

Exploitation Rates and Management Implications for the Fisheries of Bontanga Reservoir in the Northern Region of Ghana

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Abstract

The exploitation rates of eight major component fishery species, *Auchenoglanis occidentalis*, *Brycinus nurse*, *Clarias gariepinus*, *Hemichromis fasciatus*, *Marcusenius senegalensis*, *Oreochromis niloticus*, *Sarotherodon galilaeus* and *Tilapia zillii*, of gill net fishery of Bontanga reservoir, were studied from March 2004 to March 2006 based on length-based models. The exploitation rates (E) of *A. occidentalis* and *H. fasciatus* were 0.7 and 0.6, which exceeded the optimization (E_{opt}) criterion of 0.5 for sustainable exploitation of fisheries, indicating that these species were over exploited. For *B. nurse* and *S. galilaeus*, $E \approx 0.5$, indicating that these species were at their maximum rates of exploitation. For *C. gariepinus*, *M. senegalensis*, *O. niloticus* and *T. zillii*, $E < 0.5$, indicating that these species were not over exploited. Based on the selection factor of the legal minimum gill net mesh size of 5 cm of Ghana Fisheries Act 625, the estimated mesh size for catching the eight species ranged from 9.9–19.3 cm, calling for an upward review of the legal minimum mesh size of gill nets from 5 to 10 cm for sustainable exploitation of reservoir fisheries. The adoption of minimum mesh size of gill nets of 10 cm, restriction of further entry into the fishery, control rights and community based co-management system are some management options suggested to enhance sustainable exploitation and management of the fisheries.