Smart Fish
Secure fisheries *Secure futures*

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Programme for the implementation of a Regional Fisheries Strategy for the Eastern and Southern Africa and Indian Ocean Region

Programme pour la mise en oeuvre d'une stratégie de pêche pour la région Afrique orientale-australe et Océan Indien



ASSESSMENT OF IUU ACTIVITIES ON LAKE VICTORIA

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The Eastern-Southern Africa
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Implementation of a Regional Fisheries Strategy
For The Eastern-Southern Africa and India Ocean Region

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Assessment of IUU Activities on Lake Victoria

SF/2011/12

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PREFACE

Within the context of the sustainability of artisanal fisheries in the ESA-IO region, efforts are being made to understand how traditional fishers can improve economic conditions for themselves and communities through diversification from traditional activities. This would provide supplemental and/or alternative opportunities for the fishing communities that would remove pressure from over-fished stocks, as well as provide new and exciting opportunities to improve economic returns.

Whilst this context has merit, SmartFish also provides an opportunity to review and understand potential in areas that are less developed and less understood in the region, but offer quite significant potential for investment at a small scale that is suitable to the smaller entrepreneur in the region, and notably for women to be involved.

With this in mind, this study looks at Spirulina as a new business opportunity that is recognized and has the potential for developing national and regional markets. A relatively small investment is required and the technical knowledge is fairly simple to obtain. Spirulina also provides a basic business model that is similar in process to those techniques used by regular fish farming and so links well with the burgeoning interest in the aquaculture sub-sector regionally.

SmartFish is interested to identify suitable opportunities for diversification and to provide support to pilot these opportunities in suitable areas to encourage their expansion and integration within the overall strategic regional fisheries development approach that forms the basis of the Programme. This report, which has been prepared by Mr. Tony Piccolo involved a regional assessment of potential for Spirulina growth and focused attention on western Kenya, which is presently a key area where production is starting and showing promising results.

Spirulina is a less known, but potentially interesting opportunity for increased production in the region and has a high value and an established, growing market. The opportunity is particularly relevant to women from the perspective that it is an activity that can be performed with less capital intervention and can be established close to the home. This has very interesting potential with respect to the diversification of the artisanal fishing sector and enhancement of regional trade and food security.

This report is the first step and will identify the opportunity for SmartFish to communicate the potential to the region and support pilot interventions and training in future stages of the Programme.

ACRONYMS

ACP FISH 2	Africa Caribbean Pacific Fish 2 (second phase)
BMU's	Beach Management Units
CCRF	Code of Conduct for Responsible Fisheries
CM	Council of Ministers
CPUE	Catch per Unit Effort
DRC	Democratic Republic of Congo
ESA-IO	East, Southern African and Indian Ocean region
EU	European Union
FS	Frame Surveys
GIS	Geographic Information Systems
IOC	Indian Ocean Commission
IRFS	Implementation of a Regional Fisheries Strategy
IFMP	Implementation of a Fisheries Management Plan
FMP 2	Fisheries Management Plan 2
IPOA-IUU	International Plan of Action for Illegal, Unregulated and Unreported Fishing
IPOA-Capacity	International Plan of Action for fishing capacity
IUU	Illegal, Unreported, Unregulated (related to fisheries)
LVFO	Lake Victoria Fisheries Organization
MCS	Monitoring, Control and Surveillance
NWG	National Working Group
NP	Nile Perch
OSNP	Operation Save the Nile Perch
AO	Authorized Officer
RFB	Regional Fisheries Body
RFMO's	Regional Fisheries Management Organizations
ROE	Rules of Engagement
RWG	Regional Working Group
SOP	Standard Operating Procedures
RA	Revenue Authority
TL	Total Length (relating to total fish length)
TOR's	Terms Of Reference
TSH	Tanzanian Shillings
KSH	Kenya shillings

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EXECUTIVE SUMMARY

Fishing all over the world is a major source of food for humanity and a provider of employment and economic benefits to those engaged in the activity. However, with increased knowledge and the dynamic development of fisheries, it should be known that world living aquatic resources, although renewable, are not infinite and need proper management, if their continued contribution to the nutritional, economic and social well-being of the growing world's population is to be sustained.

Lake Victoria is Africa's largest and most important inland water body with a total water surface area of 68,800km2. Lake Victoria contributes significantly through its fishery and generation of electricity to the economic benefits of not only the riparian states, Kenya, Tanzania and Uganda, but also to the neighboring countries and the world at large. Lake Victoria is arguably the most important single source of freshwater fish on the African continent, contributing significantly to national and regional economies and livelihoods of the regions inhabitants. Although not often associated with inland fisheries, Illegal, Unreported and Unregulated (IUU) fishing and the trade of illegal fish has threatened the biological, social, financial and cultural integrity of the lakes resources and those that depend on them.
Given that Lake Victoria's living resources are shared amongst the three riparian states, a regional fisheries body, the Lake Victoria Fisheries Organization (LVFO) was formed in 1994 though the technical assistance of the FAO to manage the fisheries resources in Lake Victoria as a single ecological entity. Within the LVFO mandate, the identified areas of IUU fishing are considered in the form of: Illegal or misuse of fishing gears; illegal fishing, fish landing, processing and trading; unregulated fishing number of boats, fishers and gears (capacity); unregulated, unreported or undocumented domestic and regional fish trade; fishing and landing undersize fish in undesignated landing sites; and fishing during closed seasons or in the closed breeding areas or critical habitats. The decline of Nile perch stocks suggest that fisheries management and compliance structures within the three riparian states and at LVFO at the moment are at various levels of disarray, hence allowing IUU fishing to continue thriving unabated.

Since the introduction of Nile perch into Lake Victoria in the 1950's it has been the focus of an intensifying commercial fishery. In 1980, a total of 4 439 tons of Nile perch were harvested, a decade later over 338 115 tons of Nile perch were landed annually. From 2000 to 2010, and average of 253 404 tons of Nile perch are caught. Despite relatively consistent landings reported by the LVFO, total biomass of Nile perch decreased from 1.4 million tons (92% of total biomass in Lake Victoria) in 1999 to it lowest recorded estimate of 298 394 tons in 2008 (14.9% of total biomass in Lake Victoria). Currently, as of 2010, the Nile perch biomass was estimated at 18% of total biomass in Lake Victoria, which equates to 367 800 tons. Although a slight increase in biomass between 2008 and 2010 was observed, Nile perch biological indicators suggest that the fish is in a critical survival state. The average size of Nile perch has decreased from 51.7 cm TL to 26.6 cm TL, according to hydro acoustic surveys suggesting that a significant portion of total Nile perch biomass is less than 50 cm TL (legal size for export). It was reported by the LVFO stock assessment team that in 2006 and 2008, less than 2% of the Nile perch biomass was in fact greater than 50 cm TL. The size at first maturity of male and female Nile perch is also decreasing, this common amongst fish populations that are stressed (or overexploited).

Despite the biological indicators, which suggest legal size Nile perch are less than 2% of total Nile perch biomass, the average number of fishermen increased by 33% between 2000 and 2008. During the same period, Frame survey and MCS compliance missions noted a marked increase in the number of illegal gears being deployed to target undersize Nile perch. The number of vessels increased by 37% and the use of outboard engines increased by approximately 50%. It has been reported that motorized boats are more efficient, catching about 25 kg of fish per day, compared to 10 kg caught by non-motorized vessels. The increase in use of illegal gears, motorized vessels and fishermen suggests that fishing for Nile perch is still profitable. Previously driven by lucrative export prices for Nile perch, fishers now target undersize illegal Nile perch for the lucrative domestic and regional trade, which is estimated to exceed the export trade by volume and value. This shift in fishing for undersize Nile perch will effect government revenues earned from the export fishery. The Nile perch fishery over the last decade contributed 0.6% less to the Tanzanian GDP, similarly, a decrease in export trade of Nile perch from Uganda of 14% occurred between 2007 and 2008, resulting in a 0.1% decrease in GDP contribution. By not controlling fishing effort targeting illegal, undersized and immature Nile perch, economic and social hardships will worsen.
Current fisheries management both regionally through the LVFO, and nationally amongst the riparian states is inadequate,

with respect to Monitoring, Control and Surveillance (MCS). MCS is a collection of activities and tools intended to support fisheries management in fighting IUU fishing, and forms the framework on which accurate, informative and dynamic fisheries management decisions can be made. MCS is critical at all levels of fisheries management. Within the Lake Victoria region, co-management has been implemented through the establishment of Beach Management Units (BMU's). A BMU is a community-based organization, which is legally accepted as a representative of a fishing community and is mandated on a voluntary basis to engage in MCS initiatives. Lake Victoria has 1 087 registered BMU's according to the harmonized BMU guidelines, agreed upon amongst the member states and the LFVO. Although the inclusion of community based management and MCS is critical in contributing to effective management of Lake Victoria's fisheries resources, many challenges exist, including amongst others; geographical isolation of fishing communities, social issues (families of BMU members may partake in illicit activities), political interference (revenue collections, or election voting), corruption, conflict of interests (BMU members are often fishmongers and fish traders) and lack of representation in higher management committees.

Although advances in MCS technology have revolutionized fisheries management amongst many ESA-IO countries, the sharing of regional resources and capacity is fragmented and not effectively harnessed by the LVFO. Database management systems are not working effectively, data collecting, analyzing and dissemination are unreliable and time inefficient, respectively and appropriate MCS tools for example net gauges are not available.

The RWG-MCS reported that between 2004 and the end of 2008, a total of 4 605 suspects were apprehended, 12 126 beach seines, 9 550 small seine nets, 27 703 monofilament nets, 248 843 kilograms of immature Nile perch (249 tons) and 254 589 illegal gillnets were confiscated. These data are unreliable; furthermore they were not quantified in terms of definition of the item (how long were the nets that were confiscated 80 meter, or one kilometer, this has a profound effect on CPUE), of financial loss to fishers and traders versus the opportunity costs of MCS. The valve of court fines are insignificant especially if one considers the amount of uncontrolled fishing effort, uncontrolled illegal gears used in Lake Victoria, and the increasing value in the trade of immature fish on domestic markets. Also, there is no indication as to whether the court penalties and fines imposed on the same offences in the three partner states have any reference to the same severity across the region, or are recycled back into MCS initiatives. It is therefore difficult to determine whether the RWG-MCS interventions from 2004 to the end of 2008 were beneficial, as little to no comparative data exists.

The LVFO depends highly on donor funds to support MCS and management initiatives, including training, capacity building and technical expertise. When donor funds are not available, regional MCS stagnates, which is a major concern. Operation Save the Nile perch is one such example. The EAC Council of Ministers in 2009 launched the 'Operation Save the Nile Perch' (OSNP), which required each of the three member states to contribute US$ 600 000. The goal of the initiative was to target illegal fishing and to curb the trade in undersize Nile perch currently threatening the economic integrity of Lake Victoria. The target of OSNP, as ratified by the Council of Ministers was to have fisheries illegalities in the lake, based on the 2008 frame survey data as bench mark, reduced by 50% in June and 100% by December 2009. Currently as of 2011, Kenya has paid the required funds, with Tanzania only contributing 31% and Uganda zero resulting in less than half of the required funds paid in by from the member states. This undermines the legitimacy of 'Operation Save the Nile Perch' and political will and MCS operational capacity.

The aim of this report was to assess the state of IUU in Lake Victoria, and to support the SMARTFISH programme in assisting the LVFO and established MCS committees to implement joint regional MCS trainings, by conducting a short cost benefit analysis of enhancing existing regional MCS initiatives and by evaluating past and present regional action plans to deter IUU fishing on Lake Victoria. An action plan was developed through a participatory workshop between the LVFO, national states and the MCS-RWG, held in Jinja, Uganda from the 5th to the 7th of October 2011.

RÉSUMÉ EXECUTIF

La pêche dans le monde entier est une source importante de nourriture pour l'humanité et un fournisseur de l'emploi et offre des avantages économiques à ceux qui travaillent dans cette activité. Cependant, avec une connaissance accrue et le développement dynamique de la pêche, il faut savoir que le monde des ressources aquatiques vivantes, quoique renouvelables, ne sont pas infinies et demandent une bonne gestion, si leur contribution constante à la nutritionnel, à l'économie et au bien-être social de la population mondiale doit être soutenue.

Le lac Victoria est le plus grand de l'Afrique et le plus important des eaux intérieures avec une surface totale en eau de 68 800 km2. Le lac Victoria contribue de manière significative grâce à ses activités de pêche et de production d'électricité offre des avantages économiques non seulement aux Etats riverains, le Kenya, la Tanzanie et l'Ouganda, mais aussi aux pays voisins et au monde dans son ensemble. Le lac Victoria est sans doute la plus importante source unique de poissons d'eau douce sur le continent africain, contribuant de manière significative aux économies nationales et régionales et offre des moyens de subsistance aux habitants des régions. Bien que n'étant pas souvent associée à la pêche continentale, la pêche illicite, non déclarée et non réglementée (pêche IUU) et le commerce de poisson illégal a menacé l'intégrité biologique, sociale, financière et culturelle des ressources des lacs et celles qui dépendent d'eux. Étant donné que les ressources vivantes du lac Victoria sont partagées entre les trois Etats riverains, un organe régional de pêche, de la Lake Victoria Fisheries Organization (LVFO) a été formé en 1994 a travers l'assistance technique de la FAO pour la gestion des ressources de pêcheries dans le lac Victoria comme une entité écologique unique. Dans le mandat LVFO, les domaines identifiés de la pêche IUU sont pris en compte dans la forme de: illégal ou l'utilisation abusive d'engins de pêche, la pêche illégale, de débarquement du poisson, le traitement et le commerce, le nombre de bateaux de pêche non réglementé, les pêcheurs et les engrenages (capacité); non réglementé, non déclaré ou le commerce du poisson national et régional non-documente; la pêche de trop petits poissons dans les sites de débarquements non désignée, et la pêche pendant les périodes de fermeture ou dans les zones de reproduction fermées ou dans des habitats critiques. Le déclin des stocks de perche du Nil donne à penser que la gestion des pêches et les structures mise en œuvre dans les trois Etats riverains et à LVFO ont atteint en ce moment différents niveaux de désarroi, permettant ainsi la pêche IUU à continuer sans relâche et même en plein essor.

Depuis l'introduction de la perche du Nil dans le lac Victoria dans les années 1950, il a été l'objet d'une pêche commerciale intensive. En 1980, un total de 4 439 tonnes de perches du Nil a été récolté, une décennie plus tard plus de 338 115 tonnes de perches du Nil ont été débarquées chaque année. De 2000 à 2010, une moyenne de 253 404 tonnes de perches du Nil est prise. Malgré des débarquements relativement cohérents rapportés par la LVFO, la biomasse totale de la perche du Nil a diminué de1, 4 million de tonnes (92% de la biomasse totale dans le lac Victoria) en 1999 à sa plus basse estimation enregistrée de 298 394 tonnes en 2008 (14,9% de la biomasse totale dans le lac Victoria). Actuellement, à partir de 2010, la biomasse la perche du Nile été estimée à 18% de la totalité biomasse dans le lac Victoria, ce qui équivaut à 367800 tonnes. Même si une légère augmentation de la biomasse entre 2008 et 2010 a été observée, les indicateurs biologiques de perche du Nil suggèrent que le poisson est dans un état de survie essentiel. La taille moyenne de la perche du Nil a diminué, passant de 51,7 cm TL à 26,6 cm TL, selon les relevés hydroélectriques acoustiques suggérant qu'une partie importante de la biomasse totale du Nil perche est inférieure à 50 cm TL (taille légale pour l'exportation). Il a été rapporté par l'équipe d'évaluation des stocks LVFO qu'en 2006 et 2008, moins de 2% de la biomasse la perche du Nil était en fait supérieure à 50 cm TL. La taille de première maturité de la perche du Nil mâle et la femelle est également en baisse, ceci commun parmi les populations de poissons qui sont stressés (ou surexploités).

Malgré les indicateurs biologiques, qui suggèrent la taille légale, la perche du Nil est inférieur à 2% de la biomasse totale perche du Nil, le nombre moyen de pêcheurs a augmenté de 33% entre 2000 et 2008. Durant la même période, les missions de cadre de mise en conformité de l'enquête et le MCS a noté une augmentation marquée du nombre d'engins illégaux déployés pour cibler les trop petites perches du Nil. Le nombre de navires a augmenté de 37% et l'utilisation de moteurs hors-bords a augmenté d'environ 50%. Il a été rapporté que les bateaux motorisés sont plus efficaces, la capture d'environ 25 kg de poisson par jour, comparativement à 10 kg, capturé par des navires non-motorisés. L'augmentation de l'utilisation des engins illégaux, des navires et des pêcheurs motorisés suggère que la pêche de la perche du Nil est toujours rentable. Auparavant attirés par les prix lucratifs à l'exportation de la perche

du Nil, les pêcheurs ciblent désormais la perche du Nil a taille inferieure pour le commerce lucratif au niveau national et régional, qui est estimé à dépasser l'exportation en volume et en valeur. Ce changement dans la pêche pour les trop petites perches du Nil aura effet sur les recettes publiques provenant de l'exportation de la pêche. La pêche de la perche du Nil au cours de la dernière décennie a contribué a 0,6% de moins au PIB tanzanien, de même, une diminution dans le commerce d'exportation de la perche du Nil de l'Ouganda de 14% entre 2007 et 2008, résultant en une baisse de 0,1% en contribution au PIB. En ne contrôlant pas l'effort ciblant la pêche illégale, sous-dimensionnée et immature de la perche du Nil, les difficultés économiques et sociales ne feront qu'empirer.

La gestion actuelle de la pêche tant au niveau régional à travers la LVFO, et à l'échelle nationale parmi les Etats riverains est insuffisante, concernant le suivi, le contrôle et la surveillance (SCS). Le SCS est une collection d'activités et d'outils destinés à soutenir la gestion des pêches dans la lutte contre la pêche IUU, et constitue le cadre sur lequel les décisions précises, informatives et dynamiques de gestion des pêches peuvent être faites. MCS est essentielle à tous les niveaux de la gestion des pêches. Dans la région du lac Victoria, la cogestion a été mise en œuvre par la création d'unités de gestion des plages (BMUs). Un BMU est une organisation à base communautaire, qui est légalement accepté en tant que représentant d'une communauté de pêche et est mandaté sur une base volontaire à s'engager dans des initiatives de SCS. Le lac Victoria a enregistré 1 087 BMU conformément aux lignes directives harmonisées des BMUs, convenu entre les Etats membres et la LFVO. Bien que l'inclusion de la gestion communautaire et le SCS est essentielle pour contribuer à une gestion efficace des ressources de pêche du lac Victoria, de nombreux défis existent, y compris, entre autres, l'isolement géographique des communautés de pêche, les questions sociales (familles des membres des BMU peut participer à des activités illicites), les ingérence politique (recouvrement des recettes, ou de vote des élections), la corruption, les conflits d'intérêts (le membres des BMUs sont souvent des poissonniers et commercants) et le manque de représentation dans les commissions de gestion
Plus élevés.

Bien que des progrès dans la technologie SCS ont révolutionné la gestion des pêches parmi beaucoup de pays d'ESA-IO, le partage des ressources et capacités régionales est fragmenté et non exploité efficacement par la LVFO. Les systèmes de gestion de bases de données ne fonctionnent pas efficacement, la collecte de données, l'analyse et la diffusion ne sont pas fiables et le temps inefficace, respectivement, et des outils appropriés de SCS, par exemple des filets jaugés ne sont pas disponibles.

Les RWG-SCS ont rapporté qu'entre 2004 et la fin de l'année 2008, un total de 4 605 suspects ont été appréhendés, 12 126 sennes de plage, 9 550 sennes de petites tailles, 27 703 filets mono filament, 248 843 kilos de perche du Nil immatures (249 tonnes) et 254 589 filets maillants illégaux ont été confisqués. Ces données ne sont pas fiables; en outre, ils n'ont pas été quantifiés en termes de définition des articles (quels étaient la longueur des filets qui ont été confisqués, de 80 mètres, ou un kilomètre, ce qui a un effet profond sur le CPUE), de la perte financière pour les pêcheurs et les commerçants contre les coûts d'opportunité de SCS. La vanne d'amendes judiciaires n'est pas significative, surtout si l'on considère la quantité de l'effort de pêche incontrôlée, des engins non contrôlées et illégaux utilisés dans le lac Victoria, et la valeur croissante dans le commerce de poissons immatures sur les marchés intérieurs. En outre, il n'y a aucune indication quant à savoir si les sanctions pénales et d'amendes imposées pour les mêmes infractions dans les trois Etats partenaires font toute référence à la même sévérité dans la région, ou sont recyclées dans les initiatives de SCS. Il est donc difficile de déterminer si les interventions RWG-SCS de 2004 à la fin de l'année 2008 ont été bénéfiques, comme peu ou pas de données comparatives existe.

La LVFO dépend fortement des bailleurs de fonds pour soutenir les initiatives de gestion et SCS, y compris la formation, le renforcement des capacités et l'expertise technique. Lorsque les fonds des donateurs ne sont pas disponibles, le SCS régional est paralysé, qui est une préoccupation majeure. L'Opération Sauvé la perche du Nil en est un exemple. Le Conseil des Ministres EAC a lancé en 2009 l'opération «Sauver la perche du Nil» (OSNP), qui exigeait de chacun des trois Etats membres à contribuer US $ 600 000. Le but de cette initiative était de cibler la pêche illégale et de lutter contre le commerce de la perche du Nil actuellement inférieur à la menace de l'intégrité économique du lac Victoria. L'objectif de OSNP, tel que ratifié par le Conseil des ministres était d'avoir des illégalités de la pêche dans le lac, sur la base des données de 2008 de l'enquête cadre que point de repère, réduits de 50% en Juin et 100% en Décembre 2009. Actuellement à partir de 2011, le Kenya a payé les fonds nécessaires, la Tanzanie contribuant qu'a 31% et

l'Ouganda à zéro résultant en moins de la moitié des fonds nécessaires versés par les Etats membres. Cela sape la légitimité de l'opération «Sauvé la perche du Nil» et la volonté politique et la capacité opérationnelle de SCS.
L'objectif de ce rapport était d'évaluer l'état de la pêche IUU dans le lac Victoria, et à soutenir le programme de Smartfish en aidant le LVFO et créé des comités de SCS à mettre en œuvre des formations SCS régionales conjointes, en procédant à une analyse bénéfiques des coûts à court terme pour renforcer les initiatives régionales existantes SCS et en évaluant les plans d'action régionaux passés et présents pour décourager la pêche IUU sur le lac Victoria. Un plan d'action a été élaboré par un atelier participatif entre les Etats LVFO, nationale et le MCS-GTR, qui s'est tenue à Jinja, en Ouganda à partir du 5 au 7 octobre 2011.

1.0 METHODOLOGY

The consultancy involved a 28-day field mission divided up between Kenya, Uganda and Tanzania. The goal of the consultancy was to interview key stakeholders involved in MCS at local (BMU'S and local fishers), national (national/ district fisheries managers and officers), regional (LVFO) level and the private sector (fish processing factories in all three member states). Extensive literature reviews including; internet resources, reviews of LVFO documents, the outcomes from the MCS workshop held in Jinja, Uganda (held between the 5th and 7th of October 2011), assistance from LVFO secretariat with respect to Frame survey data, catch and stock assessment data and access to MCS work plans were examined and discussed. Interviews were conducted in person, and based on a questionnaire developed by the consultants, which was emailed to the respective focal points prior to the arrival of the consultants (ANNEX IV). The questionnaire focused on the following key issues among others:

- National MCS structures and interventions in fighting IUU fishing.
- Regional MCS structures and interventions in fighting IUU fishing.
- Role of BMU's and the private sector in MCS initiatives.
- IUU fishing identification, description of illegal gears and trade of illegal fish.
- Status of the Nile perch fishery.
- Effectiveness of current MCS initiatives.
- MCS data collection and analysis.

2.0 PERFORMANCE RELATION TO TERMS OF REFERENCE (TOR's):

The consultancy commenced on the 18th of September 2011, when the consulting team met in Entebbe, Uganda. Focal points at the LVFO and respective countries (LVFO partner states) were notified to the consultancy, so that interviews could be pre-planned (Tanzania Mr. Mahatane, Kenya Mr. Obadha, and Uganda, Dr. Tumwebaze). All interviews went according to the schedule, except that of Uganda where the arrival of the consultants happened to coincide with the restructuring of the Ugandan Fisheries Ministry. Key MCS focal point Dr. Tumwebaze was unavailable, as she was on a scientific stock assessment mission, whilst other MCS operatives were busy relocating the Entebbe fisheries office to Kampala. Furthermore, a regional meeting was scheduled for the same time as the arrival of the consultants in Uganda, which resulted in the inability to conduct meaningful interviews with Ugandan fisheries officials. It was decided by the consultants use the short time in Entebbe to visit a local BMU, a fish processing factory (Greenfields) and Kampala fish market to gather as much information as possible. Interviews with Ugandan fisheries authority and Dr. Tumwebaze were finally held during the Jinja workshop.

In reporting the current effect of IUU fishing on the fisheries sector of Lake Victoria, with respect to the terms of reference, the following structure has been adopted:

- Cost and benefit analysis of IUU fishing versus MCS interventions.
- Discuss the status of Nile perch biomass with respect to MCS interventions both regionally and nationally.
- Evaluate existing and past MCS action plans.
- Propose a possible action plan of MCS interventions to assist the LVFO in reducing IUU fishing on Lake Victoria.

A detailed performance of the consultancy can be found in the Implementation Report submitted separately from this report.

3.0 INTRODUCTION

Illegal, Unreported and Unregulated (IUU) fishing is playing a significant role in the destruction of both marine and inland water fish stocks globally. Current estimates suggest a global financial loss of between US$ 10 and US$ 23 billion annually (MRAG 2008). IUU undermines fisheries management and serves to erode the benefits to people who rely on the biological integrity of their associated waters to sustain their livelihoods through income generation and food security. IUU is incentive driven, the more valuable or lucrative the trade (in this case fish resources), the more likely participants will engage in illicit activities to acquire that resource. The complexity facing the eradication of IUU is identification, reliable information gathering and quantification of IUU activity. Often reliable data, both nationally and regionally pertaining to IUU fishing is fragmented, inaccurate or unavailable. The Great Lakes region of Africa, and in particular Lake Victoria is no exception to this.

Lake Victoria is Africa's largest and most important inland water body with a total water surface area of 68,800km2. Lake Victoria contributes significantly through its fishery and generation of electricity to the economic benefits of not only the riparian states, Kenya, Tanzania and Uganda, but also to the neighboring countries and the world at large. Lake Victoria is arguably the most productive single source of freshwater fish on the African continent, contributing to local incomes, employment and generating significant foreign exchange earnings from the export of Nile perch (Lates niloticus). Lake Victoria's resources are estimated to support the livelihoods of over 4 million inhabitants of the greater lake region. The sustainability of the fisheries in the lake and insurance of a sound fisheries management framework has been and is still a priority for all in the region.

Monitoring, Control and Surveillance (MCS), is the fundamental underlying support structure towards an effective fisheries management protocol. An efficient MCS structure would provide the means for collection, measurement and analysis of fishing activity, the specification of terms and conditions under which resources can be harvested and the supervision of fishing activity to ensure the terms and conditions of access are in accordance with fisheries policy frameworks and legislative structures, both nationally and regionally (Based on the FAO definition of MCS). The harmonization of MCS in Lake Victoria between riparian states is critical in structuring resource management decisions, policies and regulatory frameworks that are adaptable to the specific fishery requirements of Lake Victoria, and the social interactions thereof. Currently MCS structures within the three riparian states and at regional management level are at various levels of disarray allowing IUU fishing to continue unabated. Although it is complex to determine the extent of IUU on Lake Victoria, the near collapse of Nile perch stocks over the last decade suggests that the economic loss to society regionally, nationally and locally has been significant.



Image 1: Fish poster underlining the key issue facing Lake Victoria's fish resources. Poster displayed on the BMU offices at a local landing site in Tanzania.

4.0 DEVELOPMENT AND STRUCTURE OF THE LAKE VICTORIA FISHERIES ORGANIZATION:

According to FAO Code of Conduct for Responsible Fisheries (CCRF), States and all those engaged in fisheries management should, through an appropriate policy, legal and institutional framework, adopt measures for the long-term conservation and sustainable use of fisheries resources. Conservation and management measures, whether at local, national, sub-regional or regional levels, should be based on the best scientific evidence available and be designed to ensure the long-term sustainability of fishery resources at levels which promote the objective of their optimum utilization and maintain their availability for present and future generations; short term considerations should not compromise these objectives.

For trans-boundary fish stocks where two or more states exploit fish resources, the states concerned, should cooperate to ensure effective conservation and management of the resources. This should be achieved, where appropriate, through the establishment of a bilateral, sub-regional or regional fisheries organization or arrangements.

On the basis of the above requirement under CCRF, the East Africa, States of Kenya, Uganda, and Tanzania share a common responsibility in the management of Lake Victoria fisheries because it is a shared resource and any action taken at any one part or area of the lake may trigger an effect in another part of the lake and subsequent effect on the entire lakes fisheries.

Based on the above, the three riparian states of East Africa were willing to adopt provisions of CCRF. They sought technical and where applicable financial assistance from the FAO to form a Regional Fisheries Body (RFB) so that they could use the body as a platform for joint regional management of fisheries resources of Lake Victoria as a single ecological entity.

Driven by this need, the riparian states, which are signatories and subscribe to many international and regional conventions, agreements and treaties relevant to sustainable fisheries management including the FAO Code of Conduct for Responsible Fisheries, received the technical assistance on the modalities of forming an RFB. Being members of East African Community (EAC) made it easier for them to come together and establish the RFB by developing a convention for their RFB called Lake Victoria Fisheries Organization (LVFO), which later came to be linked with the Treaty establishing the East African Community (EAC) and finally the Code of Conduct for Responsible Fisheries (CCRF). Among the international protocols, the CCRF provides major guidelines for development and management of fisheries in order to facilitate efforts in combating IUU Fishing.

In order to effectively carry its mandate as provided in its convention, the LVFO developed a complex fisheries management structure, which is designed to connect the East African Community (EAC) national structures and ensure regional equity and harmonisation. The Organization is an institution of the EAC whose aim is to harmonise, develop and adopt conservation and management measures for the sustainable utilization of living resources of Lake Victoria to optimize socio-economic benefits for the three Partner States.

The LVFO Secretariat is the executive organ of the Lake Victoria Fisheries Organization and is headed by the Executive Secretary whose responsibility is to ensure that the work programme and activities of LVFO are coordinated and implemented in accordance with the policy and decisions adopted by the LVFO Council of Ministers (the supreme body of the organization). The Secretariat has also a Deputy Executive Secretary, Senior Economist/Fisheries Management Officer, Senior Scientist, Information and Data Management Officer and support staff who assist the Executive Secretary with day-to-day work of the organization. The LVFO has various committees involved in the different aspects of resource management, monitoring and decision-making. These committees (Figure 1), include:

- The Council of Ministers:
  Comprised of ministers responsible for fisheries from the partner states of Kenya, Uganda and Tanzania and is responsible for making and adopting measures for management and conservation of fisheries resources.
- The Policy Steering Committee (PSC):
  Comprises of Permanent Secretaries responsible for fisheries within the riparian states. Their main objective is to receive fisheries management measures from the fisheries management committee, study and adopt them before recommending them to the Council of ministers.
- The Executive Committee:
  Comprises Heads of Fisheries Management and Heads of Fisheries Research Institutes whose responsibility is to review management and scientific activities, on behalf of the PSC.
- The Fisheries Management Committee:
  Comprises of Heads of Fisheries Management Institutions (i.e. the director of fisheries for both Kenya and Tanzania and commissioner of fisheries in Uganda). Their role is to develop management policies and advise the Executive Committee on management and conservation measures.
- LVFO Secretariat:
  Represents the executive organ of the LVFO and ensures work programmes and activities of the organization are coordinated and implemented in accordance with the policy and decisions adopted by the Council of Ministers
- Departments/Directorates of Fisheries:
  Comprises of government departments or directorates under the Fisheries Ministries with the mandate for fisheries management and development.
- Fisheries Research Institutes:
  Comprises of the three National Fisheries Research Institutes in the Partner States whose role is that of collecting and analysing the scientific fisheries data and providing information required by LVFO in decision making on various disciplines of fisheries, more importantly those that are relevant for policy changes and MCS initiatives.
- Beach Management Units (BMUs):
  These include organizations of fishing communities formed at every gazetted fish-landing beach. They are legally formed under fisheries legal frameworks of the tree partner states and are being integrated into LVFO established community structures. Their role is to spearhead fisheries co-management at the beaches in support of the government efforts. They are the foundation of co-management in East Africa and they work with local and national government, the private sector (fish processing industry) and non-governmental organizations on all matters of beach management and more importantly fisheries MCS.
- Regional and national working groups (RWG/NWG):
  Consist of staff from fisheries research and fisheries management institutions, and additional experts from Fisheries Training Institutions, Universities and Civil Society Organizations who are specialists in a given programme or thematic area. Their role is the implementation of LVFO decision both nationally and regionally.

The above-mentioned committees are tasked in the regional management of Lake Victoria's fisheries. Their duties are shared between different thematic areas of expertise; however the underlining role of the LVFO is to ensure responsibility and implementation of the activities under each of the organizations programs, in respect of regional and national legal and political frameworks. The activities' outlined by the LVFO include the following programmes:

- Fisheries management.
- Resource monitoring.
- Information and database management.
- Capacity Building and training.
- Aquaculture.
- Sub-programs under the Fisheries Management.
  - Fisheries policy, legislation, institutions and Institutional processes.
  - Fisheries co-management.
  - Monitoring, Control and Surveillance.
  - Fish quality assurance, safety, product development and marketing.

STRUCTURE OF THE LAKE VICTORIA FISHEIRES ORGANIZATION (LVFO)

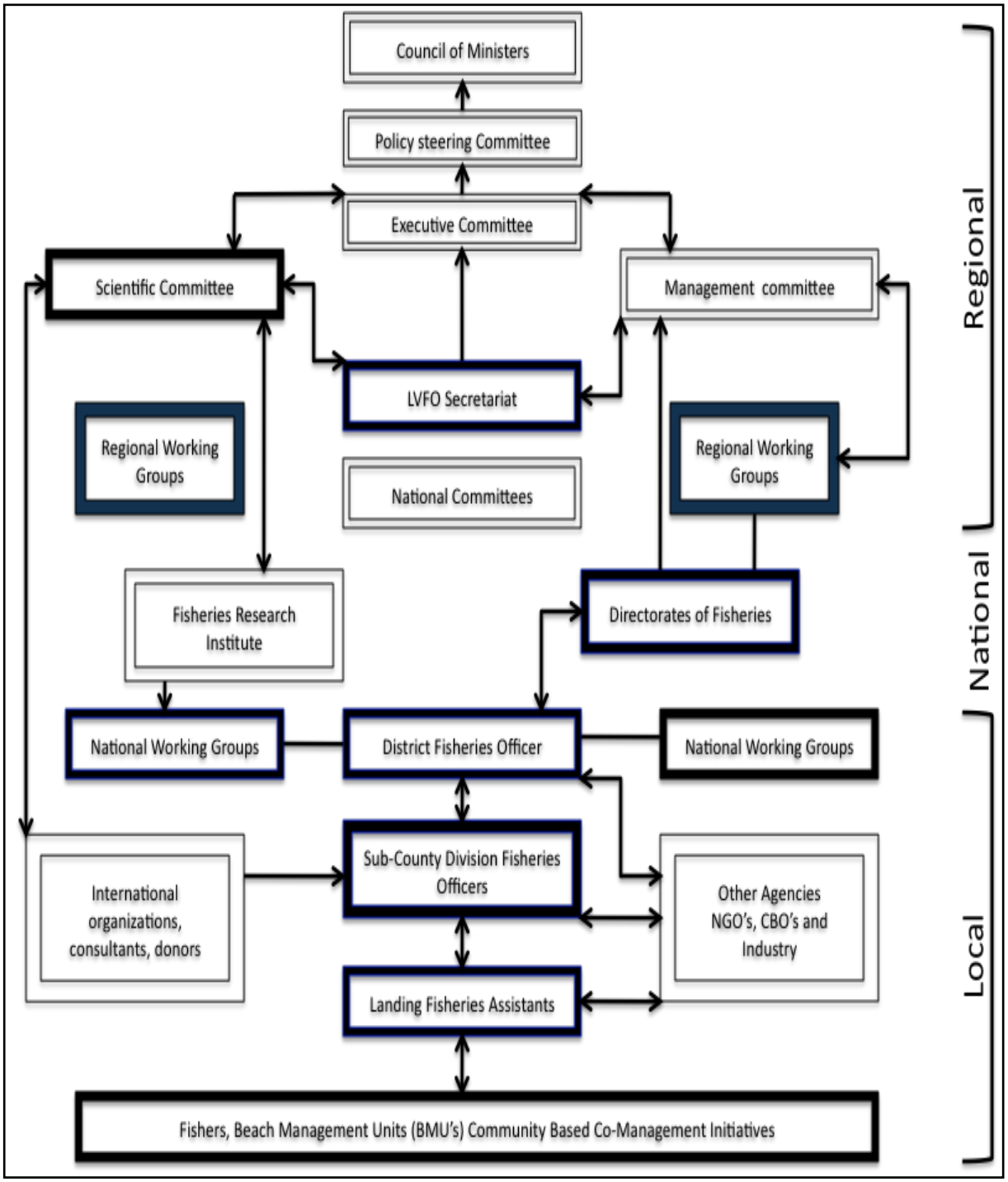


Figure 1: Structure of the Lake Victoria Fisheries Organization. Highlighted boxes indicate areas focused on by the consultants (Diagram modified from Heck et al. 2004).

5.0 DESCRIPTION OF IUU ACTIVITY

IUU fishing is often not associated with inland fisheries; however the economic incentive for illegal, unreported and unregulated fishing, which is driven primarily by domestic and regional market trade, characterizes the state of Lake Victoria's fisheries today.

According to CCRF, IPOA-IUU Fishing refers to fishing activities conducted in areas falling within national and regional areas of jurisdictions (including areas where there are no applicable management and conservation measures), which are done in the following manner:

a) Without permission, in contravention of the conservation and management measures and in violation of national laws or regional and international obligations.
b) Failure to report or misreport fishing activities or in contravention of the reporting procedures.
c) Inconsistent with or in contravention of fisheries conservation and management measures of fish stocks where there are no applicable management and conservation measures and action is taken in contravention with fishers' state responsibilities.

In pursuit to this, LVFO complies with the IPOA-IUU Fishing, through use of a developed and customized Lake Victoria regional plan of action on IUU Fishing (RPOA-IUU Fishing). According to LVFO, IUU fishing is more or so considered in the form of the following:

1. Illegal or misuse of fishing gears.
2. Illegal fishing and fish landing.
3. Unregulated, unreported or undocumented domestic and regional fish trading.
4. Fishing of undersize fish and landing them in undesignated landing sites.
5. Fishing during the legally closed seasons or in closed breeding areas.

The above five areas have been regionalized and nationally accepted as the LVFO IUU fishing criteria, and is known that by dealing with them, the partner states of the LVFO region will be dealing with IUU fishing in Lake Victoria.

Lake Victoria is an open access (the right to catch fish using any number of vessels, gears and personnel, i.e. open to all) artisanal fishery, which has expanded since the 1980's due to the introduction of what is economically Lake Victoria's most important fish, Nile perch. Originally export prices drove initial fishing effort up, however, stock assessments have shown that the number of legal size Nile perch, those greater than 50 cm Total Length (TL) have been overexploited, resulting in the decline of Nile perch not only with respect to total biomass in the system, but also in total exports and revenue earnings. Instead of a reduction in fishing effort in the hope of ensuring Nile perch stocks recovered, the trade of immature or illegal undersize Nile perch (less than 50 cm TL) became popular on domestic and regional markets (EAC regions including DRC, Burundi, Rwanda etc.). This trend has continued despite efforts to fight it, in fact fishing effort has not eased; it has intensified with the use of illegal gears to target more efficiently small illegal sized Nile perch.



Image 2: Fishers throws an illegal cast net into shallow water, targeting juvenile fish.

Illegal gears used in Lake Victoria include, the deployment of long lines using hook sizes of No.10 or smaller, the deployment of gillnets less than 5 inches mesh size, the deployment of all sizes of monofilament gears, the use of beach seine nets, the use of poisons, dynamite and cast nets. Although only one record of dynamite fishing exists, poison fishing occurred between 1997 and 2000, during which an export ban was placed on Nile perch from Lake Victoria by the European Union. Poison fishing abruptly ended. The stock assessment and the MCS interventions with respect to illegal gears are detailed in this report under the stock assessment section.



Image 3: Illegal monofilament nets, beach seine nets and gillnets confiscated by Tanzanian fisheries authorities.

IUU FOCAL POINTS AND MOVEMENT OF LEGAL AND ILLEGAL NILE PERCH TO EXPORT AND DOMESTIC MARKETS:

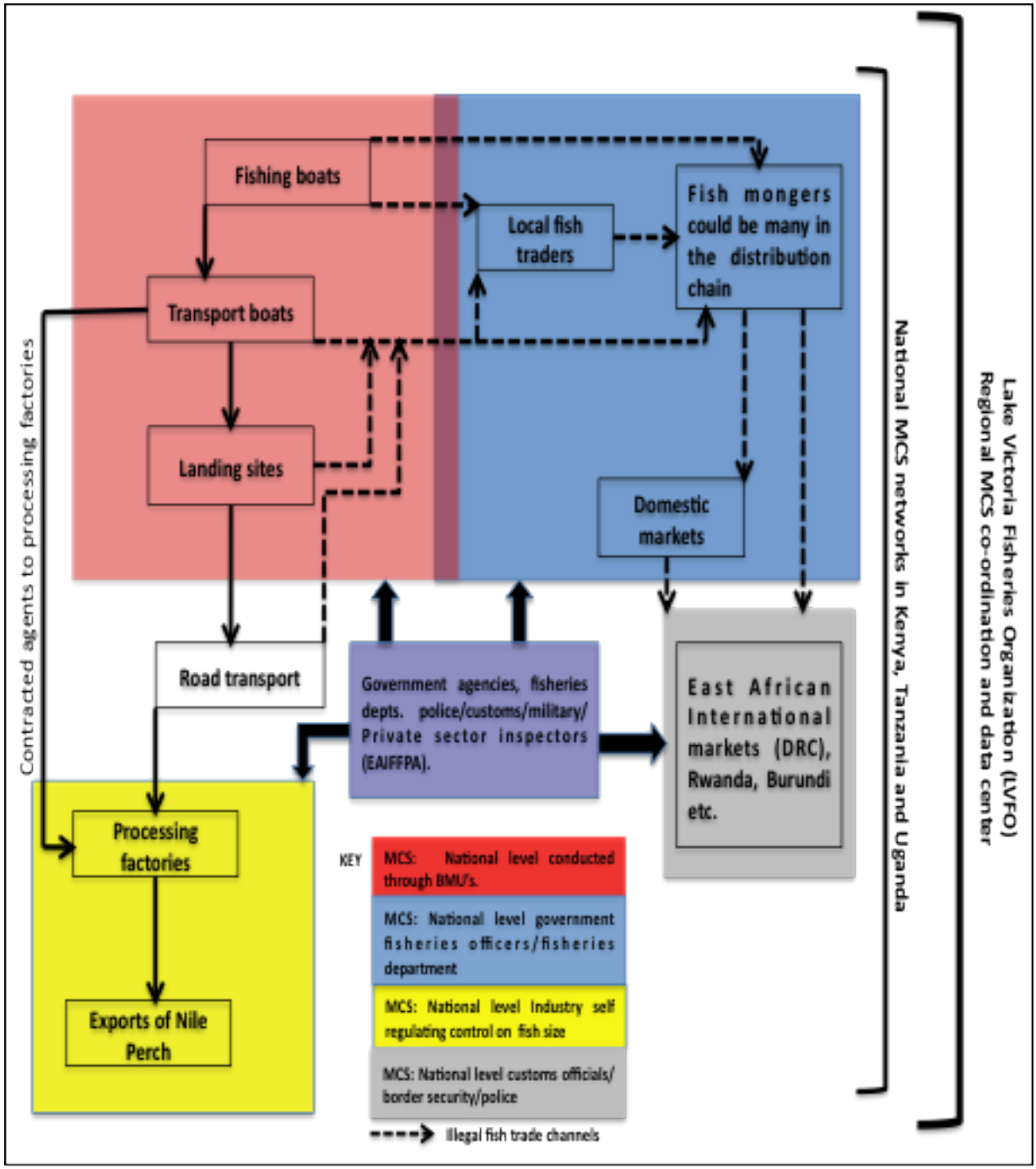


Figure 2: Diagram represents the trade and movement of Nile perch into domestic and international markets. Shaded areas represent various authorities involved in MCS interventions. The dashed lines represent the possible movements of undersize, illegal Nile perch (Diagram modified from Nyeko 2004).

6.0. MOVEMENT OF NILE PERCH TO DOMESTIC AND EXPORT MARKETS

6.1 Role of BMU's in MCS:

The co-management approach is one of the fisheries management tools which has received much attention with the belief that co-management leads to efficient fisheries management by involving fishing communities in the decision making process and management of the resources (Salehe 2008). Within the Lake Victoria region, co-management has been implemented through the establishment of Beach Management Units (BMU's). A BMU is a community-based organization, which is legally accepted as a representative of a fishing community regarding fisheries resource utilization and management (Salehe 2008). Around Lake Victoria 1 087 BMU's are registered according to the harmonized BMU guidelines, agreed upon amongst the member states. The guidelines have provided an agreed process of BMU reformation and functions. BMU's vary in size and membership number, however all fishers have to be registered with a BMUs before they are issued with fishermen licenses while fishing boats, and gears are vetted and recommended to fisheries authorities for registration and licensing respectively. Each BMU must have over 30 participants in the fishery to be ratified as a legal entity (Pers. Comm. with BMU members).

BMU's are the frontline of MCS activity, and their task is to monitor, collect data and enforce by-laws designed by the national states. They do so however on a voluntary basis, i.e. they do not get a salary or income. BMU's have set guidelines regarding MCS tasks, which include but are not mutually exclusive to, capturing fish landing data, fishing gear data, enforcing that no illegal gears are used by their signatories and ensuring that undersize Nile perch are recorded and handled appropriately. Despite that, they normally ensure that undersize fish deliberately targeted for example Nile perch of 10 cm TL, are confiscated and the fisher reported to fisheries authorities, where as Nile perch of 45 cm TL (considered by-catch) are distributed amongst the fishers for their own use as food. However barriers towards voluntary compliance are complex in the region for a number of factors, namely:

- Social issues, it is difficult to report your immediate or distant family if they are fishing illegally.
- Compliance driven by income generating possibilities (instead of eradicating illegalities, BMU's would rather allow the use of illegal gears for example and solicit fines, instead of confiscating and or destroying the gears).
- Fear of retribution in reporting perpetrators.
- Financial incentives not to report illicit fishing activities (corruption).
- Conflicts of interest, i.e. many BMU leaders are also fish traders.
- No financial incentives for doing compliance work.
- Lack of support from government departments (fisheries, police etc).
- Security issues and safety risk of the MCS operations.
- Lack of appropriate MCS equipment.
- Lack of understanding of by-laws.
- Sabotage through communication technology (cell phones are used to alert fishers, fishmongers, transport vessels, BMU operatives etc. that government patrols and or searches are happening or about to commence).
- Political interference, especially during national elections.
- Lack of representation at higher decision making committees of LVFO.

The LVFO does support a programme not only to develop the capacity of BMU's, but also to develop a BMU Network (Anderson 2011). The Network, established in principle only since March 2011, follows the governance structure of each country, with essentially village, District and national level BMU Committees. The National BMU Committees come together to form a Regional BMU Network, which is a member of the LVFO Statutory organism and is represented at the Council of Ministers (Anderson 2011). Although the development of a BMU network will provide legitimacy in developing co-management based solutions, currently the lack of sustainable finances in supporting BMU's is complementing ineffective MCS at the community level, and allowing a flourishing landing and

trade in illegal fish on domestic and regional markets to continue.

The diagrammatic representation of fish trade (Figure 1) shows that BMU jurisdiction with respect to monitoring fish, focuses primarily on the fishing vessels, the landing sites and the transport vessels. Dashed arrows, which highlight the movement of undersize Nile perch show that from each of the BMU MCS jurisdictions illegal fish are passing through to fishmongers and market traders. It is for the very reason mentioned in bullet points above that there is little control of the movement of illegal fish by BMU's. This represents a critical gap, not only in data collection, but in putting pressure on stopping the illegal trade of Nile perch and should be addressed both nationally and regionally by possibly introducing incentive driven rewards.



Image 4: Juvenile Nile perch targeted specifically by fishers at the Dunga BMU, Kisumu, Kenya. Juvenile Nile perch approximately 10 cm TL can fetch up to US$ 3.26 for three fish.

6.2 MCS self-regulation by industrial fish processors:

Contracted agents by fish processing company's buy and transport Nile perch from the various designated landing sites to their fish processing factories using ice-laden trucks. Nile perch are measured and weighed at the landing sites and only Nile perch exceeding 50 cm TL are sent to the processing factories. Strict self-control compliance from factories ensures that no undersized fish are processed. Factories are inspected randomly and based on a rule of 3% tolerance level of by-catch (3% and below of Nile perch in the processing factory less than 50 cm TL is acceptable, and is considered to be human error); if companies are non-compliant they are subjected to export bans. At the fish reception points of the factory, Nile perch measuring below 50 cm TL are rejected. According to factory self-regulation guidelines, the fish rejected by the factory are supposed to be handed over to fisheries authorities that will donate the fish to prisons or destitute homes. However, this is not happening because, when the factory rejects the undersize Nile perch, the agents take and sell the undersize fish to domestic fishmongers.



Image 5: Nile perch entering a fish-processing factory in Kenya. Nile perch arriving from the designated landing sites are measured to ensure a total length of 50 cm or greater.



Image 6: Nile perch measuring exactly 50 cm TL. Random factory inspections, coupled with economic consequences ensure only legal Nile perch are processed.

6.3 Description of illegal fish entering domestic and regional markets:

The movement of undersize Nile perch, as described by the dashed arrows in figure 2, shows that fishing vessels, transport vessels and contracted agents from fish processing companies transport and trade undersize Nile perch to fishmongers and local market trade agents. The contracted agents often place undersize fish in their trucks and distribute accordingly before reaching the processing factory. When undersize fish enters the informal trade, MCS is usually under the district government fisheries officers' jurisdiction, although the names and titles of such officers or government representatives differ amongst member states. Figure 2 also shows an overlap between the MCS jurisdictions of government fisheries officials and the BMU's. The increasing trade in undersize fish through official landing sites suggests that corruption and breakdown of ethics and integrity between BMU representatives and government officials is a common problem hampering effective MCS. Local government fisheries officers are entrusted to monitor market trade, however their main focus appears to be collecting revenue for their superiors. Common barriers to effective MCS include:

- Financial incentives not to enforce compliance.
- Social issues, involving friends and family engaging in trade of illegal fish.
- Lack of capacity and training.
- Corruption.
- De-centralized government (where policies and regulations are not harmonised between national and local government).
- Political interventions (often government fisheries officers cannot perform their duties, as orders not to engage in various positive MCS activities come from their superiors).
- Politics with respect to voting, (BMUs are representatives of the fishers, therefore to acquire election votes it is not politically advantageous to clamp down on illegal activities that may jeopardize a candidate's political career).

The trade of fish in the markets and the transport of fish to regional markets is currently not adequately controlled, although all the states surrounding Lake Victoria have provisions for export and import permits, and prohibitions on the export of Nile Perch less than 50 cm, regional trade in undersized Nile perch is flourishing. This rule is not provided for in the other countries in the region such as DRC and therefore, when fish pass the border points are considered legal.



Image 7: Local fishmonger trading undersize Nile perch in a local market in Kisumu, Kenya.

Little co-operation exists between the various government agencies such as the police, customs officials etc. It has been suggested that border and customs officials are trained in the identification of illegal fish, however not much has been achieved on this front. The national fisheries authorities of Kenya, Uganda and Tanzania do vary in their approach to MCS, however even under the regional fisheries management authority, the LVFO, hormonising of MCS activities has not led to a more streamlined and effective approach to MCS, which is evident as Nile perch stocks continue to decline driven by lucrative prices of illegal fish on domestic and regional markets.



Image 8: Mixed tilapia and Nile perch for sale in government registered market in Kampala, Uganda.

6.4 MCS at a regional level (LVFO):

The LVFO has a MCS-RWG that meets to discuss MCS interventions like patrol planning, MCS budgets, regional and national missions etc. They oversee the MCS data collection and report writing of the member states. The MCS-RWG work designed the MCS Standard Operating Procedures (SOPs), which clearly underlines the rules of engagement (ROE), patrol mission standards, the harmonization of data collecting and handling of suspects etc. There are barriers to efficient regional MCS initiatives, these include:

- Financial constraints hamper the LVFO and the MCS-RWG in implementing consistent regional patrols.
- Lack of management and operation in various SOP's.
- Lack of sensitization for top managers, politicians and decision makers about the critical financial needs for MCS, and why it is urgently required.
- Inadequate capacity to conduct effective MCS operations.
- Lack of operating equipment, and funds to operate the equipment (fuel for patrol boats etc).
- There are gaps in legislations and policies.
- Data capture, accuracy, sharing, analysis and dissemination.

The LVFO has been relatively effective in stock assessments and MCS during donor-funded projects, e.g. during the IFMP project, funded by the EU. It is when the donor funds dried out and the projects ended, that the LVFO was

unable to undertake MCS tasks. The issue primarily relates to political will of the member states, however immediate intervention on the sensitization of political leaders based on the economies of scale in achieving effective MCS and Nile perch stock improvement as opposed to ineffective MCS and the economic collapse of lake Victoria is essential (Figure 1, structure of the LVFO).

7.0 STATUS OF THE NILE PERCH STOCK AND A COST BENEFIT ANALYSIS OF MCS INTERVENTIONS:

In defining a cost benefit analysis for previous MCS interventions within the Lake Victoria region, it is imperative to highlight the linkages between the status of Nile perch stocks and the increase or decrease in the deployment of illegal gears, fishing effort, and trade in undersize fish as benefit indicators, where as direct costs of MCS actions are obtained from data supplied by the riparian states, where possible and the regional management authority, LVFO. Data pertaining to revenue generated by the government from Levies was not available, despite repeated requests to the LVFO from the consultants.

7.1 Status of Nile perch

The introduction of Nile perch in Lake Victoria in the 1950's stimulated the development of the fisheries sector, which expanded and grew rapidly through the 1980's and 1990's. Lucrative prices on international markets prompted large financial investments into fish processing within the three riparian states, Kenya, Tanzania and Uganda. The demand for fresh Nile perch fillets saw catches increase from 4439 tons in 1980 to 338 115 tons in 1990 (figure 3).

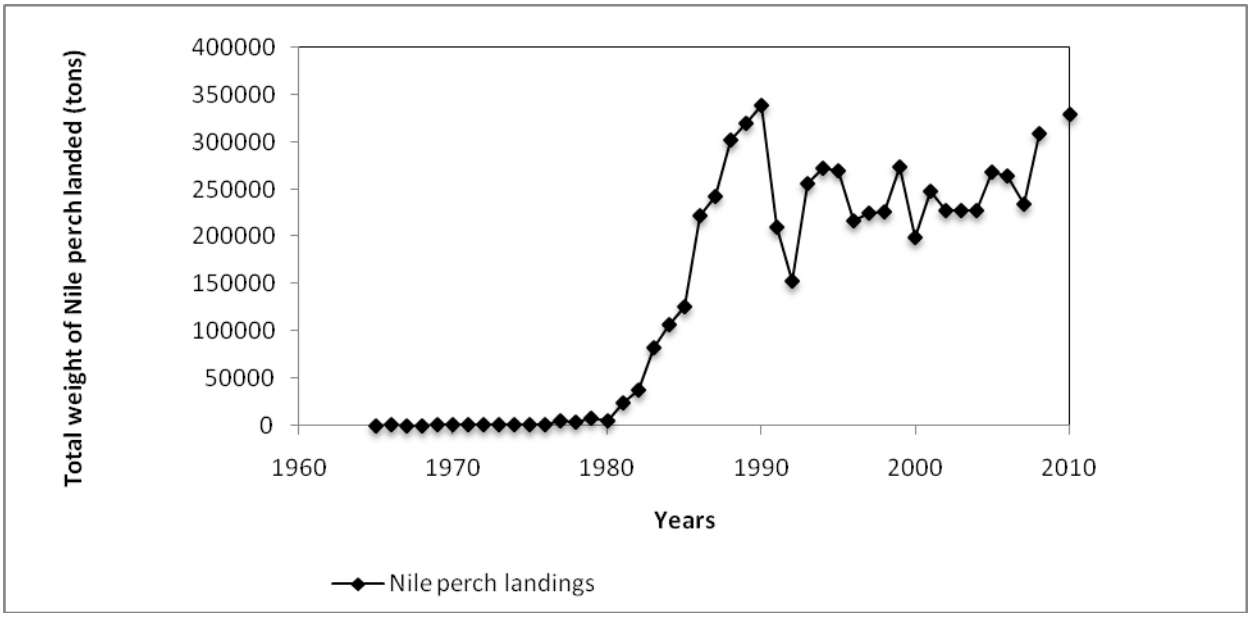


Figure 3: Total catches, represented in tons of Nile perch reported from 1965 to 2010 (LVFO data).

Fluctuations in Nile perch catch rates between 1990 and 2000 were attributed in part to market access and to an import ban of Nile perch caught in Lake Victoria imposed by the European Union (EU) from 1997 to 2000, which was primarily due to the use of poisons by fishers to catch Nile perch. However from year 2000 to 2010, catch rates remained relatively constant with an average annual landing of 253 404 tons (LVFO data). Since its introduction, Nile perch has established itself as the key economic resource in Lake Victoria not only in generating an estimated US$300 million in export revenue in 2008 (LVFO data), but also supporting the livelihoods of over 200 000 active fishers, their dependants, and those reliant on incomes generated from ancillary industries.

Despite the relatively consistent recording of Nile perch catch data (figure 3), it was not until international funds became available from the EU through the establishment of the Lake Victoria Fisheries Research Project (LVFRP), which ran from 1997 to 2001, that a formal stock assessment to estimate the biomass of Nile perch in Lake Victoria using hydro acoustic surveys was conducted (figure 4). Data from the LVFRP showed that in 1999 it was estimated that Lake Victoria had a total fish biomass of 2.1 million tons, of which Nile perch comprised 92%, 1.94 million tons. In 2001, the data suggested that the biomass of Nile perch had decreased to 1.35 million tons, whilst the total biomass increased to 2.3 million tons (Figure 4). The decline observed in Nile perch biomass and the increase in total biomass could not be linked with overfishing or over-capacity of the fishery, as no long term data pertaining to natural variation trends for Nile perch were available. Unfortunately from 2001 to the beginning of 2005, no stock assessment data was recorded, as funding from donors; the LVFO and member states were not available. Incidentally and unknown to fisheries managers during this period, Nile perch biomass decreased by just over 40% from 1.35 million tons in 2001 to an estimated 543 700 tons in 2005 (Figure 4).

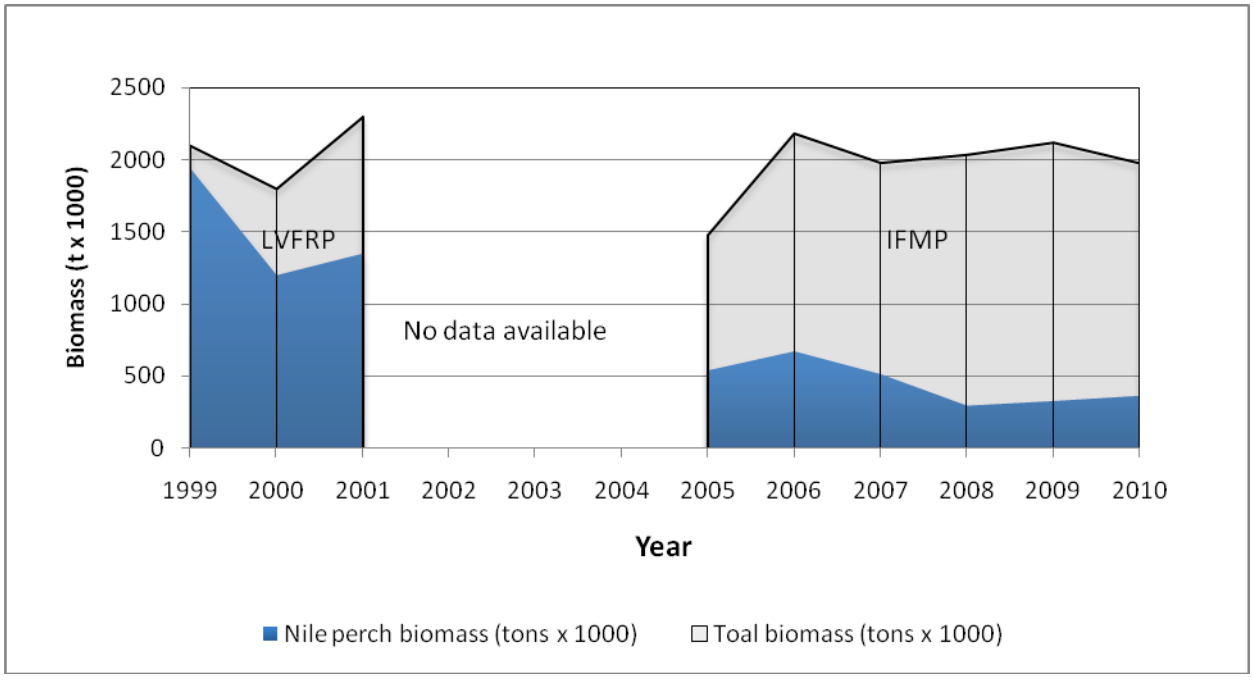


Figure 4: Stock assessment data of the total biomass compared to the Nile perch biomass from 1999 to 2010. Data from 2001 to 2005 was not available due to lack of donor funding. (Lake Victoria Fisheries Research Project (LVFRP), 1997 – 2001 funded by the EU. The Implementation of the Fisheries Management Plan (IFMP), 2005 – 2010, not including 2010, funded by the EU). Data obtained form the LVFO.

The inception of the EU funded Implementation of the Fisheries Management Plan (IFMP) in 2005, provided funds for biennial hydro acoustic stock assessment surveys. The data showed that Nile perch biomass reached its lowest recorded level of 298 394 tons in 2008, which represents just 14.9% of total biomass of Lake Victoria. Currently, as of 2010, the stock assessment survey showed a slight increase in biomass, from 298 394 tons in 2008 to 367 800 tons in 2010, which represents only 18% of total biomass.

7.2 Biological indicators of concern:

Hydro acoustic surveys (limitations of stock assessment techniques on page 28) showed that the mean maximum length of Nile perch between August 2005 and February 2007 was 51.7 cm TL. Interestingly between February 2007 and August 2008; hydro acoustic data showed that the mean maximum length of Nile perch decreased to 26.6 cm TL. There was a significant correlation between the decline in mean maximum length of Nile perch and the decrease in Nile perch biomass in 2008, as indicated in the stock assessment (LVFO technical stock assessment report 2009).

The rationale behind the correlation, according to the LVFO technical stock assessment report is that larger fish weigh more than smaller fish, therefore, the decrease in biomass may not represent a decrease in number of fish overall, but may instead represent a decrease in the number of large fish.

A length frequency distribution of Nile perch during the hydro acoustic survey in August 2006 showed two distinct cohorts of Nile perch, the first were one-year-old recruits, approximately 20 cm TL, the second two-year-old recruits, which were approximately 30 cm TL. However, the legal size of Nile perch is 50 cm TL, yet the hydro acoustic survey showed that only 1.9% of Nile perch were greater than 50 cm TL (Figure 5 and Table 2).

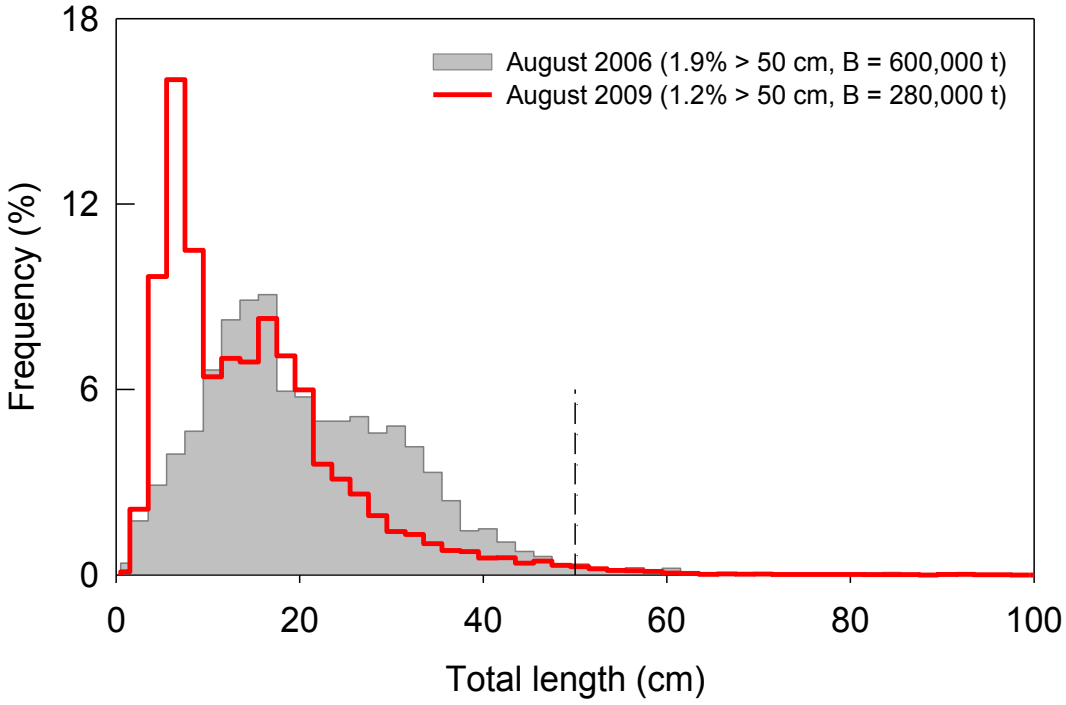


Figure 5: Length frequency distribution of Nile perch recorded during hydro acoustic and trawl surveys in August 2006 and August 2009. Note that hydro acoustic surveys do not distinguish Nile perch less than 10 cm TL from other species. Dashed line represents Nile perch at 50 cm TL. (Figure 3 lifted directly for the LVFO 2009 technical stock assessment report).

Similarly, during the August 2009 hydro acoustic and trawl survey, six-month old Nile perch, approximately 10 cm TL, were recorded, suggesting that recruitment was occurring. A second cohort of Nile perch, approximately one year old were also recorded (approximately 20 cm TL), however the survey showed that only 1.2% of Nile perch were of legal size, 50 cm TL (LVFO technical stock assessment report 2009).

Data represented in a publication by Kayanda et al. (2009), compares historic records of Nile perch length at first maturity (Table 1). The author suggests that the length at first maturity of Nile perch is at an earlier age when the population is small, and at a later age, when the population is well established. In the 1960's the Nile perch were establishing themselves in Lake Victoria, only having being introduced a decade earlier, similarly at present, the Nile perch stocks are being depleted due to overfishing and possibly represent levels similar to those in 1964, hence the similarity of length at first maturity (Table 1). It is plausible to suggest that the length at first maturity is a survival mechanism of the Nile perch, and that if overfishing continues to drive down the total biomass, a corresponding decrease in length at first maturity will be observed, until a threshold point, whereby the Nile perch stock will collapse as length at first maturity will be driven to a point of biological impossibility, as harvest continue to target smaller fish.

Table 1: Historical records of length at first maturity of female and male Nile perch. Length expressed as total length, measured in centimeters.

Date	Length at first maturity of Female Nile perch (Total length cm)	Length at first maturity of male Nile perch (Total length cm)	Source of information
1964 - 1967	45.3	32.3	Okedi 1970
1988 - 1992	93.3	62.2	Ogutu-Ohwayo 2004
2001	75.8	57.7	Unecia 2001
2007	58.0	52.0	LVFO 2007

7.3 Factors affecting the decline of Nile perch:

7.3.1. Decrease in Biomass

The decrease in Nile perch biomass has been attributed to a number of factors, the most critical of which suggests that lucrative international and more recently domestic prices for Nile perch coupled with the state of open access fishery associated with Lake Victoria have driven up fishing effort. The fisheries of Lake Victoria are classified as an open access artisanal fishery, which means there are no restrictions for individuals, vessels or gears to enter the fishery. Collecting accurate data on artisanal fishing activity is complex, however Frame surveys, a census-based approach in gathering data pertaining to fisheries activity, which include numbers of vessels, gear types (legal and illegal), number of fishers, landing sites etc. are conducted every two years at a regional level for Lake Victoria. Although the data are not entirely accurate, and that there are no historical data for comparative analysis, the results give a basic representative view of fishing capacity in the region, which is believed to be above the lake's sustainable limit.

Frame survey results from year 2000 to 2008, show that the number of fishers has increased from 129 291 active fishers in year 2000 to 194 317 in 2008, a 33% overall increase (Figure 6). This means that despite decreasing Nile perch biomass, fishers continued to fish, suggesting that it is still a profitable livelihood.

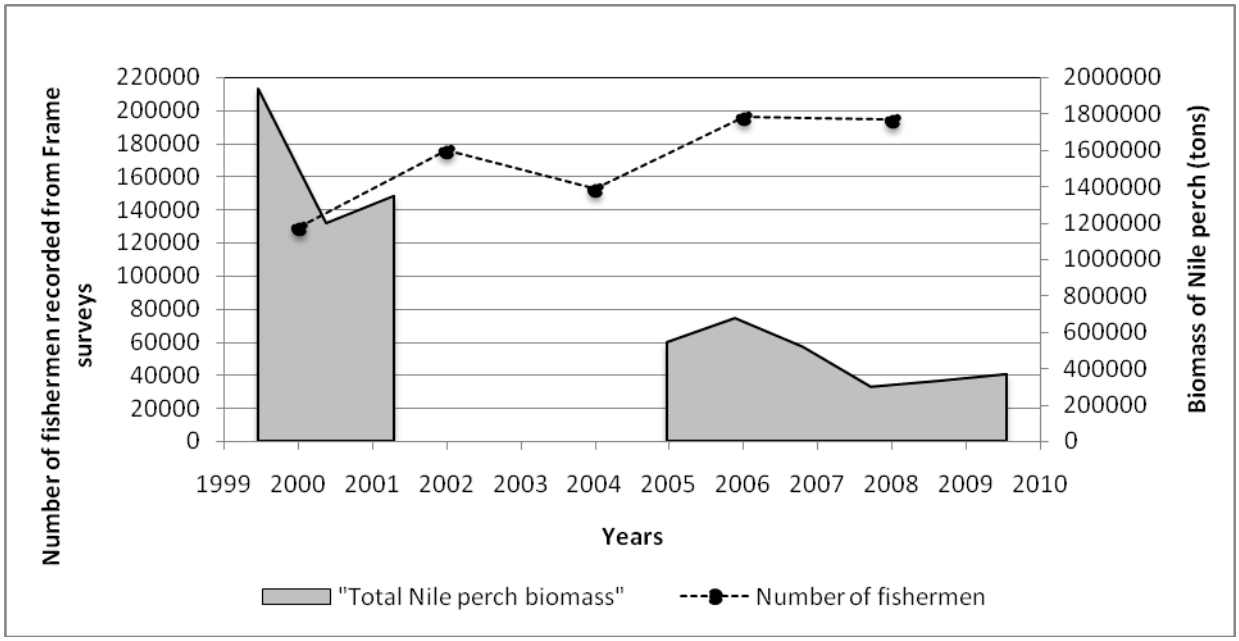


Figure 6: Total biomass of Nile perch is recorded in millions on the secondary axis, and is represented by the shaded area, whilst the dashed line represents the number of fishers measured in thousands based on Frame surveys every two years from 2000 to 2008.

What may be driving the profitability for many fishers currently is not to target Nile perch greater than 50 cm, which is the legal size, but to target smaller illegal sized Nile perch using an assortment of cheaper illegal gears, for the domestic and regional markets.

Nile perch between 50 cm and 85 cm TL are exported predominantly to Europe as fresh fillets or chilled headless and gutted trunks. Fish processing factories filleting Nile perch adhere to strict self regulations in that no Nile perch under 50 cm TL may enter the production line. Nile perch less than 50 cm TL are however not discarded, as they have value on domestic and regional markets. Nile perch fillets can fetch between Euro 10 and 13/kg on the European market, whilst at the domestic and regional trade, the value of whole Nile perch is approximately Euro 2.12/kg. According to the hydro acoustic survey data collected in August 2006 and 2009, the length frequency of Nile perch suggested that only 1.9% and 1.2% of the biomass of Nile perch was greater than 50 cm TL, respectively (Figure 5). In trying to compare the value of domestic trade versus export trade of Nile perch, a number of assumptions must be made, which are:

- Firstly, the hydro acoustic data which suggests that the length frequencies of Nile perch greater than 50 cm TL is 1.9% and 1.2% of total biomass in August 2006 and 2009, respectively is representative of the biomass throughout the year (as total recorded landings are annual data).
- Secondly, of the total recorded landings, all 1.9% and 1.2% of Nile perch exceeding 50 cm TL are harvested.
- No catch assessments were conducted in 2009, therefore the total landings of Nile perch represented in table 2 is the average of total catches in 2008 and 2010.
- Export price of fresh-filleted Nile perch is Euro 7/kg (although annual fluctuations occur due to market volatility).
- Domestic trade price of Euro 2.12/kg whole Nile perch (fluctuations in price due to supply and demand do occur).

In 2006, the total catch of Nile perch was approximately 264 070 tons, representing 39% of total biomass. If the hydro acoustic data obtained from August 2006 is suggestive of the total Nile perch biomass, the amount of Nile perch less than 50 cm TL landed far exceeds the number of Nile perch available for export. This suggests that the potential value of fish traded on domestic and regional markets is greater than those traded on the European markets (Table 2). In August 2006, the data represents the idea that given current export prices, approximately Euro 35,119,000 million could be generated given 1.9% of the biomass of Nile perch was greater than 50 cm TL. The total landed biomass available for the domestic market however is estimated at Euro 549,192,360 million Similarly for August 2009; the potential earnings for the domestic trade of Nile perch far exceeded that of the export trade, Euro 26,789,000 million and Euro 667,984,440 million, respectively (Table 2). It was reported however, that in 2006, Nile perch had a production value of US$ 340 million (Euro 227 million), and a beach value of US$ 370 million (Euro 247 million) (Warui 2007). It is not evident however if the reported values are accumulative, or suggest that 'beach value' represents domestic trade value of Nile perch, which, if the case is greater than the 'production value', or export value of Nile perch. With the closure of 10 fish processing factories over the past two to three years, accounting for on average 2000 direct job losses (approximately 200 employees per factory, and not including dependants), and that factories are functioning at minimum operating costs (pers. Comm. with factories in all riparian states), fishers are turning to the lucrative trade in illegal fish (Nile perch < 50 cm TL) on domestic and regional to generate income for their households.

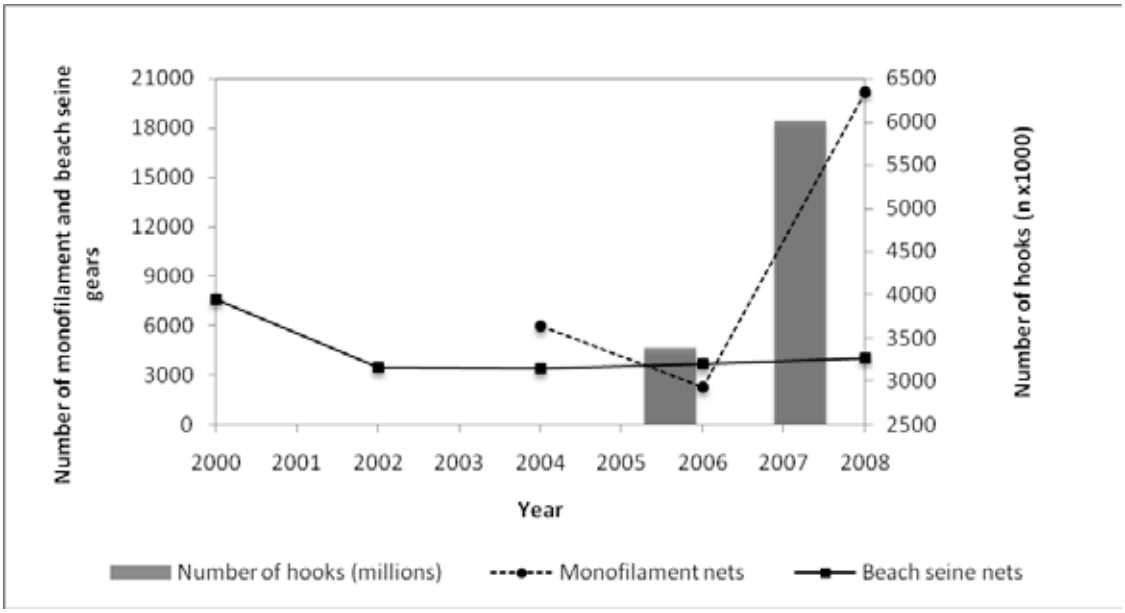
Table 2: Comparative values of biomass of Nile perch and their associated value in export and domestic markets. Total recorded landings in 2009, marked with an (*), is a computed value expressed as the average of the total Nile perch landings in 2008 and 2010, as in 2009 no catch assessments was conducted.

August 2006	Biomass (tons)	Export Market Price (Euro 7/kg). Values represented in millions	Domestic Market Price (Euro 2.12/kg). Values represented in millions
Nile perch biomass	675 700	-	-
Total recorded landings	264 070		
Of total recorded landings let 1.9% > 50 cm TL	5017	35,119,000	
Of total recorded landings let 98.1% < 50 cm TL	259 053	-	549,192,360
August 2009	**Biomass (tons)**	**Export Market Price (Euro 7/kg). Values represented in millions**	**Domestic Market Price (Euro 2.12/kg). Values represented in millions**
Nile perch biomass	331 067		
Total recorded landings*	318 914*		
Of total recorded landings let 1.2% > 50 cm TL	3827	26,789,000	
Of total recorded landings let 98.8% < 50 cm TL	315 087	-	667,984,440

7.3.2 Increase in illegal gears

According to the LVFO frame survey report from 2000 to 2008, illegal monofilament gillnets were recorded in Lake Victoria in 2004. Monofilament nets are highly efficient and can have a devastating effect on fish populations if not controlled (monofilament gears also contribute to ghost fishing, i.e. if lost in the water, they continue fishing for alone a long). Frame surveys conducted between 2000 and 2008 did not stipulate the mesh size of the illegal monofilament gears, however between 2004 and 2008, the number of monofilament gillnets observed increased from 5 944 to 20 194, approximately a 30% increase (Figure 7). The Frame surveys also recorded an increase in the number of hooks used in Lake Victoria between 2006 and 2008. Hooks have always been used to catch Nile perch, but the presence of long lines using hooks (Figure 7), and in particular size 10 hooks (which are considered illegal in Lake Victoria as they target immature Nile perch) is of increasing concern. The total number of small size hooks (size 10), was not recorded, possibly because of a lack in standardized hook measuring techniques (shaft length versus gape width etc.) and equipment (standardized hook measuring reference board with hook size samples from different manufactures, calibrated calipers etc.). The shift from legal gillnets to cheaper alternatives, like long lines (using hook size 10) is an example of a fishery focused of harvesting undersized Nile perch destined for the lucrative domestic and regional trade as opposed to targeting fish greater than 50 cm TL for the export market. Based on interviews with local fishers, hooks are cheaper to purchase than legal size gillnets, easier to hide from authorities and are effective in catching size selected Nile perch. The local market for bait is growing, fishers either harvest juvenile catfish on their own accord, or they purchase the catfish from local bait merchants in the village. Long line gears are constructed out of cheap materials, like strands of broken gillnet woven together, thereby reducing overall gear costs and increasing financial margins.

Although banned from Lake Victoria, beach seine nets have not been eradicated. Beach seines are particularly destructive, as the cod end of the net is inevitably lined with smaller mesh size nets (often mosquito nets) preventing all possibility of escape of juvenile fish. The complexity in eradicating beach seine nets can be attributed in part to geographical isolation. Uganda has over 400 islands inhabited by fishers. On such remote and isolated locations BMU's entrusted with community based management and compliance are not, for reasons described earlier in this report, able to deter fishers from utilizing illegal gears like beach seines. Beach seines confiscated are replaced by modifying gillnets and making rope out of old broken nets. The fishers on Lake Victoria are exceptionally industrious, and will fish according to market requirements. With no control of fishing effort, geographic isolation, lack of legitimacy of fisheries officers and BMU members at the community level, illegal gears will be utilized to gain a financial and competitive edge over neighboring fishing communities.



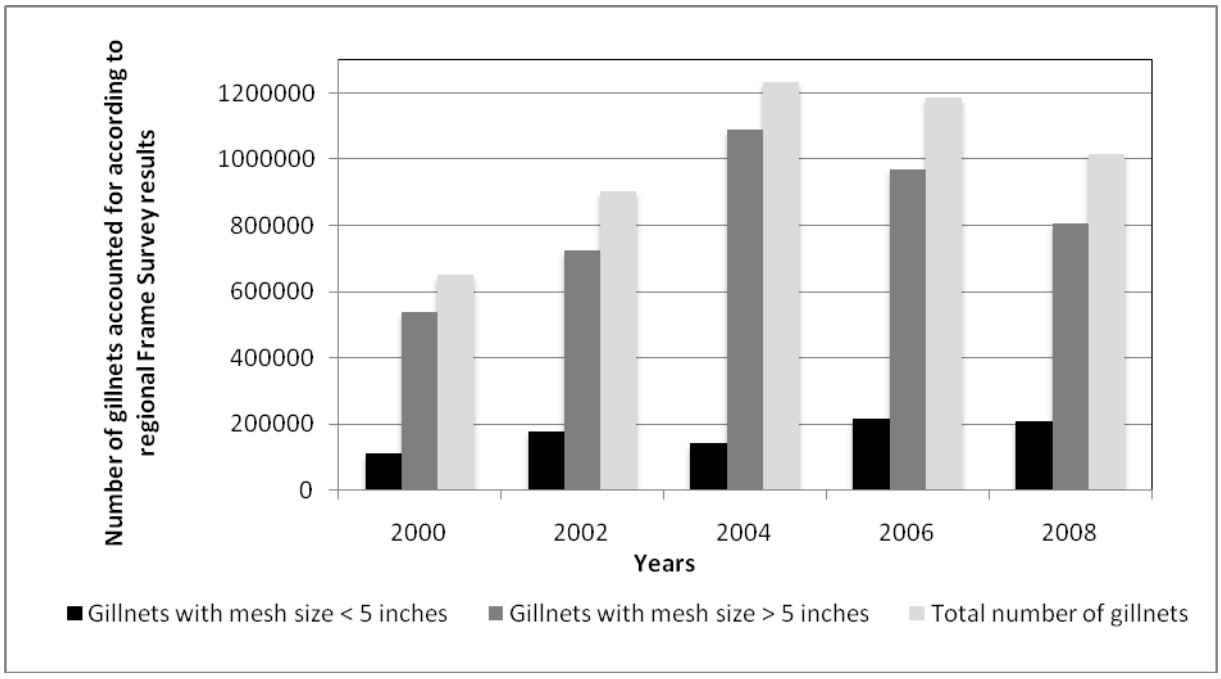


Figure 8: Total number of gillnets counted during Frame surveys between year 2000 and 2008.

7.3.3 Fleet mobility

Accompanying the overall increase in gillnets and illegal gears, the number of vessels showed an overall increase in number by 37%, from 42 519 recorded in 2000 to 67 513 recorded in 2008. There was a steady increase in the number of engines (typically outboard engines of varying horsepower, the most common of which is the Yamaha 40hp), suggesting the need to travel further to catch fish (personal communication with local fishers). Although fuel and maintenance costs of engines are greater than paddle or sail boats, they allow faster access to fishing grounds, and the ability to cover greater distances with more fishing gear (Figure 9).

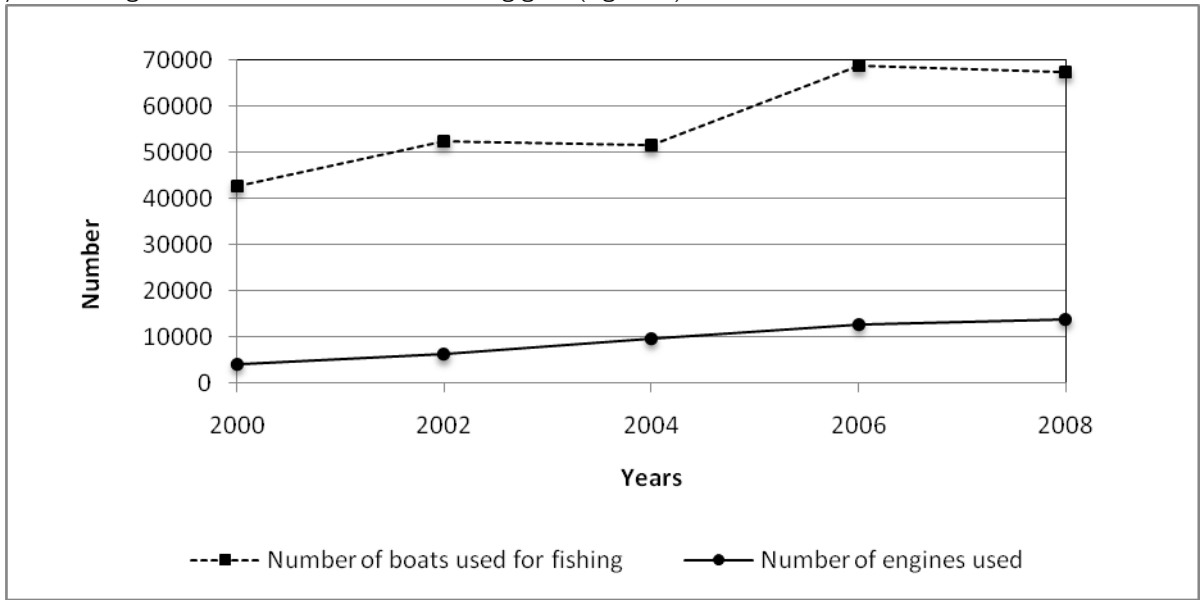


Figure 9: Number of vessels and engines recorded during Frame surveys from year 2000 to 2008.

According to a report published by Warui (2007), there is a great difference in fishing effectiveness in the harvest of the Nile perch using motorised boats and non-motorised boats. A boat that is manually paddled and using gill nets has an efficiency of catching an average of 5-7 kg boat-1 day-1 in Kenya, 8-9 kg boat-1 day-1 in Uganda and 14-15 kg boat-1 day-1 in Tanzania. A motorised boat using a gill net has an efficiency of catching 16-20 kg boat-1 day-1 in Kenya, 25-26 kg boat-1 day-1 in Uganda and 31-35 kg boat-1 day-1 in Tanzania. A motorised boat seems to be approximately three times more effective than a manually paddled boat using the same fishing method and gear (Warui 2007).

7.4 Discussion on stock abundance

Despite recruitment of Nile perch observed in 2006, 2008 and the 2010 hydro acoustic surveys, the lack of access control with respect to fishers and gears on Lake Victoria has resulted in the Nile perch fishery balancing precariously between the ability to recover and complete stock collapse. Of critical importance is to ensure accurate and continuous biological monitoring, so that trends in fish stocks are observed and factored into fisheries management decisions.
Hydro acoustic surveys are one of the fisheries independent methods for stock assessment used on Lake Victoria. Other methods used to gather data include trawl and gillnet surveys (to gather length, weight and other biological parameters to validate hydro acoustic survey results). These data are supplemented with Frame survey; catch assessment, and physio-chemical data (using secchi disks and taking CTD water samples). The objectives of the surveys are to determine the biomass, spatial and temporal distribution of major commercial fish species in Lake Victoria (LVFO 2009). The process of monitoring Lake Victoria's fisheries has limitations, which include:

- Surveys not being carried out as per schedule due to financial constraints. Trawl surveys have decreased and in 2009 no catch assessment survey was conducted.
- Frame surveys are conducted every two years.
- Hydro acoustic surveys only account for Nile perch greater than 10 cm TL.
- Hydro acoustic surveys are restricted at shallow depths due to the draft of the survey vessel.
- Catch assessment neglects the biomass of juvenile Nile perch landed by fishers targeting Dagga (small pelagic species, Rastrineobola argentea).
- Stock assessment surveys seem to rely primarily on donor funding.
- Concerns with regards to data accuracy, analysis and dissemination of results.

The LVFO stock assessment working group suggested, in their 2009 stock assessment report that a total biomass of 750 000 tons of Nile perch is required in order to sustain a Maximum Sustainable Yield (MSY) of 225 000 tons (harvest rate of approximately 30% of total biomass). The target biomass of 750 000 tons is therefore considered by the LVFO as a theoretical biologically sustainable population of Nile perch for Lake Victoria that could be attained though effective MCS and fisheries management procedures (no indication was given as to what the expected proportion of Nile perch harvested at MSY would exceed 50 cm TL). However, Figure 10 shows that in 2008 Nile perch landings far exceeded suggested MSY, indicating that fisheries management procedures and MCS initiatives were not effectively curbing the decline of Nile perch biomass. Although the stock assessment report from 2008 to 2010 suggests that Nile perch recruitment is occurring (Figure 5), and that the total Nile perch biomass increased from 298 394 tons in 2008 to 367 800 tons in 2010 relentless fishing pressure by fishers targeting Nile perch less than 50 cm TL using an assortment of legal and illegal gears, driven by lucrative trade opportunities on the domestic market, coupled with inefficient fisheries management and MCS interventions in curbing access and effort, the target recovery biomass of 750 000 tons of Nile perch seems at this point in time to be an ideology and not a reality.

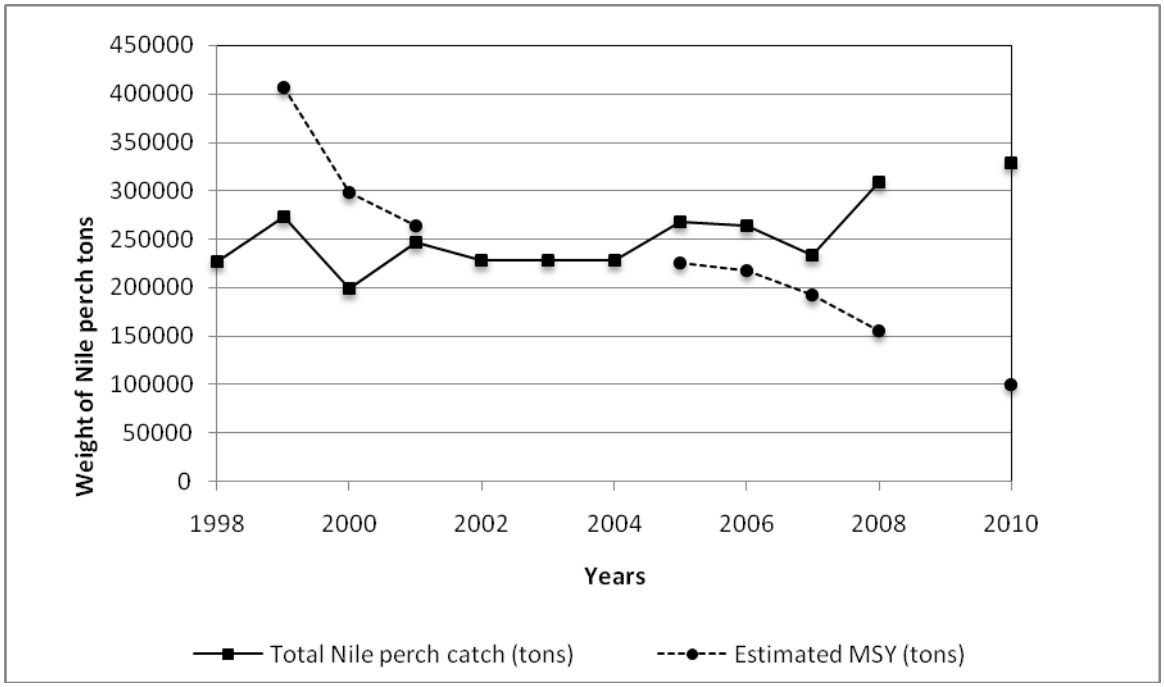


Figure 10: Weight of Nile perch in tons landed compared to calculated MSY. In 2008, a MSY of 51% of total Nile perch biomass was suggested, yet Nile perch landings were almost twice the suggested MSY. No landing data or MSY estimates are available for 2009. MSY was calculated at 30% of total biomass for 2010, yet Nile perch landings were almost three times MSY. No trend line was used between MSY and total landings from 2008 to 2010, due to no data availability in 2009.

Of great concern however is the quality and accuracy of the stock assessment, catch assessment and Frame survey data. Figure 11 suggests that in 2008, catches of Nile perch exceeded their total biomass. According to data supplied by the LVFO in 2008, a total of 309 102 tons of Nile perch was harvested, yet the hydro acoustic data used to calculate the total biomass showed that the biomass of Nile perch in 2008 was only 298 394 tons (Figure 11), an improbability. Then in 2010 catches of Nile perch were estimated at 328 708, from a total estimated biomass of 367 800, in other words 89.3% of total biomass was harvested. The data does, if accurate, indicate that Nile perch are supremely adaptable in that they are able to recruit and grow despite extremely high fishing pressure. This possibly relates to the fecundity of Nile perch. It has been estimated that mature female Nile perch produce 140 eggs per gram of body mass (Munyaho 2004). According to Warui (2007), female Nile perch spawn throughout the year in shallow sheltered areas of Lake Victoria, producing over 16 million eggs per breeding cycle. Despite being able to survive and reproduce whilst exposed to excessively high fishing pressure, the loss in terms of biomass of almost one million tons is significant in terms of loss in productivity, loss in economic opportunity and the potential loss in revenue to the government.

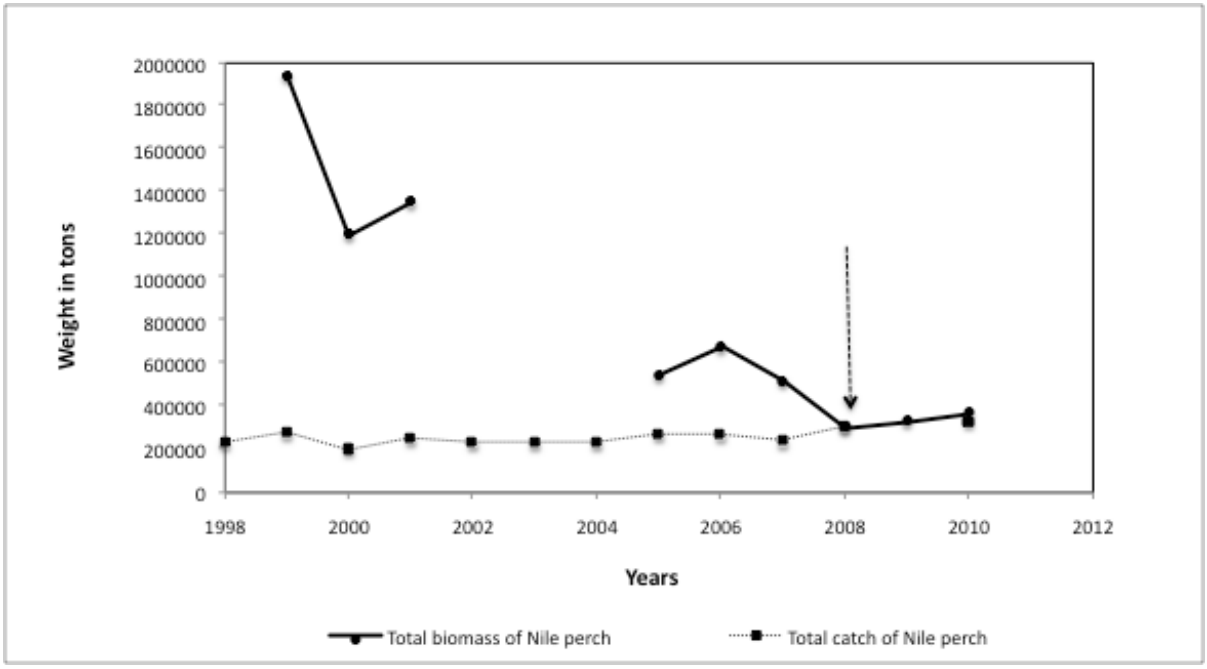


Figure 11: Total catches of Nile perch compared to total biomass, measured in tons (LVFO data). The data suggests that in 2008 the total Nile perch landings exceeded total Nile perch biomass. This can't be possible, especially since that in 2010, the total biomass was estimated at 367 800 tons. Data accuracy and analysis is unreliable.

The current biomass and catches of Nile perch are in a constant state of flux, most likely fluctuating along the lower estimates. All indications are that the effort with illegal gears will increase (see increase in illegal gears, Figure 7). The population of Nile perch can probably be sustainable even at lower levels, as Nile perch are highly fecund and they have the capacity to reduce their length/age at maturity (Table 1), which is currently reported. This however, cannot continue indefinitely.

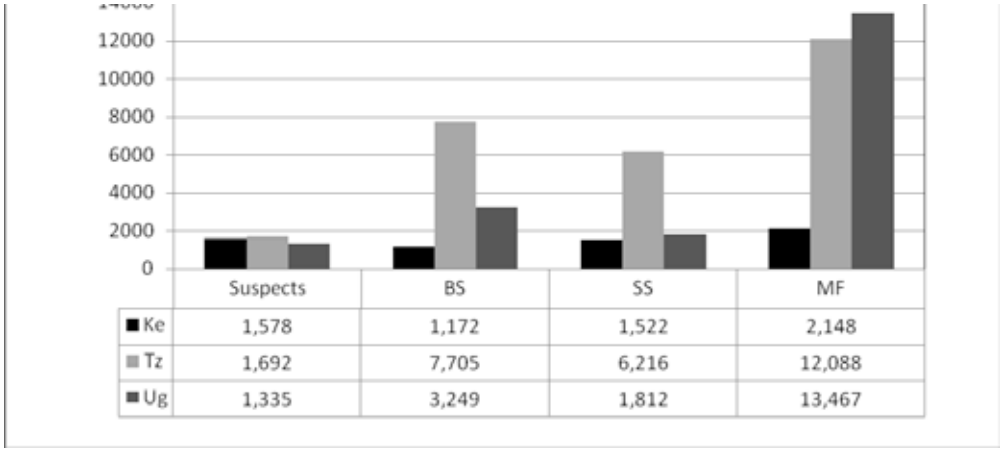
8.0 MCS INTERVENTIONS 2004 TO THE END OF 2008

(data collected from the MCS-RWG report in 2009):

MCS co-ordination within Lake Victoria is orchestrated by the MCS Regional Working Group (RWG-MCS), which is made up of senior fisheries inspectors and a senior police officer from each of the partner states. In 2006, the RWG-MCS developed and agreed upon Standard Operating Procedures (SOP's) to govern the conduct of fisheries law enforcement in the three countries sharing Lake Victoria (LVFO SOP's). Reports on annual missions are complied and analyzed by the RWG-MCS and results reported to the LVFO, who then disseminates the reports amongst member states.

The RWG-MCS reported that between 2004 and the end of 2008, during the funding period of the IMFP, a total of 4 605 suspects were apprehended, 12 126 beach seines, 9 550 small seine nets and 27 703 monofilament nets were confiscated regionally (individual confiscations represented in Figure 12, RWG-MCS report 2009). Furthermore, the report shows that 248 843 kilograms of immature Nile perch (approximately 249 tons) and 254 589 illegal gillnets were confiscated (Figure 13, RWG-MCS report 2009. Note that 254 589 confiscated nets, as reported by the MCS-RWG does not match the accumulated total in figure 13, despite being represented in the same report, an error in reporting of 20 000 nets).

If one compares the total value of undersized Nile perch confiscated with the total value of undersize Nile perch entering the domestic and regional trade between 2004 and the end of 2008, 1.3 million tons were harvested of which 248 843 kilograms were confiscated, therefore at a domestic market price (whole fish) of Euro 2.12/kg, approximately Euro 527,547 worth of undersized Nile perch were seized. No data is available to suggest of the 1.3 million tons of fish landed from 2004 to the end of 2008 what percentage of Nile perch were undersize. Stock assessment Data in August 2006 suggests that 1.9% of the total biomass of Nile perch was greater than 50 cm TL, lets assume then that of the 1.3 million tons landed, 40% were undersize (possibly an overestimate). Therefore 40% of 1.3 million tons equates to 520 000 tons. The value of illegal fish entering the domestic and regional market could therefore be in tune of Euro 1.102 billion (possibly an underestimate). \



	Suspects	BS	SS	MF
Ke	1,578	1,172	1,522	2,148
Tz	1,692	7,705	6,216	12,088
Ug	1,335	3,249	1,812	13,467

Figure 12: MCS interventions showing suspect's arrests, beach seine (BS), small seine (SS) and monofilament gillnet (MF) confiscations from 2004 to 2009, during the IFMP project (Graph lifted from the RWG-MCS 2009 regional report).

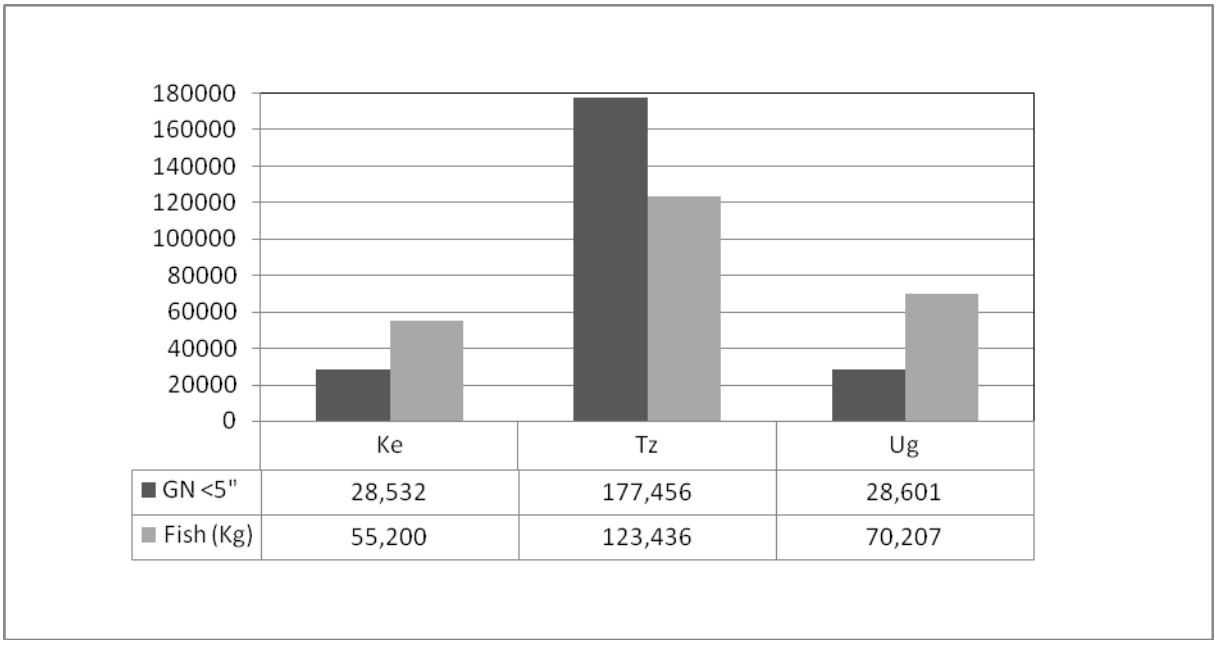


Figure 13: MCS interventions showing confiscated undersize Nile perch by state and the number of illegal gillnets seized, measured in thousands (Graph lifted from the RWG-MCS 2009 regional report).

It is difficult to ascertain whether the RWG-MCS interventions from 2004 to the end of 2008 were beneficial as these data are missing both comparative and technical information, for example:

- How many missions were conducted to achieve these values?
- Frame survey comparisons of illegalities compared to MCS confiscations.
- At what time intervals were the missions conducted?
- How long (time duration) did each of the missions take?
- Were the mission regional, national or both?
- How many personnel were involved in the operations?
- What defines a confiscated gillnet (80 meters in length or 1 kilometer in length)?
- What was the running cost of the operation?
- What was the outcome of the missions in form of cost of confiscated fish, gears and court fines from prosecuted cases at law courts?
- What gear/tools was used during the operation, i.e.
    - To measure net mesh size? (a school ruler was indicated as the tool for measuring net mesh size, which is reason for concern).
    - To measure TL of Nile perch?
    - To measure hook sizes?
    - What vessels were used, if operations occurred on the lake?

8.1 Discussion on MCS interventions from 2004 to 2008:

According to the RWG-MCS report, between 2004 and the end of 2008, approximately 254 589 gillnets with mesh size less than 5 inches were confiscated, however there is no definition of a net or net type. Fishers acquire a standard gillnets, which are approximately 80 meters in length (personal communication with community fishers and BMU's). They proceed to join the nets together, often up to one kilometer in length (over 100 net segments each 80 meters in length). Depending on the length and type of nets the MCS teams confiscated, there may have been a reduction in potential illegal fishing capacity of 20 367 km (if each net confiscated was 80 m in length), or a reduction in potential

illegal fishing effort of 254 589 km (if each net confiscated was joined to be 1 kilometer in length). The definition of net length is also not determined in the Frame surveys reports from year 2000 to 2008. If the total number of gillnets reported in Lake Victoria during 2006 was 1 184 298 million, and each net was only 80 meters in length, then in 2006 Lake Victoria had a possible lower limit of gillnet fishing capacity of 94 743 kilometers, if the nets were one kilometer long, then in Lake Victoria there is a maximum potential gillnet fishing capacity of over 1.1 million kilometers (which could be wrapped 245.2 times around the circumference of Lake Victoria, which is 4 486 kilometers). In this case therefore, it appears that there is no clear and harmonised method of data collection in relation to gillnets (or confiscated gears in general) i.e. it is important to ensure that Frame surveys and MCS-RWG operations have the same definition for what constitutes a gillnet. Only once these definitions are harmonized, can the effectiveness of gillnet confiscations be compared to the number observed during Frame surveys.



Image 9: Fishers clean their nets at a local BMU in Entebbe, Uganda. This particular BMU has over 98 vessels registered, however the crackdown on illegal gears is not strictly controlled as fear of retribution from illegal fishers (pers. Comm. with BMU official).

8.1.1 Court Fines

There was an indication as to the amount of fines collected from the courts of the three member states. Total fines paid during the MCS operations from 2004 to the end of 2008 amounted to US$ 189 388 (Euro 126,822), of which Tanzania contributed 56% (Euro 71,020), Kenya, 28.7% (Euro 36,271) and Uganda 16% (Euro 20,291). The fines collected are insignificant especially if one considers the amount of uncontrolled fishing effort, uncontrolled illegal gears used in Lake Victoria, and the increasing value in the trade of immature fish on domestic markets (Table 2). It was not reported if the funds were directed back into MCS operations or not. Although it was suggested that most of the fisheries legal provisions were harmonized during LVEMP I, there is no indication as to whether the court penalties and fines imposed on the same offences in the three partner states have any reference to the same severity across the region.

8.1.2 Levies

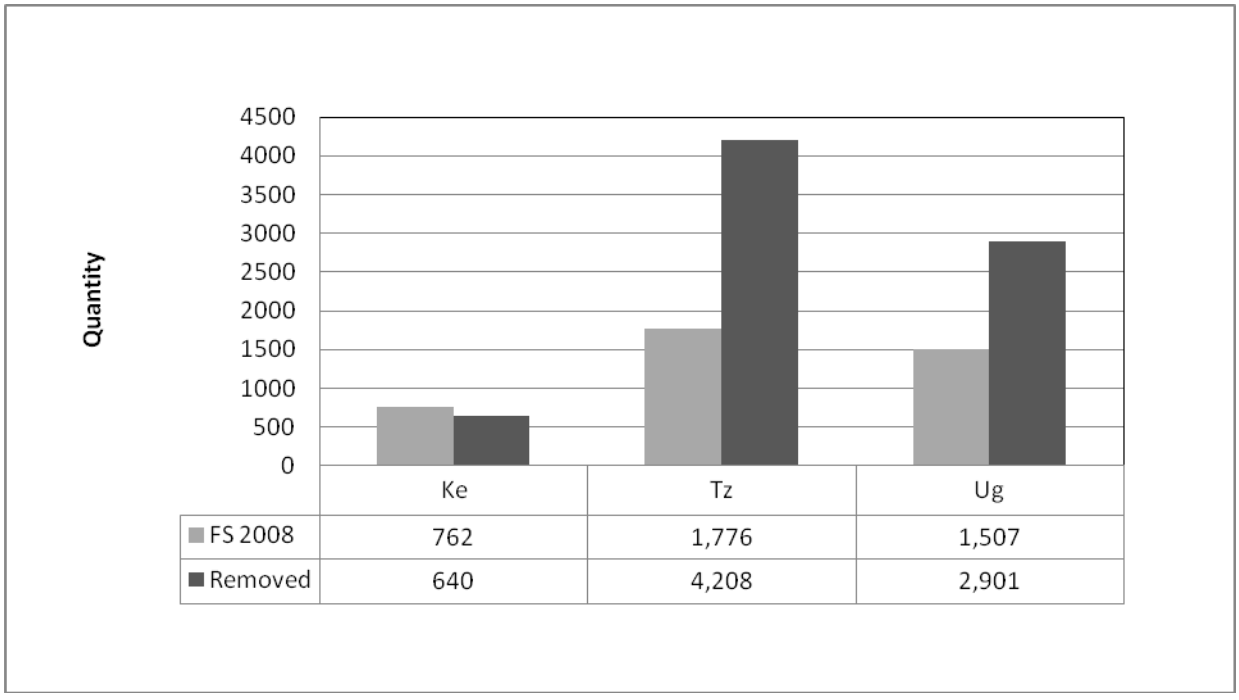
Data pertaining to levies imposed of fishermen was not readily available from district government, fisheries officers or the LVFO. However it was suggested in Tanzania, by the fisheries department, that over a 5-year period levies from the

fisheries sector amounted to approximately TSH 19 billion, or equivalently US$ 10,830,000.00 million (unconfirmed report, pers. comm.), of which zero percent is available for MCS interventions. Data from the frame surveys suggests that Lake wide, the number of fishers has not significantly decreased as Nile perch stocks have declined. This means that despite decline fish stock, levies paid to the national governments would remain relatively consistent. The major financial impact would be however the loss of taxes/revenues generated from exports, and the contribution of the fishery as a whole to GDP. A report by Bagumire 2009, showed that between 1998 and 2008, the contribution of fish and the fishery towards the GDP of Tanzania fell from 1.9% to 1.3%, respectively.

Uganda has also seen a decline on levies/revenues generated from the fishery. In 2008, 24 965 tons of fish were exported from Uganda fetching approximately US$ 124 million in export revenues, which was a reduction of 0.2% in value and 21% in volume exported as compared to 2007 (Bagumire 2009). The author further suggests that the value of fish exports in Uganda has decreased by 14% since 2006, when fish exports topped the countries earnings with US$ 145 million. In 2008 the contribution of fish towards the Ugandan GDP was approximately 1.8%, a decrease of 0.1% from 2007 (Bagumire 2009). The decrease in fish contribution towards the GDP can be explained by decreasing biomass of economically important fish such as the Nile perch, coupled with the global economic crisis and volatile export prices, increase in raw material processing costs and the reduction in purchasing power (global issue). Furthermore cheap export substitutes like (pangasius spp.), from Vietnam is placing economic strain on the Nile perch export market, and consumer awareness towards supporting sustainable fisheries (the Lake Victoria Nile perch fishery is currently not sustainable).

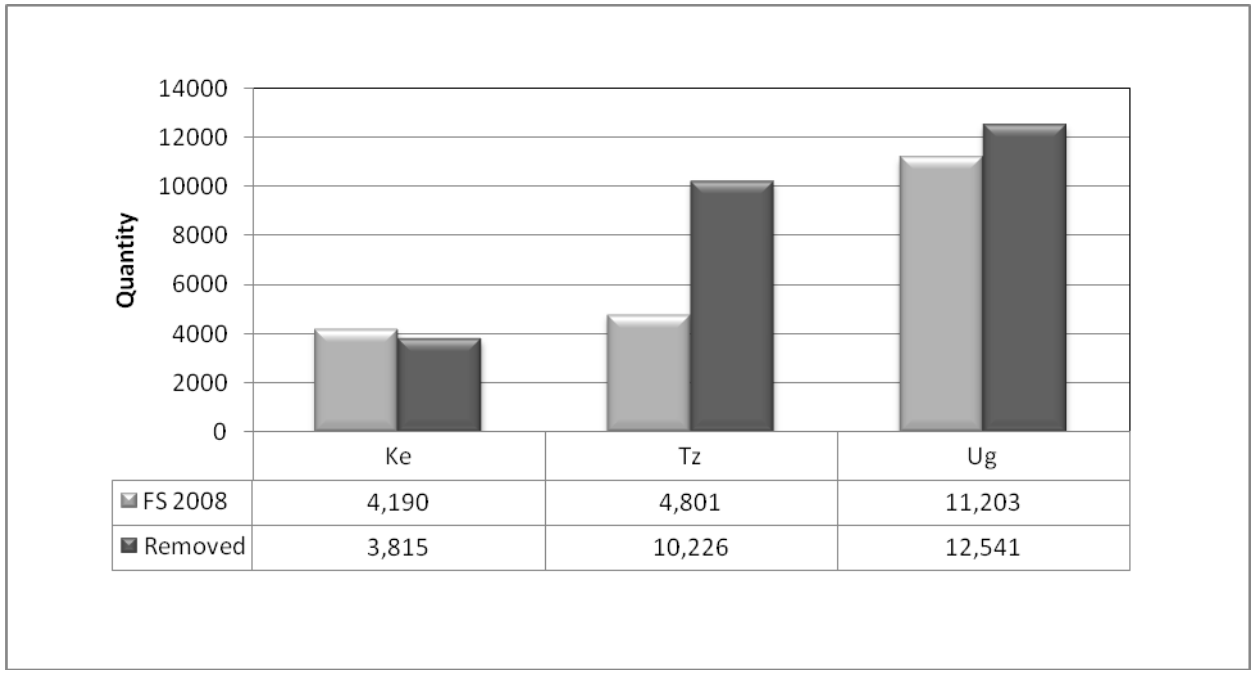
8.2 MCS Interventions based on the Council of Ministers mandate to eradicate illegal gears (January – October 2009):

The three Partner States held a Regional Stakeholders' Workshop in Kampala in November 2008 and came up with the Kampala declaration. The declaration recommended 'zero tolerance' to illegal fishing in Lake Victoria. The implementation of the declaration was scheduled to start by January 2009. To accomplish this, the 7th session of Council of the Ministers (CM) signed a joint communiqué requiring Partner States to implement zero tolerance measure to reduce illegal fishing gears, the capture and trading of immature fish by 50% before June 2009 and 100% by December 2009 using Frame Survey results as a benchmark (RWG-MCS report October 2009). During this intervention, it was reported that 18, 24 and 48 patrols were conducted in Uganda, Kenya and Tanzania between January and October 2009, respectively. No information is available as to the type of patrols conducted, and the actual costs thereof, although a generic budget was provided for district and national patrols (ANNEX 1 and 2). The following results were obtained between January and October 2009.



	Ke	Tz	Ug
FS 2008	762	1,776	1,507
Removed	640	4,208	2,901

Figure 14: Number of beach seine nets confiscated per country compared to the number of beach seine nets observed during the 2008 Frame survey (Figure directly for the RWG-MCS report, October 2009).



	Ke	Tz	Ug
FS 2008	4,190	4,801	11,203
Removed	3,815	10,226	12,541

Figure 15: Number of monofilament gears confiscated compared to those observed during the 2008 Frame survey (Figure directly for the RWG-MCS report, October 2009).

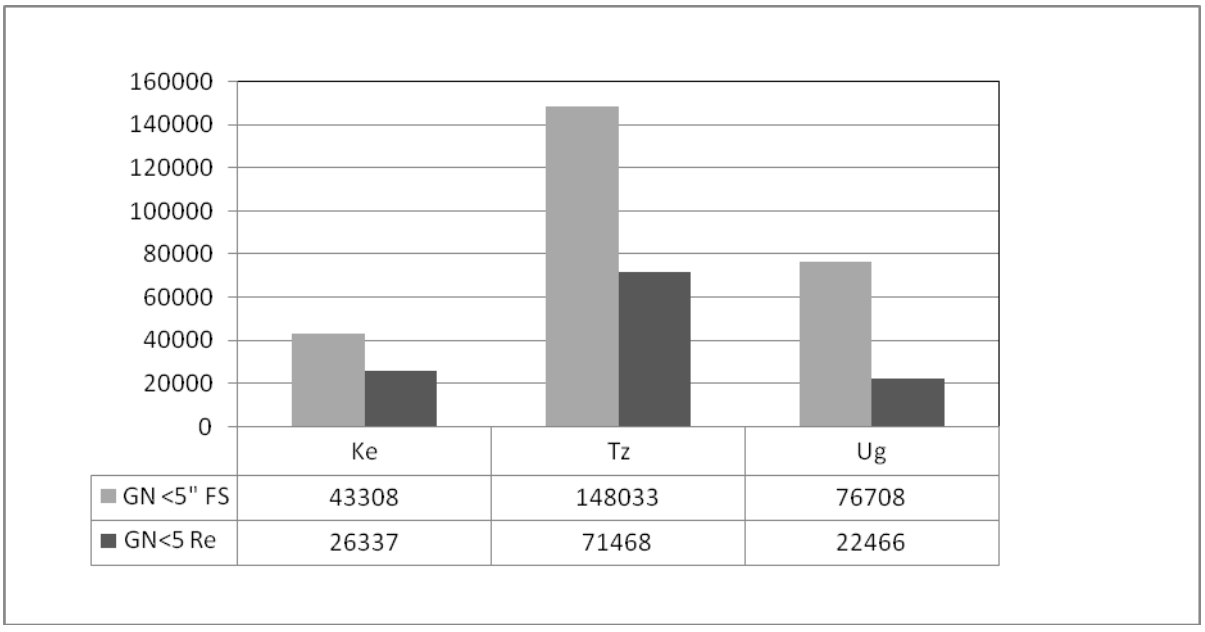


Figure 16: Number of illegal gillnets confiscated compared to the amount observed during the 2008 Frame survey (Figure directly for the RWG-MCS report, October 2009).

Table 3: Reported seizures of illegal fishing gear in the three countries around Lake Victoria, 2009. FS = number of gears reported in the 2008 Frame Survey, MCS = the number seized by the national MCS teams. Based on data presented by the MCS Regional Working Group, Kisumu, October 2009. Gears marked with an asterisk (*) do not target Nile perch (Table acquired from the LVFO stock assessment working group, October 2009).

	Kenya	Tanzania	Uganda			
	FS	MCS	FS	MCS	FS	MCS
Beach seines	762	639	1,776	4,208	1,649	2,900
Gillnets <5"	43,308	26,337	14,033	7,468	76,908	No data
Monofilament nets	4,190	3,813	4,800	10,226	11,203	No data
Cast nets*	**131**		**43**		**1,000**	
Traps/baskets*	1,230		604		7,615	

8.2.1 Discussion regarding MCS initiatives between January 2008 and October 2009:

It is evident that MCS compliance missions are effective in locating and seizing of illegal gears, however it's also evident that despite the attempt to eradicate illegal fishing gears and the trade in illegal fish, MCS operations have not achieved their goal. Comparing the confiscation data and the Frame surveys in figures 14, 15 and 16, it is possible that the quantity of illegal gears used in Lake Victoria has been underestimated in the Frame survey reports or the rate at which the gears are replaced or recycled into the system has been underestimated. For example, with respect to the confiscation of beach seine nets, 1776 nets were observed in Tanzania during the 2008 Frame survey, however 4 208 were confiscated. In Kenya 762 beach seine nets were observed but only 640 were confiscated. Does this imply that either the Frame survey is highly inaccurate in Tanzania compared to Kenya, or beach seine nets more easily accessible in Tanzania compared to Kenya (Figure 14). One could argue that Kenya achieved a 91% reduction in Beach seine nets, but Tanzania experienced a 2.36 net recycling rate (i.e. for every one beach seine net observed during the Frame survey, 2.36 nets are not observed, or will make their way back into the fishery).

A similar observation is made with respect to the removal of monofilament gears (Figure 15). During the 2008 Frame survey, 4 801 monofilament nets were recorded, yet during MCS missions, 10 226 were confiscated. This data implies that nets are easily recycled back into the fishery, i.e. for every one monofilament net observed, 2.12 nets are not observed, or will make their way back into the fishery.

The confiscation of illegal gillnets (< 5 inches mesh size) did not exceed the observations made in the 2008 Frame survey (Figure 16). Results show that Kenya confiscated 60.8% of observed illegal gillnets, Tanzania, 48.2% and Uganda 29.2%. If the total number of illegal gillnets (mesh size <5 inches) are compared to the total number confiscated, then only 44% of the illegal nets were confiscated, which falls short of the council of ministers mandate of complete eradication of illegal fishing gears by December 2009. The RWG-MCS report states that 155.5 metric tons of immature Nile perch was confiscated between January and October 2009. The value of the 155.5 metric tons of Nile perch on the domestic market would amount to Euro 329 660 (value calculated using Euro 2.12/kg as trade price). No catch assessment was conducted in 2009, so it is impossible to determine if the immature fish confiscated impacted the illegal trade of undersize Nile perch.

If one looks at the 2010 catch statistic, approximately 328 708 tons of Nile perch were harvested. Assuming that 10% (an overestimate due to hydro acoustic surveys suggesting that in August 2009, only 1.2% of the Nile perch surveyed were greater than 50 cm TL, approximately 3 972 tons) of the Nile perch are greater than 50 cm TL, then only 32 870 tons of Nile perch would be exported, leaving 295 338 tons of undersize Nile perch to enter the domestic market trade, the value of which is approximately Euro 627,176 million (Euro 2.12/kg). The confiscated immature Nile perch in 2009, when compared to the total landings in 2010 for domestic market only accounted 0.05%, indicating that MCS interventions with respect to curbing illegal trade of immature Nile perch is ineffective.



Image 10: Undersize Nile perch in transport baskets ready to be filleted in Nairobi fish market.

Data inaccuracy is of major concern and threatens the legitimacy of LVFO MCS reports. In figure 16, the MCS-RWG technical report of October 2009 shows the number of gillnets with mesh size less than 5 inches observed during the 2008 Frame survey to be 148 033 (the data does not suggest if this figure includes monofilament nets), yet the LVFO stock assessment working group report of October 2009 shows that the 2008 Frame survey suggests that 14 033 gillnets of mesh size less than 5 inches were counted (error of 134 000 nets) (Table 3, highlighted). Further inconsistencies exist, Table 3 for example reports for Uganda 'no data' available, yet figure 14 suggests that 76 708 gillnets with mesh size less than 5 inches were counted during the Frame survey, of which 22 466 were confiscated. Figure 16 suggests that of the 11 203 monofilament gears counted during the 2008 Frame survey, 12 541 were confiscated, this implies a recycling of nets back into the system of 1.1 (i.e. 1.1 enters the system for each net observed during the Frame survey), yet Table 3 suggests that 'no data' is available for Uganda. MCS is considered the 'executive arm' of fisheries management, built with a solid foundation in information gathering and sharing, it provides the basis from which informed fisheries management decisions can be made. Inconsistencies and errors in data serves to complicate effective fisheries management, the data presented in this report appears to be unreliable.

8.2.2 In Summary, occurrence of illegal gear and illegal fishing:

It is clear from the above that frame surveys only detect approximately 1/3 of all illegal gears; therefore it is likely that the total number of nets reported by the LVFO is under represented by a third (or CPUE is under-estimated by 30%). This is understandable, as it can hardly be expected of fisheries using illegal gear to display or to disclose their use of all or some of the illegal gears during Frame surveys.

What it implies is that:

- MCS efforts to reduce Illegal nets are probably accounting for only 1/3 of all the illegal nets, and therefore not making a discernable impact on their use.
- MCS efforts need to be increased by a factor of 3 to keep pace with the illegal gear deployment.
- Fishers are not deterred by the current enforcement measures as it has limited or negligible consequences.
- BMUs are not effective in front line MCS if compared to management goals, as approximately one in every three people are using illegal gears.
- IUU issue is not affected by any level of fisheries management.
- That market forces are driving the exploitation of small Nile perch and BMU's are not implementing their mandate (for reasons given earlier) to reduce and deter the landing of illegal fish.
- That the next level of MCS, government (local and national) are failing or unable to curtail the distribution of undersized Nile perch,
- MCS remains ineffective in reducing the illegal trade of undersize Nile perch despite their distribution and transport along well know routes, recognized manned border posts and inspected local and regional markets.

It is disconcerting that the mandate provided by the Ministers in 2009, has not been able to be put into practice, despite there having been regional coordination, regional acknowledgement of IUU and the repercussions if continued unabated, and the signed mandate from the council of ministers.

9.0 EVALUATION OF EXISTING AND PAST REGIONAL WORK PLANS:

9.1 LVFO mandate and objective in implementing RPOA-IUU Fishing and RPOA-Fishing Capacity

In the effort of LVFO ensuring its mandate and objectives of regionally managing Lake Victoria's fisheries resources as a single ecological unit and to foster cooperation amongst the contracting parties as provided in its convention, it adopted two main tools of responsible fisheries management borrowed from the Code of Conduct for Responsible Fisheries (CCRF) International Plan of Action on Illegal, Unregulated and Unreported Fishing (IPOA-IUU fishing) and International Plan of Action to control Fishing Capacity (IPOA-Capacity). The two action plans were contextualized into a Regional Plan of Action for IUU-Fishing (RPOA-IUU Fishing) and Regional Plan of Action for Fishing Capacity (RPOA-Capacity) as its operational tools. This set of tools became the basis of operation of LVFO and contains various action plans, which cover broad aspects of fisheries management of Lake Victoria. The target of SMARTFISH to this regional initiative is based on the fact that most fish stocks in Lake Victoria are shared among the three states and therefore meet the criteria under which the IRFS is operating on. This project thus intends to evaluate the action plans for LVFO in order to assess their strengths to fight, deter and eliminate IUU fishing on Lake Victoria and if possible make recommendations on their improvement.

9.2 Action plans from RPOA-IUU fishing

In the context of the Code of Conduct for Responsible Fisheries and its overall objective of sustainable fisheries, the issue of illegal, unreported and unregulated (IUU) fishing is of serious and increasing concern. IUU fishing is known to undermine efforts to conserve and manage fish stocks in all capture fisheries. When confronted with IUU fishing, national and regional fisheries management organizations like LVFO can fail to achieve management goals. This situation leads to the loss of both short and long-term social and economic opportunities and to negative effects on food security and environmental protection. IUU fishing can lead to the collapse of a fishery or seriously impair efforts to rebuild stocks that have already been depleted. Many tools to fight, deter and eliminate IUU globally have failed due to lack of political will, priority, capacity and resources to implement them. Within the framework of LVFO, this is not exceptional, however, under the EU funded IFMP project, work was done on developing MCS structures and strengthening them regionally. The following are the harmonized, agreed and adopted management measures and strategies to be implemented by Partner States of LVFO:

1. To implement the FAO International Code of Conduct for Responsible Fisheries, (CCRF) and the accompanying Technical Guidelines such as Inland Fisheries.
2. To enhance collection of fisheries statistics and socio-economic data.
3. To continue studies on Lates niloticus (Nile perch), Tilapias and Rastrineobola.
4. To assist member countries to put in place policy and legal provisions geared towards fighting IUU fishing.
5. To restrict use of fishing gears with less than the approved mesh sizes of 10 mm, 5 and 7 inches for Rastrineobola, tilapia and Nile perch, respectively.
6. To implement the Nile perch slot size of 50 – 85 cm and gill net mesh size restriction of 7 inches.
7. Not to fish and land Tilapia of less than 25 cm TL.
8. Restrict the use of all illegal gears.
9. To implement closed areas, season restrictions.
10. To develop joint licensing mechanisms.
11. Not to introduce alien species of both plants and fish without consent of the other contracting states of LVFO.
12. To encourage fish stock enhancement.
13. To protect the environment and critical fish habitats.
14. To ensure fish quality assurance and international fish trade.

15. To strengthen collaboration between policy makers, researchers, fishers and other stakeholders.
16. To encourage and promote fisheries associations, cooperatives and credit schemes.
17. To give commitment and assurance for budgetary provision fisheries management, development and research.
18. To provide financial resources for monitoring, control and surveillance and also for preventing deterring and elimination of IUU.

The above 18 points represent the harmonized, agreed action points of the RPOA – IUU fishing, however Table 4, looks at the most pertinent areas of the action plan with respect to MCS, examines the status of implementation by member states and/or the LVFO, and lists possible recommendations in implementing the actions.

Table 4: Actions, implementation status and recommendations of the RPOA-IUU fishing.

ACTIONS	STATUS OF IMPLEMENTATION	PROPOSED RECOMMENDATIONS
1. **Data collection:** Ensure collection of correct fisheries and socio-economic data, analysis, storage and dissemination	Data collection with respect to MCS is recorded at local level (BMU), national level (fisheries departments) and at a regional level (LVFO stock assessments, Frame Surveys etc). The data is however fragmented and unreliable. The EAFISH database is not functional, i.e. data is not compiled, analyzed and shared efficiently or effectively.	• Data collection should be regionally driven and effectively co-coordinated by the LVFO. • Need to invest in efficient management of a regional database center (LVFO), thereby ensuring accountability, accuracy, security, acquisition and dissemination of data to member states.

2. Research: Ensure that continued research on the status of Lake Victoria's fish resources is routinely carried out. **3. Reduce illegal gears:** Restrict use of all illegal gears in the waters of Lake Victoria. Illegal gears include for restriction are: Gillnets with < 7 inch (Nile perch) and < 5 inches mesh size (for tilapia), hook sizes < 10, monofilament nets, cast of throw nets, poisons, dynamite, trawling and beach seine nets.	Current stock assessment sampling techniques include: • Hydro acoustic surveys • Trawl assessments • Catch assessments • Frame surveys • Gillnet surveys However due to financial restrictions, only Frame and hydro acoustic surveys have been conducted as to schedule. Currently, Nile perch stocks are on the brink of collapse, highlighting the need for sustained and focused data monitoring research. Data pertaining to the amount of illegal gears deployed in Lake Victoria are based on biennial Frame surveys. The data therefore is subject to scrutiny, and may not reflect the true extent of illegal gear usage in Lake Victoria. • Regional MCS patrols: Regional patrols coordinated by the LVFO have not been effective in reducing illegal gears deployed in Lake Victoria. Regional patrols depend on donor funding (no regional patrols have been conducted since 2009 after the termination of the IFMP project). • National MCS patrols: Occur stochastically and are dependent on availability of funds from the respective national governments which sometimes is not adequate and does not come as soon as is needed.	It is important to conduct focused research on the following key areas: • Illegal trade of fish in domestic and regional markets. • Socio-economic implications in improving data collection and MCS compliance. • Economic trends and incentives for MCS. • Research pertaining to biological indicators (size at first maturity of Nile perch, and the interaction of the major commercial species in Lake Victoria). • Seek sustainable funding for long-term research from government (it can be developed through institutionalization of prior proposed Fish Levy Trust Fund). Continued research to refine and conduct trainings not only to community members, Reducing illegal gears on Lake Victoria should be the top concern of regional and national fisheries managers, BMU's, communities and fishers. The diversity of stakeholders represents a diversity of knowledge and understanding. Therefore key recommendations include: Sustained, long-term training and capacity building within BMU's; • Financial support or incentives to motivate BMU members to undertake MCS initiatives; • Training aimed at government, senior fisheries managers and politicians on economic and social indicators related to IUU fishing; • MCS training for regional and national fisheries staff, including

	• BMU and MCS BMUs are key role-players towards effective MCS. BMUs control vessel registry, fisher licensing and gear registries. However, complex social issues and financial constraints often complicate data collection and MCS interventions. • Technical MCS procedures Currently, the net mesh size is measured with school rulers and confiscated nets are not defined with respect to length of material etc. • State of MCS equipment: Currently, regional MCS patrol vessels are not in good working condition. Equipment available for MCS is variable amongst national fisheries departments but due to lack of adequate finances is underlined as a key issue.	data collection and confiscations among others. • Training pertaining to technical MCS, i.e. what defines a confiscated net (is a net 80 meters in length or 1 kilometer need to be standardized). Also net measuring techniques etc); • Carry out awareness campaigns highlighting the state of illegal fishing, the social impact and the need for MCS to all stakeholders; • Training on how to challenge corruption, political interference, sabotage of MCS patrols etc. This should be an information-sharing platform organized at a regional level; • Training for fisheries officers with respect to recognizing IUU activity and what constitutes illegal gears; • Technical assistance in equipment maintenance and care. • Explore more economical modes of conducting patrols, including using the scientific trawl vessels.

3. Control landing of illegal fish: **Restrict fishing and/or landing of Nile perch and Tilapia of less than 50 cm and 25 cm total length, respectively.**	The decline of Nile perch greater than 50 cm TL, and therefore a decrease of export quality fish, has resulted in targeted fishing for smaller undersize Nile perch. Nile perch landed have two key markets: • Industrial fish processing for export to the global market. • Undersize landings for domestic and regional markets. Fish processing industries through their national and regional organizations strictly adhere to self-regulation protocols. This protocol involves use of independent fish inspectors who are mandated to inspect all Nile perch processing facilities randomly. Only 3% of all Nile perch that enter the factory can be allowed to be less than 50 cm TL due to human error. As a penalty of lack of compliance to this, export bans are imposed to affected factories (if more than 3% of Nile perch entering the factory are less than 50 cm TL) • Domestic and regional fish trade and MCS: Most of the regional and domestic fish routes and market outlets are not controlled allowing illegal Nile perch easy trade access.	The informal trade of undersize (less than 50 cm TL) Nile perch is of critical concern for two main reasons. Firstly, the decrease in export size Nile perch has resulted in fishers deliberately targeting undersize Nile perch often using illegal gears. Secondly, though self-regulation by fish processing factories is effective, and MCS to deal in the informal trade sector is literally non-existent (despite the dramatic increase in domestic and regional trade). To be able to address the issues of MCS in this field, key recommendations include: • Strengthening BUMs' capacity through financial means. • Strengthen the link between BMU and district government fisheries officers. • Institute sustainable long-term financial incentives for BMUs from funding generated by licensing and levies obtained by national governments. • Decrease the reliance of national and regional governments on donor funding for basic fisheries management interventions. • Train local fisheries officers to identify, and accurately gather evidence of illegal fish trade in local markets. • Train inter-governmental agencies (border police, customs officials, police, military etc) to identify illegal fish, especially illegal fish traversing borders. • Revisit the 50 cm TL legal size of Nile perch, with the possibility of creating a legal size Nile perch for domestic trade (42 – 49 cm TL can legally be traded, thereby contributing to legal generation

		• any trader caught with Nile perch less than the legal domestic size can be prosecuted accordingly. • Institutionalize independent team to survey BMUs to gather baseline data on their effectiveness on the matters of MCS.
4. Restricted fishing areas, seasons and fish species: Implement restrictions to fishing in closed areas and adequately researched seasons and associated fish species.	The issue of closed areas, seasons and fish species is still not harmonized and where closed areas are gazetted in the regulations, demarcation and marking on the ground has not been done.	There is need first to harmonise these provisions among the partner states and second undertake the process of identification, gazetting and demarcation. It is after these processes are done that plans to protect them can be institutionalized and sustainable sources of funds for their protection established.
5. Joint licensing mechanisms:	The national operators have not established modalities of doing this, though nationally, joint licensing through use of BMUs may have been explored.	LVFO should initiate the process and form a platform where such activities can be harmonized.
6. Protect the environment and critical fish breeding and/ or nursery grounds:	Identification of critical fish breeding and or nursery areas especially for the three important species and the clarification of environmental issues need to be clearly defined from scientific assessments and harmonized regionally.	• Process should be driven by the LVFO at a regional level. • Process driven by scientific investigation. • Conduct training and sensitization to BMUs, and fisheries managers as to the importance of nursery areas and holistic ecosystems based management. • Process must be harmonized at a national level and managed regionally.

7. Provide financial resources for MCS:	This is a recurrent problem which is normally tackled nationally when states prepare their budgets for fisheries management i.e. MCS are prioritized with other services and therefore what is allocated to fisheries management depends on other important national priorities. Usually, fisheries are classified together with crop and animal sectors of agriculture and take the lowest financial portion of the national budget in that sector.	Fisheries management aspects are complicated, expensive and often in conflict with political agendas because fisheries resource falls under "open access policy" falling in the category of areas of natural resources considered to be suffering under the "Tragedy of Commons". It is therefore imperative to create awareness among the politically elected leaders that fishery management and the sustainable use thereof are important economically, socially and politically and therefore requires government financial support and political will.

9.3 Action plans from RPOA-Fishing Capacity

Globally, the issue of excess fishing capacity in fisheries is an increasing concern. Excessive fishing capacity is a problem that, among others, contributes substantially to overfishing, the degradation of fisheries resources, and decline of food production potential, significant economic waste and social loss. In furtherance of the commitment of the partner states of LVFO towards CCRF is geared towards achieving an efficient, equitable and transparent management of fishing capacity, they agreed that there was need to elaborate and adopt action plans under IPOA-Fishing Capacity into a Regional Plan of Action on Fishing Capacity (RPOA- Fishing Capacity) for Lake Victoria. This development of RPOA-Capacity was based on shared understanding amongst partner states on the use of fisheries rights-based management approaches as a vehicle for ensuring the sustainable utilization of fisheries resources in the lake. The process of developing RPOA-Fishing Capacity was done through three stakeholders meetings held in Mwanza, Tanzania (9-10 October, 2006), Kisumu, Kenya (12 -13 October, 2006), and Mukono, Uganda (17-18 October 2006). Key areas associated with fishing capacity were explored and appraised to determine their relationship with RPOA- Fishing Capacity. It was clear throughout the stakeholder meetings, that fishing capacity had not been incorporated into Lake Victoria fisheries management protocols. The meetings served to bring the stakeholders together with the assistance of FAO to establish a mechanism for the control of fishing capacity in Lake Victoria. The following key areas were underlined regionally as focal points in developing a fishing capacity management strategy which include:

- Policy development.
- Legal issues.
- Technical (training and capacity) issues.
- Environment and the sustainable use of resources.
- Socio-economic issues, relating to incomes, increasing population.

Table 5: Focal points of the RPOA-Fishing Capacity in relation to the challenges faced in the implementation of the action plans and recommendations.

ISSUES	CHALLENGES	RECOMMENDED SOLUTIONS
1. Policy issues:	Different investment policies among riparian countries have resulted in the lack of harmonized regulations to deal with fishing capacity. Fishing overcapacity is responsible for persistent use of illegal fishing gears and methods aimed at maximizing fishers' returns. Lack of compliance with agreed regulatory measures. Illegal cross-border fishing and fish trade. Weak monitoring and law enforcement. Lack of legitimate demarcated fish landing and fish spawning/breeding areas. Policies formulated by Political technocrats should be ratified by politicians at National and Regional level.	• Data collection should be Harmonization of fisheries investment policies and license fees for the three riparian states is needed and LVFO can take lead in bringing the states together in order to build consensus on the matter. Harmonise registration and licensing of fishers, boats, and fishing gears including setting the maximum capacity of the lake and agree on modalities of its enforcement. LVFO need to explore, monitor in order to establish levels of compliance identify associated challenges and develop a mechanism to follow and ensure compliance by partner states is achieved. Partner states need to come up with harmonized approach to deal with trans-boundary issues including conflicts (inter-agency communication and training required). Partner states to increase efforts in dealing with MCS issues and LVFO to establish an independent monitoring mechanism (determine MCS effectiveness). Create a forum to discuss the issue and develop a consensus among partner states, including agreeing on the most appropriate strategy to create, demarcate, monitor and protect sensitive areas within the lake. 1. Create channels for sensitizing politically elected leaders on their roles for effective participation in the management of the Lake; 2. Involvement of stakeholders

	Weak monitoring and law enforcement Divergence of fisheries policy in the three riparian states High population growth in the lake catchment area. Inadequate financing to fisheries sector. Inadequate personnel to address technical fisheries issues. Inadequate public awareness of fisheries policies.	unreported and unregulated (IUU) fishing;
2. Legal issues:	Out dated legal frameworks, and the lack of legal structures at the regional level including delays in the enactment of pending Fisheries Bills (e.g. Uganda) has strongly contributed to weak enforcement of RPOA-Capacity. Also amongst riparian states there is porosity in understanding the rights of stakeholders, and the challenges by which the laws can act in preventing illicit fishing activities. Lack of enabling collaborative laws for the BMU's and Local government. Legal measurers to ensure there is concerted effort in the fight against illegal fishing in the closed areas, and closed seasons are not clear nor identified.	1. Need to review and harmonise legal frameworks, which support MCS of Lake Victoria. 2. LVFO to take the lead in ensuring that partner states are brought together to discuss and agree on reviewing of their laws in harmony with other countries sharing the lake. 3. There is need for efficient training of all stakeholders on the legal capacity with respect to fisheries management and illicit fisheries activities. Development and harmonization of enabling collaborative laws, e.g. ordinances and by-laws especially to be used by BMU's and Local governments. LVFO should motivate for the appropriate training and workshops in developing and sharing amongst riparian states a standard operating legal procedure based on closed/ breeding areas and closed fishing seasons.

3.	Environmental concerns:	Environmental issues affecting the fisheries are not properly addressed (i.e. pollution, water quality etc). Mechanisms to deal with the effects of trans-boundary rivers to lake basin and lake ecosystems not established Water abstraction along trans-boundary rivers, which are essential for fish migration. Environmental laws are not integrated with fisheries laws. Poor enforcement of land use laws leads to erosion and deforestation. Smoking fish for regional and domestic fish trade and the local coal industry has lead to the complete disappearance of trees on the islands, and areas surrounding Lake Victoria. Pollution of fish habitat and degradation of wetlands. Lack of control of solid and liquid wastes into the lake Universities and Research institutions failure to collaborate in researching and providing the information of concerns to the lake Environmental issues affecting the fisheries not well articulated in the RPOA-Capacity; Lack of proper sanitation at the beaches.	Environmental related problems are not directly related to MCS but for a healthy lake ecosystem, the issues should be explored and means of addressing them agreed among the partner states and recommendations forwarded to Lake Victoria Environment Management Programme (LVEMP II) Trans-boundary river and river basins development authority/authorities are needed where they do not exist and where they exist, they should be charged with responsibilities of controlling the activities in the rivers and their basins. Policy and legal reviews are necessary among partner states in order to address the problem. LVFO has the mandate to bring the issue to the attention of LVEMP II for discussion and guidance arrived at. Integrate relevant sections or parts of environment laws of partner states in fisheries law especially the ones targeting all forms of water pollution. 1. Regional land use laws need to be harmonized and Inter-regional collaboration in the enforcement be arranged. NB: In this case, Rwanda, which is the source of River Kagera should be included in the finding of the solution to the problem. 2. Training on environmental resource sustainability amongst all stakeholders must be conducted, with a long-term vision of generating more sustainable alternative incomes.

		Need to explore what type of pollution is occurring in critical fish habitats and consequently develop mitigation measures. Need for creation of awareness among community around the lake, fishers, operators of water transport and Municipal authorities locate at the shores. 1. LVFO through relevant institutions in the partner states to institute a dialogue between them. 2. Universities and fisheries research institutions to find a working mechanism of collaboration in the area of concern. It is important to review RPOA-Capacity in order to include relevant environmental issues affecting fisheries as part of the RPOA. Ministries concerned in the partner states should liaise with BMUs to be involved in beach planning and management.

4. Socio-economic concerns:	Absence of regional policy on social and economic issues. Insufficient re-investment of revenues collected from fisheries; Exploitation of fishers by the 'middlemen' (traders, fishmongers etc.). Poor land use practices in the catchment's basin. Lack of age limit to those who are supposed to be licensed as fishers. Lack of collaboration between researchers and BMU's. Need to develop alternative incomes.	Defined at national government level, then harmonized regionally and information disseminated through stakeholder training workshops. Modalities of re-investing revenue collected from fisheries can be explored and operationalised 'Middlemen' operations are not well covered in the partner states rules and it is important to have them well provided for in the fisheries legal frameworks for the three partner states. A multi-disciplinary approach to ecosystems based management should be adopted by governments. Enforce age limit to exclude children (child labour), from entering the fisheries. Researchers to work together with BMUs for better inclusion in fisheries sector. Need to develop legitimate, long-term sustainable alternative incomes targeting the young people around the lake basin.

5. Political issues::	Differing and contradictory political goals among different or competing politicians. Lack of political will to fight corruption in the fisheries sector. Inadequate commitment of politicians to resolve fishers' problems. Changing policies with changing political regimes. Conflict of interest in resource use among different users. Elected political leaders lack proper channels of communication for effective participation in the management of the Lake Political interference International boundaries in the lake not well defined on the lake Different levels of decentralization in the three countries Political interference in law enforcement and management of fisheries.	Creation of awareness amongst politicians from the three partner states on their political roles in fisheries MCS and how their political goals can be developed in liaison with the fisheries sector. Corruption is a major issue facing the region and the sustainability of fish resources. Sensitization of politicians on political positive elements of fisheries, which they can use for their political mileage. This can make them committed in fisheries MCS issues without fear losing politically. Explore how fisheries policy issues can survive changing political regimes. Need to establish key players in fisheries management and set rules of conduct to avoid conflict of interests. Channels for sensitizing the MPs and Councilors on their roles for effective participation in the management of the Lake need to be created Sensitization of politicians on importance of MCS for future survival of the fisheries and continued social benefits. High-level discussions on territorial boundaries in the lake are ongoing between two partner states and this forum can expand its mandate to all the three states. Need to study how devolved organs of the governments can have positive impacts on the fight against fisheries illegalities. Political interference is evident, especially during elections and mechanisms to address the issue should be developed.

6.	Security issues:	Insecurity of MCS teams while in the lake.	Need for joint patrol with Security, Community and Fisheries Department and explore mechanisms for the sensitization of community on the importance of fisheries to the community and introducing community policing in the areas of MCS operations.
7.	Cross cutting issues:	There are no clear procedures for streamlining donor funding. Fisheries sector lacks lobby groups/ persons to lobby for adequate funding from national budgetary systems among partner states for effective fisheries MCS. There is lack of capacity building among the fishers There is lack of awareness among the stakeholders and the general public on the issues of conservation and sustainability of fisheries resources and also economic gain. Disregard of indigenous knowledge in MCS issues among the modern fisheries scientists	Donors can engage with relevant management authorities so that aid finances do not overlap other projects, and that governments do not squander donor funds (donor accountability). Need to have actors that can lobby for better budgets (development partners and even government to lobby). There is need for building capacity among the fishers. Awareness creation for the stakeholders and the general public for conservation and sustainability of resources and economic development is necessary. Available Indigenous knowledge among the fishers can be captured, documented and utilized in management and safety of fishers around the lake.

10.0 MCS INTERVENTION "OPERATION SAVE THE NILE PERCH"

The SMARTFISH Result 3 is an initiative to strengthen Regional MCS tools to combat IUU fishing. Currently Lake Victoria and the three riparian states are facing a probable social crisis in the destruction of the economically valuable Nile perch stocks. Current MCS initiatives have not had the desired effect on curbing illegal activities or understanding fully the extent of illegal fishing and trade of undersize Nile perch. There is however a consensus in thought and understanding between the riparian states fisheries experts that if no immediate MCS interventions are implemented, then there is a real possibility of social instability through loss of livelihoods, incomes and food security, especially as the Lake Victoria region has an annual population growth rate of 3%. The EAC Council of Ministers in 2009 launched the 'Operation Save the Nile Perch' (OSNP), which required each of the three member states to contribute US$ 600 000. The goal of the initiative was to target illegal fishing and to curb the trade in undersize Nile perch currently threatening the economic integrity of Lake Victoria. The target of OSNP, as ratified by the Council of Ministers was to have fisheries illegalities in the lake, based on the 2008 frame survey data as bench mark, reduced by 50% in June and 100% by December 2009. In order to realize this target, partner states were requested to prepare action plans, which were harmonised and adopted as the modes operandi of OSNP. The crisis management framework for the recovery of Nile perch under the thematic area of MCS proposed the following:

- 'Pre Operation Save the Nile Perch': Included awareness campaigns of the state of Nile perch resources, and the potential loss of livelihoods if the fishery continued as is (estimated time frame 4 weeks, estimated cost US$ 150,000.00).
- 'Operation Save the Nile Perch': Action campaign to confiscate illegal gears, fishing vessels, and crack down on the illegal trade of undersized fish etc. The Frame survey results from 2008 were to form the benchmark of the success of the operation (estimated time frame 14 days, estimated cost US$ 1,350,000.00).
- Continued 'on water' MCS activity: Monthly patrols (national and district) planned for all 37 districts (estimated timeframe 24 months, estimated cost US$ 3,860,000.00).
- Land based MCS operations: Continue land-based operations in domestic and regional fish trade markets and routes (estimated time frame 12 months, estimated cost US$ 150,000.00).

The following total cost of the initial MCS operation place, including continued monthly district patrols of the crisis management "Operation Save the Nile Perch" intervention amounts to US$ 5,510,000.00 million. Based on the three member states each contributing US$ 600,000.00, the total combined funding for the OSNP from the member state governments equates to US$ 1,800,000.00 million, leaving an outstanding amount to be raised by donors of US$ 3,710,000.00 million. Presently Kenya has paid the required funds, with Tanzania only contributing 31% and Uganda zero. Currently as of 2011, less than half of the required funds from the member states have been raised, undermining the legitimacy of 'Operation Save the Nile Perch', political will with respect to the operation and MCS operational capacity. The total two-year budget for OSNP required to sensitize politicians, communities, conduct monthly patrols, collect conduct stock assessments and to enhance data storage and capture, amongst others is approximately US$ 9.47 million (Emergency budget ANNEX 3).

Based on the efforts and MCS initiatives highlighted in this report, a two-week intensive operation to eradicate illegal gears and curb the illegal fish trade will not be effective. However as OSNP is a ratified agreement by the CM, it is an entry point for SMARTFISH to contribute to targeted patrols and training over a 23 month period, which would contribute considerably to the social welfare of the Lake Victoria region by reducing illegal fishing effort, developing operational capacity, allowing the member states to restructure their funds to more accurately monitor the success of the fishery and most importantly getting OSNP operational. The entry point of SMARTFISH (Table 6) would first be to undertake the initial remedial action as budgeted by partner states (Annex III) through MCS training, and thereafter to use the trained personnel in carrying out intensive and continuous lake wide MCS operations for the duration of the SMARTFISH project.

11.0 DEVELOPMENT OF AN ACTION PLAN

During the MCS workshop held in Jinja, Uganda between the 5th and 7th of October 2011, a platform of discussion and knowledge sharing was established whereby fisheries managers and MCS staff could critically analyze the state of National and regional MCS. The platform allowed the harmonization of MCS challenges to discussed and agreed upon (ANNEX V). The harmonized challenges formed the basis of an action plan for effective MCS in Lake Victoria both nationally and regionally. The action plan is summarized in Table 6 below.

Table 6: Proposed action plan based on the outcomes of the MCS workshop in Jinja, Uganda. Bold text suggests possible entry points for the SMARTFISH programme Module 3 focusing on MCS interventions.

Goals	Verifiable Indicators	Assumptions
Sustainable integrated and harmonized regional MCS for Lake Victoria.	Clear data reflecting reduced IUU fishing and increase fish biomass for three main target species of fish (Nile perch, Tilapias and Rastrineobola) in Lake Victoria.	All players including politicians are in support of the fight against IUU fishing and that policy and frameworks harmonized to be in conformity with requirements to carry effective MCS in the lake
Purpose	Verifiable indicators	Assumptions
To reduce IUU fishing in Lake Victoria to a level that can allow the biomass of the three main target species of fish in the lake.	Clear data collected from Frame surveys, stock assessments, Hydro acoustics, trawls, and gear reflecting increase biomass of target species and fish confiscations, arrests, successful convictions and court fines.	All players are well trained, facilitated to carry out MCS operations and their security assured at all times of operations
Outputs	Verifiable indicators	Assumptions
1. Develop a regional and national mechanism to ensure sustainable funds are made available to support national and regional MCS operations including data collection.	Data on national budgetary provisions reflect increments in all the countries and MCS data show improvement.	Political will must be developed and financial policy and legal adjustments and amendments are undertaken to accommodate new demand.
2. Reduced trade in immature fish through training and capacity building, as it is the major avenue in the support of IUU fishing in Lake Victoria.	Reliable data on the arrests of traders, confiscations of fish and impounding of vehicles, successful prosecutions, and convictions.	National budget for the support of MCS and reduction political interference in MCS operations.
3. Improved national MCS capacity through provision of state of the art MCS equipments, facilities and technical, professional training and facilitation in MCS operations.	Number of equipments and necessary facilities provided and the number and relevance of personnel trained or recruited for MCS purposes	National governments willingness to procure the necessary equipments, facilities, tools and training services.

4. Improved capacity for the BMU's regionally including their networks for them to be able to effectively carry out grassroots fisheries management responsibilities including MCS activities within their areas of jurisdictions i.e. having a beach based MCS operations.	Number of empowered BMU's and MCS data of their operations	Commitment from the major players in empowering them is necessary
5. Ensured MCS equipment and facilities for the entire region are adequate and in working order.	Number of rehabilitated or procured MCS equipments and other necessary facilities	Partner states and donors willingness to provide funds to rehabilitate or procure MCS facilities and equipments
6. Reviewed fisheries policies and legislations with no gaps	Number of policies and pieces of legislations reviewed and gap cleared	Partner states willingness to review the policies and legislation with support of donors
7. Ensured timely sharing and dissemination of available and reliable MCS information to the fisheries management stakeholders	Working and linked databases at both fisheries national (focal points) and regional data centre at LVFO.	Partner states and LVFO willingness to ensure the existing data collecting, compiling and management centers are linking and working
8. A proper system of MCS data collection analysis, storage, and management at both national and regional centers is established	Working and talking MCS databases both at national and regional centers.	Partner states, LVFO and their donors' willingness to fund for the revitalization of the existing data working systems as well as procuring both soft and hardware necessary for reactivation.
9. Established economically and attractive viable alternative livelihood especially among the youth persons around the lake basin.	Number of economically viable livelihoods activities among the youth and the number of youth engaged in such activities	In the first place, the youth and general populace must agree to rethink business/ economic way in order to establish the difference in economic returns in new investments with respect to fishing enterprises. Secondly, training in entrepreneurship is necessary.
10. Established a sustainable working regional observer and joint patrol program	Number of observations made and effects on MCS achievements	Willingness of partner states in having the observer program both nationally and regionally

12.0 SUMMARY AND CONCLUSIONS

The unregulated capture of approximately one million tons of Nile perch in Lake Victoria over the last decade has not only severely jeopardized the social welfare of about 4 million inhabitants that depend on Lake Victoria's fish resources for their livelihoods, but also the economic investment and contribution of the fishery to the riparian states economies. The main contributing factors to the dramatic decline of Nile perch biomass in Lake Victoria are, illegal fishing, the uncontrollable use of illegal fishing gears, the fast rate of gear recycling back into the fishery (MCS appears to be only identifying one third of all illegal gears), the uncontrolled access to the fishery, disorganized national and regional MCS initiatives, lack of political will, lack of funding from the riparian state governments, a lucrative domestic market for the trade of undersize fish, a dependence on donor funding (aid), the inability of BMU's to efficiently conduct MCS interventions, corruption, unreliable fisheries management/MCS data and a lack of regional fisheries management in general. Inaccuracies, inconsistencies, and a lack of reliable scientific, MCS, biological and social data undermines the ability of fisheries managers to develop pro-active, adaptive and contextualized management measures, resulting in a crisis instead of a precautionary fisheries management approach. In Lake Victoria for example between 2000 and 2004, the Nile perch stocks declined significantly, but as no donor funds were available for stock assessments, the decline continued unnoticed. Today, biological indicators (average fish size, size at first maturity etc.) suggest that the Nile perch stocks in Lake Victoria are on the precipice of complete collapse, which would have profound socio-economic effects. The reality is that there is a clear an imminent crisis with respect to the fisheries resources of Lake Victoria, the consequences of which will have a ripple on effect locally, nationally, regionally and internationally. Forced into a state of crisis fisheries management, the success of MCS interventions today, are for the immediate and long-term benefit of all resource stakeholders.

Regional capacity to manage Lake Victoria's fisheries resources is possible, as the relevant structures have been institutionalized. The East African Community Partner States of Kenya, Tanzania and Uganda formed the LVFO in 1994, to holistically manage the utilization of Lake Victoria's living resources. Currently, MCS initiatives coordinated by the LVFO and national partner states is ineffective in deterring IUU fishing and the trade of illegal fish in domestic and regional markets. Initially international export markets drove the fishers to harvest Nile perch, coupled with financial investments by the private sector in developing industrial fish processing factories, the Nile perch fishery quickly developed into a lucrative industry, supporting millions of people financially. As Nile perch stocks declined to their lowest reported biomass in 2008, industrial fish processing factories began to close. Data supplied by the LVFO suggests that Nile perch greater than 50 cm TL (legal size for export) represent less than 2% of the total Nile perch biomass. If this data is accurate, the export market for Nile perch has collapsed. Tanzania and Uganda have already experienced a decrease in GDP contribution from the Nile perch fishery of 0.6% and 0.1%, respectively. Currently the Nile perch fishery in Tanzania contributes only 1.3%, to GDP, compared to 1.9% in 1998. Similarly in Uganda, exports of Nile perch decreased by 14% since 2006 (a reported loss of Euro 21 million), and in 2008 only contributed 0.7% of GDP (compared to 0.8% in 2007). The decrease in fish contribution towards the GDP can be explained by decreasing biomass of economically important fish stocks, coupled with the global economic crisis and volatile export prices, increase in raw material processing costs and the reduction in purchasing power (global issue). Furthermore cheap export substitutes like (pangasius spp.), from Vietnam is placing economic strain on the Nile perch export market, and consumer awareness towards supporting sustainable fisheries. Ironically faced with a crisis, the fishing pressure for Nile perch has not reduced, despite the potential social and economic consequences. With poor prospects in the future of the Nile perch export industry, fishers have turned to generating incomes/livelihoods by trading undersized Nile perch on domestic and regional markets. In doing so fishers are actively targeting undersize Nile perch using an assortment of efficient illegal gears. Currently it appears it that illegal trade in Nile perch far exceeds the legal trade by volume and value (Table 2), which if left unchecked will compromise the biological integrity of the Nile perch fishery in Lake Victoria and the livelihoods of those that depend on it.

Fishers are not deterred by the current enforcement measures as it has limited or negligible consequences. BMU's, considered the frontline of MCS, are critical in their role to curb illegal fishing activity at the community level, however BMU's have fallen short of their mandate in effectively implementing MCS. The barriers to successful voluntary MCS/co-management are complex and involve, but are not mutually exclusive to social structures, financial support, political

interference, safety and security (retribution from illegal fishers). Currently BMU's are not financially supported by their respective governments are not represented at the decision making level, with respect to fisheries management, therefore there is little incentive to effectively engage in potentially dangerous MCS interventions. With respect to the Lake Victorian fisheries sector, BMU involvement and participation in management is critical if the resources are to be sustainably harvested.

The underlining structure of fisheries management is MCS and in particular data collection, analysis and dissemination. Currently, fisheries data for Lake Victoria is fragmented and unreliable. Data provided by the LVFO with respect to the stock assessment conducted in 2008 suggested that 309 102 tons of Nile perch were harvested from a total Nile perch biomass of 298 394 tons, which is impossible. The report highlights further data inconsistencies, however unreliable data serves to undermine the very integrity and legitimacy of fisheries management decisions, which is currently the scenario facing the LVFO. Partner states and the LVFO have to focus on data issues with respect to social, MCS, economic and biological data if Lake Victoria's resources are to be managed according to the LVFO mandate.

MCS interventions reported by the LVFO MCS-RWG suggest that MCS activities are highly dependant on donor funding. Where donor funds are not available, MCS operations, with particular reference to regional MCS operations stagnate. MCS data highlights a number of concerns, which include, but is not mutually exclusive to:

- The underreporting of illegal gears in Frame surveys by about 30%.
- Net and gear confiscations are reported but not defined (the reduction in fishing effort can vary greatly depending on the net length).
- It appears that MCS interventions offer little deterrent to those who are involved in illicit activities.
- MCS is ineffective in preventing the trade in undersized fish.
- Government/fisheries managers are unable to prevent/reduce illegal fishing activities or the trade in illegal fish.
- BMU's are not effective in their mandate.
- Data inconsistencies, inaccuracies are common.
- Ineffective MCS interventions (Operation Save the Nile Perch).

Operation Save The Nile Perch is one such example of a failed MCS intervention. Faced with the crisis of biological and financial collapse of the Lake Victoria Nile perch fishery, the three riparian states were unable to source the finances to initialize the OSNP intervention despite full ministerial support. OSNP was conceived and mandated for operation in 2009, yet as of the end of 2011, little has transpired, which jeopardizes the integrity of national and regional fisheries management and the political willingness to tackle the issue. Despite the inability of OSNP to become operational, it has however provided an operational platform ratified by the Council of Ministers where donor funding/MCS operational and technical support can be channeled.

The SMARTFISH Result 3 module is an initiative to strengthen Regional MCS tools to combat IUU fishing. The programme aims to assist the LVFO and the established regional and national MCS committees to implement and carry out MCS trainings, operational support and sharing of expertise. During the MCS workshop held in Jinja, Uganda in October 2011, national and regional fisheries managers and MCS staff harmonised a set of challenges and possible interventions required to rescue the Nile perch fishery from complete collapse. The harmonised challenges formed an entry point for the SMARTFISH programme to develop a strategy to assist in some aspects of the implementation of the OSNP intervention and the haronised action plan. The following challenges were considered key for the SMARTFISH programme:

- Harmonised Action Plan: Reduced trade in immature fish through training and capacity building, as it is the major avenue in the support of IUU fishing in Lake Victoria.
- Harmonised Action Plan: Reviewed fisheries policies and legislations with recommending possible revisions.
- Harmonised Action Plan: Established a sustainable working regional observer and joint patrol program for land and lake based missions.
- Harmonised Action Plan: Improved national MCS capacity through training support, technical and professional training and in some circumstances MCS equipment provisions.
- Harmonised Action Plan: MCS operational support and expertise.

- OSNP: Pre operation save the Nile perch sensitization and information sharing.
- OSNP: Lake wide patrol and operational support.
- OSNP: Land based investigations and confiscations with respect to the illegal trade of fish.

The SMARTFISH programme aims to assist in the training and capacity building of MCS staff though the following training modules.

1. National capacity building.
2. Regional coordination.
3. Strengthening regional MCS tools to combat IUU fishing.
4. Joint patrol activities.
5. Awareness building.

The training modules were refined during a MCS regional meeting with the partner states in Nairobi, Kenya from the 10th to the 14th of October 2011, thereby ensuring a participatory approach in defining the specific training needs required to implement the SMARTFISH programme MCS interventions for OSNP and the harmonised action plan for Lake Victoria.

In general terms, the study findings have come out clear that Nile perch fishery in Lake Victoria besides other types of fisheries has been the main source of livelihood of a huge population around the great lakes region and its sustainability hangs in a balance and only quick, effective and serious MCS intervention can save the situation. This scenario of the state of this fishery required strong commitment at the highest levels of the LVFO and the partner states.

It is also an issue that needs to brought in a very clear and concise manner to the key stakeholders i.e. the governments of the region including the consuming states, fishers, fish processors, traders and community in general that all of them are the beneficiaries of the fishery and if actions as has been suggested and proposed in this and other earlier studies are not heeded to, the social implications will be devastating.

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ANNEX I

Budget of proposed MCS actions:
Table 7: Budget outline for inter-district patrols of 14-day duration (RWG-MCS report, October 2009).

Personnel	No of Pax.	Rate $	Days	Total $ per Month	Total $ per QR	Annual. Total ($)	
DFO	1	60	14	840	2,520	10,080	
Officers	2	60	14	1,680	5,040	20,160	
Crew	4	40	14	2,240	6,720	26,880	
Security	4	40	14	2,240	6,720	26,880	
Drivers	2	**30**	14	**840**	2,520	**10,080**	
Coxswains	1	30	14	420	1,260	5,040	
BMUs	2	20	14	560	1,680	6,720	
Fuel Veh	2	40	14	1,120	3,360	13,440	
Fuel Boat	1	80	14	1,120	3,360	13,440	
TOTALS				11,060	3,180	132,720	

Country	Districts	US$ Per district		All districts per Month US$	US$ Per Quarter	US$ Per year	Total in Shs.
(Ke, Ug, Tz)	1	60	14	840	2,520	10,080	
Kenya	12	11060	1	132,720	398,160	1,592,640	119,448,000
Uganda	11	11060	1	121,660	364,980	1,459,920	2,773,848,000
Tanzania	١٤	11060	1	154,840	464,520	1,858,080	2,378,342,400

ANNEX 2

Table 8: National patrol budget. National patrols are required to monitor the performance of the district patrols to handle issues beyond district operations including piracy (RWG-MCS report, October 2009).

Personnel	No of Pax.	Rate US$	Days	Total US$ per Month	Total US$ per Quarter	Annual. Total (US$)	
Officers	4	60	8	1,920	5,760	23,040	
Crew	4	40	8	1,280	3,840	15,360	
Security	6	40	8	1,920	5,760	23,040	
Drivers	2	30	8	480	1,440	5,760	
Coxswains	1	30	8	240	720	2,880	
BMU	2	20	8	320	960	3,840	
Fuel Veh	2	40	8	640	1,920	7,680	
Fuel Boat	1	80	8	640	1,920	7,680	
TOTALS				7,440	22,320	89,280	
Country	No. of Zones						Total in Shs.
Kenya	3	7440	1	22,320	66,960	267,840	20,088,000
Uganda	3	7440	1	22,320	66,960	267,840	508,896,000
Tanzania	4	7440	1	29,760	89,280	357,120	457,113,600

ANNEX 3

Table 9: Operation Save the Nile Perch (OSNP) proposed total emergency and crisis budget estimates (OSNP emergency meeting budget report 2009).

$US	Source of funds 2009/2010	S/N
000 600	Republic of Kenya	١
000 600	United Republic of Tanzania	2
000 600	Republic of Uganda	3
000 1.800	Subtotal	
000 3.685	(Deficit (Development partners	4
000 5.485		Grand total

Table 10: OSNP estimated emergency and crisis budget expenditures (OSNP emergency meeting budget report 2009).

S/N	Activity Description 2009/2010	US$
MCS interventions	Eradication of illegalities	
1	Pre-operation to OSNP	150 000
2	OSNP	1.350 000
3	Monthly national and district patrols	1.930 000
4	Operation to eliminate illegal domestic and regional fish trade	150 000
	Sub total	3.580 000
	Management of fisheries capacity	
5	Elimination of open access and control of increasing fishing effort	150 000
	Sub total	150 000
	Nile perch stock assessment	
6	Conducting of fisheries resource monitoring to evaluate recovery	1.200 000
7	Maintenance and procurement of research equipment and supplies	105 000
8	Maintenance of research vessels	150 000
	Sub total	1.455 000
	Implementation of the fisheries	
9	Implementation of the Fish Levy Trust	300 000
	Sub total	300 000
Total for MCS capacity		5.485 000
Monitoring Capacity		

10	Fish levy trust fund	300 000
11	Control of fishing effort	150 000
12	Fund BMU's data collection	150 000
13	Upgrade LVFO database	300 000
	Sub Total	900 000
14	Quarterly catch assessment surveys	750 000
15	Biennial trawl surveys	510 000
16	Biennial acoustics and environmental surveys	420 000
17	Maintain database	300 000
18	Frame surveys every two years	250 000
19	Purchase laboratory equipment	210 000
20	Annual socio-economic assessment	165 000
21	Research vessel service and repairs	150 000
22	Quarterly assessments of fish factories for biological samples	145 000
23	Convene regional working group meetings	100 000
24	Convene biennial regional working group workshops	60 000
	Sub Total	3,060,000.00
Grand total		**9,470,000.00**

ANNEX 4

Questionnaire sent to National and Regional focal points: underlining key topics of discussion prior to the arrival of the consultants.

Questions listed below represent a guideline for interviews and discussions. Issues raised during discussions were explored, and interviews were not mutually exclusive to the structure of the questionnaire.

1. Past National MCS interventions under the LVFO?

2. Explain national structures for implementing MCS?

3. What are the cost/benefits realized through MCS (direct and social costs)?

4. Can you show the impacts of MCS with respect to fish stocks?

5. What are the National/Regional plans of action to fight and deter IUU?

6. What are the challenges to successful MCS?

7. What are possible mitigation measures towards the challenges of MCS?

8. What are the current proposed MCS measures and are they successful?

9. What could be the best interventions required to strengthen current MCS?

10. What would the overall benefits of that strategy be?

11. What are the most suitable and effective approaches towards MCS?

12. What is the current status of MCS?

13. What are the current resource requirements for:

    a. An effective national/regional integrated MCS system?
    b. Efficient MCS data capture, analysis and dissemination?
    c. Conducting regional/national patrols?

14. Is there a national/regional response center (operations center) for IUU?

15. How do you identify IUU in Lake Victoria with respect to:

    a. Gears deployed?
    b. Licensed fishers/boats/nets?
    c. Fish size?

16. How are resources shared to conduct regional/national patrols?

17. What resources are available?

18. What are the actual patrol frequencies/successes/challenges?

19. Are the SOP's realistic, do they need revision, and how many regional patrols have been conducted using the SOP's?

20. Insight into the illegal fish trade?

21. Where do illegal gears come from?

22. What are the current national and regional MCS budgets?

23. Explain the fisheries management structures of member states and their relationship with the LVFO?

24. Number of Industrial fish processing plants, and the role of the private sector in MCS.

25. The role and importance of BMU's in MCS?

26. Funding MCS operations, how do you access-funding, donors, governments?

ANNEX V

PROCEDINGS OF THE IMPLEMENTATION OF A REGIONAL FISHERIES STRATEGY (IRFS) WORKSHOP ON THE DEVELOPMENT OF MCS ACTION PLAN TO ASSIST LVFO IN IMPLEMENTING MCS INTERVENTIONS FOR LAKE VICTORIA.

5th – 7th OCTOBER 2011, SUNSET HOTEL, JINJA, UGANDA



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ACKNOWLEDGEMENTS

The implementation of a regional fisheries strategy (IRFS) workshop on the development of MCS action plan to assist Lake Victoria Fisheries Organization (LVFO) in implementing MCS interventions on Lake Victoria was hosted in Jinja, Uganda from the 5th to 7th of October 2011. The workshop was organized by the LVFO on behalf of the IOC. The EU funded the workshop through SMARTFISH Result Module 3. The topics for discussions were identified through consultation with LVFO member state delegates and the MCS-RWG. Results were tabled and presented by the two Agrotec consultants, Mr. Markovina and Mr. Kariuki. All member countries, Tanzania, Kenya, Uganda and regional LVFO representatives were instrumental to the success of the workshop.

ACRONYMS

ACP FISH 2	Africa Caribbean Pacific Fish 2 (second phase)
BMU's	Beach Management Units
CM	Council of Ministers
CPUE	Catch per Unit Effort
ESA-IO	East, Southern African and Indian Ocean region
EU	European Union
FS	Frame Surveys
GIS	Geographic Information Systems
IOC	Indian Ocean Commission
IRFS	Implementation of a Regional Fisheries Strategy
IFMP	Implementation of a Fisheries Management Plan
FMP 2	Fisheries Management Plan 2
IUU	Illegal, Unreported, Unregulated (related to fisheries)
LVFO	Lake Victoria Fisheries Organization
MCS	Monitoring, Control and Surveillance
NWG	National Working Group
OSNP	Operation Save the Nile Perch
AO	Authorized Officer
RFMO's	Regional Fisheries Management Organizations
ROE	Rules of Engagement
RWG	Regional Working Group
SOP	Standard Operating Procedures
RA	Revenue Authority
TL	Total Length (relating to total fish length)
TOR's	Terms Of Reference
TSH	Tanzanian Shillings
KSH	Kenya shillings

1.0 OPENING SESSION

Dr. Rhoda Tumwebaze, Asst. Commissioner of Fisheries Uganda, chaired the opening session, which started with prayers and self-introduction. The participants came from Kenya, Tanzania and Uganda, LVFO Secretariat and SMARTFISH. The list of participants is attached as Annex I. The agenda was reviewed and adopted without amendments. The agenda programme is in Annex II.

1.1 Welcome remarks by Uganda

Dr. Rhoda Tumwebaze, Asst. Commissioner of Fisheries Uganda, as a host welcomed the participants to Uganda and Jinja. She said that Jinja is a beautiful place, cool and an important tourist attraction. She advised the participants to find time to visit the interesting sites in Jinja. She observed that it had taken long for the MCS Regional Working Group (RWG) to meet and this forum should be used to address regional challenges. Uganda has come up with guidelines to regulate the regional trade in fish and fisheries products. She said that Uganda is reviewing the BMU guidelines and called upon the other Partner States to do it at country level and then harmonize, regionally. She noted that tenure of office of BMU Committee need to be addressed and that removing BMU chairs involved in illegalities is a challenge. She further emphasized that Uganda has challenges with regard to contribution to Operation Save Nile perch but BMUs using minimum resources have intensified collaboration using existing systems with the BMUs, Police, Association of Fishers and Lake Users (AFALU) and Uganda Fish Processors and Exporters Association (UFPEA) and many illegal fishing gears and trucks of immature fish have been confiscated. The Fisheries sector has a new Minister of State for Fisheries who is very active and with these efforts the country expects improvement in the stocks. She concluded by expressing that she expected the workshop to come up with a strategy to address the many challenges on Lake Victoria.

1.2 Remarks by Kenya

The leader of Kenyan delegation Mr. Mike Obadha, Assistant Director of Fisheries, Kenya conveyed greetings from Minister of Fisheries Development, the Deputy Minister, the Permanent Secretary and the Fisheries Secretary. He said that the participants were from the Ministry of Fisheries Development and one representative from Marine Police. He said that there was restructuring and four fisheries directories have been formed. He said that the workshop meeting was for a purpose, noting that a lot of work has been done on Lake Victoria. He added that despite all efforts it appears not much has been achieved. The decline of Nile perch has led to closure of factories and now only 4 in Kenya are operating but under capacity. He requested the other Partner States to facilitate and implement agreed LVFO Council of Ministers Decisions. He recalled that a red flag was raised and an emergency meeting was held in 2009 and the Partner States agreed to contribute funds to LVFO for Operation Save Nile Perch (OPSN). Kenya contributed but unfortunately OPSN has not been implemented. He added that Kenya needs a statement from LVFO on state of contributions. He stressed the need to think outside the box and observed that researchers were continuing to put up the outdated issues of the 1950s. He identified that the current major concern now is food security, yet it is known that Lake Victoria can contain species of various characters. He identified the need to introduce new species of desirable characters to the lake. He noted that Omena was being landed more than Nile perch. He observed that in research there are some conservative people yet the future does not belong to cowards. There is need to address fishing pressure and alternative livelihoods. Interventions on alternative livelihood have failed because the recommendations are done by foreigners. There is need to revisit the socio –economic studies conducted by research institutions and advise government accordingly. He observed that a lot has been done for Lake Victoria more than on other lakes. He cautioned on expenditure of meetings and advised that future meetings should be held near the fisher communities. This would provide an opportunity for the participants to observe the various methods and gears being developed by fishers noting that fishers are moving a head of us in technological innovations. He concluded by stressing the need to facilitate the implementation of agreed regional plans of action.

1.3 Remarks by Tanzania

Mr. Rashid B. Hoza, the Acting Assistant Director of Fisheries, Tanzania, thanked Uganda for hosting the meeting and the LVFO Secretariat for organizing the meeting with SMARTFISH Programme. He noted that the fisheries were facing many challenges with financial resources being a major challenge amidst many priorities. Despite challenges we have continued to work together and there are forums to discuss policy and technical issues. This is a technical workshop to discuss issues related to MCS. Tanzania is committed to implement agreed priority actions by the Partner States. He identified cross-border fish trade as another challenge and noted that the Partner States have to develop joint strategies to curb illegal regional fish trade. Hence, the reason for their presence was to discuss priority actions for MCS. He concluded by saying that the Tanzania National Fisheries Policy of 1997 is outdated and it is in the process of approval by the Government. Thereafter the Fisheries Division will work on the new Fisheries Act.

1.4 Remarks by Consultants

Mr. Johnson Kariuki appreciated having worked together with many of the participants and now having another opportunity to work with them after his retirement from government service. He informed the participants that the consulting team was there to collect views on what is happening in the field with MCS in Lake Victoria and if there is any way to assist LVFO and its structures to improve MCS and reverse the declining trend of the fish stocks. He thanked all the officers met in the field and for the good reception received because the consultants got what was needed in the field and that discussion will be done on findings from the field. The consultants were expected to come out with a final MCS Action plan as an output of the assignment.

1.5 Remarks by Executive Secretary

Mr. Samson Abura on behalf of Executive Secretary welcomed all participants. He conveyed apologies from the Executive Secretary who was in Arusha on meeting of heads of EAC institutions and Deputy Executive Secretary who was in Djibouti in another important meeting. He observed that with the vast knowledge acquired from Lake Victoria they should be able to work in synergy. He informed members of the program on IRFS which covers COMESA, SADC, EAC, IGAD and IOC. The program covers 20 countries and includes Somalia. The program is at a start up phase and the RAO is IOC based in Mauritius with other regional economic block acting as the deputy RAO. When it comes to fisheries, Lake Victoria basin has over 30 million people and hence there is a big stake to satisfy the hungry. LVFO is a focal point and Mr. S. Abura is focal person to SMARTFISH. Programme will run for 23 months for phase one and 36 months for phase two.

He observed that a lot of work has been done on MCS yet the situation remains bad. "Business as usual" should stop and ways of handling MCS should be changed where it has not yielded results. There is need to consider externalities that affect fisheries by adopting Ecosystem Approach to fisheries, e.g. mining, destruction of breeding grounds affect our fisheries. He advises the Partner States that as they do MCS they should look at issues in totality so that they survive the technology edge. MCS challenge is how to manage the human being and not the fish. It is possible to get one time resource, which is not sustainable and yet Partner States could generate their own funds from the fishery. Why don't they operationalise the Fish Levy Trust Fund rather than being donor dependent? This would provide a lot of funds. It is important to borrow a leaf from Namibia, which is putting 6% back to the fisheries management. How much do the Partner States provide back to the lake. They should look at their national budgets and improve what is allocated to fisheries. There is a need for a paradigm shift (business unusual) if the Partner States are to survive the currents, otherwise it will consume them.

The LVFO Council of Ministers agreed on OPSN and each country to contribute US $ 600,000 but to-date Kenya has contributed 99%, Tanzania 31% and Uganda Nil. The Council of Ministers will meet again soon to authorize how to use the funds or align the funds that have been contributed. He concluded by welcoming participants to LVFO their institution and Jinja and urged them to deliberate on how to remove the illegal fishing gears. He encouraged them to find time to go for sight seeing at the source of the Nile.

2.0 BRIEF BY CONSULTANT ON TOR'S

The Consultant pointed out that the programme is geared towards assisting LVFO and established MCS structures to carry out joint planning on the areas of MCS activities.
The consultancy has 3 major assignments:
1. Undertake work to come out with short background study on costs and benefits to enhance MCS on Lake Victoria;
2. Evaluate existing regional action plans in use with view of assisting LVFO to implement IUU fishing measures, in order, to improve their effectiveness; and
3. Bring all the actors together in a workshop to deliberate on issues and see whether consultant's reports reflects what is on the ground and suggest revision where necessary.

The consultants are to finalize the report and submit to AGROTEC.

3.0 PRESENTATIONS ON STATUS OF THE MCS ACTION PLANS

3.1 Country Presentation by MCS RWG members

Presentation was received from Kenya, Tanzania and Uganda outlining what has been undertaken at national level, the achievements and challenges. The national reports are attached in Annex III.

3.1.1 Kenya

Mrs. Roseline Okwach MCS RWG member from Kenya made the presentation. She outlined the strategies for Kenya as follows:

- Sector Policy

Primary goal is to ensure increased and sustainable fish production. The Priority is fisheries resources conservation and management. The Effective management tool is the Monitoring Control and Surveillance (MCS) with focus on eradication of illegal gears and fish processing and trade in immature fish. The strategies is to increase self monitoring and voluntary compliance to fisheries regulations, include:

- Promotion of aquaculture as income generation for the BMUs, Strengthening of BMUs and BMU Networks nationally;
- Institutionalization of the Nile perch Traders Networks in Lake Victoria; and
- Allocation of funds for the establishment of an equivalent of a coast guard in Lake Victoria.

Major constraints include:

- Ineffective enforcement of the Management measures due to unsustainable financing mechanism to support MCS operations;
- Unsustainable exploitation of the major commercial fishery;
- Inadequate adoption and implementation of viable alternative livelihoods; and.
- Current penalties are not deterrent enough, no minimum fines/penalties defined.

The country is in process of Establishing the Surveillance and Enforcement Unit,
The following recommendation were made

- Implement the OPSN;
- Finance and implement the National Annual work plan; and
- Fast track the operationalisation of the Nile perch Traders Network.

3.1.2 Tanzania

Mr. Angelous Mahatane, MCS RWG member from Tanzania made the presentation. He said that the fishery resources in Tanzania are under pressure from natural and human factors. This is a real threat to the sustainability of the fisheries resources and the accruing socio – economic benefits to local communities, government, investors, and others who depend on fish for food, income, revenue, and foreign exchange earnings. Furthermore, the overall contribution of the fisheries sector in overall national development and economic growth will be affected.
The major challenges include:

- Illegal fishing gears and practices include beach seine nets, monofilament nets, under mesh size Gillnets (below 6" under mesh size Dagaa nets (Less than 8mm), splashing, fishing in prohibited areas are most destructive;
- Declining fish catches;
- Excessive fishing effort (Unrestricted access) resulting in declining of catch per unit effort (fishing gear, boat, fishing time);

- Illegal trans- border fish trade; and
- Landings and trading of immature fish (Nile perch and Nile tilapia).

MCS success include:
- Confiscation illegal fishing gears and immature fish, apprehension of culprits during patrols;
- There has been frequent lake wide awareness raising and sensitization of stakeholders on value of responsible fishing and the Fisheries Act and Regulations and the benefits of sustainable fishery;
- Processing industries are self policing and now totally reject immature fish; and
- Corrupt officers abetting illegalities/non conformity have been summoned, ashamed and some demoted;

Constraints to MCS
Despite the effort undertaken by the government to curb illegal fishing there are several constraints faced by the sector. The major ones are the following:-
- Inadequate funding and working facilities.
- Lack of sustainable source of income to meet BMUs operations and provide motivation to BMU's.
- The difficulty of BMUs to enforce against leaders and close relations in the Community.
- Dishonest and corruption among leaders and law enforcers.
- Involvement of some BMU members in illegal fishing practices.
- Greed for money among fishing community members.

3.1.3 Uganda

Mr. Paul Okware, the Chairman of the MCS RWG and a member from Uganda made the presentation. He outlined the major objective of the compliance checks was to crack down illegal fishing and trade in identified hot spots. The other reason behind these operations was to ensure increased compliance to fisheries regulations. Awareness raising to all stakeholders is also another important objective. The achievements include:
- BMUs mobilized and undertook operations to impound illegal fishing gears, using funds accrued from Fish movement permits.
- Departmental, District and inter-district patrols were undertaken and infringements were impounded.
- Registration of Regional Fish Traders is ongoing and guidelines of regional fish trade developed.
- Licensing of fishers streamlined and implemented.
- Statutory Instruments for Permanently Closed Area Rules, Lacustrine Protected Area (LPA) 2009 were drafted and gazzetted and the Fish (Fishing) rules 2010 were also gazette.
- Operation save Nile Perch was developed as a regional strategy for the recovery of the Nile perch.

Challenges
- Operation save Nile Perch, the Status quo not known
- Less funding to MCS yet the demand of fish is ever increasing
- Need to train Authorized Officers in all fisheries related offences including court proceedings
- Need to support BMUs in skills for MCS.

3.2 Regional Status on MCS

Mrs. C.T. Kirema-Mukasa on behalf of LVFO made a presentation which highlighted lessons from the past management measures. She acknowledged that the Status of Implementing MCS on Lake Victoria was well covered by the Partner States presentations and because most of these plans and reports were harmonized at the regional level with LVFO coordination. She considered it important to learn from the past in order to address the challenges and not to repeat the past mistakes. In 1900s Lake Victoria had over 500 species with about 300 haplochromine species. The major species was Tilapia. Following a survey by Graham 1927-29 it was agreed to fix minimum mesh size for Tilapia at

5" and its implementation began in 1931. In the absence of a legal regional body to coordinate enforcement on a shared resource, two institutions were established. The Lake Victoria Fisheries Service was established to collect catch statistics and harmonize law enforcement and EAFFRO was established in 1947 for research and monitoring. But there was no clear working relationship between the two.

Concern was raised that a single species measure was hindering the exploitation of other species that mature at smaller sizes. In 1956 the 5" gill net was repealed to allow full exploitation of other species. Consequently, this led to the collapse of the Tilapia fishery and increased use of smaller and smaller nets led to the collapse of other important fisheries such as the Labeo victorianus . As a result in 1960 the LVFS was disbanded and its role nationalized in the Fisheries Departments of Partner States. EAFFRO remained until it also collapsed with breaking up of the first East African Community in 1977. Hence, leaving no lake-wide fishery body on Lake Victoria.

Mitigation measure to the collapsed Tilapia fishery was introduction of exotic species of Tilapia and Nile perch between 1950s and 1960s. Tilapia species included (Oreochromis niloticus, O. leucosticus, Tilapia zilli and T. melanopleura) between 1950 and 1960. Out of these only O.niloticus became a well-established commercial fishery while the other disappeared. Nile perch was introduced to convert the big biomass of Haplochromine into food.

With the declining Nile perch and fishermen shifting to Rastrineobola argentes (Dagaa/Omena/Mukene and Haplochromis, the question now is, should we now focus on Nile perch or on all species. Failure to implement measures designed for the recovery of the Nile perch fishery may result into the collapse of the entire commercial fisheries like it was with the collapse of the Tilapia fisheries in the 1950s. Failure to implement 'Operation Save Nile perch' is a major drawback to Partner States commitment.

Due to the need for continued collaboration on a shared resource, Kenya, Tanzania and Uganda established the Lake Victoria Fisheries Organization (LVFO) in 1994, with the spearheading of FAO CIFA sub-committee for Lake Victoria, to jointly manage the lake fisheries.

She recognized that each country has put in place strategy for regional fish trade but there is need to harmonize these strategies regionally. She pointed out that an opportunity from ACP fish II to fund stock assessment surveys was lost because ACP funding conditions could only allow funding of pre- and post field activities but not the actual field surveys. She called upon the research institutions to fund stock assessment while LVFO funds the pre- and post-field activities. She outlined the harmonized measures set through the LVFO coordination and highlighted the major challenges to MCS as follows:

- Declining (collapse) of a fisheries – e.g. Nile perch.
- Open access, uncontrolled fishing effort.
- Law enforcement on a Multi-species fisheries.
- Increasing demand for fish in national, regional and international markets.
- Increasing use of undersized and destructive fishing gears and methods.
- Regional Trade in undersized fish.
- Sustainable funding of MCS activities – (e.g. OPSN).

The recommendations include:

- Specific interventions for restoration of the Nile perch fishery such as OPSN should be implemented (its collapse may result into the collapse of other fisheries).
- Funding of MCS & Stock Assessment (SA) surveys should be prioritized in the national budgets.
- Research should specifically provide funds for regional SA surveys.
- Regional strategy on regional trade should be harmonized, with clear guidelines for MCS activities.
- Regional Fishery –specific management plans should be domesticated by the Partner States and implemented.

3.3. Status of MCS database

Mr. Abura from the LVFO Secretariat highlighted the status of EAFISH. The modules available are: Frame Survey (FS), Catch Assessment Survey (CAS), Monitoring, Control and Surveillance (MCS), Beach Management Unit (BMU), Trawl, Fish Biology and Dagaa.

The main challenge with MCS module is lack of information on MCS activities. Most data is stored in electronic spreadsheets and individual notebooks. Data analysis often stops at descriptive stage and does not extend to predictive modeling and knowledge discovery because of inadequate skills and software. At LVFO institutions, we have basic hardware and a stable LAN environment to start from. We are building some serverbased databases accessible at all workstations at all LANs.

Challenges:

- Lack of data acquisition and sharing modalities.
- Incomplete data in MCS Module.
- Inconsistency and integrity in datasets. Data sets collected once does not justify elaborate databases.
- Unreliable internet access and lack of LAN and WAN.
- Lack of trained database developers and managers.
- Data security - viruses, password theft.
- Inept preparedness against disasters – Human beings are perishable goods and data kept by an individual may be lost at his/her death.
- Lack of funds for establishing centralized databases.
- Use of outdated software (i.e. access software inability to handle huge data sets).
- Lack of awareness of the importance/need of reliable unifying databases.
- Institutional data sets are in different formats (excel, word etc.) hardcopies and are scattered.
- Capacity building at LVFO institutions.
- Missing time series data due to funding gaps.
- Power shortages.
- Data integrity and security – data collected or processed must be reliable and secure.
- Resilience of the ICT services (i.e. disaster recovery).
- Historical data collected by different means not captured in the database; and
- Lack of timely dissemination.

3.4 Stock Assessment

Mr. Tabu from NAFFRI gave an overview of the status of the stocks based on the hydro acoustic surveys conducted by the regional team. The surveys were conducted quarterly during IFMP but are now constrained by lack of funds. The surveys showed that the stocks have fallen to the lowest levels since its upsurge in 1980s. This has led to decline in catches with closure of some fish processing factories.

Causes:

- Open access with few restrictions on fishing effort.
- Fishing effort expansion stimulated by fish exports.
- Increasing demand due to increasing population.
- Over-investment in processing capacity.
- Inadequate resources to MCS.

FS 2008

- Increase in boats targeting Nile perch.
- Hooks increased by 322% from 3.5 to 11.3 million with the undersized hooks of size >10 constituting 53.3%.
- Number of gillnet units decreased but there was an increase in joining of nets.
- Increasing number of beach seines.

Hydro acoustics findings:

- Total biomass is fairly constant at about 2 million tons but the Nile perch biomass has decreased (now 350,000 tons) while the biomass of Rastrineobola argentia has increased.
- Maximum length of fish also reduced i.e. removal of big fish drives the biomass down.
- Higher densities in the Northern quadrants and the South East Coastal waters.
- Fishers now reach the centre of the lake.
- Sizes of fish in the population reduced with majority of fish less than 50cm TL.
- Length frequency graphs of 2008 and 2009 surveys overlap at 30cm for both acoustics and trawl-net surveys.
- Biomass and catch is almost the same (i.e. we are catching almost the whole biomass).
- Decline in trends of monthly catches in all the 3 Partner States.
- The yield ranged from 58 – 86% of MSY and from 12 – 23% of mean biomass.
- Reference point for MSY is 225000 tons as opposed to desirable 750,000 tons.
- Presence of six-month-old fish (10cm in length) and one year (20cm). Fish of 10cm weigh about 11gm, 20 cm = 100gm, 30cm = 360 gm, 40cm = 750 gm so even a small increase in average length will lead to increase in biomass.

It is observed that most of what is caught is being exported.

Immediate required steps

- Eradicate illegal fishing.
- Protect breeding area.
- Control access into the fishery by new entrants.
- Species specific licensing.
- Institute a levy on fish exports and ring fence it for fisheries.

4.0 PRESENTATION ON CHALLENGES BY CONSULTANT

The Consultant re-emphasized on what MCS stands for. MCS is the mechanism of implementation of agreed policies and plans and without MCS management is incomplete. The economic costs and social costs should be taken into consideration if Nile perch fishery collapses. Rapid increase in illegal gears shows the poor state of the fishery as confirmed by acoustic surveys. Nile perch biomass of 2006 was 600,000 tons and only 1.9% was >50 cm translating to 11,400 tons of value. Nile perch of >50cm is economically important. If an analogy of a shop is used, the shop keeper closes shop when the sales fall whereas in fisheries when there is decline in catches, fishermen respond by increasing fishing effort to make it profitable often through subsidies and this results in more investments.

MCS does not require sophisticated technology but calls for voluntary compliance by fishers.

The Consultant presented a list of observed challenges in the field, which included the following among others:

- Lack of a regional observer programme.
- Management and operation of MCS in the same rules of engagement is lacking.
- MCS operation at national level is not up to expected standards.
- Inadequate funds to facilitate carrying out regular patrols.
- Corruption and piracy on the lake.
- Mobile phones are used to facilitate IUU fishing.
- Regional fish trade in immature fish supports IUU fishing.
- Fish breeding grounds not identified/gazette.
- Factories operate below capacity due to limited raw materials leading to loss of employment.
- Frontline staff thin on the ground for effective MCS.
- Community sensitization in the importance of fisheries to their livelihoods is crucial.
- Need of verification of frame survey data to give the correct intelligence information to aid MCS among others.

5.0 GROUP DISCUSSIONS ON CHALLENGES

Participants were divided into 3 groups and asked to look at the challenges identified by the consultant, discuss and rank them. These were discussed in the plenary and agreed on the major challenges. MCS regional working group was assigned work to prioritize them.

Participants were cautioned that declining Nile perch stocks is the main concerns and therefore the need to identify those actions that will help to reverse the decline and will give a major impact keeping in mind limited funding.

The challenges were harmonized into 10 as follows and the harmonized challenges and action plans are attached at the end of this report.

1) Unsustainable funding to conduct MCS activities.
2) Regional trade in immature fish supports IUU fishing
3) Inadequate Capacity to conduct MCS
4) Inadequate Capacity of BMUs to implement management measures
5) MCS facilities including equipment not in working condition.
6) Gaps in Legislations and Policies
7) Inadequate information dissemination.
8) Inadequate data collection, storage analysis and management
9) Lack of viable alternative livelihood
10) Unsustainable Regional observer and joint patrol programs

6.0 PRESENTATION ON SMARTFISH

SMARTFISH is a codename for Implementation of Regional Fisheries Strategy i.e. joint regional strategy from all regional Economic Commissions. It tries to have a strategy for managing fisheries in all the 20 countries.

The programme has five result areas:
1) Governance.
2) Fisheries management.
3) MCS.
4) Trade.
5) Food security.

All the 5 Result Areas should lead to a more integrated approach to fisheries management in the region. The programme will not fund more studies but is expected to fund implementation of interventions/ actions.

Smart Fish focuses on Result Area 3 on MCS, which is to address the development of an effective MCS for trans-boundary fisheries resources in the ESA-IO region. The focus on MCS is due to (i) the increasing IUU fishing; (ii) importance of fish in providing food and employment; (iii) intra and inter regional trade with fish being the most highly traded commodity. ESA-IO region has an estimated 3.5 million full- and part-time fishers. Trade in fish in the ESA-IO region is worth Euro 1.33 billion

IUU is fishing that takes place outside the regulatory environment and it can either be illegal, unregulated and/or unreported.

Impact of IUU fishing is that it jeopardizes the sustainability and food security in the region. In 2005 IUU fishing global estimates was US $ 4-9 billion and with 1 billion coming from Sub-Saharan region.

Barriers to developing MCS regionally:
- Lack of institutional policy capacity to recognize importance of integral regional MCS operations;
- Number and impact of IUU fishing is poorly understood or un-quantified in the region;
- Perceived conflict of interest between national and regional cooperation particularly in data exchange;
- Lack of integration of national MCS tools on a national level such as surveillance and intelligence instruments.

There are different systems in use;
- Lack of compatible vessel licensing systems in the region;
- High cost of national and regional joint patrols; and
- Limited or no cost recovery systems for MCS.

Under Result Area 3 on MCS there are 5 areas:
1) National capacity building;
2) Regional coordination;
3) Strengthening regional MCS to combat IUU fishing;
4) Joint patrol activities; and
5) Awareness raising.

Module 1: National Capacity Building
Expected outputs include:
- Legal and Regulatory frameworks of Partner States developed and updated for effective undertaking of MCS activities; and
- Participating countries improve their workforce skills to implement effective MCS of their trans-boundary resources, centrally planned MCS operations and their RFMO obligations.

Activities to be undertaken include:
- Analysis of legal systems;
- Assistance with updating legal systems where required;

- Analysis of training and standards; and
- Provide assistance of training where required.

Module 2: Regional Coordination

Expected outputs:

- Coordination with other related MCS program and activities in the IOC and IOTC region is established;
- Coordination with SADC;
- Regular contact with regional institutions and programmes and between them strengthen;
- Planning meeting on regional interventions;
- Strengthen intervention through assisting with implementation; and
- Avoiding duplication of programs.

Module 3: Strengthening Regional MCS tools to combat IUU fishing

Expected outputs:

- Regional component of the MCS activities of ESA –IOC region is strengthened;
- Systems for the collection of MCS related data and management of fisheries information including timely reporting of data to RFMO's strengthened; and
- Capacities in pooling and sharing operational MCS information on a bilateral basis strengthened.

Activities:

- Investigating effective mechanism to share information;
- Implementing regional responses to IUU fishing; and
- Assisting with implementation.

Module 4: Joint Patrol Activities

Expected outputs:

- Grants for joint patrol awarded to eligible governments; and
- ESA-IO countries conduct joint patrols and provide evaluation of their outcomes.

Activities:

- Assist with planning and undertaking regional joint patrols;
- Training on compatible standards;
- Assist in prosecution preparations – currently there is low level of prosecutions in the region due to lack of evidence chain; and
- Risk assessment and planning.

Module 5: Awareness Raising

Expected outputs:

- Awareness of the importance of the MCS in the ESA-IO region is increased. People must understand the impact of their activities.

Under the 80/20 principle, psychologists have found out that if the 20% of the people that are doing wrong things are made to change and do the right thing, then the 80% will do the right thing.

In conclusion, the presentation emphasized that the outcome of this workshop should be a set of activities that can be financed under the SMARTFISH programme. Grant from EU is not 100% but requires commitment from countries under the 80/20 principle i.e. EU gives 80% and the countries give 20%. The grants are for marine-based countries and individual countries can apply.

The time frame for the program is 23 month for phase 1.

7.0 PLENARY DISCUSSION

Concern was raised by participants of lack of resources to fund the process of establishing the Fish Levy Trust Fund (FLTF). LVFO was requested to follow-up in collaboration with LVBC to get funds for the activity. It was noted that fisheries was not given funds under LVEMP II on assumption that there was going to be IFMP II. The Mid Term Review of LVEMP II has already been undertaken and it was clear it was not possible to relocate funds from other components to fisheries. Due to the agreement to have Fish Levy Trust Fund established, it may be removed from LVEMP II. If the second programme comes, may be fisheries activities will be considered because they need a huge amount of funds. Uganda suggested holding of inter-ministerial meeting for ministries in charge of fisheries, finance and justice for them to look at the process required to establish the Fish Levy Trust Fund and agree on away forward and requested SMARTFISH to consider funding the meeting.

The team leader SMARTFISH answered some of the questions raised by the participants.

i) Focal persons – these were nominated by the countries themselves and they represent both the country's interest and interface with IOC. In letters to focal points to organize specific meetings, the focal points tend to nominate themselves to attend the workshop;

ii) The SMARTFISH website will be running soon and information on meetings, trainings, etc. will be available on the web;

iii) Request from Uganda to fund the establishment of Fish Levy Trust cannot be addressed because it could have fallen under governance but unfortunately, governance result area covers only ocean-based countries; and

iv) The programme has a total of Euro 21 m but a big chunk of it goes to administration leaving only about Euro 14 million for all other result areas. This will limit the number of activities that can be funded. It is unlikely funds will be moved to LVFO for disbursement to the Partner States because the responsibility of project financial management was given to IOC.

8.0. AN OVERVIEW OF THE IMPLEMENTATION OF A REGIONAL FISHERIES STRATEGY (IRFS) PROGRAMME.

A brief overview of the entire programme was presented by Mr. Kroese to the participants to allow then understand what may be undertaken under the programme.

The programme has 5 result areas.

Result Area 1 Fisheries Management

It will be implemented by FAO and has not yet started. It covers trans-boundary stocks but unfortunately, Lake Victoria is not covered.

Areas that will be addressed include:
- Fisheries Policy and Legal Framework;
- Fisheries information systems;
- Institutional and human capacity for fisheries management; and
- Coherence between fisheries management and MCS.

Result Area 2 on Governance

It has 2 approaches
- National and regional governance capacity built; and
- Regional Institutional capacity to implement and undertake governance processes for sustainable resources.

Result area 2 will not cover inland waters. It will be implemented through RECs because of the trans-boundary nature of fisheries.

Result Area 3 MCS

This was already covered under this workshop.

Result Area 4 Regional Trade

Work has started with a number of workshops held.

The programme will focus on identifying trade constraints at country level to allow development of regional trade strategy.
- Removing barriers to make trade easier.
- Balance trade regionally.
- Provide support to national trade components as well as RECs to develop competitive environment.
- It also touches on food security, infrastructure, processing and linking to stock sustainability. Eco-labeling is becoming increasingly important in large regional and international markets.
- Improve market information (this is a data poor environment).

Trade analysis and assessment of quality approaches will be undertaken in collaboration with ACP-FISH II which has similar activities.

Result Area 5 Food Security.

This will be implemented by FAO. It will implement/integrate food security in line with the NEPAD policies. Focus is on:

- Food availability for domestic consumption;
- Food access taking into consideration gender concerns;
- Utilization; and
- Stability – economic pries, seasonal food security and climatic issues.

The programme will assist in integration of fisheries into national and regional food security strategies.

9. WAY FORWARD

Mr. Marcel Kroese informed the workshop that the harmonized challenges be adopted as is and this would provide the chance to develop implementation plans. Challenges outside MCS will be taken on by appropriate result areas of SMARTFISH. MCS challenges will involve national and regional interventions. Under Result 3 – the 'Operation Save Nile Perch' can be operationalised through small programmes, such as on awareness rising and training since the Council of Ministers has approved the strategy. SMARTFISH can pay per diems and pay for patrol fuel but will handle the finances itself. MCS RWG will be considered as the focal persons in the countries for this result area – 3.

The Partner States including LVFO Secretariat supported the consultants to review the challenges and see what they can fund and also the operationalisation of OPSN under Smart fish

Kenya has already disbursed OPSN funds to LVFO Tanzania has allocated the funds and these will be disbursed in two portions. The Executive Secretary informed the participants that under the LVFO regulations, the ES has to remind the Partner States of their obligations and this has been done many times. The issue of operation save Nile perch is with the EAC and Partner States were urged to pay their contribution and OPSN funds before the EAC Summit meets in November 2011.

10. CLOSURE OF THE MEETING

10.1 Consultants

Mr. Kariuki on behalf the Consultants said that the exercise has gone on very well. Although at the beginning of the workshop, there was some bottlenecks but finally the end has been good and appreciate the contribution made and has captured all needed to be captured. He thanked the participants and expected the work to be concluded well.

10.2 IOC

Mr. Kroese of IOC thanked the Partner States for the hospitality accorded to the consultant and pleased with the workshop recommendations and work will be easier with the harmonized challenges. Thanked the LVFO MCS RWG. Thanked the LVFO for hosting the workshop.

10.3 Uganda

Dr. R. Tumwebaze thanked the LVFO for organizing the workshop and SMARTFISH for funding the programme. Uganda is looking forward in October on activities that would be funded by SMARTFISH. She wished the participants safe journey back home.

10.4 Tanzania

Mr. R.B. Hoza, thanked God and thanked Uganda for hosting, LVFO Secretariat for organizing the works and for SMARTFISH's support. Thanked all who presented for the good presentations. The issue of understanding the value of fisheries of Lake Victoria will be useful in addressing the challenges over fishing. The Partner States have to develop a mechanism for sustainable funding to BMUs operations. The countries have to work together under LVFO to address the issues of illegal fishing and fish trade and also to achieve our goals.

10.5 Kenya

Mr. Ogwang on behalf of Kenya congratulated LVFO for bringing them here and thanked SMARTFISH for agreeing to assist in addressing challenges on the Lake. He hoped that all are committed address the challenges with or without SMARTFISH support. Thanked Uganda for hosting the participants and wished all safe

10.6 LVFO

Mr. Dick Nyeko, the LVFO Executive Secretary informed the participants the LVFO is not the Secretariat. It is the institutions and the governing bodies. The Secretariat is there to assist coordinating them. He added that he had been in Arusha, and he managed to make a very good case for LVFO that fisheries management is about people and not fish and that EAC should focus on funding productive sector such as fisheries. He requesting EAC to fund the LVFO well and preserve it under a bigger EAC fisheries commission to include Rwanda, Burundi, and Sudan. He gave them 3 priorities for funding through EAC (i) Monitoring Control and Surveillance (MCS); (ii) Aquaculture, and (iii) Resource monitoring because it is important to make informed decisions.

He noted that there have been changes in Partner States and LVFO Secretariat needs to know formally whom to communicate to. The LVFO Secretariat has handed over a total of 17 fish landing sites to the Partner States and its their responsibility to manage and maintain. It is important to handle the BMUs well and this process was done from high level Council decisions and is not just a single Partner issue.

The ES thanked SMARTFISH for agreeing to work with LVFO. LVFO has structures and standard operating procedure. There is need to support training and operations and communications including software and hardware. Derogation to EU is possible and can be used to justify undertaking certain decisions. The ES bid the participants safe journeys. He thanked Mr. Kariuki for remaining in contact with the LVFO even after retirement.

11. ADOPTION OF THE REPORT

The Report of the IRFS-IOC Workshop on MCS Action Plan for Lake Victoria was adopted and signed at Sunset International Hotel in Jinja, Uganda on 7th October 2011.

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13.0. LIST OF HARNISED MEASURED SIGNED DURING THE WORKSHOP BY STATE DELEGATES AND THE LVFO.

Table 11: Harmonized challenges and action plans signed by member states during the MCS regional workshop supported by the IOC held in Jinja, Uganda from the 5th to the 7th of October 2011.

No	Challenges	Action/Solution
1	Unsustainable funding to conduct MCS activities	• Initiate fish levy trust fund. • Find partners to assist funding to ensure regular patrols.
2	Regional trade in immature fish supports IUU Fishing.	• Develop regional strategy to address the vice. • Support regional traders to form an association.
3	Inadequate capacity to conduct MCS	• Strengthen capacity to undertake MCS.
4	Inadequate capacity of BMU's to implement Management measures	• Train BMU's in MCS procedures. • Develop by-laws that generate funds for MCS. • BMU's develop intelligent list of fishers owning illegal gears, submit DFR • Support BMU's to undertake MCS only under networks in higher levels.
5	MCS facilities not in good working condition	• Create inventory of all MCS equipment in the partner states. • Funds required for equipment maintenance.
6	Gaps in legislations and policies	• Review, update and harmonize legislations and policies with respect to: • Controlled access (species specific). • Protective gear control legislation. • Regional trade. • Streamline licensing of persons and vessels. • Introduce closed seasons. • Introduce quota system. • Identify and protect important fish breeding areas.

7	Inadequate information dissemination	• Train community TOT's for sensitization. • Involvement of all leaders at all levels. • Use media campaigns. • Support front line staff to undertake monitoring.
8	Inadequate data collection, storage, analysis and management	• Train officers in data management, collection, analysis and storage. • Procure and maintain data equipment • Support partner states to generate and disseminate relevant LVFO data
9	Lack of viable alternative livelihoods	• Identify and support alternative livelihoods (poultry, bee keeping). • Possible horticulture and aquaculture activities.
10	Unsustainable regional observer and joint patrols	• Ensure regular and sustainable joint activities.

ANNEX VI

Table 11: Consultant findings on regional and national challenges and proposed interventions in fighting IUU in Lake Victoria.

CHALLENGES OF REGIONAL NATURE				REGIONAL STRENGTHS	REGIONAL INTERVENTIONS
LVFO	KENYA	TANZANIA	UGUNDA		
1. Need for a regional observer program composed of retired experts of unquestionable character who need to be trained with a role to confirm SOPs and prepare check lists. 2. Management and operation in the same rules of engagement, SOPs is lacking. 3. MCS operation at national level is not to the expected standard. 4. Inadequate funds to facilitate carrying out of regular patrols both regionally and nationally. 5. Corruption and piracy at the lake is rampant due to use of liquid cash on water at all times.	MCS facilities including equipment not in working condition. Lack of a dedicated sustainable funding for MCS even to carry out minimum patrols. Needed immediate and sustainable protection the juvenile of Nile perch so that they can grow to maturity. Fisheries MCS frontline staff structure is very thin on the ground and not able to conduct meaningful MCS work. BMUs are not effective because of various constraints. Some fisheries staff and the BMU members are not properly trained in MCS operations. Need to roll out MCS operation manual developed at LVFO for implementation.	Fisheries are affected by upstream markets, which accept both legal and illegal fish. Community sensitization Capacity building towards infrastructure and equipments (patrol boat, vehicles, fish landing sites, and communication). Need for direct, deterrent and intelligent based and routine patrols. Need for verification of Frame Survey data to give the correct intelligent information to guide preventive patrols. Registration of vessels, fishermen, issue of fishing licenses and patrols at grassroots	District fisheries officers are answerable to the local authority chiefs and have no direct role in MCS thus making this structural arrangement a big challenge implementation of MCS. Chain of command in the fisheries administration is not harmonizeed among partner states encouraging corruption in the field MCS operations. MCS has imposters who operate as fisheries law enforcers. BMU's are unable to carry out the MCS operations successfully because of lack of necessary security, equipments and other supportive facilities.	Sustainable level of 1 million tons though species composition has changed i.e. NP volume is low while the Rastrineobola spp. of low value is increasing. The LVFO secretariat has a role of coordinating regional discussions to get consensus on MCS and finally secure agreement on its implementation. There are LVFO structures comprising Council of Ministers, Policy Committee, Fisheries Management Executive Committee and Research Committee, ,which drive the implementation of all LVFO programs.	A strategic approach needs to be undertaken to ensure MCS is not compromised A strategy comprising information policy focusing on fishing community psychological and superstitions to support interventions including use of propaganda to scare illegal fishers from the art. There is urgent need to have effective and implementable Action Plans. Assess investment with respect to ripple effects on the fish stocks.

6. Mobile phones have become a tool in the support of IUU fishing. 7. Regional trade (informal) trade supports IUU fishing. 8. BMU's have no prosecutorial or arresting roles 9. The term of office for the BMU officials is too short (2years) for effective implementation of effective MCS operations. 10. Breeding areas in the entire lake have not been identified, demarcated and gazette.	It is important to organize networks for the BMU's and Nile Perch traders to assist in MCS activities. Social barriers have been identified as a challenge between BMU's.	level upward to national and regional levels should be based on LVFO Plans of Actions and SOPs. The MCS equipment provided during IFMP Project cannot be used properly because of inadequate funds. Political interference and natural disasters affect national funding for MCS. Continuous entry of illegal fishing gears through unidentified entry points. Lack of integrity among implementers and stakeholders. Inadequate working facilities such as effective patrol boats; land transport, communication systems and operational funds.		There are Regional and National Working Groups who are responsible for implementation of LFVO agreed MCS programs. LVFO has standard MCS patrol vessels with capacity to continuously operate on water autonomously for three consecutive days which can be used for observer program; There are also smaller fiber glass catamaran with outboard engines and can be used for quick counter checking exercises or surveillance activities; LVFO has RPOA-IUU and RPOA-Capacity. Fisheries management Action Plan is there and targets Action plan for each fishery and	Establish a harmonized and effective system of data collection, dissemination and sharing in regional MCS resulting to regional and national reports. Training in terms of implementation and proper capturing of data and how to authenticate the same data ready for in the MCS. Need for improvement of data capture modules and SOPs for regional MCS. Need for establishment and strengthening of an efficient and effective MCS Regional data-monitoring centre (RMDOC) at with satellite national centers. Participatory approach through use of government

11. Nile Perch decline has far reaching consequences since factories started self regulation because many agents lost NP fishery and instead they promotes catching of illegal fish. 12. Regional informal fish trade is a drive to IUU fishing. 13. Processing factories have reduced from 35 to 25 and had the effect of losing foreign exchange, and employment.		Weak devotion and proper MCS training among BMUs. Inadequate sensitization of MCS players on use of information and information technology BMU's networks are established at the Sub County level and targeted hot spots but not facilitated to carry out their roles Inadequate qualified personnel and personnel needs including facilities such as patrol boats and support vehicles; Samaki database and EA –Fish database are not working as anticipated.		will allow fishing only a specific fishery. The BMU's are important grassroots MCS structures if their operations are guided through SOPs. Lake Victoria SOPs guide on the implementation MCS through enforcement of fisheries laws in the partner states especially on size of vessels (for the Nile Perch, Dagaa, or tilapia and collector vessels) and Beach seines, monofilament nets, vertical and horizontal integration and hook size. There are national legal instruments that guide the	specialists who understand fisheries very well (professionals) will strengthen Public Private Partnership (PPP) in MCS. Conduct campaigns, trainings, sensitizations to all players including politically elected leaders, police, DPP, judicial and revenue officers. Curry out investigations and collect intelligent information. Harmonize arresting procedures and prosecution in line with the office of DPP. Encourage aquaculture or any other economically well paying as alternative livelihoods.

		Shortage of IT equipments and skills to deal with urgent data collection and dissemination. Factories cutting capacity per day reduced on reducing scale. Looming lying off some of the fish processing workers, undocumented fishers and agents in the event factories closes. BMUs relations with illegal fishers makes control over illegal fish and gears ineffective.		will allow fishing only a specific fishery. The BMU's are important grassroots MCS structures if their operations are guided through SOPs. Lake Victoria SOPs guide on the implementation MCS through enforcement of fisheries laws in the partner states especially on size of vessels (for the Nile Perch, Dagaa, or tilapia and collector vessels) and Beach seines, monofilament nets, vertical and horizontal integration and hook size. There are national legal instruments that guide the MCS and they include:- • Fisheries Acts, • BMU Regulations of 2007.	Finalize fisheries policies review. Fully operationalize of Fisheries Acts and regulations. Put into operations fisheries Management Plans developed in 2010. Improve the fisheries MCS equipment at the three levels of operation. Need to operationalize EA Fish database and data collection, and sharing at all levels (including BMU levels) with strong power backups and MCS data be incorporated in the EA- Fish database. Personnel at Surveillance Patrol Units (SPU's) at the districts and BMU's need training on fisheries management systems.

				MCS Regional Working Group operates through an Enforcement Unit Other LVFO Regional Groups are responsible for Monitoring BMU's linked through regional BMUS network are responsible for vetting the boats and fishers before registration and licensing by fisheries authorities. Self-regulation on the undersize fish by fish processing industry is a success regional initiative in the fight against illegal fish. Data of Nile Perch and information of people involved in fisheries is available from report of FRAME SURVEYS.	Need to establish Regional and national Response and Rescue Center (RR&RC) at identified strategic areas around Lake Victoria. Need to put in places fisheries management measures on fishing vessels, gears, fishers, fish size/limit and fishing time; SOPs should be operationalized as in accordance with the available budget. Data on patrol outcome, stock assessment, frame survey, inventory, budget, illegal fish, gears and seasons collected, analyzed and applied for MCS. Strengthen BMUs in form of capacity building in the areas of training in income generating

					projects,busin (entrepreneur ship), and any other areas that will empower them with tools to carry out MCS activities effectively. Development of BMUs offices, working facilities, and patrol equipments. Setting of a BMU fund made of (20%) of the fisheries revenue collected by local authorities. Fisheries Officers should be facilitated to carry out regular and scheduled BMUs mentoring. There are anticipated funds and when made available shall be used in the recruitment of frontline fisheries law enforcement personnel and procurement of MCS facilities and repair of boats and engines received during IFMP Project.

					Need to procure small canoes of low fuel consumption to be used for surveillance purposes and a few big vessels with state of the art of the art able to carry confiscated gears and persons. Need to train fisheries staff and BMU members in the areas of MCS using the MCS Training Manual from LVFO.

					of LVFO Terms of Training (TOT). To minimize social barriers among BMUs through establishment of BMU networks. Training of members of Patrol Sub-Committees within BMUs networks at location level to co-manage within location, Division District and Counties within Lake Victoria. Develop Code of Practice for the BMU's and expedite formation of BMU networks. BMU training should be streamed in the national budget. Establish an independent MCS Monitoring System. Enhance community data collection,

					proper packaging of information and dissemination. Institutionalize proper collection of targeted intelligent information, which will give road map to informed operation for deterrent purposes. Roll out BMU training manual and develop a harmonized system of prosecution processes and reporting in the support of fisheries MCS. Establish fishing capacity for Lake Victoria based on actual facts; Establish an independent BMU performance-monitoring group that can conduct random BMU surveys. Carry out a study on the

					best alternative livelihood with high economic gains which can attract the your around the lake. Extend self-regulation to the fish landing stations where all the fish including undersize are landed. Ensure all agents supplying fish to the processing factories are members of Nile Perch fish traders' networks. Ensure there is effective control on the fish going to the local markets and those on transit to various parts of the region. Institute legal control on importers, manufactures, suppliers and stocking of illegal fishing gears and netting materials. Implement National Strategy

					for a formalized MCS Plan. Explore possibilities of applying closed season or allocation of quotas Empowerment of Local Authorities and BMU's through sensitization and facilitation in order to be able to protect fisheries from illegal exploitation. Strengthen the laws by providing stringent measures and severe penalties for illegal fishing and trading in illegal fish.

LIST OF PUBLICATIONS – LISTE DES PUBLICATIONS

SmartFish Programme

1. *Report of the Inception / Focal Point Meeting of the SmartFish Programme – Flic en Flac, Mauritius, 15th-16th June 2011*. REPORT/RAPPORT: SF/2011/01. August/Août 2011. SmartFish Programme. Indian Ocean Commission (55 pages).

2. *Report of the First Steering Committee Meeting of the SmartFish Programme – Flic en Flac, Mauritius, 17th June 2011*. REPORT/RAPPORT: SF/2011/02. August/Août 2011. SmartFish Programme Indian Ocean Commission (51 pages).

3. *Rapport de la réunion de présentation du programme SmartFish aux points focaux – Flic en Flac, Ile Maurice, 15-16 juin 2011*. REPORT/RAPPORT: SF/2011/03. August/Août 2011. SmartFish Programme. Indian Ocean Commission (55 pages).

4. *Eco-Certification for the Tuna Industry, Technical Assistance for Implementation of a Regional Fisheries Strategy for ESA-IO (IRFS)*. REPORT/RAPPORT: SF/2011/04. May 2011. SmartFish Programme. Indian Ocean Commission (40 pages).

5. *Regional Market Assessment (Supply and Demand)*. REPORT/RAPPORT: SF/2012/05. March/Mars 2012. SmartFish Programme. Indian Ocean Commission (264 pages).

6. *Trade Assessment Study*. REPORT/RAPPORT: SF/2012/06. March/Mars 2012. SmartFish Programme. Indian Ocean Commission (120 pages).

7. *Gouvernance des Pêches Maritimes dans l'Ouest de l'Océan Indien*. REPORT/RAPPORT: SF/2012/07. June/Juin 2012. SmartFish Programme. Indian Ocean Commission (101 pages).

8. *Value Chain Assessment of the Artisanal Fisheries – Mauriti*us. REPORT/RAPPORT: SF/2012/08. June/Juin 2012. SmartFish Programme. Indian Ocean Commission (85 pages).

9. *Kenya Fisheries Governance*. REPORT/RAPPORT: SF/2012/09. June/Juin 2012. SmartFish Programme. Indian Ocean Commission (36 pages).

10. *Training Needs Analysis – Quality and Hygiene*: REPORT/RAPPORT: SF/2012/10. June/Juin 2012.SmartFish Programme. Indian Ocean Commission (95 pages).

11. *A Review of Somalia's & (Semi-Autonomous Regions) Fisheries Legislation and Management*. REPORT RAPPORT: SF/2012/11. June/Juin 2012 SmartFish Programme. Indian Ocean Commission (49).

12. *Assessment of IUU Activities On Lake Victoria*. REPORT/RAPPORT: SF/2012/12. June/Juin 2012 SmartFish Programme. Indian Ocean Commission (116 pages).

La bonne gouvernance et de la gestion des pêches et de l'aquaculture permettent d'améliorer la contribution du secteur à la sécurité alimentaire, au développement social, à la croissance économique et au commerce régional ; ceci en assurant par ailleurs une protection renforcée des ressources halieutiques et de leurs écosystèmes.

La Commission de l'Océan Indien (COI) ainsi que la COMESA (Common Market for Eastern and Southern Africa), l'EAC (East African Community) et l'IGAD (Inter-Governmental Authority on Development) ont développé des stratégies à cette fin et se sont engagés à promouvoir la pêche et l'aquaculture responsable.

SmartFish supporte la mise en œuvre de ces stratégies régionales en mettant l'accent sur le renforcement des capacités et des interventions connexes visant à :

- mettre en place des mécanismes pour la gestion et le développement durable des pêches ;
- développer un cadre de gouvernance des pêches au niveau régional ;
- renforcer le suivi-contrôle-surveillance pour les pêcheries partagées ;
- développer des stratégies et supporter des initiatives propres à accroître le commerce régional du poisson ;
- contribuer à la sécurité alimentaire en particulier par la réduction des pertes après captures et la diversification de la production.

SmartFish est financé par l'Union Européenne dans le cadre du 10ème Fond Européen de Développement.

SmartFish est mis en œuvre par la COI en partenariat avec la COMESA, l'EAC et l'IGAD et en collaboration avec la SADC. Une collaboration étroite a également été développée avec les organisations régionales de pêche de la région. L'assistance technique est fournie par la FAO et le consortium Agrotec SpA.

By improving the governance and management of our fisheries and aquaculture development, we can also improve food security, social benefits, regional trade and increase economic growth, while also ensuring that we protect our fisheries resources and their ecosystems.

The Indian Ocean Commission (IOC), the Common Market for Eastern and Southern Africa (COMESA), the East African Community (EAC) and the Inter-Governmental Authority on Development (IGAD) have developed strategies to that effect and committed to regional approaches to the promotion of responsible fisheries and aquaculture.

SmartFish is supporting the implementation of these regional fisheries strategies, through capacity building and related interventions aimed specifically at:

- implementing sustainable regional fisheries management and development;
- initiating a governance framework for sustainable regional fisheries;
- developing effective monitoring, control and surveillance for transboundary fisheries resources;
- developing regional trade strategies and implementing regional trade initiatives;
- contributing to food security through the reduction of post harvest losses and diversification.

SmartFish is financed by the European Union under the 10th European Development Fund.

SmartFish is implemented by the IOC in partnership with the COMESA, EAC, and IGAD and in collaboration with SADC. An effective collaboration with all relevant regional fisheries organisations has also been established. Technical support is provided by Food and Agriculture Organization (FAO) and the Agrotec SpA consortium.

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