SOME ASPECTS OF THE BIOLOGY AND POPULATION DYNAMICS OF THE DOMINANT FISH SPECIES IN KEDUNGOMBO RESERVOIR, CENTRAL JAVA, INDONESIA

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MASTER OF SCIENCE
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Thesis Submitted in Fulfilment of the Requirements
for the Degree of Master of Science in the
Faculty of Fisheries and Marine Science
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JUNE 1993

Chairman : Assoc. Prof. Dr. Hj. Mohd. Zaki Mohd. Said

Faculty : Faculty of Fisheries and Marine Science

The study was aimed to investigate some aspects of the biology and population dynamics of dominant fish species, namely *Oreochromis mossambicus* (Peter), *Puntius gonionotus* (Bleeker), *Puntius bramoides* (Cuvier & Valenciennes), *Mystacoleucus marginatus* (Cuvier & Valenciennes), and *Channa striatus* Bloch in the Kedungombo Reservoir, Central Java, Indonesia.

Gillnet sampling in six sub-fishing areas of the reservoir once a month for a 12 month period and catch assessment survey (CAS) at three fish landing sites were carried out. Length-based methods for fish population study were adopted.

Results of the study showed that the dominant species were distributed all over the reservoir, except *C. striatus* which were distributed in a restricted area. The riverine species were concentrated in the upper portion of the reservoir. The species richness and diversity of the fish community were high in the upper portion of the reservoir. Based on the values of the index of preponderance, *O. mossambicus* and *M. marginatus* were classified as planktivores; *P. gonionotus* and *P. bramoides* as herbivores; and *C. striatus* as a carnivore. Food competition occurred between *O. mossambicus* and *M. marginatus*, and between *P. gonionotus* and *P. bramoides*. However, the food competition among other species was considered low.

O. mossambicus reproduced at intervals of about three months and their reproduction occurred extensively during high water level. Reproduction of *P. gonionotus, P. bramoides* and *M. marginatus* started from December until March when the water level of the reservoir began to rise. In *C. striatus* reproduction occurred during high water level. Fecundity of *O. mossambicus, P. gonionotus, P. bramoides, M. marginatus* and *C. striatus* were between 178-1,574; 25,980-86,916; 42,454-99,659; 4,702-15,681; and 2,585-12,880, respectively. The fecundity was highly correlated with total length, body weight, and gonad weight and it increased with the increase in total length, body weight and gonad weight.

Length-weight relationship of the species showed that *O. mossambicus*, *P. gonionotus* and *P. bramoides* grew isometrically and *M. marginatus* and *C. striatus* grew allometrically.

Von Bertalanffy growth parameters, $L\infty$ and K of *O. mossambicus*, *P. gonionotus*, *P. bramoides*, *M. marginatus* and *C. striatus* were 31.5 cm and 0.57 yr^{-1}; 41.90 cm and 0.54 yr^{-1}; 31.24 cm and 0.86 yr^{-1}; 19.40 cm and 1.21 yr^{-1}; and 66.93 cm and 0.40 yr^{-1}, respectively.

Recruitment patterns of the five dominant fish stocks showed two peaks of recruitment, particularly in *O. mossambicus*, *M. marginatus* and *C. striatus* stocks.

Exploitation rate of *O. mossambicus* and *C. striatus* stocks were at an optimum level and the other fish stocks were considered below optimum level. Relative yield per recruit of the stocks showed the maximum at 0.48 for *O. mossambicus*, 0.52 for *P. gonionotus*, 0.50 for *P. bramoides*, 0.55 for *M. marginatus* and 0.52 for *C. striatus*.

The fish yield of the reservoir was estimated to be 430.962 mt annually or 88 kg/ha/yr.