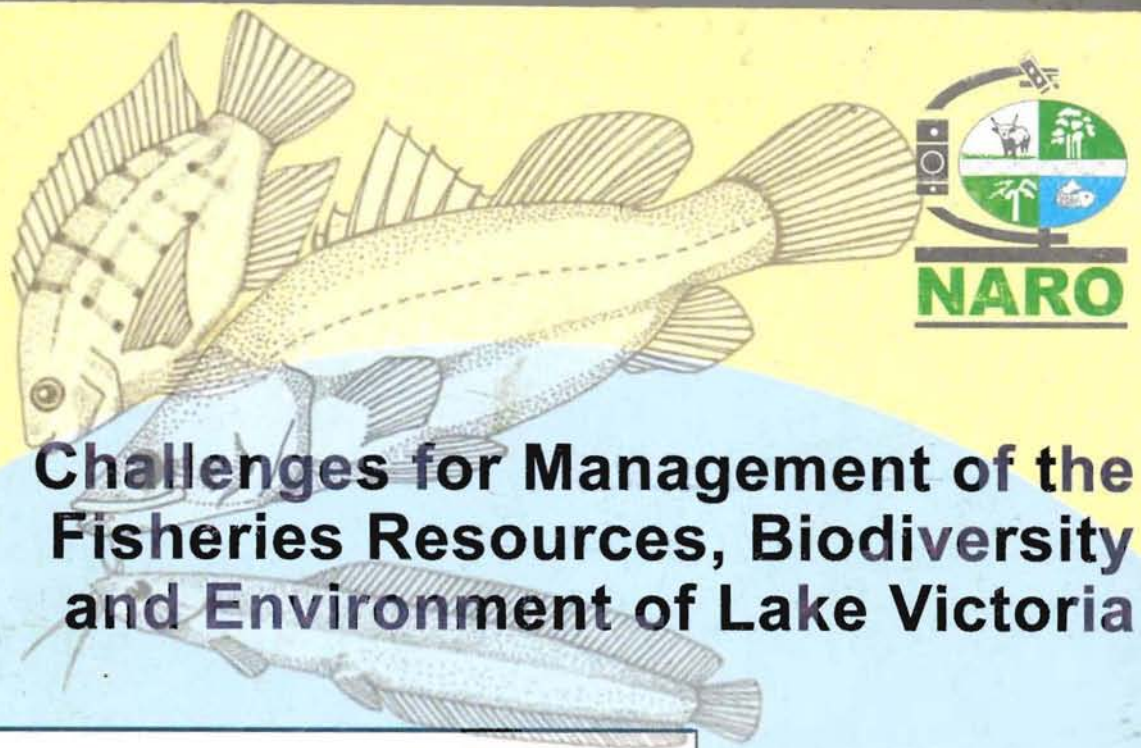


**FIRRI**



# Challenges for Management of the Fisheries Resources, Biodiversity and Environment of Lake Victoria



Editors:  
J. S. Balirwa,  
R. Mugidde,  
R. Ogutu-Ohwayo.

**Fisheries Resources Research Institute**

Technical Document No. 2 First Edition - 2004



# Challenges for Management of the Fisheries Resources, Biodiversity and Environment of Lake Victoria

Edited by: J.S. Balirwa, R. Mugidde and  
R. Ogutu-Ohwayo.

Fisheries Resources Research Institute

Technical Document No. 2

First Edition 2004  
FIRRI, Jinja Uganda.

### 9.3. The Potential for Co-Management in Fisheries

*O.K. Odongkara, A.T. Nyapendi and M. Kyangwa*

#### Introduction

Concerns have been raised over the sustainability of the fisheries resource base of Lake Victoria for some time. The draft National Fisheries Policy states: *"The key issues in the fisheries sector are resource depletion through overfishing aggravated by use of destructive fishing gear and methods"* (MAAIF 2000).

A fishery is said to be degraded if any or all of the indicators begin to show including decline in catches from the fishery, higher proportion of immature fish in the catch and reduction in the species composition of the catch. Inadequate implementation of fisheries management is considered the main cause of resource degradation. One of the factors identified as constraints to fisheries management has been lack of involvement of the resource users.

#### The Fisheries Resource Problem

A general indication of the resource depletion on Lake Victoria is provided by the annual catch statistics (Table 9.3.1), showing significant decline of catch estimates after 1993.

Table 9.3.1: Fish Catch for Lake Victoria, Uganda: 1990 - 2000 ('000 tonnes):

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Catch	119.9	124.7	129.7	134.9	103	103	106.4	106.6	105.2	111.4

Source: DFR 2000

Comparing the results of experimental bottom trawling surveys carried out in 1993 and 1977 to those of 1967 to 1971, Okaronon (1998) reported a decline in standing stocks from 80 kg/ha to 39 kg/ha over the period. Concerning decline of the individual major commercial species, Ogutu-Ohwayo (1998) examined the sustainability of the *L. niloticus* fishery, based on a study of the changes in total fishery yields and life history characteristics of the *L. niloticus* itself and its prey from the time the predator got established in Lakes Kyoga and Victoria. He concluded that the species may not sustain the high yields realized soon after its establishment in Lakes Kyoga and Victoria, partly because of the very high fishing pressure on the species, attributed to the high demand created by the increasing population and export.

A study (UNECIA 2001) also reported that the Nile perch fishery exhibited classic indicators of overfishing. These included reduction in age/length at maturity, higher mortality especially caused by fishing pressure, reduction in catch per unit effort, reduction in mesh size of nets used and an increased proportion of immature fish in the catches. Similar trends in the indicators of exploitation were found in tilapia and *Rastrineobola argentea* the other major commercial species of the lake. Increases in offshing efforts have also escalated, growing from 8,674 boats in 1990 (Okaronon Wandanya, 1991) to 16,093 in 2000 (FSTC, 2001). In Lake Victoria, Uganda, in 2000, 18.4% of the gill nets were below the recommended or legal mesh size of 5 inches and other banned gears including beach seines, cast nets, traps, undersized hooks and mosquito seines were in use (Table 9.3.2). Closely related to resource degradation is the problem of deterioration in water quality.

The scientific information is corroborated by fishers in a survey of their perception to resource change, conducted in 1999 (SEDAWOG 2000). Most fishers of *L. niloticus*, *O. niloticus* and *R. argentea* in the sample agreed that there was less fish in 1999 than five years before (86%, N=339). They also felt that they spent more time to catch the same amount of fish than they did five years before (79%, N=342) and they agreed that the species diversity had declined over the five years (91%, N=342). They also agreed that there were more boats on the fishing grounds, fish were smaller in size, there were more illegal gear in use and that fishing paid less than it did five years before.

Table 9.3.2: Gears on Lake Victoria, Uganda by Type: 2000.

Item	Number
Gill nets	
<2.5 ..	675
2.5 "	321
3.0 ..	3,014
3.5 ..	9,626
4.0 ..	20,235
4.5 ..	20,473
5.0 ..	51,357
5.5 ..	16,294
6.0 ..	94,771
6.5 ..	8,067
7.0 ..	52,590
7.5 ..	1,398
8.0 ..	8,014
9.0 ..	1,776
100"	5,709
> 10"	625
Gill nets - Total	294,945
Longlines (hooks)	254,453
Beach seines	811
Trawlers	
Handlines	4,585
Traps	11,349
Mosquito seines	2,452
Engines (Outboard/inboard)	2,031
Other gears	71

Source: FSTC 2000

Fisheries resource degradation could be explained using the Lélé Model (Lélé 1991). The model is an attempt to provide a realistic presentation of the environmental degradation causation problem. In the schematic representation of the model (Fig. 9.3.1) poverty is seen as a major cause of fish resource degradation. Many fishers reported using banned gears and fishing methods because they could not afford the recommended ones. On the market, many consumers exhibit high demand for immature fish because they cannot afford the recommended fish sizes.

According to the model, overfishing and use of destructive gears and fishing methods could be a consequence of affluence, as fishers seek to catch much more fish than their needs. This feeling was expressed by Kiiza (1998), who stated: "Excessive greed for money and the fulfillment of dietary demands are a riddle to the fisheries industry!" Fishers also made reference about the "greed" in their fellows as a major source of management problems in the fisheries. Affluence is also exhibited by industrial processors, who try to process more than their quota allocations of the catch, in their desire to maximise profit. Lastly, the foreign consumers, whose affluence, drawn from their desire for high quality cholesterol-free white meat, leads to excessive demand and drives the whole system towards unsustainability.



The model also tells us that fisheries resource degradation may be attributed to the type of access regime on the lake, because of its impacts on poverty, affluence and resource degradation. Restricting access could create poverty directly for the people to whom access has been denied, which in turn exacerbates resource degradation as explained above. Open access, on the other hand, starts off with affluence, which will however, be short-lived, as greater effort is attracted into the fisheries, resulting in degradation of the resource base. The lesson is, therefore, that better management should involve some degree of control of access to the fisheries.

There is a second cycle within the model, linking affluence, culture and technology to environmental degradation. The lesson is to adopt an exploitation system that is not driven entirely by productivity maximisation but is instead moderated by culture and values to extract quantities of the resources required to meet local needs. One approach to controlling access to resources and making use of culture and values is by granting tenitorial user-rights to the different fishing communities. This is the basis for co-management.

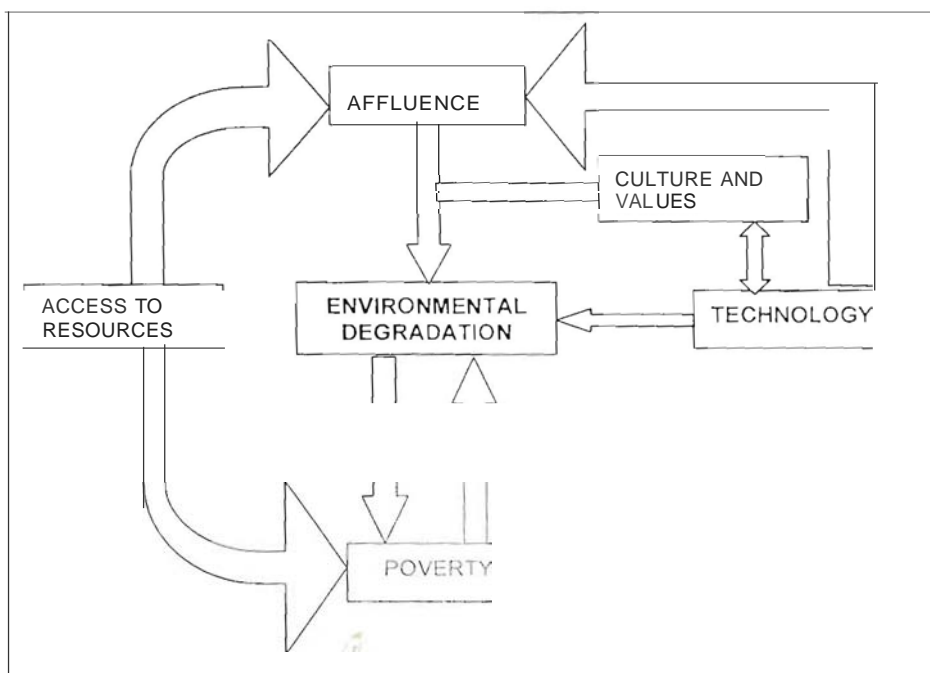


Fig. 9.3.1: The Lélé Model of the Causes of Environmental Degradation

Source: (Lélé 1991).

High population growth rates, estimated at 2.5% per annum and lack of alternative employment sources in the rural as well as urban areas, have also increased pressure on the lake. Limited access to land, lack of farming inputs, unpredictable weather patterns and lack of market, have all contributed to the influx into the fisheries.

Species introductions, particularly of the predator *L. niloticus* and of water hyacinth, have also affected the fisheries and water quality. Human activities within the catchment of the lake have resulted in pollution. Natural causes have also been identified, notably eutrophication. Destruction of the shoreline wetland, which functions as a filter against pollutants, nursery and refugia for fish, has exacerbated the problem. Other practices have also been responsible for destroying essential fish habitats.

### Issues in Fisheries Management

Fisheries management is aimed at achieving some optimum level of output from the resource base, through effective regulations. It is considered essential for addressing the resource problems threatening the sustainability of the fisheries. The literature reveals a number of models aimed at creating a shift from unsustainable tendencies to sustainability in natural resource exploitation. Maintaining of sustainable development (SO) would require that regulations be periodically injected into the fisheries. Drummond and Symes (1997) observed that there are unsustainable tendencies that develop in response to regulations when they are introduced. They were concerned that SO in fisheries and elsewhere has made little progress and this is attributed to the current approaches to sustainability involving policies, which attempt to address unsustainable events, and practices directly. Their conclusion was that policy must move beyond treating unsustainable practices and events as discrete occurrences, to a situation where they are addressed as outcomes of economic and social process and the conditions in which they occur. However, there are examples from the fisheries of Uganda's Lake Victoria to indicate that this approach is not applied.

Management of Lake Victoria fisheries has been operating on stipulated sets of rules and regulations which fishing communities are expected to adhere to and for which they are liable for punishment in case of disobedience. A historical perspective of state-based management regime of the fisheries of Lake Victoria suggests that centralised management strategies in Uganda have not been successful. The Lake Victoria Fisheries Service (LVFS) was the first regulatory body established for the management of the lake's fishery as a whole. However, due to staffing and funding problems, the LVFS's activities became sufficiently fruitless for the organisation as a whole to be disbanded in 1960. In 1960 the Fisheries Department was formed and in 1964, the Fish and Crocodile Act (later renamed the 1964 Fish Act) was also introduced. The Act, which is currently in force, relies heavily on the creation of rules by the Minister in charge and/or the Chief Fisheries Officer. Commenting on the Act,

the Fisheries Department itself notes, "...by current standards [The Act] is neither comprehensive enough nor flexible enough to provide for the proper management and conservation of fisheries" (MAAIF, 2000).

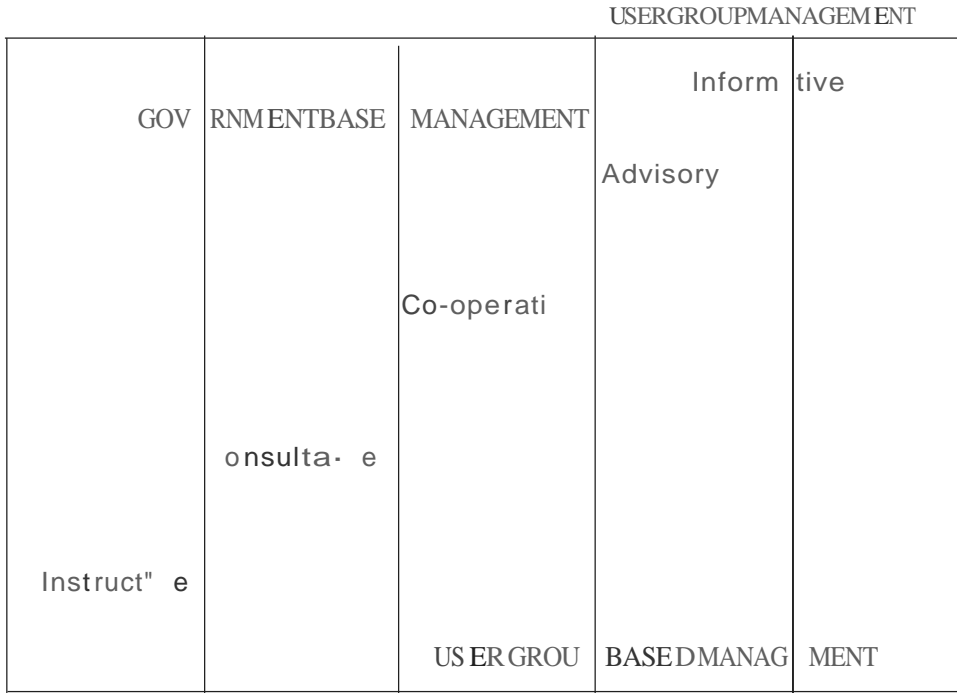
Catch declines, loss of bio-diversity, declining fish stocks, the use of illegal gears and effort increases (Cox 2001; FSTC 2001; Okarionon 2000; Okarionon and Wandanya, 1991) are not indicative of successful regulatory strategies suggesting that the present management style has not worked and requires substantial reform. Generally, the failure of the state-based management regime has been attributed to under-staffing, lack of law enforcement, and corruption of fisheries department personnel poor facilitation and more so, non-involvement of fishing communities in fisheries management (SEDAWOG 2000).

### **The Case for Co-management**

The success of regulations in fisheries is dependent on the management regime within which they are applied. Sen and Nielsen (1996) outline the range of management options, ranging from state-based to community-based extremes. Under the state-based management model, the role of user-groups in management would be minimal as government would be the dominant partner, setting the agenda. This is the "instructive" model of management (Fig. 9.3.2). The next stage is the "consultative" type of management, where Government would still provide the lead role, but there is greater involvement of the user groups in the management process. The stages that follow include the "co-operative" model, where there is equal power between the state and user groups; the "advisory" type, where the user groups assume greater role than the state, which is reduced to offering management advice. At the extreme end is the 'informative' model, where the user group would shoulder the burden of management and government would only be informed of the management progress.

However, because of the management failures experienced under the 'instructive' management on Lake Victoria, there is now a desire to move out of this model, identifying greater role for user groups. The Fish (Beach Management) Rules, 2003 have been formulated to this effect, aimed at giving legal empowerment to fishing communities to participate under a co-management regime within the fisheries.





GOVERNMENT MANAGEMENT

Source: Sen and Nielsen (1996)

Fig. 9.3.2: A Framework for Developing a Co-Management Model

Co-management is defined as a partnership between the state and the user-groups under which the responsibility and roles are shared, for effective fisheries management. The main advantages of co-management are that it is cost-effective and it provides power to the fishing communities to decide on wise use of the resources, in which they have a stake. Pomeroy *et al.*, (1995) outlines the potential advantages of co-management as follows:

- a) Co-management is assumed to be more economical in terms of administration and enforcement than centralised systems since it involves self-management where the fishers take responsibility for a number of managerial functions.
- b) It allows the community to develop a management strategy that meets its own needs, conditions, and is more legitimate in their eyes.
- c) This form of self-management provides communities with a sense of ownership over the resource that they can view as a long-term asset.
- d) Communities are able to devise and administer regulatory instruments that are more appropriate to local conditions than externally imposed regulations.
- e) Fishers are given an incentive to respect and support the rules because they complement cultural values, are self-imposed, and because they are seen as individually and mutually beneficial.

- f) Since the community is involved in the formulation and implementation of management measures, a higher degree of accountability and compliance can be expected.
- g) Co-management makes maximum use of indigenous knowledge and expertise to provide information on the resource base and to complement scientific knowledge for management.
- h) Its strategies can minimise social conflict and maintain or improve social cohesion in the community.

Pomeroy *et al.*, (1995), also mentions a number of limitations of co-management regimes, namely:

- a) Many communities may not be willing to or capable of taking on the responsibility of co-management. A long history of dependence on government may take years to reverse.
- b) Leadership may not be available within the community to initiate or sustain co-management efforts. For many individuals and communities, the incentives - economic, social and/or political- to engage in co-management may not be present.
- c) The risk involved in changing fisheries management strategies may be too high for some communities and fishers.
- d) The costs for individuals to participate in co-management strategies (time, money) may outweigh expected benefits.
- e) Sufficient political will may not exist among the local resource stakeholders or in the government to actually manage the fisheries in a sustainable manner.
- f) Actions by user groups outside the immediate community may undermine or destroy the management activities undertaken by the community
- g) Particular resource characteristics, such as migratory patterns, may not make it possible for the community to manage the resource.
- h) There is no guarantee that the community will organise itself into an effective governing institution.
- i) The delegation of significant authority to manage the fisheries may be one of the most difficult tasks in establishing co-management systems.

### The Process of Establishing Co-management

In 1992, the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF), under which the Fisheries Department falls, separated the duties of extension from law-enforcement. This led to the creation of the Fisheries Regulations and Control Unit (FRCU), whose mandate is to manage the exploitation of fisheries resources, to facilitate and guarantee the safety and quality of fish and fishery products for food security, and economic development through the implementation of appropriate regulations (Kizza 1999).

Fisheries extension work has been devolved to the districts bordering Lake Victoria as part of the process of the state's commitment to decentralisation, promulgated in Uganda's Constitution (Government of Uganda 1995).

Under the Local Governments Act, 1997 districts are given considerable powers over both revenue collection and the management of their resources. In addition, districts are given the power to formulate their own bye-laws, provided these do not in anyway contradict the Laws of Uganda. (Government of Uganda 1997). As a result, districts have considerable leeway to act on fisheries matters, and are prepared to do so. In 1999, following widespread incidences of fish poisoning, several Ugandan districts unilaterally closed their Lake Victoria fishery, and subsequently resisted central government demands that the fishery be re-opened. An important tenet in the management of the fish-poisoning crisis was the formation of task forces on Lake Victoria's beaches, which were responsible for trying to control fish poisoning on the lake. Since the alleviation of the poisoning problem, the re-opening of the fishery and resumption of export of Nile perch to foreign markets, these task forces became a permanent feature on Uganda's fisheries management landscape, and transformed into Landing Management Committees (LMCs). They were seen as a form of institution for the participation of resource users in fisheries co-management (Atai *et al.*, 2000).

Ostrohm (1990) and Pinkerton (1989) suggested the criteria that should be followed for successful resource regulation under co-management. The conditions relate to appropriate institutional framework for governing common property resources and organisation of the user groups for collective action. They include: clearly defined boundaries of the resource to be managed; membership; cohesion; organisations within the groups; benefits from management should exceed the costs; there should be participation by those affected; rules enforced; users should have local rights to organise and co-operation and leadership should exist at community level. The conditions also require decentralisation and delegation of authority but with co-ordination between government and community. Some of these conditions exist on Lake Victoria to varying degrees while others need to be created.

Furthermore, an understanding of relationships between individuals in a user-group over a resource is provided by WPTPA (1997), involving a 'triangle of strategic assets' that describe the ingredients for an effective working relationships between individuals and groups. The assets include group size, where the smaller size works better; mode of communication, with preference for face-to-face contact; holding of shared norms, particularly if they are cultural; congruency of interests and resources and track record over time. These factors are considered relevant in explaining the reactions of individuals in the managing of natural resources. The model could relate to the Uganda fishing communities as they consist of small groups found at isolated landing sites. Their communication is face-to-face, by

word of mouth. They share several norms, mainly relating to the fishery and often make contributions towards settling issues relating to the fishery. They usually know each other's past and in the case of new comers, efforts are made to establish their track records before they are admitted into the communities as members who could be trusted. As a result of their triangle of assets, there is co-operation at the landing sites for purpose of successful fishing, marketing and settling internal disputes. However, corruption, which is said to be rampant within the general society in Uganda, often threatens this triangle of assets and the capacity to manage the resource.

Since 1999, the Department for Fisheries Resources began a process of establishing co-management on the lake. The community institutions participating in the partnership are to be called Beach Management Units (BMU). In a recent study on the perceived need for BMUs and assessment of their formation, roles and performance (Odongkara *et al.*, 2002), it was found out that most respondents expressed the desire to have one community organisation that brings together all the fishers at their beach. Most were equally aware of the existence of Landing Management Committees (LMCs) involved in management of the fisheries resources at their beaches to varying degrees. The communities elected between four and six office bearers to these committees. The main executive positions were chairperson, vice chairperson, general secretary, treasurer, secretary for defence and secretary for environment. Most LMCs were accountable to Fisheries staff at the beaches, rather than to the community. Upon alleviation of the poisoning problem, LMCs assumed other beach management responsibilities such as enforcing fisheries regulations, fish inspection, registration of new fishers together with their fishing gear and the maintenance of hygiene and sanitation at beaches.

Some of the achievements attributed to the LMCs included providing good mechanism for conflict resolution, improved sanitation, reduced use of illegal gears, improvement in catches and sizes of fish and reduced gear theft. Fishers believed that LMCs were good avenues through which local communities could participate in fisheries resources management. This was because they were the authorities that were always available at the beach, living with the communities; they were democratically elected; not very expensive to facilitate; their activities involved the participation of all community members, such as formulation and implementation of bye-laws and they presented a faster way of resolving conflicts among members of fishing communities.

Fishers also suggested a number of ways to improve the work of BMUs in order to allow wider community participation in fisheries resource management. They proposed that there should be remuneration for their activities and adequate facilitation in order to counter the temptation to be corrupt; training of committee members in fisheries management and

leadership skills; guidelines specifying the roles of each BMU members to be drawn and they should be given legal backing, the activities of the BMUs should be co-ordinated by higher committees at the Sub-county and District levels and that DFR staff and other authorities at the beach such as LCs and Gabunga should become part of the BMUs.

One of these requirements has now been met by government, namely providing legal backing through formulation of the Fish (Beach Management) Rules, 2003, though the Statutory Instrument No. 35 of 2003. It provides for the establishment of BMUs, election of office bearers, registration of BMUs, roles of the key actors under the Statutory Instrument, financing and supervision of BMU activities. Guidelines are in the process of being developed, to help operationalise the Statutory Instrument.

### The Way Forward

Co-management would require obtaining consensus around certain key issues concerning management of the fisheries. While there is considerable common ground between the Government's and stakeholders' views of the desired management, there are also differences that need further deliberations. On the question of ownership and access, the Government is clearly for limiting access to the fisheries, as stated in its first policy objective as follows: "To ensure a sustainable harvest (catches) of fish in lakes and rivers by shifting from Open Access Fisheries (OAF) to Effectively Controlled Fisheries (ECF) (MAAIF 2000). The stakeholders, on the other hand are for open access, desiring: "maximisation of the sustainable utilisation of the resource, ensuring access and benefits to all user-groups and continuity of a better quality of life for future generations" (ICRC and ODS 2001 p. 4). The question of access is fundamental to the management regime and needs to be resolved right at the beginning. Another area was that of boundaries. Part of the objectives of the Fisheries Management Component of LVEMP has been to attempt to demarcate boundaries for areas that the various fishing communities could look after under co-management. During discussions at different fora, however, fishers have opposed the suggestion to limit migration, arguing that the resource they exploited was mobile and needed to be followed.

With respect to how co-management should be established, the LVFRP recommended a three-level management structure, consisting of the Beach Committee (BC), District Committees (DC) and Regional Committees (RC) (UNECIA 2001). The BC would consist of representatives of fishing communities, fish processing factories, DFR and any other relevant groups. Their role would include the identification of regulations that they believed were just and fair and which they were capable of implementing, monitoring and enforcing. They would also be responsible for sanctioning of these rules by means of punishments that

the community agreed upon. Lastly, they would be represented on the Des. Their funding would come from the various beach contributions.

The DC would be responsible for, among others, higher levels of formulating regulations and sanctioning of rules, co-ordinating and informing the BCs. It would also arrange for representation on the RC. Lastly RC would operate under the auspices of LVFO and be responsible for co-ordination at the regional level. The logic behind the proposed structure was that the formulation of regulations for Lake Victoria should be a product of negotiated process between the various stakeholder groups.

Lessons can also be drawn from the Constitution of Lake George Basin Integrated Management Organization (LAGBIMO), 2003. The purpose for which LAGBIMO was formed 'Nas to provide a framework for co-ordination and coherence in the planning and implementation of any form of interventions for the socio-economic development of the communities within the basin through the sustainable management of the Lake George Basin natural resources. The Constitution of LAGBIMO spells out its structure consisting of the Lake Wide assembly, the Executive Committee and the Secretariat. It also sets out the principles to be used by the Organization in promoting and supporting the establishment of Fish Landing site .Institutions.

## Conclusion

Fisheries management on Lake Victoria has been regarded as generally unsuccessful under the state-based management regime. With the help of relevant theories, the factors contributing to the poor fisheries management have been identified and analysed. The need for co-management as a strategy for improving implementation of fisheries management was examined. Willingness has been shown by the communities to participate in managing their resources and existing local institutions would provide a basis for their participation . A new Law has been formulated in support of this community participation . The chapter has provided ideas on how co-management can now be operationalised on Lake Victoria and integrated into the LVFO system.

## Recommendations

Co-management is already provided for in the draft National Fisheries Policy and given legal backing through The Fish (Beach Management) Rules, 2003. Establishment of BMUs for co-management should be based on the existing local user-groups A three-level management structure should be established , ranging from the beach to district and lake-wide levels.