Overview of Lake Victoria frame survey 2000 - Uganda

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Abstract

This paper gives observations made on the frame survey that was carried out on the Uganda part of Lake Victoria in March 2000. The paper highlights the major changes affecting fishing, fishing gears and facilities in the industry on the Ugandan controlled waters of Lake Victoria. The method of using communities as a cost effective method of data collection was effective and allowed timeliness in collecting results. Data collection was supervised by technical staff and processed in a harmonized approach agreed on by the three East African frame survey scientists.

Mention has also been made of the survey costs in order to spell alertness to the survey activities planned for future. Strategies to overcome problems encountered in Frame Surveys 2000 have also been mentioned.

Keywords: Frame survey, fish landing, boats, fishermen, fishing gear

Introduction

Lake Victoria is the second largest lake in the world having a surface area of 68,000 km^2. It is shared by three riparian countries, namely: Tanzania, Kenya and Uganda. Uganda manages 30,720km^2 of the lake area. However, the exploited water in Uganda part of the lake constitutes only 18,000 km^2 (Walker, 1971).

The shoreline length on the Uganda part of the lake is at a magnitude of 2,400Km, and is mainly composed of sheltered bays, which are surrounded, by papyrus, swamps and gulfs at a number of places. The exploitable volume of water is 1,000 km^3.

A number of inventory surveys (Frame Survey) have been conducted on lake Victoria, Uganda, in recent years. Various methods have been used in these surveys but have mainly been aerial counts and in one instance supported by area transects to check the results (Graham, 1972a, 1972b). Water approach was used by Uganda Fisheries Department (UFD), 1990 and now FS2000 has combined a water and land approach using community participation strategy.

Objectives of Frame Survey 2000

1. Frame Surveys in the Fisheries sub-sector are carried out to determine, among others the structure of the fishery. Information is generally obtained on Landing sites, fishing vessels, fishing gears, fishermen and their socio economic status.

2. Pave way for designing catch and effort assessment surveys.

3. Provide benchmark data for further fishery management options.

4. Obtain a frame for designing socio economic surveys.

5. Study changes taking place in the structure of industry in time.

6. Evolve management action plans

Materials and methods

Coverage

The surveys covered shorelines of the ten Administrative Districts across Lake Victoria catchment including all-islands (Kalangala District) in the middle of the lake system. Data was collected on administrative units, fishing crafts details, facilities and utilities, staffing and usage of landing sites. Two hundred community based enumerators were recruited and assigned to fish landing sites at a ratio of 1:4.(based on 1990 estimates of 715 landing sites). The survey lasted for four days (22nd – 25th March 2000. Supervisors were the district and sub-county Fisheries Officers. Enumerators used either a bicycle or canoe to cover allocated areas.

Data collection

The questionnaire forms for the survey were developed by a co-operative effort of Research and Management Institutions of the three countries and harmonized at a series of regional meetings. These forms were delivered to district and sub-county officers during the supervisors training held at Colline Hotel, Mukono, on 16th March 2000. Subsequently recruited enumerators assembled at sub-county's headquarters and got trained on the survey approach, data forms, and record entry by the supervisors. Upon completion of the training they were handed the fresh questionnaires to commence the exercise of landing sites enumeration.

Data processing

In preparation for processing of the survey data, a one-week course in computer data processing was organized for the three countries in Dar-es-Salaam, Tanzania, from 17th –22nd April 2000. Three officers from Uganda attended the training (1 Researcher, 2-Management). A data processing program was developed during the training. The data has since been successfully stored into a Microsoft Access database.

Data quality

Control of non-sampling errors was done through a number of steps, namely:

(a) Training of district and sub-county supervisors who in turn trained enumerators on the survey forms.
(b) Follow up ground supervision and later editing the returned questionnaires with the enumerator to verify or validate the entries for coverage, completeness and adequacy. (giving reduction of coverage and non response errors).

(c) Issuance of detailed guidelines and instructions to supervisors at district, sub-counties and headquarters geared toward quality control measures.

(d) Completed questionnaires were returned to the Headquarters two weeks from the end of the survey period. This gave the District Fisheries Officers ample time to go through all returned questionnaires at base to observe omissions or commissions.

(e) During the survey four teams from the headquarters and Research (FIRRI) traveled to different districts to note problems encountered and give remedy as appropriate.

(f) Recruited data entry personnel were of sound background in computing with hands-on experience in data entry activities.

(g) Interviewing knowledgeable people at beaches

Results

Frame survey overview

A lot of changes have occurred in the structure of the fishing industry over the past thirty years: namely, numbers of fishermen, Fish landing sites and fishing boats.(Table 1).

Table 1: overview of frame survey in Uganda

S/N	YEAR	No. Fish Landings	No. Fishing Boats	Authority	Method Used
1	1970	620	2,643	Wildlife Services Ltd	Aerial (10 days)
2	1971	197	3,264	EAFFRO/FAO	Aerial
3	1972	--	3,002	Fisheries Department	Aerial
4	1988	291	3,470	MAAIF, Planning Dept.	Land Based
5	1990	715	8,674	Fisheries Department	Water & Land
6	2000	597	15,544	Fisheries/LVEMP/ LVRFP Projects	Community, Water & Land

*1970 there were 10,572 fishermen
*2000 there were 34,889 fishermen

Fishing communities and their activities

The fishing community has steadily increased on Lake Victoria over the years. In 1970 there were 10, 572 fishers; In 2000, there were 34,889 fishers reflecting an increase of 69.7%.

Fish landings

In the same period the number of fish landings around the lake has ranged between 197 in 1971 to 715 in 1990 showing an increase of 72.03%. Figure 1. is a summary of the number of landing sites from FS2000. Highest numbers are in Mukono, Kalangala Bugiri, Mayuge, Mpigi, Masaka, Jinja, Rakai, Kampala and Busia districts in that order.
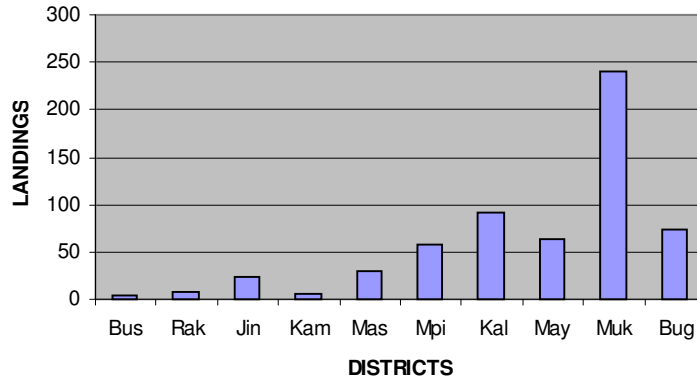
Figure 1 Number of fish landing sites by districts

Fishing boats

The number of fishing boats increased form 2,643 in 1970 to 15,544 in 2000. i.e. an showing 80.4% over the thirty years period. A total of 2,777 boats (14.35%) lay derelict on beaches. Mukono, Kalangala and Mayuge and Bugiri disytricts lead the rest in the high number of fishing boats (Fig.2).
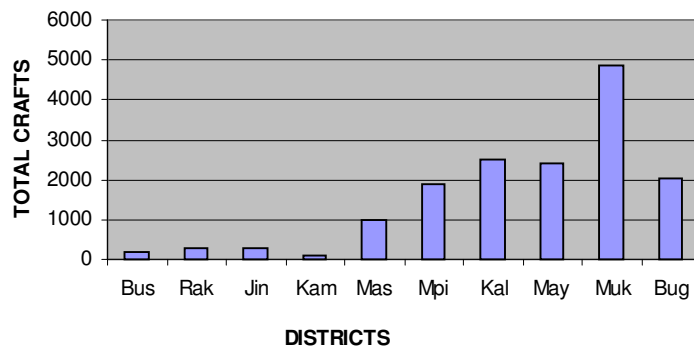

Figure 2 Number of crafts by district

Fishing crew

A total of 34,889 fishermen was recorded. Mukono, Kalangala and Mayuge districts had the highest number of fishers in the lake region (Figure2b)
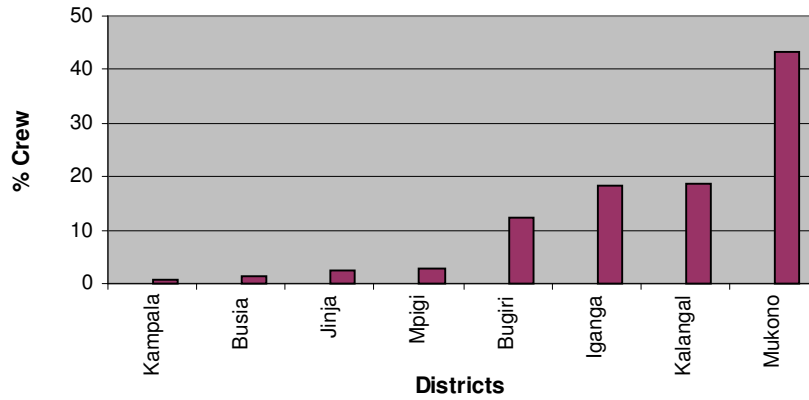
Figure 2b. Total crew by district

Boat propulsion

A total of 2031 boats used outboard engines (13.1%) while 12,848 boats were paddled (82.6%). Boats with sails were 665 and made up only 4.3% of total fishing boats.(Figures 3, 4 and 5).
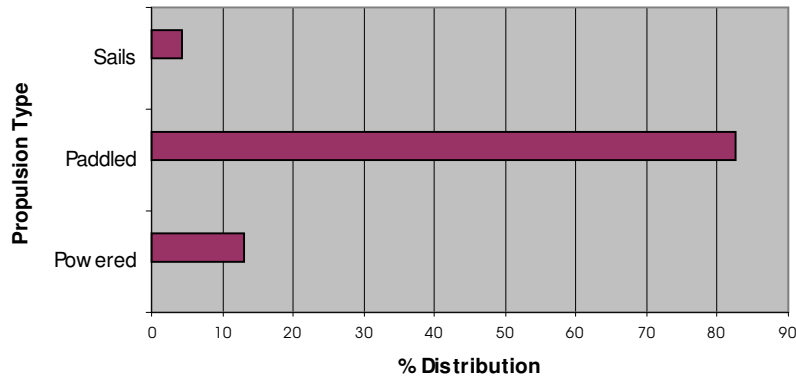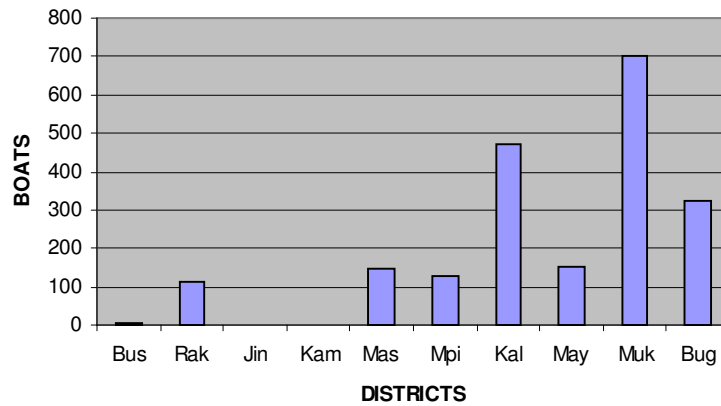

Figure 3: National status of boat propulsion

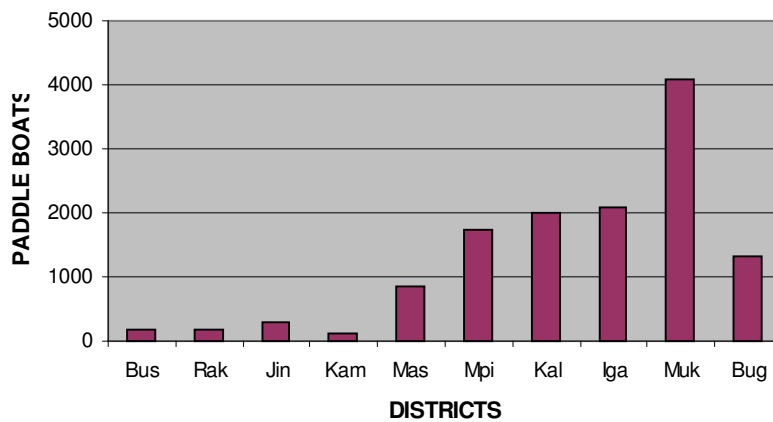
Figure 4. Outboard propulsion

Figure 5. Propulsion by paddles

Percentage paddled within districts

Figure 6 shows within-district distribution of paddled boats as follows. Jinja (100%), Kampala (99%), Busia (97.7%), Mayuge (86.2%), Kalangala (80.8%), Mukono (84.13%), Rakai (60.4%), Bugiri (64.8%).
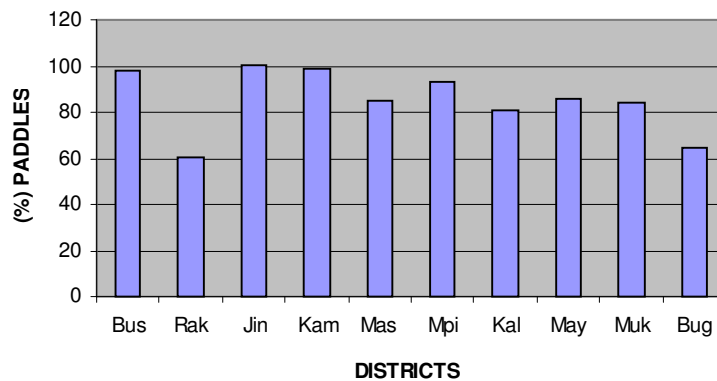

Figure 6. Means of propulsion within districts (%) Paddles

Boats using sails

Figure 7 shows the distribution of boats using sails by district. Total sails on lake were only 665.   This made (4.3%) of national total fishing canoes. Percentage distribution of sails within district were spread out as follows: Bugiri (19.4%), Mayuge (7.6%), Mukono (1.5%) and Mpigi (0.27%).
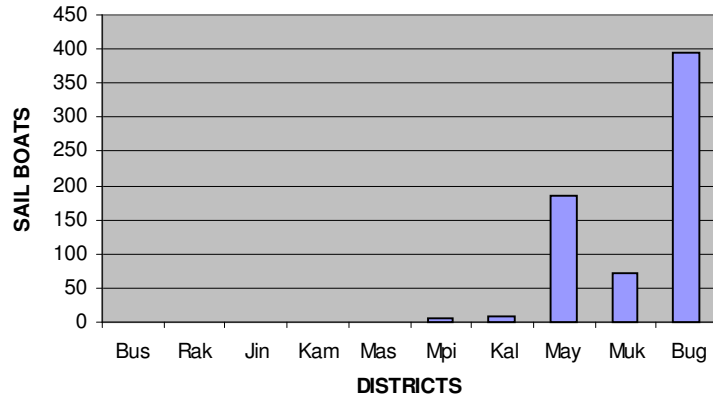
Figure 7. Propulsion by sails

Percentage outboard engine distribution within districts

The Percentage distribution of outboard engines within districts is depicted in Figure 8. It is as follows: Rakai (39.4%), Kalangala (18.95%), Bugiri (15.8%), Mukono (14.4%), Masaka (14.6%).

Gillnets

Figure 9 displays histograms of boat types and composition of gillnets sizes they carry. It was found out that Ssese boats using sails and motorized engines are appropriate for fishing since they carry higher mesh gillnets of >5 inches.
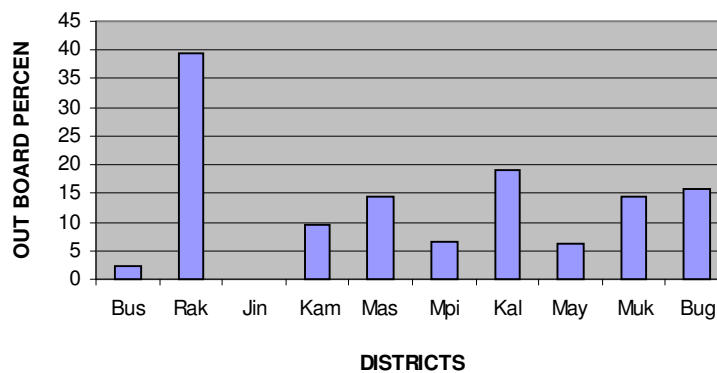

Figure 8 Means of propulsion within districts (%) outboard

Road network

A total of 127(23%) fish landings reported having an all weather road network in the vicinity.

Power network

Only 16 (3.6%) landings reported having power at/or very near source.

Survey costs (millions UGX)

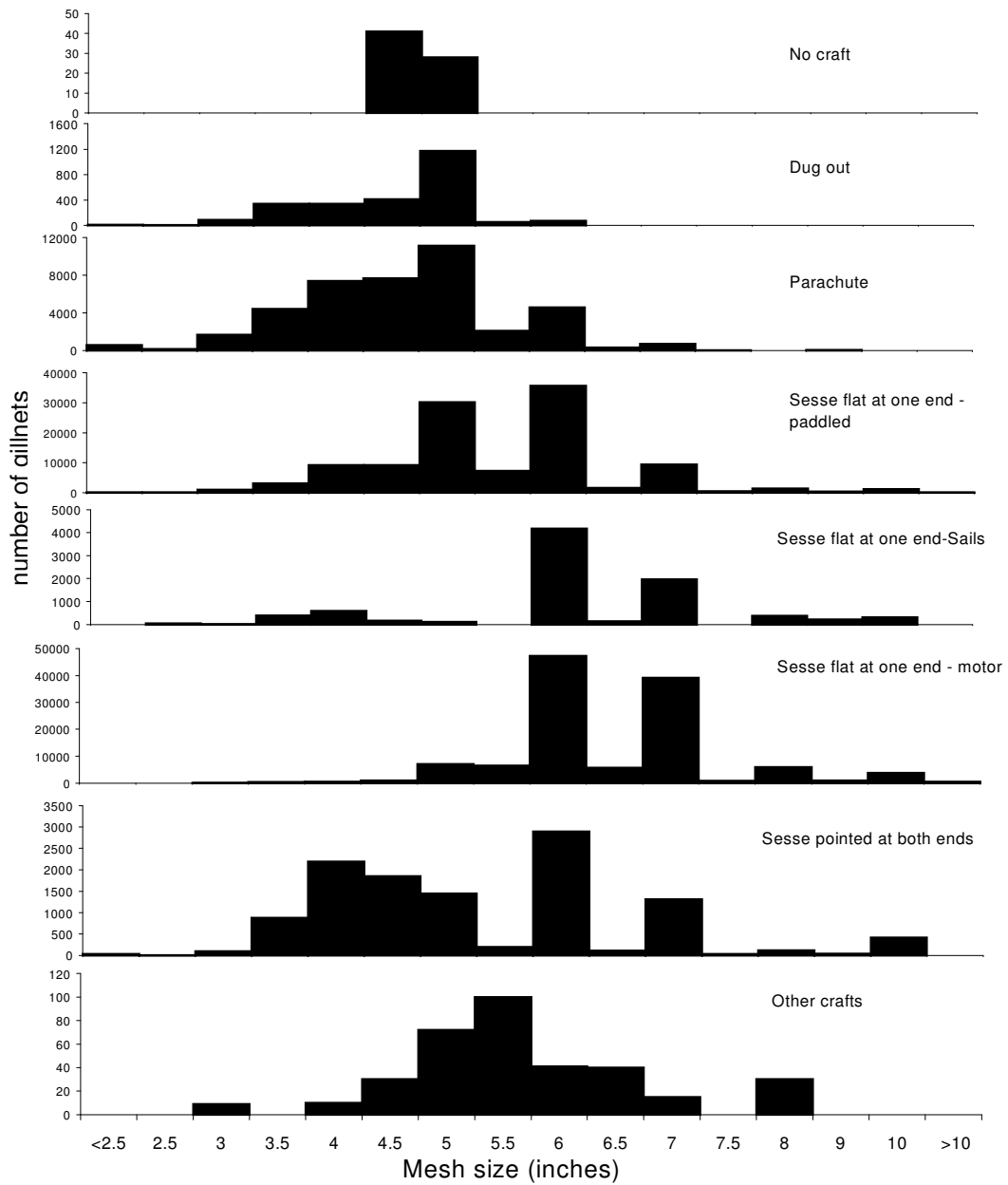|	
Total survey costs	62,939,650
Conducting Frame Survey	28,645,250
Data processing	6,869,400
Printing Report	12,425,000
Training (LVFRP)	15,000,000

Figure 9. Gillnet mesh size composition in boats of different types in the Uganda sector of Lake Victoria

Discussion

Frame Survey 2000 was carried out on lake Victoria after a previous one done way back in 1990 by the Fisheries Department. It is important to compare the shift in fishing effort and entry into the lake Victoria fishery: We note a substantial entry into the fishery in the past ten years. There were about 25,000 fishers by 1990. Now there are 34, 889 fishermen over the lake. This is an increase by 28.3% in past ten years. Compared to 1970, there has occurred an increase of 69.7% entry into lake Victoria fisheries.

There were 8,674 fishing boats in the 1990 survey. Today there are 15,544 fishing boats. This now represents a double increase in effort in the past ten years. This roughly represents a rate of entry of 700 vessels per year on lake Victoria.

Nationally, canoe motorisation is at about 14%. There is a high incidence of entry of fishers but with a low capacity to exploit the offshore fishery efficiently. The highest percentage of boats (82.6%) use paddles. Only 4.3% use sails. The use of sails has been gaining popularity in eastern districts but has not gained ground in the rest of the lake due to inadequate knowledge to use it. It is a cost effective method compared to use of engines for fishing.

Infrastructure development at fish landings has remained rudimentary since time immemorial. Access roads are wanting. Only 127 landings (23%) of all landings reported an access road; Power is also wanting. Only 16 landings are linked to power. These are mostly near urban areas. We also note lack of suitable amenities at all fishing villages e.g. all reported cold rooms were non-functional. Overall development is restricted and markets cannot be accessed.

The future of the fishing industry now lies in developing a multi-sectoral approach to development, integration of community, mobilization and empowerment for change in preparation for a new down.

Conclusion

This analysis suggests that there is already high effort on lake a high rate of entry per year. The majority of boats use paddles. These boats (which are 82.6%) in the in fishery carry fishing gears that are not recommended. It therefore, becomes important start out on a management plan of action that translates into good not only for us a nation but also for sustainability of the fishery itself. There is also need for resources mobilization to empower communities to participate in management. They have proved a viable ally in the area of data collection and need minimal funding compared to previous strategy of using extension staff.

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