Macro-economic assessment of Lake Victoria Fishing Industry in East Africa

Richard O. Abila[1], Konstantine O. Odongkara[2] and Paul O. Onyango[3]

[1] Kenya Marine and Fisheries Research Institute (KEMFRI) P.O. Box 1881 KISUMU, Kenya
[2] National Fisheries Resources Research Institute (NaFIRRI) P.O. Box 343 JINJA, Uganda
[3] University of Dar es Salaam, P. O. Box 35091, Dar es Salaam, Tanzania

Abstract

The contribution of Lake Victoria fisheries in the economies of Kenya, Tanzania and Uganda is usually grossly undervalued and inaccurately reported. This study supported by the Lake Victoria Fisheries Organization assessed the macro-economic importance of the fishing industry in the region, based on review of literature, analysis of secondary information and primary data.

The study has provided data and information on fish production, fish exports and domestic fish trade; contribution of fisheries in employment, incomes, government revenue, Gross Domestic Product (GDP) and food security. The report reveals that an estimated total of 1,042,868 tonnes were landed in the whole lake in 2006, with an ex-vessel value of US$ 371 million, shared between Tanzania (47%), Uganda (33%) and Kenya (20%). About 152,196 tonnes of Nile perch were processed by the region's 32 operating factories to produce 76,098 tonnes of various Nile perch products for export, which generated substantial foreign exchange. The fish export markets are diversified to include at least 26 countries in all five continents, of which EU is dominant. Fisheries contribution to the GDP of riparian countries though is relatively small, ranging between 0.5 and 2%. Lake Victoria fishery is also an important sector for informal employment in fish production, which employed about 196,426 people in 2006, and also many more informal employment opportunities in fish trade and artisanal processing. With all these benefits it is economically and socially justified for increased investment of resources to sustainably manage the fishery.

Key words: Fisheries, macro-economy, Lake Victoria, East Africa

---

Conversion rates: **1 US$ = Ksh (65), Tsh (1285), Ush (1740)**

1.0 INTRODUCTION

The contribution of fisheries in economic growth and poverty reduction has been the subject of many fisheries socioeconomics studies. (FAO 2005) provides guidelines on how small-scale fisheries can contribute to poverty alleviation and food security. The report notes that small-scale fisheries can generate significant profit, prove resilient to shocks and crises and make meaningful contributions to poverty alleviation and food security. Fisheries therefore contribute to poverty reduction at all levels: household, community and national, although it is not always a straightforward or equitable process.

Direct and indirect contributions of fisheries to economic growth are seen through the generation of foreign exchange, contributions to GDP and revenue generation, to local economies through income and employment multiplier effects and to household poverty alleviation through employment. The contributions, however, are not always easy to enumerate and may be outweighed by negative impacts, particularly in terms of food security and local employment.

Cunningham and Neiland (2005) recognize that there are other macroeconomic imperatives for fisheries other than economic growth, such as food security and supporting livelihoods for the poor. FAO (2005;2003), Odongkara (2005) and Odongkara *et al* (2005) discuss the relationship between small-scale fisheries, trade and national food

security, noting that there are numerous factors to be considered in promoting trade or the contribution of fish to food security. They note that the relationships between the balance of trade and food security are complex, because of contributions to employment, wages and foreign exchange. They therefore conclude that the impacts of increasing trade on food security for the poor are not necessarily clear-cut. People may have insufficient assets to purchase or barter fish and trade is being driven by exports and imports from and to developing countries. At the household level, there may be more indirect contribution of fish to household food security, for example selling fish to buy other food products instead of consuming the fish itself (FAO, 2005; Macfadyen and Corcoran, 2002).

In the East African region fisheries has become increasingly integrated in the formal economic sector chiefly due to international fish trade, however, much of it still remains in the rural non-monetary economy. This has caused the role of fisheries to be grossly undervalued, despite making substantial contribution to the regional economy. Valuation of fisheries has tended to focus mainly on the monetary value of fisheries, based on the sector's contribution to the Gross Domestic Product (GDP, while the sector's input in the non-monetary economy is largely ignored.

As a result the contribution of fisheries in the creation of rural and urban-based employment and source of livelihoods for fishers, fish traders, fish processors and in related support enterprises are under-estimated. Furthermore, the trickle down effect of fisheries on other industries, for example, gear manufacturing, fuel and spare parts for motorized boats and timber for boats are not considered. It also does not value fisheries in the subsistence economy, particularly in the contribution of food in many households which does not involve monetary transaction. Most transactions along the fish supply chain are also not recorded, therefore, the true value of incomes to fishers and traders and revenue generated for the local governments are unknown. Without a clear perspective of the role of fisheries, the riparian Governments are bound to allocate resources to this sector that is not commensurate with its significant contribution. This information is essential for policy guidance, to identify who is benefiting, how they are benefiting, and whether interventions are needed to promote certain policy objectives.

This report provides data and information on values of landed fish, processed fish; fish in domestic, regional and international fish trade. It presents information on employment creation, generation of incomes and revenue, food security and GDPs of the riparian countries. The report also identifies existing gaps in knowledge on this subject that would be addressed through further research and data collection.

1.1 Objectives

The overall objective of this study was to improve understanding of the contribution of Lake Victoria fisheries to economic growth, poverty reduction and development of the East African region through fish consumption, contribution to employment, earnings, GDP, foreign exchange and trickle down effects on other economic sectors.

1.2 Methodology

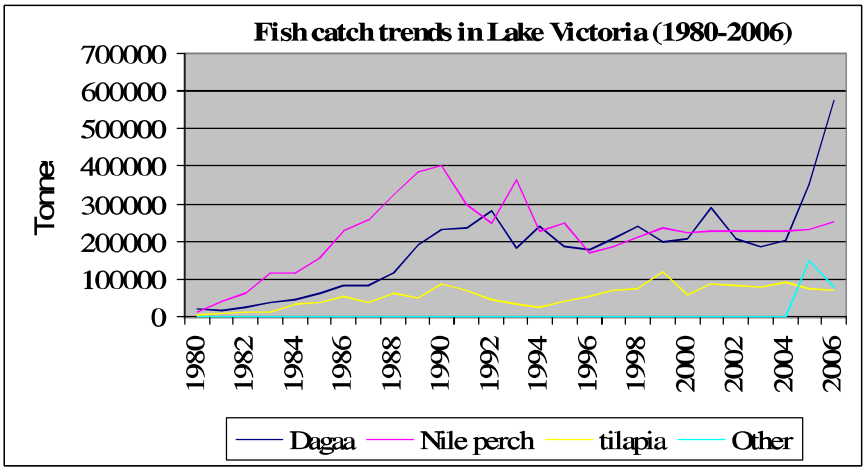
The study was implemented in Kenya, Tanzania and Uganda. The initial stage involved literature review and collation of secondary data and information, including; published and unpublished manuscripts, official government records and publications, such as; statistical abstracts and bulletins from respective national Bureau of Statistics, economic survey reports, national development policy documents, trade reports, sectoral strategy documents produced by relevant ministries in the three countries. Information was also got from several data sources and previous studies undertaken by the Lake Victoria Fisheries Organization. The research teams also made short visits to key national institutions to collect primary data and fill in information gaps. The final stage involved compiling data on key variables and indicators and writing the report.

2.0 DESCRIPTION OF THE FISH SUPPLY CHAIN

2.1 Fish production

An estimated total of 1,042,868 tonnes were landed in the whole lake in 2006 (LVFO, 2006). Dagaa was the leading fish at 574,494 tonnes, representing 55.1%, followed by Nile perch at 253,792 tonnes, constituting 24.3% of fish landed. Tilapia catches were 69,494 tonnes forming 6.7%, Haplochromines at 137,962, representing 13.2, while all other species combined represented less than 1% of the total. Of most concern is the decline in proportion of Nile perch from about 40% of total catch in 2000, which implies significant impact on the regional economy due to its

value in international trade. On the other hand, Haplochromines have significantly resurged, particularly in Tanzania, and now is one of the principal species. Tanzania is leading in quantities of fish landed from the lake at 726,464 tonnes, representing 69.6%, followed by Uganda, which landed 216,035, constituting 20.7% and Kenya at 100,796, forming 9.7% of total catches.



2.2 Domestic fish marketing

The domestic market handles higher volumes of fish than the export channel and is much more important for domestic food security, employment creation, income generation and distribution. Yet the sub-sector is least documented and regulated, with low standard specification and investment. As a result the sector often handles under sized fish sometimes of very low quality, the volumes and value of trade are not known and even the number of traders are not recorded or controlled. Generally domestic marketing usually starts at landing sites, when canoes return from the fishing grounds and discharge their catches to waiting traders, processors, and consumers. In some cases, fish can be sold directly on the water to those operating collection boats. From the beaches, the fish goes to the urban and semi-urban markets, to rural communities, fishmeal factories, hotels and restaurants within the country. The fish is marketed fresh or processed in line with consumer preferences, storage conditions and supply and demand (Onyango, 2003; Onyango *et al*, 2006).

The lack of cold storage and marketing facilities makes fresh and frozen fish distribution to the inland population difficult. Therefore, some of the fish is smoked, salted or dried in Tanzania and Uganda. The artisanal processing sub-sector may be divided into three broad categories, namely; the processing system for Nile perch frames, the traditional processing systems for whole fish and the fresh fish trade. The traditional processing system for whole fish handles tilapia, 'dagaa' and Nile perch rejected by fish processing factories. Over time, the traditional fish processing has declined along the lake as indicated by the disappearance or abandonment of the traditional fish smoking kilns.

Prior to establishment of industrial fish processing in the early 1990s, smoking and sun-drying were the main method for artisanal fish processing employed at the landing sites. Smoking is considered to have caused significant environmental degradation over a number of islands and at landing sites, but now is on the decline. Sun-drying is of limited importance, being restricted mainly to the processing of dagaa and juvenile tilapia. Salting is a traditional mode of processing fish although salted products are not especially popular in the region, but have always enjoyed a strong demand on the DRC markets. Frying has become a popular method for the Nile perch in all three countries. Fried perch, often prepared in its own oil, is widely sold in the regular municipal markets of urban centres around the lakeshore, has also become an extremely common item in the numerous informal neighborhood street markets that have become a standard feature of city life (FIRRI, 2003). Hot-smoking is by far the most popular processing method and is reputed to provide the best returns to the processor. At many remote islands and mainland fishing communities most of the catch is smoked, due to transport constraints.

A typical artisanal fish processor-trader is likely to be female, with nearly half of them engaged in subsidiary activities to supplement the income from fish trade. The processor-traders most often will transport fish to a market 2-3 days in a week while the other days are spent seeking supplies and processing the fish. Very few traders, if any, have received a formal training relevant to their trade. Artisanal processors and traders' incomes vary very widely between individuals, market sites, the type of activity, level of investment and seasons. Hence, it is difficult to have an accurate representative income or cost structure for the artisanal fish trade (Abila *et al*, 2006; Lwenya *et al*, 2006). Gibbon (1997) estimated that a small-scale lake-based artisanal fish processor handling about 10 fish pieces a day, each piece giving a margin of US$ 0.36, would result in about US$ 109 in a month. After deducting costs the processor would remain with a net income of about US$ 42 per month. On the other hand, an artisanal fish processor at a larger scale handling about 1,000 pieces in a month would make a net income of about US$ 327 a month. Another study by Abila (1996) determined that a Nile perch frames processor in Kenya received a profit margin of 8-10% of the sale price, equivalent to about US$ 0.03 per Kg of processed fish frame.

2.3 Intra-Regional fish trade

The intra-regional fish trade has not been adequately documented, even though it makes very important contributions. Much of the trade is informal and unregulated, passing through the lake or unofficial non-custom border points. The regional trade takes two dominant forms; outflows from riparian countries, particularly Tanzania and Uganda, and inflow into Kenya.

Kenya is entirely a receiver of regionally traded fish, the main imported fish being tilapia (Sun-dried, Fresh, smoked), Dagaa (sundried), Nile perch (fresh, fish frames and by-prodcuts), and haplochromines (sundried). There are no proper records kept of this trade, hence no accurate estimates of quantities and value of fish. However, a recent LVFO study on cross-border fish trade estimated that imports from Tanzania to Kenya amounted to over 6,000 tonnes a year.

In Tanzania regional fish trade is mainly export oriented but has not been adequately documented. Tanzania exports fish and fish products to the regional countries including Kenya, Uganda, Democratic Republic of Congo, Burundi, and Rwanda among others. Onyango et al (2006) revealed that there is great potential of developing fish and fish products and trade for the intra-regional market .Some of the products like off-cuts, fish chest and dried fish are exported in greater quantities to Democratic Republic of Congo as food for local consumption. These give employment opportunities to those involved in processing and trading such products.

Uganda is a major exporter of fish to the Great Lakes Region. The regional trade became vibrant in the 1990s with the proliferation of the Nile perch and dagaa. Fish is distributed both through the formal as well as the illegal, unrecorded and unregulated (IUU) channels, which mainly involve immature Nile perch and Tilapia. The traders are mostly organized in formal groups to reduce costs and trade risks through pooled transport and licensing. Most traders make an average of one trade trip in a month, depending on catches and distance. Fish species exported are mainly sundried tilapia, mukene and juvenile Nile perch as well as factory by-products.

2.4 Industrial fish processing

Lake Victoria is characterized by a number of fish processing factories located mainly in the urbanized areas along the shoreline. Abila (2005) reports that fish factories were first established in the region beginning in the early 1980s, at the onset of the Nile perch boom. The first plants were set up in Kenya, however by 1985, fish processing firms in Kenya controlled less than 20% of the fresh fish trade, implying that much of Nile perch was still going to the local market. According to Gibbon (1997), the bulk of Kenyan Nile perch catch was being consumed domestically up to the late 1980s. By 1987, the number of Nile perch processing factories in Kenya had increased to 10, which exported frozen fillet initially to Israel (Reynolds and Greboval, 1988).

The development of fish processing in Uganda and Tanzania was initially slower, starting from the early 1990s, but by 2000 the number of factories in the three countries had become roughly equal at roughly 10 – 15 factories in each of the three countries (Ponte, 2005; Uganda Country Report; Abila, 2005). Even though the quantity of processed and exported

Nile perch has risen over the years, the number of factories has changed very little in the last decade (Abila, 2005). Some of the initial factories closed down as new modern ones with larger capacity were established.

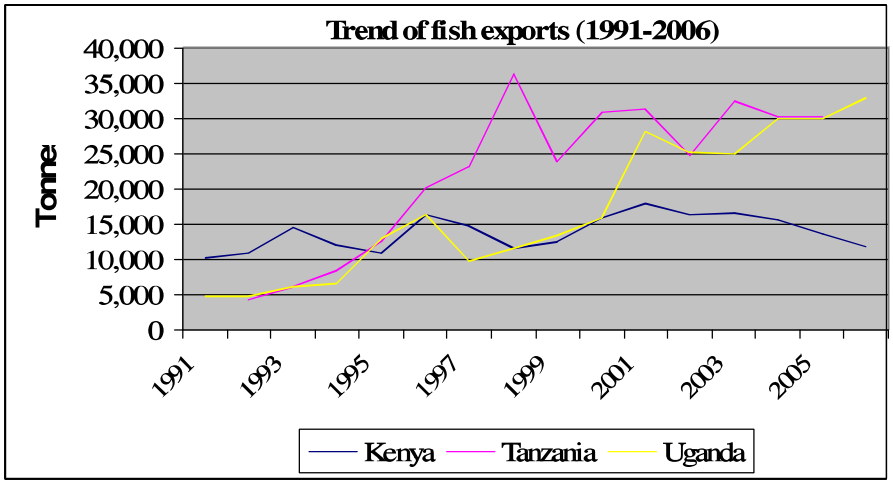
The increase in export volumes over time has come as a result of larger processing units being established (so as to attain economies of scale) rather than increase in numbers of factories. As from 1997, the processing industry has been operating at only about half of the available processing capacity (Abila and Jansen, 1997; Abila, 2005; Gibbon, 1997; SEDAWOG I, 1999). The main reason for under-capacity utilization has been fish supply problems, but for some factories, insufficient operating capital has also been a limiting factor.

Currently there are 32 operating fish factories in the region. Of these 7 are in Kenya, 10 in Tanzania and 15 in Uganda. In 2004 about 152,196 tonnes of raw fish were processed in the region, of which Uganda processed 60,114 tonnes, Tanzania 60,636 tonnes and 31,456 tonnes in Kenya. Most recently in 2006, Kenya processed about 27,466 tonnes while Tanzania processed 60,114 tonnes of raw fish.

2.5 International fish export

Nile perch is exported to all the five continents, namely; Europe, America, Australia and New Zealand, Africa and Asia. The European Union (EU) is the preferred destination for Nile perch as it offers higher prices than other markets. The Middle East, including Israel, is also a strong market for Nile perch, and particularly became a very useful alternative outlet during the ban on Nile perch by EU in the mid 1990s. All the three countries export nearly the same types of Nile perch fish products, namely; Chilled and frozen fillets; (skin on and skinless), whole fish (gutted and beheaded), fish maws and swim bladders. The by-products are fish frames, scales, skin, offals, fish fat and oil.

A total of 76,098 tonnes of Nile perch were exported from the region in 2004. In Uganda, 31,808 tonnes of fish were exported in 2004, of which 30,057 tonnes were Nile perch. Nile perch therefore constituted about 95% of Uganda's fish exports (UBOS, 2005). In 2006 Nile perch export quantities increased to 32,855 tonnes. In Kenya 17,779 tonnes of fish were exported in 2004, of which Nile perch exports were 15,728. Nile perch therefore composed about 90% of all exports (Kenya Government, 2005; 2006). Kenya's Nile perch exports declined to 13,733 tonnes in 2005 and further down to 11,841 tonnes in 2006. In Tanzania a total of 42,355 tonnes of fish were exported in 2004, of which Nile perch were 30,313. Nile perch hence represented about 72% of fish exports (Tanzania Fisheries Divisions data).



3.0 CONTRIBUTION OF FISHERIES TO INCOMES

3.1 Value of fish at landing

The landed value of fish is normally estimated as a product of the quantity of each species landed and the prevailing annual average price at the landing beaches. The total value of landed fish in 2006 was estimated at US$ 243.9 million. Due to high international market demand and good prices, Nile perch continued to be the highest valued

species despite its relatively low catch levels. Nile perch fishers in the region earned US$ 243.9 million, representing 65.9% of the total value of fish at landing. Dagaa came second, with a value of US$ 76.2 million representing 20.6%, while Tilapia earned fishers US$ 38 million, constituting about 10.3% of total value. Haplochromines earned about US$ 8.5 million, of which about 84% went to Tanzania. In overall, Tanzania earned US$ 172.6 million, constituting 20.1%, Uganda got US$ 132.2 million and 33.3%, while Kenya received US$ 74.6 million representing 20.1%.

3.2 Value of fish exports

In Kenya, fish exports earned US$ 70.9 million, contributing about 2.4% of the value of all exports from the country in 2005. Fish was ranked eighth in value among all exports from Kenya, and fifth among agricultural export commodities. The value of Kenya's fish exports grew by about 6.8% in 2004/05. In Uganda, fish and fish products earned US$ 143 million in 2005, making it the second largest foreign exchange earner after coffee. Fisheries composed about 17.6% of all foreign exchange earnings for Uganda in 2005. Fisheries exports from Uganda increased in value by about 17%, but declined in percentage share of the country's exports by about 1% between 2003 and 2004. However, it is not known how much of the foreign exchange from fish exports is actually repatriated, considering the liberalised forex retention policies in an industry that is highly foreign-owned.

Fisheries is an important source of revenue to local authorities, cooperatives and other institutions along the lake. The sources of revenue include tax charged on fish trucks and fishing vessels, market fee earned through tendering of the beaches to fish factories, landing fee charged on visiting vessels and commissions charged by cooperatives. Other benefits include better keeping of landing statistics by the authorities at the beaches served by refrigerated trucks while sanitation at these beaches has also improved.

4.0 CONTRIBUTION OF FISHERIES IN EMPLOYMENT

Fishing and fisheries related activities provide employment, both directly and indirectly to the communities around Lake Victoria (Abila *et al*, 2006; Lwenya *et al*, 2006). The sector is a source of employment and income to many fishers, fish traders, and source of indirect livelihood and nutrition. These employment opportunities are directly linked to the fish landing beaches around Lake Victoria which are the centres of initial fishery activities. The frame survey conducted by LVFO (2006) show that the total number of landing sites on the lake declined gradually between 2000 and 2006 from 1,492 to 1,431. However, the number of fish landing sites increased slightly from 598 to 634 in Tanzania and from 297 to 316 in Kenya, while in Uganda the number dropped from 597 to 481 between 2000 and 2006 largely due to merging of landing sites.

The types of jobs may be broadly categorized as direct (those in the core fisheries activities) and indirect (in activities that support, or which are linked to the core fisheries activities). The core activities providing direct employment include; Fishing, fish farming, artisanal fish processing, industrial fish processing, fish transportation and fish marketing. Indirect employment opportunities are many and varied, including for; Boat builders, net and hook manufacturers, outboard engine providers, fish vehicle providers and repairers, fuel suppliers, fish bait suppliers, ice suppliers and providers of containers and packaging material (Karuga, *et al*, 2002; Abila *et al*, 2006; Lwenya *et al*, 2006).

The total number of fishers operating on Lake Victoria increased from 129,305 in 2000 to 153,066 in 2004 then rising sharply to 196,426 in 2006 (28% increase between 2004 and 2006). By country, fishers increased by 18.5% from 37,348 to 44,263 in Kenya, by 25.6% from 77,997 to 98,015 in Tanzania and by 43.5% from 37,721 to 54,148 in Uganda between 2004 and 2006. In 2006, 23% of fishers were in Kenya, 28% in Uganda and 49% in Tanzania. The density of fishers on the lake increased between 2004 and 2006 from 9 to 10.7 fishers km^{-2} in Kenya, 2 to 2.8 fishers km^{-2} in Tanzania and 1 to 1.8 fishers km^{-2} in Uganda. This indicates an overall increase in fishing effort. There are however, no reliable and precise figures of the total number of people deriving livelihood from artisanal fish processing and trading through direct and indirect employment. This leaves an important gap in the contribution of fisheries in employment in this particular sub-sector.

5.0 CONTRIBUTION OF FISHERIES TO GDP

The three countries' national statistical bulletins routinely combine all fisheries resources in evaluating their contribution to GDP. The national figures therefore do not disaggregate the contribution of Lake Victoria from the other fish sources within each country. Fisheries contribution to the region's GDP, estimated at about US$ 508.3 million in 2004, is relatively small by proportion but increasingly quite significant in each country's economy. In 2005 fisheries contributed US$ 249 million in Tanzania and US$ 99 million in Kenya. In Uganda fisheries contributed US$ 190 million in 2004. The percentage contribution of fisheries to GDP was 2.5% in Tanzania and 0.5% in Kenya in 2005, while in Uganda fisheries contributed 2.6% of GDP in 2004. The percentage contribution of fisheries to GDP has remained relatively stable over the last decade in the three countries. In Kenya, the contribution has ranged between 0.5% and 0.7%, in Tanzania between 2.5% and 2.7%, while in Uganda it has ranged between 2.2% and 2.6%. In both Kenya and Tanzania there seems to be a very marginal declining trend in fisheries proportional contribution, which could be due to increasing strength of other economic sectors and declining catch trends.

The specific contribution of Lake Victoria fisheries to GDP can be estimated based on the relative contribution of the lake to total catch. Lake Victoria contributes on average about 1.5% of Tanzanian GDP while the other lakes contribute 1%. In Uganda, Lake Victoria contributes on average about 62% of the total catches, therefore, taking proportional representation, the lake contributes between 1.6% and 2% of Uganda's GDP. In Kenya, Lake Victoria contributes about 90% of fish catches and value, therefore its contribution to the country's GDP is between 0.45% and 0.5%.

6.0 CONCLUSION AND RECOMMENDATION

The study has enumerated the importance of Lake Victoria in the economies of Kenya, Tanzania and Uganda, through; fish production, fish exports and domestic fish trade; contribution of fisheries in employment, incomes, government revenue, Gross Domestic Product (GDP) and food security.
The study has identified information gaps that need to be addressed, including; accurate estimation of contribution of Lake Victoria to GDP; Time series data on quantities of non-commercial fish species processed; Time series data on commercial fish species processed for local markets; Marketed quantities of major fish species in the local markets; Time series data on fish prices for non-commercial fish species; Reliable information on regional fish trade; Data on employment in the fisheries sector and related enterprises; Earnings from other activities related to fishing; Household incomes of fisher communities; Per capita consumption of fish; Time series totals on different revenue sources; Data on fish contribution to Balance of Trade and Balance of Payment; Contribution of fisheries in fishmeal.

7.0 REFERENCES

Abila R. O., Yongo E., Lwenya C., Omwega R., (2006). 'Socio-Economic Baseline Survey of Fishing Communities in Lake Victoria, Kenya'. LVFO/IFMP Technical Report 1. Lake Victoria Fisheries Organization. Jinja, Uganda. February 2006.

Abila, R. (2005) Impacts of International Fish Trade: A Case Study of Lake Victoria Fisheries, FAO Study on International Fish Trade and Food Security, Rome.

Abila, R. O. (1996) 'Economic Analysis of the Domestic and Export Marketing of Kenya's Nile Perch and its Products'. Proceedings of the 6th FAO Expert Consultation on Fish Technology in Africa on 27 - 30 August 1996, Kisumu, Kenya. *FAO Fisheries Technical Report* 574, Food and Agriculture Organization, Rome, 574: 123-143.

Abila, R. O. and E. G. Jansen (1997) 'From Local to Global Markets: The Fish Processing and Exporting Industry on the Kenyan part of Lake Victoria - its Structure, Strategies and Socio-economic Impacts'.

Working Paper no. 1997.8. Center for Development and the Environment (SUM), University of Oslo, Norway, 8 (1997): 1-46.

Cunningham, S. and A. E. Neiland (2005) *Investigating the Linkages Between Fisheries, Poverty and Growth: Key Concepts and Methodology*. Report prepared for the Department for International Development (DFID) project The Role of Fisheries in Poverty Alleviation and Growth: Past, Present and Future', IDDRA, Portsmouth.

FAO (2003) Report of the Expert Consultation on International Fish Trade and Food Security, Casablanca, Morocco, 27-30 January, *FAO Fisheries Report* No. 708, Food and Agricultural Organization, Rome.

FAO (2005) Increasing the contribution of small-scale fisheries to poverty alleviation and food security. *FAO Technical Guidelines for Responsible Fisheries*, No. 10, Food and Agricultural Organization, Rome.

FAO, 2005: GLOBEFISH 2005. www.globefish.org

FIRRI, 2002; Globalization and Fish Utilization and Marketing Study: Economic profiles of selected landing sites on Lake Victoria.

Gibbon, P. (1997) 'Of Saviours and Punks: The Political Economy of Nile Perch Marketing Chain in Tanzania'. *CDR Working Paper no.* 97.3. Centre for Development Research, Copenhagen: 8-45.

Kenya Government, (2005). *Statistical Abstracts 2005,* Central Bureau of Statistics, Nairobi.

Kenya Government, (2006) *Economic Survey 2006*. Central Bureau of Statistics. Ministry of Finance and Planning. Nairobi, Kenya.

LVFO (2005). Report on the Fisheries Catch Assessment Survey (Kenya) 2005. IFMP/EDF Project No. 8 ACP POR 029. Draft.

LVFO (2006). Regional Catch Assessment Survey synthesis report for APE 2. Lake Victoria Fisheries Organization. Jinja. Uganda.

LVFO (2006). Report on the Lake Victoria (Kenya) Fisheries Frame Survey 2006. IFMP/EDF Project No. 8 ACP POR 029. Draft.

Lwenya, C., E.O. Yongo and R.O. Abila (2006). 'Assessment of the Cross-border Fish Marketing Channels for the Major Commercial Fish Species of Lake Victoria: Case of Kenya'. LVFO/IFMP Technical Report 1. Lake Victoria Fisheries Organization. Jinja, Uganda. July 2006.

Macfadyen G and E. Corcoran (2002). Literature review of studies on poverty in fishing communities and of lessons learned in using the sustainable livelihoods approach in poverty alleviation strategies and projects. *FAO Fisheries Circular No. 979*. FAO: Rome.

Odongkara, K. (2005) Poverty in the Fisheries: Indicators, Causes and Interventions, *Socio-economic Research Report 2*, Lake Victoria Environmental Management Project, Fisheries Resources Research Institute, Jinja.

Odongkara, K., R. Abila and P. Onyango, 2005: Distribution of economic benefits from the fisheries of Lake Victoria. Proceedings of the Lake Victoria Stakeholders' conference, February 2005, Entebbe, Uganda. pp 124-131

Onyango, P. O. (2003). Situational analysis of malnutrition in Lake Victoria catchment area, Tanzania. In Ndaro, S. G. M., and Kishimba, M (2003) *Proceedings of the LVEMP Tanzania scientific conference.* pp 128-143

Onyango, P. O., Onyango, P. O., M. Salehe and Mrosso, H. D. J. (2006) Review of the Economy Vol16, No. 1 June 2003. ERB University of Dar es Salaam. pp 45-112

Reynolds, J.E and D.F. Greboval (1988). Socio-Economic Effects of the Evolution of Nile perch Fisheries in Lake Victoria. A Review

SEDAWOG I, (1999) 'Marketing Study'. LVFRP Technical Document No. 2. LVFRP/TECH/99/05. The Lake Victoria Fisheries Research Project. Jinja

UBOS (2004). Statistical Abstract, Uganda Bureau of Statistics Entebbe.