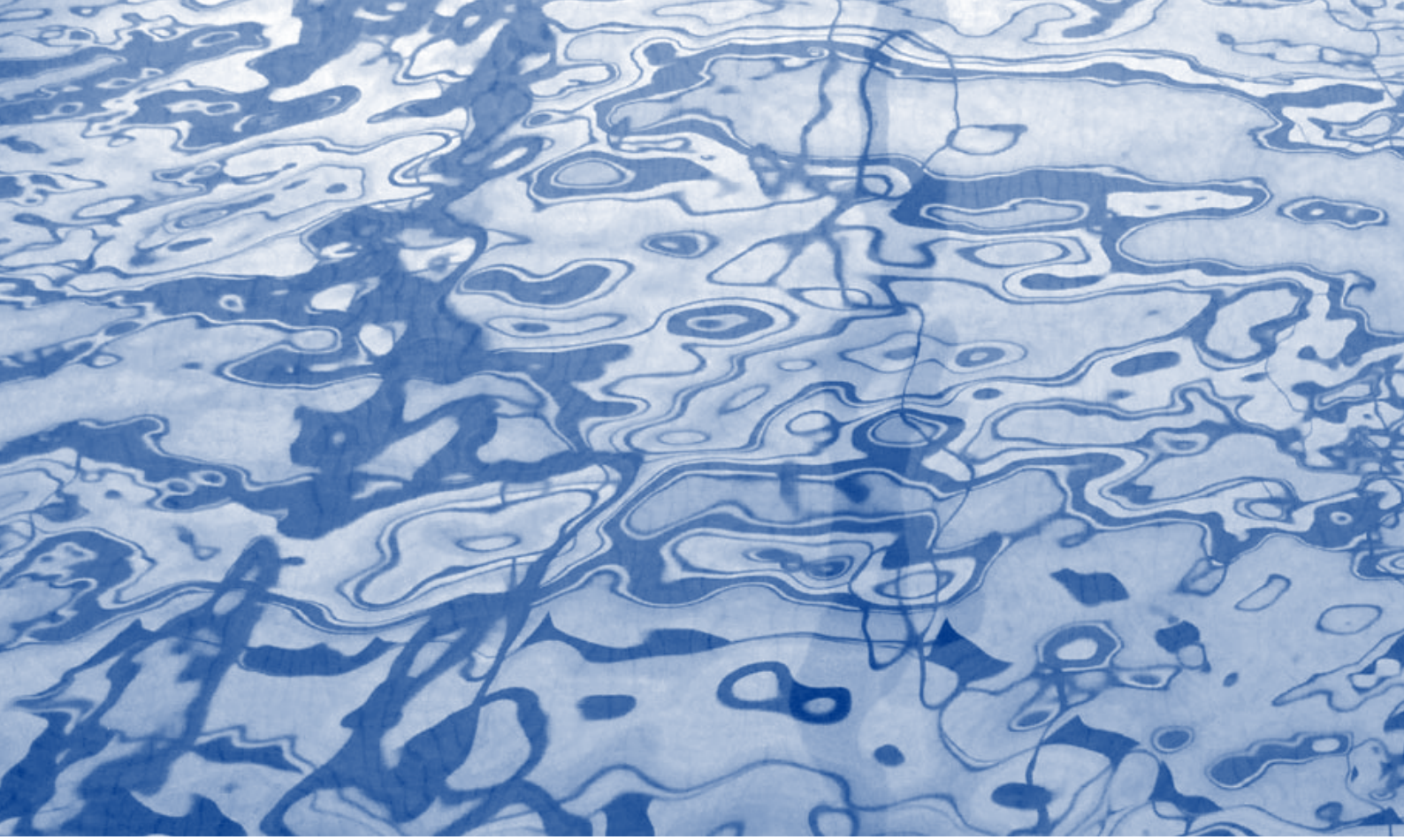
Lessons from Lake Victoria

Management of shared inland fisheries: Lessons from Lake Victoria (East Africa)



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Abstract

Africa has many large lakes most of which are shared between more than one country. One of them, Lake Victoria (68,000 km^2) is shared between three East African Community (EAC) partner states with 6% of the lake in Kenya, 43% in Uganda and 51% in Tanzania. The lake has a very lucrative fishery yielding 750,000 tonnes of fish valued at US$ 400 million annually. Fish exports from the lake earn partner states US$ 250 million annually, and about 3 million out of 30 million people in the lake basin depend on the lake fisheries directly or indirectly for their livelihood. Management of the fisheries of Lake Victoria poses a challenge partly because it is done by national governments under national jurisdictions. How then have the partner states managed to harmoniously exploit the fisheries of the lake under multiple jurisdictions? The partner states established a regional institution, the Lake Victoria Fisheries Organization (LVFO) to harmonize national measures, and to develop and adopt conservation and management measures for sustainable utilization of the fisheries. National measures are harmonized into regional measures and agreed upon through the structures from the national village level to a ministerial regional level. The LVFO then developed programs and formed working groups (WGs) at national and regional levels through which different activities are implemented. Through these efforts, the partner states have put in place similar measures to control access to the fishery through licensing, limiting the size of fish harvested, setting the minimum mesh size of gill nets to be used on the lake, and prohibiting certain fishing gears and methods. The agreed measures have been incorporated in national fisheries regulations and the partner states have developed and adopted a regional plan of action to prevent, deter and eliminate illegal, unreported and unregulated (RPA-IUU) fishing on Lake Victoria and its basin. The partner states have also developed and implemented joint projects on the lake. These efforts provide a model for management of shared inland fisheries resources.

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Challenges to management of shared inland fisheries

Importance of the inland waters of Africa

Africa is rich in inland lakes, most of which have important fisheries which provide food, employment and income. The lakes also serve as sources of water, avenues for transport, and some of them are reservoirs for hydropower generation. Most inland lakes in Africa such as Victoria, Albert, Edward, Tanganyika, Malawi and Turkana are among the most important lakes in the world. Lake Victoria is the second largest lake in the world while Tanganyika the second deepest lake in the world. Lakes Malawi, Tanganyika and Victoria have the highest fish species diversity in the world. Sustainable management of the fisheries of these lakes is therefore of great national and international importance. Most of the lakes are shared between more than one country and their management poses a challenge because the fisheries are managed under different national jurisdictions. There is need for a common system to facilitate management of each of the lakes harmoniously.

Historical methods of controlling access

The central objectives to management of the fisheries resources are sustainability and economic growth. Management of fisheries is normally through different ways of controlling access. Access to fisheries in Africa has for a long time been controlled through licensing. This measure has however not been effective in controlling the amount of fish taken from a fishery because, in most cases, the number of licenses issued has not been controlled leading to excessive increase in effort. Other measures have included control of the type and mesh size of fishing gear used, control of the size of fish harvested and through closed seasons and fishing grounds and through limiting the type and size of fishing craft.

Methods of allocating fisheries

Access to fisheries and allocation of the fisheries to those who have been granted access have been major challenges. This generally varies between countries and between fisheries. It is complicated where the fisheries are shared between more than one state. Allocation of fisheries has either been direct, through user rights or quota systems, or indirectly through various restrictions. Allocation of quotas is normally practiced in those fisheries where the total allowable catch (TAC) has been determined and this is then allocated to different components of the fishery. This is however not possible in fisheries like those of Lake Victoria and many of the African lakes where information on TAC is not available and is difficult to determine. In such fisheries indirect restrictive measures are used. This paper uses Lake Victoria to share experiences in management of shared inland fisheries using measures used to control access to different categories and segments of fisheries of the lake.

Basic characteristics of the Lake Victoria fishery

Lake Victoria (68,800km^2) is shared between Kenya (6%), Uganda (43%) and Tanzania (51%). It has a long coastline of 3,450 km. The current fishery comprises two introduced species (Nile perch and Nile tilapia) and one native cyprinid, *Rastrineobola argentea* (Dagaa/Omena/Mukene). Annual fish catches increased drastically from 100,000 tonnes in the early 1970s to over 750,000 tonnes by 2004. This stimulated construction of up to 30 factories to fillet and export Nile perch. The valued of the fishery was US$ 400 million locally with exports estimated at US$ 250 million by 2004. The high value of the fishery and the ready market provided by the processing plants has stimulated increases in fishing effort and provided a recipe for a potential scramble for the fishery. By 2004, the lake had 1433 fish landing sites, 153,066 fishing craft, 1.2 million gill nets targeting Nile perch and Nile tilapia, 8,601 seine nets targeting *Rastrineobola argentea* (Dagaa/Omena/Mukene) and 6.1 million hooks targeting Nile perch. The lake basin has a rapidly growing population of over 30 million people with limited employment opportunities and a third of them depend directly or indirectly on the fisheries. There is therefore high potential for rapid increases in pressure and a potential source of conflicts on the lake and its fisheries.

Characteristics of the fish stocks

The Nile perch grows to a maximum size of about 200 cm total length (TL). Males mature at 50 cm TL and females at 80 cm. The population is male dominated but all fish above 120 cm are females. The fish is exploited using gill nets and hooks. Much of the Nile perch harvested is filleted and exported

to international markets. Nile tilapia grows to a length of 75 cm TL. It matures at 25 cm TL at the age of 8 to12 months. It is also exploited using gill nets. Much of the Nile tilapia is consumed locally. Dagaa grows to a maximum length of 7 cm. The fish matures at 3.5 cm at the age of 8 months. The fish is exploited using seine nets of 5–10 mm mesh in combination with light attraction. The fish is used for human consumption and in human feed and targets the local and regional market.

Management of shared inland fisheries

The Lake Victoria model

The riparian countries of Lake Victoria have put a lot of effort to ensure that the lake and its fisheries are managed in a sustainable manner. This has been achieved through different cooperative arrangements which started as early as 1929. The current arrangement is through the Lake Victoria Fisheries Organization (LVFO) which was established through a convention signed in 1994 to coordinate development and management of the fisheries resources of the lake. The LVFO then formed programs through which to implement management measures and working groups (WGs) at national and regional level to implement programs. It has also developed joint projects to through which to implement the programs. The national working groups (NWGs) produce national guidelines for management of the fisheries. The national guidelines are harmonized at regional level by regional working groups (RWGs). The guidelines are then discussed by organs of the LVFO and actions for sustainable management of the fisheries are agreed upon and adopted by the LVFO Council of Ministers. These are then passed to partner states for implementation.

The mandate of the LVFO

The mandate of the LVFO is to promote cooperation among the contracting parties by harmonizing national measures, developing and adopting conservation and management strategies for the sustainable utilization of the living resources of Lake Victoria. The specific functions are to promote: Proper management and optimum utilization of fisheries; generation of information for management of fisheries; management of the databases and disseminating of the information; improvement of infrastructure and human resources capacity; and provision of a forum for discussion and making decisions on issues concerning management of the fisheries.

The programs of the LVFO

The mandate of the LVFO is implemented at national and regional level through five programs covering: Fisheries Management; Resource, Environmental and Socio-economic Research and Monitoring; Database; Information, Communication and Outreach; Capacity Building; and Aquaculture. The Fisheries Management Program develops and harmonize fisheries policies, laws and regulations; promotes adherence to fisheries laws and regulations; promotes participation of fisher communities in management of the fisheries through beach management units (BMUs); and adherence to fish quality and safety standards. The Resource, Environmental and Socio-economic Research and Monitoring Program collects data and monitors fish catches, fishing effort, fishing gear and methods, the abundance, composition, distribution and population structure of commercially important fish stocks, the biology and ecology, productivity, the health of the fish habitat, and fisheries socioeconomics. The Database, Information Communication and Outreach Program manages fisheries databases from research, and packages and disseminates the information. The Capacity Building Program develops infrastructure and human resource capacity. The Aquaculture Program reduces pressure on capture fisheries by provides guidelines for aquaculture development in the Lake Victoria Basin.

Implementation structure and processes

Level of implementation of LVFO activities

The activities of the programs of the LVFO are implemented within and between different levels of governance of individual partner states from the village national level to the regional EAC level. The lead institutions at national level are the ministries responsible for fisheries, the departments/directorates responsible for fisheries management and the institutions responsible for fisheries research. One recent development in management of the fisheries of Lake Victoria is the involvement of communities in management of fisheries through formation of beach management units (BMUs). The BMUs are to co-manage the fisheries with existing government and public institutions, nongovernmental organizations (NGOs) and the private sector. The functions of BMUs will include: overall planning for fisheries management; development of by-laws; identifying and recommending the fishers for licensing, thus involving them in resource allocation; collection of fisheries data; sensitising communities on fisheries issues including actions agreed upon by the partner states; community policing at local level; conflict resolution at local level; and collect and utilize revenue.

The activities are implemented by working groups (WGs) comprised of thematic experts. The WGs operate at national level as national working groups (NWGs) and at regional level as regional working groups (RWGs). The fisheries management institutions formulate fisheries policy, laws and regulations; enforce fisheries laws and regulations, oversee fish quality and safety assurance, aquaculture development and extension and implement the management actions agreed upon by the Council of Ministers. Fisheries research institutions collect data and provide information on the fish catches, fishing effort, fishing gear and methods, abundance composition and distribution of the fish stocks, biology and ecology of the fishes and the fish habitat, and fisheries socioeconomics. The NWGs develop national technical guidelines.

The national guidelines are harmonized into regional technical guidelines by the RWG. The technical information from research RWGs is passed to the Scientific Committee (SC) while that from management RWGs is passed to the Fisheries Management Committee (FMC). This process continues through higher organs of the LVFO for adoption after which the harmonized actions are passed to the partner states for implementation. The SC which consist of directors of fisheries research institutes identify research requirements, review research methodologies and results and ensure dissemination of research results. The FMC which consists of heads of fisheries management institutions review management information, develop and implement management policies and recommend management and conservation measures. The Executive Committee (EC) of Heads of Fisheries Management and Heads of Fisheries Research Institutes, reviews management and scientific activities, agrees on management measures to be implemented and submits them to the Policy Steering Committee (PSC). The PSC of permanent secretaries is responsible for fisheries reviews and submits the management recommendations from the EC to the Council of Ministers. The Council of Ministers (CM) is responsible for fisheries and is the topmost organ of the organization and makes decisions and adopts measures for management of fisheries resources. The decisions of the CM are sometimes passed through the EAC Council of Ministers and to the summit comprising the three presidents of the partner states.

Current state of resource allocation on Lake Victoria

Through the above arrangement the Council of Ministers of the LVFO has adopted a number of measures for management of the fisheries resources of Lake Victoria including: licensing; limiting the size of fish (Nile perch and Nile tilapia) harvested; limiting the minimum mesh size of gill net to be used on the lake; prohibiting a number of fishing gears and methods and touched in fishing power especially in relation to cross-border fishing and fish trade. Other restrictive measures being used on the lake by the partner states include closed seasons and closed area restrictions.

Licensing

Licensing is the main authority to gain access to the fisheries of Lake Victoria. The partner states have agreed that nationals will be allowed to fish in their national waters. Nationals from other partner states would be allowed to fish in the national waters of the other partner states as long as they comply with applicable laws and regulations of the partner states. Fishers from other partner states are however treated as foreigners and the conditions for licensing foreigners are very prohibitive.

Limiting the size of fish harvested

The size of Nile perch to be harvested has been set within a size range of 50 cm to 85 cm and the minimum size of Nile tilapia to be harvested has been set at 25 cm. The lower size range is intended to protect immature fish. The upper size is intended to protect breeding females which were becoming rare in the population. The size of Nile tilapia is intended to protect immature fish.

Limiting the minimum mesh size of gillnets

Gillnets and hooks are selective and catch only certain sizes ranges of fish. The minimum mesh size of gill nets of 127 mm (5 inches) is intended to avoid catching immature Nile perch and Nile tilapia.

Prohibiting use of certain fishing gears and methods

Monofilament gillnets have been banned because they are highly efficient and kill fish resulting in rapid loss of quality. They also do not decay and continue to fish for a long time when lost. Beach seines have been banned because most are not selective and are used in shallow inshore breeding areas where they destroy tilapia nests. Trawls nets have been banned because they are not selective and also sweep and destroy gear of small- scale fishers. Cast-nets are used in breeding areas of tilapia. Dynamite and poison are highly unselective and kill other organisms and make the fish unsuitable for human consumption.

Restricting fishing during certain times and seasons

This is intended to avoid fishing during critical times in the fishery such as the breeding season and to avoid bycatch. Closed seasons have not been applied widely on Lake Victoria except for the closed season for Dagaa in the Kenyan part of the lake. This is aimed at protecting juvenile of the larger species during the breeding season.

Limiting fishing in certain areas

This is aimed at protecting certain species such as biodiversity hot spots or development stages of a particular species. Closed areas have also not been applied widely on Lake Victoria but there are some areas of the lake with protected areas. Efforts are also being made to protect refugia of endangered species such as rocky outcrops, marginal areas, and satellite lakes.

Limiting fishing power – vessel size and propulsion power

The size and propulsion power of the vessel will determine how far the vessel can go and hence the size of the fishing ground. On Lake Victoria, vessels less than 5 m (Bawo Tatu) are prohibited because they fish mainly near the shore, which is the breeding ground of tilapia.

Other measures adopted by the council of ministers

The laws of the partner states have been harmonized and the new agreed measures incorporated into the national laws of partner states. The Council of Ministers also adopted an RPOA-IUU for Lake Victoria

Regional projects

The programs of the LVFO have in many cases been implemented through joint regional projects. These have included projects like: The Lake Victoria Fisheries Research Project (1996-2002); The Socio-economics of the Nile Perch Project (2003 – 2005); The Lake Victoria Environmental Management Project (1997-2004); and the Production and Marketing of Value Added Fishery Products in Eastern and Southern Africa (2003 – 2006). These activities are currently being undertaken through the Implementation of a Fisheries Management Plan (IFM) Project for Lake Victoria (2003-2008). IFMP is a five-year project (2003-2008) finance by the European Union. Key activities of the project include: improving institutional mechanisms, policies, laws and regulations; monitoring the status of the fish stocks, fishing pressure, and the fish habitat; promoting compliance to fisheries laws and regulations through patrols; promoting stakeholder participation in management of the fisheries through establishment of Beach Management Units (BMUs); improving human resource capacity; improving fisheries infrastructure through provision and rehabilitation of office space, providing patrol boats, research vessels, constructing fish landings to meet international fish quality requirements, and providing social infrastructure to fisher communities.

CHALLENGES

The main challenge for controlling access and allocation is law enforcement. On Lake Victoria, it is hoped that involvement of BMUs in management of the fisheries will improve appreciation of the relevance of the measures and improve compliance. Some of the outstanding issues such as the mesh size for Dagaa and right size of hook are being dealt with by ongoing projects.

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