Portia Chiyedza Chifamba, J Aquac Res Development 2017, 8:8 (Suppl)
DOI: 10.4172/2155-9546-C1-017

Evaluation of factors that may have cause the collapse of the sardine fishery of Lake Kariba

Portia Chiyedza Chifamba
University of Zimbabwe, Zimbabwe

Statement of the Problem: A fishery on an introduced freshwater sardine, *Limnothrissa miodon* started in Lake Kariba in 1974. Fishing effort and catches increased to peak in 1990 and thereafter declined. Overfishing and climate change are blamed for the collapse of the fishery. Fishing is known worldwide to drive evolution of life history parameters and should be monitored. There has been no attempt to examine both alleged causes of collapse together and no recent estimates of size at maturity.

Aim: The purposes of this study were to establish the Maximum Sustainable Yield (MSY), to evaluate the relationship between fishing effort, environmental variables, fish catches and effort and also determine size at maturity.

Methodology & Theoretical Orientation: The catch and effort time series data were used to fit two surplus yield models from which the MSY and the effort used to catch it was calculated. The association of fishing effort and Catch per Unit Effort (CPUE) with temperature and hydrological variables were assessed using Generalized Linear model analysis. Size at maturity, when 50% of fish in particular length or age group are mature, was estimated using logistic curves.

Findings: The fishing effort after 1990 was above MSY, suggesting overfishing. The CPUE is significantly correlated to air temperature. A multiple regression analysis showed that fishing effort and lake level explained the variation in total catch whilst fishing effort and maximum temperature explained variation in CPUE (as indicator of biomass), suggesting a strong effect of fishing effort. Maturity occurred at a much smaller size in this study than before the fishery.

Conclusion & Significance: A combination of unsustainable fishing effort and unfavorable environment may have contributed to the collapse of the fishery. Environmental condition particularly climate change and small size at maturity may affect the recovery of the fishery even when fishing effort is reduced.

Biography

Portia Chiyedza Chifamba has keen interest in Fish and Fisheries Biology. Her work includes studies of diet and growth of several fish species. She has undertaken extensive studies of two fish species introduced into Lake Kariba; Nile tilapia, *Oreochromis niloticus* and freshwater sardine, *Limnothrissa miodon*. The studies demonstrate that unplanned introduction of Nile tilapia had negative impact on the ecosystem compared to planned introduction of the sardine intended to fill a vacant niche and improve fish production. She has compared the diet, aggression, reproductive capacity and growth of the Nile tilapia in order to determine the traits that might have given the introduced species competitive advantage over the endemic indigenous cichlid, *Oreochromis mortimeri*. The fisheries work she has undertaken includes establishing that effective fishing effort in the sardine fishery and it increases as a result of fishing vessel and gear improvement, an aspect critical in the management of fishing effort.

pcchifamba@yahoo.col.co.uk

Notes: