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Nile Perch Fishery Management Plan for Lake Victoria 2015 - 2019



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ABBREVIATIONS AND ACRONYMS

B_{lim}	Biomass limit – minimum safe stock size
B_0	Unexploited (maximum) biomass
B_{MSY}	Biomass that gives rise to MSY
BMU	Beach Management Unit
BS	Beach seine
CAS	Catch Assessment Survey
CPUE	Catch per unit of effort
EAC	East African Community
EAF	Ecosystem approach to fisheries
EAIFFPA	East African Industrial Fishing and Fish Processing Association
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FAO CCRF	FAO Code of Conduct for Responsible Fisheries
FMO/P	Fish movement orders/permits
FMP	Fisheries Management Plan
FS	Frame survey
GDP	Gross Domestic Product
GN	Gillnet
HAS	Hydro-acoustic survey
HL	Hook and line
IEC	Information-Education-Communication
IFMP	Implementation of a Fisheries Management Plan
IUU	Illegal, unreported and unregulated fishing
LVEMP	Lake Victoria Environmental Management Programme
LVFO	Lake Victoria Fisheries Organisation
LVFO-CoM	Lake Victoria Fisheries Organisation Council of Ministers
MCS	Monitoring, control and surveillance
MSY	Maximum sustainable yield
MEY	Maximum economic yield
M&E	Monitoring and evaluation
NP	Nile perch
NPFMP	Nile perch Fishery Management Plan
NPFMP2	Nile perch Fishery Management Plan, 2015-2019 (this document)
OECD	Organization for Economic Cooperation and Development
OSNP	Operation Save Nile perch
RWG	Regional Working Group (LVFO)
SWOT	Strengths, weaknesses, opportunities and threats

EXECUTIVE SUMMARY

The Lake Victoria Nile perch (NP) fishery (fishing and post-harvest activities) is a significant contributor to the social and economic development of the Lake Victoria Fisheries Organization (LVFO) Partner States (Kenya, Tanzania and Uganda). The catch of NP has averaged 250 000 tonnes per annum for the last two decades. During the last decade, the fishery has faced serious problems of overcapitalisation and overfishing and high levels of non-compliance to regulations in the fishing and post-harvest sub-sectors. This has led to decreasing stock health resulting in an increased vulnerability of the resource base and suboptimal contribution of the fishery to the lake-side economies.

A first specific Fishery Management Plan for the Nile perch Fishery (NPFMP1) covering the period 2009-2014 was developed in 2008 by LVFO. Other initiatives, both national and regional, aimed at reversing the Nile perch stock decline have also been promoted since 2008. The implementation of NPFMP1 and related initiatives has led to some progress in the management of the NP fishery; however gaps and weaknesses are still affecting the sustainability of the fishery and the full expression of social and economic benefits that could be derived from proper management of the fishery.

The LVFO has engaged since the end of 2013 in the revision of NPFMP1 and has requested the assistance of the EU-funded SmartFish Programme to prepare a final draft NPFMP2 covering the period 2015-2019. The process of preparing the NPFMP2 is expected to make use of lessons learnt from NPFMP1 and to place particular attention on governance and economic considerations. The NPFMP2 is also to be reorganized into a policy and planning document to present the most important aspects for various parties concerned, especially decision-makers.

A Final Draft NPFMP2 was presented at a regional LVFO stakeholder's workshop (Entebbe, 09th and 11th March 2015). On the third day of the meeting, Permanent/Principal Secretaries of the three Partner States joined the validation process of NPFMP2.

The present document (called NPFMP2, 2015-2019, April 2015) incorporates the comments, suggestions and recommendations made during the stakeholders' meeting. This document has been approved in principle by the Permanent/Principal Secretaries of the three Partner States who expressed their intention to support its adoption at the next LVFO-Council of Ministers (LVFO-CoM) meeting. They also expressed their wish that each country can, at a later stage, develop specific action plans and costings at national level in order to facilitate the overall implementation of the NPFMP2 when it is formally adopted.

An in-depth analysis of the current situation and trends in the NP fishery and of its governance system calls for a change in the management approach promoted so far and the adoption of a new paradigm that can be summarised as follows:

Promote a different and more appropriate approach for a social management of the NP fishery. This should not only consist in promoting mechanisms for further participation of fishers in the provision of management services but rather in establishing enabling conditions to increase the creation of wealth and its sharing at local level to the benefit of sedentary fishers and related economic actors in a context where the NP fishery is nowadays a pure business-orientated fishery.

The need for the management to be policy-driven at both central and local levels in relation to wealth generation. Current economic benefits that are derived from the NP fishery are sub-optimal and they are not sustainable. Economic benefits could be at least sustained and possibly significantly increased provided that the necessary institutional and infrastructural investments and fiscal arrangements are set-up to support the implementation of the management plan.

The promotion of a specific and operational NP fishery management plan is of utmost importance. Major lessons learned from NPFMP1 have shown that NPFMP2 should better address regulation of access to resources, compliance with existing fishing regulations and formalisation/regulation of all post-harvest activities. Moreover, NPFMP2 should be more action-driven and implementation orientated.

Management arrangements should further involve actual (commercial) actors including fishers, boat-owners, processors and traders.

Responsibility of all public institutions concerned with fishery management (including local government and the judiciary system) to fulfil their mission/mandate should be seen as a key condition of success of NPFMP2. There will therefore be a need to mobilise adequate human, financial, and logistical means and to ensure that institutions are accountable of their actions.

Promote a sustainable approach for the financing of NPFMP2. This signifies that financing of implementation of fisheries management by Governments should be in relation to bio-ecological, economic and social stakes and to requirements. Reliance on external funding should be reduced. Particular attention should also be placed on establishing mechanisms for co-financing by all commercial operators involved in fishing and value chain.

Research should focus on providing technical and scientific advice to support decision-making in relation to the implementation and the monitoring and evaluation of NPFMP2. This should include improving knowledge on stock dynamics and status and developing capacities in each country and at the LVFO Secretariat level in economic analysis.

The Goal of NPFMP2 is to enable the Lake Victoria NP fishery to increase its contribution to the economic and social development of the LVFO Partner States in a sustainable and responsible manner.

The Specific Objectives of NPFMP2 are:

To rebuild the biomass of the NP stock to the level that will sustain catches above 300 000 tonnes per annum;

To increase wealth generated by NP fishing and related activities by at least 10% through improved regulation of fishing activities and enhanced value addition in the artisanal and industrial post-harvest sector;

To improve wealth sharing to the benefit of local communities.

In order to reach these management objectives, the NPFMP2 provides a strategy that includes ending open access to the fishery, ensuring compliance of all actors involved in fishing and post-harvest activities with existing regulations, promotion of actions aimed at continuing rebuilding the NP stock, and promotion of value addition. The outlines of the NPFMP2 strategy are as follows:

Immediate

Control access to the fishery resource through minimal conditions of access and formalisation of all fishers and boat-owners in the NP fishery.

Regulate all post-harvest activities with a focus on regional trade and fish maw trade.

Enforce existing priority fishing regulations through effective MCS, with priority given to those designed to prevent the most harmful fishing practices.

Short-to-medium term

Restrict fishing capacity to the 2015 level.

Strengthen the NP fishery regulatory framework with the objective of further reducing fishing effort (notably through introduction of a closed season for two months a year) and protecting the NP resource (notably to protect the largest spawners targeted by fish maw traders).

Evaluate the feasibility of introducing secure fishing rights.

Strengthen post-harvest sector in respect to fish quality and wealth generation in both artisanal and industrial value chain (processing and trade).

A NPFMP2 action plan for the period 2015-2019 is structured around four main types of actions:

Deliver key fisheries management services - General fishery administration, research and MCS.

Improve the governance framework - Policy and planning and legal issues, co-management and Public-Private

Partnership (PPP) and collaborative and funding mechanisms.

Implement complementary actions - Communication of NPFMP2 to decision-makers, fishers and stakeholders, improved access of fishing communities to education and health, accompanying actions for fishing closure and livelihood diversification, value addition in post-harvest sector and increased ex-vessel price of NP.

Monitor and evaluate - Regular M&E of indicators and reviews.

In total the estimated cost of the action plan is approximately USD 57.3 million over a period of 5 years, i.e. about USD 11.5 million per year. The share of the cost between the three Partner States and the LVFO Secretariat is 90.4% and 9.6% respectively. This amount of USD 11.5 million represents about 1.0% of current turnover of the NP fishery, or 1.4% of the wealth (value added) that is currently generated by the NP fishery. Moreover, this amount should be compared with total revenues from the NP fishery that benefit the Partner States and that are currently around USD 10 million per annum.

The expected benefits from the NPFMP2 are, above all, that the sustainability of the NP resource is ensured and that the current and already significant contribution of the fishery to the national and local economies is maintained. Note that in a 'no-change' scenario, catch of NP is expected to decrease from 250 000 to 200 000 tonnes per year, resulting in an annual loss of about USD 222 million in terms of turnover and USD 158 million in terms of wealth (value added) generated by the NP fishery. Moreover, full implementation of the NPFMP2 would result in an increased contribution of the NP fishery to the economies, particularly in the lake-basin area. The budget revenue to the Partner States would increase by about 50% to USD 15 million per year (to be compared to the cost of the NPFMP2 which has been estimated as USD 11.5 million per year).

The expected annual maximum benefits from year 5 onwards if combined potential loss and potential gain, from avoiding loss and increasing net benefits, would result in an annual gain of USD 451 million in terms of wealth created.

Furthermore, the Partner States and LVFO will be at the forefront of sustainable management of a shared inland water body through the implementation of NPFMP2. It can also be argued that PFMP2 will provide a successful example of the Pan-African Policy Framework and Reform Strategy for Fisheries and Aquaculture in respect to wealth creation in fisheries. Not to mention that a success of NPFMP2 will create further interest from donors and investors in the EAC area.

Finally, MCS efforts on the NP fishery (which represent about 31.7% of the estimated total cost of the action plan) will also benefit other Lake Victoria fisheries since it will result in a considerable reduction of the most harmful fishing gear and practices on the lake.

With regards to the financing mechanism for NPFMP2, a policy shift towards making direct resource users (boat-owners, fishers, processors and traders) contribute more towards the management costs will be implemented. This could be facilitated through an agreed tripartite financing plan. Funding could be derived from a range of different but complementary sources: Government budget and Fish Levy Trust Fund at national levels (to be financed partly by fishing rights and taxation of the fishery); LVFO Fish Fund for Lake Victoria Nile perch; 'Operation Save the Nile Perch' (OSNP); co-financing of monitoring and control of fish in processing factories; and development partners.

For the short term, until the financing plan is in place, it is proposed that EAC partnership funding be sought to which the three national governments will contribute and to which donors could be sought as additional funding sources. In addition to this, the process of establishing the Fish Levy Trust Fund for NP initiated at national levels and the LVFO Fish Fund for NP should be finalized as a matter of urgency so that they can take over as the major contributing funding source.



1 INTRODUCTION

Lake Victoria covers an area of 68 000 km2 with a catchment area of 193 000 km2. It is the site of Africa's largest freshwater fishery. The lake is shared between Uganda (43%), Kenya (6%) and Tanzania (51%). It is relatively shallow with a mean depth of 40 m, a maximum depth of 84 m, and it has a shoreline of 3 450 km. The lake is also the source of the River Nile. It is estimated that Lake Victoria's resources contribute directly to supporting the livelihoods of over two million people through income, food and employment generation (LVFO Fisheries Management Plan for Lake Victoria, 2009-2014).

Lake Victoria fisheries are currently dominated by three species: Nile perch (NP) *Lates niloticus*, Nile tilapia *Oreochromis niloticus* and dagaa *Rastrineobola argentea*. These three species are also the most commercially important ones, contributing up to 90% of the catch biomass.

Figure 1: Lake Victoria Basin showing the drainage and international boundaries (source: draft Fisheries Management Plan for Lake Victoria, 2015-2020)



The Lake Victoria Nile perch (NP - *Lates niloticus*) fishery is the most valuable freshwater fishery in Africa and since the 1990s has supported an extremely valuable export-orientated fishery that generates a significant source of revenue for the population of the three riparian countries. The fishery has attracted migrants to the fishery and catches have declined since their peak in 1990 in response to increasing fishing pressure and changes in fishing practice. A specific Fishery Management Plan for Nile perch (NPFMP1) covering the period 2009-2014 was developed in 2008 as part of the revision of the first Regional Fisheries Management Plan for Lake Victoria conducted under the aegis of the Lake Victoria Fisheries Organization (LVFO).

The NPFMP1 was developed as a means of managing the NP fishery specifically, and was adopted by the LVFO Council of Ministers (LVFO-CoM) in June 2009. The priority objectives for the management of the NP fishery were to:

- Optimize sustainable fish production.
- Maximise contribution to macro-economic growth through foreign exchange generated by exports of fish products.
- Maximise net income of participating artisanal fishers.

The NPFMP1 stressed the urgent need to reverse the state of overfishing of the resource and recommended a further reduction of fishing effort, using in particular regulations for closed seasons and closed areas. The NPFMP1 also emphasised the need to eradicate the illegal trade in undersized, immature fish, and the most harmful illegal fishing practices, including beach seining and the use of undersized gillnets.

Other recent initiatives to reverse the NP stock decline have included:

- The "self-monitoring and control" initiative led by the fish processing industry associations. This started in Uganda in September 2007 and was later applied in Kenya and Tanzania.
- The "zero-tolerance" compliance policy of the harvested NP slot size of not less than 50 cm total length by the industry in February 2009.
- The launching by the LVFO-CoM of the "Operation Save Nile Perch" (OSNP) in November 2009 which gives emphasis to fighting Illegal, Unreported and Unregulated fishing (IUU fishing) through improved monitoring, control and surveillance (MCS) operations. This operation had an operational objective of initially reducing IUU fishing by 50% and 100% by the end of 2010[1].

Despite implementation of a range of management measures, the NPFMP1 has not achieved its aim of managing the fishery in accordance with the stated reference points, including that of Maximum Sustainable Yield (MSY). The fishery is currently overfished at a level approaching its biologically safe limit. This situation results in the stock being highly vulnerable which, unless reversed, may lead to stock collapse, as well as suboptimal contribution of the fishery to the economies of the Partner States (loss of economic and social benefits that could potentially be derived from an adequate level of exploitation and improved post-harvest practices).

The main reasons for this undesirable situation are that fishing effort has steadily increased and inadequate enforcement of fishery regulations. The underlying reasons (core drivers) have included *inter alia* an increase in the population of the lake-side communities and the lack of alternative livelihoods, a growing regional market for small immature fish (illegal trade), the open access regime of the fishery, and the weak delivery of fisheries management services, including MCS, which is closely linked to governance issues.

The lack of funding since the end of the EU-funded IFMP project in 2010 is also believed to have exacerbated governance problems in relation to the management of the shared NP fishery. The lack of financial commitment of LVFO member States to support the implementation of the OSNP can also be highlighted to explain the lack of effectiveness of MCS in support of the management process of the NP fishery.

The EU-financed ACP Fish II project assisted the LVFO Secretariat to revise the NPFMP1 during the second half of 2013[2]. The process involved a prior evaluation of the NPFMP1, the holding of a stakeholders workshop in Jinja (August 2013) where a first draft NPFMP2 was prepared, and the holding of two technical workshops in October 2013 to consolidate this first draft. The draft NPFMP2 was then presented and revised during a second regional stakeholder's validation workshop that was held on 22nd and 23rd October 2013 in Jinja.

The structure of the first draft NPFMP2 was similar to the structure of NPFMP1, with emphasis given to the analysis of the bio-ecological dynamics of the fishery and to identifying objectives that should be pursued through the plan in relation to reference points such as MSY. The draft NPFMP2 emphasised the need to reduce the overall fishing effort through closed seasons and stronger enforcement of existing regulations to combat IUU fishing.

The LVFO-CoM meeting held in November 2013 "*noted with concern the continued decline of the NP stocks and urged the Partner States to intensify curbing of illegal fishing activities including catching and trading in undersize/immature fish and use of prohibited fishing gears; and implement species specific licencing in order to control fishing effort*". The LVFO-CoM also "*noted the status of the Partner States remittance towards the OSNP and requested Partner States to fulfil obligation towards operationalization of the plan by June 2014*".

Based on the above, the LVFO Secretariat organized two meetings in January 2014 and May 2014 involving *inter alia* the Regional Working Group on MCS (RWG-MCS). The purpose of both meetings was principally to "re-plan the strategy for the OSNP". Meanwhile, the meetings considered the draft NPFMP2 and expressed their concern that the draft, although being a good scientific document, may be difficult to understand, especially by the main parties and policy makers, and was insufficiently developed in terms of the provision of a concrete action plan.

It is in this context that the LVFO Secretariat requested the assistance of the EU-financed SmartFish Programme to reorganize the draft NPFMP2 into a policy document, with stronger economic justifications for the steps to be taken and the use of scientific evidence that can be easily understood by the various parties concerned, including provision of a more detailed action plan for the three countries concerned and the LVFO Secretariat.

A second draft NPFMP2 (called the *Reorganized NPFMP2 – 2015-2019, Nov 2014*) was prepared in the period September-October 2014 with the assistance of an international consultant recruited under SmartFish who worked in close consultation with the LVFO Secretariat and the LVFO Desk Officers from each Partner State[3]. The document was reviewed and edited in early 2015 by SmartFish.

A *Final Draft NPFMP2* was presented at a regional LVFO stakeholder's workshop that was held on 09th and 11th March 2015 in Entebbe with the technical and financial support of SmartFish. On the third day of the meeting, Permanent/Principal Secretaries of the three Partner States joined the validation process of NPFMP2.

The present document (called *NPFMP2, 2015-2019, April 2015*) incorporates comments, suggestions and recommendations made during the stakeholders' meeting. This document has been approved in principle by the Permanent/Principal Secretaries of the three Partner States who expressed their intention to support its adoption at the next LVFO-CoM. They also expressed their wish that each country can, at a later stage, develop specific action plans and costings at national level in order to facilitate the overall implementation of the NPFMP2 when it is formally adopted.

2 RATIONALE FOR PROMOTING A SPECIFIC FISHERY MANAGEMENT PLAN FOR THE LAKE VICTORIA NILE PERCH FISHERY

2.1 Brief Introduction to Fisheries Management

A fishery means an economic activity based on the exploitation and valorisation of a given fishery resource, like the Lake Victoria Nile perch resource. Fishery resources have four main characteristics:

- *They are natural renewable resources, produced by the ecosystem, which means that the economic cost of fish harvesting is relatively low since it is limited to the costs of catching the resource.*
- *The fishery production depends on environmental parameters and is limited by the carrying capacity of the ecosystem, which means that social and economic returns derived from fishing can only be achieved within the biological limits imposed by the productivity of the target fish stocks and their environment.*
- *Most fishery resources are publicly-owned resources which means that in practice access to the fishery is essentially open.*

1 *Since its adoption in 2009, only Kenya has contributed to OSNP; hence the plan could never be operational. The OSNP process has however been recently reactivated (LVFO-CoM November 2013).*

2 *The ACP Fish II project was started in July 2013 through SOFRECO, the selected consulting company, which provided for inter alia two key experts: S.P. Marriott and Dr A.S. Halls.*

3 *The mission team included: Breuil Christophe (SmartFish Consultant), B.A. Abura Samson (LFVO ICT expert), C. Mkumbo Oliva (LVFO Deputy Executive Secretary), Ikwaput Nyeko Joyce (Uganda LVFO Desk Officer), Meela Braison (Tanzania Principal Fisheries Officer), Nyandat Beatrice (Kenya LFVO Desk Officer), Rhoda Tumwebaze (LFVO management specialist).*

The selling price of the fish often steadily increases as a result of the scarcity of the resource and increased demand of domestic, regional and international markets.

These four main characteristics can explain the 'usual' trend of many fisheries that is a continuous increased number of fishers and boats, combined with improved efficiency of fishing in terms of the number and size of gears by boat, motorization of boats, etc.

In any fishery, the application of a steady increase of fishing effort will result at the beginning of the fishery in increasing fish production until a maximum is reached (MSY level). If fishing effort then continues to increase, the total fish production will more or less stagnate around the MSY level for a certain time before starting to decline. However, during that period, the abundance (biomass) of the resource will continue to decrease to the detriment of the sustainability of the resource, particularly if the stock biomass is close to its safe biological limit[4]. The catch rate expressed in terms of catch per unit of effort (CPUE)[5] will also continue to decrease. This means that fishers will have to spend more and more time and/or money to catch the same quantity of fish. This will result in net economic losses for the fishers in terms of profitability. This may also lead an increasing number of fishers to low compliance with regulations so as to compensate the decreased profitability of fishing activity and hence high occurrence of IUU fishing.

This will also result in a decrease of the intrinsic value of the fishery resource with reference to the notion of resource rent which corresponds to the economic surplus that can be extracted when normal fishing costs have been covered[6]. This means that people in general (represented by the State which is the owner of the resource) cannot benefit from the wealth that could be potentially and sustainably generated by the fishery.

Finally, if nothing is done to prevent such a situation continuing, the fishery may collapse, resulting in an ecological, social, economic and political crisis.

In order to prevent such an undesirable scenario, there is a crucial need for public and private stakeholders to adequately manage the fishery. This should consist of developing conditions, incentives and rules that would firstly ensure the sustainability of the resource (through aligning fishing effort with the natural productive capacity of the resource) and secondly optimise the social and economic returns that can be derived from fishing and related activities in line with governmental objectives.

It should be stressed however that when the level of fishing effort is above the level where MSY (and the corresponding biomass level - B_{MSY}) can be reached, it does not mean that the fishery cannot be sustainable. It means that the fishery is overfished to the detriment of certain objectives like the maximisation of both production (MSY) and wealth generation (Maximum Economic Yield – MEY), but this may be to the advantage of other objectives, including maximising employment (which is generally the case in an open access fishery). However, if fishing levels are steadily increasing the stock size (abundance) will gradually decline and resource will become more and more vulnerable until it may collapse.

In a poorly regulated fishery, the key challenge for managers is thus to ensure first that the stock biomass remains above the safe biological limit such that the long-term productivity of the resource is not endangered. To this extent, the notion of 'acceptable level of overfishing' can be referred to. Between these two key reference points that are the 'acceptable level of overfishing' and the MSY, the managers should have the possibility to determine the level of fishing effort where the fishery should go or remain so as to satisfy the objectives assigned to the fishery.

Fisheries management therefore consists of identifying the level of fishing effort between these two reference points (to satisfy given objectives) and then deciding how to reach this required level through the implementation of a set of measures and regulations aimed at regulating the fishing pressure and conserving the resource. In the context of the LVFO, two sets of measures and regulations have been envisaged so far:

- *Regulation of access to resources (effort control) through regulating the number of fishing units (e.g. limited number of fishing permits) and/or limiting the number of fishing days (e.g. temporal closure).*
- *Conservation of the fish resource through imposing a certain number of technical regulations such as minimum mesh size, minimum fish size, closed area (sensitive areas), banning of harmful or destructive fishing gear or practices (e.g. beach seines).*

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4 The safe biological limit of the stock corresponds to the biomass (maximum carrying capacity of the stock) below which the stock is in serious risk of collapsing.

5 The catch rate which is usually expressed in terms of catch per unit of effort (CPUE) measures the fish production by unit of effort and is often expressed in terms of fish caught per fishing trip.

6 The CAADP (Comprehensive Africa Agriculture Development Programme) paper on "The Wealth Generation Opportunities of African Fish Resources" (African Union, 2010) states that resource rent is a key concept in fisheries exploitation and management since it is the driving force behind the widespread overexploitation of fisheries, and, it determines the potential economic and social benefits that may be derived from well-managed fisheries.

It should be stressed that these two sets of measures and regulations are complementary and should not be promoted separately.

In order to set up and effectively implement these two sets of measures and regulations, several management functions and services have to be developed, including general administration of the sector (e.g. registration, licensing), regular data collection on catch and effort, stock assessment, MCS and prosecution in cases of infringement, and fisheries cooperation (of utmost importance in the case of a shared water body like Lake Victoria). These functions and services will only be effective if the legislative and institutional framework is adequate and if the different stakeholders, including the Governments, provide sufficient resources.

Fisheries management should also include policies and actions aimed at improving the economic dynamics of fishing and related activities, including fish processing and marketing activities, to make sure that the fishery will better contribute to the social and economic development of the countries.

Fisheries management should also consider the direct and indirect effects of fishing and related activities concerning a specific fish resource on the other fish resources and the environment in general. On Lake Victoria, the monitoring of the predator/prey relationships between NP, Nile tilapia, dagaa, haplochromine cichlids and the crustacean *Caridina nilotica* is of particular importance.

2.2 Rationale for Promoting a Specific Nile Perch Fishery Management Plan (NPFMP) for Lake Victoria

For several decades, most of countries have considered fisheries management through a sectoral approach embracing all the components of the fishery sector. Such an approach has proved to be insufficient based on the specifics of each of the fisheries and to pay low attention to the access regime to resources. Under such an approach, public actions have also proved to be insufficiently coordinated and mostly focused on the provision of only some of the required management services, global monitoring of the sector (insufficient to support sound analysis), conducting of research projects that are too academic and insufficiently linked to decision-making, enforcement of technical management measures in priority (to the detriment of access control), and prevention of sanitary risks (particularly for export oriented fisheries).

This sectoral approach – which has proved to be inadequate, weakly efficient and minimalist due to budget restrictions - can explain the unsatisfactory current situation in most of fisheries. Fishery resources have become more and more vulnerable, excessive fishing capacity has been accumulated (e.g. number of boats, number of fishers, and number of gears) and social and economic performances of fisheries have remained under expectations.

This has led many countries and regional fisheries organization, such as the LVFO, to promote specific fisheries management plans (FMP). The main rationale in promoting a specific FMP, when compared to a sectoral approach for fisheries management, refers to its capacity of structuring the public action for better efficiency in a general context of budget limitations. Another reason for developing an FMP is because it is thought to better address the key issue in fisheries management which is the regulation of the access to resources including through promoting processes to clarify and secure fishing rights. Moreover, an FMP is an appropriate policy instrument to support regional cooperation, public-private partnership (PPP) and co-management.

There is no universally accepted model for the format of an FMP. Based on relevant technical guidelines of the FAO Code of Conduct for Responsible Fisheries, it is however widely accepted that an FMP, in addition to referring to an adequate management unit, should indicate inter alia: objectives assigned to the fishery, management options and strategies to achieve these objectives, measures and actions to support the implementation of the strategy (action plan), and institutional and financial arrangements for the implementation of the FMP.

An FMP must also give particular attention to communication so as to ensure adequate ownership by the major fishery stakeholders, as well as to monitoring and evaluation (M&E), considering that an FMP, as for any public project, must be regularly adjusted and periodically revised.

3 MAJOR ISSUES RELATING TO THE MANAGEMENT OF THE LAKE VICTORIA NILE PERCH FISHERY

3.1 Management Framework for the Nile Perch Fishery

In 1994 Kenya, Tanzania and Uganda formed the Lake Victoria Fisheries Organisation (LVFO) which was established through the LVFO Convention. The objective of the LVFO is to foster cooperation among the three East African Community (EAC) Partner States by harmonizing national measures and developing and adopting conservation and management measures for the sustainable utilization of the living resources of Lake Victoria for maximum socio-economic benefits[7].

The highest statutory body of the LVFO is the LVFO-CoM. The three Partner States have operational Fisheries Acts for the management and development of fisheries resources and lower level legislation governing fisheries within national territories. Decisions made by the LVFO-CoM are taken up at national level and legislation developed where needed.

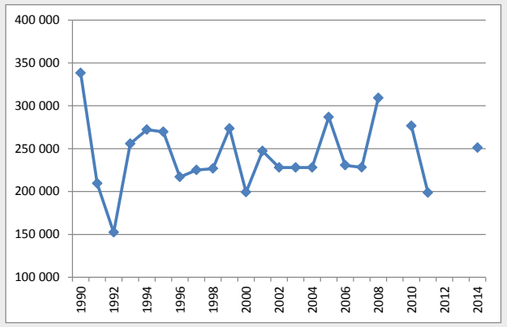
The LVFO Secretariat is the executive body of the LVFO. Its functions are to coordinate the activities and functions of the Organization, provide technical fisheries resource monitoring and economic guidance to the Organization and coordinate and maintain regional data storage and management systems for the benefit and use of the Organization.

3.2 Major Characteristics of the Nile Perch Fishery

NP is a native to the Nile system but was introduced together with Nile tilapia into lakes Kyoga and Victoria in the 1950s and 1960s. Following their introduction, the NP population expanded rapidly and is now distributed throughout Lake Victoria with juvenile fish tending to inhabit shallow inshore waters whilst larger fish are more widely distributed. Following the introduction of NP and Nile tilapia, the increased NP population coupled with overfishing led to dramatic changes in the ecology and a reduction in the biodiversity of the lake.

The catches of NP reached a maximum of about 340 000 tonnes in 1990. The catches have subsequently varied between 200 000 tonnes and 300 000 tonnes per year since 1993. In 2014, landings were estimated at 251 060 tonnes (draft LV-FMP3, 2015-2020).

Figure 2: Annual catch of Nile perch on Lake Victoria in tonnes (1990-2011) - source: LVFO



7 *The functions of the LVFO are to:*

a) *Promote the proper management and optimum utilization of fisheries and other resources of the lake;*
b) *Enhance the capacity of existing fisheries institutions;*
c) *Provide a forum for discussion of the impacts of initiatives on the lake;*
d) *Provide for the conduct of research on the living resources of the lake and its environment;*
e) *Coordinate and undertake training and extension in all aspects of fisheries;*
f) *Consider and advise on the impact of introductions on non-indigenous organisms into the lake;*
g) *Serve as a clearing-house and a data bank for information on the fisheries of the lake;*
h) *Promote the dissemination of information.*

The NP fishery is predominantly a small-scale commercial fishery. Two fishing gears, i.e. gillnets (GN) and longlines (LL), a form of hook-and-line, are the most important gears in the fishery. These are predominantly carried by two main boat categories, i.e. sesse boats8 using paddles, which operate in waters close to the home landing sites, and sesse boats operated with engines or sails that are able to cover longer distances to fishing grounds further away from the home landing sites. The NP fishery also involves the use of a significant number of beach seines (BS) and monofilament nets (for gillnetting), both of which are illegal.

A fishing unit consists of a single craft (motorized, sail or non-motorized) regardless of size combined with a type of gear used for targeting NP (gillnet, longline, beach seine). In 2012 there were about 37 600 fishing units targeting NP on Lake Victoria (LVFO Frame Survey - FS, 2012). These units can be grouped into seven main categories as shown in Table 1. The total number of fishing units targeting all species was close to 70 000 in 2012; the NP fishery represented about 53% of these.

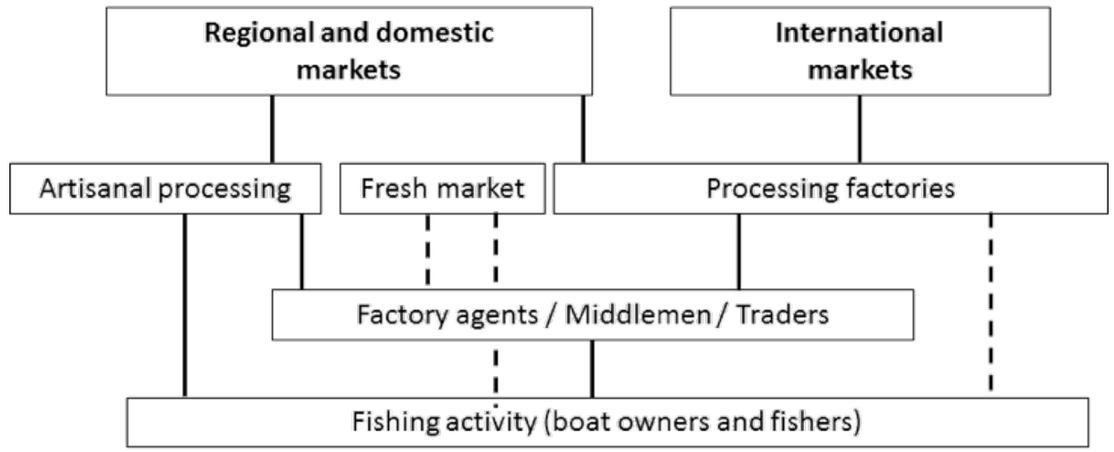
Table 1: Number of fishing units targeting Nile perch by main category (LVFO FS, 2012)

	Kenya	Tanzania	Uganda	Total
Motorized craft – Gillnets	1 246	7 195	6 841	15 281
Sail craft – Gillnets	1 529	296	192	2 017
Un-motorized craft – Gillnets	657	1 714	1 581	3 952
Motorized craft- Longlines	169	892	1 810	2 871
Sail craft- Longlines	1 424	1 450	821	3 695
Un-motorized craft – Longlines	246	3 712	2 892	6 850
Un-motorized craft – Beach seine	405	1 379	1 135	2 919
Total	**5 676**	**16 638**	**15 270**	**37 585**

There has been a substantial migration into the fishery, especially in Kenya, of unskilled workers, with a low income and with little incentive or means to invest in any long-term approaches to their fishing or the future of the fishery. There are now about 200 000 fishers operating on the lake (LVFO FS, 2012) of which about 106 000 (assuming a ratio of 53% of the total) are believed to be involved in the NP fishery.

The supply chain of Lake Victoria NP is briefly described in Figure 3.

Figure 3: Supply chain of Lake Victoria Nile perch (source: MRAG, 20089)



8 *A sesse boat is a boat constructed from planks or timber and it has a V-shaped bottom with a keel. Its common size ranges from 6 to 12 m.*
9 *Pollard, Iain (2008) Value Chain Analysis of the Lake Victoria Nile perch Fishery May-July 2008. MRAG. IFMP (ACP ROR/029)*

The growing market for high-quality white fish meat, particularly in Europe, encouraged the establishment of processing and exporting factories around the lake during the 1980s and early 1990s. NP is processed at lake-side plants and exported as chilled or frozen fillets. During the last five years, the value of the exports of NP products has varied between USD 250 million and 310 million per annum. In 2008 the main market was the EU (taking about 60 to 80% of the total product). Other markets include Japan, Israel and the Middle East[10].

The situation may however have changed significantly in recent years as a result of the development of the international trade in fish maw (dried swim-bladders) to the Asian market. Fish maw traders target large mature fish (which are substantial spawners) and only buy the fish maw at a quiet attracting price (close to USD 100 per kg, compared to flesh at about USD 2.5 per kg), leaving the fisher to dispose of the flesh and carcass in the local market at a lower price than would be obtained from selling to regulated processing factories. Fish maw trade involves both regulated and unregulated industrial processing factories.

The volume of the trade is unknown since it mostly lies outside the normal reporting requirements. Economic stakes associated with export of fish maw are believed to be important; in terms of value the share of the dried fish maw would represent about 40% of the royalties (levies/CESS on exports)[11].

This recent change in catch destination has indirectly resulted in a reduced supply of raw material for the regulated processing factories. In 2014 the share of NP sent to these factories represented about 39% of the catch (compared to 60 to 80% at the end of the 2000s). The share of NP used for artisanal processing and for the fresh markets (both domestic and regional) was about 22.5% and 38.5% respectively.

The competition for fish supply has led to the closure of around half of the regulated processing factories in the last ten years with those still working now operating at around one-third of the plants' operating capacity with only one shift per day. In 2014 there were 26 active factories, compared to 15 in 1990 and 35 in 2005.

There is also a subsidiary trade in processing factory by-products, including heads, frames (carcass), meat, fat and skins which are re-processed by smoking, drying or salting and oil extraction. This trade is aimed at both the domestic and regional markets, including South Sudan, Rwanda, Zambia and the Democratic Republic of Congo (DRC).

Most NP consumed locally, or exported to regional markets, is believed to comprise of undersize (i.e. below 50 cm length) or 'oversize' fish. Note that the term 'oversize' fish refers to the maximum legal slot size which is above 85 cm length according to regulation. The term 'oversize' fish may also be understood as a size of NP that cannot be adequately processed in processing factories to meet the demand in the EU and Middle-East markets; the large catch being the most valuable for the maw trade. Around 70 000 tonnes of NP was estimated to be traded "informally" in 2008 (MRAG, 2008). Since then, the quantity is believed to have significantly increased. For regional markets the export route is by truck and fresh as well as processed product is exported in this manner.

3.3 Fishery Status and Trends

Table 2 shows the changes in fishing capacity on Lake Victoria (all fisheries included) in terms of the numbers of fishers, boats and the use of certain gears between 2000 and 2012 based on LVFO FS. The number of fishers has increased by a factor of approximately 60% and the number of boats has increased by a similar margin. The number of boats per fisher is therefore relatively constant. Changes in the number of gears are more variable. The numbers of hooks have increased by 260% between 2000 and 2012, while the numbers of pieces of (legal) gillnet have increased by about 60%. Fishermen have clearly increased their fishing power per boat by increasing the number of gears over the last decade.

The number of boats using outboard engines or sail also increased by a factor of approximately 1.7 between 2000 and 2012, whilst the rate of motorization increased from 9.7% in 2000 to 29.1% in 2012, suggesting that fishing units are moving to more distant, less heavily fished grounds probably to maintain catch rates.

10 *Information from processing companies (MRAG, 2008)*
11 *Information from processing companies (SmartFish, 2015)*

Table 2: Numbers of fishers, boats and certain fishing gear on Lake Victoria, 2000, 2006 and 2012 (LVFO frame surveys)

	Number of fishermen, boats and gears					Number of boats/gears per fisherman		
	2000	2006	2000-2006	2012	2006-2012	2000	2006	2012
Fishers	129 305	196 426	52%	205 249	4%	-	-	-
Fishing boats	42 519	68 836	62%	69 549	1%	0.3	0.4	0.3
Gillnets < 5" (ill.)	113 177	215 049	90%	200 689	-7%	0.9	1.1	1.0
Gillnets > 5"	537 475	1 007 258	87%	832 295	-17%	4.2	5.1	4.1
Longline hooks	3 496 247	9 044 550	159%	13 257 248	47%	27.0	46.1	64,6
Monofilaments	-	2 293	-	28 103	1 125%	-	-	-
Beach seines	7 613	3 653	-52%	4 375	20%	-	-	-
Motorized boats	4 108	12 765	211%	20 217	58%	-	-	-
Rate motorization	9.7%	18.5%	92%	29%	57%	-	-	-
Sail boats	6 304	10 310	64%	7 871	-24%	-	-	-

Not all fishing units target NP but the increase in gear types that target this species are significant; for instance, the numbers of pieces of gillnets >5" mesh rose by 55% and longline hooks by almost 280% over the period 2000-2012.

Table 3 shows the numbers of fishing units (i.e. combination of type of craft and type of gear) targeting NP on Lake Victoria, based on the LVFO FS 2012. When compared to the total number of fishing boats operating on Lake Victoria (Table 2), it can be estimated that about 53.4% of fishing units rely on the NP fishery.

Moreover, illegal monofilament gillnets have dramatically increased between 2000 and 2012 by a factor of approximately 12.3. In the same period, the number of beach seines has decreased even if more recently a general trend of increase can be observed (Table 2). The number of illegal gears involved in the NP fishery is still significant compared to legal gears (Table 3); for instance, fishing units using beach seines form about 10% of all fishing units targeting NP.

Table 3: General composition and number of fishing units targeting Nile perch on Lake Victoria (LVFO Frame Survey 2012)

	Gillnets	Long lines	Beach seine	Mono-filament	Total
Parachute - small craft (paddle)	609	903	170	110	1 792
Sesse Flat (paddle, sail or engine)	11 442	6 745	921	241	19 349
Craft paddle or sail	3 625	9 536	2 523	326	16 010
Total	**15 676**	**17 184**	**3 614**	**677**	**37 151**

In the meantime, there is evidence that the efficiency (or catchability) of a fishing unit targeting NP has increased by approximately 4% per annum since 2000 as a result of increases in engine power and the number of gears, particularly hooks, operated by each boat and of improvement of fishing know-how.

Yet, despite the increased fishing capacity (and related fishing effort considering that the number of fishing trips per annum per fishing unit has remained the same), the total catch of NP has stagnated over the last decade around 250 000 tonnes per year in average as mentioned above. Consequently, average catch rate (CPUE) have steadily declined thereby indicating an increased vulnerability and decreased profitability of the fishery (i.e. more fishing costs for the same amount of fish) – see table 4.

Table 4: Indicative catch rate for fishing units targeting Nile Perch in 2000, 2006 and 2011-2012 (LVFO Frame Survey 2012 and CAS 2011)

	2000	2006	2011-2012
Production of NP (tonnes)	199 068	230 493	198 624
Estimate number of FU targeting NP (53.4% total)	22 705	36 758	37 139
Catch rate (tonnes per year)	**8.8**	**6.3**	**5.3**

The increased vulnerability of the NP stock has been confirmed by recent scientific work which had shown a drastic decline in stock abundance (biomass) from about 1.44 million tonne in 2006 to about 0.55 million tonne in 2008. However, a gradual increase has been recorded in 2009, 2011 to 1.23 million tonnes in 2014 but with dominance of juvenile (immature) fish with only 5.9% of the spawner biomass above the slot size of 50 cm (draft LV FMP3, 2015-2020).

A decrease in length at maturity has also been reported and could be a sign of heavy exploitation, even if it could also result from environmental changes (Kolding et al., 2014[12]).

Total production (Yield) is currently maintained by increasing fishing capacity and effort, threatening the long-term viability of the population and lowering catch per unit effort rates. Action is therefore required to halt further depletion and to rebuild the stock biomass to increase sustainable yield and avoid compromising the reproductive capacity of the stock, thereby reducing the risk of a stock collapse.

There is also a strong need to improve stock assessment methods that have been developed so far on Lake Victoria. The available scientific information on the actual status of the NP fish stock may indeed show some incongruity when comparing key reference points such as MSY or safe biological limit of the stock biomass with current catch level.

3.4 Current Contribution of the Nile Perch Fishery (including value chain) to the Economies of the Three Partner States

The detailed methodology and information that were used to evaluate the current contribution of the NP fishery to the economies of the three LVFO Partner States is provided in a separate document[13]. Some key figures are provided below confirming the importance of the NP fishery in terms of its contribution to the social and economic development of the three LVFO Partner States. Note that calculation was made on the basis of an average production of 250 000 tonnes per year.

Value (turnover) and Value Added generated by the NP Fishery

Table 5 provides an estimate of the value (turnover) and value added (wealth generated) along the NP fishery. These figures should however be considered as being conservative considering the little and sometimes opacity in information on the magnitude and economic stakes relating to: by-products from factories, regional trade of processed products including frame, regional trade of high valued fresh/frozen fish ('by-products' of fish maw trade) in particular to Kenya and Rwanda and fish maw trade.

Total value in pre-harvest and post-harvest sector can be estimated at a minimum USD 1.2 billion per year.

Total value added in the NP fishery can be estimated at a minimum USD 800 million per year. This represents a total contribution of at least 1.0% of the combined Gross Domestic Product (GDP) of all three Partner States. It is likely that in Uganda the contribution would be much higher than Kenya and Tanzania as these latter countries have important marine fisheries.

Moreover, contribution of the NP fishery to Lake-basin economy is important, i.e. at least 15% of Lake basin GDP.

12 *Kolding, J., Medard, M., Mkumbo, O. and van Zwieten, P.A.M (2014). Status, trends and management of the Lake Victoria Fisheries. In Welcomme, R.L, Valbo-Jørgensen, J. and Halls, A.S. (eds.). Inland fisheries evolution and management – case studies from four continents. FAO Fisheries and Aquaculture Technical Paper 579. In press*

13 *Breuil, C. (2014) Draft Reorganised NPFMP2, November 2014 – Annex: Current Contribution of the Lake Victoria Nile Perch Fishery to the Countries' Economies, SmartFish*

Table 5: Value (turnover) and value added generated by the Lake Victoria NP fishery (LVFO/SmartFish, 2015)

	Turnover (million USD)	Value added (million USD)	Value added (% of total)
Pre-harvest activity (fishing inputs)	53.9	10.8	1.4%
Fishing activity	632.4	441.6	55.3%
Agents/Middlemen	386.6	81.1	10.2%
Processing factories	306.8	61.4	7.7%
Artisanally processed	297.5	92.1	11.5%
Fresh fish (domestic/regional	376.5	79.0	9.9%
Fish maw processing	129.3	32.3	4.0%
Total	**1 163.9**	**798.3**	**-**

Contribution of the NP Fishery to Budget Revenue

The total revenues that currently benefit the Partner States are estimated to be a very minimum of USD 6 million. This represents less than 1.0% of total value added in the NP fishery.

These estimates are however very conservative. Calculation indeed only includes available and partial information relating to vessel licence, fishing licence, permits for factories, and levy/CESS on exports (royalties). They could not include revenues from the artisanally processed and fresh NP sold on domestic and regional markets (about 60% of current catch destination) as well as other existing taxation in the fish landing process such as the daily landing fee per boat and the parking fee for trucks at landing site and fees from recreational fisheries. Moreover, available information on levy/CESS on exports may only capture about 60% of total amount when considering the opacity regarding fish maw trade.

Meanwhile, this gives an idea of what could be generated by the NP fishery sector to the benefit of the Partner States if it was better managed in terms of compliance with existing regulation on fishing and related activities. *A tentative figure of USD 10 million per year may not be overestimated.*

Interestingly, it can be noted that the fishing activity contributes to about 25% of budget revenue in the NP fishery (with boat owners and fishers contributing almost equally). The contribution of the post-harvest sector (75% of total) is almost entirely composed of levy/CESS on exports (i.e. about 99% of post-harvest contribution).

Contribution to trade balance

Officially, the total export of NP fish and fishery products has varied between USD 245 million and 315 million per year over the last decade, hence playing a significant role in foreign exchange earnings, as shown in Table 6. These figures do not however include international trade of fish maw and informal regional fish trade.

Table 6 shows that official export of NP fish and fishery products contributes about 2% to national trade balance.

Table 6: Official contribution of Lake Victoria NP fishery to trade balances in Partner States (LVFO/ SmartFish, 2014)

	Kenya	Tanzania	Uganda	Total
Export of NP fish and fishery products (million USD) - 2012	39.9	106.4	115.6	261.9
Share of NP in total fish exports - 2012 (%)	85.5%	65.2%	-	-
National trade balance in 2012 (million USD) (World Bank)	-6 420	- 4 574 (2011)	- 1 822 (2011)	-12 816
Contribution of NP exports to trade balance (%)	0.6%	2.3%	6.3%	2.0%

Contribution to employment

Based on the generally accepted ratio of 2.5 workers in the pre- and post-harvest sectors to each fisher, the total number employed in the NP fishery can be estimated at 442 000 persons (Table 7). These estimates could however be largely underestimated as stressed by countries. Unfortunately, no information is available to adjust them.

The only data available on gender issues in the NP fishery come from Uganda; these indicate that women play a significant role in the post-harvest sector making up 80% of the artisanal processing labour force, 39% of fresh market retailers; 36% in the processing factories and 40% in fish maw processing.

Table 7: Contribution of Lake Victoria NP fishery to employment in Partner States (LVFO/SmartFish, 2014)

	Kenya	Tanzania	Uganda	Total
Number of fishers involved in NP fishing	20 675	58 197	47 562	126 435
Estimated number of workers in NP pre- and post-harvest sectors	51 689	145 494	118 904	316 087
- of which in processing factories	(2 190)	(3 285)	(5 500)	(10 975)
Total	72 364	203 691	166 466	442 521

Contribution to food security

NP fish and fishery products are principally sold on the regional and international markets. It is estimated that only 30% of the total NP catch is sold within the Partner States' markets; the contribution of the NP fishery to fish consumption in the three Partner States is estimated to be 6.5% (Table 8).

At lake-level, such ratio is however believed to be much higher and steadily increasing as a result of recent change in catch destination with less fish entering into regulated processing factories.

Table 8: Contribution of the NP fishery to fish consumption in Partner States (LVFO/SmartFish, 2014)

	Kenya	Tanzania	Uganda	Total
Population ('000) – 2012	43 180	47 780	36 350	127 310
Fish consumption in 2009 (kg/person/year) – FAO	3.4	5.7	13.5	-
Total fish availability (tonnes/year)	146 812	272 346	490 725	909 883
Total NP availability 2011 (30% total catch) (tonnes/year)	-	-	-	59 587
Contribution of NP to fish consumption (%)	-	-	-	6.5%

3.5 SWOT Analysis of the Nile Perch Fishery

Major strengths in the NP fishery include the following:

- Existence of adequate fisheries management framework (through LVFO)
- Existence of national institutional arrangements for Lake Victoria fisheries management capable of being restructured.
- Established Beach Management Units (BMUs) and BMU networks.
- Established processing associations.
- Established harvesting rules.
- Industry self-monitoring with established penalty rules.
- Importance of NP fishing and related activities for wealth creation, foreign exchange earnings, employment creation, and food security to wider community.
- Established trading and marketing chains with quality controls and standards for certain types of fish products and markets.
- Available resources, infrastructure and technical capacity.

Major Weaknesses in the NP fishery include the following:

- Inadequate follow-up of agreed issues among Partner States (measures, recommendations, etc.)
- Poor funding levels for the LVFO and its Secretariat by Partner States with delayed payment of operational funds impacting on regional activities. This makes reference inter alia to the funding of Secretariat by Partner States through line ministries instead of directly through the EAC
- Reliance on donor projects and funding for research and MCS activities.
- Inadequacy of institutional structures and staffing arrangements in LVFO Secretariat.
- Poor funding of BMUs operates against co-management role. Weak legitimacy within fishing communities and poor leadership of some BMUs is also a problem.
- Inadequate understanding of precautionary principle at high level impedes prompt management action.
- The fishery is over-fished and there has been increasing encroachment on the spawning biomass. This is dangerous for the long-term survival of the fishery.
- Several gaps in availability of high-quality fisheries data.
- Insufficient level of knowledge about fishery and biology.
- Importance and increased demand of the unregulated regional markets.
- Deficiencies in fish quality for certain NP value chain
- Poverty and HIV Aids have a negative impact on conserving fish stocks (short-term outlook of fishers).

Major Opportunities in the NP fishery include the following:

- Acceptance of stock decline situation and acceptance of the need for action by all stakeholders at all levels.
- Recognition of LVFO and its functions in the EAC Treaty.
- Recognition of the need to establish specific fishing licences for Lake Victoria, including a specific NP fishing licence (LVFO-CoM, November 2013).
- In one Partner State (Uganda), recent initiative of permanent markings for fishing vessels/vessel identification plates on-going.
- Several recent initiatives/funding for improved MCS, including procurement of new and rehabilitation of patrol vessels.
- The BMUs operate at primary level and are well-established with opportunity to be effective co-management bodies.
- The recognition of eco-labelling as a tool for sustainable fisheries management by cross-section of key players provides opportunity for lake-wide application.
- Donor and development partner interest in selected research and MCS projects in Lake Victoria area.
- Possibility to increase value addition in the 'traditional' fish processing industry targeting international and regional markets and in the fish maw trade.
- Established markets in developed countries.

Major Threats in the NP fishery include the following:

- Open access fishing regime, poor regulation of fishing effort and unsustainable fishing capacity.
- Low cost of entry has exacerbated the expansion in numbers of fishing units to a level where withdrawal

of units is likely to have a possibly unacceptable political cost.

- Substantial quantities of "IUU" fish traded in local and regional markets.
- Weak and under-funded enforcement (MCS) systems.
- Political interferences take precedence over management decisions and implementation of management measures.
- Constrained governance standards affect management, notably that key players at local Government, are not directly answerable to the ministry in charge of fisheries.
- Increased poverty amongst the fishing community, which is believed to be an aggravating factor for the development of illegal activities.
- Gaps in scientific information due to stalled research and survey activities.
- Localised pollution and climate change effects on the fishing environment and fish stocks.



4 NILE PERCH FISHERY MANAGEMENT PLAN FOR LAKE VICTORIA, 2015-2019 (NPFMP2)

4.1 Towards a New Paradigm for Adequate and Responsible Management of the Nile Perch Fishery

The current situation and major trends in the NP fishery can be summarised as follows:

- The health of the NP stock is of an increasing concern due to excessive fishing pressure and an extremely high number of small and immature fish in the catches and a deterioration of the reproductive capacity of the stock as there are fewer females and females are smaller in size at first maturity. This has resulted from a steady increase of fishing capacity and effort and a tremendous increase of illegal gear and practices, making the NP fishery more and more vulnerable.
- There is low compliance with fishing licencing system which means that access to the fishery is poorly regulated and almost free for resource users. At the same time the increase in regional fish trade and fish maw trade, which is generally informal, is resulting in less control of post-harvest sub-sector. Generally speaking, the NP fishery involves an increased number of actors (both in fishing and value chain) operating in an unregulated and informal environment. This has led to increased complexity of the management system and negative impacts on both the local economies and the budget revenue. In other words, there is increased unfair distribution of the wealth generated by the fishery resource to the detriment of people living in the three Partner States.

- The contribution of the NP fishery to the local and national economies is still important. This means that in addition to leading to an ecological crisis on Lake Victoria, a likely collapse of the NP stock would result in a significant social and economic crisis and related conflicts at local, national and possibly regional levels. This may have serious impact on the stability of the lake-basin area.
- The management system for the NP fishery is inadequate. In particular there is excessive reliance on devolved management structures including BMUs which has proved to be inappropriate in the context of the NP fishery which is mainly a business-oriented fishery involving commercial actors (fishers, boat-owners, processors and traders). Note that the meaning of the word 'commercial' does not refer to the size of the economic units that are involved but rather to the logics of almost all the actors whose priority is clearly to seeking profits. In other words, the vision of a fishery capable of supporting the livelihoods of thousands of fishing communities and which could be managed though community-based arrangements is no longer valid. There is also a poor level of enforcement of existing regulations in general and fisheries management services are weak as a result of the lack of political will at decentralized and central levels to effectively manage the fishery. Finally, management initiatives that have been supported by donors in the last two decades have focused on scientific projects rather than implementation of management measures.

Based on the above, there is now a crucial need for change in the management approach. The new paradigm can be resumed as follows:

- Promote a different and more appropriate approach for a social management of the NP fishery, i.e. an approach that would better benefit the local communities. This should not only consist in promoting mechanisms for further participation of fishers in the provision of management services such as data collection and MCS but rather in establishing enabling conditions to increase the creation of wealth and its sharing at local level to the benefit of sedentary fishers and related economic actors. This would include in particular formalization of economic actors, regulation of fishing activities, promotion of secure access to resources, and improvement of value chain.
- Need for a change in policy-driven at both central and local levels in relation to wealth generation. Current economic benefits that are derived from the NP fishery are sub-optimal and they are not sustainable. Economic benefits could be at least sustained and possibly significantly increased provided however that decision-makers make the necessary institutional and infrastructural investments and set-up adequate fiscal arrangements. While doing so, decision-makers should consider that return on investment could be considerable and beneficial to all stakeholders including the States (and hence all people from the three Partner States).
- The promotion of a specific and operational NP fishery management plan is of utmost importance. Major lessons learned from NPFMP1 have shown that NPFMP2 should better address regulation of access to resources, full compliance with existing fishing regulations and formalisation/regulation of all post-harvest activities. Moreover, NPFMP2 should be more action-driven and implementation orientated than NPFMP1.
- Management arrangements should further involve actual (commercial) actors including fishers, boat-owners, processors and traders.
- Responsibility of all public institutions concerned by fishery management (including local government and the Judiciary system) in fulfilling their mission/mandate should be seen as a key condition of success of NPFMP2. There will therefore be a need to mobilise adequate human, financial, and logistical means and to ensure that institutions are accountable of their actions.
- Promote a proper approach for the financing of NPFMP2. This signifies that financing of implementation of fisheries management by Governments (central and local) should be in relation to bio-ecological, economic and social stakes and to requirements. This also means that there should be no longer reliance on external financing for action. Particular attention should also be placed on establishing mechanisms for co-financing by all commercial operators involved in fishing and value chain and not only registered/regulated processing factories as it is today.
- Research should focus on providing technical and scientific advice to support decision-making in relation to the implementation and the monitoring and evaluation of NPFMP2. This should include improving knowledge on resource dynamics and status and developing capacities in each country and at the LVFO Secretariat level in economic analysis.

4.2 Goal and Specific Objectives of NPFMP2

The goal and specific objectives of NPFMP2 should be in line with objectives stated in overarching LVFO policy documents and recent LVFO-CoM recommendations. Policy documents include the Strategic Vision for Lake Victoria (1999-2015), Regional Plans of Actions and the draft Fisheries Management Plan for Lake Victoria, 2015-2020 (FMP3) under preparation.

The Strategic Vision for Lake Victoria (1999-2015) underlines the need of a healthy ecosystem and to assure a sustainable development of resources[14].

The Regional Plan of Action to prevent, deter and eliminate illegal, unreported and unregulated fishing (RPOA-IUU) on Lake Victoria adopted in 2004 by the LVFO-CoM contains agreed measures to combat IUU fishing on Lake Victoria. These include actions to licence and register fishing vessels, strengthen law enforcement on the lake, promote community participation in fisheries through Beach Management Units (BMUs) and implement a series of technical measures designed to ensure sustainable fisheries, including a minimum mesh size for gillnets and slot size for NP. Implementation of RPOA-IUU is underway through legislation and plans of the Partner States.

The Regional Plan of Action for Management of Fishing Capacity on Lake Victoria (RPOA-Capacity) adopted in 2004 by the LVFO-CoM recognized efforts being made in fisheries management and committed Partner States to manage fishing capacity to prevent, deter and eliminate overfishing on Lake Victoria. Implementation of the RPOA-Capacity is underway, but requires further support and agreement on measures to ensure achievement of key objectives.

The issue relating to access controls is a crucial issue in both RPOAs. The last LVFO-CoM meeting held in November 2013 recommended that the Partner States establish specific fishing licences, including a specific NP fishing licence.

The Vision of the draft FMP3 under preparation is *"to contribute to the sustainable economic growth and reduction of poverty in the East Africa Community". The focus of the Vision statement of the draft FMP3 is very clearly on impacts on the lives of people in fisheries*[15]*. The Goal of FMP3 is "sustainable utilization of fisheries resources of Lake Victoria basin to contribute to wealth creation and provide equitable opportunities and benefits in the EAC".*

Furthermore, for each fishery-specific management plan to be developed (such as NPFMP2), the draft FMP3 indicates technical management measures (gear size restrictions, restricted areas, gear/fishing restrictions) aimed at achieving management objectives. The objective assigned to the NP fishery is *"to rebuild NP biomass of Lake Victoria from current levels of 1.2 million tonnes to the historical highest standing biomass of 1.4 million tonnes".*

Based on the current situation and trends of the NP fishery, considering the need for a change in the paradigm for adequate and responsible management of the NP fishery, and with reference to the above policy guidance, the Goal and Specific Objectives of the Nile perch Fishery Management Plan, 2015-2019 (NPFMP2) are as follows:

GOAL (long term):	To enable the Lake Victoria Nile perch fishery to increase its contribution to the economic and social development of the LVFO Partner States in a sustainable and responsible manner.
SPECIFIC OBJECTIVES (5 years):	To rebuild the biomass of the Nile perch stock to the level that will sustain catches above 300 000 tonnes per annum; To increase wealth generated by Nile perch fishing and related activities by at least 10% through improved regulation of fishing activities and enhanced value addition in the artisanal and industrial post-harvest sector; To improve wealth sharing to the benefit of local communities.

14 *The LVFO developed its own Strategic Vision for Lake Victoria (1999-2015) which aimed to "foster a common systems/resource management approach amongst the Partner States in matters regarding Lake Victoria, with the goal of restoring and maintaining the health of its ecosystem, and assuring sustainable development to the benefit of the present and future generations".*

15 *The 2015-2020 draft FMP Vision statement recognizes that "Lake Victoria and its basin will continue to be an engine for economic growth and poverty reduction in the region, acting as a central hub, welding the Partner States firmly together in a sphere of cultural, political, social and economic integration and harmony".*

The above specific management objectives for the NPFMP2, 2015-2019, are in line with the following national policies in the fishery sector:

- Kenya: National Oceans and Fisheries Policy (NOFP) of 2008.
- Tanzania: National Fisheries Sector Policy and Strategy Statement of 1997, draft National Fisheries Policy (NFP) of 2010, and Fisheries Sector Development Program developed in 2011 to support the operationalization of the draft NFP of 2010.
- Uganda: National Fisheries Policy (NFP) of 2004 and Development Strategy and Investment Plan (DSIP) 2010-2015 developed by the Ministry in charge of fisheries

Moreover, the specific objectives of NPFMP2 and the proposed strategy to achieve these objectives (see below) are in good coherence with the African Union's Policy Framework and Reform Strategy for Fisheries and Aquaculture that focuses on the need to promote wealth-based management in fisheries through improved regulation of access to resources and development of opportunities in the value chain and to ensure equity in wealth distribution through adequate fishing rights and taxation16.

4.3 Strategy for NPFMP2

Considering the current status of the NP resource and the gradual decline of the NP fishery in terms of its contribution to the economies of the three Partner States, the overall strategy of NPFMP2 to reach the specific objectives should be first to focus on actions aimed at reducing the fishing pressure and rebuilding the NP stock to a point that it is compatible with its sustainability. This will be achieved through the regulation of all NP fishing and related activities and compliance with existing regulations.

When this objective of an 'acceptable level of overfishing' and yield is achieved (i.e. when the level of fishing pressure is compatible with the carrying capacity of the stock), managers may then wish to promote actions aimed at continuing rebuilding the NP stock, further regulating fishing effort (e.g. by introducing a closed season) and strengthening post-harvest sector in order to satisfy more specific fishery management objectives of an ecological, social and/or economic nature.

A range of potential management options were explored to reduce the fishing pressure using a biomass dynamics model of the fishery. These options focused upon introducing easily monitored and enforced controls over fishing effort (number of fishing days, numbers of boats, gears and boat propulsion) and enforcement of existing regulations[17].

In order to reduce fishing pressure, two main options are available. The first option (input-control) consists of regulating the fishing effort exerted on the resource with emphasis on controlling fishing activities (number of fishing units, number of fishing days, etc.). The second option (output-control) requires regulation of the fishing mortality through controlling fish harvesting or fish landings or post-harvest activities. Each of the two options has its own advantages and disadvantages depending on the characteristics of the fishery to be managed. In the case of the Lake Victoria NP fishery, the second option is not realistic considering the number of fish landing sites (3 450 km of shoreline) and the existence of significant domestic and regional markets that are poorly regulated. At the time when NP products were largely sold on the international market through processing factories, this option could have been considered but this is no longer an option.

The preferred option to reduce fishing pressure is therefore to promote an 'input-control' management system, with priority actions including putting an end to the open access, reducing illegal fishing and gradually establishing clearer user rights. Other related key challenges relating to this option include preventing further increase in, and possibly reducing, the overall fishing capacity (by removing illegal fishing) before, or in parallel to, promoting measures aimed at reducing fishing effort such as closed seasons. Additional measures aimed at contributing to the conservation of the resource, such as closed/protected areas, may also need to be introduced in a longer term.

The total target in terms of reduced fishing effort at the end of NPFMP2 could be close to 15-20%. This target may be below recommendations of scientists, aiming to reach the theoretical MSY level, however, considering current weaknesses in the governance system and due to the balancing of social challenges and the possible destabilizing effect that massive management actions may have at the lake-basin level area, a target to reduce effort by 15 to 20% by 2019 is considered realistic. Key challenges associated with NPFMP2 are to ensure that the risk zone where the stock may collapse is not reached and to shifting from a poorly managed to an effectively regulated NP fishery and value chain.

Based on the above, the outlines of the NPFMP2 strategy are as follows:

Immediate

- Control access to resource through minimal conditions of access to and formalisation of all fishers and boat-owners in the NP fishery.
- Regulate all post-harvest activities with a focus on regional trade and fish maw trade.
- Enforce existing priority fishing regulations through effective MCS, with priority given to those designed to prevent the most harmful fishing practices.

Short-to-medium term

- Restrict fishing capacity to the 2015 level.
- Strengthen the NP fishery regulatory framework with the objective of further reducing fishing effort (notably through introduction of a closed season for two months a year) and protecting NP resource (notably to protect the largest spawners targeted by fish maw traders).
- Evaluate the feasibility of introducing secure fishing rights.
- Strengthen post-harvest sector in respect to fish quality and wealth generation in both artisanal and industrial value chain (processing and trade).

These strategic elements are further developed below.

In parallel, cross-cutting actions will need to be promoted. These will include improved delivery of key fisheries management services including general administration of the sector, MCS and research and improved legal and institutional framework. To this extent, particular emphasis will be placed on developing public-private partnership at both local and national levels and strengthening collaborative arrangements at regional level to adequately address regulation of fishing activities and fish trade.

Other guiding principles for improved governance and management of the NP fishery are provided in box below.

16 *See Policy Framework & Reform Strategy for Fisheries and Aquaculture in Africa (2014) NEPAD Planning and Coordinating Agency.*

17 *Size/age-related harvest controls (landing size restrictions, gear size restrictions, slot size etc.) and controls over the spatial distribution of effort (closed areas) could not be examined due to lack of suitable data. However, the effects of such controls could be examined in the future with the application of an age-structured model (see proposed action for research in NPFMP2 action plan).*

Other guiding principles for improved governance and management of the NP fishery

Ecosystem Approach to Fisheries (EAF) and the Precautionary Approach

The purpose of implementing an Ecosystem Approach to Fisheries (EAF) is to plan, develop and manage fisheries in a manner that addresses the multiple needs and desires of societies, without jeopardizing the options for future generations to benefit from the full range of goods and services provided by ecosystems. An EAF strives to balance diverse societal objectives, by taking account of the knowledge and uncertainties of biotic, abiotic and human components of ecosystems and their interactions and applying an integrated approach to fisheries within ecologically meaningful boundaries.

Applying an EAF when developing a fishery management plan should consist of addressing components of ecosystems within a geographic area, in this case, Lake Victoria, in a more holistic manner than is used in the current single-species approach and it would also consider the ecological, social and economic aspects of the fishery. When applying EAF to the management of the NP fishery, sustainability of haplochromines species as an important prey base for NP and for its ecological role in the lake ecosystem should be given particular attention.

The FAO Code of Conduct for Responsible Fisheries (FAO CCRF), 1995, and the EAF approach adopted to implement the CCRF encourages the authorities to develop fisheries management plans (FMP), with appropriate emphasis on the precautionary approach and rights-based allocation.

The precautionary approach states that "the absence of adequate scientific information should not be used as a reason for postponing or failing to take measures to conserve target species, associated or dependent species and non-target species and their environment" (FAO CCRF, 1995. Art. 6.5)

Gender equity

The active participation and respective role of men, women and youth in the fishery sector should be recognized and accounted for during the implementation of the NPFMP2, particularly as regards to post-harvest activities.

Other social issues

Other social (human dimension) aspects are high on the agenda of any artisanal fishery such as the Lake Victoria fisheries. These refer for instance to whether the young are entering the fishery or whether AIDS/HIV or other health issues are of importance since it may lead to short-termism within the fishery. Also poverty, inequity in wealth distribution, etc. should be given particular attention in the management of any fishery involving small-scale fishers.

4.3.1 Control Access to Resource (immediate)

The establishment of minimal conditions of access to and formalisation of all fishers and boat-owners in the NP fishery should include promotion of the application of basic administrative tools such as boat registration and the issuing of specific NP fishing licences and the development of basic monitoring tools to monitor fishing capacity. In particular this should consist of the following:

- *Registration and marking of all vessels targeting NP (indicating inter alia nationality, name of owner, length, mode of propulsion, type of gear used, number of gear by craft, basic safety devices, etc.)*
- *Establishment of a specific annual NP fishing licence for Lake Victoria with agreed and consistent conditions among the three Partner States (e.g., a link between fishing licence and vessel registration, provisions for the licence to be suspended or revoked in case of serious infringement, requirements for declaring catch, etc.).*
- *Development of harmonized and computerized national and LVFO vessel registers and fishing licence registers for the NP fishery.*

The procedure for registration and licencing of fishing units should provide the opportunity to stop the existing open (and quasi-free) access to the fishery and to create enabling conditions that will allow in a later stage to further clarifying user rights as well as to restrict the fishing capacity to its current level. Note that in addition to creating the possibilities for effectively controlling fishing effort at a later stage, this measure is also of particular relevance for the success of certain technical measures including closed seasons, for instance, to prevent boat owners from further investing in new fishing units and increasing their overall effort in the months following the reopening of the fishery.

It will be essential to ensure harmonization of procedures and conditions attached to licencing among the three Partner States.

4.3.2 Regulate All Post-Harvest Activities (immediate)

Ensuring proper regulation of post-harvest activities will involve putting emphasis on the effective issuance of permits/authorisations to all economic entities involved in value addition in accordance to existing regulations in each of the three Partner States. The existing regulations distinguish the following categories:

- *Annual permit/authorization for 1 agent/middleman*
- *Annual permit/authorization for 1 fish retailer*
- *Annual permit/authorization for 1 artisanal fish processor*
- *Annual permit/authorization for 1 processing factory*
- *Annual permit/authorization for 1 fish maw processor*

There will be also a need to extend the issuance of Fish Movement Orders/Permits from Lake Victoria (FMO/P issued by Competent Authorities in the context of traceability of products) to all NP fish and fishery products whatever their final destination. Note that the issuance of such administrative act is currently poorly effective in the cases of domestic and regional trades.

Measures to control entry of IUU fish into the domestic and regional market channels will also include strengthening of border controls, inter-agency collaboration and inter-country collaboration.

4.3.3 Enforce Existing Priority NP Fishery Regulations (immediate)

Enforcement of existing regulations with respect to IUU fishing would result in major progress towards improved conservation of resources by eliminating harmful fishing practices and make a significant contribution towards the objective of reducing fishing capacity and effort. Combatting IUU fishing however presents some challenges as follows:

- *MCS requires considerable funding if satisfactory intelligence and operational activities are to be achieved at lake level.*
- *To ensure successful MCS certain governance elements require improvements, including the adoption of increased penalties in case of infringements to provide a deterrent effect and the setting-up of an enabling environment for proper prosecution.*
- *Harmonization of regulations and a concerted effort is required by all three countries to ensure that illegal fishers would not simply move in response to enforcement operations from one Partner State to another Partner State.*
- *If fishers change behaviour from illegal to legal fishing because of enforcement, i.e. if the numbers of legal fishers increase in response to intervention, then the overall fishing capacity (in respect to numbers of fishers) would remain the same, however the overall effort may be reduced.*

Combatting IUU fishing should be given high priority due to the potential to implement it relatively immediately and the strong political will in favour of such an option with reference to the communiqué of the last LVFO-CoM held in November 2013 recommending the reactivation of the OSNP as a matter of urgency.

Although the NPFMP2 requires that the current regulations are retained in their entirety as they are at present. However, in a context of financial, logistical and human resources constraints, there will be a need to focus MCS and enforcement efforts on a limited number of regulations considered as priority, based on ecological, social, economic and institutional considerations with an objective of 100% compliance. The priority regulations include the following:

- *NP fishing vessel registration.*
- *Specific NP fishing licence.*
- *Slot size for NP of 50 cm minimum.*
- *Use of gillnet mesh size above 6".*
- *Prohibition of the use of beach seines.*
- *Prohibition of the use of monofilament gillnets.*
- *Registration of processing units, both artisanal and industrial.*

When legal provisions are drafted to support the envisaged establishment of a fishing right system (see after) MCS should aim towards 100% compliance of relevant regulations.

4.3.4 Restrict Fishing Capacity to the 2015 Level (Short-to-Medium Term)

At the end of year 2 of NPFMP2 at the latest, it can be assumed that the NP fishery will be satisfactorily regulated in terms of compliance by boat-owners, fishers, processors and traders with existing regulations. In order to prevent any increase in fishing capacity and to create enabling conditions for the possible introduction of more sophisticated measures aimed at reducing fishing effort such as closed season, there will be a need to restrict the overall NP fishing capacity to the 2015 level. Concretely, this means that only the renewal of both vessel and specific fishing licencing will be authorized using information available on relevant registers.

This action will definitely end the current open access regime of the NP fishery.

4.3.5 Strengthen the NP Fishery Regulatory Framework (Short-to-Medium Term).

Introduction of a closed season for two months a year

The purpose of a closed season is to contribute to the reduction of total fishing effort and to strengthen the set of technical management measures aimed at conserving the resource (e.g. reduce the risk of catching spawners or pre-spawners by introducing a closed season before and during the main breeding period). As indicated above, a condition for success of such a measure is that the fishing capacity is capped.

For the introduction of a two months closed season, two approaches were considered: either a 1-day closure each week throughout the year (52/365 days = 14% in terms of reduced fishing effort) or a continuous two months closure during a well-defined and consistent period (2/12 months = 16.6% in terms of reduced fishing effort). Although a continuous closure may be more disruptive for processing factories and possibly for fishers, it is the preferred option for cost-efficiency reasons in relation to MCS and enforcement.

Other elements that should be taken into consideration for the introduction of a closed season are as follows:

- The closure should apply to all fishing units targeting NP and should be covered by the same regulations for all three countries.
- Harmonised national regulations should also allow for additional closures by Legal Notice in response to possible changed or exceptional circumstances.
- No Fish Movement Orders/Permits (FMO/P) from Lake Victoria should be issued for NP during closure period and it should be illegal to transport NP without an FMO/P or with an FMO/P issued during a closure period.
- No NP should be received by any fish processing entity during a closed period (with some exceptions under certain conditions to be further determined, for example, in the case of Uganda where there are other sources of NP supply from Lake Albert[18] and Lake Kyoga[19]).
- No NP should be sold at a market for unless an FMO/P has been issued during a closure period.
- Accompanying measures should be promoted specifically regarding the export of high value chilled/ frozen products on the international market so as to prevent any risk of a commercial nature20.
- Accompanying measures should also be promoted within fishing communities so as to facilitate their access to alternative livelihoods, in particular for sedentary communities. This will include promoting aquaculture while making use of strategies provided by the FMP3 to increase availability of quality seed and feed and capacity building of technical staff and farmers.

18 *Lake Albert is the natural home of the NP which was introduced to Lakes Victoria and Kyoga. In Lake Albert, there are two species of Nile perch (Lates niloticus and Lates macrophthalmus). A recent catch assessment survey was undertaken in in 2014. Results indicate an annual landing of 151 600 tonnes of fish from Lake Albert. Amongst the large commercial species, NP was the most dominant species caught on the lake and third overall with an estimated annual catch of 5 200 tonnes (2013) and 3 800 tonnes (2014) of the total production. Most of the NP caught is exported to the neighboring countries of Democratic Republic of Congo and Rwanda while their fish maws are brought to Kampala where it is processed for export to Hong Kong.*

19 *In Lake Kyoga, the introduced NP became a successful fishery just like in Lake Victoria resulting in Lake Kyoga having the highest catches in the 1970s with a catch of 167 000 tonnes in 1978. However, due to high fishing pressure, the fish catches in Lake Kyoga have declined to less than 50 000 tons. The most dominant species in the commercial catches include Tilapia, Rastrineobola, Nile perch, Protopterus, Clarias, Bagrus, Mormyrus and Synodontis in that order. The NP remains very important in terms of beach value. Some NP is taken to factories for processing while a majority is processed by artisanal processors for the regional market.*

20 *"From the market side, one of the key selling points of LVNP is its all-year-round availability. In changing this there would be impacts in demand and possibly long-term consequences. These would be minimised through explanation to the market of why it is necessary for sustainability reasons. Proper planning on shutting down the fishery, when it would be restarted and how it would be restarted are critical. The market must know when supplies will recommence and be prepared to market it with promotions so that it re-starts properly. In fact full stakeholder consultation is prudent to avoid a disaster in the fishery not re-starting exports after a closure." (MRAG, 2008)*

Consolidation of conservation measures, notably to protect the largest spawners targeted by fish maw traders

The dramatic development of the very lucrative fish maw trade in recent years has resulted in an increased demand for large NP (which form an important component of the spawning stock) that are also caught in shallow waters in breeding areas. There is a regulation in all three countries which defines the maximum slot size of NP at 85 cm but this regulation is difficult to enforce, to the detriment of the observed recruitment over-fishing. It is in this context that new measures should be promoted in order to discourage the catch of large mature fish. This could be done through:

- The formalization of fish maw processors/exporters (registration/approval to meet the require standards, obligation of fish movement permits, etc.) – see above.
- The introduction of a regulation aimed at banning the trade of fish maws heavier than a certain weight (to be identified via research work) considering that MCS efforts to enforce such measures could rely on collaborative mechanisms with Customs (all dried fish maw is exported to Asian markets).

Other conservation measures to protect the NP resource should also include the following:

- Protection of sensitive areas notably in the main breeding and nursery areas which are targeted by fishers. Some areas have already been pre-identified by research but they need to be further specified based on additional research programmes. When they are demarcated, priority sensitive areas (no fishing zone) should be gazetted.
- Promotion of measures aimed at conserving the haplochromine fishery in relation to specific management measures recommended in the draft FMP3.

4.3.6 Evaluate the Feasibility of Introducing Secure Fishing Rights (Short-to-Medium Term)

The key issue in fisheries management relates to the regulation of the access to resources. Towards this end, the formalization of actors involved in fishing activities (boat-owners and fishers) and the end of open access in the NP fishery will constitute essential first steps. In order to ensure increased wealth creation in fishing activity, another major step will be to promote processes to clarify and secure fishing rights. It is in this context that NPFMP2 will evaluate the feasibility of introducing a system of fishing right.

A key question that will have to be adequately evaluated concerns the nature and duration of fishing rights. It is recommended that the fishing right be given to boat-owners who in most cases own several fishing units, for a duration of 5 years. Note that 5 years is the average lifespan of a craft (lifespan of gear averages 1.5 years) and 5 years should be the maximum duration of any NPFMP before its revision.

The nature of the fishing right could take the form of a private access agreement (e.g. a concession for a duration of 5 years) between a given Partner State and a boat-owner. The concession should clearly indicate the number of authorized fishing units per boat-owner (each fishing unit becoming eligible to specific annual fishing licence) and give precise technical specifications to define the total fishing capacity allowed per boat-owner. It should clearly state that the concession can be suspended or cancelled in case of non-compliance with the terms of the agreement or fishing regulations. A clear link should then be established between vessel registration, private access agreement and (annual) specific fishing licencing.

A harmonized and computerized national and LVFO fishing right register for the NP fishery could be established before the end of NPFMP2

At the end of NPFMP2, the administration and boat-owners could enter into a dialogue to revise the level and the distribution among boat-owners of the total authorized fishing capacity for the next 5 years. These decisions would then support the revision of private access agreements for another 5 years.

4.3.7 Strengthen Post-Harvest Sector (Short-to-Medium Term)

The post-harvest fishery sector is faced with problems relating to inadequate fish quality, the existence of some physical and economic post-harvest losses and inequity in the sharing of value addition among fishers and other stakeholders. The causes of these problems are to be found in the lack of infrastructure and equipment, the use of unsuitable practices in fish handling, processing and marketing, poor fish quality control and inadequate market information systems.

A prerequisite to the strengthening of post-harvest sector will be to formalize/regulate all types of fish processing

and trade whatever the final destination of the NP fish and fishery products. This will be addressed in the immediate term as stated above.

In a context of poorly regulated fisheries (which is the case today for most Lake Victoria fisheries), care should be taken when promoting value addition activities as these must be balanced with the status of the NP stock and developed to not exacerbate current over-capacity. In other words, a condition for the full success of actions in favour of value addition and enhanced pro-poor growth should be that NP fishery is adequately regulated. That is the reason why most actions in relation to strengthening of post-harvest activities are planned in the short-to medium term.

During NPFMP2, emphasis will be placed on compliance to food safety in all fish processing factories and on actions aimed at reducing physical and economic post-harvest losses.

4.4 NPFMP2 Action Plan

The NPFMP2 action plan for the period 2015-2019 is structured around four main types of actions as follows:

1. Deliver key fisheries management services - General fishery administration, research and MCS.
2. Improve the governance framework - Policy and planning and legal issues, co-management and Public-Private Partnership (PPP), collaborative and funding mechanisms.
3. Implement complementary actions - Communication of NPFMP2 to decision-makers, fishers and stakeholders, improved access of fishing communities to education and health, accompanying actions for fishing closure and livelihood diversification, value addition in post-harvest sector, increased ex-vessel price of NP.
4. Monitor and evaluate - Regular M&E of indicators and reviews.

Detailed outline of the action plan is provided below.

4.4.1 Delivery of key fisheries management services

General fishery administration

- Vessel registration, including vessel marking and management of a computerized register.
- Specific NP fishing licensing, including management of a computerized register.
- Quality and safety control for NP fish and fishery products by Competent Authority (e.g. inspection, health certificates, fish movement permits, and export sanitary certificates).
- NP fishery data collection, processing and management.
- Frame survey (every 2 years) for the purpose of monitoring the NP fishing capacity
- Private access agreement (concession for 5 years between a given Partner State and boat-owner).
- Contribution to M&E of NPFMP2.

Research

- Annual hydro-acoustic survey (HAS) to monitor the status of NP stock.
- Catch Assessment Survey (CAS) twice a year to estimate NP fish production and catch rate.
- Standardization of fishing effort (between different boat types and gear types) to obtain a standardized unit of effort per fishing unit in number of fishing days or trips.
- Stock assessment based on a dynamic model to evaluate the status of the NP stock and make recommendations to enable the alignment of fishing capacity/effort with the resource base.
- Development of an age-structured model to verify the effort control-response of the stock predicted by the biomass dynamics model and make recommendations on measures to improve yield-per-recruit from the fishery and to prioritise resources to control illegal gears under MCS.
- Development of an economic model aimed at making recommendations for the regulation of fishing capacity/effort.
- Specific scientific projects to investigate the biological, social and economic consequences of closed seasons, where closed areas should be developed to protect ecologically sensitive areas, the impact of different fishing gear types on the fishery and the general ecosystem.
- Specific projects to regularly evaluate the social and economic performance of the NP fishery, better understanding the magnitude and core drivers of regional trade for illegal fish and fishing gears, better understanding the fish maw trade, value addition of fishery products, improvement of wealth sharing to the benefit of fishing communities, etc.
- Contribution to M&E of NPFMP2.

Monitoring, Control and Surveillance (MCS) to ensure compliance with fishery regulations

- Strengthening of MCS capacities including the establishment of enforcement units.
- Coordination of MCS planning including through operationalizing National and Local/Decentralized Task Forces and strengthening regional coordination.
- Development of intelligence networks and systems.
- Conducting joint patrols.
- Inspection and control at fish landing sites (50% total) and artisanal processors.
- Inspection and control within processing units (export).
- Awareness-raising, training and collaborative mechanisms with other administration (incl. Customs, Police, and Revenue Authorities) to control trade of illegal fish and fishing gears in markets, manufacturing and strategic border posts.
- Strengthening and supporting BMUs and working with other community and education activities to promote voluntary compliance.
- Contribution to M&E of NPFMP2.

4.4.2 Improvement of the governance framework in NP fishery

Policy and planning issues

- Integration of NPFMP2 into the Revised Lake Victoria FMP 2015-2020.
- Integration of NPFMP2 into the fisheries strategies and plans of the three Partner States.
- Integration of NPFMP2 action plan into the Decentralized/Devolved Government action plans and any other sector plans as required.

Legal issues

- Ensure adequate legal support for NPFMP2 in each of the three Partner States.
- Revision of penalties for increased deterrence of existing regulations whilst ensuring harmonization between the three Partner States.
- Development of new provisions where necessary (regulations and by-laws) relating to boat registration, private access rights, specific NP fishing licencing, fishing closure, control of the fish maw trade (including formalization of fish maw processing), and fish quality standards for domestic and regional markets, whilst ensuring harmonization between the three Partner States.
- Amendment of East Africa Customs Management Act Schedule 2 (with the aim of empowering Revenue Authorities to prohibit all import of monofilament nets, trade in illegal NP and require the Competent Authority to issue clearance to traders in gillnets, fish hooks and fishery products).
- Ensure adequate legal support (formation, operation, financing, etc.) for co-management structures at various levels (industry, BMU networks, fisherfolk associations).

Co-management and Public-Private Partnership (PPP)

- Revisit co-management guidelines for Lake Victoria, capacity building of BMUs, and promotion of motivating mechanisms (e.g. rewards to BMUs for voluntary compliance and contribution to NPFMP2).
- Promotion of NP boat-owners associations, in consultation with BMUs, to support the process of establishing private access agreements.
- Promotion of fisherfolk associations to strengthen co-management including through contribution to the delivery of management services.

- Support to industry self-monitoring and control system (including through developing MoU between industries and administration).
- Support other initiatives aimed at developing PPP with the industry and fishers associations (e.g. Task Force for improved MCS)

Collaborative mechanisms with other institutions

- Awareness-raising and training of Local/Devolved Government and Judiciary system to ensure proper prosecution and the imposition of appropriate sanctions to create effective deterrence.
- Contribution to the implementation of local environmental plans (promoted by other institutions like Ministry of Water and Environment) in the protection of wetlands and fish breeding areas.

Sustainable funding mechanisms

- *Iden*tification and adoption of a financing plan for NPFMP2.
- Establishment of an NP Fish Levy Trust Fund at national levels.

4.4.3 Complementary actions to ensure the success of NPFMP2, including through promotion of specific actions to increase wealth generated by the NP fishery

Communication of NPFMP2 with appropriate tools to decision-makers

- Production of policy briefs.
- Production of short progress reports.

Communication of NPFMP2 with appropriate tools to fishers and related stakeholders involved in the Nile perch fishery

- Production of IEC material (leaflets, posters, fact-sheets, etc.) into English and at least 2 local languages (Kiswahili, Luganda).
- Information via mass-media (radio, TV, newspaper).

Improved access to education and health within fishing communities

- Liaise with ministries responsible for education, health, water, environment, roads, social affairs, etc. for delivery of relevant services.
- Support small projects.

Accompanying actions to facilitate fishing closure and support livelihood diversification

- Development of communication material for main stakeholders (Cabinet, devolved/decentralized Government, Parliament, fisherfolks, industry, development partners, NGOs).
- Promotion of alternative livelihoods for fishers, including aquaculture, in collaboration with other relevant institutions.
- Promotion of saving schemes and financial management.
- Strategy for international markets (at the reopening of the fishery) including promotion campaign.

Value addition in post-harvest sector (traditional, industrial processing)

- Improved quality of products, including reduction of post-harvest losses (through improved handling, processing, packaging and transportation).
- Products diversification and promotion.
- Certification and promotion of (eco-) labelling for Lake Victoria NP fishery.

Increased ex-vessel price of NP

- Development of a Lake information system on ex-vessel fish price.
- Promotion of gazetted specific fish landing sites for NP.

4.4.4 Monitoring and evaluation (M&E)

Regular M&E of indicators of activities, actions/expected results and expected outcomes envisioned in the NPFMP2

Identification of activities to be undertaken when NPFMP2 is approved.

Identification of indicators, time-frames, responsibilities, etc.

Implementation of the M&E system, incl. development of database.

Regular M&E of indicators of NPFMP2 specific objectives of bio-ecological, social and economic nature

Implementation of the M&E system incl. development of data base (see proposed matrix in Annex 5.1).

Annual review of NPFMP2

- National multi-stakeholders meetings.
- Regional multi-stakeholders meeting.
- Production of annual progress reports

Mid-term review of NPFMP2 (after end of year 3)

- Preparation of a draft report.
- National multi-stakeholders meetings.
- Regional multi-stakeholders meeting.
- Production and dissemination of mid-term review report.

Revision of NPFMP2 (at the end of year 5)

- Final evaluation of the NPFMP2.
- National multi-stakeholders meetings.
- Regional multi-stakeholders meeting.
- Preparation of a draft NPFMP3.

4.5 Costing of the NPFMP2 Action Plan

Table 9 gives a summarized costing of the action plan by main category of actions in USD; detailed costing of the action plan is provided in Annex 5.2. In total the estimated cost of the action plan is approximately USD 57.3 million over a period of 5 years, i.e. about USD 11.5 million per year.

The share of the cost between the three Partner States and the LVFO Secretariat would be 90.4% and 9.6% respectively.

This amount of USD 11.5 million represents about 1.0% of current turnover of the NP fishery, or 1.4% of the wealth (value added) that is currently generated by the NP fishery. Moreover, this amount should be compared with total revenues from the NP fishery that benefit the Partner States and that are currently around USD 10 million per annum.

In order to give an indication of the total cost of the proposed action plan, we can also use an OECD model[21] which suggests the annual management cost of a fishery should be around 10% of the total catch value (in developed countries). Using such a model, and based on catch value of NP (at landing site) currently estimated at USD 632.4 million, the action plan could cost close to USD 63.2 million per year. The cost of the NPFMP2 action plan is much lower than the OECD estimate by a factor of 5.5.

The OECD model also suggests that MCS, which is the most expensive component of the fishery management services, would be expected to represent about 40% of total costs. In the NPFMP2 action plan, MCS represents about 31.7% of the total costs.

21 *OECD, 2003. The cost of managing fisheries.*

Table 9: Summarized costing of proposed NPFMP2 action plan 2015-2019 by main category of actions (in USD) – LFVO/SmartFish 2015

	Total Partner states	% Grand Total	Total LVFO Secret.	% Grand Total	TOTAL	% Grand Total
1. DELIVERY OF KEY FISHERIES MANAGEMENT SERVICES						
1.1. General fishery administration	9 510 000		210 000	0.4%	9 720 000	17.0%
1.2. Research (for NP fishery)	3 990 000		1 405 000	2.5%	5 395 000	9.4%
1.3. MCS (compliance with fishery regulations)	17 400 000		790 000	1.4%	18 190 000	31.7%
Sub-Total 1	30 900 000	53.9%	2 405 000	4.2%	33 305 000	58.1%
2. GOVERNANCE						
2.1. Policy and planning issues	1 050 000		50 000	0.1%	1 100 000	1.9%
2.2. Legal issues	1 650 000		235 000	0.4%	1 885 000	3.3%
2.3. Co-management and Public Private Partenrship (PPP)	3 150 000		75 000	0.1%	3 225 000	5.6%
2.4. Collaborative mechanisms with other institutions	1 200 000		50 000	0.1%	1 250 000	2.2%
2.5. Sustainable funding mechanisms	1 560 000		75 000	0.1%	1 635 000	2.9%
Sub-Total 2	8 610 000	15.0%	485 000	0.8%	9 095 000	15.9%
3. COMPLEMENTARY ACTIONS						
3.1. Communication of NPFMP2 to decision-makers	0	0.0%	350 000	0.6%	350 000	0.6%
3.2. Communication of NPFMP2 w to fishers and related actors	1 800 000	3.1%	400 000	0.7%	2 200 000	3.8%
3.3. Improved access to education and health / fishing communities	1 425 000	2.5%	0	0.0%	1 425 000	2.5%
3.4. Accompanying actions for fishing closure and livelihood diversification	2 910 000	5.1%	280 000	0.5%	3 190 000	5.6%
3.5. Value addition in post-harvest sector	5 040 000	8.8%	400 000	0.7%	5 440 000	9.5%
3.6 Increased ex-vessel price of NP	600 000	1.0%	10 000	0.0%	610 000	1.1%
Sub-Total 3	11 775 000	20.5%	1 440 000	2.5%	13 215 000	23.1%
4. MONITORING & EVALUATION						
4.1. Regular M&E of actions	0	0.0%	225 000	0.4%	225 000	0.4%
4.2. Regular M&E of specific objectives	0	0.0%	175 000	0.3%	175 000	0.3%
4.3. Annual review of the NPFMP2	375 000	0.7%	250 000	0.4%	625 000	1.1%
4.4. Mid-term review of the NPFMP2	75 000	0.1%	160 000	0.3%	235 000	0.4%
4.5. Revision of NPFMP2	75 000	0.1%	350 000	0.6%	425 000	0.7%
Sub-Total 4	525 000	0.9%	1 160 000	2.0%	1 685 000	2.9%
GRAND TOTAL	**51 810 000**	**90.4%**	**5 490 000**	**9.6%**	**57 300 000**	**-**

4.6 Expected Ecological, Social and Economic Benefits

The expected benefits from the NPFMP2 are, above all, that the sustainability of the NP resource is ensured and that the current and already significant contribution of the NP fishery to the economies of the three Partner States is maintained. In a 'no-change' scenario, catch of NP would decrease from 250 000 to 200 000 tonnes per year, resulting in an annual loss of about USD 222 million in terms of turnover and USD 158 million in terms of wealth (value added) generated by the Lake Victoria NP fishery.

Moreover, it can be argued that full implementation of the NPFMP2 would result in an increased contribution of the NP fishery to the economies of the three Partner States, particularly in the lake-basin area.

It was not possible to develop a bio-economic model to measure the impact of the management measures and actions on the NP fishery year after year over a five years period and to evaluate the cumulated annual effects. It should indeed be reminded that during the first years of implementation catch rates would be expected to continue to stagnate or decrease, taking into consideration the time necessary for the rebuilding of the NP stock biomass. In the short-term, since the overall level of fishing effort is expected to decrease, this would result in a decline of total catch (and turnover). In contrast, during the later years of implementation, catch rates are predicted to increase and this would result in an increased catch level despite the reduced level of fishing effort.

Economically speaking, it can be argued that during the later years of implementation catches will be higher and less money will be spent to catch the fish since fishing effort will be reduced. This would result in increased value added in the fishing activity. Moreover, if illegal gears such as beach seine have been eradicated, an increased average ex-vessel selling price can be expected, to the benefit of wealth generation in both the fishing and posts-harvest sectors. Other actions contained in the NPFMP2 will also contribute to increased value added in the post-harvest sector through improved fish quality and value addition. Finally, a satisfactory regulation of fishing and related activities (processing and trade) will result in a significant increase of the budget revenue to the benefit of each Partner State.

In order to provide some basis in support of decision-making, a basic simulation has been conducted to show what the contribution of the NP fishery to the economies of the three Partner States could be if the NPFMP2 is implemented. Calculation hypotheses used were as follows, based on best case scenarios:

- Restriction of legal fishing capacity (i.e. excluding beach seines and monofilaments) at the 2015 level
- Fishing effort reduced by 15% (removal of IUU fishing gear and 2 months closed season)
- Catch level increased by 10% as a result of the gradual rebuilding of the NP stock
- Ex-vessel price and fish and fishery products prices increased by 10% as a result of improved quality and value addition and increased average size of NP
- Conversion rate value added / turnover in the fishing activity and post-harvest sector increased by 5%
- 100% compliance with existing and foreseen fishing and related regulation (including regional trade)

Table 10 presents the main results from the simulation. As expected all the economic indicators show a significant increase, including the budget revenue to the Partner States which would increase by about 50% to USD 15 million per year. This can be compared to the cost of the NPFMP2 which has been estimated as USD 11.5 million per year.

The expected annual maximum benefits from year 5 onwards if combined potential loss and potential gain, from avoiding loss and increasing net benefits, would result in an annual gain of USD 451 million in terms of wealth created.

The only indicator which not surprisingly would decrease relates to employment. This can be explained by the reduction in the number of fishers as a result of reduced illegal fishing.

Table 10: Simulation of the likely economic and social effects of NPFMP2 in Partner States (LVFO/SmartFish, 2015)

	Current situation (2014)	Potential situation(2019)	Variation 2014-2019	
			Quantity	Percentage
Catch (tonnes)	250 000	300 000	+ 50 000	+ 20.0%
Turnover (USD million)	1 164	1 465	+ 301	+ 25.9%
Value added (USD million)	798	1 091	+ 293	+ 36.7%
Contribution to national GDP	1.0%	1.4%	-	-
Total budget revenue (USD million)	10	15	+ 5.0	+ 50%
Total employment in NP fishery	442 500	400 000	- 42 500	- 10%
Total NP availability in 3 States (tonnes)	75 000	90 000	+ 15 000	+ 20%
Contribution of NP to fish consumption	6.6%	7.2%	-	-
Total NP export in value (USD million)	250	325	+ 75	+ 30%

Moreover, the Partner States and LVFO will be at the forefront of sustainable management of a shared inland water body through the implementation of NPFMP2. It can also be argued that NPFMP2 will provide a successful example of the Pan-African Reform Strategy in respect to wealth creation in fisheries. Not to mention that a success of NPFMP2 will create further interest from donors and investors in the EAC area.

Finally, it should be stressed that MCS efforts on NP fishery - which represent about 31.7% of the estimated cost of the action plan - will also benefit other Lake Victoria fisheries since it will result in a considerable reduction of the most harmful fishing gear and practices on the lake.

4.7 Proposed Financing Mechanisms

The major constraint of the NPFMP1 was the lack of reliable and consistent funding for implementation and essential monitoring activities. The result is that many of the activities for essential monitoring, for management and effective enforcement have either not taken place or have only been carried out sporadically with a consequent lack of proper implementation. It is evident that donor funding is no longer an option to cover all management activities. Consequently, the funding solution lies within East Africa and with the direct beneficiaries of the NP fishery: the three national governments, the fishing actors (boat-owners and fishers) and the actors involved in post-harvest sector (processors and traders).

The point needs to be made clear that the direct resource users (boat-owners, fishers, processors and traders) have enjoyed access and advantages from the fishery, virtually free of any charge, apart from minimal licence fees and a low levy charge. What charges that have been made are in no way reflective of the real cost of the management of the fishery. It is proposed that there should be a policy shift towards making resource users better contribute to the meeting of management costs through a concerted financing plan, agreed by all three Partner States (this action is proposed in the action plan).

To meet these costs, user fees from licences/permits (vessel, fishing, processing) and the levy charged on processors should be utilised as appropriate funding sources. User fees from private access agreements (concessions) should also contribute when the system has been established. For instance, the introduction of a nominal private access agreement fee of USD 500 for 5 years per boat-owner (10-15,000 in total), a nominal annual boat licence fee of USD 30, an individual annual fisher license fee of USD 20 combined with a 2.5 % levy of exports valued at about USD 300 million, would generate about USD 12.6 million per year, i.e. more than the funds required to implement the NPFMP2 (annual cost estimated at USD 11.5 million per year). To this, it should be added other sources of revenues such as user fees from licences/permits for processing and trade units.

Therefore, sources of funding that should be clearly indicated in the financing plan of NPFMP2 should include:

- Government recurrent budget.
- Fish Levy Trust Fund for NP (to be financed partly by fishing rights and taxation in the NP fishery).
- LVFO Fish Fund for Lake Victoria NP.
- OSNP (USD 680,000 per country, i.e. USD 2 million for the total duration of NPFMP2).
- Co-financing of monitoring and control of fish in all processing factories (including 'traditional' factories and those dealing specifically with the processed fish maw trade).
- Development partners.

For the short term, until the financing plan is in place, it is proposed that EAC partnership funding be sought to which the three national governments will contribute and to which donors could be sought as additional funding sources. In addition to this, the process of establishing the Fish Levy Trust Fund for NP initiated at national levels and the LVFO Fish Fund for NP should be finalized as a matter of urgency so that they can take over as the major contributing funding source.

5 ANNEXES

5.1 Regular M&E of indicators of specific bio-ecological, social and economic objectives

A monitoring protocol is proposed below.

Survey	Information generated	Parameters and Indicators for management	Frequency/ sample size	Coverage
Frame Survey (FS)	Total fishing effort (legal and illegal) Changes in total effort Distribution of fishing effort	# Fishers # Boats # Outboards # Hooks # Gillnets # Illegal gears by type	Once every 2 years	National and regional synthesis (all States undertake survey at the same time)
Catch Assessment Survey (CAS)	Catch by species and vessel-gear. Effort by vessel-gear. Length and weight distribution of catch by species. Additional biological sampling of catch as required.	Total catch (and by vessel-gear). CPUE (and by vessel-gear). Catch by gear Catch at length/age Unit value ($/kg). Gear selectivity ($Lc_{50}$). Z (from length-converted catch curve). VBGF parameters from LFD. Length-fecundity relationship parameters. Length-weight relationship parameters. Condition factor. Length at maturity (LM_{50}).	Two times a year	National and regional synthesis (all States undertake survey at the same time)
Fish factory processing & export	Total weight of whole fresh fish received into factories Total exports - weight & value Total number & weight of fish rejected at factories with reject code.	Total catch weight and proportion processed by factories. Value of exports.	Continuous sampling, report monthly	National and regional synthesis
Fish factory sampling	Biological sampling of fish in factories including length frequency/ L/ Wt, aging & diet, maturity.	Z for cohorts corresponding to slot size. Length at maturity (LM_{50}). Mean fish size above 50 cm. Condition factor Reproductive state, age and diet	Daily random sample of 500 fish Report every six months: .	National and regional synthesis
Hydro-Acoustic Survey (HAS)	Biomass. Distribution (horizontal & vertical by length of fish). Biological sampling Environmental parameters.	Biomass (B). Spawning Stock Biomass (SSB). Biomass of prey species. Environmental parameters.	Once per annum in February corresponding to the stratified lake period.	Regional (lake-wide)

5.2 Detailed costing of the NPFMP2 5 years action plan (2015-2019)

	Unit Cost per country	Nb of units per country	Unit Cost for LVFO	Nb of units for LVFO	Total Partner states (5 years)	Total LVFO Secret. (5 years)
1. Delivery of key fisheries management services						
1.1. General fishery administration						
Vessel registration, including marking and management of a computerized register	100 000	5	15 000	2	1 500 000	30 000
Specific NP fishing licensing, including management of a computerized register	120 000	5	15 000	2	1 800 000	30 000
Quality and safety control of NP fish and fishery products by Competent Authority - CA (e.g. inspection, health certificates, fish movement permits,	80 000	5	0	0	1 200 000	0
Data collection and processing on NP fishery	130 000	5	10 000	5	1 950 000	50 000
Frame survey (every 2 years) to census of fishing capacity (boats, gear, engines, fishers, etc.)	135 000	2	25 000	2	810 000	50 000
Fishing access agreement (concession for 5 years between a given Partner State and boat-owner)	150 000	4	25 000	2	1 800 000	50 000
Contribution to M&E of NPFMP2	30 000	5	0	0	450 000	0
Sub-total	-	-	-	-	**9 510 000**	**210 000**

		Unit Cost per country	Nb of units per country	Unit Cost for LVFO	Nb of units for LVFO	Total Partner states (5 years)	Total LVFO Secret. (5 years)
1.3. MCS (compliance with fishery regulations)							
	Strengthening of MCS capacities including establishment of enforcement unit	500 000	5	0	0	7 500 000	0
	Coordination of MCS planning (incl. National and Local/Decentralized Task Forces and regional coordination)	100 000	5	50 000	5	1 500 000	250 000
	Development of intelligence systems	50 000	5	0	0	750 000	0
	Conduct of joint patrols	150 000	7	70 000	7	3 150 000	490 000
	Inspection and control at fish landing sites (50% total) and artisanal processors	120 000	5	0	0	1 800 000	0
	Inspection and control in processing units (export)	50 000	5	0	0	750 000	0
	Awareness-raising, training, collaborative mechanisms with other (incl. Customs, Police, and Revenue Authorities) illegal fish and fishing gears	100 000	5	25 000	2	1 500 000	50 000
	Contribution to M&E of NPFMP2	30 000	5	0	0	450 000	0
	Sub-total	**-**	**-**	**-**	**-**	**17 400 000**	**790 000**

		Unit Cost per country	Nb of units per country	Unit Cost for LVFO	Nb of units for LVFO	Total Partner states (5 years)	Total LVFO Secret. (5 years)
2. Governance							
2.1. Policy and planning issues							
	Integration of NPFMP2 in the Revised Lake Victoria FMP 2015-2020	0	0	25 000	2	0	50 000
	Integration of NPFMP2 in the fisheries policies of the three Partner Stares	30 000	5	0	0	450 000	0
	Integration of NPFMP2 action plan in the Decentralized/Devolved Government action plans	40 000	5			600 000	0
	Sub-total	**-**	**-**	**-**	**-**	**1 050 000**	**50 000**
2.2. Legal issues							
	Ensure legal backing of NPFMP2 in each of the three Partner Stares	20 000	5	0	0	300 000	0
	Revision of penalties for increased deterrence for existing regulations whilst ensuring harmonization	20 000	5	30 000	2	300 000	60 000
	Development of new legal provisions: boat registration, private access rights, specific NP fishing licencing, fishing closure, control of fish maw	40 000	5	25 000	3	600 000	75 000
	Amendment of EA Customs Management Act Schedule 2 (empowering Revenue Authorities and CA to control illegal trade in fish and fishing gear	0	0	50 000	2	0	100 000
	Ensure legal backing (formation, operation, financing, etc.) for co-management structures at various levels (industry, BMU networks,	30 000	5	0	0	450 000	0
	Sub-total	**-**	**-**	**-**	**-**	**1 650 000**	**235 000**

		Unit Cost per country	Nb of units per country	Unit Cost for LVFO	Nb of units for LVFO	Total Partner states (5 years)	Total LVFO Secret. (5 years)
2.3. Co-management and Public Private Partenrship (PPP)							
	Revisiting co-management guidelines for Lake Victoria, capacity building of BMUs, and promotion of motivating mechanisms	80 000	5	25 000	2	1 200 000	50 000
	Promotion of NP boat-owners associations to support the establishment of private access aggreements	25 000	5	25 000	1	375 000	25 000
	Promotion of fisherfloks associations to strengthen co-management including through contributing to delivery of management services	50 000	5	0	0	750 000	0
	Support to industry self-monitoring and control system (including through developing MoU between industries and administration)	30 000	5	0	0	450 000	0
	Support other initiatives aimed at developing PPP with the industry and fishers associations	25 000	5	0	0	375 000	0
	Sub-total	**-**	**-**	**-**	**-**	**3 150 000**	**75 000**
2.4. Collaborative mechanisms with other institutions							
	Awareness-raising and training of Local/Devolved Government and Judiciary system	50 000	5	25 000	2	750 000	50 000
	Contribution to the implementation of environmental plans	30 000	5	0	0	450 000	0
	Sub-total	**-**	**-**	**-**	**-**	**1 200 000**	**50 000**
2.5. Sustainable funding mechanisms							
	Identification and adoption of a financing plan for NPFMP2	20 000	1	25 000	1	60 000	25 000
	Establishment of NP fish levy trust fund	100 000	5	25 000	2	1 500 000	50 000
	Sub-total	**-**	**-**	**-**	**-**	**1 560 000**	**75 000**

		Unit Cost per country	Nb of units per country	Unit Cost for LVFO	Nb of units for LVFO	Total Partner states (5 years)	Total LVFO Secret. (5 years)
3. Complementary actions to ensure the success of NPFMP2							
3.1. Communication of NPFMP2 with appropriate tools to decision-makers							
	Production of policy briefs	0	0	50 000	5	0	250 000
	Production of short progress reports	0	0	20 000	5	0	100 000
	Sub-total	**-**	**-**	**-**	**-**	**0**	**350 000**
3.2. Communication of NPFMP2 with appropriate tools to fishers and related actors involved in the Nile Perch fishery							
	Production of IEC material (leaflets, posters, fact-sheets, etc.) into English and at least 2 local languages (Kiswahili, Luganda)	20 000	5	80 000	5	300 000	400 000
	Mass-media (radio, TV, newspaper)	100 000	5	0	0	1 500 000	0
	Sub-total	**-**	**-**	**-**	**-**	**1 800 000**	**400 000**
3.3. Improved access to education and health within fishing communities							
	Liaise with ministries responsible for education, health, water, environment, roads, social affairs, etc. for delivery of relevant services	15 000	5	0	0	225 000	0
	Support small projects	80 000	5	0	0	1 200 000	0
	Sub-total	**-**	**-**	**-**	**-**	**1 425 000**	**0**

		Unit Cost per country	Nb of units per country	Unit Cost for LVFO	Nb of units for LVFO	Total Partner states (5 years)	Total LVFO Secret. (5 years)
3.4. Accompanying actions to facilitate fishing closure and support livelihood diversification							
	Development of communication material for main stakeholders (Cabinet, devolved/decent Gvt, Parliament, fisherfolks, industry, dvt partners, NGOs)	40 000	5	25 000	2	600 000	50 000
	Promotion of alternative livelihoods for fishers, in collaboration with other relevant institutions	120 000	5	25 000	2	1 800 000	50 000
	Promotion of saving schemes and financial management	30 000	5	20 000	1	450 000	20 000
	Strategy for international markets (at the reopening of the fishery) including promotion campaign	10 000	2	80 000	2	60 000	160 000
	Sub-total	-	-	-	-	**2 910 000**	**280 000**
3.5. Value addition in post-harvest sector (traditional, industrial processing)							
	Improved quality of products, including reduction of post-harvest losses (through improved handling, processing, packaging and transportation)	300 000	5	25 000	2	4 500 000	50 000
	Products diversification and promotion	30 000	5	25 000	2	450 000	50 000
	(Eco)Labelling	10 000	3	100 000	3	90 000	300 000
	Sub-total	-	-	-	-	**5 040 000**	**400 000**
3.6 Increased ex-vessel price of NP							
	Development of a Lake information system on ex-vessel fish price	15 000	5	5 000	2	150 000	10 000
	Promotion of gazetted fish landing sites specific for NP	30 000	5	0	0	450 000	0
	Sub-total	-	-	-	-	**600 000**	**10 000**

		Unit Cost per country	Nb of units per country	Unit Cost for LVFO	Nb of units for LVFO	Total Partner states (5 years)	Total LVFO Secret. (5 years)
4. Monitoring and Evaluation (M&E)							
4.1. Regular M&E of indicators of activities, actions/expected results and expected outcomes envisioned in the NPFMP2							
	Identification of indicators to be done when NPFMP2 approved	0	0	50 000	1	0	50 000
	Implementation of the M&E system incl. data base			35 000	5	0	175 000
	Sub-total	-	-	-	-	**0**	**225 000**
4.2.Regular M&E of indicators of NPFMP2 specific objectives of bio-ecological, social and economic nature							
	Implementation of the M&E system incl. data base	0	0	35 000	5	0	175 000
	Sub-total	-	-	-	-	**0**	**175 000**
4.3. Annual review of the NPFMP2							
	National multi-stakeholders meetings	25 000	5	0	0	375 000	0
	Regional multi-stakeholders meeting	0	0	40 000	5	0	200 000
	Production of an annual progress report	0	0	10 000	5	0	50 000
	Sub-total	-	-	-	-	**375 000**	**250 000**

		Unit Cost per country	Nb of units per country	Unit Cost for LVFO	Nb of units for LVFO	Total Partner states (5 years)	Total LVFO Secret. (5 years)
4.4. Mid-term review of the NPFMP2 (after end of year 3)							
	Preparation of a draft report	0	0	100 000	1	0	100 000
	National multi-stakeholders meetings	25 000	1	0	0	75 000	0
	Regional multi-stakeholders meeting	0	0	50 000	1	0	50 000
	Production and dissemination of mid-term review report	0	0	10 000	1	0	10 000
	Sub-total	**-**	**-**	**-**	**-**	**75 000**	**160 000**
4.5. Revision of NPFMP2 (at the end of year 5)							
	Final evaluation of the NPFMP2	0	0	100 000	1	0	100 000
	National multi-stakeholders meetings	25 000	1	0	0	75 000	0
	Regional multi-stakeholders meetings	0	0	50 000	1	0	50 000
	Preparation of a draft NPFMP3	0	0	200 000	1	0	200 000
	Sub-total	**-**	**-**	**-**	**-**	**75 000**	**350 000**