

IUCN Eastern Africa Programme

Socio-economics of the Lake Victoria Fisheries

**CONSTRAINTS AND OPPORTUNITIES FOR 'COMMUNITY
PARTICIPATION' IN THE MANAGEMENT
OF THE LAKE VICTORIA FISHERIES**

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ABSTRACT

During the last 20 years the Lake Victoria fisheries have been completely transformed. From being a locally based fishery with little intervention and capital investment from outside, the present fishery is dominated by national and international capital penetrating the industry. There are many institutions and organisations involved in the management and development of the Lake Victoria fisheries. These institutions include Government departments and agencies of the three states sharing Lake Victoria (Kenya, Uganda and Tanzania), international development banks, donor organisations, local, national and international NGOs. Despite their differences in size and approach to development issues, they share at least one common feature: They all emphasise the importance of promoting "community participation" in the management of the Lake Victoria fisheries.

"Community participation" is a vague and an elusive concept and the different institutions involved in the Lake Victoria fisheries do not have a common conception about what "community participation" would involve when implemented in the context of the Lake Victoria fisheries. The main objective of this paper is to discuss some aspects of this concept and relate it to changes which have occurred in the Lake Victoria fisheries. We discuss what we think are some of the relevant **areas for community participation** in the Lake Victoria fisheries. We adopt a "holistic" approach to community participation and we suggest that participation should not only seek to involve people in the management of the production sector of the fisheries, but also should include the processing and distribution sectors and consumption of fish.

We discuss how **the broader context of the Lake Victoria fisheries** has changed over the last two decades with rich outsiders coming into the fisheries and investing in it. This has resulted in a change of technologies in both the production, processing and distribution sectors of the fisheries which is closely related to the development of overseas markets. We discuss the role the governments are playing in promoting the export of fish from Lake Victoria to Europe, Japan and USA and the effects the export of fish have for local food security and the local employment situation.

A main point we make is that "community participation" is closely linked to opportunities for obtaining **employment and income** from the various sectors of the fisheries. Employment in one of the sectors of the fisheries is, in our view, the major "entry point" for participation of the local people in the Lake Victoria fisheries. We discuss in detail how the new technologies introduced in the fisheries and the new markets for fish from Lake Victoria to a large extent have contributed to a loss of employment for the local people in many sectors of the fisheries. We say that unless people are able to retain their jobs in the fisheries there is very little for many members of the local communities to participate about.

1. INTRODUCTION

"Community participation" has during the last decade been regarded as an essential component in the management of natural resources. This is also the case for the management of the fisheries resources of Lake Victoria. In reports and papers issued by the governments of the three countries sharing Lake Victoria (Kenya, Uganda and Tanzania) and the recently established Lake Victoria Fisheries Organisation, it is emphasised that the people living along the shores of the lake should be engaged in the management of the fisheries resources (CIFA, 1994).

That "community participation" is regarded as an important element in the Lake Victoria fisheries, is also evident from the plans of two large development programs concerning the Lake Victoria fisheries. These two programmes which will play a dominant role in the development of the Lake Victoria fisheries, are the Lake Victoria Fisheries Research Project supported by the European Development Fund of the EU and the Lake Victoria Environmental Management Programme (LVEMP) supported by GEF and the World Bank. Both of the programmes will work through and support relevant Government institutions in the three countries. The two programs that have been in the planning process for many years, are expected to last for at least five years each. The two programmes are comprehensive in terms of the issues they will address. Both programmes will employ a staff of socio-economists who will focus on how the local communities can be involved in the management of their fisheries resources. The two programmes will to a large extent influence how the three governments will plan and implement the management of the fisheries resources for Lake Victoria. The recommendations of the two programmes will therefore have a significant impact on how "community participation" is both perceived and supported in the Lake Victoria fisheries.

The main objective of this paper is to present and discuss some selected issues which we believe are important to address when the concept of "community participation" is discussed in the Lake Victoria fisheries. In the next section of this paper we will clarify what we mean by community participation in the context of the Lake Victoria fisheries. In the subsequent sections we will discuss what we think are important areas for community participation and the wider framework which influence the opportunities for participation in these areas. The last sections of the paper will discuss how the recent transformation of the Lake Victoria fisheries has provided opportunities and set constraints for community participation.

The data and information used for this paper has been collected by interviewing a section of stakeholders mostly in the Kenyan part of Lake Victoria. However, the results have been generalised in some cases where the issues under discussion are relevant lakewide

.2. COMMUNITY PARTICIPATION - A BRIEF DISCUSSION OF THE CONCEPT

Community participation is only one of many concepts that have been used to characterise the involvement of local communities in the management of their natural resources (IUCN, 1991). In conservation, community participation has been embodied in the framework of "community conservation" (Barrow and Murphree, 1998). Although they in no way are synonymous, other concepts used are "community based resource management", "co-management" and for the fisheries sector, "customary marine tenure (Hviding and Jul-Larsen, 1995). A large theoretical and practical literature has been developed showing how local resource users can become more and better involved in the management of their natural resources. It is, however, beyond the scope of this paper to discuss this broad literature and the various concepts which have evolved.

In this paper we will employ the concept "community participation" as this seems to be the most commonly used concept by NGOs, national and international institutions when discussing how people around Lake Victoria can become more involved in the management of the fisheries resources.

Both "**community**" and "**participation**" are vague and elusive concepts. We will deal with the two concepts separately.

"Community"

Who is the community that is to participate in the management of the Lake Victoria fisheries? In a recent article Harris (1998), states:

"In contrast to the traditional view of fishery management, the community is no longer just local actors". This expanded view of the community has led analysts to talk of stakeholders (Decker *et al.* 1996). In case of Lake Victoria, stakeholders are found at ten levels or realms:

1. global level: bio-diversity, common heritage of humanity;
2. transnational levels: traders;
3. society level: national resource;
4. citizen level: food security, nutritional needs for protein;
5. national government level: foreign exchange;
6. recreational realm: tour operators;
7. industrial realm: processors and marketers;
8. fishers; boat owners, operators, crew;
9. family and neighbours: employment;
10. lakeside people: subsistence consumption." (Harris, 1998).

We agree with Harris that today there are many different stakeholders in the Lake Victoria fisheries. Many of the stakeholders have, as we will show in this paper, different and contradictory interests in the resources of the lake. For the purpose of this paper, however, we have elected to use a more confined definition of community. Here we will use the International Institute for Environment and Development's (IIED) approach to the concept of **community**. IIED points out that communities can be understood in **spatial, socio-cultural** and **economic** terms (IIED, 1994). Discussing IIED's approach to the concept of "community", Barrow and Murphree (1998) note: "combining these constructs one can derive a model of community as an entity socially bound by a common cultural identity, living within defined spatial boundaries and having a common economic interest in the resources of this area".

Although it is difficult to apply this ideal-type model to the fishing communities around Lake Victoria, there is no doubt that many of these communities can be considered "**communities of place**", even if they have changing membership due to the frequent migration of fishermen. Many of the members of the fishing communities share a **common cultural identity**, but many of the fishing communities are diverse, encompassing members of various tribes with different identity and traditions. Although all members of the fishing communities should, at least in theory, have **common economic interests** in managing the fish resources in a sustainable manner, the members of the fishing communities belong to different groups, often with contradictory economic interests.

Despite the varied socio-cultural and economic background people may have, we will for our purposes, nevertheless, consider that it is the people who live close to the lake and depend on the fisheries resources who are the members of the fishing communities. It is these people that all institutions involved with the development of the Lake Victoria fisheries would like to see, at least on paper, **participate** more in the management of the fisheries resources. In relation to the ten levels of stakeholders Harris identified above, the IIED definition covers level 8, 9 and 10. It is, no doubt, important that the concerns and participation of the actors of all the levels are included in the management of the Lake Victoria fisheries. In practice, however, the local communities, level 8,9 and 10, are often left out. Harris (1998), comments on the role of various actors in the development of the plan for the important LVEMP:

"On the one hand, most of the international meetings leading to the formation of the LVEMP Plan were held outside Africa, and most of the influential actors in the planning process were international agencies and transnational associations. On the other hand, the final document resulted from a consultative process which engaged over 100 scientists, officials and business leaders in each country, and the formal proposals were assembled by task forces of officials from the three countries. Although this process included the industrial processors and marketers, *it excluded any participation by the boat owners and operators and crew, or the leaders of fishing communities*" (italics by authors).

"Participation"

When development thinking during the last two decades shifted from a "top-down" approach towards "bottom-up" and "people-centred" development, "**participation**" has become an important part of the language of development thinking (Chambers, 1983). IUCN notes "properly mandated, empowered and informed communities can contribute to decisions that affect them and play an indispensable part in creating a securely-based sustainable society" (IUCN 1991). Participation for members of communities can take many forms and, it varies from being passive at one extreme (only be informed by outsiders about what will happen) to self-mobilisation at the other (see Table 1).

Although Table 1 summarises to what extent people can participate in development programmes, it can also be used to show the varying degrees people participate in managing their own natural resources. It is obvious that the participation level among the members of the local communities varies a great deal. The level of participation depends, *inter alia*, on issues which include to what extent various groups of people are involved in the use of the natural resources, their political power, economic status and gender. In the next section we will discuss what we think are the important **areas for participation** for the people living in the fishing communities around the lake.

Table 1: How people can participate in development programmes:

Participation Typology	Some Components
Passive Participation	Being told what is going to happen or already happened. Top down, information shared belongs only to external professionals
Participation in information giving	Answer questions posed by extractive researchers - using surveys etc. People not able to influence
Participation by consultation	Consulted, and external agents listen to views. Usually externally defined problems and solutions. People not really involved in decision-making. Participation as consultation
Participation by material incentives	Provision of resources, e.g. labour. Little incentive to participate after the incentives end, for example much on farm research, some community forestry
Functional Participation	Form groups to meet predetermined objectives. Usually done after major project decisions made, therefore initially dependent on outsiders but may become self dependent, and enabling. Participation as organisation.
Interactive participation	Joint analysis to joint actions. Possible use of new local institutions or strengthening existing ones. Enabling and empowering so people have stake in maintaining structures or practices
Self-Mobilisation	Already empowered, take decisions independent of external institutions. May or may not challenge existing inequitable distributions of wealth and power. Participation as empowering.

Source: Barrow and Murphree (1998).

Table 2: Changes in the Lake Victoria Fisheries in Kenya with Regard to Community Participation

Sector	Level	Nile Perch fishery	Dagaa fishery
Harvesting	1	<i>Tembeas</i> increasing. Trawlers still seen in parts of the lake. These reduce local people's opportunities for employment in Nile perch harvesting sector.	Still dominated by traditional canoes. They provide employment for many local fishermen.
Processing	2	Increased proportion (now about 80-90%) of adult Nile perch going for industrial processing. Decrease in traditional smoking and sun-drying of Nile perch. Local processors now mainly involved in the processing of Nile perch skeletons from factories. Local people's involvement in this sector compromised by industrialisation of Nile perch processing.	Traditional sun-drying of <i>dagaa</i> on nets still dominates. There is increasing industrial processing of <i>dagaa</i> for fishmeal. The sector still provides employment to many women, but is now threatened with increasing industrialisation.
Trading	3	Nile perch trade sector dominated by export	Still a source of employment to many

		of Nile perch fillets. Local trade in whole Nile perch has greatly decreased. Local traders now mainly involved in selling Nile perch skeletons.	women. However, the involvement of women is threatened by increased industrialisation of <i>dagaa</i> processing for fishmeal..
Consumers	4	Very little Nile perch of good quality available for local consumption. Local people mainly consume skeletons and rejected Nile perch.	Still consumed by a large majority of local people. This is set to decline as more of <i>dagaa</i> goes for fishmeal.
Government	5	Has put great effort to improve hygienic conditions to meet fish export standards.	No major interventions by government
Donors and Development Banks	6	Given financial support to factories and government to improve quality of fish exports	No major interventions by government

3. WHAT ARE THE AREAS FOR "COMMUNITY PARTICIPATION" IN THE LAKE VICTORIA FISHERIES?

For some institutions concerned with the Lake Victoria fisheries, community participation is linked to the management of the fish resources only. For these institutions management methods of the fisheries is concentrated around the harvesting sector of the fisheries and the sole aim is management of the fish stocks. The fish stocks can be severely depleted by over-fishing and important management measures are related to controlling access to the fishery. Methods for managing a fishery include: Limiting the number of people who may fish; controlling the fishing techniques; controlling the mesh size of nets to prevent the harvest of immature fish; maintaining the quality of the fish habitat - primarily the quality of the water, spawning and feeding areas; controlling the timing of open season and imposing size limits of fish that may be kept. We believe it is very important for the people in the local communities to "participate" and play a prominent role in these tasks of management. However, in our view, community participation in the fisheries should not only be considered in relation to management of the harvesting sector of the fisheries.

We would therefore like to look at fisheries management in a more holistic perspective, paying attention to the entire production chain from the harvesting of fish to the processor, distributor and the consumer (cf. Lindquist and Molsa, 1992). The **areas for community participation** are therefore to be found in the **harvesting sector of the fish resources, the processing, distribution and consumption sectors of the fisheries**. We believe this broad approach is important as so many people outside the harvesting sector are dependent on fish resources. Several hundred thousand people, mainly women, are engaged in the processing and trading sectors of the Lake Victoria fisheries. Tens of millions of people in East and Central Africa depend on the fish from Lake Victoria as an important source of animal protein. What happens in the harvesting sector has direct bearing on the other sectors and vice versa. From such a perspective an important goal of the management of the Lake Victoria fisheries is related to employment, income, nutrition and well-being of people in the riparian countries and especially those living in the fishing communities around the lake. We are also aware that areas for community participation relate to other issues like access to credit and capital for equipment in the fisheries sector, socialisation into the fisheries and distribution of knowledge in the various sectors of the fisheries. These are issues we are not able to discuss in detail in this paper.

We believe this broad perspective on management of the various sectors of the fisheries is fully in line with the views which the Government of Kenya has adopted. The Government of Kenya has developed a fisheries policy which clearly reveals that the Government is concerned about all the sectors of the fisheries. Besides maximising the production of fish on a sustainable basis, the Government of Kenya has the following objectives for its fisheries policy:

- (i) "First and foremost, to increase the per capita consumption of fish through production of low cost high protein food (fish);
- (ii) Secondly, increase employment opportunities in the country through fishing, fish processing and fish trade;
- (iii) Thirdly, to enhance the living conditions of the fishermen and their families by maximising economic benefits to them. This is achieved through provision of cold storage, fish handling and processing facilities;
- (iv) Fourthly, to maximise export and foreign exchange earning capacity" (Kenya Government, 1995).

The Governments of Uganda and Tanzania have adopted similar broad-based policies for the fisheries sector. On the basis of these policies, we believe that it is appropriate to discuss community participation with reference to all these sectors of the Lake Victoria fisheries.

4. "COMMUNITY PARTICIPATION" AND EMPLOYMENT

Table 1 above shows the wide variety of ways in which people can participate in development programs and in the management of their natural resources. Within all the sectors we find varying types of participation. In the harvesting sector we noted participation in management issues related to when and where fishing should be permitted, who should be allowed to fish and with what type of equipment. Within the processing and distribution (trade) sector, members of the local communities participate in decision-making about a number of issues which have bearing on the management of the natural resources; i.e. how the fish is being processed and how it is being transported, who has access to the processing and distribution sectors, etc. As we have shown elsewhere, locally based regulations and "enforcement institutions" have developed in the fishing communities to manage the various sectors. (Owino, 1999; Mbuga *et al.* 1998; Abila and Jansen, 1997)

In our view, participation is closely related to the opportunity to take part in decision-making about management of the resources concerning the sector one is engaged in. This is decision-making about issues which influence directly one's own involvement and interests in the sector and the fisheries as a whole.

In this paper, however, we will be less concerned about the detailed aspects of participation in decision-making in these sectors. Our focus will be more to discuss to what extent local members of the communities can obtain or keep their employment in these sectors. **Unless members of the fishing communities can obtain or keep their employment or an income from these sectors, there is very little to "participate" about.**

In other words, the possibility for having employment or an income from one or several of these sectors is an important **entry point to participation** for the members of the local communities. When people lose their jobs and income from the sectors they are also excluded from participation. We believe that one of the most important development processes now going on in the Lake Victoria fisheries is the destruction of tens of thousands of jobs for the members of local communities in the various sectors we have identified above.

5. THE CONTEXT FOR "COMMUNITY PARTICIPATION" IN THE LAKE VICTORIA FISHERIES

What is the wider context which influences the possibilities for community participation in the areas which we have identified? In particular: which factors affect the possibilities people have for obtaining or keeping their employment and income from the various sectors of the Lake Victoria fisheries?

The context which sets constraints and gives opportunities for community participation is complex. It consists of ecological, technical, political, economic, cultural and social factors. In various ways, and in interaction, these factors to a large extent determine the possibilities for local people to find employment and income from the different sectors and participate in decision-making.

Much socio-economic literature about the Lake Victoria fisheries has focused on how social, cultural, economic and political factors at the local and the national level have acted as constraints and opportunities for how people are involved in the management of their resources. An excellent work in this regard is Kim Geheb's recent study from the Kenyan part of Lake Victoria. In his study Geheb describes how the various management regimes of the Lake Victoria fisheries have evolved during the last couple of hundred years. In his work he exposes the intentional and the inadvertent regulatory mechanisms which have affected the various fisheries regimes (Geheb 1997). Geheb's study provides much valuable and important information about the context in which community participation must be understood.

Our paper will have a more narrow focus than Geheb's study. We will limit ourselves to discuss certain aspects of the wider economic and political context which shapes the possibilities for the local population to obtain employment and income and thereby participate in the management of the fisheries resources.

In the past all these sectors we have mentioned were to a very large extent "managed" by the local people themselves. There were few "outsiders" who participated and set constraints to the activities taking place within the harvesting, processing, distribution and consumption sectors of the Lake Victoria fisheries. This situation is very different today when new actors, mainly **outsiders, have entered the Lake Victoria**

fisheries and totally transformed it (see the list of stakeholders at various levels, identified by Harris above).

We will in particular discuss how the fish export and fishmeal industries, which have been established during the last 15 years around Lake Victoria, have affected the opportunities for employment, income and participation in the areas we have identified above. We will also focus on how the three Governments' policies and practice in the management of the fisheries have changed as a result of the outside investors and the new industries which have emerged.

6. DEVELOPMENT OF THE LAKE VICTORIA FISHERIES

Since about 1980 the fishery of Lake Victoria has been completely transformed. From being a locally based fishery with little intervention and capital investment from outside, the present fishery is dominated by national and international capital penetrating the industry. This change is very much the result of the rapid proliferation of Nile perch and the strong demand which has developed in the global markets for this fish. In order to understand the recent developments of the Lake Victoria fisheries, it is therefore useful to distinguish between the "old" pre-Nile perch fisheries regime which lasted up to about 1979 and the "new" fisheries regime which developed during the 1980s (Greboval, 1989).

The pre-Nile perch regime

Until the mid 1970s the fisheries of Lake Victoria was exploited solely by small scale fishermen. It was estimated that some 50,000 fishermen operated from about 12,000 canoes (Butcher and Colaris, 1975). The total catch of fish from the three countries was about 100,000 tons per year. In the pre-Nile perch regime there were clear barriers to investment in equipment in the production sector. Very few owners of canoes possessed more than one canoe or owned more gill-nets than they were able to control themselves. The typical boat would be operated by its owner who had all or some of the gear in the boat. The ownership pattern was thus very decentralised and the income from the lake was fairly evenly distributed (Jansen 1973 and 1977). There was limited investment in fishing technological improvement. Although outboard engines were introduced in the early 1950's almost all canoes continued to be manually operated. The engines were used for transport purposes only.

In the pre-Nile perch regime, the processing and trading sectors of the fisheries were almost totally dominated by small scale operators, most of them women, who were based in the local communities around the lake. The part of the fish which was not sold fresh, was processed by being smoked or sun-dried on the beach and carried to local inland markets. There were few wholesalers in the fish trade, and the traders never acquired control over the fishermen as they have managed to do in so many other traditional fisheries through the establishment of credit relationships. Most of the fishermen sold their fish to a limited number of women fishmongers with whom they had developed long standing relationships. Most of the animal protein which the local population ate came from the lake.

There was limited interference in the Lake Victoria fisheries by the Government. The Governments of the riparian states, however, collected statistics on the fishery and formulated different regulations. These regulations were rarely enforced. Although in principle there has been an open access to fish in the lake, the local communities around the lake have all through this century developed rules which regulate the fisheries. These rules stipulate who may fish, during which season, in what area, what type of fishing gear is acceptable and what type or size of fish can be caught. Local rules had also developed concerning the role of the fishmongers and their relationship to the fishermen. Institutions have been developed in the local communities to enforce these regulations. The rules and nature of enforcement institutions vary from one area to another and they have also changed over time. In some places these rules are detailed, clearly defined and well-known in the community. In other areas the rules may be non-existent or be more vague, cover less issues related to the fishing effort and may not be generally recognised in the community.

It was not only the Government which had a limited role in the management of the fisheries, outside financial investment also played a minor role. The members of the local communities were thus the most important "participants" in the management of the fisheries. Almost all the equipment was owned and operated by members of the local communities and the fish was being processed, traded with and consumed by people living in the region. It was also the same people who were active in decision-making about management issues in the various sectors of the fisheries.

There were, no doubt, many factors which gave opportunities or constrained the way in which the Lake Victoria fishery was organised. Ecological, technological, political, economic, social and cultural factors all contributed to shape the fishery. What we want to emphasise is that actors outside the local communities around the lake played a much less prominent role in the fishery than in the Nile perch regime.

Characteristics of the Nile Perch Regime (1980 - 1999)

In order to understand the transformation which took place in the Lake Victoria fisheries and why outside actors entered the fisheries, it is necessary to present information about the "explosion" in the catch of fish and the way in which the fish was used.

The rapid proliferation of Nile perch started in the Kenyan part of the lake about 15-20 years after the fish was introduced in the lake. In 1978 about 1,000 tons of Nile perch were caught, in 1981 nearly 23,000 tons and in 1991 the production had increased to a peak of 123,000, and has since been on a generally declining trend.

An even faster increase took place in Uganda and Tanzania. In each of these countries less than 1,000 tons of Nile perch were landed in 1981. In 1986 approximately 41,000 tons of Nile perch was caught in Uganda and about twice that amount in Tanzania. The total production of this fish in the three countries in 1993 was close to 363,000 tons, with 29% landed in Kenya, 27% in Uganda and the rest in Tanzania (Greboval and Mannini 1992; Goulding, 1997).

The total catch of all fish species of Lake Victoria increased from about 100,000 tons in 1979 to about 500,000 tons in 1989. Since 1989 the annual production has remained at a level four to five times higher than what was achieved during the late 1960s and 1970s. In the last 6-7 years, the production of fish from Lake Victoria has represented about 25% of the annual total catch from Africa's inland fisheries (FAO, 1995).

Along with the rapid increase in the stock of Nile perch, the composition of the fish biomass in the lake changed dramatically. Nile perch, being a predator, feeds on most of the species of fish in the lake. From being a multi-species fishery, Lake Victoria is today basically a "three species fishery". Nile perch is the dominant species, but about a third of the lake's catch consists of *Dagaa* (*Rastrineobola argentea*) - a small sardine like fish - while various species of tilapia, mainly *Oreochromis niloticus*, constitute about 10%. These three species alone have during the last years made up about 98% of the total catch in the lake. In the Kenyan part of the Lake, it may today even be more correct to talk about a "two-species" fishery. In 1995 about 91.5% of the catch consisted of the combination of Nile perch composing 47.2% and *Dagaa* constituting 44.3% (Othina and Osewe-Odera, 1996).

In response to the increased landings of Nile Perch during this time, more fishermen were recruited into the fishery. The number increased from about 11,000 fishermen in 1971 to 22,000 in 1989 and 24,000 in 1992 on the Kenyan part of Lake Victoria. The number of canoes also doubled in the same period. There were over 6,000 canoes of different types in this area in 1990. Besides, there was substantial investment in fishing nets, and especially the gill nets with larger mesh-sizes aimed at catching the bigger Nile Perch (Reynolds *et al*, 1992; Hoekstra *et al*, 1990; Ogutu, 1994). We should mention, at this stage, that the harvesting sector of the Lake Victoria fisheries is, and has always been, dominated by men. Almost all fishing operations are carried out by men. Some women do participate in the pulling of beach-seine nets from the shores, but hardly any women go to the lake in boats and participate in the fishing operations. Also, almost all of the equipment in the harvesting sector is owned by men. Lately, however, more women have invested their money in boats and gear. Many of these women have accumulated capital from work in the processing and trading sector, and have decided to invest in boats and gear. Some women, do, in fact, own and manage the fishing operations of small fleets of canoes.

Initially the local market could not absorb all the Nile perch landed. In particular, it was difficult to sell the perch in the local markets in Kenya in the early 1980s. Many of the consumers living in the fishing communities near the lake resented the "oily and fatty" fish. However, it only took a few years before the perch became a popular table fish also in Kenya as new forms of fish processing developed (Yongo, 1994; Abila, 1995, 1996). Preliminary results of a consumption survey we carried out in 1997 and our previous investigations in 1996 show that Nile perch has become even more popular and spread to new markets all over East Africa.

Unlike in Kenya, the Nile perch was better known in the other countries sharing the lake, as Lakes Kyoga and Albert in Uganda and Lake Tanganyika in Tanzania had supported flourishing perch fisheries in the past. During the mid-1980s, in a period of only 3-4 years of the Nile perch boom, the market in East Africa

was able to absorb a supply of almost three times higher than any time previously, without much effect on prices. This shows the popularity of the Nile perch and the existence of a huge demand for a medium priced table fish in the three countries. There is no doubt that many new fish consumers gained tremendously from the changes which affected the rich Lake Victoria fisheries during the 1980s, with huge amounts of fish having been made available at more affordable prices in many parts of the three countries (Greboval and Mannini, 1992).

People in the harvesting, processing and distribution sub-sectors of the fisheries also benefited greatly from the new fisheries regime. It has been estimated that during the 1980s an additional 180,000 jobs were created in the primary and secondary fields of the fisheries. Many people who had been unemployed or under-employed were able to obtain incomes at levels they had never experienced before. No wonder that many fisher-folk nick-named the Nile perch "the savior" (Reynolds and Greboval, 1988).

In the early and mid 1980s the fisheries continued to be almost exclusively operated by small scale rural fisher-folk with little fundamental changes in technologies, techniques and practices compared to the former fisheries regime. The period saw more women engaged in the processing and marketing of fish both on the Lake Victoria beaches and in markets in several towns in Kenya, as in the other countries (Yongo, 1994; Abila, 1994).

Linked to the rapid growth of the Nile perch, another "revolutionary" change took place in the Lake Victoria fisheries. This change is related to the huge demand for Nile perch which soon expanded beyond the three countries sharing the lake. A market for the perch developed quickly in the industrialized countries. In order to satisfy this market, processing factories were established along the shoreline of Lake Victoria. The first plants in Kenya were set up in the early and mid 1980s to process Nile perch and export its fillets to markets overseas. They proved to be so profitable that more factories soon were set up in all the three countries.

Today there are about 35 factories spread around the lake. Many of the factories have been financed by international development banks and received support from government development aid agencies of the industrialized countries. Most of the factories have the technical capacity to process Nile perch which far exceeds the amount of fish they are able to obtain (Asowa-okwe, 1996; Jansen, 1997; Goulding, 1997). The filleting factories around Lake Victoria are therefore competing to secure sufficient raw fish. Many factories have already been closed permanently or temporarily due to lack of Nile perch.

Previously the factories only processed Nile perch of minimum weight 2-3kg. Due to increased competition for wet fish, the plants now accept lower weights, at times even under 1kg. Almost all Nile perch of good quality above 1kg goes to factories for processing. The only Nile perch available in the local markets are the juveniles or that rejected by factories due to poor quality. Even the frames (skeletons) of Nile perch, which previously were sold, processed and consumed in the local markets are now largely being processed into fishmeal in Nairobi.

In the past few years, some processing factories have also started to fillet tilapia, in addition to Nile perch, and to market this fish in the industrialized countries. There is sufficient demand for tilapia in the international market. The only constraint is that very little amount of tilapia is landed at the moment. The export of tilapia could easily pick up if more of it is landed.

Also the small sardine fish, *dagaa*, has been subject to regional and international commercialization. Special factories have been established to convert the sardine into fishmeal for use in the animal feeds industry. Thus, all the three important fish species of Lake Victoria, which together make up 98% of the catch, have become integrated into the global market (Jansen, 1997).

New stakeholders

As we can understand from the description above a set of new actors have entered the Lake Victoria fisheries. The owners of the fish export factories and fishmeal factories had no connection to the Lake Victoria fisheries in the past. The factories are mainly owned by Europeans, Israelis and Asians. The Asians are mainly residing in East Africa, some of whom are citizens of Kenya, Uganda or Tanzania while others

are non-citizens. These national and transnational companies are "heavy players", and they have completely transformed the Lake Victoria fisheries. In a separate paper we have described and analysed some of the effects of the fish exporting and fishmeal industries in Kenya (Abila and Jansen, 1997). Below we will in particular discuss which constraints and opportunities these factories have provided for "community participation" for the local population who has traditionally depended on the Lake Victoria fisheries.

However, it is not only outside investors which have influenced the Lake Victoria fisheries in the fields of production, processing and trade. Also the governments in East Africa have taken on a different and much more active role in the management of the fisheries. The role the governments have played during the last two decades in the Lake Victoria fisheries will be briefly discussed towards the end of this paper.

7. THE HARVESTING SECTOR

How has the harvesting sector been affected by the entry of new actors in the Lake Victoria fisheries? Has the above trends supported possibilities for increased employment opportunities, income and community participation? There are no simple answers to these questions. In this paper we will only be concerned about the Nile perch and the *dagaa* fisheries, because they are most affected by the industrial development in Lake Victoria.

The Nile perch and *dagaa* fisheries are organised differently. Different technology is being used in the two fisheries, and the ownership of boats and equipment vary. Below we will discuss these two types of fisheries separately. We will mainly be concerned with the effects the industrial development of these fisheries have on the employment situation, but also discuss a few other related issues.

The Nile perch fishery

With the Nile perch boom, there is no doubt that more people have come to the lake and participate in the fishing operations. A clear indication of this is the increase in the number of canoes. In the Kenyan part of the lake the number of canoes doubled between 1975 and 1995 (from 4000 to 8000) and the number of fishermen increased from 12,000 to 24,000. In this way many more people have been **employed and "participate"** in the harvesting sector. This is no surprise, given that the production being landed in Kenya has increased many fold during this period.

With the increased catch, there is **much more money in fishing communities in the 1980s and 1990s than in the 1970s**. The agents of the fish export factories always pay a little more than the local market can afford, or bind the fishermen in such a way that they cannot sell to the locals even if the price is the same or better at the local market. Evidence of the increased wealth because of the Nile perch boom is seen, *inter alia*, in the large number of bars, restaurants and shops which have been established on the landing sites where the fishermen sell their catch. Higher incomes provide opportunities to spend money in new and different ways. The increased income has also contributed to create new employment opportunities for people who serve or sell goods to the fishermen.

The rich fisheries which developed during the 1980s provided opportunities for new investments into the sector. No doubt, some of the pre-Nile perch fishermen who were owner-operators, prospered during the 1980s. Many of them invested their money in a second or third canoe and purchased improved fishing equipment. Some even managed to purchase the more expensive transport canoes powered by outboard engines. A few, in fact, were so successful that they were able to establish themselves as purchase agents for the fish processing factories. There is no doubt that many fishermen increased their earnings and obtained a better standard of living during the 1980s.

During the early years of the Nile perch fisheries, the ownership pattern of the canoes remained the same as in the pre-Nile perch regime. Most canoes were owner-operated. We believe that **the way in which the means of production is owned, is closely related to possibilities for people in the community to participate in the fishing industry**. When canoes are owner-operated, the owner has a much larger say in decision-making about the operations of the canoe and sale of the fish and in general management of the fish resources.

While many of the fishermen gaining from the Nile perch boom in the 1980s reinvested their increased incomes in the fisheries, other fishermen diversified their increased earnings and invested in cattle, larger families (more wives), shops, transport vehicles, etc.

However, with the good return on investment in the harvesting of the fisheries, many well-to-do people, with no or little background in fishing started to invest in boats and gear. Many of these people were government officials, teachers or businessmen who would hire people to fish for them. **Absentee ownership** opened up for a development in which new categories of employment developed (see Harris *et al.*, 1995). Some absentee owners would "manage" their canoes from the beach, collecting fish and selling it. Some owners were, however, real absentee owners, living in the larger towns and cities. They would hire resident managers, often relatives, who would wait for the canoe at the beach, take care of the catch, pay salaries and give shares to the various crew members.

Thus, from being owner-operated fishery in the 1970s, the late 1980s and 1990s developed to be a fishery in which absentee ownership became much more prominent. Asowa-Okwe reports that in the late 1980s, 83% of the men who participated in the fishing operations from the boats in the Ugandan part of Lake Victoria, neither owned any gear in the canoe they fished nor the canoe itself (Asowa-Okwe, 1996). We do not have comparable figures from Kenya or Tanzania, but there is no doubt that absentee ownership increased in the late 1980s and the 1990s. On many of the beaches we visited in the mid and late 1990s, we were informed that rich men, could own as many as 5-20 canoes including the gear used in the vessels.

Although there was a shift from owner-operated canoes to absentee ownership from the late 1980s to the late 1990s, some essential aspects of the fisheries technology in the harvesting remained the same. The fishing operations were still quite labour intensive. The boats used sails and oars as a means of propulsion as they had done for many decades. Each boat, depending on the type and amount of gear, continued to require from 2-6 men for its operation. From the point of view of the people in the local communities, the Nile perch fishery had many positive features: Some fishermen increased their earnings many fold, while others who had been unemployed or under-employed obtained jobs as crew. **Thus, with the rich Nile perch fishery, opportunities were created for employment and thereby increased participation in the harvesting sector.**

Recent changes in the harvesting technology of the Nile perch fishery

With more fish export factories being set up, the competition for raw material (fish) increased. Most factories only operated at 50% capacity (Abila and Jansen, 1997). A major concern for the fish export factories has been to obtain more fish, and a number of strategies were made for this purpose. One of the strategies was to encourage a more efficient technology in the harvesting sector. During the 1980s many factories acquired **trawlers**. The trawlers had the advantage that they each could deliver large quantities (500-1,500kg) of fresh and undamaged fish per day at major landing points served by the insulated trucks of the factories. During the last few years all the three governments of East Africa, have, however, banned trawling due to the adverse effects trawling has on the ecological habitat of the lake and the destruction of gear of the local fishermen.

However, trawling still continues, particularly in Kenya where some 10-15 trawlers are in operation and providing the fish export factories with top quality fish. Mbuga *et. al.* (1998) estimates that for each work place created in a trawler, 7-8 work places in the traditional harvesting sector of the fishery is being destroyed. In addition, trawlers regularly destroy the expensively purchased gill nets of the local fishermen and in this way force them out of business. Violent confrontations between the trawlers and local fishermen have occurred often during the last decades. **Thus, the operation of trawlers in a very real way undermines the opportunities for employment and participation in the harvesting sector of the fishery.**

According to information we received in Tanzania, many trawl boats based there are not being used at all, or only being used for transport purposes because of the ban on trawling. One fish export factory manager in Tanzania informed us that he plans to use some of his company's trawlers for fishing with double gill nets in a drift-net technique. He would also introduce modern equipment to locate the fish stocks.

However, trawlers have never caught more than 5-10% of the fish landed along the shores of Lake Victoria. A much larger threat, with regard to loss of employment possibilities for people in the local communities, is coming from a very recent change of technology in the harvesting sector - the *tembea* boats.

Tembea boats

The first outboard engines were introduced into the Lake Victoria fisheries in the 1950s. Although some well-to-do fishermen fitted the engines to their *Sese* canoes, motorised fishing never really took off in Lake Victoria. A main reason for this was the additional expenses needed for fuel. It never made any economic sense to put on an outboard engine for fishing with gill nets only 5-10 km from land. Sail and oars have continued to be the means of propulsion for the small scale fishermen until today. Since the 1950s the outboard engines have, however, been used extensively for transport purposes. Larger '*Sese*' canoes, fitted with 10-40hp outboard engines, were, and are, extensively used to ply the routes between the islands and the mainland with fresh and processed fish. Outboard engines were also used to transport passengers between the various fishing communities.

Thus, until very recently the harvesting sector has retained many of its characteristics - it is non-motorised and continues to remain labour intensive. When the number of fish caught has increased this has meant that more boats and more people have been needed.

However, this is in the process of being changed now. A new technique of fishing is fast developing. The local fishermen have named it *tembea* (Swahili: moving, drifting). *Tembea* fishing is done with a large *Sese* canoe, having a flat rear end to which the outboard engine is fitted. The boats operate up to 100 double gill nets with a mesh size between 6 to 9 inches. The nets are joined together and have a length of 1-2 km. The nets attached to the boat, are set in the evenings and drift back and forward during the night. They are hauled in the morning hours. With the fish on board, the boats quickly return to the beaches where the trucks from the fish export factories wait for them. The first *tembea* boats were able to catch up to 1,200kg in a day. With increasing numbers of *tembea* boats, the catch has dropped significantly, but is still often 5-10 times higher than the catch obtained by the traditional boats. The various types of investment are, however, many times higher for the *tembea* fishing unit. It may go up to Kshs. 600,000 (=USD 10,000) in total for one boat with its equipment. In greater detail, the enlarged and stronger *Sese* canoe will cost Kshs. 60,000-90,000 while the engine costs Kshs. 100,000-150,000 depending on type and size. The mounted double gill nets attached to each other will cost KShs. 200,000-400,000, depending on size, type and how many nets are used.

The *tembea* fishing technique constitutes "a revolution" in the Lake Victoria fisheries and has already had important socio-economic impacts. According to our own investigations in 1998 and 1999, the *tembea* technique started in the Ugandan part of the Lake in the mid 1990s. In 1996 the first *tembea* boats entered the islands of Remba and Ringiti in Kenya. In 1997 and 1998 many of the *tembea* boats left the islands and started to fish from the mainland. What is amazing about the *tembea* fishing technique is how quickly it has caught on. In November 1997, there were no *tembea* boats in Sori-Karungu, which is one of the largest landing beaches in Kenya where up to 200 traditional fishing boats land their catch. In March 1998 we observed less than 10 *tembea* boats at Sori among the about 100 traditional boats fishing with gill nets for Nile perch. Four months later there were about 40 *tembea* boats and no traditional canoes catching Nile perch. A similar process took place in Mohuru, Uhanya and Usenge and other major beaches outside the Nyanza gulf.

In terms of employment each *tembea* boat seems to employ 3-5 persons, on average one more person than the traditional canoes. Since the catch of the *tembea* boats are many times higher, there is a real displacement of labour. This was in clear evidence in Sori. Many of the traditional fishing boats were pulled on shore or had moved to more distant and minor beaches, used only for very local subsistence fishing. Very many of the people employed on the traditional boats had lost their jobs. Many tried, but few succeeded, to obtain employment on the *tembea* boats.

With the introduction of *tembea* fishing, also the ownership structure of the fleet was radically altered. According to our investigations in Sori, only 8 people owned the 40 *tembea* boats - the largest owner alone possessed 18 boats. In Uhanya we found that one business man owned 15 *tembea* boats, another man 10

boats. The owners of *tembea* boats are rich people, having invested up to Kshs 600,000 in each fishing unit. Most owners are also into other businesses: transport, hotels, etc.

Some of the owners of the *tembea* boats also work as agents for the fish export factories. They thus supply the factories both with their own fish and fish they may buy from other suppliers. In Tanzania many of the fish export factories themselves owned large fleets of *tembea* boats and transport boats. In our future research, we intend to establish to what extent the factories in Uganda and Kenya possess their own fleets of *tembea* boats. However, there is no doubt, that there is a close link between the *tembea* boats and the factories. Like the trawlers, *tembea* boats are, in contrast to the traditional boats, able to supply large amounts of fresh fish to the factories which often have a higher quality than the fish landed by the slow moving sailing boats.

A characteristic feature of the *tembea* boats are that they move around in a fleet, from one place to the other. When the catch of fish goes down in one area, the fleet move to another beach from where they fish for some time, completely undermining the operation of the locally based traditional boats, as we observed in Sori beach. From the point of view of **participation**, there is no doubt that the migratory *tembea* boats destroy work places in the traditional harvesting sector. Not only do they destroy work places, they also destroy the gear of the local fishermen. Many conflicts have occurred between the crew of *tembea* boats and the local fishermen having either lost their nets, or had their nets caught up with the drift nets of the *tembeas*.

With their negative impact on so many of the local fishermen, how have the owners and managers of the *tembea* boats been allowed by the local communities to continue? According to the information we received from Sori beach and also other major beaches, the owners of the *tembea* boats are careful to sell all their catch through the established local co-operatives at the landing beaches, paying 10% commission of the price they obtain for the fish. This makes the owners of *tembea* boats popular with the management of the local co-operatives. *Tembea* owners, we were informed, also carefully cultivated their relationships with the Government representatives of the Fisheries Department and the Co-operative Department, in addition to the local chiefs. For the Government Fish Scouts, the *tembea* boats use gill nets of large mesh sizes which are not illegal. This makes it easier for the Fish Scouts to defend the operation of the *tembea* boats. A few relatives of local influential people were employed on board the boats. Thus, the rich *tembea* owners or their representatives have effectively aligned themselves with the local elites and the Government representatives and in this way bought themselves some "protection". With all the conflicts on the fishing grounds this is important. Theft of gear, has been and is rampant in the lake, and after the *tembea* boats appeared, theft of outboard engines has started to occur. Heavily armed gangs moving around in canoes with strong outboard engines will attack the *tembea* boats in the lake and rob the others of their engine and nets. Killings have occurred and some crew in *tembea* boats now illegally carry with them guns when they go fishing.

Many of these "pirates" are said to have been local fishermen themselves who have been robbed of their gear. In their frustration they attack other fishermen outside their own area (most of the robberies in Kenya are, according to the Kenyans, carried out by people crossing the border from Tanzania and *vice versa*). The threat of theft and piracy to some extent structure the movements of the boats. Thus the insecurity of the lake, partly caused by trawlers and *tembeas*, has resulted in **negative participation through stealing and piracy**.

For how long and how quickly will the *tembea* fleet continue to grow, and to which areas of the lake will it expand? According to the information we obtained, there were *tembea* boats operating within the Nyanza gulf in 1998. This area was still the domain of the traditional canoes and some trawlers. One year later, *tembeas* have been reported in Asat, Kaloka, Dunga and other beaches in the gulf. Some of these are the large traditional sail boats, with a bit of modification, which now operate as non-motorised '*tembeas*'. There is, however, no doubt that the many hundreds of *tembea* boats have already dramatically altered the structure of the harvesting sector in other parts of the Lake Victoria fishery as well.

Dagaa fishing

Probably the most comprehensive study about the organisation of the *dagaa* fishery was carried in the Tanzanian part of Lake Victoria (Gibbon, 1997). Gibbon gives a detailed description of the four different fishing techniques for *dagaa* which he observed in Tanzania. Our own observation from Kenya, showed that fishing for *dagaa* is carried out at night when the moon is down. The small *dagaa* sardines are attracted to the 3-5 lanterns set out by each *dagaa* boat. Fishermen leave the beach in the dark of the night and work all night long hauling up the *dagaa* which have been caught by the nets in the light of the lanterns. Fishing for *dagaa* is therefore considered hard work for one has to be physically fit. Very few middle aged or old men participate in the fishing operations from the boat. Although there are various methods for *dagaa* fishing, no technological revolution, like what we have seen in the Nile perch fishery, has taken place. The *dagaa* fisheries is therefore still not motorised and very labour intensive, requiring 4-7 people on each boat.

Some of the fishermen who lost their jobs when the *tembea* boats took over the Nile perch fishery, have obtained jobs as crew in the *dagaa* boats. Many, however, have for different reasons been unable or unwilling to go into *dagaa* fishing.

We still only have the rudimentary information about the ownership situation in the *dagaa* fishery. We have come across some owners who possess 10 to 15 *dagaa* boats each. We have been informed that some rich women engaged in trade of *dagaa* own small fleets of boats. Ownership and organisation of the *dagaa* fishery is much more locally based than the Nile perch fishery and not influenced by external actors. However, at this stage we do not have sufficient information about the impact the animal feed factories, using thousands of tons of *dagaa* for fish meal, have on ownership and organisation of the *dagaa* fishery. It is, however, clear that today the *dagaa* fishery is much more locally based, in terms of ownership and employment, than the current Nile perch fishery.

8. THE PROCESSING AND TRADING SECTORS

Although it could be useful to distinguish between these sectors since people in the processing and trading sectors perform different tasks and have different functions, we will nevertheless, lump them together here. This is because many people are engaged in both sectors, that is, many people both buy and trade in the fish as well as process the fish they have bought. However, there are also many examples of people who only process and people who only buy and trade in fish.

What have been the effects of the outside actors entering the Lake Victoria fisheries on the people engaged in the traditional processing and trading sector in terms of employment and participation? Also when discussing this issue it can be useful to distinguish between the Nile perch fishery and the *dagaa* fishery.

Nile perch fishery

We have noted above that the demand for Nile perch in the overseas markets are unlimited, and that almost all the fresh Nile perch above 1kg is being filleted and exported. How many work places, or potential work places in the traditional processing and trading sectors, have been destroyed as a result of the export of Nile perch?

In Kenya, on average 200 tons (= 200,000kg) of whole Nile perch is being loaded into the trucks and sent to factories each day (Abila and Jansen, 1997). If we assume that the average trader/processors would buy about 15kg of Nile perch per day, some 13,333 people could have been employed per day to process and trade on the fish which go to the factories each day. (This should not be an unreasonable assumption; small scale women traders usually purchase fish for KShs.200-1000 per day and 1kg of Nile perch for the local market would cost Kshs 20-35, depending on season). For each truck loaded with 7- 5 tons of Nile perch, an average of 500 women could have obtained employment in processing and sale of the fish.

In both Kenya and Uganda we have observed during the periods when a ban has been imposed on export of Nile perch to the European Union markets, that only a few days after the trucks from the factories disappear, hundreds of women are ready to buy, process and sell Nile perch in the local markets. A problem many of the women face when the local markets suddenly can be flooded with whole Nile perch, is that the processing places for Nile perch have been torn down. In Uhanya beach, in Kenya, where about

10-15% of the catch in the Kenyan part of the lake is landed, there is only one kiln - traditional processing place - for Nile perch which is left. This kiln today only smokes the Nile perch which is rejected from the agents of the factories. We were informed that some 5 years ago there were about one hundred kilns, a clear sign of the decreasing amount of Nile perch being left for the local market.

Uganda and Tanzania process even more Nile perch than Kenya. So, provided that the local market for Nile perch had been given a chance to develop, tens of thousands of work places could, theoretically, have been created.

With almost all Nile perch above 1kg going for export, what is left for the local traders and processors? It is mainly the following three types of Nile perch:

- (i) the rejected Nile perch (partly rotten or damaged fish) - according to interviews made with many factories, they only reject less than 2% of the fish delivered to them.
- (ii) the fingerlings and Nile perch below 1kg (too small for the factories). The total amount of this part of the catch seem to vary between 10-35% of the total catch of Nile perch.
- (iii) the Nile perch skeletons left after the fish has been filleted.

What type of work places have been created by the export industry? In terms of direct employment there are basically two different type of work places:

- (i) In connection with the fish export factories in Kenya, about 2,400 work places have been created (Abila and Jansen, 1997). Since the number of factories is about the same in Uganda and Tanzania and they operate under very similar conditions with those of Kenya, we expect a similar number of jobs to have been created there.
- (ii) In Kenya there are 3 towns where the skeletons of the Nile perch are being processed. (The skeleton or frame is what is left after the fillets of the fish has been removed in the factories). Although the number of people employed in this informal sector varies a lot, we estimate that about 1,500 people, mainly women, are occupied in this informal industry. A main threat to this industry is to use the skeletons for fish meal. For 1997 in Kenya, we estimated that about 60% of skeletons was used for this purpose (Abila and Jansen, 1997). If regulations are imposed to get rid of the fish waste (skeletons) as quickly as possible for hygienic reasons, more work places can be destroyed in this sector.

For every work place created in the modern fish export sector, we have, elsewhere, estimated that about 6 - 8 work places, or potential work places, are lost in the traditional sector (Abila and Jansen, 1997). There is no doubt that when given an opportunity, thousands of unemployed and under-employed people, mainly women, are ready to seize it. Around the places where Nile perch skeletons are processed there is such a strong competition to get jobs, that only a fraction of the number of people wanting these jobs are able to obtain it. In Homa Bay, the co-operative organising the Nile perch skeleton processors have divided them into four groups, each group being able to work for only 1-2 days per week, while all would have wanted to work for at least six days a week. When, for various reasons, less of the Nile perch skeletons is being sent by truck to the fish meal factories in Nairobi, hundreds of women are eagerly crowding outside the walls of the fish factories to get hold of as many skeletons as possible.

What should be clear from the aforementioned is that tens of thousand of work places, or potential work places, have been lost in the fishing communities around Lake Victoria. Some of the people who have lost their part or full time employment in these sectors may still be able to obtain a marginal income from processing and trading sectors. Many have, however, been sloughed off from these sectors and have to do with poorer or may be, no alternatives at all as a source of income. For these people there is **very little to "participate" about** in the processing and trading sectors.

The *Dagaa* fishery

How have the outside investors in the *dagaa* fish meal industry influenced the opportunities for employment and participation for the traditional processors and traders in the sector?

Although an increasingly larger part of the *dagaa* is being sent to fish meal factories, this has not so far affected the processing technique of *dagaa*. *Dagaa* is sun-dried on the beach seine and mosquito nets in the morning and early afternoon hours after the fish has been brought to the beaches in the morning. It is a labour intensive work. Normally the women buying *dagaa* for Kshs 200-1000 each per day will sun-dry their fish before selling it. In the trading sector there are some clear tendencies to more large scale operations. We found some rich women who regularly supplied the animal feed factories in Nakuru in Kenya with several tons of dried *dagaa* each week. These women traders would employ many other women to process and pack the *dagaa* in large bags which they would take to animal feed factories. Up till now, processing of *dagaa* has been carried out in a labour intensive manner with no technological equipment. This situation may, however, soon change.

In mid 1998 we observed a factory for the production of fish meal which was being constructed at Uhanya beach in Kenya. It was the first of its kind in Kenya. The factory would take all the wet *dagaa* being landed. Using imported machines from Dubai, the wet *dagaa* would be dried and, with other imported machines, the dried *dagaa* would be crushed into fish meal. In other words, the very labour intensive sun-drying process by women on the beach seines and mosquito nets would be unnecessary. The factory was constructed by a rich man owning a fleet of 15 tembea boats and 18 *dagaa* boats. His aim was to supply his factory with his own fish and also to purchase *dagaa* from others. The owner also possessed a fleet of 10 large transport boats with strong engines which would bring him *dagaa* from various beaches and islands. He estimated that his factory would be able to process about 20 tons of *dagaa* per day.

The owner of the factory argued that his factory would be able to supply better quality fish meal to the animal feed factories, since the *dagaa* would be properly dried and cleaned. (Much of the *dagaa* going to animal feed factories used to be, and still is, of an inferior quality, not properly dried because of rains and partly covered with sand). The managers in the animal feed factories have, however, lately become much more conscious about the quality of the fish meal they want to use in their chicken feed and therefore there will be a strong demand for the cleaner product from this factory in Uhanya.

If this factory succeeds it may well be replicated by other rich business men with the consequence that thousands of women may lose their work in the traditional processing of *dagaa*.

9. THE CONSUMERS

How has the presence of the new outside actors, involved in fish export and fish meal production, influenced the largest group depending on the Lake Victoria fisheries? Again we will distinguish between the Nile perch and *dagaa* fishery.

The Nile perch fishery

As we have noted above, Nile perch, when it became abundant, was not much sought after. People in the fishing communities clearly preferred tilapia and the other species they were used to. However, new processing techniques were developed and the fatty and oily taste of Nile perch started to disappear. Some women boasted that they could process Nile perch in such a way that it could even be mistaken for tilapia. Few people in the fishing communities who initially rejected the perch, now resent it (Abila and Jansen, 1997). However, the Nile perch soon found a market, not only abroad, but also in other areas of East Africa, where people were not traditional fish eaters. Nile perch has the advantage that there is much flesh in the fish and little bones and therefore it is easy to handle. Ethnic groups unfamiliar with fish, started to eat Nile perch and new trade routes for Nile perch were developed inland.

With the increased demand from overseas markets, less Nile perch were being left for the local and regional markets. Above, we have noted that what mainly was left of the Nile perch for the local market, was that which was rejected by the factories, the skeleton of the Nile perch after the fish had been filleted and the juvenile Nile perch. But during the last few years there has also become much less of these types of Nile perch for the local markets. The reasons for this are:

- (i) With an increasing number of new motorised transport boats, less fish needs to be rejected. Many factories only reject 1-2% of the fish they purchase.
- (ii) Some years ago the managers of the factories stated that they would not process Nile perch less than 2kg. The lower limit for the size of Nile perch which is accepted in the factories has continued to fall. Now all factories openly admit that they take all Nile perch above 1kg. Some factories even accept Nile perch of 700-800 grams. One reason for this, we were informed, was that the fillets of this fish which weighs only 100-200 grams each, are much sought after and well paid for, in parts of Europe.
- (iii) Also there is less flesh left on the skeletons. New cutting techniques have been developed. Ten years ago only 30-35% of the total weight of the Nile perch was being exported, now 35-48% of the fish is being exported or used as small fish chips. "These days the skeletons are completely naked" the processors remark
- (iv) Also an increasingly larger part of the skeletons are sent directly from the factories in trucks to Nairobi where they are being turned into fish meal. A new fishmeal factory, costing Kshs 1 - 2 billion, using the skeletons as raw material, will soon be established in Kisumu (East African Standard, 1999).

The response to this massive withdrawal of Nile perch from the local population, has been that some of the local fishermen have started to target the fingerlings of the Nile perch using non-selective mosquito nets and beach seine gear. From the point of view of loss of biodiversity and having a sustainable production, this practice is clearly damaging. However, from the point of view of the consumers, the targeting of the juvenile fish may to some extent have compensated for the loss of Nile perch from the local market.

The dagaa fishery

Up till 1987 all fish meal was being imported into Kenya from overseas markets, mainly from Latin America. With the increasing amount of *dagaa* being caught in Lake Victoria, the animal feed factories obtained a new and cheaper source of supply of animal protein. The factories have continued to increase their supply from lake Victoria and today only a minor portion of the fish meal used for animal feed is being imported. Some years ago the animal feed factories mainly took the *dagaa* which had not been properly dried and/or were dirty. In the later years also the animal feed factories demand higher quality - a quality for which there is a direct competition between *dagaa* for human consumption and fish meal. Elsewhere we have estimated that about 70% of the *dagaa* being landed in Kenya ends up in the animal feed factories (Abila and Jansen, 1997). According to interviews we had with the managers of animal feed factories, there is still a great demand for more *dagaa*; "*dagaa* is the only source of animal protein for our formulations", and "we only get enough *dagaa* for our chicken feed. We would also like to put it into the dog, cat and pig feed".

What are the effects of the withdrawal of so much fish and animal protein for the human population in the lake region? Nutritional surveys carried out by the Kenya Medical Research Institute in some particular communities next to the lake show clearly that there is severe malnutrition: In Siaya District, 30-50% of children were found to be moderately to severely malnourished, 50-70% were from moderate to severely malnourished in terms of lack of zinc, iron, and vitamin A. Malnutrition related diseases were rampant. Access to only 10 grams of dried *dagaa* would adequately address the iron, zinc and vitamin A deficiency among the children (Mwaniki, 1999; see also Chalken, 1988 and Kenya Government, 1997).

Because of the withdrawal of so much of Nile perch and *dagaa*, we have elsewhere estimated that the per capita consumption of fish in Kenya between 1990 and 1996 reduced from 6 to 3kg per person per annum (Abila and Jansen, 1997). This is a very low figure not only by international standards but also by African standards. Having adopted a broad view on what "community participation" entails - the outside actors have certainly contributed to less "participation" also among the consumers.

10. NEW ROLE OF THE GOVERNMENTS IN THE FISHERIES

Above, we have discussed the effects that outside investors have had on the various sectors of the traditional fisheries. Here we will look at how the role of the Governments of Kenya, Uganda and Tanzania have changed in the Lake Victoria fisheries during the last decades. We will try to assess the impact that activities of the Governments have had on the possibilities for the local communities to participate through having opportunities for employment in the fisheries.

As we have noted above, the Governments' role, experience and competence in the fisheries sector had been developed to relate to a small scale fishery of local and regional nature. Until the mid 1970s the Governments played a limited and benign role in the fisheries.

Much changed with the unexpected Nile perch boom, and when the fish export factories were being established. Suddenly there was a lot of money in the fisheries. Many decisions had to be taken about new and unfamiliar issues, several of which were complicated policy issues. How should the new production and processing sector be organised? How should one strike a balance between fish going for the export market and the local market? Should the export trade in fish be limited? During the 1980s and 1990s the governments had, probably partly through the influence of the various international conferences on different development issues, adopted policies which gave guidelines on how to deal with the issues mentioned above. We noted above the governments' objectives about food security, local employment generation, other local benefits and the need for earning foreign exchange in their fisheries policy. How were these policies followed up in practice? We believe that despite the enlightened policies which were adopted in the field of fisheries, the Government fisheries departments were neither prepared, staffed nor equipped to deal with the new situation which arose.

Nile perch fishery

We have described how a fleet of trawlers developed very much as a result of the needs of the factories to obtain large quantities of fresh fish. We noted that in order to protect the ecological habitat and the interest of the local fishermen, the three governments decided to ban trawling activities. Mbuga *et al.*, (1998) describe in detail how, in Kenya, the ban on trawling has not been followed up in practice. In Kenya some 15 trawlers, closely linked to the fish export factories, are still operating despite the ban. Articles in the same publication also show that many of the government Fish Scouts are not always following up and enforcing the regulations concerning use of illegal gear, periods and places which are closed for fishing.

A few decades ago the local fishermen themselves would play the most important role in regulating the fisheries. All landing beaches had, at that time, and still have, their own **beach leader and beach committee**, to which the fishermen elect their representatives. The objective of the beach committee is to regulate and control the fisheries and to solve conflicts between the fishermen. This is done in collaboration with the Government Fish scouts responsible for the beach. With all the money flowing through the fishermen and middlemen because of the Nile perch export, the Government's presence has become much more prominent on the landing sites. For the poorly paid Fish Scouts there are considerable incentives to allow fishermen to adopt illegal practices. Many times Government officials influence the composition of the beach committees which are elected (Owino, 1999). In the production sector, many fishermen would, today, no doubt maintain that it is the government representatives who are the most active **participants** in the regulation of the fisheries. As we have shown elsewhere (Owino, 1999, Mbuga *et. al*, 1998) government officials can some times "participate" and regulate the fisheries in such a way that greater "benefits" are accruing to them rather than the fishermen and the environment. Many fishermen maintain that the Government's involvement in the regulation of the production sector has undermined the possibilities of a positive "**participation**" by the local fishermen. Through our field work we have many times heard laments from fishermen that "**the lake is no longer ours**".

The Government presence has also increased in the **trading sector**. Since the early 1970s fishermen co-operatives were established with the assistance from the Government (the Department of Co-operatives). All fishermen are supposed to sell their fish through the co-operatives and pay a 10% commission to the co-operative. It is then the task of the co-operative to sell the Nile perch to the agents of the fish exporting

factories. Many co-operatives obtain millions of Kenya shillings of revenue each year, much more than they did before the Nile perch boom. It has become very attractive to become a member of the co-operative committee, and many efforts are being made to get elected to the committee. From the point of view of the ordinary fishermen, however, the co-operatives are not rendering the services to the fishermen as they are supposed to. Few co-operatives give loans and there is widespread agreement that most co-operatives are not managed properly. It is widely recognised that in most fishermen co-operatives transparency in the financial matters is rare and misappropriation of money is rampant. Many will maintain that the Government officials of the Co-operative Department play an important role in the way in which the co-operatives are managed (Owino, 1999). A clear response to this situation is seen in the efforts many fishermen are making by withdrawing from the Government initiated co-operatives. Instead they form their own self help groups through which they try to achieve the objectives which the co-operatives have failed to do (Owino, 1999).

It is particularly in the **processing sector and the external trade sector** of the modern fishing industry that the Government has played an important role. The government has not played a role by participating and investing in the industry itself, but by encouraging it and allowing the industry to develop and grow. The government has gone to considerable lengths to support the industry so that the fish exported complies with the international standards required in the export markets (the ISO 9000 standards). The governments' concern for exporting an acceptable product is clearly revealed in the media and press, where there regularly are articles describing the efforts the Governments of the countries of East Africa are doing to increase the exports of a high quality Nile perch product.

However, in relation to the support for the growth of the export industry, the government has not been uniform in its viewpoints. Interviews we have conducted with representatives of the fisheries departments in Uganda and Kenya reveal that there has been some concern about the rapid expansion of the export sector to the detriment of the government policy objectives which cater for the interests of the local people (food security, local employment). Other more influential parts of the government, i.e. the investment authorities and the Finance departments, have received priority when decisions about licences for establishment of new factories are made.

However, in our view, there is no doubt that the Governments of East Africa, in practice, have given priority in their fisheries policy to the objective which emphasise the earning of foreign exchange and that this has occurred at the expense of the other objectives, mentioned above, which would contribute to strengthen community participation in the fisheries.

The daga fishery

There has been no active participation by Government institutions in the *daga* fishery. Both the production sector, processing and trading sector operate with little government intervention. The governments have not intervened when the animal feed factories gradually started to use *daga* as their main source of animal protein in formulations. There are no government statistics showing how much of the *daga* goes to the animal feed factories and how much goes for human consumption. When the Fisheries Department learnt from our research (Abila and Jansen, 1997) that up 70% of the *daga* landed and coming into Kenya went for animal feed, the officials were completely taken by surprise. The Fisheries Department, at the top level, also seems unaware of the new modern, mechanised, processing facilities being set up for the drying of *daga* and of the consequences this may have for local participation and employment in the traditional processing of *daga*.

In the *daga* fishery the government seems to be a distant spectator. It does not seem to consider how the use of *daga* for fish meal and the new processing technique may have considerable influence on the livelihood situations for tens of thousand of people and that interventions may be needed to achieve the declared policy objectives of the fishery.

11. CONCLUSIONS

Above we have tried to describe the changes which have taken place in the Lake Victoria fisheries during the last decades and the role outside investors and the Governments of East Africa have played in this transformation. We have in particular tried to assess whether this transformation has affected the

possibilities for the members of the local communities to "participate" in the management of the fisheries. Our purpose for focusing on the effects on **community participation**, was because of the important role this concept has obtained among the major institutions involved in the management of the Lake Victoria fisheries. All institutions involved in the Lake Victoria fisheries, international development banks, donors, NGOs and the governments, agree that participation by people living in the fishing communities is essential and should be promoted.

In this paper we have emphasised that the possibilities for obtaining and keeping employment opportunities in the various sectors of the fisheries is the entry point to community participation in the Lake Victoria fisheries. Without employment or an income from any of the sectors in the fisheries there is very little to participate about. Our approach in this paper has therefore been to discuss the effects the transformation in the fisheries have had on the possibilities for the creation and maintenance of work places and income in the various sectors. We have discussed this issue at length and paid less attention to the possibilities for people to participate in decision-making about management issues when they already are employed or obtain an income from one of the sectors of the fisheries.

Above we noted the initial positive opportunities created by the Nile perch boom for the increase of employment in all the sectors of the fisheries. As the Nile perch export industry expanded and new technology was adopted in the harvesting, processing and trading sectors, tens of thousand of work places were destroyed and the consumers also suffered. The *dagaa* fishery has not undergone the same technological transformation as the Nile perch fishery and is still labour intensive in its harvesting and processing sector. But for the consumers there has been a major change in that most of the *dagaa* now goes for fish meal production. We also indicated that technological changes may soon take place in the processing sector of the *dagaa* fishery which could undermine the jobs of many of the women involved in this sector.

We believe therefore that the manner in which the Nile perch export industry has expanded and the growth of the *dagaa* fish meal industry have destroyed the possibilities for community participation in the fisheries. The more trawlers and *tembea* boats which get into the fisheries, the less jobs and thereby "community participation" there will be in harvesting sector. The more fish which will be sent out from the local communities, the less jobs there will be in the local processing and trading sectors.

We have shown that outside investors and the Governments have played a major role in this transformation. The Governments have, no doubt, had many good intentions for the development of the fisheries, but the effects of what has happened have been very negative with regard to community participation. However, **the situation depicted above is not static**. Very often decisions are taken concerning whether or not to give licences for new factories to be established; or decisions are made, or not made, regarding the enforcement of the ban of trawling; or decisions are taken, or not taken, about sending the Nile perch skeletons to fish meal factories. All these decisions have an impact on the possibilities for the communities to obtain employment and participate in the fisheries.

However, there are, no doubt, many situations in which the governments make decisions which have a positive impact for the local communities. It seems that Tanzania and Uganda have been much more successful than Kenya in implementing their ban on trawling. Although it has not been able to achieve it, the Government of Uganda has imposed an upper limit of 60,000 tons of Nile perch to be exported. Three quarters of the fish in Uganda has by regulations been allocated to cater for the needs of the local population. In Tanzania there are regulations prohibiting the export of tilapia, because tilapia, according to regulations, has been allocated for local consumption. Decisions and implementation about these issues also have impacts for the possibilities of the local communities to participate in the fisheries.

In some areas it may be difficult to impose regulations on the new trends of development in the fisheries. May be the *tembea* boats have come to stay, and that it will futile to try to ban them? For other areas there should be room for manoeuvre, policy making and implementation. How much and what type of *dagaa* should go for fish meal? How much Nile perch should go for export? Should the Nile perch skeletons be allocated for human consumption or fish meal? The governments themselves have already for a long time recognised that they must **strike a balance between export of fish and fish for local consumption** (CIFA, 1994).

If the governments, donors and NGOs are to let "community participation" be more than rhetoric in their fisheries policies, they need to consider the issues discussed above, and also make more efforts to implement many of the sound policies they already have adopted.

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