THE BIOLOGY AND ECOLOGY OF LAKE VICTORIA FISHES:

THEIR DEVELOPMENT AND MANAGEMENT

(UGANDAN VERSION)

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Chapter 3

The Biology, Ecology and impact of the Nile perch, *Lates niloticus* in lakes Victoria, Kyoga and Nabugabo and the future of the fisheries

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Nile perch (Mputa), *Lates niloticus* was introduced into Lakes Victoria and Kyoga from lake Albert to increase fish production of these lakes by feeding on and converting the small sized haplochromines (Nkejje) which were abundant in these lakes into a larger table fish. It was, however, feared that Nile perch would prey on and deplete stocks of the native fishes and affect fish species diversity. Nile perch became well established and is currently among the three most important commercial species. It is presently the most important export fish commodity from Uganda. Considerable changes have taken place in fishery yield, and in life history characteristics of the Nile perch itself since the predator got established in Lakes Victoria and Kyoga.

After establishment of the Nile perch, fishery yield in lakes Victoria and Kyoga increased five to eight times. Total yield in the Ugandan region of Lake Victoria increased from 17,000 tonnes in 1981 to 132,000 tonnes by 1989 due to increase in contribution of Nile perch from 14,000 tonnes in 1983 to 101,000 tonnes in 1989. Similarly fishery yield in Lake Kyoga increased from 18,000 tonnes in 1964 to 167,000 tonnes in 1978 due to the rise in the contribution of Nile perch from about 700 tonnes to 71,000 tonnes. However, the yield of Nile perch in Lake Kyoga later decreased to 15,000 tonnes by 1989 suggesting that Nile perch may not sustain the high yields realised soon after its establishment in the new habitats. This decline has been attributed to heavy fishing pressure, use of destructive fishing gears and methods especially beach seines, and reduction in food supply.

Before establishment of the Nile perch, up to 14 fish species occurred in the commercial catches. After its establishment, the number of exploited fish species decreased to three, Nile perch, Nile tilapia and one native species; *Rastrineobola argentea* (Mukene). Although the original decline was due to overfishing, that after establishment of Nile perch was mainly due to predation by the Nile perch. Since 1991 stocks of haplochromines and other native species have started to increase in Lake Kyoga. This seems to be due to the reduction in predation pressure as a result of over-fishing of Nile perch and the increase in cover from predation provided by the expansion of the water hyacinth.

Before Nile perch become well established in lakes Victoria and Kyoga, haplochromines and small mormyrids (Kasulu) were its main food. As populations of Nile perch increased, stocks of haplochromines and other native species declined. Thereafter prawns, *Caridina nilotica* and dragonfly nymphs became the dominant prey of juvenile Nile perch while larger Nile perch ate Mukene, Nile tilapia and its own young. The average sizes and numbers of prey eaten have also changed. Following increases in haplochromine stocks in Lake Kyoga since 1991, haplochromines have again become important food of Nile perch in the lake. Similar increases in haplochromine stocks have started to occur in inshore areas of Lake Victoria.

Nile perch in the new habitats were initially heavier and falter than in native habitats due to abundance, at that time, of vulnerable haplochromine prey. After haplochromines had been depleted, the average weight of the fish decreased and they are now lighter than even in their original habitat. Reduction in Nile perch prey through human over-exploitation can depress the condition of the Nile perch to levels that would affect the health of its stocks and should be avoided. There is therefore need to control exploitation of Nile perch prey.

Male Nile perch mature at 50 - 55 cm total length and females at 90 - 100 cm. The species has a very high reproductive potential; females produce 3 to 18 million eggs depending on size. There are more males than females in Lakes Victoria and Kyoga than was the case when food was abundant. Although reproductive potential of the Nile perch does not seem threatened by changes in prey supply due to the very large numbers of eggs produced, the male biased sex ratio might have some effects on the stocks.

The decline in Nile perch yield in Lake Kyoga, the reduction in the prey supply in the new habitats, the decrease in average weight of the Nile perch and the male biased population suggest that Nile perch may not sustain the very high yields realised soon after its establishment in Lakes Victoria and Kyoga. This situation is compounded by the very high fishing pressure on the species due to the very high demand for fish by the increasing human population and the export oriented fish processing plants.

For the Nile perch fishery to remain sustainable, it is recommended that:

- destructive fishing gears and methods should be controlled
- fishing effort should be regulated and
- Nile perch prey especially the prawns should be commercially harvested