

# An Assessment of Co-Management Potentials in the Lake Victoria Fisheries in Kenya

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## **SUMMARY**

*Co-management is a system or a process by which responsibility and authority for management of common resources is shared between the state, local users of the resource as well as other stakeholders, and where they have the legal authority to administer the resource jointly. Co-management has received increasing attention in recent years as a potential strategy for managing fisheries. This paper presents and discusses results of a survey undertaken on the Kenyan part of Lake Victoria fisheries to assess the conditions - behaviour, attitude and characteristics of resource users, as well as community institutions - that can support co-management.*

*The survey was implemented through a two-stage stratified random sampling technique based on district and beach size strata. A total of 405 fishers, drawn from 25 fish landing beaches, were interviewed using a structured questionnaire. Data was entered and analysed in EXCEL and SPSS programs. This paper is based on the first stage analysis of the survey results, mainly involving cross tabulation of variables.*

*The study reveals that Kenya's Lake Victoria fisheries qualify in a number of the identified criteria for successful co-management. However, there are some critical conditions that still lack, such as definition of boundaries in the fishing ground, community members' rights to the resource, delegation and legislation of local responsibility and authority. On the basis of this study alone, it is, therefore, not possible to make authoritative conclusions on the potentials for co-management in Kenya's Lake Victoria fisheries. Further studies, especially using participatory methods, may produce more conclusive information on the subject.*

## **INTRODUCTION**

Fisheries in many parts of the world are under pressure or in crisis, raising doubts about the effectiveness of current management regimes. The problems facing global fisheries are myriad, but can be summarised in three categories: first is biological - the threat of depletion of fish stocks. The second is economic: the over-accumulation of labour and fishing capital, described by Pearse (1994) as 'the waste of labour and capital in redundant catching capacity, excessive costs and declining incomes'. The third problem is that of governance, which arises because many fisheries are managed by the state.

Governments commonly manage fisheries through legal and administrative measures - the so called 'command and control regime', which regulate when, where and how fishing activities should take place (Dublink & Vliet, 1995; Johnston, 1992; Pearse, 1994). Advocates of the command and control regime argue that administrative means such as laws and licences, especially if backed by law enforcement, can constrain and guide individual and group strategies towards responsible use of resources. The command and control regime is, however, often criticised as being outdated, inadequate and ineffective. It is blamed for the increasing problems of implementation, compliance and control of fisheries regulations (Kooiman 1993; Stone, 1975). Dublink & Vliet (1995) explain that the command and control regime faces problems at the instrument level (the choice of appropriate regulatory instruments) as well as at the organisational level. The latter arises because governance is mainly organised at the macro-level of state bureaucracy, making irrelevant the potential contribution of the meso-level (the level of civic and private contribution) and the micro-level of the individual appropriator or firm. Government systems are often distant, impersonal, insensitive, understaffed, under-funded and too bureaucratic. Hence, they have a limited capacity to regulate and monitor what goes on in widely scattered fishing grounds (Jentoft *et al.*, 1998; Pomeroy *et al.*, 1997).

The failure of state organs to regulate fisheries has prompted re-thinking into new strategies for fisheries management. First is the market-based regime, whose central theme is that the government should create market mechanisms and use instruments such as quotas, taxes and subsidies to regulate fisheries. The main disadvantage of market-based mechanisms is that they often do not achieve the desired objectives due to market failure (Gordon, 1954; Neher, 1988). Market failure is said to occur when the price mechanism or the market system fails to bring about a 'social optimum'. As Tidsell (1993) explains, 'the market system induces individuals to maximise their private gains, and provides them with little incentive to work for society's best interests'.

Another drawback of the market-based regime is the lack of clear property rights in fisheries. Clearly defined property rights, among other conditions, are essential for the proper functioning of a market mechanism, hence that of the market-based regime. In some systems, individual transferable quotas (ITQ) are applied as a way of allocating property rights. However, even ITQs fall short of restoring full property rights. Pearse (1994) explains that full property rights can only be attained if the rights are 'exclusive, perpetual, divisible and transferable, and convey all the economic benefits to its holder'. Thus, even the person to whom a fishing quota has been allocated does not have exclusive rights to a stock of fish, since the stock is shared with other quota holders. Without full property rights on the resource, user groups have less incentives to conserve it than would be if the use and ownership rights are clearly bestowed on them. On the other hand, full privatisation of natural resources, if it can be achieved, could raise concerns of inequity in resource utilisation. The equity problem is especially important for developing countries, where access to a natural resource is crucial for the subsistence of impoverished population groups (Baland and Platteau, 1996).

Co-management is one approach in fisheries management that has received much attention in recent years as a potential answer to the problems of governance. The principle behind co-management is that some responsibility for collective problems should be transferred to user groups and other civilians at the community level. Sen & Nielsen (1996) define co-management as 'an arrangement where responsibility for resource management is shared between the government and user groups'. Jentoft *et al.*, (1998) define it as 'the collaborative and participatory process of regulatory decision-making among representatives of user groups, government agencies and research institutions'. These are similar in content to Geheb & Crean's (1999) definition of co-management: 'resource management that draws on the input of at least two distinct groups of people which have legal authority to administer a resource jointly'. They explain that in co-management, fishing communities can play an active, even dominant, role in conjunction with Fisheries Departments, and that additional stakeholders such as fish processing factories and fishermen's co-operative societies can also have a role. Co-management is, therefore, some form of collaboration between the government and user groups, in which both parties share authority for resource management to varying degrees. The basis of co-management is that neither local communities nor central governments can, on their own, successfully manage common resources. Jentoft *et al.*, (1998) argue that resource users must be allowed to participate in regulatory decision-making, implementation and enforcement, because they have wide knowledge and experience. Furthermore, their participation in management gives the process legitimacy (Dubink & Vliet, 1995; Jentoft *et al.*, 1998).

Co-management is not a fixed idea. Sceptics have this as its major undoing - that it lacks a strong theoretical foundation. Others see co-management practices as remnants of the past, ideal situations, requiring particular cultural foundation or communal values that have become increasingly rare in modern settings. Jentoft *et al.*, (1998) attribute such pessimism to an overly narrow understanding of the social theory about the role and nature of institutions. However, the negative criticisms of co-management should not overshadow its potential benefits.

For successful co-management to be effected, certain conditions are essential. First, it requires an appropriate institutional and organisational framework for common property resource governance. Second is the requirement that resource user groups are adequately organised to act collectively for their common good. According to Balland & Platteau (1997), co-management may have very little success if user groups are totally incapable of collective action to manage resources. Olson (1965) explain why communities may not act collectively to solve common or public problems, and by extension, why co-management may be difficult to establish.

### **Ostrom and Pinkerton Criteria for Co-management**

Many cases of co-management and community-based management of natural resources have been studied in different locations around the world (Balland & Plateau, 1996; Berkes, 1989; Jentoft & McCay 1995; Hannesson, 1998; Ostrom, 1986; 1990; 1997; Wade, 1988). From the results, certain conditions are emerging which appear to be central to the possibility of developing and sustaining institutions that can support successful co-managerial arrangements. Ostrom (1990) and Pinkerton (1989) have summarised and documented some of those key conditions necessary

for successful co-management institutions. From their work, co-management is likely to succeed in resource systems where: boundaries are clearly defined; membership is clearly defined; the user group is cohesive; the user group has prior experience with organisation and the benefits of management exceed costs.

Additional criteria are that: there be participation in management by those affected; management rules are enforced; the user group has legal rights to organise; there is co-operation and leadership at the community level; there is decentralisation and delegation of authority, and there is co-ordination between the government and the community.

These key conditions are explained, analysed and discussed in this study, in as far as they exist in the fishing communities of Lake Victoria in Kenya. Lake Victoria, the world's second largest fresh-water lake, faces a number of problems, which consequently affect the efficient, equitable and sustainable utilisation of its resources. There are reports of declining fish stocks, uncontrolled and increasing fishing effort, use of destructive fishing methods and decreasing opportunities for local communities to benefit from the fisheries, among other issues (Abila & Jansen, 1997; Crean, 2000; World Bank/ GEF, 1996). Lake Victoria fisheries, thus, depict a typical example of a common property where the applied management regime seems to have failed in achieving compliance. Of the three East African countries sharing Lake Victoria, the problem of management failure is most observable in Kenya, which owns only 6% of the lake, but has the highest and fastest growing fishing intensity and, evidently, the largest proportion of overfished waters.

The history of fisheries management in Kenya shows that in the pre-colonial era the main regulatory mechanisms were the formal and informal mechanisms embedded in traditional practices of fishing communities (Geheb, 1997; Owino, 1999). The colonial authorities introduced state-based formal regulations, which effectively shifted responsibility for the fishery away from the lake side communities into the hands of the state, thus changing it from a community-managed property into a state-managed property. This command and control regime has persisted into post-independence, progressively eroding community-based resource management structures. This has been facilitated by failure of the legal framework to recognise community-based institutions as well as by the increasingly integrated economy of the lake. By involving them in co-management, it is hoped that user groups will find incentives to comply more with the fishery regulations.

## **OBJECTIVES**

The goal of this paper is to present and discuss results of a survey undertaken on the Kenyan part of Lake Victoria to assess the conditions - behaviour, attitude and characteristics of resource users, as well as community institutions - that can support co-management. The study is part of the socio-economics research activities of the Lake Victoria Fisheries Research Project (LVFRP), whose overall goal is to design a management plan for the fisheries of Lake Victoria.

## METHODOLOGY

A two stage stratified random sampling strategy was employed. Beach landings were selected for sampling on the basis of districts and beach size. Within each district the selection of beaches was based on the proportional number of small and large beaches on Kenya's portion of Lake Victoria, based on a 1994 boat count (Asila & Othina, 1995). A total of 25 landing beaches were sampled (Table 1) 17 of them categorised as small with less than 29 and 8 as big with more than 29 boats. Three beaches that had been selected were replaced either because of the poor state of access roads or they had been blocked by the water hyacinth.

The respondents in the co-management survey were fishers of all categories - boat owners, gear owners, crew and retired fishers. Once at the landing site, the selection of respondents did not follow a pre-determined random selection procedure. Initially, the register of boats at beaches was consulted in order to identify a sample. Some beaches, however, did not maintain a register. On other beaches, boats on the register had already departed and the method was no longer used. Subsequently, at small beaches, anyone who was available to be interviewed was selected. At the larger beaches, the first four respondents, corresponding with the number of interviewers, were selected randomly from the fishers present on the beach, after which the beach leader would recommend additional interviewees. A total of 405 respondents from 25 beaches were interviewed. Of the respondents, 43% had fished for more than 11 years, 20% for 6-10 years, while 37% had fished for 5 years or less.

A team of 4 researchers using a structured questionnaire collected data. All questions in the questionnaire were pre-coded. Once collected, data was first entered in EXCEL and subsequently transferred into SPSS for analysis. This paper is based on the first stage analysis of the survey results, mainly involving cross tabulation of variables. The results are evaluated and discussed on basis of the 11 key conditions identified by Ostrom (1990) and Pinkerton (1989) as essential for successful co-management. In each section the key criteria is first outlined, followed by the presentation and discussion of the survey results relevant to that condition.

**Table 1. List of beaches selected for the survey**

<b>District</b>	<b>Beach (No. of boats in brackets)</b>
Busia	Budumbusi (50); Nalera (50); Bulwani (26);
Bondo	Sirongo (19); Sifu Island (48); Kamariga (37); Madundu (28); Kunya (18); Kokach (14)
Kisumu	Kagwel (12)
Nyando	Nyandho/ Chuowe (21)
Rachuonyo	Kamwala/ Alara (11); Miti Mbili (25)
Suba	Kamwai/ Alii (14); Sukru Island (70); Luanda Nyamasare (37); Litare Kandiege (21); Kongata Takawiri (16); Kibuogi 'B' Island (15); Konyango (18);Nyagwethe (10)
Migori	Okiro (20); Aloma (18); Luanda Konyango (31); Gethegunga (18)

## RESULTS AND DISCUSSION

**Clearly defined boundaries:** *The physical boundaries of the area to be managed should be distinct so that fisher groups can have accurate knowledge of them. The boundaries should be based on an ecosystem that fishers can easily observe and understand. It should be of a size that allows for management with available technology e.g. transport and communication.*

### *Physical boundaries of the area to be managed*

There are international political boundaries that fishers clearly know about. Certain water-based geographical features and landmarks demarcate such boundaries. For example, in the Port Victoria area, Kenya-Uganda border is known by fishers to be just behind Sumba Island. In the Sio Port area, the outlet of Sio River into the lake marks the same boundary. In the Karungu area, the Migingo Islands located on the Kenya-Uganda-Tanzania tripoint demarcates the boundary separating the three countries. Thus, there is sufficient clarity as to the demarcation of international boundaries. In many cases fishers are reminded of the border line by being repeatedly arrested, fined or their gear confiscated for trespassing international boundaries.

The administrative district boundaries on land are known by fishers but are not clearly identified in the water. This is because each beach falls in a location, district and province which are clearly known to the fishers. District Fisheries Officers normally regard the water adjacent to beaches in their district, and within the international boundary, to be within their jurisdiction. On this basis, fishers may be expected to take water around their beaches to belong to their district. However, where two beaches share a district boundary, for example Osieko in Busia District and Nambo in Bondo District, it is not easy to place the water around the beaches in either district.

Another concept of physical boundary may be in terms of where fishers land their fish. Fishers are generally sure of where they will land their fish. Each fisherman has a beach to which he or she belongs, and which each of them refers to as 'my' beach. Any fisherman who does not belong to a particular beach and wishes to land fish there must seek permission. This may be in form of verbal permission from beach authority (38%), a letter of introduction from the previous beach leader (37%) or paying a landing-rights fee (locally called a 'kanyaga': (22%). Only 3% of fishers thought they could land on a beach to which they do not belong, without seeking permission.

Respondents further indicated that permission, if granted, would entitle a fisher from another beach to fish in their water. Of the fishers interviewed, 92% stated that anyone with permission would be allowed to fish in the waters adjacent to their community. Thus, fishers recognize the beach as a boundary that excludes non-members. The beach can, therefore, be used as basis for defining a boundary since the demarcation is clearly understood and accepted by most fishers. Any boundary formed on the basis of a beach is likely to be effective.

### ***Ecosystem boundaries***

An ecosystem defines the complex interaction between an organism, in this case fish, with its environment. Features of an ecosystem would, in this case, be breeding areas for fish or fish nurseries and river mouths. In the survey, 40.8% of Kenyan fishers indicated that they would not fish in fish nurseries and in other closed areas. About 79% of them would not fish in those closed areas because they understood them to be breeding areas. This indicates that most fishers have a good concept of boundaries based on the ecosystem of the lake. Thus, the breeding and closed areas provide an ecosystem-based boundary, of which fishers have good knowledge of.

### ***Technological and communication boundaries***

Managing the open waters of the lake raises the additional problem of communication. Fishers have to travel some distance to their fishing ground, with Nile perch and 'dagaa' fishers travelling longer distances than their tilapia counterparts. Most Kenyan fishers agree that the distances to their fishing grounds have been increasing. Of the Kenyan fishers, 89% indicated that they now go on longer fishing trips than they did 5 years previously. Some of these fishers have to use outboard engines to reach their fishing grounds. For some fishers, for example those targeting tilapia, it may be that they are fishing in the same fishing grounds, but they spend more time to catch the same quantity of fish they caught 5 years ago.

To be able to monitor activities on the open waters of Lake Victoria, it may be necessary that those patrolling or monitoring have similar communication facilities as those possessed privately by fishers. Thus, outboard engines are necessary for regular monitoring use. However, the use of such facilities has the negative effect of raising the cost of managing the fishery.

In summary, the boundaries recognized and understood by fishers are the international boundaries, administrative boundaries on land, boundaries based on landing beaches, and ecosystem boundaries demarcating breeding and closed areas. For co-management, boundaries can be based along the lines described above. In most cases, the transport and communication means on either land or water can enable the monitoring of such boundaries. However, there is need for improved transport facilities, such as outboard engines to raise the monitoring capacity. One non-recognizable boundary is that which divided fishing grounds between different communities.

***Membership clearly defined:*** *Individual fishers or households with rights to fish in a bounded fishing area, and participate in area management, are clearly defined. In addition, the number of fishers or households should not be too large so as to restrict effective communication and decision making.*

In the Kenyan part of Lake Victoria, this second criterion fails in a number of ways. First, The Fisheries Act allows anyone to fish as long as he or she has obtained a fishing license from the Department of Fisheries (Kenya Government, 1991). This license is granted on payment of a fee and, in practice, is rarely subject to any other condition. Anyone from any part of Kenya can obtain a fishing license to fish on Lake Victoria.

In the survey, 58% of fishers did not agree that one community should claim parts of the lake and exclude others. This suggests that fishing communities themselves do not want to define membership, and exclude non-members from fishing. Similarly, 61% of fishers did not agree that fishing communities themselves should say who could fish in their waters. In addition, 95% agreed that anyone could fish in the waters adjacent to their community or beach. In fact, most fishers, 93%, indicated that they often meet with fishers from other communities when they go out fishing. This shows that many fishers do not recognize any membership restriction that may keep off non-community members from fishing near their beach. Furthermore, a majority of fishers, 70%, believe that the waters next to their beach belong to the government. This negates any attempt to exclude non-community members and define membership in terms of which individuals or households have the right to fish in the waters near the community. Thus, it seems that there is no clear membership definition, as described by Ostrom (1990) and Pinkerton (1989), in the Lake Victoria fisheries.

***Group cohesion:*** *The fishers group or organization should permanently reside near the area to be managed. There should be high degree of homogeneity, in terms of kinship, ethnicity, religion or fishing gear type, among the group. Local ideology, customs and belief systems should create a willingness to deal with collective problems. Finally, there should be a common understanding of the problem and of alternative strategies and outcomes.*

In terms of ethnicity, the survey revealed that three ethnic groups - Luo (73%), Abasuba (14%) and Luhya (12%), dominate Kenya's Lake Victoria fisheries. These ethnic groups largely occupy specific ethno-political boundaries. The Luhya group is mainly found in Busia District at the northern end of Kenya's Lake Victoria shoreline. The Suba ethnic group is largely in the Suba District, which was carved out from Homa-bay and Migori districts. The Luo, who are the majority, are mainly in Bondo, Kisumu, Nyando, Rachuonyo, Homa-bay and Migori districts. In recent years, though, fishers from different communities have migrated into new fishing areas, which has slightly reduced the degree of ethnic homogeneity in most areas around the lake. It is, therefore, common to find Luo fishers fishing in Busia district, or Luhya fishers in traditionally Luo-dominated districts.

Interestingly, 99% of respondents in the survey thought that their own communities were historically fishers. Each ethnic group has its customs and taboos, which indicate cohesion of members. However, the survey revealed that customs and taboos no longer play significant roles in the management of the fishery. Only 1.5% of respondents indicated that taboos have a role in regulating fishing activity in their village. Possibly as a result of regular interaction between fishers of different ethnicity as well as the impact of modern religion and education, the importance of local ideology, customs and beliefs have diminished in regulating the fishery. Within each ethnic group, fishing communities have traditionally grouped along clan lines. Some beaches, in fact, bear the name of a particular clan. For example, of the beaches sampled in this study, Kokach, Kagwel and Konyango reflect the names of the local clans bearing the same names, who traditionally have occupied the area of the respective beaches. Thus, many beaches have in the past developed on basis of clan structures. Members of one clan are of the same family lineage or kinship.

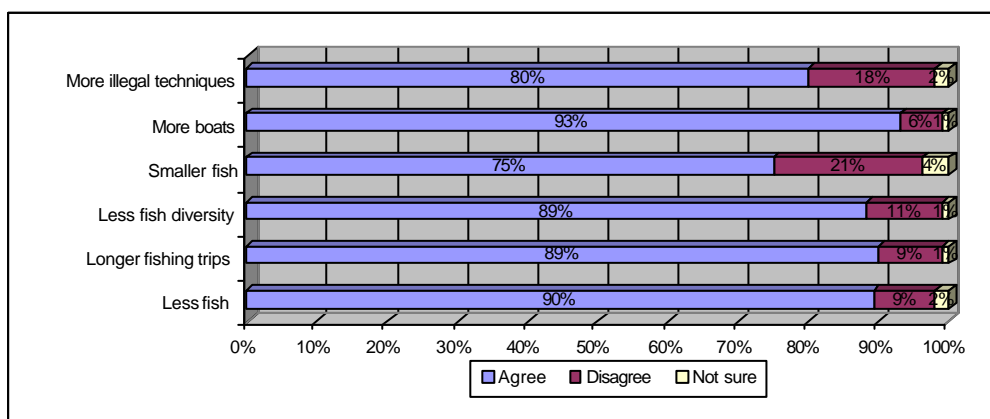


An indicator of cohesion is that most fishers, 86%, agreed that they are able to recognize almost all members of their own communities. In addition, 68% of fishers indicated that they always go out fishing with the same group of fishers. This would suggest that, within each of the communities, there is the possibility of effective communication. However, 93% of respondents stated that they fish in the same places with fishers from other communities. The survey, though, did not reveal to what extent fishers interact with the members of these other communities whom they fish together with, hence, the possibilities for communication across different communities. As a further indicator of cohesion, over 41% of fishers said they would tell their fellow fishers if they knew of a good fishing spot. Some said they would do this because it is difficult to keep secret such information.

With a few exceptions, generally there is specificity of gear types according to beaches. Fishers on one beach, with few exceptions, tend to use one type of fishing gear. Thus, certain beaches are specifically for 'dagaa' fishing, while others are Nile perch or tilapia beaches. Some beaches such as Bukoma, in Busia district, specialize on beach seining. Other beaches will only use gillnets, longlines or mosquito seines.

According to Ostrom (1990) and Pinkerton (1989), group cohesion requires *a common understanding of the problem and of alternative strategies and outcomes*. Results in this survey do indicate that most fishers perceive a decline in the fishery. In the survey, 343 respondents were asked to compare various conditions of the fisheries at the time of the survey, compared to what it was 5 years previously. Their responses are displayed in Figure 1. The fishers also perceive fishery management problems, the most important being lack of regulation to govern the fishery (24%), followed by the problem of gear theft (16%). The third most important problem is the use of illegal fishing techniques (14%).

In summary, there is high degree of homogeneity in terms of ethnicity and kinship as well as gear types among groups to be managed. At the same time, fishers commonly perceive problems facing the fishery, and do recommend alternative management strategies.



**Fig. 1. Fishers' Perception of Current Resource Condition, Compared to 5 Years Previously**

***Existing organization:*** *The fishers have some prior experience with traditional community-based systems and with organization, where they are representative of all resource users and stakeholders interested in fisheries management.*

In most fishing villages the traditional management systems, where a community was headed by a clan elder, no longer exist. This has been largely replaced by a government administrative system, where a chief appointed by the state heads a location, whose boundaries have been drawn along areas traditionally occupied by particular clans. However, at community level there is a beach leader who is elected by fishers. There are also a number of organizations that have come up in most beaches, although some have little relation with the traditional organizations.

Most respondents in the survey have past or current experience with one or more types of community-based organizations. Of 405 total respondents in the survey, 294 have been a member of a community-based organization. These may be a cooperative society, a marketing group or a savings and credit group based on the beach. Virtually all beaches have a beach committee charged with the responsibility of organizing fishers and handling disputes among fishers on the beach. The Beach Leader, sometimes called 'Chairman', heads the beach committee. The authority of the Beach Leader, and by extension, the mandate of the beach committee, is fully recognized by most fishers. Of all fishers interviewed, 84% stated that they would first complain to the beach leader whenever they had problems in the fishery. In contrast, less than 10% of fishers would, in the first place, report their fishery-related problems to the Fisheries Department. Another 4% indicated that they would report fishery-related problems to the community elders or fellow fishers.

Furthermore, most fishers (67%) stated they would obey the instructions of the Beach Leader in fisheries related matter. Thirty percent of fishers would take instructions from the Fisheries Department representative on the beach while another 2% would obey other government officials based in the community.

In summary, most fishers have experience with community-based organizations, which, however, are not traditional. The system of beach committee, headed by a Beach Leader, as an organ for organizing fishers and solving community disputes and fisheries-related matters, is well understood and accepted by nearly all fishers.

***Benefits exceed cost:*** *Most likely where individuals have the expectation that the benefits to be derived from participation in, and compliance with, community-based management will exceed the costs of investments in such activities.*

Co-management essentially means that some of the costs of managing the fishery will be transferred from the state, or the society, to the particular community using that resource. Whatever role is found as suitable for local fishing communities to play in the co-management process, it is a new cost to that community which, otherwise, they would not be paying. The benefits to be derived from co-management, (such as better fish yields and community's exclusive use rights over the resource within a defined boundary), must be balanced against the costs of managing the fishery.

These costs may include the allocation of the community's time, effort and resources to surveillance, defense and retaliation.

Fishers will participate in management if they expect the management outcome to solve their resource problems. As Figure 2 shows, most fishers perceive a decline in the resource status in the last 5 years. Two factors contribute to the worsening resource status: an increase in the number of fishing boats (93%) and in the number of illegal fishing techniques now being used to catch fish (80%). As a result of this situation, fishing pays less now than 5 years previously. As such, the benefits of management could be the reversal of declining yields and an increase in fishers' income. A community highly dependent on a particular resource could be expected to attach high value to that resource. In this case, the benefits of achieving a healthy fishery, by reversing the trends of resource scarcity, must rank very highly in the priorities of local fishing communities. However, this survey did not collect data to ascertain this.

In summary, this study lacks sufficient information as to whether benefits of co-management in the Lake Victoria fisheries would exceed the costs.

***Participation by those affected:*** *Most individuals affected by management arrangements are included in the group that makes and can change the arrangements. The same people that collect information on fisheries make decisions about the management arrangements*

Although fishers, fish traders, and fish processors are the most affected by management arrangements, these groups are not involved in making decisions concerning the fishery's management. The Fisheries Act (Kenya Government, 1991) does not define any role for involving fishing communities in managing the fishery. The Fisheries Act itself has been made without the participation of fishing communities.

Despite this omission, most fishers would prefer to directly participate in decision-making concerning management of the fishery. In the survey, 84% of the fishers stated that fishers should be allowed to participate in rule making. In contrast 14% would not wish to see fishing communities participate in fishery management, while 2% made no preferences. One of the areas in which fishers would like to be involved is in applying sanctions to offenders. The survey results revealed that 76% of fisher would like fishing communities to be allowed to punish offenders. However, most fishers, 71%, did not agree to the suggestion that that no more fishers, boats and nets should be allowed on the lake. Similarly most fishers, 61%, disagree that fishing communities should be the ones to determine who can or cannot fish.

One of the reasons why fishers strongly feel they should participate in management is because they are dissatisfied with the current management system of the lake. The majority (54%) stated that the Fisheries Department does not do well protecting the fish stocks. As evidence of their lack of participation and little contact with the Fisheries Department personnel, most fishers are not aware of some of the basic fishery regulations contained in the Fisheries Act. Asked to state the minimum mesh size of gillnet allowed in the lake (which correctly is 5 inches), 52% specified a wrong mesh size, while only 41 % got it correctly. The rest, 7%, did not provide any response

or were not sure.

Research and data collection on Lake Victoria fisheries is principally carried out by The Kenya Marine and Fisheries Research Institute and, to a lesser extent, the Fisheries Department. Other national research institutions, including universities, as well as NGOs also have a role in collecting data. Of these institutions, only the Fisheries Department has the mandate of making management decisions. Fishers are neither involved in collection information nor in making decisions on the management of the fisheries.

In summary, fishers are willing to participate in making decisions affecting them, and in implementing some of them. However, at the moment there is little opportunity for them to do so. The institutions that collect fisheries information are not directly related in making management decisions.

***Management rules enforced:*** *The management rules are simple. Monitoring and enforcement can be effected and shared by all fishers.*

Most fishers, 85%, did not agree to the suggestion that fishery regulations are 'no good'. Most respondents, 77%, thought that their fellow fishers obeyed fisheries regulations, while 22% thought otherwise. Despite this, a large proportion of fishers, 44%, indicated that they saw fishers breaking fisheries regulations 'all the time', while 41%, of respondents saw fishery regulations broken 'sometimes'. The remaining 16% indicated that they never saw fishery regulations being broken on their beaches. The Fisheries Department is responsible for taking action against rule-breakers in the fishery. The kinds of action taken by the Fisheries Department against the breach of regulations are listed in Table 2. It is not clear as to whether or not the Fisheries Department personnel destroy fish caught with illegal gears and techniques. In the survey, 48% of the fishers stated that they had seen fish catches being destroyed while almost a similar percentage, 49%, had not seen the Fisheries Department take such an action on their beaches. The remaining 3% were not sure.

**Table 2. Action taken by the Fisheries Department**

Action	All the time	Sometimes	Never
How often Fisheries Department personnel are seen arresting fishers on the beach	9.6%	59.3%	31.3%
How often Fisheries Department personnel are seen destroying illegal gear on the beach	5.4%	44%	50.6%

The success of the enforcement of fishing rules differs depending on the type of rule and how easy it is to effect and be understood. Fishers gave various opinions, shown in Table 3, concerning the efficacy of enforcement of various regulations. From the table it seems that most rules are simple and easy to understand, hence are, according to fishermen, effective.

**Table 3. Fishers' perception of efficacy of Fisheries Regulations**

<b>Efficacy</b>	<b>Effective</b>	<b>Unaware of regulation</b>	<b>Useless</b>
Mesh size control	63.9%	2.2%	33.8%
Closed fishing areas	57.7%	2.5%	39.8%
Closed fishing season	47.8%	2%	50.2%
Poison ban	79.1%	1%	20%
Trawling ban	66.9%	8.7%	24.4%
Minimum fish-size regulations	65.4%	2%	32.6%
Licensing	78.8%	0.7%	20.4%
Boat registration	92.3%	0.5%	7.4%

In summary, there are a number of management rules applied in the fisheries. Fishers commonly break many of these regulations. However, most fishers think that nearly all the mentioned regulations can be effective. This would suggest that they are simple to understand and effect. However, monitoring and enforcement is done by the Fisheries Department alone, and there is little role for fishers. Fishers are largely dissatisfied with the current management system of the lake.

***Local rights to organize:*** *The fisher group has the right to organize and make arrangements related to its needs. There is enabling legislation from the government defining and clarifying local responsibility and authority.*

A major weakness of initiatives aimed at involving local communities in fisheries management is the lack of legal recognition of such an approach. The Fisheries Department has encouraged the formation of beach committees, lead by a beach leader, on each beach. The beach committee has many roles and responsibilities, some of them defined, while others are just assumed. The following are some of the roles:

- a) Presenting fisher community's problems to the Fisheries Department
- b) Solving conflicts between fishers, or any other persons residing on their beach.
- c) Is the link between the government and the community, through which any inward or outward communication for the community is channelled;
- d) Convenes and chairs community meetings
- e) Receives visitors on the beach

The responsibilities of the beach leader and committee listed above, however, are not legislated. They are sectoral arrangements by the Fisheries Department, aimed at letting communities do

those tasks that the Fisheries Department finds hard to perform. The lack of legislation is a major weakness of the system, since the beach leader assumes powers and authority, for which he/she has no legal rights to exercise. The Fisheries Act itself does not mention or specify any roles for local communities. It does not mention or recognise the institution of the Beach Committee. The Act entrusts almost all the functions of fisheries management to the Fisheries Department through the Director or Commissioner of fisheries. Despite this, the legitimacy of the beach committee and the beach leader seems to be widely accepted by fishers, and their roles are clearly understood. As table 4 shows, most fishers prefer to report their fishery-related problem to the beach leader. In summary, Kenya's Lake Victoria fisheries lacks an enabling legislation from the government defining and clarifying local responsibility and authority. The Fisheries Department has encouraged the formation of beach committees, headed by a beach leader, but this authority is not legislated. Despite this, fishing communities recognise the legitimacy and authority of the beach leader and the beach committee.

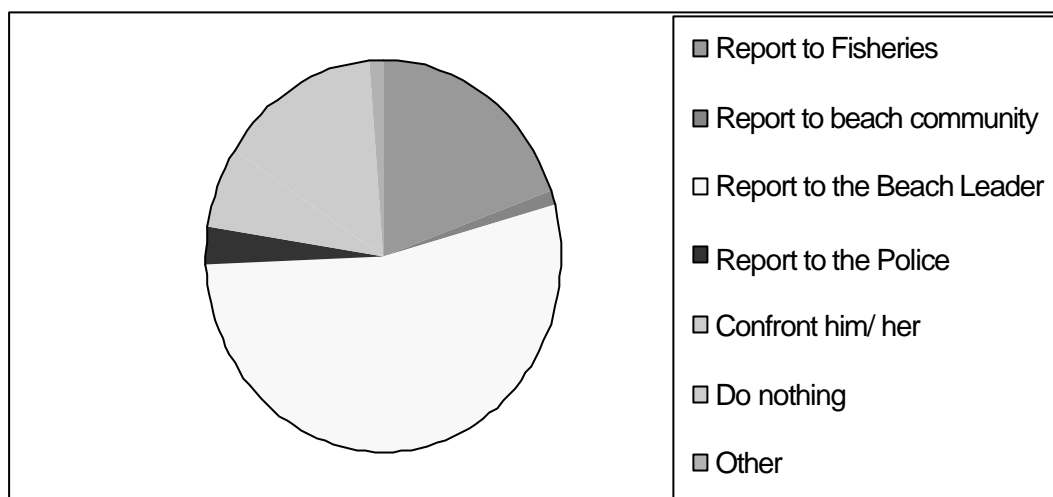
**Table 4. The relevant authority to complain to in fishery related problems**

<b>Authority</b>	<b>% of responses</b>
Beach leader	83.7
FD representative	9.7
Elders	2.2
Fellow fishers	1.7
The police	0.7
Don't know	0.7
Other	1.2

***Co-operation and leadership at community level:** There is an incentive and willingness on the part of fishers to actively participate, with time and effort and money, in fisheries management. There is an individual or core group who takes leadership responsibility for the management process.*

Fishers themselves recognize their potential role in ensuring that regulations are followed. In the survey, 94% of fishers agreed that there was a need for the government and fishing communities to take regulations more seriously. As previously discussed, most of the fishers (76%), agree that fishing communities should be allowed to punish offenders. At the same time, 84% of all fishers agree that fishing communities should be allowed to participate in rule making.

Asked what they would do if they knew that a fellow fisher was using illegal fishing technique, 84% fishers said they would report it. Fig. 2 shows to whom they would report regulatory infringements of this kind.



**Fig. 2. Fishers' perception of current resource condition, compared to 5 years previously**

As previously indicated, there are regulations in place already which respondents said have been made by the fishing communities. In the survey, only 11% of fishers said that no such regulations existed. The rest either confirmed that there were community-made rules in their beaches, or they (8%) did not know that such rules existed. Apart from this, members of the community often spend time attending village meetings discussing problems facing the community and the lake. Fishers also informally discuss amongst themselves problems facing the fisheries.

In almost all the fishing communities, there is a core group who will take leadership responsibility for the management process. The survey revealed that all beaches (100%) have a beach committee, headed by a beach leader. The survey results also indicate that various other community organisations were present on most of the beaches. They included fishermen co-operatives, marketing groups, savings and credit groups and other more informal fisher groups. These groups can potentially take responsibility for some aspects of managing the fishery or improving the welfare of fishers. Most fishers (77%) belong to one or more of these community organisations.

In summary, there is willingness on the part of the fishers to participate with time and effort in fisheries management. The survey did not reveal whether or not fishers would also contribute money towards management activities. On nearly all beaches, there is also an individual or core group, in form of a beach leader and beach committee, who can take leadership responsibilities for the management process. Other community organisations such as co-operatives, fishers' groups, marketing groups and savings and credit organisations can also play a part in certain aspects of fisheries management.

***Decentralisation and delegation of authority:*** *The government has established formal policy and/or laws for the decentralisation of administrative functions and the delegation of management responsibility and/or authority to local government and local government organisation levels.*

The Government of Kenya has established a policy of decentralised management and development prioritisation, through the District Focus for Rural Development policy. At the District level there is a District Development Committee (DDC), chaired by the District commissioner. Members of this committee include heads of various government departments at the district level, representatives of the local government and members of parliament, amongst others. There are various tasks and responsibilities of the DDC but overall, it allocates development resources within the district.

In the same spirit of decentralisation and delegation, the Fisheries Department has informally let some tasks of management to be carried out by the fishing community alone or jointly with the Fisheries Department. Often these are tasks that the Fisheries Department finds hard to perform, or it lacks the means to do so. For example, the local communities can patrol the lake if they have the means to do so. The beach leader can also look out for those breaking fisheries regulations around the beach report them to the Fisheries Department. The beach leader may even apply sanctions on some fisheries-related offences. For very minor offences, the beach leader and his committee can punish offenders by fining them or suspending them from operating on the beach. For serious offences, such as fish poisoning, the community leaders may take the offender to the Fisheries Department for prosecution. However, the actions taken by the beach leader are limited in that their legality can, and in fact is often, disputed by some community members, and even government authorities.

In summary, the Fisheries Department has informally decentralised and delegated some little authority to fishers' communities, especially those tasks that the Fisheries Department is not in a position to do. However, this is limited by the lack of clear legal backing for communities to perform these roles.

***Co-ordination between government and community:*** *A co-ordination body is established, external to the local group or organisation and with representation from the fishers' group to or organisation and government to monitor the local management arrangements for resolving conflicts, and reinforce local rule enforcement.*

In Kenya's Lake Victoria fisheries there is no body that qualifies for the above description. In effect, fishing communities largely operate on their own, with little reference to, or support from, any external body. The Government, through the Fisheries Department, legally performs the supervisory role, but the relation is so top-down, that little co-ordination is affected. The Government organ has no representation from fishers' communities to ensure a co-ordinated response to management problems. At the same time, Fisheries Department is not represented in the beach committee.

## **SUMMARY AND CONCLUSION**

In summary, fishers recognize and understand international boundaries, local administrative boundaries on the land, boundaries based on landing beaches, and ecosystem boundaries demarcating breeding and closed areas. However, there is no clear boundary demarcating fishing grounds to separate different communities. Also there is no clear membership description, defining



households and individuals with rights to fisheries resources.

Fishing groups are, to a large extent, homogeneous in terms of ethnicity and kinship as well as gear types. At the same time, fishers commonly perceive problems facing the fishery. These factors indicate that fishers have some degree of cohesiveness, which is important for establishing local institutions for co-management. Most fishers have experience with community-based organizations. The system of beach committee, headed by a Beach Leader, as an organ for organizing fishers and solving community disputes and fisheries-related matters, is well understood and accepted by nearly all fishers. Fishing communities recognise the legitimacy and authority of the beach leader and the beach committee.

Fishers are willing to participate, with their time and effort, in making decisions affecting them and the fisheries, and in implementing some of these decisions. But at the moment there are few opportunities for them to do so. There are a number of management rules applied fisheries, although fishers commonly break many of them. Despite this, fishers think that most of the applied regulations can be effective. This would suggest that the rules are simple enough to understand and implement. However, monitoring and enforcement is done by the Fisheries Department alone, and there is little scope for fishers to be involved. There is lack of an enabling legislation from the government defining and clarifying local responsibility and authority. On nearly all beaches, there is an individual or core group that does, or can, take leadership responsibilities for the management process. These include the Beach Leader, beach committee and other community organisations such as co-operatives, fishers' groups, marketing groups and savings and credit organisations. These can have roles in fisheries management.

In conclusion, the study has revealed that Kenya's Lake Victoria fisheries qualify in a number of the conditions identified by Ostrom (1990) and Pinkerton (1989), for establishment of local level-institutions that can support successful co-management. However, there are some critical conditions that are still lacking, such as definition of boundaries in the fishing ground and community members' rights to the resource, delegation and legislation of local responsibility and authority. On the basis of this study alone, it is, therefore, not possible to make firm conclusions on the potential of co-management in Kenya's Lake Victoria fisheries. Further studies, especially using participatory methods, may produce more conclusive information on the subject.