



EAST AFRICAN COMMUNITY
LAKE VICTORIA FISHERIES ORGANIZATION



HARMONIZED GUIDELINES FOR ESTABLISHMENT AND MANAGEMENT OF FISH BREEDING AND NURSERY AREAS IN LAKE VICTORIA



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FOREWORD

Lake Victoria supports one of the world's most productive inland fisheries with estimated total fish landings of about 1 million tonnes per year. The fishery provides direct employment for more than 800,000 people, the foreign exchange earnings from fish exports to international market is about US\$ 300 million and contributes on average of about 2 to 3% to the total GDP of the riparian countries. Therefore, effective management of the fisheries is very important to sustain these benefits for the current generation and many more to come.

The lake's fisheries resources have been reported to be under immense threat from various human activities, resulting in conflicts between conservation, management and exploitation. To underscore the importance of sustaining the fisheries of Lake Victoria, Lake Victoria Fisheries Organization (LVFO) Council of Ministers in 2016 directed the Partner States to intensify the balance between exploitation, management and conservation through protection of fish breeding and nursery areas. Protection and conservation of these areas have a number of benefits which include: increased replenishment of fish stocks; increased biomass and abundance; increased fish catches and income to fishers; enhanced food and nutrition security to the communities; and increased revenue to Devolved/Local and National Governments.

These guidelines are an effort towards harmonizing establishment and management of fish breeding and nursery areas at regional level. The guidelines are intended to harmonize procedures for identification, mapping, gazettement, marking, roles and responsibilities of various stakeholders involved in the conservation, protection and monitoring of fish breeding and nursery areas. The Partner States are requested to incorporate provisions of these guidelines in their national laws, regulations, guidelines, and management plans for implementation to ensure sustainability of the fishery resources in the lake.

Dr. Shigalla Mahongo
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1. BACKGROUND

Lake Victoria with a surface area of 68,800 km² is the world's second largest freshwater body. It supports one of the world's most productive inland fisheries with an estimated total fish landings of about 1 million metric tonnes per year. Lake Victoria has a commercial fishery dominated by three species; Nile perch (*Lates niloticus*), Nile tilapia (*Oreochromis niloticus*) and Dagaa (*Rastrineobola argentea*) constituting over 95 % of the total fish catch. The fishery provides direct employment for more than 800,000 people, while foreign exchange earnings from Nile perch exports to international markets is about US\$ 300 million and contributes about 2 to 3% of the total Gross Domestic Product (GDP) of the riparian countries (LVFO, 2016¹).

The fisheries of Lake Victoria have been managed under a harmonized Fisheries Management Plan (FMP) since 2003 and the current FMP-III is for the period 2016-2020. The Plan provides for rebuilding of Nile perch biomass from 1.2 million MT to 1.4 million MT and to raise the Nile perch catches from 250 MT to about 300 MT by 2020. It also provides for raising the catch for tilapia from 60 MT to 90 MT and the corresponding value from US\$ 106 to US\$ 160 within the same period. One of the management intervention areas to achieve the targets in the FMP-III is the protection of breeding and nursery areas. Partner States have identified potential fish breeding and nursery areas of which some have been gazetted but may need review. Additionally, the boundaries of these areas are not specified in the existing regulations and guidelines are at different levels of development.

Lake Victoria is experiencing increasing fishing pressure and declining fish stocks mainly due to increased use of illegal fishing gears and methods which tend to extend into fish breeding and nursery grounds.

Following the stock assessment technical reports of 2008 and 2015 (LVFO, 2008² and 2015³) which underscored the importance of establishing and protecting nursery and breeding areas for increased fish production, the Lake Victoria Fisheries Organization (LVFO) Council of Ministers in 2016 directed the Partner States to intensify the balance between exploitation, management and conservation through protection of fish breeding and nursery areas. It is against this background that these guidelines are developed to provide regional guidance on establishment and management of fish breeding and nursery areas.

2. INTRODUCTION

Lake Victoria shallow inshore areas⁴ are associated with diverse shoreline features with a range of habitats that influence fish productivity and diversity. The habitats with vegetation cover, rocky, sandy and muddy substrata, bays and river mouths are important breeding, nursery and

¹ LVFO (2016). Regional Catch Assessment Survey Synthesis Report June 2005 To November/December 2015. Lake Victoria Fisheries Organization, Jinja, Uganda. 35pp

² LVFO (2008). Stock Assessment Report. Lake Victoria Fisheries Organization, Jinja, Uganda. 28pp

³ LVFO (2015). Stock Assessment Report. Lake Victoria Fisheries Organization, Jinja, Uganda. 49pp

⁴ Areas providing breeding and nursing functions

feeding grounds for variety of fishes. Degradation and fishing in these habitats has therefore contributed to the loss of biodiversity and decline in fish biomass.

Currently, a number of management measures have been harmonized at regional level including fishing gear regulations, allowed sizes of fish to be caught and recommended fishing methods to ensure sustainability of fisheries. Despite these measures, the fish stocks are still dominated by juvenile fish. A recent hydroacoustic survey (LVFO 2018⁵) showed that 98% of the Nile perch in the lake were less than 50 cm Total Length which is the allowed minimum slot size to be caught. Bottom trawl surveys conducted in 2017 indicated that majority of juveniles of both Nile perch and Tilapia were found in bays and shallow waters. A Dagua selectivity study conducted in 2005 showed high presence of juveniles in shallow areas which informed the Council of Ministers' directive in 2009 to fish for Dagua outside 2 km distance from the shoreline.

Therefore, these guidelines are developed with the aim of harmonizing establishment and management of fish breeding and nursery areas to increase productivity and enhance biodiversity.

3. RATIONALE

The Lake Victoria basin is facing rapid urbanization, industrialization and destruction of critical habitats including fish breeding and nursery areas as a result of increased human activities. Partner States have developed the requisite fisheries laws for proper management of fish breeding and nursery areas. However, development/review of regulations and guidelines to operationalize these laws are at different stages and they need to be harmonized. Lake Victoria being a shared ecosystem, these harmonized guidelines will ensure conformity in establishment and management of fish breeding and nursery areas in the Partner States.

In addition, the riparian States of Lake Victoria are signatories to International Conventions and Treaties which call upon parties to protect critical habitats. The Food and Agriculture Organization (FAO) of the United Nations Code of Conduct for Responsible Fisheries calls upon all critical fisheries habitats to be protected and rehabilitated. The Treaty which established the East African Community; Article 114 sub-Article 2(b) (ii) provides for adoption of common regulations for the protection of shared aquatic resources. Also the Convention for the establishment of LVFO provides for Contracting Parties to harmonize national measures for the sustainable utilization of the fisheries resources.

4. AIM AND SCOPE

The aim of these guidelines is to provide guidance regarding establishment and management of fish breeding and nursery areas and also to aid in restoration of degraded fish habitats and species in Lake Victoria. The guidelines are intended to harmonize procedures for development of national guidelines, awareness creation, identification, mapping, validation, gazettement, marking, monitoring and evaluation of fish breeding and nursery areas. These guidelines also specify roles and responsibilities of various stakeholders involved in the conservation, protection, monitoring and evaluation. They provide a framework for collaboration and

⁵ LVFO (2018). Report of the Lake-wide hydro-acoustic and environmental survey on Lake Victoria. Lake Victoria Fisheries Organization, Jinja, Uganda. 66pp

participation of key stakeholders in the management of the fish breeding and nursery areas. It is intended that, by protecting these areas, there will be increased replenishment of fish stocks; increased catches and income to fishers; enhanced food and nutrition security to the communities; and increased revenue to Devolved/Local and National Governments.

5. ESTABLISHMENT OF FISH BREEDING AND NURSERY AREAS

The establishment of fish breeding and nursery areas should be a step by step process including development of national guidelines, awareness creation, identification, mapping, validation, gazettelement, marking, monitoring and evaluation. The process should be consultative with relevant stakeholders involved for their input and ownership.

5.1. Development of National guidelines

National guidelines should be developed in consultation with key stakeholders. The guidelines should provide procedures and processes required for establishment and management of fish breeding and nursery areas as provided for in these guidelines.

5.2. Awareness creation

Awareness creation should be conducted at various levels to key stakeholders to have a common understanding of the importance of fish breeding and nursery areas; prevailing challenges facing fisheries of the lake, and the need to demarcate such habitats.

5.3. Identification

The identification of fish breeding and nursery areas should be science-based (literature review and primary data) and backed up by indigenous knowledge. The primary data should be collected from bottom trawl and hydroacoustic surveys, experimental gillnetting, electrical fishing or other efficient methods of sampling to obtain fish of all size ranges so as to assess the breeding intensity (concentration of juveniles and gravid-females⁶) of the population. In areas with transparent waters, scuba diving may also be used to verify the presence and number of tilapia nests and abundance of juvenile fish.

Factors to consider in the determination of the extent of the area (polygon) to be considered for demarcation should include:

- i. Biological parameters – abundance of juveniles, gravid-females and mature fish by species
- ii. Habitat type - sheltered bays, sandy beaches, denuded areas, river mouths, marginal swamps and vegetated areas, rocky and muddy areas. For example, cichlids usually establish their nests in sandy beaches; carps and catfishes migrate to denuded floodplains for breeding, Lungfish breed in marginal swamps
- iii. Physical parameters - depth, temperature, water clarity and low water current.
- iv. Chemical parameters - dissolved oxygen (DO), pH, heavy metals within allowable ranges, nutrient levels and conductivity

⁶Female fish with ripe eggs.

The following information should be provided for every identified fish breeding and nursery area:

- a. Name of the fish breeding and nursery area
- b. Administrative/Geographical location: Region (Tanzania-Tz, Uganda-Ug) / County (Kenya-Ke), District (Tz, Ug) / Sub-County (Ke), Division (Tz, Ke) / Sub-County (Ug), Location (Ke) / Ward-(Tz) / Parish (Ug), Sub-location (Ke) / Village (Tz, Ug)
- c. GPS coordinates of the specified fish breeding and nursery area (polygon)
- d. Size of the area to be protected (Km²)
- e. Major fish species for protection
- f. Habitat type (rocky, muddy, vegetated, sandy, etc)
- g. Date
- h. Surrounding human activities (e.g. fishing, cage farming, navigation, agriculture)

5.4. Mapping

Plotting GPS coordinates of the identified fish breeding and nursery areas to produce maps to guide demarcation and gazettelement.

5.5. Validation

The demarcated fish breeding and nursery areas should be verified by relevant stakeholders for concurrence on extent.

5.6. Gazetting

Gazettelement should be as per each Partner State's legislative processes. The regulation should include the information provided in Sub-section 5.3 (a - h) and respective maps.

5.7. Marking

Marking process should be participatory with the involvement of all relevant stakeholders for the purpose of buy-in and ownership. Marks should be conspicuous at a distance to show the physical boundaries of the fish breeding and nursery areas for ease of identification by fishers and other lake users. The type of marks used should be environmental friendly to the ecosystem and other users of the lake.

6. MANAGEMENT OF FISH BREEDING AND NURSERY AREAS

Fish breed and nurse their young in particular areas of the lake which have favourable biological and environmental conditions. These areas should be protected to ensure sustainability of the fish stocks and measures put in place for restoration of degraded habitats. Partner States should therefore ensure effective management of such areas with regular sensitization of the fisher communities and relevant stakeholders on the importance of protecting these areas and benefits that accrue from them.

In view of the above, no fishing activities should be conducted in the gazetted fish breeding and nursery areas. However, Partner States may customize this provision according to their local situation. For research and related purposes, permission must be sought from relevant authorities. Other human activities which compromise the integrity of the fish breeding and

nursery areas such as cage farming, sand mining, bathing, domestic/car washing and clearing of shoreline vegetation should be prohibited. No human activity should be allowed within a distance of 100 m from the markings. For day- to- day management and protection of these areas, Partner States should ensure that each fish breeding and nursery area has a management committee/BMU/respective BMU network. Each fish breeding and nursery area should have a management plan developed with the involvement of all relevant stakeholders. The plan should at least indicate objectives, activities, verifiable indicators and means of verifying them. The Central/National and Devolved/Local governments should mainstream establishment and management of fish breeding and nursery areas in their plans and programs.

7. MONITORING AND EVALUATION

Partner States should put in place a periodic monitoring system at National, Devolved/Local and Community/Beach Management Units (BMUs)/BMU network levels. Monitoring indicators should include: levels of compliance, presence of markings, the weight and value of fish landed, income and revenue. In addition, changes in fish sizes (young, juveniles and brood stocks) and biodiversity, habitat and their physico-chemical characteristics, fish stocks, fish consumption, employment and livelihood should also be monitored.

8. RESPONSIBILITIES AND OBLIGATIONS

Successful establishment and effective management of fish breeding and nursery areas call for participation and collaboration of various stakeholders at different levels charged with responsibilities and obligations as stated below:

8.1. Lake Victoria Fisheries Organization Secretariat

- i. Coordinate the development/review of regional guidelines for the establishment and management of fish breeding and nursery areas.
- ii. Follow up on the status of implementation of these guidelines.
- iii. Facilitate regional monitoring of implementation of these guidelines
- iv. Coordinate synthesis of national reports on implementation of these guidelines.
- v. Develop/review Standard Operating Procedures necessary for management of fish breeding and nursery areas
- vi. Report to Sectoral Council whenever there is a need for policy guidance in regard to these guidelines.

8.2. National Fisheries Management and Development

- i. Ensure development/review of national guidelines and regulations for the establishment and management of fish breeding and nursery areas.
- ii. Conduct awareness creation on the importance of fish breeding and nursery areas.
- iii. Provide guidance to Local/Devolved Governments on the establishment and management of fish breeding and nursery areas.
- iv. Coordinate the identification and mapping of fish breeding and nursery areas.
- v. Develop/review regulations and ensure gazettelement of fish breeding and nursery areas at national level in consultation with key stakeholders.
- vi. Ensure installation of harmonized devices/marks for identified fish breeding and nursery areas.

- vii. Monitor and enforce compliance of laws and regulations regarding protection of fish breeding and nursery areas.
- viii. Monitor the presence of markings, weight and value of fish landed, income and revenue
- ix. Provide/source funds for the identification, mapping, marking, monitoring and compliance checks in fish breeding and nursery areas.
- x. Report to stakeholders on the performance of the fish breeding and nursery areas.
- xi. Disseminate management information on fish breeding and nursery areas in a user-friendly manner to key stakeholders.

8.3. Fisheries Research

- i. Conduct the identification and mapping of fish breeding and nursery areas in collaboration with National/Devolved/Local fisheries management and in consultation with other relevant stakeholders.
- ii. Monitor the changes in fish sizes (young, juveniles and brood stocks), biodiversity, habitats, physico-chemical and environment conditions and fish stocks of the fish breeding and nursery areas
- iii. Monitor the benefits accruing from protecting fish breeding and nursery areas like food and nutritional security, employment and livelihood
- iv. Share the final reports on findings of 8.3 (i-iii) with the respective National Fisheries Management and Development institutions.
- v. Package and disseminate research findings on fish breeding and nursery areas in a user-friendly manner to key stakeholders.
- vi. Source for requisite funds to facilitate implementation of the above activities.

8.4. Local/Devolved Governments

- i. Conduct awareness creation on the importance of fish breeding and nursery areas.
- ii. Participate in the identification, mapping, installation of physical marks and protection of fish breeding and nursery areas.
- iii. Develop and implement ordinances/by-laws on fish breeding and nursery areas.
- iv. Support development of by-laws by the fisher communities and approve them.
- v. Provide technical guidance in the development/review of management plans for fish breeding and nursery areas by fishing communities.
- vi. Collaborate with the National government and other relevant stakeholders in the management and protection of fish breeding and nursery areas.
- vii. Monitor compliance and enforce rules and regulations regarding protection of fish breeding and nursery areas
- viii. Monitor the presence of markings, the amount of fish landed, income and revenue
- ix. Ensure collaborative management for trans-boundary (between two Devolved/Local governments) fish breeding and nursery areas.
- x. Provide/source funds for awareness creation, technical support and compliance checks regarding the management of fish breeding and nursery areas.
- xi. Keep records on the performance of the fish breeding and nursery areas
- xii. Share the reports of 8.4 (vii, viii and xi) with the respective National Fisheries Management and Development institutions and other relevant stakeholders.
- xiii. Disseminate management information on fish breeding and nursery areas in a user-friendly manner to key stakeholders.
- xiv. Promote exchange visits to help fishers/Management Committee/BMU/BMU network to learn from others with well protected fish breeding and nursery areas.

8.5. Beach Management Unit Committee/Beach Management Unit network

- i. Create awareness on the importance of fish breeding and nursery areas to fishers, riparian communities and local leadership.
- ii. Participate in the identification, mapping, installation of physical marks and protection of fish breeding and nursery areas.
- iii. Develop and implement by-laws on fish breeding and nursery areas.
- iv. Develop a management plan in consultation with Local/Devolved Governments for each fish breeding and nursery area.
- v. Monitor compliance in accordance with their respective by-laws and presence of marks and the amount and value of fish landed.
- vi. Keep records and share data regarding performance of their fish breeding and nursery areas.
- vii. Disseminate management information on fish breeding and nursery areas in a user-friendly manner to fishers, riparian communities and local leadership.

8.6. Fishers

- i. Create awareness on the importance of fish breeding and nursery areas to their fellow fishers.
- ii. Provide indigenous knowledge during the identification of fish breeding and nursery areas.
- iii. Participate in identification, validation, installation and monitoring of presence of markings in fish breeding and nursery areas.
- iv. Comply with the provisions in the guidelines, regulations and by-laws regarding management and protection of fish breeding and nursery areas.
- v. Report any illegal activities in the fish breeding and nursery areas to the relevant authorities.
- vi. Report any incidence, such as fish kills, that may be found in or around the fish breeding and nursery areas to the relevant authorities
- vii. Provide data and information on fish catch and value and share with BMU Committees.

8.7. Civil Society Organizations

- i. Create awareness on the importance of fish breeding and nursery areas.
- ii. Support activities towards establishment and management of fish breeding and nursery areas.
- iii. Lobbying for implementation of these guidelines by respective stakeholders.
- iv. Monitor the impact of protection of fish breeding and nursery areas.
- v. Source and facilitate patrol and monitoring of fish breeding and nursery areas in consultation with relevant authorities.

8.8. Other relevant Stakeholders

These guidelines recognize the roles and responsibilities of relevant Ministries, Departments, Agencies (MDAs) and Development Partners whose functions recognize and support conservation of biological resources, protection of critical habitats, wildlife, endangered species and sustainable environmental management. It is envisaged that the interventions of MDAs and Development Partners will contribute to the implementation of these guidelines.

9. PENALTIES RELATING TO PROTECTION OF FISH BREEDING AND NURSERY AREAS

Penalties related to protection of fish breeding and nursery areas should be as specified in national laws and regulations of the Partner States. The following activities amongst others should be considered for penalization if they take place in the breeding and nursery areas and adjacent catchments;

- i. Fishing.
- ii. Vandalizing markings.
- iii. Destroying habitats.
- iv. Installation of cages.
- v. Sand mining.
- vi. Domestic/car washing
- vii. Recreational activities
- viii. and any other activities against existing national laws and regulations such as water and environment

10. OPERATIONALIZATION OF THESE GUIDELINES

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Partner States should endeavor to incorporate provisions of these guidelines in their national laws, regulations, guidelines and work plans for implementation. The Local/Devolved Governments should equally endeavor to incorporate the national provisions in their by-laws and work plans.