various reasons.

Absence of completed fish stock assessment leads to lack of the baseline scientific information that could assist management "to explore the relationship between fisheries activities and complex ecology of the fishing area to ensure productive and sustainable use of the venture"(NDP 7-yellow pages p.19). In addition, if the fish stock assessment report was in existence it would assist management to develop strategies or plans of actions for the protection and sustainable use of the resource. It would also be a starting point towards documenting and understanding the capacity for monitoring and could be helpful in identifying gaps and implementing strategies to fill them.

Management Comment

As rightly observed, the Fisheries Division is having serious manpower constraints, particularly at senior levels. The fatal accident that claimed the life of one officer in 2002 and resignation by the other that same year who were both key to implementation of the stock assessment project worsened the situation. These are the primary reasons that led to the delay in the production of the fish stock assessment report. However, with the restructuring exercise complete, there will be a thorough review of the manpower needs of the division with a view to filling gaps.

3.5 NATIONAL FISH INVENTORY

There was no consolidated inventory for fish species presently being monitored. At the time of audit initiatives existed at the Regional Office where there was database for the Okavango Delta's fish species and at the Headquarters (Fisheries Division) where there was database for the Water Utilities Corporation's dams and none existed for the Chobe fish. According to Management the Chobe fish species' list did not exist due to acute shortage of both manpower and other resources.

3.6 FISH AND HABITAT PROTECTION CONTROLS

3.6.1 Fish Protection Controls

The Fish Protection Act (CAP. 38:05) of 1975, required the Division to have provided for and regulated the “description and form of nets to be used in fishing and sizes of the meshes thereof, or the prohibition of the special description of nets or meshes or any tackle, instrument or appliance whatsoever tending to impede the lawful taking of fish or being in any manner detrimental to the preservation or increase of fish”. However, on inquiry regarding the control mechanisms in place to protect the resource, the OAG was informed that currently there were no controls but the fishery made its regulatory measures, as some lagoons were not accessible. According to the Division’s management, they had instead adopted the extension methodology to educate and encourage fishers to practice good fishing methods, which included inter alia;

- i. Use of mesh sizes 100mm to 125mm
- ii. Desist from using harmful methods such as fish driving, seining and fish trapping
- iii. Setting of gillnets at 0700-1800hours or 1800 to 0700hours and not fish during the night.

In addition to that, fishers had been encouraged to form Okavango Fishermen’s Association, which was a forum discuss different fishing issues.

This view was corroborated by interview with 46 fishers who confirmed that indeed Officers encouraged them to use methods that would lead to sustainability of the resource. However, substantiation of whether education and encouragement initiatives reaped the intended purpose revealed the following:

- i. Information obtained from the Quarterly reports (January to March 2002, July to September 2002 and October to December 2002) indicated that all the 17, 26 and most of the fishers at Xhaxhaba Extension Area were using seine fishing respectively. This was corroborated by the Daily

Catch and Effort Record Forms which revealed that 4% (a fisher) at Xhaxhaba used seine-fishing method in February 2004.

ii. 15% (3 fishers) of fishers in Shakawe Extension Area practised fish driving in October 2003 (Daily Catch and Effort forms).

iii. Information obtained from Quarterly reports (January to March 2002 and April to June 2002) revealed that 6%(6 fishers) of the fishers at Kauxwii Extension Area used 75mm gillnets. This was corroborated by interview with one of the fishers in the area who confirmed that he still used his 75mm gillnet.

iv. 22%, 4%, 2% and 2% of the fishers interviewed revealed that basket fishing, fish trapping, seine fishing and drive fishing were still practised at Mohembo, Kauxwii, Seronga and Samochima respectively.

v. Interview with fishers revealed that most fishers in summer, at Mogothon, Sepopa and Ngarange areas fished during the night and 8.7% confirmed that they fished between 0300 -0600 hours, 0600 - 2400 hours, 2100 - 2400hours and 1800-2400 at the lagoons during receding water levels.

The OAG appreciates efforts made by the Division to sensitise fishers to protect fish but, current encouragement initiatives for fishers not to use harmful fishing methods, in order to protect the fish were not sufficient enough to be used as a tool for achieving sustainable utilisation of the resource. If initiatives were to be used as a means to manage and protect the resource in absence of the regulations, then the Division's management needed to assure Parliament and the public that these initiatives were achieving the intended results. These initiatives lacked measurable targets and performance measures that fishers were expected to meet. Currently, there were no consequences for failing to comply with initiatives made by the Division. Therefore, inconsistent and incomplete reports might lead to unconfirmed sense of confidence that fish was being protected and that there was no any fish species' decline.

Management Comment

In response Management contended that the extension system had brought positive socio economic impact on the conditions of the people both at community and household levels.

3.6.2 Habitat Protection

According to staff and management fishers were trained through seminars and encouraged to protect the fish habitat by digging pits in which to bury the gutting and scales at the fishing points, clean their fishing camps and market places and not to burn the lagoons which they thought had abundant fish. This view was corroborated by interview with 46 fishers, 80%(37) of whom confirmed the statement and 20% (9) indicated that they were not aware of this environmental concern. A further interview with 30 fishers out of 46, to substantiate whether they adhered to the encouragement initiatives given, revealed the following:

- i. 70% dug the burial pits and buried scales; gutting and barbels' heads but washed the gutted fish in the river.
- ii. 30% scaled caught fish by the riverside but gutting and heads taken home for dogs.

In addition to the interview, during site visits at fishing camps at Kanana, Pompong, Gwuxhwe (Islands) and riverbanks at Seronga and Samochima, OAG observed that;

- i. Fishing camps were clean
- ii. The burial pits had been dug along the river bank or some meters (distance unknown) away from the river and they were shallow. On inquiry, Operational staff informed the OAG that they had not stated burial pits' depth and their distances from the river bank.
- iii. Scales were seen scattered along the riverbanks. On inquiry, OAG was informed that most pollution along the riverbanks was caused by subsistence fishers (children and women) who had not registered with the Division.
- vi. The OAG observed that there was no proper fishers' sanitation arrangements within the islands and the

concern was that this might lead to increase in sewerage as waste was not exposed off accordingly.

The effects of the above environmental issues are difficult to detect and may result from long term and continuous exposure, as they will be accumulative effects.

Management Comment

We believe that education is the key to fish habitat protection. The “ methodology of educating and encouraging fishers to practise good fishing methods” has built a good rapport between fishermen and the Division. As a matter of principle a prerequisite to community involvement is education. This enhances positive response and a common understanding and hence the likelihood of achieving desired results.

3.7 ROUTINE INSPECTIONS

The Division did not know the extent to which fishers complied with the encouragements and training given pertaining to the fish protection. This made it difficult for OAG to review the extent to which inspections were conducted in order to gather strategic information regarding fish protection and sustainable use of the resource. That is; inspection activity was not used to systematically monitor compliance but rather it was used to check viability of fishing projects in case it was conducted. The Division's Management acknowledged that the staff in most cases concentrated on the adoption of new technology and fisheries management initiatives and in addition, there was also acute shortage of transport.

Furthermore, the Extension Officers did not prepare Annual Inspection Plans neither was this activity included in Extension Areas Operational Plans.

Whilst there was no doubt that staff had built cordial relations with fishers and that fishers were honest individuals who were committed to sustainable fish protection so that the industry could remain viable, there were some who seemed to evade any form of regulation. (see paragraph 3.5 above). In this regard, management seeks to conduct routine inspections to detect compliance and give more guidance regarding fish protection and sustainable use of the resource.

3.8 MANPOWER, TRAINING AND DEVELOPMENT

3.8.1 Manpower

According to Management, the Division's responsibilities had increased twofold in the past decade, to include Research and Aquaculture components in addition to that of Extension and yet the skills and number of staff remained the same. In that regard, there was not enough manpower resource to match the size of fishing activities. In substantiating Management's view point, the OAG found that the scientific capacity in the Division was lacking to an extent that capacity to support informed decision making and deliver core divisional mandate was lacking behind. For instance, 71% of the entire staff, manned Extension Areas and 41.2% of them were Industrial Class Employees and covering a radius of between 5 to 40 kilometers. 20% of the permanent and pensionable officers who were responsible for the research component had no background on fish stock assessment. According to the Division management, in addition to fish stock assessment, other fields of research which include inter alia, fish migration, limnology and fish taxonomy were lacking in the Division.

Furthermore, the Division had no Scheme of Service, which would indicate the minimum qualification that one should have to be employed as Technical Assistant-Fisheries. Interview with Management revealed that previously, the Division used the Department of Animal Health and Production's (DAHP) Scheme of Service, which was Agriculture oriented and at the time of audit the staff was still referring to it. This made it difficult for the Division to have the right calibre of staff. At the time of audit, the Division had 11.8 % professionals, 11.8% degree holders, 17.6% Technical officers, 17.6% Artisanal officers and 41.2% were Industrial Class employees.

Management Comment

In response to condition on the Schemes of Service , Management stated that, the DWNP new Schemes of Service that would also cater for the Fisheries Division needs was in the process of being developed.

3.8.2 Training and Development

During the audit, staff manning Extension Areas visited and those at the Regional Office were not adequately trained. 70.6% of the staff including the Industrial Class Employees and Research officers, received on the job training and had no fisheries certificates and formal training in fishery discipline that is, “not highly competent in fish biology and taxonomy” (Mmopelwa – Trends in Fisheries Development in Botswana Post and Present Status, 1997). In substantiating the extent to which staff was trained/untrained, the OAG found that;

- i. 23.5% was trained in Fishing and boat building,
- ii. 23.5% got in-service training on Fisheries management and technologies
- iii. 11.8% was untrained but also worked as Extension officers
- iv. Interview with staff revealed that research officers (11.8%) lacked speciality in fishery/management principles to enable them conduct sound scientific research, which would assist management in making long-term decisions and strategies.

In addition, there was no indication that the Division had any training plan, that could be used to enhance the skills of the staff.

The availability of manpower with the right skills and number at both the supervisory and extension levels was critical to efficient and effective operation of the Division for it to be seen as meeting its core activities.

3.9 MONITORING AND REPORTING

According to the Division's Management, monthly and quarterly reports were used as Regional Management tool to monitor the extension activities. These reports were consolidated into Regional Quarterly reports for onward transmission to the Assistant Director Fisheries for use in the compilation of the Division's Annual Reports. However, the OAG noticed that, although the format of reporting was standardized, reports from the Extension Areas varied in presentation. For instance, Extension Officers at Xhaxhaba, Kauxwii, Shakawe, Etsha13 and Gaborone reported extensively on the performance of their Extension Areas, as they indicated

methods, sizes and numbers of gillnets used, number of catches by each fishers and status of each project, whilst officers in other Extension Areas used generic descriptions such as; fisher not serious, in operation, the project is participating actively in fishing or fisher is part time.

Furthermore, the OAG in examining the Division's Annual reports for the years under review, observed that they included inter alia; staff and transport constraints, provision of Field staff accommodation, extensions' activities, production trends, fish imports and SADC Inland Fisheries and were workflow related. In this regard it was difficult to determine whether the Division was efficiently and effectively achieving its operation. For instance, whether the resource was sustainably used and whether the education and encouragement initiatives given to fishers achieved their intent of protecting fish and the extent to which this resource was protected.

Management General Comment

In their response, Management stated that they took note of the OAG's focus on the protection of fish as a resource rather than on how the Fisheries Division had effectively executed its mandate to ensure a balance between conservation and improvement of rural livelihoods through sustainable utilization of the resource. Furthermore, they stated that they attach great importance on the fact that once the beneficiaries of the resource got to place some value on the resource they became important partners in its conservation. Thus sustainable use of the fisheries resources could be more appreciated if the peoples' living conditions are brought into the equation.

OVERALL CONCLUSION

The Fisheries Division's efficient and effective management of the fisheries operations were inhibited by the absence of the fisheries specific policy and regulations, whose development were long over due, and the inadequate Fish Protection Act which lead to its non-enforcement. In addition, they were inhibited by incomplete and inconsistent information regarding fishers' catches which was due to non-completion of forms by some fishers as they might not be knowing the importance and benefits of that data and illiteracy aspect. They were further impeded by lack of scientific capacity in the Division which exacerbated the lack of capability to provide informed decision making on the fish population dynamics of the Okavango Delta and the transport constraint that was critical to the success of the Division in achieving the mandated activities.

However, the OAG acknowledged and appreciated that the Division had forged ahead and made significant progress by building up fish database and using Pas Gear in order to hasten analysis of data for the fish stock assessment activity and encouragement initiatives and education given to fishers to sustainably use the resource. The Division did all these and other fisheries activities, irrespective of high workload for the present staff (Headquarters and Region) with the limited resources allocated to them to manage the national fishery resource.

Therefore, it is the OAG's view, that the capacity of the staff be enhanced and increased to rigorously assist in providing scientific information that will lead to informed management decision-making and strategies and achieve the mandated responsibilities.

CHAPTER FOUR

RECOMMENDATIONS

This chapter contains the OAG's recommendations aimed at improving the management of fisheries by the Fisheries Division in Department of Wildlife and National Parks. In order to improve the efficiency and effectiveness of the Division's operations DWNP should closely look into the following aspects and implement proper corrective measures:

Policy Aspects
Planning Aspects
Fish Stock Assessment
National Fish Inventory
Fish and Habitat Protection Controls
Routine Inspections
Manpower, Training and Development
Monitoring and Reporting

4.1 POLICY ASPECTS

4.1.1 Policy Framework

DWNP should develop the policy framework that is specific to fisheries that will include the following aspects:

1. Specific fisheries objectives, which have measurable targets and timeliness;
2. Clearly defined environmental aspects, which will address:
 - i. Fish and habitat protection initiatives that show punitive outcomes that will be taken with respect to breaches of the fishing laws and regulations.
 - ii. Fish stock assessment and related information requirements including roles and responsibilities of those involved in fishing process;
 - iii. All aspects of monitoring catches in all the water bodies;

iv. All fishing controls that will indicate limit of fishing effort for each fisher's operation;

v. Establishment of national fishing seasons

The policy should also include strategies for the protection and sustainable use of the resource.

4.1.2 Fish Protection Act

1. DWNP should review the Fish Protection Act with a view to identifying any deficiencies and differences between the Act and current operational requirements including environmental and related aspects.

2. The Fish Act terms and conditions should be more rigorously enforced in order to strengthen the fishing controls and to improve the inspection activity.

4.1.3 Fisheries Objectives

The DWNP management should establish clear objectives and targets for managing and protecting fish and should also develop reliable mechanisms to track and report on the sustainable use of the resource.

4.1.4 Fisheries Regulations

DWNP should hasten to develop and implement the Fisheries Regulations that will include inter alia:

1. Limits of fishing effort.
2. Fishing capacity, which sets conservative catch levels in order to safeguard the fishery resources.
3. Established control mechanism or measures for use in open access fishing, to control all types of fishing; for example, sport/recreational, competition and foreign fishers.

4. Stringent measures and punitive actions that will be taken with respect to breaches of fisheries laws and regulations.

4.2 PLANNING ASPECTS

4.2.1 Management Plans

The DWNP management should provide direction on the development of both short-term and long-term fisheries management strategies, which include:

1. The protection and sustainable use of the resource.
2. Prevention of polluting at the fishing sites and markets.
3. Strategies for achieving intended objectives.
4. Geographical fishing locations.
5. Fish species, fishing methods, and gear together with the fishing capacity permitted for fishing.
6. The management strategies should also include measurable targets and specific timetables for all the activities.
7. The management strategies if developed should indicate clear direction concerning the roles and responsibilities of all parties involved in the fishing process.

4.2.2 Operational Plans

The operational plans should be:

1. Prepared at all Divisional levels and should indicate all activities that will be performed.
2. Time oriented and the performance reporting should indicate activities that are in progress, those that have

been completed and reasons for not completing the planned activities.

3. Transport situation should be improved in order for the Division to efficiently achieve planned activities.

4.3 DAILY CATCH AND EFFORT RECORD FORMS

1. DWNP management should device alternative method to improve the quality of data, for example, increased inspections to obtain independent verification of information of Daily Catch Record Forms' data and strengthen education programmes.
2. The Division's Management should ensure that information on habitat description of the fishing area is provided at all times before the forms are passed to the Research Unit for input.

4.4 FISH STOCK ASSESSMENT

DWNP Management should:

1. Ensure that fish stock assessment data is analysed in a timely manner and that relevant reports are produced without delay in order to allow for decision making at all levels.
2. Develop fish stock assessment process which will assist staff in knowing which information is required, so as to reduce the analysis and reporting time. This should define roles, accountability, timeliness, decisions and procedural steps.
3. The research should be conducted to determine the impact of non-gillnets fishing methods (basket, fish trapping, hook and line) recreational and competition fishing, on the fish population dynamics, that is catch rates, mortalities, hook selectivity, species composition and size distribution catches. This will assist in evaluating their contribution to the fish stock assessment activity.

4.5 NATIONAL FISH INVENTORY

DWNP management should develop and maintain a consolidated inventory for fish species of all the water bodies in order to have comprehensive data that will be used as a monitoring tool.

4.6 FISH AND HABITAT PROTECTION CONTROLS

4.6.1 Fish Protection

1. The fish protection encouragement initiatives should be regularly reviewed to determine their effectiveness and should be reported upon on an annual basis.
2. The DWNP Management should encourage the Division personnel to rigorously educate all types of fishers, including recreational and competition (tour operators) and stressing on the benefits of better fish records.

4.6.2 Habitat Protection

The DWNP Management should:

1. Develop a comprehensive habitat protection strategy that includes clean up action plans in order to deal with polluted fishing sites or fish markets.
2. Ensure that its core industry reflects Government's intents to pollution prevention.

4.7 ROUTINE INSPECTIONS

1. The OAG recommends that DWNP Management review the levels of inspection resources to determine the number and quality and should ensure that this activity is conducted efficiently and effectively to support the provisions of the Act.
2. DWNP Management should ensure that routine inspections are conducted to detect compliance and give more guidance regarding the protection and sustainable use of the resource.

4.8 MANPOWER, TRAINING AND DEVELOPMENT

1. DWNP Management should ensure that the skills and number of staff is strengthened and improved in order for the Division to achieve its mandated activities.

2. The Research Unit should have trained personnel who will assist management to formulate long term decisions and strategies to fulfill Government's intent.
3. The OAG recommends that DWNP Management should evaluate their development policies in relation to the Fisheries Division staff profiles to ensure that the level and type of training is consistent with the long -term strategies of the Division.
4. DWNP Management should develop Scheme of Service, which will indicate the Division's personnel recruitment prerequisite.

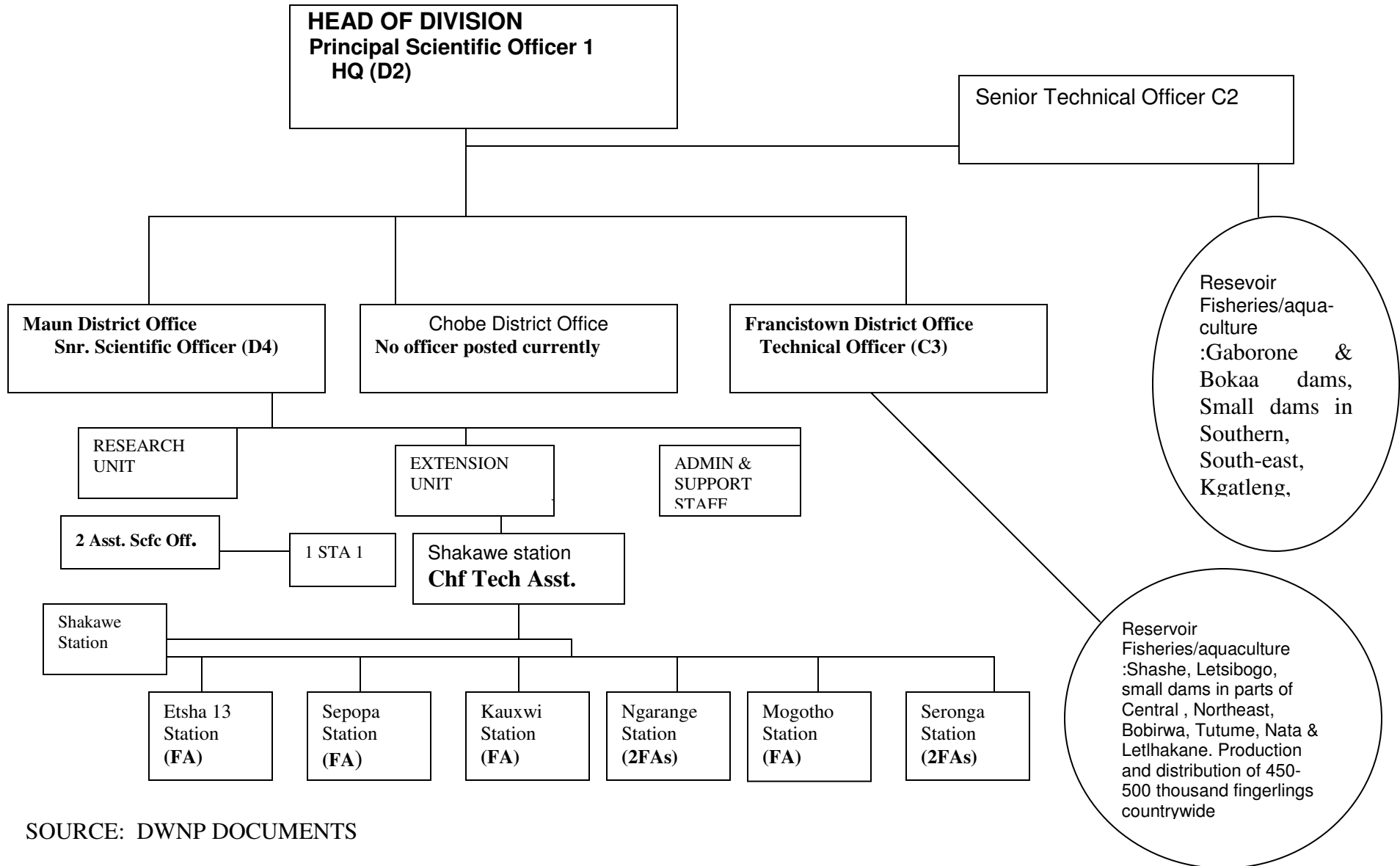
4.9 MONITORING AND REPORTING

1. Management should ensure that the standard for consistency and quality that is set is met at all the Extension Areas.
2. The DWNP Management reports should indicate the Organisation's achievements in protecting fish and its habitat and should assure Parliament and the public that fish resource is sustainably used.
3. DWNP Management should develop performance indicators for fish protection and sustainable use of the resource in order to provide for decision making at all levels.

OPERATIONAL STRUCTURE

APPENDIX A

FISHERIES DIVISION



SOURCE: DWNP DOCUMENTS

APPENDIX B

KAUXWII

(MOHEMBO)

Code	Fisher's Name	Total No. caught					Month
		Bream	Barbel	S.Barbel	Tiger	Other	
906	K. Xoro	50	8	50	9	-	June 03
	K. Xoro	155	-	-	-	-	June 03
912	S. Modisaotsile	49	-	-	-	-	May 03
	S. Modisaotsile	128	-	-	-	-	April 03
910	M. Dierenge	116	108	231	64	-	May 03
	M. Dierenge	117	125	14	89	7	June 03
903	N. Bakae	17	3	-	-	-	May 03
	N. Bakae	29	6	-	2	-	June 03
907	M. Mohako	343	266	-	24	-	May 03
	M. Mohako	85	119	-	14	-	June 03
	M. Mohako	98	146	-	28	-	July 03
904	M. Marubu	52	-	-	-	-	July 03
912	S. Modisaotsile	175	-	1	-	2	July 03
912	S. Modisaotsile	30	13	-	1	-	July 03
925	M.M. Segole	84	3	-	17	-	July 03
917	M. Disho	264	21	-	11	9	July 03
903	B. Ndera	52	-	-	-	-	July 03
905	M. Xoro	159	-	-	-	-	July 03
906	K. Xoro	93	-	-	-	-	July 03
908	F. Moriri	15	140	-	-	-	July 03
917	M. Disho	59	30	13	-	-	Aug 03
903	B. Ndara	6	-	-	-	-	Aug 03
905	M. Xoro	91	-	-	-	-	Aug 03
909	K. Kaphorwe	16	214	-	1	-	Aug 03
916	K. Scotch	96	-	-	-	-	Aug 03
902	H. Sembunga	8	-	-	-	-	Aug 03
901	S. Modisaotsile	71	-	-	12	3	Aug 03
915	M. Mogorosi	3	-	-	-	-	Aug 03
960	D. Wanga	279	82	-	21	-	Aug 03
967	M. Mohako	66	65	-	101	-	Aug 03
908	F. Moriri	91	57	-	35	10	Aug 03
963	M. Dierenge	201	143	77	228	-	Aug 03
981	K. Kaporwe	120	150	-	32	18	Sept 03
909	F. Moriri	29	14	5	6	6	Sept 03
914	D. Seya	4	-	-	-	-	Sept 03
902	H. Sebonga	21	-	-	-	-	Sept 03
994	H. Sebonga	99	-	-	-	-	Sept 03
905	M. Xoro	127	-	-	-	-	Sept 03
916	K. Scotch	175	-	-	-	-	Sept 03
906	K. Xoro	177	-	-	-	-	Sept 03

917	M. Disho	239	-	-	-	-	Sept	03
901	S. Modisaotsile	152	-	-	-	-	Sept	03
908	F. Moriri	95	15	-	-	12	Oct	03
960	W. Diko	211	21	-	21	11	Oct	03
903	K. Kaphorwe	54	22	-	28	-	Oct	03
907	M. Mohako	116	35	-	15	-	Oct	03
917	M. Disho	188	-	-	-	-	Oct	03
906	K. Xoro	218	-	-	-	-	Oct	03
903	B. Ndara	32	-	-	-	-	Oct	03
901	S. Modisaotsile	147	-	-	-	-	Oct	03
916	K. Scotch	89	-	-	-	-	Oct	03
904	M. Marumbu	33	-	-	-	-	Oct	03
914	S. Dinyando	18	-	-	-	-	Oct	03
902	S. Haiti	79	-	-	-	-	Oct	03
905	Xoro Matsokhwe	114	-	-	-	-	Oct	03
925	S. Mocks Mokowe	25	1	-	-	-	Oct	03
929	J. Dirunda	228	8	-	71	-	Nov	03
968	M. Dierenge	61	19	-	11	-	Nov	03
904	M. Marumbo	107	-	-	-	-	Nov	03
906	Xoro Kachire	124	-	-	-	-	Nov	03
902	S. Haiti	10	-	-	-	-	Nov	03
905	Xoro Motsokhwe	159	-	-	-	-	Nov	03
901	S. Modisaotsile	87	-	-	-	-	Nov	03
903	B. Noara	205	-	-	-	-	Nov	03
916	K. Schotch	68	-	-	-	-	Nov	03
917	M. Disho	64	-	-	-	-	Nov	03
914	S. Dinyando	45	-	-	-	-	Dec	03
917	M. Disho	60	-	-	-	-	Dec	03
994	S. Haita	25	-	-	-	-	Dec	03
904	M. Marumbo	124	-	-	-	-	Dec	03
906	K. Xoro	68	-	-	-	-	Dec	03
903	B. Ndara	116	-	-	-	-	Dec	03
905	M. Xoro	74	-	-	-	-	Dec	03
908	F. Moriri	40	31	-	-	-	Dec	03
907	M. Mohako	10	36	-	-	-	Dec	03
963	M. Dierenge	3	72	-	5	-	March	04
909	K. Kaporwe	7	88	-	4	-	March	04
909	K. Kaporwe	21	48	-	19	-	Jan	04
913	M. Yathine	17	111	-	-	-	Jan	04
929	J. Dirunda	41	46	-	-	-	Jan	04
906	K. Xoro	122	-	-	-	-	Jan	04
916	K. Scotch	50	-	-	-	-	Jan	04
905	M. Xoro	80	-	-	-	-	Jan	04
920	M. Tome	42	95	-	-	-	Jan	04
901	S. Modisaotsile	50	-	-	-	-	Jan	04

MOGOTHO

316 04	K. Moropaise	117	118	-	-	-	March	
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311 03	S. Serenguru	7	8	-	-	-	May
304 03	T. Ditilo Dienga	363	-	-	-	-	April
310 03	J. Mboroma	219	58	195	-	451	June
301 03	B. Simon	261	-	-	-	-	April
302 03	M. Simon	3	36	22	-	103	May
302 03	M. Simon	4	-	-	-	35	June
316 03	Kafoko	403	585	-	-	-	April
316 03	Kafoko	20	-	-	-	-	May
307 03	S. Gunikogo	329	7	-	-	-	June
307 03	S. Gunikogo	301	-	-	-	-	April
307 03	S. Gunikogo	282	-	-	-	-	May
314 03	O. Matende	52	-	-	-	-	April
314 03	O. Matende	53	-	-	-	-	April
321 03	S. Moshongo	47	48	1	-	-	Sept
320 03	E. Malangu	167	-	-	-	-	Sept
341 03	K. Samoja	816	153	-	29	-	Sept
336 03	M. Sefo	251	-	-	-	-	Sept
307 03	S. Gunekogo	6	-	-	-	-	Sept
310 03	J. Mbengera	163	26	725	-	-	Sept
308 03	M. Itanga	81	70	-	12	2	Sept
307 03	S. Gunikogo	25	60	28	5	31	Sept
312 03	K. Xaawa	12	2	-	-	-	Sept
302 03	M. Simon	18	1	38	-	41	Sept
324 03	N. Dihupe	33	3	-	26	-	Sept
303 03	J. Gwexha	43	30	-	10	9	Sept
321 03	S. Moshongo	96	199	1	-	-	Sept

320 03	E. Molangwa	78	108	-	-	-	Sept
340 03	M. Montsho	86	114	56	59	-	Sept
341 03	K. Samuja	846	843	5	13	454	Sept
310 03	J. Mboroma	110	44	504	8	562	Sept
332 Sept	N. Lesitanyi 03	72	11	-	14	-	-
307 03	S. Gunekogo	73	-	-	-	-	Sept
308 03	M. Itanga	742	42	-	-	-	Sept
310 Sept	J. Moroma 03	229	4	14	-	-	38
339 Sept	G. Kaxwe 03	423	22	9	-	-	9
303 Sept	J. Gwexa 03	451	-	-	-	-	-
309 Nov	M. Malebo 03	266	5	53	-	-	-
309 Dec	M. Maloba 03	510	-	-	-	-	94
303 Dec	J. Gwexa 03	46	4	-	-	-	-
302 Dec	M. Simon 03	100	4	-	-	-	-
302 Dec	M. Simon 03	100	4	-	-	-	-
308 Dec	M. Itanga 03	950	416	-	-	-	-
343 Dec	K. Popego 03	60	3	-	-	-	-
304 Dec	D. Dienga 03	55	4	-	-	-	-
310 Dec	M. Joseph 03	84	-	-	-	-	-

SHAKAWE

1208 July	S. Njwaki 03	51	-	-	-	4	
1204 July	S. Dibebe 03	262	12	9	-	-	142
1214 July	D. Modisaotsile 03	27	35	-	-	107	
1207 03	K. Kachaba	122	-	-	-	1	July

1212 03	S. Diyerenge	37	2	-	-	-	July
1203 03	K. Disho	35	-	-	-	-	July
1203 03	K. Disho	75	10	-	4	92	July
1209 03	K. Shamakokere	169	-	-	3	60	July
1206 03	P. Sema	354	-	-	-	-	July
1205 03	M. Shimwe	86	-	-	-	26	July
1205 03	M. Sefo	27	-	-	-	-	July
1205 03	S. Chabi	158	1	-	-	-	Nov
1205 03	M. Shimwe	152	-	-	-	-	Nov
1214 03	D. Modisaotsile	27	-	-	-	-	Nov
1203 03	M. Shimwe	92	-	-	-	-	Dec
1205 03	S.Chabi	138	-	-	-	-	Dec
1203 03	K. Disho	5	-	-	-	4	Dec
1212 03	S. Dierenge	64	-	-	-	-	Dec
1208 03	S. Njwaki	47	-	-	-	-	Dec
1213 03	K. Royeta	64	-	-	-	2	Dec
1204 03	S. Dibebe	134	-	-	5	-	Dec
1203 03	K. Disho	331	-	-	-	-	Oct
1204 03	S. Dibebe	761	-	-	-	-	Oct
1207 03	K. Kachara	83	-	-	-	-	Oct
1214 03	D. Modisaotsile	274	-	-	-	-	Oct
1205 03	S. Chabi	156	-	-	-	-	Oct
1205 03	M. Shimwe	160	-	-	-	-	Oct
1212 03	S. Diyerenge	88	-	-	-	-	Oct
1202 03	S. Nengu	203	-	-	-	-	Oct
604 03	S. Kavara	1349	-	-	-	-	Oct

1213 03	K. Royeta	36	-	-	-	-	Oct
1208 03	S. Njwaki	297	-	-	-	-	Oct
1206 03	P. Semao	426	-	-	8-	-	Oct
1201 03	M. Jwaxhi	254	-	-	4-	-	Oct
1212 03	S. Diyerenge	88	-	-	-	-	Oct
604 03	S. Kanara	634	-	-	-	-	Sept
1208 03	S. Njwaki	144	2	3	1	5	Sept
1202 03	S. Nengu	347	-	-	-	55	Sept
1212 03	S. Diyerenge	127	-	-	14	21	Sept
1205 03	S. Chabi	274	-	-	11	13	Sept
1204 03	S. Dibebe	152	-	-	-	-	Sept
1213 03	K. Roveta	32	-	-	-	-	Sept
1219 03	M. Mosinyi	16	-	-	-	-	Sept
1203 03	K. Disho	264	-	-	-	-	Sept
1207 03	K. Kachara	254	-	-	-	4	Sept
1214 03	D. Modisaotsile	141	-	-	-	-	Sept
1209 03	K. Shamakokore	21	-	-	-	-	Sept
1201 03	M. Jwaxhi	337	-	-	12	44	Sept
1208 03	J. Njwaki	86	-	-	-	-	Aug
1208 03	S. Njwaki	118	-	-	-	-	Aug
1209 03	K. Shamakokore	176	-	-	-	-	Aug
1203 03	K. Disho	110	-	-	-	-	Aug
1203 Aug 03	K. Disho	99	-	-	-	-	
1203 Aug 03	K. Disho	18	-	-	-	-	
1205 Aug 03	Mafoko/Sefo	685	-	-	-	-	
1201 Aug 03	M. Jwaxhi		45	-	-	-	

1209	K. Shamakokore Aug 03	169	-	-	-	-
1207	K. Kachara Aug 03	564	-	-	-	21
149	M. Sesinyi Aug 03	43	-	-	-	20
1203	K. Disho Aug 03	109	-	-	-	-
1213	K. Roveta Aug 03	50	-	-	-	-
1204	S. Dibebe Aug 03	15	-	-	-	-
1202	S. Nengu Aug 03	47	-	-	-	-
1208	S. Njwaki Aug 03	195	-	-	-	-
1201	M. Jwaxhi Aug 03	44	-	-	-	-
1207	K. Kachara Aug 03	789	-	-	-	-
1213	K. Riveta Aug 03	67	-	-	-	-
1205	M. Shimwe Aug 03	290	-	-	-	-
1204	S. Dibebe Aug 03	15	-	-	-	-
1219	M. Sesinyi Aug 03	110	-	-	-	-
1201	S. Chabi Aug 03	291	-	-	-	-
1202	S. Nengu Aug 03	47	-	-	-	-
1209	K. Shamakokore Feb 04	19	-	-	-	-
1208	S. Njwaki Feb 04	56	-	-	-	-
604	S. Kayara Feb 04	21	-	-	-	-
1212	S. Diyerenge Feb 04	63	-	-	-	-
1279	M. Sesinyi Feb 04	38	-	-	-	-
1207	K. Kachara Jan 04	326	-	-	4	6
994	S. Haita Jan 04	192	-	-	-	30
1214	D. Modisaotsile Jan 04	40	-	-	-	-
604	S. Kayara Jan 04	60	-	-	7	7
1212	S. Diyengere Jan 04	148	-	-	-	-

1203	K. Disho Jan 04	195	-	-	-	-
1213	K. Riveta Jan 04	97	-	-	-	43
1211	M. Dibebe Jan 04	129	-	-	-	37
1208	S. Njwaki Jan 04	57	-	-	-	7
1205	S. Chabi Jan 04	182	-	-	1	5
1205	S. Shimwe Jan 04	182	-	-	1	5
1204	S. Dibebe Jan 04	30	-	-	3	3
1213	K. Roveta Feb 04	107	-	-	-	-
1214	D. Modisaotsile Feb 04	88	-	-	-	3
1203	K. Disho Feb 04	132	-	-	-	-
994	S. Haita Feb 04	99	-	-	-	-
1219	M. Sesinyi Feb 04	92	-	-	-	7
1205	M. Shimwe Feb 04	196	-	-	-	5
1205	S. Chabi Feb 04	308	-	-	-	-
1204	S. Dibebe Feb 04	236	-	-	-	-
1207	K. Karacha Feb 04	236	-	-	-	-

SEPOPA

1506	N. Shamakamba Oct 03	1006	71	-	-	20
1504	O. Nyangana Oct 03	242	1	-	-	-
1503	S. Ngambi Oct 03	369	-	-	-	-
1543	K. Molapo Oct 03	1475	1495	40	80	14
1506	N. Shamakamba Sept 03	201	343	-	31	-
1545	K. Molapo Sept 03	828	1402	30	159	-
1528	S. Rijowo Aug 03	3	13	-	13	-
1519	B. Johane Aug 03	7	24	-	-	2

1513	T. Seemero	-	17	-	-	-
Aug 03						
-	S. Ngambi	142	14	-	-	-
Aug 03						
1545	K. Molapo	322	743	-	63	29
Aug 03						
1506	N. Shamakamba	52	58	-	7	-
Aug 03						
1502	K. Dithsameko	83	-	-	-	-
Aug 03						
1509	M. Majaro	32	68	-	-	10
Aug 03						
1502	K. Ditshameko	83	-	-	-	-
Aug 03						
1509	M. Majaro	32	68	-	-	10
Aug 03						
1544	K. Sefo	-	9	-	-	1
Aug 03						
1518	M. Motsamai	9	13	-	-	-
Aug 03						
1528	M. Rijowo	3	6	-	-	-
Aug 03						
1518	M. Motsamai	60	57	-	-	-
Aug 03						
332	N. Lesitane	125	50	-	-	17
July 03						
1503	S. Ngambi	1193	13	-	-	-
July 03						
1524	K. Saaza	-	2	-	-	-
July 03						
1502	K. Ditshameko	182	-	-	-	-
July 03						
1546	R. Kaveto	69	135	7	-	23
July 03						
1504	O. Nganyana	244	25	-	26	-
April 03						
1504	O. Nganyana	56	10	-	-	-
May 03						
1518	M. Motsamai	116	65	-	-	-
April 03						
1518	M. Motsamai	9	12	-	-	-
June 03						
1518	M. Motsamai	81	25	-	-	-
May 03						
1503	S. Ngambi	185	24	-	24	-
April 03						
1503	S. Ngambi	153	7	-	-	2
May 03						
1505	G. Kamuti	124	74	-	33	-
June 03						
1522	M. Tatolo	68	161	-	-	-
April 03						

1960	B. Karombe April 03	251	77	-	-	-
1528	S. Rijaro May 03	33	17	-	-	-
1519	B. Johane April 03	16	43	-	-	-
1526	S. Barozi April 03	34	20	1	-	-
1560	B. Karombe March 03	242	45	3	-	-
1208	S. Jwaki Nov 03	21	-	-	-	-
1501	I. Keetile Nov 03	1	-	-	-	1
1514	D. Keshetile Nov 03	96	2	-	3	1
1506	N. Shamakamba Nov 03	391	63	-	16	-
1507	D.W. Morongwa Dec 03	500	101	-	27	-
1550	D. Samotanzi Feb 04	30	28	-	-	-
1527	J. Twaimango Feb 04	34	204	-	-	-
1751	K. Karekola Feb 04	-	16	-	-	-
1547	L. Xhadao Feb 04	111	398	-	-	-
1501	I. Keetile Feb 04	55	-	-	-	-
1552	R. Kareto Feb 04	69	135	-	-	-
1503	S. Ngambi Jan 04	310	1	-	-	-
1504	O. Nyangana Jan 04	465	1	-	-	-
1501	I. Keetile Jan 04	98	27	-	-	-
1549	O. Amos Jan 04	33	-	5	2	15

ETSHA 13

1843	S.J. Masasa March 04	543	38	-	-	-
1866	P. Kakuvi March 04	142	177	-	-	-
1826	T. Dikaelo Jan 04	3058	19	-	5	-

1843	J. Masaja	540	-	-	-	-
Oct	03					
1858	K. Shamoruo (Late)	708	102	-	62	-
Aug	03					
1855	K. Xan	1917	517	-	-	-
Aug	03					
1826	F. Dikaelo	3221	14	-	-	-
Aug	03					
1843	S.J. Masasa	1423	-	-	-	-
Aug	03					
1853	K. Shamoruo (Late)	973	135	-	-	-
Sept	03					
1855	K. Xan	1282	147	-	4	-
July	03					
1507	D. Morongwa	49	15	-	13	-
July	03					
1826	T. Dikaelo	1288	-	-	-	-
July	03					
1875	M. Yakeya	73	41	-	-	-
July	03					
1858	K. Shamoruo (Late)	242	31	-	-	-
July	03					
1877	K. Ovaya	1717	-	-	-	-
July	03					
1545	K. Molao	132	21	4	14	-
July	03					

MAUN EXT. AREA

2121	E.R. Mosweu	125	102	-	1	-
March	04					
2121	E.R. Mosweu	323	209	-	-	-
March	04					
2124	S. Segarega	535	274	-	-	-
March	04					
2108	M. Morotsi	47	79	-	-	-
Aug	03					
2108	M. Morotsi	114	94	-	11	-
Sept	03					
2108	M. Morotsi	326	126	6	-	22
Nov	03					
2110	B. Michael	583	86	-	5	5
July	03					
2110	B. Michael	316	84	-	-	-
June	03					
	D. Mange	756	462	-	-	-
April	02					
	D. Manage	830	345	-	-	-
March	02					

Aug	Nyami Serurubele	309	44	-	-	14
	03					
	D. Maphomo	253	102	-	-	-
Oct	03					
	O. Samati	207	128	-	20	5
Nov	03					
	O. Samati	2155	244	-	54	8
Sept	03					
2121	E. Kosweu	274	86	-	1	-
Dec	03					
	N. Serurubele	1668	219	-	-	24
July	03					
	A.G. Nyane	79	33	-	-	-
July	03					
	M. Morotsi	71	28	-	-	-
July	03					
	M. Morotsi	58	7	16	-	7
Dec	03					
	A. Morotsi	94	10	17	-	7
Dec	03					
	B. Michael	214	163	-	-	1
June	03					
	D. Maphomo	60	54	-	-	-
Feb	03					
	M. Morotsi	106	39	-	-	6
Jan	04					
	M. Morotsi	50	56	-	-	5
Oct	03					
	D. Maphomo	464	57	-	-	-
Jan	04					
2121	E. Mosweu	487	118	2	-	-
Jan	04					
	D. Maphomo	40	38	4	-	11
Feb	04					
	M. Morotsi	50	35	-	-	-
March	04					
1404	D. Maphomo	792	66	-	-	-
July	03					