Lake Victoria Fisheries

Catch Assessment Surveys. (CAS)

Information, Uganda

2005-2011

Introduction

The Partner states of the EAC through the Lake Victoria Fisheries Organization (LVFO) are monitoring exploitation of the fisheries resources of Lake Victoria. It has harmonized fisheries data collection around the lake including collection of information on trends of fishing effort and fish catches through Catch Assessment Surveys (CASs). The data generated by CASs provide Catch per unit effort (CPUE), which together with fishing effort information obtained from regular biannual Frame surveys is used to estimate catches. Data from CASs also provide a rough index of stock size. The monthly catches in this report, covering the period between July 2005 and December 2008 are estimated using raising factors from the 2008 Frame Survey data while those covering March 2010 and September 2011 are estimated using the 2010 Frame Survey.

This CAS report provides estimates of the quantities of fish landed in the riparian districts sharing the Ugandan waters of Lake Victoria; the monetary value of the fish catches; the contribution of different fish species to the catches; and the trends in fish catch rates, and the monthly catches for the sampled month since the beginning of the current CAS activities, from July 2005 to May 2011. So far there have been 14 CASs conducted in the Uganda sector of the lake. The report also compares the annual catch and gross beach value of the catch in 2005, 2006, 2007, 2010 and 2011. However, it should be noted that the annual catch estimates for the years 2010 and were based on one sampling covering the rainy season and may not capture changes that could occur in dry season. There is need to include dry season sampling in future surveys.

Why Catch Assessment Surveys?

The data generated by CASs provides Catch per unit effort (CPUE), which, together with fishing effort information obtained from regular biannual Frame surveys is used to estimate:

1. The quantities of fish landed in the riparian districts along Lake Victoria
2. The monetary value of the fish catches
3. The contribution of different fish species to the total catches



Current CAS results

District total fish catches and beach value of the main commercial species

Distribution of fish crafts

Landing sites are the primary sampling units (PSUs) and the vessel-gear (VG) types landing at each site are the secondary sampling units (SSUs). Within each of the formerly eleven districts sharing the Ugandan part of the lake, 10% of all landing sites (PSUs) selected for sampling at the beginning of the surveys in 2005 were maintained but implementation of the CAS activities were done by new districts. A total of 54 PSUs were sampled in the Ugandan part of Lake Victoria. The landing sites were selected randomly with Probability Proportional to Size (PPS), where size is based on the number of vessels landing at the site.

There have been changes in district boundaries that resulted in formation of new districts with corresponding changes in location of some CAS landing site. However for purposes of maintaining the SOPs, landing sites in the formerly 11 districts were considered during the further analyses of monthly and annual estimates because the 2010 Frame survey was based on the former eleven districts.

Table 1. Distribution of fishing crafts including rafts and foot fishers in the riparian districts of the Ugandan part of Lake Victoria (Frame survey 2010 data)

District	No. fishing crafts	%ge
Busia	172	0.7
Kampala	181	0.8
Jinja	315	1.3
Rakai	568	2.4
Mpigi	850	3.6
Masaka	1511	6.4
Wakiso	2147	9.1
Mayuge	2640	11.2
Bugiri	2948	12.5
Kalangala	3695	15.6
Mukono	8601	36.4
Grand total	23628	100.0

Nile perch

The Nile perch catch rates in both paddled and motorized sail Sesse gillnetting boats decreased from March 2010 to May 2011. In paddled Sesse beach seining boats there was an almost two fold increase in the catch rates from March 2010 to May 2011 shown in the table below.

Table 2 Estimated annual fish catches in the Ugandan part of Lake Victoria presented by district and species for 2006 to 2011(Nile perch)

	2006		2007		2008		2010		2011	
DISTRICT	Catch	Value	Catch	Value	Catch	Value	Catch	Value	Catch	Value
Busia	396.0	762.7	227.7	388.5	234.9	524.70	594.8	2,079.3	504.4	2285.
Bugiri	15,666.4	30,178.0	16,411.8	27,962.0	14,739.3	32,923.92	10621.3	37,130.9	9007.7	40807.
Mayuge	8,145.8	15,691.1	7,737.9	13,159.6	6,936.7	15,492.67	9516.6	33,269.3	8070.9	36563.
Jinja	578.8	1,114.9	505.3	862.6	510.2	1,139.26	1104.6	3,861.6	936.8	4243.
Mukono	35,852.5	69,062.3	33,550.4	57,081.1	31,337.0	69,979.81	30929.1	108,125.3	26230.4	118830.
Kampala	632.9	1,219.1	546.4	927.8	519.8	1,160.92	679.8	2376.4	576.5	2611.
Wakiso	6,297.8	12,131.3	5,842.0	9,941.3	5,462.53	12,196.53	7732.3	27,031.3	6557.6	29707.
Mpigi	1,954.1	3,764.2	1,766.4	3,002.3	1,859.97	4,157.28	3058.9	10,693.7	2594.2	11752.
Masaka	2,387.3	4,598.7	2,121.1	3,601.5	2,661.75	5,953.80	5438.1	19,011.0	4611.9	20893.
Kalangala	16,912.7	32,578.8	15,771.7	26,825.5	14,603.90	32,610.27	13255.3	46,339.4	11241.6	50927.
Rakai	2,214.9	4,266.5	2,174.5	3,701.6	2,110.59	4,716.13	2039.3	7,129.1	1729.5	7835.
	91,039.1	175,367.7	86,655.3	147,453.8	80,976.67	180,855.29	84970.1	297,047.5	72061.5	326456.



Tilapia

The parachute boats (*bawo tatu*) are the main craft in the tilapia fishery in the Ugandan waters of Lake Victoria. Paddled Sesse boats, to a lesser extent also operate in the tilapia fishery, and gillnet is the most commonly used gears to target tilapia in both craft types. Other gears used in the tilapia fishery but are less common include basket traps, hand line hooks and cast nets.

The parachute boats with gillnets which are more specialised in the tilapia continued to record significantly higher catch rates of tilapia than the paddle Sesse boats which also apply in the Nile perch fisheries. In May 2011 both categories of boats registered decrease in catch rates both in parachute boats and paddle Sesse boats from March 2010 to May 2011.

Table 3. Estimated annual fish catches in the Ugandan part of Lake Victoria presented by district and species for 2006 to 2011(Tilapia)

	2006		2007		2008		2010		2011	
DISTRICT	Catch	Value	Catch	Value	Catch	Value	Catch	Value	Catch	Value
Busia	166.8	161.1	127.1	133.8	173.1	258.6	118.8	258.5	135.5	379.6
Bugiri	2,807.6	2,712.1	2,276.2	2,366.0	2,056.4	2,983.0	2,121.4	4,615.7	2418.8	6779.1
Mayuge	2,794.6	2,699.6	2,491.3	2,601.9	1,954.0	2,785.8	1,900.8	4135.7	2167.3	6074.1
Jinja	375.3	362.5	333.7	345.5	361.5	532.4	220.6	480.0	251.6	705.0
Mukono	8,290.7	8,008.8	7,126.8	7,479.3	5,671.0	7,985.5	6,177.5	13440.9	7043.6	19740.7

Kampala	205.0	198.0	175.7	184.4	150.8	215.3	1,355.8	295.4	154.8	433.9
Wakiso	2,825.7	2,729.6	2,774.6	2,905.4	2,413.0	3,466.6	1,544.4	3360.2	1760.9	4935.2
Mpigi	1,536.5	1,484.3	1,425.9	1,495.1	1,143.5	1,617.2	2011.0	1329.3	696.6	1952.4
Masaka	2,345.6	2,265.8	2,392.9	2,516.2	1,735.3	2,432.1	1088.1	2363.2	1238.4	3470.9
Kalangala	5,235.2	5,057.2	4,798.3	5,033.7	3,523.9	4,923.8	2647.5	5760.4	3018.7	8460.3
Rakai	478.5	462.2	433.0	453.5	374.0	535.8	407.3	886.2	464.4	1301.6
	27,061.4	26,141.3	24,355.6	25,514.8	19,556.6	27,736.0	16971.1	36925.7	19350.5	54232.7



Mukene/Dagaa

The Mukene fishery has consistently been dominated by paddled Sesse boats using either small seines (Lampala) or scoop nets. There was an almost a threefold increase in the catch rates of scoop nets from March 2010 to May 2011.

Table 4. Estimated annual fish catches in the Ugandan part of Lake Victoria presented by district and species for 2006 to 2011(Mukene)

	2006		2007		2008		2010		2011	
DISTRICT	Catch	Value	Catch	Value	Catch	Value	Catch	Value	Catch	Value
Busia	219.7	42.8	282.2	47.7	134.4	36.5	408.0	112.2	618.0	320.9
Bugiri	8,697.5	1,696.0	11,090.9	1,875.3	8,190.5	2,234.4	7285.4	2003.5	11035.0	5730.5
Mayuge	6,563.0	1,279.8	8,447.7	1,426.3	5,471.7	1,491.0	6527.7	1795.1	9887.4	5134.6
Jinja	47.2	9.2	47.3	7.8	16.2	4.4	757.7	208.4	1147.6	596.0
Mukono	37,624.8	7,336.8	46,851.3	7,921.2	25,376.2	6,899.6	21215.0	5834.1	32133.9	16687.3
Kampala	88.4	17.2	116.4	19.7	47.2	12.8	466.3	128.2	706.2	366.8
Wakiso	4,979.2	970.9	6,274.6	1,061.4	3,198.7	869.2	5303.7	1458.5	8033.5	4171.8
Mpigi	358.3	69.9	474.1	79.4	497.9	136.2	2098.2	577.0	3178.1	1650.4
Masaka	5,089.5	992.4	6,453.3	1,092.2	4,889.4	1,333.9	3730.1	1025.8	5649.9	2934.0
Kalangala	31,920.0	6,224.4	33,581.2	5,615.6	22,132.4	6,018.9	9092.1	2500.3	13771.7	7151.7
Rakai	146.5	28.6	172.2	29.0	46.0	12.4	1398.8	384.7	2118.7	1100.3
Arrow Aquaculture	-	-	-	-	-	-	434.4	119.5	528.2	274.2
	95,734.1	18,668.1	113,791.3	19,175.6	70,000.5	19,049.2	58717.3	16147.3	88808.2	46118.5

Table 5 Estimated annual fish catches in the Ugandan part of Lake Victoria presented by district and species for 2006 to 2011 (Other fish species)

	2006		2007		2008		2010		2011	
DISTRICT	Catch	Value	Catch	Value	Catch	Value	Catch	Value	Catch	Value
Busia	18.2	11.4	9.8	8.0	11.6	14.4	15.9	31.3	25.2	56.0
Bugiri	206.1	155.1	252.2	210.6	225.2	273.6	283.9	559.8	450.6	999.7
Mayuge	178.1	136.3	227.5	190.8	207.6	255.2	254.3	501.6	403.7	895.7
Jinja	19.7	14.6	30.6	25.2	29.9	35.1	29.5	58.2	46.9	104.0
Mukono	800.3	604.0	1,172.5	968.6	1,076.4	1,245.4	826.6	1630.0	1312.1	2911.2
Kampala	17.9	13.3	26.6	21.8	24.4	28.0	18.2	35.8	28.8	64.0
Wakiso	208.4	163.9	257.9	212.5	232.9	276.0	206.6	407.5	328.0	727.8
Mpigi	96.0	74.4	96.6	78.8	97.3	113.8	81.8	161.2	129.8	287.9
Masaka	83.4	65.1	83.2	70.8	76.5	95.3	145.3	286.6	230.7	511.9
Kalangala	449.2	366.5	498.6	409.5	469.8	537.8	354.3	698.6	562.3	1247.6
Rakai	31.7	23.3	30.0	24.2	37.6	47.2	54.5	107.5	86.5	191.9
	2,109.0	1,627.9	2,685.5	2,221.0	2,489.3	2,921.6	2270.9	4478.1	3604.6	7997.8

Annual Fish Catches and Value

The annual fish Catch estimates based on the sample month estimates from 2005 to 2011. The overall annual Catches of Nile perch in the Ugandan part of the lake has decreased over the years from 94,903 in 2005 to 70.061 in 2011; a 24% reduction in 7 years. Despite the reduction in Catches, the gross revenue from the Catches has almost doubled to around shs 435 billion. The annual Catch estimates for tilapia reduced by 34% from 29,415.0 in 2005 to 19,350 in 2011but like for the Nile perch, the gross revenue from the Catches has almost doubled to approximately shs 54 billion. The annual Catch estimate for Mukene of 88,808 was higher than that recorded in 2008 and 2010 of 70,001 and 58,717 respectively since 2005 but was still low compared with the estimate for the last consecutive years between 95,000 and 113,791.

Estimated Annual catches (tones) and value (Million shs) in 2005 to 2011

	2005		2006		2007		2008		2010		2011
	Catch (t)	value	Catch (t)	value	Catch (t)	value	Catch (t)	value	Catch (t)	value	Catch (t)
Nile perch	94,903	182,810	91,039	175,368	86,655	147,454	80,977	180,855	84,969	297,048	70,061
Tilapia	29,415	28,351	27,061	26,141	24,356	25,515	19,557	27,736	16,971	36,926	19,350
Mukene	106,400	20,748	95,734	18,668	113,791	19,176	70,001	19,049	58,717	16,147	88,808
Other species	7,815	8,176	2,109	1,628	2,685	2,221	2,489	2,922	2,270	4,478	3,605
Overall	238,533	240,085	215,943	221,805	227,487	194,366	173,024	230,562	162,929	354,599	183,824

Recommendations

1. The low tilapia and Nile perch catches corresponded with high unit price to the extent that the amount doubled yet gross income was still obtained in the two fisheries in 2011 as compared to when the catches were higher in 2005. The ready market and price incentive is likely to be the main factor keeping fishers in business against declining catches.

2. The general out cry of low catches in the fishery, closure of factories are other indicators of the depletion of the Nile perch and tilapia fisheries. The annual estimates for between 2005 and 2011 clearly indicate a decreasing trend for the Nile perch fisheries with a slight increase in 2010 but still lower than catches recorded 2005 and 2007 but with the lowest catch recorded in 2011. These results were consistent with Acoustics survey in February 2008 and August 2008 which also indicated the lowest biomass of Nile perch less than 400,000 t compared with more than 500,000 t in 2005 and 2006. However there were no comparable data on biomass for 2010 and 2011.

3. The Mukene fishery which had shown some stability in catches in the 2005 to 2007 surveys, showed a large decrease in the 2008 and 2010 surveys but an increase in 2011. Mukene is a short lived fish that is likely to have strong seasonal variations in abundance. Inconsistence in

sampling periods could be one of the reasons for the observed erratic changes in catches. The intended quarterly sampling in the Standard Operating Procedures for CASs was not closely followed because of funding gaps leading to inconsistent coverage of seasonal variations of catches.

4. On the other hand, the most illegal destructive fishing gears, i.e. Seines, monofilament gillnets, basket traps and cast nets increased substantially. Illegal monofilament gillnets also increased by 8% between 2008 and 2010. The Nile perch catch rates of boats in the long line fishery continued decreasing compared somewhat increasing trends in the last four surveys probably due to reduction of hook size. Another factor of the hook fishery that is not sufficiently documented is their impacts on the Nile perch and other fishes during bait collection in the lake using mosquito seines. The impacts of the long line fishery in the Nile perch fishery should be evaluated and the fishery regulated accordingly.

5. The use of Monofilament gillnets is a major threat in the tilapia fishery where they are most commonly used. They are being preferred by fishers because of their higher efficiency of catching fish than the ordinary multifilament gillnets as the tilapia catches continue to decrease. This trend is likely to rapidly worsen the status of the tilapia fishery if the proliferation of monofilament gillnets continues unabated. The elimination of the rampant use of illegal gears, especially seines and under sized gillnets that capture immature fish and monofilament gillnets should be given priority to reverse the trends of declining catches of Nile perch and tilapia. Other management interventions that would ensure quick recovery of the Nile perch and tilapia fisheries i.e. closed seasons/areas, regulation and reduction of the fishing effort targeting the species should be considered.

6. The Mukene fishery in the Ugandan waters of Lake Victoria remained a near shore activity in which paddle Sesse boats using small seines or scoop nets were the dominant craft. Development of this fishery in the offshore waters, with the more efficient fishing methods suitable for open waters, remains an option to be explored to further increase the Catches of Mukene beyond the current levels. Trials of the lift net and paired boat (catamaran) technology, which is prominent in the Tanzanian part of the lake, are being conducted around Sesse Islands by some fishers under support of the FAO funded project under the Department of Fisheries Resources, Entebbe. A policy on the sustainable exploitation of the light fishery is also being developed under the

same project. The success of these trials might result in transformation of this fishery in the Ugandan waters of Lake Victoria.