

## **D-11: Decline in fish yields at the Victoria Reservoir**

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It has been theoretically calculated and practically estimated that the Victoria Reservoir has the potential to produce the highest fish yield among deeper hydro-power reservoirs in the country. A significant decline in fish yield is evident in this reservoir from 1990 to date following the cessation of Government Patronage to Inland Fisheries in Sri Lanka. An attempt was made to determine whether this

decline was due to unwarranted fishery practices or unsuitable ecological characteristics resulting from anthropogenic interferences and intrinsic morphological features of the reservoir basin.

Fish brought to the Digana market from 3 major fish landing sites were examined fortnightly in 1990 and 1994. The relative abundance and mean total length of 4 exotic fish species (i.e. *Oreochromis mossambicus*, *Oreochromis niloticus*, *Tilapia rendalli*, and *Cyprinus carpio*) were recorded. Hydraulic data (water level fluctuation) and rainfall data were obtained from the Mahaweli Engineer's Office, Digana, while relevant limnological characteristics were examined using standard techniques.

In spite of a greater fluctuation in water level and higher intensity of rainfall during the monsoonal period in 1994, the overall hydrological and meteorological pattern has remained more or less the same in both years. Except for an increase in micronutrient concentration (indicative of loading of fertilizers or human waste) only minor differences in physical, chemical, and biological parameters were observable.

Comparison of fish catches from the 2 main inflow areas revealed that in the Kumbukkandura area (near the Hulu Ganga inflow) the smaller sized *O. mossambicus* was predominant accounting for 78 to 82% of the catch in 1990. However, a decline in the catch along with a decrease in size of all the principal marketable exotic species was observable since 1990. For example, the mean total length ( $\pm$  SD) of *O. mossambicus* had decreased from  $22.65 \pm 0.24$  cm in 1990 to  $16.40 \pm 0.29$  cm in 1994, and the mean total length of the Common carp, *Cyprinus carpio* from  $31.25 \pm 0.11$  to  $28.16 \pm 0.19$ . Comparison of condition factors between the individual fish caught in 1990 and those caught in 1994 revealed that there was no marked difference and therefore no stunting or physiological changes in the fish species. The reason for the preponderance of small individuals in the catch of this area could be attributed to the practice of using small meshed gill nets (5-7 cm) along with cast nets.

In the Haragama-Ambacotte areas (Mahaweli inflow) the larger sized *O. niloticus* are more abundant and constituted 50 to 65% of the total catch. In this area, the fishermen by common consent agreed to use gill nets above 4½" in mesh size to avoid catching small fish. Although the total amount of fish reaching the market was found to be much lower in 1994, the mean total lengths of cichlids and carp were not significantly different from previous years. Observations indicate that specific ecological characteristics of this inflow area combined with over fishing accounts for the decline in fish yield.

Based on this evidence, it can be concluded that the decline in fish yield in this reservoir may be attributable to both the fishery practice and the reservoir ecology.

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