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1.0 INTRODUCTION

1.1 General Background

Fisheries are very important to Uganda's economy. Besides its contribution to foreign exchange and employment, about 60 % of the people mostly the-rural poor depend on fish protein to supplement on their diet. With growing fishing pressure and human activities on large lakes: Victoria, Kyoga, Albert and George, the fisheries are already showing signs of overexploitation and mismanagement. Lake Victoria basin has very important 4-5 satellite lakes constituting Lake Nabugabo the largest of all and believed to have formed when the water level of Lake Victoria fell and a sand bar separated a portion of Lake Victoria about 4,000 years ago. The rest of the lakes (Kayanja, Kayugi and Mariywa) are in the same drainage basin, and are thought to have formed in the same way. Over the years, these lakes (that support important fisheries and other economic activities besides socio-cultural values) and their surrounding environments have been encroached upon as a result of human activities. The fish stocks and species diversity of the lakes are declining very fast and this will threaten the livelihoods as well. Despite their importance, however, these lakes have previously attracted less attention from socioeconomic scientists and there is dire need for socioeconomic studies.

A number of fish species, some of which were found only in Lake Victoria have been depleted through over-exploitation, introduction of exotics especially Nile perch and environmental degradation. Some of these fishes have been observed to survive in satellite lakes in the Victoria and Kyoga lake basins. According to Ogutu-Ohwayo and Wandera S.B., the first fishery surveys of Lake Nabugabo showed that the most important commercial fish species were *P. aethiopicus*, *B.docmac*, *S. intermedius*, *C. gariepinus*, *O. esculentus* and *O. variabilis*. Eight of the 21 other fish species found in the lake were haplochromines, 5 of which were endemic. When Nile perch and several tilapiine species were introduced in Lake Nabugabo, many of the native species disappeared. The Nabugabo satellite lakes contain the endemic Cichlid fish species, *O.esculentus* and two haplochromine species previously found only in Lake Nabugabo. These satellite lakes are separated from Lake Nabugabo by extensive swamps.

Against this background, there is need to protect the lakes by ensuring sustainable use of the resources through instituting a managerial framework that caters for the interests of all the stakeholders. The Nabugabo system was proposed as a Ramsar site. One of its criteria that a wetland should fulfill is supporting rare, endangered, vulnerable or endemic species of plants or animals. These satellite lakes have endemic species and therefore qualify to be protected as a Ramsar site.

1.2 Objective of the study

In order to have such a framework, research was undertaken, to establish the socioeconomic aspects of Lake Nabugabo and its sister satellite lakes' (kayanja, kayugi and manywa) fisheries and implications for management options; on which basis resource users will be made aware of their commitment to wise use and management of the resources. The specific objectives were:

1. Identify activities taking place around the lakes
2. Identify socio-economic values attached to the lakes.
3. Identify socio- economic and environmental problems facing the lake and the resource users.
4. Examine existing local based institutions for effective initiation and/ or strengthening of co-management.

2.0 METHODOLOGY

Two surveys were conducted on Lake Nabugabo and its sister satellite lakes from October to December 2001. 100 respondents, of which 88 were randomly selected from Lake Nabugabo and the rest from the other 3 lakes were talked to. Three landings on Lake Nabugabo (.Kituti, Kaziru and Luwafu (See table 1)) were visited. At the different landings and lakes, people were mobilised with the help of Local council Chairmen and *Gabungas*. Thereafter focus group discussions of 6-8 people were held using semi-structured interviews. To ensure a wider representation of views, and equal contribution to the topics the groups consisted of elders, fishermen, fishmongers and farmers. A key informant questionnaire was also administered to the local area leaders, as a way of getting general information on the study area. 5 semi-structured interviews were held and 5 key

informant questionnaires were administered. Observations were made of the activities taking place around the lakes.

Table 1: Landings/Lakes visited in course of the exercise

Lake	Landing site	Attendance for focus group discussion
Nabugabo	Luwafu	8
	Kaziru	6
	Kituti	6
Kayanja		6
Kayugi		6

3.0 RESULTS AND DISCUSSION

3.1 Socio-demographics

Baganda tribe (84%) are the dominant tribe of the lake followed by Nyarwanda, Nyankole and others respectively. Fifty seven percent of the fishers are married and 40 percent are single. At least 91 percent of the respondents have undergone primary school education.

3.2 Activities around the Lakes' system

3.2.1 Lake Nabugabo

Majority of the respondents (66%) reported fishing as their main activity. It is done for both subsistence and commercial purposes and it is where they get their main source of income. The Lake has three main landing sites with no permanent settlements. There are approximately 100 fishermen and 95 boats mainly of the parachute type. Nile perch, Tilapia and haplochromines were the most common type of fish caught. Average catches per week of Nile perch and Tilapia were

1,050 kg and 850 kilograms respectively, however, the most commonly caught (64%) and consumed (86%) fish is tilapia followed by Nile perch. Common means of propulsion for fishing boats were oars and the common gear types were gillnets of 3.5" to 7" and hooks of number 6 to 8. This situation applies for the rest of the sister lakes.

The second most important income-earning activity is crop farming. This is mainly done upland away from the lake. Other activities include livestock keeping, charcoal burning, brick making, and tourism. The youth are highly involved in the fishing, brick-making and charcoal burning activities, whereas the elderly are the ones engaged in farming activities according to the key informant.

Unlike Kayugi and Kyanja, Lake Nabugabo is a tourist attraction site, owners of beaches benefit from tourism, while at the same time locals benefit from the employment opportunities created. As regards tourism, there are four active beaches on the lake, some of which have recreational activities like swimming and boat racing. They also have facilities for conference rooms. With development of resort beaches, there is rising concern on how their waste disposal is managed because effluent from them can end up in the lake.

3.2.2 Lake Kyanja

Activities engaged in are mainly crop farming and livestock keeping, which is done upland from which the people derive their livelihood. Watering of animals at the lake is also common and is done once a day by those involved. Fishing is done on a small scale at subsistence level by very few fishermen. There are about 3 fishermen and the common type of fish caught were Tilapia, with an average of 10kgs per week. Others included *Haplochromines* and *protopterus*. 2 boats of the parachute type operate on the lake and the common means of boat propulsion reported were oars with gillnets and hooks as the main fishing gears.



3.4 Other socioeconomic values associated with the lake ecosystem

- o The surrounding wetland environment is used as a hunting ground for especially wetland antelopes (Sitatunga) and birds for game meat.
- o Water is used for domestic purposes and watering animals.
- o Grass is used for grazing animals and thatching houses
- o Reeds are used for building and firewood
- o Papyrus is used for making mats, fish traps and baskets
- o Palms are used for making rafts, hats, baskets, mats and for house construction
- o Trees provide firewood

3.5 Values Attached to the Lakes

3.5.1 Social and Cultural values

Information on the social cultural values of these lakes was captured through conducting a focus group discussion and holding discussions with key people especially the village elders.

In the discussions, it was found out that the three lakes have a lot of social cultural values attached to them by members of the fishing communities. Firstly, it was reported that Lake Nabugabo is a "female" lake; women are not supposed to fish neither bathe in this Lake. Specific parts of the lake were designated for cultural rituals; traditionally, there was a tree called Karinzi, which was used as a cultural site for a woman called Nabugabo in charge of performing rituals for the lake. It was reported that people who were fishing during those days used to take some of their catches to the spirits as a sign of appreciation. After the woman died, the tree was cut down and presently; some of the locals attribute the declining lake productivity to the cutting of this tree.

At Kayanja, it was reported that the lake belongs to the "Kasimba" clan. Some time back, the clan members were expected to perform cultural rituals as a way of pleasing the spirits of the lake. It was believed that once the rituals are performed

the lake productivity would increase. It was also reported that, as part of the "lake culture" the tycoon method of fishing is forbidden.

Lake Kayugi, a relatively small lake has a multiplicity of social cultural values. Traditionally it was the responsibility of the 'Ngo' clan to perform rituals for the lake but with the death of the clan head, these rituals are no longer performed; Women are forbidden to go to the lake; fishing after sex is considered a taboo and boats are not allowed on the lake.

3.6 Problems facing the lake

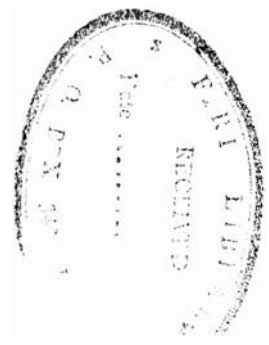
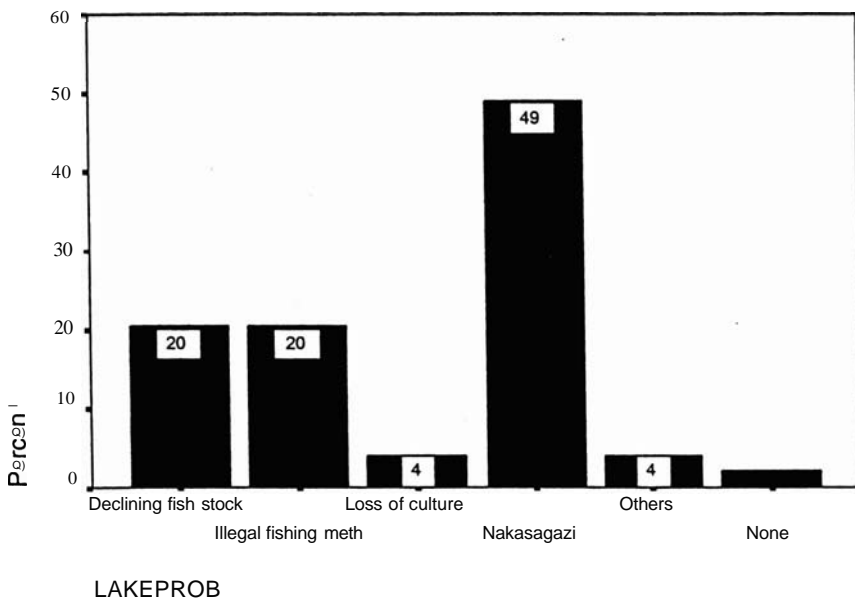
The major problems (Fig.1) reported were: -

- a Water plants locally known as *Nakasagazi*(47%) are decreasing the size of the lake and open waters for fishing. This is in reference to Lake Nabugabo
- a Use of illegal fishing methods such as tycoon (20%). These' methods are becoming rampant, although efforts have been made to sensitise fishermen about the dangers that come with this practice.
- a Declining fish stocks and species diversity (20%). At all the three lakes, it was mentioned that catch and catch composition was no longer as it used to be. On lake Nabugabo the problem was more severe; original fish species like *Nzere and Ssemutundu* were slowly reducing. Most fishermen attributed the declining fish stocks and species diversity to the use of illegal fishing methods and gears and the introduction of the Nile perch; a predator species in the lake. As for the other two lakes, (Kayanja and Kayugi) the declining fish stocks was mainly attributed to the fact that cultural rituals attached to lake productivity, have ceased to be performed.
- a Loss of cultural identity. The three lakes once had a diverse culture; different cultural taboos Le. not bathing in the lake, no tycoon and no fishing after sex, had elements of protecting the lakes. However, it was reported that, presently, some members of the communities no longer have respect for these taboos; this explains the increase in the use of tycoon method.

was observed that farmers at Lake Kayugi are slowly encroaching on the amp near the lake. There is also deforestation and charcoal burning of trees at e of the landings on Lake Nabugabo.

- 7 Management interventions suggested by the people include: -
- o Putting tougher restrictions on those found using illegal fishing methods
 - o Lake restoration by removing Nakasagazi manually or any possible means
 - o Restocking the lake with more Nile perch
 - o Formation and strengthening of local beach committees to help in the management
 - o Restoration and strengthening of the cultures associated with the conservation of the lake resources

Fig. 1: Problems facing the lake

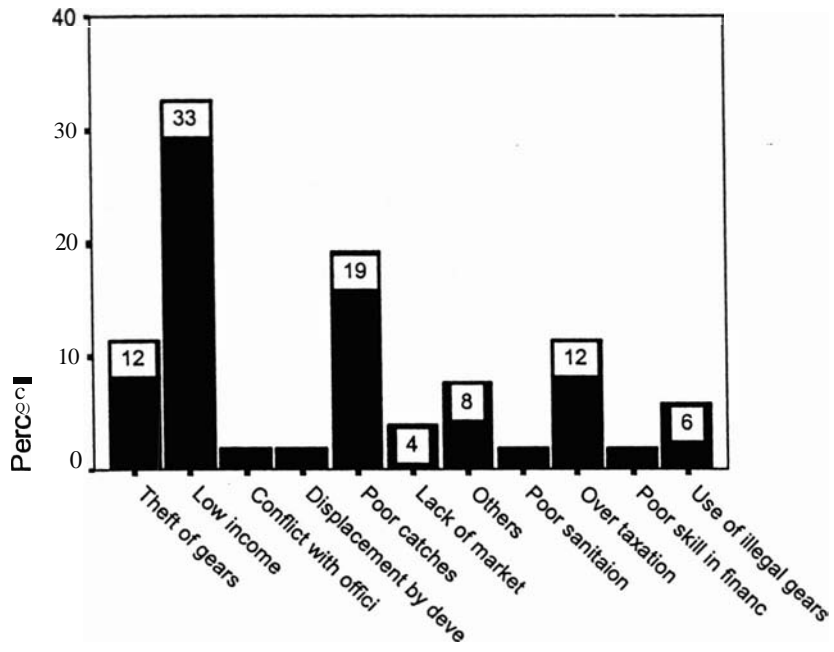


3.8 Problems facing the resource users

As the resource base changes, different problems have tended to affect the present resource users. They included the following: -

- a Low incomes (33%)

- Poor catches (19%)
- ▣ Theft of fishing gears (12%)
- ▣ Overtaxation (12%)
- Use of illegal fishing methods
- Lack of market for fish
- Conflict with officials.
- Displacement by developers/investors due to ungazetted landing sites



PROBUSER

9 Resource Management and management institutions

In exploring the management of the resource base for the three lakes, it was found that it was only Lake Nabugabo that had some leadership institutions, specifically put in place to cater for sustainable use of resources. The other two lakes (Kayanja and Kayugi) due to limited fisheries activities, leadership institutions were not in place except the local councils for the respective villages.

3.9.1 Management of Lake Nabugabo Resource

The local management of resources on Lake Nabugabo has focused much on the fish resource than any other surrounding resource. Informants reported that institutions have come up of recent, all with the prime objective of protecting the Lake and ensure sustainable resource utilization.

In the discussions, at all the three landing sites visited, it was reported that the local management committee (L.M.C) was the only local based institution mandated to act on behalf of the Government in relation to fisheries management. However, informants further argued that in some cases local councils (L.C.1) could intervene where a problem occurs off water.

3.9.2 Local Management Committees -

Local management committees are put in place through a democratic process, where the fishermen are given the opportunity to elect capable personnel among themselves, under the supervision of the fisheries officer. Table 2 shows how the local management structure looks like.

Table 2: Lake Nabugabo Local Management Committee: Composition and flow.

Chairman (<i>Gabunga</i>)
Vice chairman
Secretary
Treasurer
Information
Defence
Health
Adviser

3.9.3 Roles

These committees are expected to play some roles, geared towards the management of the lake. Among those reported the following were outstanding:

- o Arrest fishers who use wrong fishing gears
- o Ensure that all fishers pay the required revenue
- o Ensure that fishers use the appropriate gear sizes and fishing methods
- o Supervise the size and quality of fish
- o Work in collaboration with the fisheries department with respect to fishery work

3.9.4 Constraining Factors to Local Based Management Institutions

In a bid to execute these roles, local based institutions are constrained in a number of ways. When asked about the major constraining factors, the following were reported:

- o Compromising of local leaders. That due to poverty, at times, local leaders get involved in illegal fishing and on several occasions are bribed by lawbreakers
- o Lack of local based security to ensure on time arrest of the culprits
- o Poor co-ordination with the fisheries department; their visits to the landings are often irregular, making it hard for the local people to co-ordinate their activities.
- o Social ties inhibit execution of duties Le. the people meant to enforce set rules and regulations tend to fear to arrest culprits due to social relations among themselves.
- o Limited powers; more properly defined powers should be given to local management committees
- o Open access policy; wrongdoers keep on shifting to different landing sites
- o Conflict of interests with the local councils (L.Cs)

4.0 IMPLICATIONS FOR SUGGESTED MANAGEMENT OPTIONS

- o Government should continue to manage the fisheries resource according to 48% fishers, however, traditional management options (of non-involvement of fishers) employed by government with poor supervision, corruption and lack of trust for fishers will only continue to complicate the situation. Majority of the fishermen on Lake Nabugabo depend on fishing for food and as their main source of income and employment. For others, it is their only source of income. If they are not involved in the management of the fisheries, they are affected as their livelihood depends on it.
- o On the other hand if the resource management responsibility is left to beach committees (47%), open access nature of the resource and poor institutional and structural capacity building will cripple the fishers and community and, consequently the resource.
- o If Government and other service providers work jointly to supplement local beach management committees (70%) using participatory approaches, backed by legal frameworks, conflicts management arrangements and clearly defined roles then enhanced fisheries and socioeconomic values will be achieved.
- o Co-Management perceptions: Already Local Management institution exists with beach committees on Lake Nabugabo handling most of fisheries conflicts. Cases that are beyond their jurisdiction are referred to Government Local councils of the area. The fisherfolk communities (79%) feel government and beach committees should work jointly for sustainable management of the resource. There exist some useful cultural values that are important for the conservation of the resource as well and these can be incorporated in the co-management framework.

5.0 CONCLUSIONS

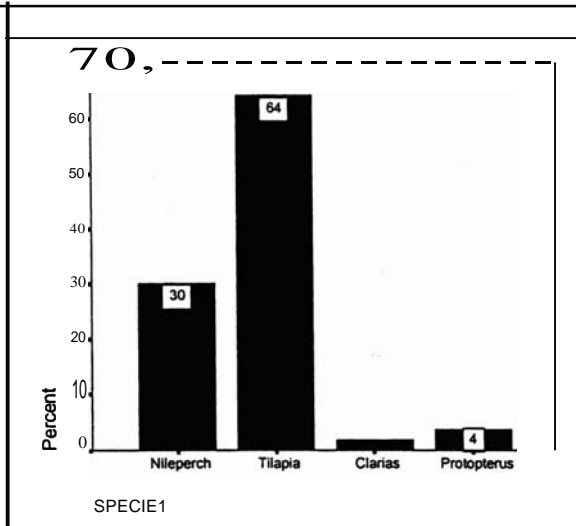
- o Nabugabo lakes have a number of socioeconomic activities and values of which fishing, farming, charcoal burning and brick-making are the most important and directly impacting the lakes' ecosystem

Trewavas, E. 1933. Scientific results of the Cambridge Expedition to East African Lakes, 1930-31. II. The cichlid fishes. *Journal of the Linnaean Society (Zoology)* 38:309-341.

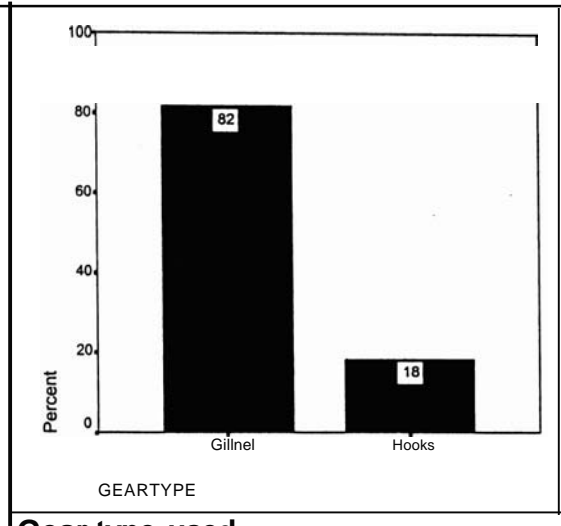
Worthington, E. B. 1932a. A report on the fisheries of Uganda investigated by the Cambridge Expedition to the East African Lakes, 1931-1932. Crown agents for the colonies, London, England.

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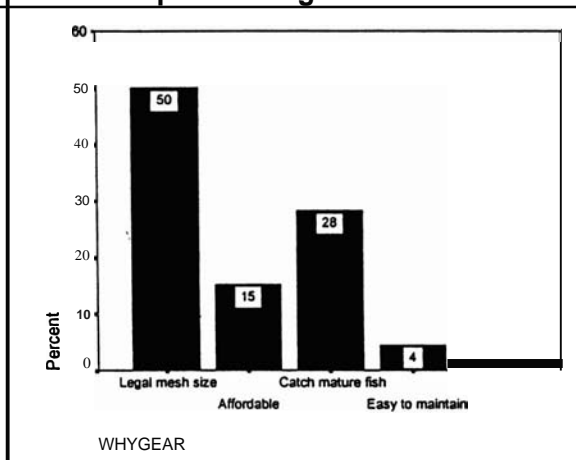
FISH PRODUCTION



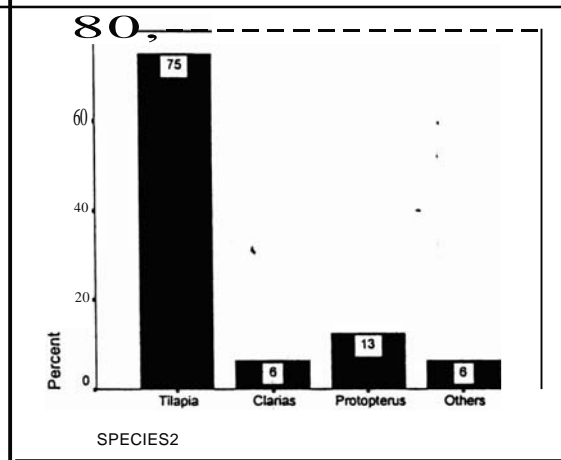
Main fish species caught



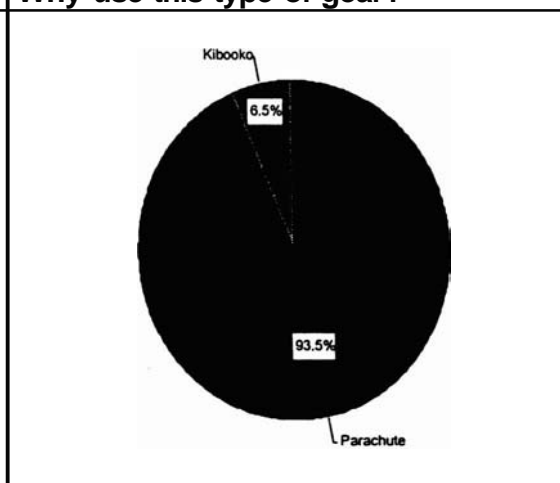
Gear type used



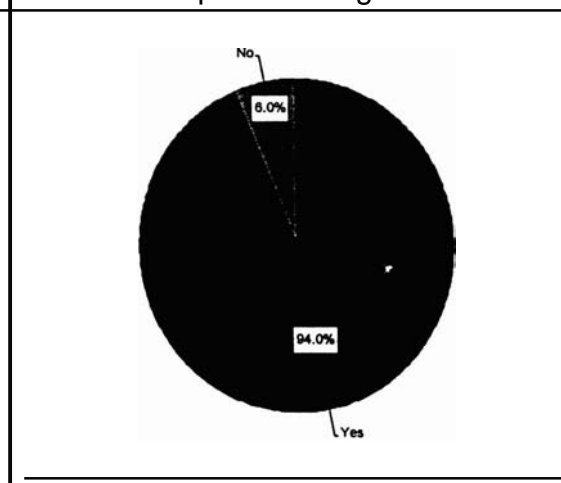
Why use this type of gear?



Other Fish species caught



Boat type used



Do you sell some fish you catch?