FISHERY COUNTRY PROFILE	Food and Agriculture Organization of the United Nations	FID/CP/BOT
PROFIL DE LA PÊCHE PAR PAYS	Organisation des Nations Unies pour l'alimentation et l'agriculture	April 2007
RESUMEN INFORMATIVO SOBRE LA PESCA POR PAISES	Organización de las Naciones Unidas para la Agricultura y la Alimentación	

THE REPUBLIC OF BOTSWANA

GENERAL ECONOMIC DATA

Area:	581 730 km²
Water area:	23 280km²
Population (2005):	1 800 000
GDP at purchaser's value (2005):	US$ 9.4 billion
GNI per head (2005):	US$ 5 180
Agricultural GDP (2005):	US$ 244 400 000
Fisheries GDP (estimate for 2002):	0,002% of GDP

Fisheries data (2003):

	Production	Imports	Exports	Total Supply	Per Caput Supply
	'000 tonnes live-weight				kg/year
Fish for direct human consumption	112	4 900	70	4 941	2.8
Fish for animal feed and other purposes	10	n/a	n/a	n/a	

Estimated Employment (2006):	
(i) Primary sector (excluding aquaculture):	3000 fishers in Botswana
(ii) Secondary sector:	50
Gross value of fisheries output (estimate 2005):	53 000 $US
Trade (2004):	
Value of fisheries imports:	US$ 3 477 000
Value of fisheries exports:	US$ 43 000

3. Fishery areas and main resources

The Okavango Delta fishery

As the largest source of water in Botswana, the Okavango Delta has the largest and most important fishery in Botswana. Based on 2004/ 2005 statistics, the Okavango Delta production constituted approximately 80 per cent of the national fish catches.
The main exploited stocks/ principal species in the Delta are the Tilapia (also commonly called Bream) and these, in order of importance are; *Oreochromis andersonii, tilapia rendalli* and *Oreochromis macrochir*. The other bream species which are also harvested, but at low levels are several Sargochromis species (*S. carlottae, S. greenwoodi, S. codringtonni*), several Serranochromis species (*S. robustus, S. angusticeps, S. altus, S. macrocephalus*). Based on the 2004/ 2005 period, these constituted approximately 64 per cent of the total national fish production figures. Other exploited stocks are the Clarias species (*Clarias gariepinus* and *C. ngamensis*), *Hydrocynus vittatus*, and *S. intermedius.*

The Chobe fishery
The most productive fishing grounds in this fishery dried out several years ago (i.e. Lake Liambezi). Consequently, due to the limited fishing grounds available, due to the Chobe National Park where any form of fishing is prohibited, there is very little off-take from the Chobe River. Most of the fishing is done across the border in Namibia and then brought to Botswana (to Kasane, the main village in the area) for sale. Notwithstanding, currently the Fisheries Division does not have a field officer based in the area, therefore no information is collected in the fishery. It was perhaps due to lack of manpower in the area, and not necessarily lack of fishing, that no fish catch statistics were recorded in the 2004/ 2005 period. There is however, substantial hook and line fishing going on in the Chobe River catching mostly tiger-fish and the large sized tilapia. Moreover, small boys have been observed on several occasions using bottle traps submerged in water with lumps of maize porridge inside to trap smaller sized species such as cyprinids.

The reservoir fishery

There are four small reservoirs in south-eastern Botswana which annually give out approximately 11 commercial fishing licenses. Total catch from these reservoirs based on the 2004/ 2005 statistics contributed 20 per cent of the total national catch. The principal species harvested in these reservoirs are *Labeo lunatus* in Shashe Dam, bream species (with *Oreochromis mossambicus* as the most dominant species) in Gaborone and Letsibogo dams, and catfishes (especially *Clarias gariepinus* as the dominant species) in Bokaa Dam.

4.1 Overall fishery sector

There are three main kinds of fishers in Botswana; commercial, subsistence and recreational fishers. While commercial fishing is the main source of revenue for the local fishing communities, the subsistence fishery is the main source of food for socio-economically challenged rural fisherfolk who live on the fringes of the Delta and the Chobe systems. Commercial fishers use gill nets, while subsistence fishers use a motley of fishing gear that ranges from homemade gill nets, to fishing baskets, hook and line, fishing traps, and fishing fences.
Aquaculture in Botswana is still at an infantile stage, which is possibly due to the high capital costs involved in such enterprises. Most of the aquaculture activities are centered around educational or government institutions who have small ponds. The Fisheries Division stocks these pond/ small dams periodically with fish fingerlings from other established dams. In the 2004/ 2005 season, 15 clients were supplied with fingerlings for their dams. Out of these, 10 were government institutions while 5 were private individuals.

4.2.1.1 Means of fishing/ production

Boat type	*Total number*
Dug out canoes (*Mekoro*)	779
Fibre glass canoes	87
Fibre glass boats	29
Aluminum boats	80

According to the table above, dugout canoes (locally called *mekoro*) are the most widely used form of transport in the Okavango Delta's fishery. These are made out of wood by the fishers themselves (generally). Approximately 94 per cent of the aluminum boats are motorized and these are generally used by commercial fishers. *Mekoro* and fiber glass canoes are generally used by subsistence fishers. Generally, subsistence fishers who use traditional fishing gear do not use/ own any form of water transport because they are normally cost prohibitive.

Gear type	*Total number*
Gill nets	1468
Hook and line	1492
Fishing baskets	1336
Other gear	191

The table above shows that hook and line are the commonest fishing gear in the Okavango Delta fishery, while gill nets are the second most common fishing gear. Hook and line fishing gear is generally a piece of wooden stick to which is tied a fishing line with a hook attached at the end. There are approximately 10 different hook sizes currently in use in the local hook and line fishery. This fishing gear is used mostly by young boys and older men in the subsistence fishery. Gill nets are cotton multi-filament nets with varying mesh sizes, with the commonest being 100 – 125 mm stretched mesh sizes in the commercial fishery. Subsistence fishers normally use a range of mesh sizes from 50 – 125 mm stretched mesh. Some subsistence fishers make homemade gill nets from multi-filament cotton twine that is generally available in most shops around the Delta. Other subsistence fishers use threads found in old/ used vehicle tires to make the fishing nets. For all these homemade gill nets, old lead-acid batteries are used as lead sinkers while some styrofoam pieces are used as floats. Fishing baskets are normally made from local material and woven into a funnel-like structure. Other kinds of fishing gear used in the fishery include fishing weirs or barrage traps, and fishing spears.

4.3.1.1 Catch profile

Fish production figures by species group and by catch station from the main fishing areas in Botswana for the 2004/ 2005 fishing season

Fishing Area	*Species Groups*							
	Bream	Catfishes	Silver Catfish	Tiger-fish	Carp	Labeo	Other species	**Totals**
Okavango Delta	88604.7	32081.8	2006.5	4824.2	0	0	2095.9	129613.1
Gaborone Dam	2783	1550.9	72	0	226.9	0	0	4632.8
Bokaa Dam	3876.6	4668.8	0	0	0	0	0	8545.4
Shashe Dam	2884.7	1439.7	1756.9	0	0	7250	0	13331.3
Letsibogo Dam	4139.6	361.2	0	0	0	0	0	4500.8
Totals	102288.6	40102.4	3835.4	4824.2	226.9	7250	2095.9	160623.4

The catch data summarized in the table above reflect catches from gill net only. Currently, no catch statistics are collected from other fish production sectors in Botswana such as women basket fishers, hook and line fishers, the recreational fishery (etc) in the Okavango Delta and other fishing grounds. Apart from the four main small reservoirs in south eastern Botswana, a

substantial amount of fishing goes on unreported in other small dams in south eastern Botswana. Moreover, some recreational fishing has been observed in several small dams in south-eastern Botswana. Furthermore, while no fish catch statistics were reported for the Chobe fishery, some fishing has also been observed in the Chobe River. While most of the recreational fishery in the Delta claims to practice catch and release, there is however a substantial portion of the catch which is not released back into the water but is rather kept for consumption. These catches are also not reported and are relatively substantial. Therefore, these catch statistics are therefore a misrepresentation of the actual annual off-take from the fishery.

5. Post harvest use

5.1 Fish utilization

The Okavango Delta fishery

All the fish caught is either consumed at the household level or sold at both formal and informal market structures. Some of the fish such as the catfish species (i.e. Clarias spp) and tiger-fish (*Hydrocynus vittatus*) are bartered for other commodities such as grain. Fish caught by women basket fishers usually include small sized species such as cyprinids like Barbus spp and small sized cichlids like *Tilapia sparrmanii*. There are three main kinds of fish products that are sold in Botswana. Fish are either sold as fresh/ frozen, sun dried or smoked. The fresh/ frozen product is usually kept in deep freezers at two main landing places in the panhandle of the Okavango Delta. These facilities are normally operated by fishing cooperatives and the oldest, Samochima (in the panhandle), has been operating since 1995. Other enterprising commercial fishers have one or two deep freezers facilities (each), capable of reaching –40 ^{0}C. These freezers are either kept at the fishing village, or some commercial fishers set up camp deep in the (lower) Delta, where they subsequently set these temporary freezers facilities. These freezers (except for those from the two main cooperatively run facilities in the Delta's panhandle) are gas powered. When these freezers fill up, they are then transported on the back to the main villages are sold either to middle men or to supermarkets in the main village of Maun.

The reservoir fishery

Most of the fish caught in the reservoirs is either packed in ice or sun-dried before being transported to the market.

5.2 Fish markets

Okavango Delta fishery

There are two fish cold storage facilities in the upper panhandle of the Okavango Delta. These are the major fish landing areas for commercial fisher cooperatives in this part of the Delta and were developed through grants provided by government. Some commercial fishers keep one or two freezers in their villages while other fishermen keep their catch in cool boxes packed with ice and then transported to major villages for selling. Middle-men then travel from major centers using refrigerated trailers to purchase the fish (from the cold storage facilities) which are then sold to either supermarkets or sold from individual cold storage facilities in Maun, which is the major urban village in the region. Some of the fish is however, exported to major urban centers such as Gaborone for sale to major supermarkets. Notwithstanding, marketing is still a major problem in most of the fishing villages in the region, especially in villages from eastern Ngamiland, which has a poor road network. Most fishers pack their fish in ice (in cool boxes) and then transport them by road to Shakawe, which is the major village in the panhandle of the Delta, for sale. Some fishers in other fishing villages around the Delta smoke or sun dry their catch, pack it and transport it by bus for sale in Maun.

Chobe fishery
Most of the fish in this fishery is sold as fresh fish in the market. Originally, the main fishing grounds were at Lake Liambezi which has since dried up. In that fishery, fish were kept in a cold storage facility before being transported to the market in Kasane, which is the main urban village in the region.

Reservoir fisheries

Most of the catches from the reservoir fisheries are sold fresh or sun dried. This is mainly because the reservoirs are within urban areas with a readily available market.

6 Fishery sector performance

6.1 Economic role of fisheries in the national economy

While the fishery has very little impact on the national economy (approximately 0.002 per cent of national GDP at 2002 market prices), it has a relatively high socio-economic impact at the regional level (i.e. the Okavango Delta region which has the main fishing grounds). During the 1980's and early 1990's (drought period), the main product was dried salted fish which government bought from commercial fishermen and then re-distributed among the fishing community as drought relief food. At 1989 market prices, commercial fishermen made an average of USD 265.00 (sales) per month. Past research shows that gill net fishermen earned approximately USD 106.00/ month in 1999. In 2001, commercial fishermen on average earned a monthly profit of USD256.00. Moreover, commercial fishermen were (and still are) also important sources of informal sector employment. There are also indirect economic values associated with supporting industries such as sales of capital/ fixed fishing equipment like gill nets, fishing hooks, outboard engines, aluminum boats; and running costs such as fuel and boat maintenance.
Moreover, recent research has shown that commercial fishing in the Delta has high investment returns (return on investment values of 109 per cent) which suggests that it has a positive economic impact on the rural community. While the economic role of the recreational fishery has not been evaluated, it is considered to be substantial also.

6.2 Demand

There is currently a high demand for freshwater fish in all the fishing areas in Botswana. This is best illustrated by the high imports of seafood into Botswana compared to the low fish catches produced annually.

6.3 Supply

Annual supply is currently at approximately 130 tons in Botswana. However, as already indicated, this is an under-reporting of the actual off-take from all the water-bodies in Botswana.

6.4 Trade

The frozen/ chilled seafood (i.e. various fish species, prawns/ shrimp, lobsters etc.) is a million USD industry valued at over US$ 2 million for the past several. Total net weight of imports (in tons) has grown steadily since 2002 and peaked in 2005, before decreasing slightly in 2006.

6.5 Food security

Recent socio-economic research in the Okavango Delta's subsistence fishery has shown that the majority of subsistence fishers are single parent households headed by females. Generally, households have 7 individuals on average, and are also characterized by a relatively high prevalence of young children (i.e. age range of 0-60 months old). These households regard fish as their major livelihood strategy where the majority of them increase fish catches as a major strategy to offset food shortages. Moreover, there is a high proportion of females (53 per cent based on a 2006 frame study of the Delta's fishery) in the Okavango delta's fishery which attests to its importance as a major source of protein to young children. This is based on the observation that female basket fishing harvests mostly low value fish species (small sized fish species) which do not have any market value, either for barter or for selling, and is rather consumed within the household. Moreover, research has shown that most people turn to fishing during lean economic years and then pursue other livelihood activities during good years, which makes the fishery a social safety net for most households.

6.6 Employment

While the commercial fishery is an important source of informal sector employment, there are currently no statistics to validate this observation.

6.7 Rural development

Commercial fishing enterprises are perhaps the major actors contributing towards rural development in the fishery sector. While their impact on rural employment may at best be minimal, they also contribute towards infrastructural development in some villages. Apart from the existing two cold storage facilities in the panhandle of the Delta, several enterprising commercial fishers have built small concrete structures to house one or two freezers to store their fish catches. These facilities then employ people to assist in fish selling. Moreover, some of the commercial fishing enterprises employ a few people to assist in fishing activities.
A national fish hatchery has been constructed in a rural area and this has subsequently contributed to rural development and also enhanced rural employment. The provision of electricity to the facility, the provision of roads, and the employment of local people in the daily running of the hatchery are indeed positive contributions of this place to rural development.

7 Fishery sector development

7.1 Development prospects/ strategies

7.1.1 Main areas for opportunities

The main areas that need to be developed in the fishery sector in Botswana is a market for the fishery. While government encouraged the emergence of middle-men in the fishery through the provision of grants to entrepreneurs, these appear not to have caught up well. Because of the dispersed nature of the fishery among the different fishing villages in the Okavango Delta, there is no centralized market, which makes it difficult for fishers (commercial) to sell their catch. Moreover, as indicated, the lack of fish catch statistics from the Chobe fishery in the 2004/ 2005 year is more a reflection of manpower shortage than total absence of fishing in the area. Fishing of all types (gill netting, hook and line, and other traditional fishing forms) can still be encouraged in the region to not only contribute to household food security, but also augment income for impoverished households.

There are two main fish species that have a large biomass in the fishery but are currently not exploited optimally. *Schilbe intermedius* (silver catfish) and Clarias spp, especially *Clarias gariepinus* (sharp-tooth catfish) and *C. ngamensis* (blunt-tooth catfish) contribute a significant proportion of the fish biomass in the Okavango and Chobe fisheries and some of the small reservoirs, but these appear to have a low preference in the market. However, it has been observed in the south-eastern part of Botswana appear to have a higher preference for catfish (people indicate that it has more meat and less bones) than the tilapia species (which are bony). Therefore, a concerted effort is needed to market these fish species as a viable option to the principal target species in the fishery. This will not only relieve exploitation pressure on the principal species, but will also result in an optimum utilization of a large fish biomass that is currently relatively unutilized in the fishery.

While most fishing occurs in four main reservoirs in the country, there are over to 300 small dams in south-eastern and central Botswana which have fishing potential. These small dams can therefore be stocked intensively and peripheral communities encouraged to utilize the fish resource inside them. This will increase access of rural households to cheap but readily available protein and may also be a viable source of income. The construction of a national fish hatchery suggests that there is a readily available fish seed available to enterprising fish farmers in the country. Fish fingerlings can therefore be stocked to enhance fish production in the small (i.e. the 300 small dams) dams in south eastern Botswana to optimally utilize their fish potential.

Moreover, the four main reservoirs can be stocked with *kapenta* (*Limnothrissa miodon*) which has proven very successful in several reservoirs in Southern Africa (e.g. Lake Kariba, Itezhi-Tezhi Dam, Caborra Bassa Dam, etc). Currently, there is an empty niche in each of these reservoirs that *kapenta* can occupy quite successfully. This is an important commercial species with potentially high economic value for both the local and export markets. Therefore, encouraging *kapenta* production can conceivably increase not only the fish production of the main reservoirs but also the economic value of the fishery. *Kapenta* can indeed be an important export commodity due to its high desirability in southern Africa.

The smaller sized species in the Okavango Delta (e.g. cyprinids, and smaller sized cichlids) are a potential aquarium trade species that has not been explored. Essentially, this species group constitutes a biomass that is hardly utilized, except for very few people fishing with mosquito nets.

7.1.2 Main constraints to development

The lack of a national fisheries policy will and continues to be a major hindrance towards the development of a vibrant fishery sector in Botswana. Due to lack of a national fisheries policy, fisheries development issues in the country are still relatively incoherent and unfocused. There is no clear guiding principle towards fisheries management which can be attained through a national fisheries policy. Because of this dearth of guidance, the full economic value of the recreational fishery has never been realized where recreational fishers can enter the country, participate in fishing competitions anywhere in the country, and leave as they please. Moreover, because of the lack of a national fisheries policy, potentially productive fisheries such as Chobe and the small dams in south eastern Botswana are currently unutilized.

7.2 Research

- **Fish Stock Assessment of the Okavango Delta Fishery:** Assessing exploitation levels and sustainable yields in the Okavango delta fishery and proposing optimum exploitation levels and a management regime for the Okavango Delta fishery. This project is funded by the Botswana Government and done in collaboration with Fisheries Division (Ministry of Environment, Wildlife and Tourism in Botswana) and the University of Botswana.
- **Flood-plain Fish Ecology - Fish production, feeding ecology and migration in a seasonal flood-plain, Okavango Delta, Botswana:** A systems ecology approach to

fisheries management whose main aim is to determine fish population dynamics in a highly variable system and implications to fisheries management in the delta. This project is funded by the Office of Research and Development at the University of Botswana

- **The Future of Fishing in the Okavango River – Factoring inland fisheries into River Basin Planning:** The aim of this project was/ is to assess the needs of fish as indicators of ecological health along the Okavango River and include these needs in the development of long-term management plans for the basin. The project was funded by the Natural Heritage Institute (USA) and done in collaboration with Natural Heritage Institute, University of California – Davis and the University of Botswana
- **Fisheries Socio-Economic Survey:** One of the major outcomes of this project is to create an enhanced understanding of the role of the Okavango fishery to the economy of the Ngamiland district (and its impact on rural livelihoods), and the impact of fish consumption on child nutrition and well-being. The project is funded by the University of Botswana
- **Frame Survey of the Okavango Delta Fishery:** The major outcome of this project is to determine the structure of the Okavango Delta fishery, and to study immigration and emigration rates of the fishery. The Botswana government funded the project**.**
- **Indigenous traditional knowledge in fisheries.** The major outcome of this project is to document indigenous traditional knowledge in the fisheries of the Okavango Delta. This information will eventually be used to develop a comprehensive and holistic management regime of the Delta's fishery. This project is funded by the University of Botswana
- **Bi-Okavango.** The main goal of this project is to 'build local capacity for conservation and sustainable use of biodiversity in the Okavango Delta.' The three production sectors that the project is focusing on to achieve this goal are, water, tourism and fisheries.

7.3 Education

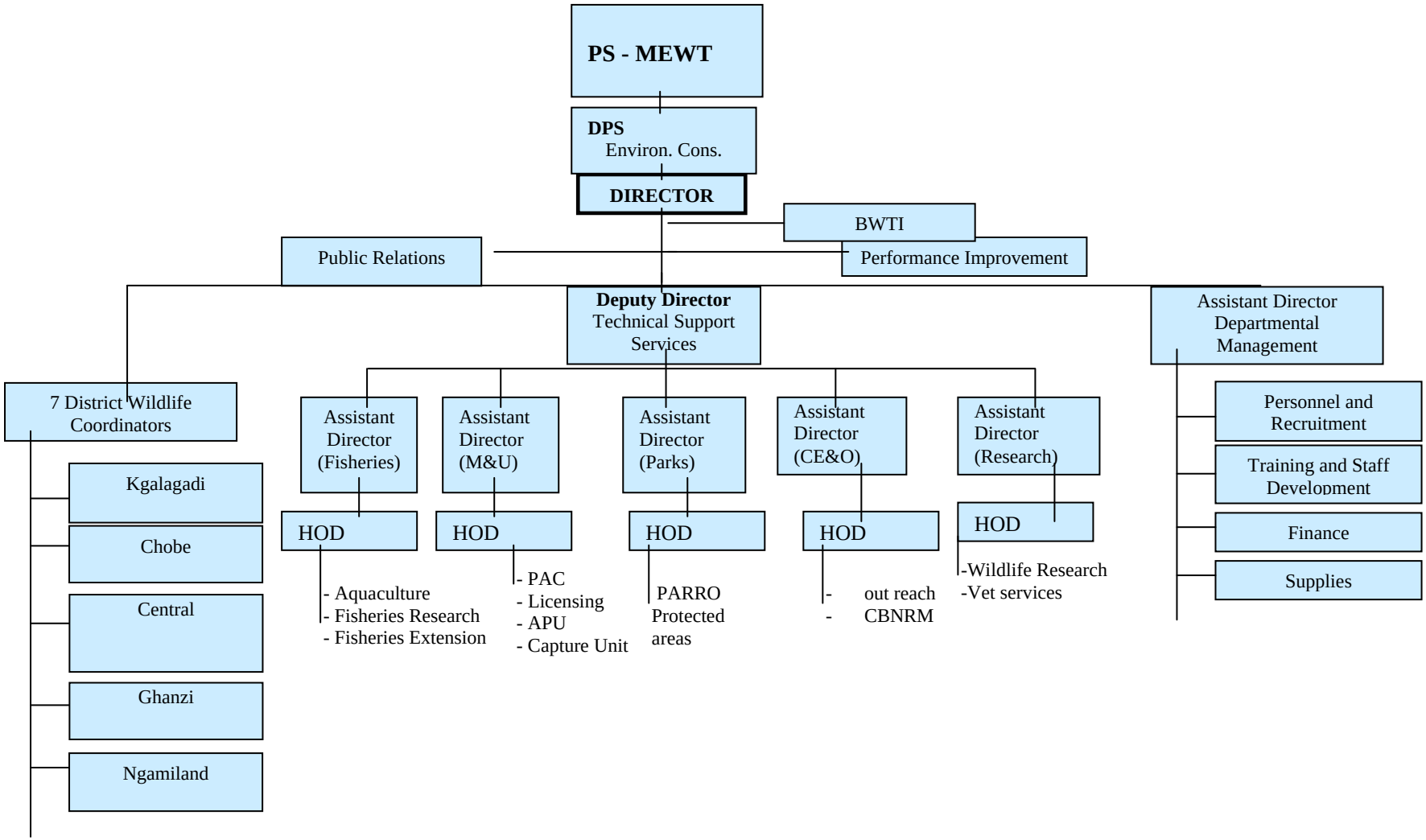
As a way of ensuring sustainable fish utilization in Botswana, the Department of Wildlife and National Parks actively promotes village based education programmes in the fishing villages. These courses include;

- Gear technology (which includes elements of net mending and net mounting, etc)
- Fish processing and post harvest technology (which includes elements of fish handling, etc)
- Marketing (which includes elements of simple book-keeping, etc)
- Fisheries management (which includes elements of sustainable utilization, etc)

7.4 Foreign aid

- The UNDP funded Bi-Okavango project which is co-financed with the Botswana Government.
- The Natural Heritage Institute (USA) which funded one of the fisheries projects in Botswana

8 Fishery sector institutions



9 General legal frameworks

There are currently no fisheries regulations in Botswana, which is perhaps related to the absence of a national fisheries policy. The only fisheries management legislation that exists is the Fish Protection Act, CAP 38: 05 of 1975. The Act empowers the Minister (of Wildlife, Environment and Tourism);

- authorization or prohibition of specific fishing methods and fishing gear, including the use of any explosives, poisonous or noxious substances or the use of any instrument or appliance that might prove to be detrimental to the 'preservation or increase of fish;
- registration of fishers and fishing crafts in all fishing areas and establishment of fees to be paid thereof;
- designation of fishing seasons and regulation of fish sales; and
- prohibition of both importation of live fish into the country and translocation of live fish within the country without authorization

10 Management applied to the main fisheries

The Department of Wildlife and National Parks (DWNP) strategic plan

After the (then) Fisheries Unit was incorporated into the Department of Wildlife and National Parks (in the Ministry if Environment, Wildlife and Tourism) in 2003 (from the Department of Animal Health and Production in the Ministry of Agriculture), it was upgraded to a Division. Subsequently, fisheries were managed under the DWNP strategic plan which is founded on the Wildlife Conservation and National Parks Act of 1992 and the Fish Protection Act of 1975. The basis of this plan is that fish and wildlife resources 'contribute to the cultural, socio-economic and biological integrity of the nation through:

- Creation of economic opportunities;
- Diversification of the economic base;
- Contribution to biological diversity;
- Provision of resources for tourism development; and
- Provision of platform for aesthetic, scientific, recreational and educational values.'

Under the strategic plan matrix, there are several key result areas (KRA) and goals mapped out to aid towards the achievement of the plan. KRA 1 is 'sustained fish and wildlife populations and habitats. Goal 1.2 of the plan is stated as 'species-specific off-take level to fall within biologically sustainable off-take. Objective 4 under this goal is stated as to 'determine biologically sustainable off-take by conducting fish and wildlife surveys'. Goal 1.3 is to 'develop and implement policies, regulations and strategies for sustaining fish and wildlife in their habitats'. Goal 1.4 states 'to promote awareness in the general public on the importance of fish and wildlife through education programmes.' Goal 1.5 states 'to sustain the quality and extent of fish and wildlife habitats'. Objective 5 under this goal states 'to monitor the quality and extent of fish habitat in the Okavango panhandle through fish stock monitoring.' The first KRA focuses more on the biological management of the fish resource in Botswana.

KRA 2 states 'public use and enjoyment of Botswana's fish and wildlife resources.' Goal 2.4 under this KRA states 'promote sustainable use of fish and wildlife resource.' The several fisheries specific objectives under this goal include courses on fisheries utilization; development of fisheries extension packages on fish farming; provision of fish fingerlings; and establishment of fish farms.

1.1 Main goals/objectives

1.2 Institutional arrangements

1.2.1 Co-management activities

KRA 3 of the Department of Wildlife and National Parks strategic plan states 'partnerships in sustainable utilization and management of wildlife resources.' This suggests that the department will strive to develop partnership will local and international actors towards the development of the sector (fish and wildlife). Goal 3.1 of this KRA suggests that 'communities will be beneficially engaged in the sustainable utilization of fish and wildlife resources.' This goal will be achieved through three objectives; (i) to improve stakeholder participation in the management of Community Based Natural Resource Management (CBNRM); (ii) to mobilize communities to participate in CBNRM activities; and (iii) to conduct training for existing Community Based Organizations (CBO's) in financial management, entrepreneurial skills and business ethics. Through this initiative, the department is clearly making an effort to co-management fish and wildlife resources with local communities. However, this policy is much more advanced and pronounced in wildlife resources and not fish resources. This is based on the observation that fisheries joined the department a few years ago and therefore, still has to be integrated fully into the department.

1.2.2 Rights-based approaches to fisheries management

The Okavango Delta fishery

While the fishery is mostly open access in most parts of the Delta, there are fishing restrictions on some parts of the Delta due to other land-use activities. Fishing in the Moremi Game Reserve (which falls within the Okavango Delta) is prohibited. Initially, fishing was allowed through a daily bag limit but this was eventually discontinued. Notwithstanding, traditional user rights access are given to fishers in Controlled Hunting Areas (CHA's) in the lower Delta. These land-use types allow for consumptive (e.g. trophy hunting) and/ or non-consumptive (e.g. photographic safaris) use of wildlife resources. Regulation 4.12.1 of the CHA's confers the rights of access and transit to citizens and also for the traditional utilization of resources within them. Notwithstanding, regulation 4.12.2. highlights that the lease holder only have 'exclusive rights' to tourism and ' other commercial uses' in their areas.

Chobe and reservoir fisheries

There are no rights based approaches to fisheries management in these fishing areas.

1.3 Management measures

Okavango Delta Fishery

The Okavango Delta fishery is currently open access which has and continues to fuel conflict between the main stakeholders in the fishery sector. This conflict is based on accusations and counter-accusations between the stakeholders on allegations of fish stock over-exploitation. However, recent research has shown that the principal commercial and recreational fish stocks are not over-exploited. Hitherto, the Fisheries Division has 'encouraged' gill net fishers to use larger sized mesh nets ostensibly to 'protect' pre-recruitment exploitation of the principal species. The downside of this approach of course is that smaller sized fish species

are invariably un-exploited and this selective exploitation of the fish community may ultimately skew the fish community structure towards smaller sized species in the fishery. Notwithstanding, there is some element of spatial controls in the fishery within game reserves where fishing is strictly prohibited. Interestingly, no research has proven the efficacy of this approach in the Delta to evaluate the value of the game reserve towards conservation of the Delta's fish stocks. This is based on the observation that the game reserve is in the seasonal part of the Delta (the lower Delta) where there is comparatively low fishing effort/ exploitation pressure compared to the panhandle of the Delta. Consequently, there is no scientific basis to show whether this 'refuge' indeed acts as a repository for the entire Delta where fish migrate upstream to re-populate areas under relatively intense exploitation pressure, or whether the reserve helps to re-populate peripheral areas only.

Chobe fishery

Fishing in the Chobe system is restricted to areas outside the Chobe National Park, which leaves very little fishing grounds available to local fishers. Most of the fishing therefore, occurs across the river in the Namibian side and this has been a thorny issue between the Chobe local communities and government. The most productive fishing grounds in the areas were in Lake Liambezi which has since dried up. Notwithstanding, a section of the local community has always complained that the Botswana government is managing/ conserving the fish stocks of the Chobe River for the benefit of Namibians, because there is no reserve on their side of the river that restricts fishing. Subsequently, Namibian fishers export their freshly caught fish to the Botswana side for sale in the market. This issue accentuates some of the dichotomies of trans-boundary management of natural resources such as fish; where one country restricts/ prohibits fishing because the major fishing areas fall within a game reserve while the other bordering state allows fishing.

Reservoir fisheries

Fishing in the four main reservoirs is controlled through effort limitation and fishing seasons. There are three commercial fishing licenses at Gaborone Dam, two at Bokaa Dam, four at Shashe Dam, and two at Letsibogo Dam. There is a closed fishing season that occurs annually between October and January.

Fishing communities

Currently, the Okavango Fishermen Association (OFA) is the only recognized fishermen institution in Botswana, based in the Okavango Delta. This association, formed in 1995, was born due to escalating cases of conflict/ friction that existed (and still do) between commercial and recreational/ sport fishers. The commercial fishers felt that they needed an association that will articulate their concerns better and represent their grievances to government as a collective voice of the majority. The association charges an annual membership fee and membership is open to everybody. Interestingly, some recreational fishers have been approved membership of the OFA. This suggests that perhaps the organization sees itself transcending the internal friction that exists between the two major stakeholders, and is rather beginning to focus more on substantive issues pertaining to the development and management of the fishery in general.

Notwithstanding, the OFA is currently (for the past three years) saddled with a weak and indecisive leadership. Subsequently, the OFA is therefore floundering and on the verge of a systematic collapse. It has a weak membership drive, and because it does not have any other income generating ventures, is also financially weak. These financial woes are highlighted through the organization's inability to hold its AGM as per constitution for the past three years. It has also failed consistently to elect new office bearers annually. Therefore, there is a

clear and present need for external intervention to lift the OFA, otherwise it will simply collapse.

There are currently no formalized fishers' associations/ organizations in the other fisheries (i.e. Chobe and reservoir fisheries), possibly as a consequence of the low fisher numbers in them.