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An Urgent Call for Application of Output Controls alongside Current Input Controls in Commercial Fisheries Management System of Inland Lakes: Case Study of Malawi

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Abstract
Fisheries resources continue to decline globally and in Malawi amidst ever increasing human population. This study was conducted to assess catch composi+tion, species composition and catch per unit effort (CPUE) among commercial fishers. Secondary catch data (2000 to 2021) obtained from Department of Fisheries was used. Trend of fish species composition over the 21-year period was initially dominated by *Lethrinops* species and Utaka (*Copadichromis* species) until 2002 when Ndunduma (*Diplotaxodon* species) started to become prominent. Pattern of Utaka appears to be more cyclic as three- or four-year peaks were followed by about four years troughs. Dominance of Ndunduma which in most years was above 50% demonstrates economic importance of the fishery in commercial trawl industry. Dominance of Pelagic Utaka and Ndunduma is attributed to the increased adoption of midwater trawl nets by the fishery with very few units operating bottom trawl nets. In 2021, the pair trawlers contributed 52% of landings than stern trawlers. Scramble for fishing by commercial fishers may lead to tragedy of commons. It is recommended to allocate to individual fishers catch quotas (output control). By employing input controls and this output control, commercial fishers will be prudently managed in a very sustainable way.

Keywords: commercial fishery, largescale fishery, food security, Malawi.

1.0 INTRODUCTION

Fisheries resources continue to decline globally amidst ever increasing human population to 7.8 billion in 2020 from 6 billion in 1999 (Population Reference Bureau, 2020). Malawi is not spared as the recent biomass assessment survey has shown that most of economically important fish species maximum sustainable yield (MSY) and populations are dwindling (Malawi Government 2020). In response, the Government of Malawi has instituted a closed season for commercial fishers from 1st December to 28th of February (1st November to 31st January for small scale fishers) to allow fish population rejuvenate. The large-scale fishery which is categorised into commercial (Stern trawlers) and semi-commercial (Pair trawlers) fishery dates back to late 1960s after some successful biomass assessment trials in mid 1960s. The fishery which used to be concentrated in the Southern Lake Malawi has witnessed shifting of fishing effort to central Lake Malawi chiefly due to depleted stocks in the southern part (Turner 1992).

As a way of input controls on Lake Malawi, fishing by commercial fishers is restricted to designated fishing areas which run parallel from south to north (A to N) as allocated during fishing license issuance. Pair trawlers are restricted to a combined 90 horse power, and a maximum of 386 horse power for a stern trawler. The allowable

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