

POPULATION DYNAMICS OF RASTRINEOBOLA ARGENTEA (PELLEGRIN)
1904 (PISCES: CYPRINIDAE) IN THE WINAM GULF OF LAKE
VICTORIA, KENYA.

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ABSTRACT

Fish stock assessment of R. argentea (Pellegrin) was carried out for the first time in the Winam Gulf of Lake Victoria in 1989/90 using Length-based Fish Stock Assessment (LFSA) methods. Correlation between total length (TL), fork length (FL) and standard length (SL) were derived. Length-weight relationship were derived for juveniles, males and females by logarithmic transformation of the raw data.

The Fultons condition factor (K) was highest in December and March /April but lowest in June for all stations. The asymptotic length (L_{∞}) for the whole Gulf was 67.8 ± 4.3 mm TL while the mean growth curvature (K) was 0.576 ± 0.070 yr⁻¹. Growth performance index (ϕ') was determined to be 3.40 ± 0.07 . Mortality rates were quite high with a range of total mortality coefficient (Z) of $1.766 - 2.860$ yr⁻¹ while the fishing mortality coefficient (F) was $0.966 - 1.984$ yr⁻¹. Mean Z/K value was 3.749 ± 1.104 . F_{max} was 0.82 ± 0.13 yr⁻¹ while $F_{0.1}$ was 0.51 ± 0.07 yr⁻¹. The range of selection length (L_C) for fully recruited fish was 45 - 50 mm TL.

The current exploitation rate (E_{CUR}) was $0.551 - 0.653$ which was above the maximum sustainable yield

($E_{MSY} = 0.460 - 0.483$), maximum economic yield ($E_{F0.1} = 0.348 - 0.365$) and optimum exploitation rate ($E_{opt} = 0.5$) by 5.1 - 74%. Two-way analysis of variance (ANOVA) revealed no significant differences between stations nor sexes in 90% of the population parameters. A general reduction in asymptotic length (L_{∞}) of R. argentea was realized in the Winam Gulf while the stock is currently overexploited.

"Dagaa" fishery in the Winam Gulf of Lake Victoria is commercially important as a source of poultry feed, fish feed, cattle feed and human food. Rational exploitation of this fishery could be possibly achieved through correct management policies including the fisheries cooperative societies, licencing of nets in addition to registration of boats and strict observation of closed seasons.