FISHERY AND AQUACULTURE COUNTRY PROFILE	Food and Agriculture Organization of the United Nations	FID/CP/LSO
PROFIL DE LA PÊCHE ET DE L'AQUACULTURE PAR PAYS	Organisation des Nations Unies pour l'alimentation et l'agriculture	
RESUMEN INFORMATIVO SOBRE LA PESCA Y LA ACUICULTURA POR PAÍSES	Organización de las Naciones Unidas para la Agricultura y la Alimentación	October 2008

LESOTHO

1. GENERAL GEOGRAPHIC AND ECONOMIC DATA

Area:	30 355 km²
Water area:	80 km²
Population (2006):	1 994 000
GDP at purchaser's value (2006):	USD 1.419 billion
GDP per head (2006):	USD 2 600
Agricultural GDP (2006)	16.1% of GDP
Fisheries GDP (2006)	NA

2. FISHERIES DATA

2006	Production	Imports	Exports	Total Supply	Per Caput Supply
	tonnes live weight				kg/year
Fish for direct human consumption	45	2 000	0	2 045	1.0
Fish for animal feed and other purposes	0	0	0	0	0

Employment (2007)	
(i) Primary sector (including aquaculture):	245
(ii) Secondary sector:	NA
Gross value of fisheries output in 2006	NA
Trade (2006)	
Value of fisheries imports:	USD 502 000
Value of fisheries exports:	9 000

3. FISHERY AREAS AND MAIN RESOURCES

Lesotho is a small land-locked country located between 28°S and 31°S latitude and 27° and 30°E longitude. Lesotho is completely surrounded by the Republic of South Africa. The land area covers 30 355 square kilometers. The country has a seasonal rainfall and more than 85% of the annual rainfall occurs in the seven months from October to April. Rainfall varies from 500 mm in lowlands districts to over 1300 mm in north-east along the Drakensberg Mountains.

Lesotho's water resources are mainly in the form of rivers. There are however a few medium-sized reservoirs, the largest, Katse reservoir, being only 36 Km^2. The area of surface waterbodies is currently estimated to 80 km^2. This follows filling up of new reservoir such as Mohale. The bulk of water occurs as running water in river. The rivers form part of the Senqu (Orange) river system, the largest system south of the Zambezi. There are basically three river sub-systems in Lesotho. These are the Senqu (Orange), Makhaleng and Mohokare (Caledon). The total river length constituted by these rivers and their main tributaries is estimated at 2 160 km. The rivers have a total drainage area of about 3 100 000 hectares and have an estimated total runoff of 4 400 million cubic meters per year.

Fishing and fish farming currently play very insignificant roles in the economy of the country. Capture fisheries as well as the rural aquaculture are of the subsistence type and their main role is in food security. However, cold-water aquaculture, while still at its initial stage, already indicates potential for becoming an important foreign exchange earner for the country.

The diversity of fish species in Lesotho is very limited, consisting only of 17 species. Nine of these are indigenous while eight have been introduced. The indigenous species with potential for development of capture fisheries are: small mouth yellow fish (*Barbus aeneus),* large mouth yellowfish (*Barbus kimberleyensis*), Orange River labeo or mudfish *(Labeo capensis*), Mud mullet or Moggel (*Labeo umbratus*) and sharp tooth catfish (*Clarias gariepinus*)

Exotic species of fish have been introduced into Lesotho since 1912. The initial introductions were mainly aimed at improving capture fisheries while later introductions were made with the main objective of increasing productivity in fish farming. Species introduced to boost up capture fisheries are: Rainbow trout (*Oncorhynchus mykiss*), brown trout (*Salmo trutta*), Common carp (*Cyprinus carpio*), largemouth bass (*Macropterus salmoides*) and bluegill sunfish (*Lepomis macrochirus*)

Common carp is currently the main species produced in warm-water fish farming. The sharp tooth catfish has been tried at experimental level and indicated good results. The species is however not being produced due to unreliable fingerling production. Cold-water fish farming of rainbow trout takes place in the Lesotho Highlands Water Project (LHWP) area. A cage culture unit has been set by a private company to produce trout for exporting to the Republic of South Africa. Trout production is at a pilot stage allowing maximum production of 300 tonnes of fish per year. Stocking of fish occurred in 2006 while first harvesting was in 2007.

4. FISHERY SECTOR STRUCTURE

4.1 Overall fishery sector

4.1.1 Inland capture fishery

There is a limited capture fishery in Lesotho and this situation can be attributed to the limited fisheries resources. The current legislation requires that people only use hook and line for fishing but recently the use of illegal gears, such as sacks and sharp objects to catch fish is on the increase. Sport fishing for rainbow trout and yellowfish takes place in mountain streams. This activity mostly attracts tourists from the Republic of South Africa.

There is little monitoring of catches from river and most reservoirs and as a result the reported production is an estimate. A small gillnet fishery exists in the Katse dam. The total annual catch from this fishery ranges from 14 to 20 tonnes. National capture fisheries estimates are based on this known catch.

Lesotho production from capture fisheries (tonnes)

Source: FAO capture database (2008)

Species	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Common carp	18	18	18	20	8	10	12	15	15	12
Freshwater fishes nei	10	10	10	10	14	26	25	25	25	30
North African catfish	2	2	2	2	2	4	5	5	5	3
Total	30	30	30	32	24	40	42	45	45	45

4.1.2 Aquaculture

Fish farming plays a very important role in the development of the fisheries sector in Lesotho. The potential for aquaculture development has increased as a result of the current and planned water development projects.

Initiated by the Lesotho government through donor-funded projects, fish farming in Lesotho is public sector oriented. However, this orientation is changing as government encourages private sector investment.

Due to differences in altitude Lesotho has two distinct fish farming zones. These are: the lowlands, where temperatures are relatively high, and the highlands, characterized by cold climatic conditions.

4.1.3 Warm-water fish farming

The introduction of warm-water fish farming in Lesotho began in 1964 through construction of a fish hatchery that was stocked with common carp and tilapia *(Oreochromis mossambicus and Tilapia sparmanii)* during the 1965 growing season. While production of common carp fingerling succeeded,trials using both *T. sparrmanii* and *O. mossambicus* proved that tilapia farming was impossible due to low winter temperatures. The culture of tilapia in covered ponds and under controlled temperature is currently being considered.

Research work on the artificial propagation and mass production of the sharp-tooth catfish (*C. gariepinus*) started in 1982 and proved that this species has potential. However, production requires artificial propagation and artificial propagation of this species has not been possible but an effort is being made to establish a facility for induced spawning of sharp-tooth catfish.

Common carp is currently the main species being produced in warm-water fish farming. Production of common carp is practised under three production systems.

- The first fish farming system is the village fish farmers associations. The system involves organized groups of farmers who own ponds communally, manage and market fish together and equally share proceeds from the farms. This system has not been successful due to mismanagement associated with communal ownership. Most of these communally owned schemes have become dysfunctional.
- The second system is that of individual fish farmers. Under this system private farmers who have abundant water near their properties or have water stored for other purposes are encouraged to start fish farming. Although expanding slowly due to frequent droughts, this system is comparatively more sustainable.
- The third system is that of using reservoirs and dams for culture-based fisheries. Here individuals or groups of people stock dams annually and harvest fish throughout the growing seasons. This system has so far worked fine including for groups of youth.

4.1.4 Cold-water fish farming

A commercial aquaculture project has been initiated in Katse dam, the main Lesotho Highlands Water Project (LHWP) reservoir. This project is a joint effort by residents of the Republic of South Africa and Lesotho under a company known as Katse Fish Farms (KFF). The project produces rainbow trout in a cage culture system and will undertake primary processing of fish as well as establish a small trout hatchery. The company has been allowed to produce 300 tonnes at maximum production. However, production during the first year (2007) is expected to reach around 100 tonnes. The cage culture system is still in the pilot stage and is likely to expand if good results can be achieved.

4.2 Marine sub-sector

Lesotho is a landlocked country therefore has no marine fisheries. Marine fisheries resources are however utilized, as most imported fish are of marine origin.

4.3 Inland sub-sector

In Lesotho fishing is exclusively subsistence and is constituted by both the indigenous and exotic species. Occurrence as well as abundance of these species varies from one water body to another, thus they provide different types of fishery. The Maqalika reservoir located in Maseru city has up to seven species. The high species diversity is caused by an impounded stream and by water being pumped from the Caledon River into the reservoir. Species being fished in most water bodies are: small mouth yellow fish, large mouth yellowfish, Orange river labeo or mudfish, mud mullet or Moggel and sharp tooth catfish, rainbow trout, brown trout, common carp, largemouth bass and bluegill sunfish.

5. POST-HARVEST USE

5.1 Fish utilization

Almost everybody in Lesotho eats fish in one form or the other. The amount and type of fish consumed depends on availability and to some extent on affordability of fish products. The fish product that is mostly accessible to consumers is canned fish as even the most remote retail store is likely to have it in stock. Frozen fish is accessible through frozen food facilities and is almost restricted to urban areas. Both canned and frozen fish products are imported from neighboring countries.

Fresh fish from capture fisheries and aquaculture is only available to people living around water bodies where such production takes place. This is because currently neither processing nor formalized distribution occurs. The fish is usually sold whole or gutted from landing sites in capture fisheries or pond side in fish farming. It is well known that most people who buy fresh fish sun-dry it before cooking or roasting, however no effort has been made to sun-dry before marketing. The Lesotho Fisheries Project conducted fish smoking trials using both cold and hot smoke; however, smoking is not perceived as being viable because of limited firewood. Sun-drying of fish on a relatively large scale is also envisaged and is likely to be tested at national level as fish production increases.

5.2 Fish markets

All locally produced fish, with the exception of by-products from processing, is consumed by Lesotho residents. Marketing of fresh fish is done by fishermen or fish farmers rather than specialized marketing companies. The plan for the farmed trout is to have primary processing (removal of heads and the gut) on site and the final processing (filleting and smoking) to be undertaken by another partner based in the Republic of South Africa. The partner will also have the responsibility to market the fish. Smoked trout fillets are sold in the Republic of South Africa to wholesalers such Woolworths.

6. FISHERY SECTOR PERFORMANCE

6.1 Economic role of fisheries in the national economy

Up to now the contribution of fishing and fish farming to the economy of the country has been insignificant. However, initiation of trout farming in the highlands of Lesotho will result in an increase in export earnings. The earning expected during the first year (2007) from the sale of 140 tonnes is USD 600 000. When the current project operates at maximum production (300 tonnes) the country will earn about USD 1.3 million a year.

6.2 Demand and supply

Lesotho's population was 1.994 million in 2006 and is growing at an annual growth rate of 2.0 percent. *Per caput* consumption of fish has in turn increased from about 0.9 kg annually in 2000 to about 1.0 kg in 2006. There is a visible change in the eating habits of many urban households towards more use of white rather than red meat. Given population growth the demand for fish is expected to increase. The expectation is however that the bulk of fish consumed will still come from imported canned fish, due to its relatively lower price.

Fish consumed in Lesotho comes from both local production and fish imports. In 2006 total production from aquaculture and capture fisheries was 45 tonnes. This figure is, however, expected to increase as aquaculture output increases. Imported fish is expected to remain the same in terms of products required but projections are that a slight increase in the demand will occur.

6.3 Trade

International trade in fish has up to now consisted almost entirely of imports of fish for human consumption. In addition, Lesotho Farm Feed Mills (LFFM) imports animal feed concentrate, one of the ingredients of which is fish.
Lesotho initiated the export of rainbow trout in April 2007 and expects to export 140 tonnes by the end of the year. However, the country will remain a net importer of fish and fish products.

6.4 Food security

Almost all fish produced by capture fisheries and warm-water fish farming is consumed within the households of fishermen or fish farmers. The little that is sold to other consumers is mostly used to meet food requirements, hence fisheries and fish farming contribute directly to food security.

6.5 Employment

Capture fisheries offers very limited employment opportunities due to the magnitude of available resources. Most of the fishermen undertake fishing as a part-time activity and only about 15 percent of known fishermen are full-time. The number of people engaged in fishing activities was estimated to be 150 in 2007.
Warm-water fish farming is also done on a part-time basis by people engaged in other farming activities. Trout farming has provided full-time employment for 10 people and this figure is expected to increase once the hatchery and primary processing facilities become operational. In 2007 the total number of fish farmers was 95 people, of which 50 women.

6.6 Rural development

Currently capture fisheries and aquaculture do not play any special role in rural development. Income from crop and livestock farming make it possible for people to stay in rural areas while fisheries-related activities are complementary, and not a major reason for them to remain in rural areas.

7. FISHERY SECTOR DEVELOPMENT

7.1 Development prospects/strategies

7.1.1 Main areas for opportunities

Lesotho has a climate conducive to produce both high-value food fish (e.g rainbow trout) for local and export markets and low-value food fish (e.g common carp) for household food security.

The Lesotho Highlands Water Project has provided a vast amount of water well suited for trout farming. The country is also relatively free of fish diseases, thus it has a comparative advantage in the export of fish products.

The government of Lesotho has currently embarked on water storage projects for the lowlands and this will become an additional resource for fisheries development. The envisaged development is for culture-based fisheries and warm-water aquaculture, both of which aim to address the issue of food insecurity.

7.1.2 Main constraints to development

The main constraint for the development of the fishery sector is the shortage of well trained personnel in this field. Other problems include the high cost of pond construction when machinery is used, and the lack of credit.

7.2 Research

Lesotho does not have specialized institutions for fisheries research; however, some research work has in the past been done by both the Fisheries Section of the Ministry of Agriculture and Food Security and by the Lesotho Highlands Water Project. Aquaculture research has mainly consisted of pilot studies to adapt new technologies to Lesotho's conditions. Studies related to fisheries have concentrated on the rare and endangered Maloti minnow (*Pseudobarbus quathlambae*)

7.3 Education

Lesotho does not have any fisheries training institutions. All people that have specialized in fisheries received training outside the country. Lesotho Agricultural College has for a long time been offering a one semester course, "Introduction to Fisheries", to students undertaking Diploma in General Agriculture. During the 2006/07 academic year the National University of Lesotho (NUL) initiated programs of specialization in all fields of agriculture, including Animal Science. Undergraduate students studying Animal Science take an introductory course in aquaculture. The National University of Lesotho anticipates offering more elaborate training in aquaculture but there is a need to build the University's capacity before such a program can be offered.

7.4 Foreign aid

Fisheries development in Lesotho was initiated through donor funding due to limited local investment in the sector. Assistance has come in the form of technical support and funds from the Israeli government, the US Peace Corps and from ODA, OXFAM, UNICEF, FAO, USCC. WFP has assisted in pond construction through "food for work" schemes.

The World Bank through the Lesotho Highlands Water Project has assisted in preliminary work relating to development of cold-water aquaculture. Most of the work on the rare endangered Maloti minnow has also been funded by the World Bank as part of the Lesotho Highlands Water Project. It is important to note that funds used under LHWP are not necessarily "Aid" but a grant to the Lesotho Government.

8. FISHERY SECTOR INSTITUTIONS

The responsibility for the fisheries development, both capture fisheries and aquaculture, lies with the Fisheries Section of the Ministry of Agriculture and Rural Development. The Fisheries Section is one of the six sections of the Animal Production Division. The Animal Production Division together with the Veterinary Services constitute the Department of Livestock Services (DLS). DLS and six other departments constitute the Ministry of Agriculture and Food Security. The

department of the ministry responsible for extension services, including fisheries extension, is the Department of Field Services (DFS). Although technically backstopped by fisheries headquarters staff, people dealing with fisheries extension at district and community council levels fall under the DFS. The authority directly responsible for supervision of these extension officers is the District Agricultural Officer (DAO) in the Department of Field Services. There are, however, informal linkages between different levels of the two departments, DFS and DLS, that allow technical information to flow between them. The responsibility for research lies with the Department of Agricultural Research but so far no fisheries research work has been undertaken by that department.

9. GENERAL LEGAL FRAMEWORK

Regulation of fisheries is currently covered under the Basutoland Fresh Water Fish Proclamation (1951). Some of the areas addressed in this proclamation are: (a) Close seasons and prohibited fishing; (b) Use of explosives; (c) Prohibited means of capturing fish; (d) Damaging property for purposes of taking fish; (e) Obstruction of waters. In addition, the legislation provides penalties for all areas addressed.

While the proclamation might have been good for its times, it is certainly not sufficient for present management of fisheries resources because its emphasis is on capture fisheries. The legislation has also been seen by some authors as lacking vision and environmental standards. This later argument is however not very accurate, since the law can still be used to avoid over-utilization of fisheries resources. The main challenge at present is its enforcement.

10. MANAGEMENT APPLIED TO THE MAIN FISHERIES

Capture fisheries is negligible in Lesotho. Little monitoring of the fisheries is done. The national fisheries and aquaculture policy as well as strategies have been formulated in line with the Ministry of Agriculture and Food Security's policy of poverty eradication, income generation, employment creation and food security.

The policy goal for the fisheries sector is to promote conservation of biodiversity; foster development and management of capture fisheries in rivers, reservoirs and dams, and support sustainable aquaculture development in suitable locations. The policy is implemented primarily through village-level institutions.

10.1 Main goals/objectives

The goal for capture fisheries development is to manage the fisheries in rivers and reservoirs to ensure that they are exploited on an ecologically sustainable basis and to maximize economic returns from such fisheries. Strategies to be employed include:

- Promote, in collaboration with other relevant institutions and sectors, proper watershed management for the purpose of reducing siltation in rivers and reservoirs and conserving biodiversity
- Manage fish habitats to ensure maximum fish production and species diversity
- Develop capture fisheries, preferably of indigenous species in all reservoirs capable of maintaining such fisheries

- Collect, compile and disseminate fishery data and statistics to facilitate fishery planning and management
- Stimulate the tourist industry by stocking suitable streams/rivers and highland dams with trout for sport fishing
- Support fisheries research on the biology of fish species in order to ensure suitable management strategies
- Formulate suitable legislation and restrictions for subsistence and sports fisheries
- Protect, through community-based management and legislation, the endangered indigenous fish species and depleted fish stocks.
- Educate and train communities living around rivers and reservoirs about the economic importance of fisheries resources, fish utilization and fisheries management
- Control the introduction of new exotic fish species in rivers, dams and reservoirs

The main objective of aquaculture development is production of fish as food for farming communities and generation of income for fish farmers. Strategies to be employed include:

- Increase the availability of high quality fish protein in rural communities to ensure the national goal of food security
- Promote rural aquaculture and integrate it into the overall farming system at household level in districts with high potential
- Encourage local community participation in integrated aquaculture planning and development
- Rehabilitate and construct fish hatcheries for production of fry and fingerlings necessary for stocking of fish farms and natural waters
- Encourage integration of fish farming with livestock (pig, duck, etc.) as well as vegetable production
- Assist raising the standard of living and income of rural communities through the sale of fish and related products
- Encourage the private sector involvement in aquaculture
- Promote and rehabilitate aquaculture schemes in suitable districts with sufficient water and the required soil types
- Formulate the necessary legislation and restrictions for fish farming in conformity with the FAO Code of Conduct for Responsible Fisheries (CCRF)
- Invest in the production, processing and distribution of fish and related products, thereby providing employment for both rural and urban communities

10.2 Institutional arrangements

10.2.1 Co-management activities

Management of fisheries resources at national level is the responsibility of the Ministry of Agriculture and Food Security, with implementation being undertaken by the Fisheries Section in the Department of Livestock Services.

There are no shared waters between Lesotho and its only neighbour, the Republic of South Africa, except for rivers that originate in Lesotho and flow through RSA or are

found forming borders between these two countries. Management of fish stocks in rivers, even in cases where they form borders, is done in isolation by each country.

10.2.2 Participatory approach

A participatory approach to fisheries management is seen as having potential in ensuring sustainable utilization of fisheries resources. Currently efforts are being made to organize resource users into groups so that these groups can assist in enforcing sustainable management strategies at community level.

10.2.3 Rights-based approaches to fisheries management

In Lesotho the management of fisheries resources is the responsibility of the Fisheries Section in the Ministry of Agriculture and Food Security. There are, however, some reservoirs for which, because of having been constructed for particular purposes (e.g. reservoirs under LHWP and those used for Municipal water supply), authorities have been allocated special rights to control activities on these water bodies, including management of fisheries resources. These users have been allowed to prescribe management strategies specifically applicable to the water bodies. General guidance for the management of fisheries resources is derived from and implemented in collaboration with the Fisheries Section.

10.3 Management measures

Very limited management measures occur to fisheries resources at the national level. Fisheries management strategies are however being applied in the Lesotho Highlands Water Project reservoirs. Strategies include periodic monitoring of resources, setting size limits for fish to be harvested and observation of a closed season. Special fishing permits allocated for fishing in these reservoirs stipulate some of these conditions. As available project resources permit enforcement, this approach leads to better management of fisheries than is generally the case elsewhere in the country.

11. RECREATIONAL SUB-SECTOR

Sport fishing mainly takes place in mountain streams and mostly attracts tourists from the Republic of South Africa. There is also limited trophy fishing taking place in lowlands reservoirs done by groups of fishermen most of whom are Basotho. Sport fishing activities mostly centre around rainbow trout and yellowfish fishing.

12. FISHING COMMUNITIES

There are no specialized fishing communities in Lesotho. However, some individuals living near rivers and reservoirs continuously fish and use the fish for household food supply and other needs but do not entirely depend on fishing.