

Assessment of stock status of frequently caught grunts, seabreams and snappers along the Kenyan Coast

Okeri Maorine

Bioengineering sciences, VUB

E-mail: maurineokeri12@gmail.com

Grunts (Haemulidae), seabreams (Sparidae), and snappers (Lutjanidae) account for a considerable catch of small-scale fisheries along the Kenyan Coast, significantly impacting the local economy, enhancing livelihoods, and providing nutrition for coastal communities. Although these fish families seem vital, their fisheries are less prioritised by the regulatory framework due to the scarcity of information about their stocks. This study aims to avail baseline information on the stock status of the four frequently caught species: *Plectorhinchus gaterinus*, *Polysteganus coeruleopunctatus*, *Pristipomoides filamentosus*, and *Lutjanus lutjanus* using data from the Kenya Marine and Fisheries Research Institute (KMFRI)'s Catch Assessment Survey (CAS) between 2017 and 2023. Species composition and abundance of the fishers' catch, species diversity, and gear usage were analysed. Length frequency and length-weight relationship (LWR) were done using MS Excel; growth parameters (K —growth coefficient and L_{inf} —Length infinity) and mortality were estimated using ELEFAN (electronic frequency analysis). Length-based spawning potential ratio—LBSPR and length-based indicators—LBI, were used to assess stock status, using the estimated growth parameters K , L_{inf} , mortality, and LWR as inputs.

A total of 1008 species belonging to 146 families were recorded: with a species diversity index (H') of 4.58 and an evenness of $J=0.67$. A total of 27 gears were found to target grunts, seabreams, and snappers with ring nets, basket traps, monofilament, reef seine, handlines, and beach seine fishing small-sized fish (<10 cm). The results of frequently caught species showed that *P. gaterinus*, *P. filamentosus*, and *L. lutjanus* had exploitation rates above the threshold ($E > 0.5$), while *P. coeruleopunctatus* seemed to be underexploited ($E < 0.5$). Spawning potential ratio (SPR) for *P. gaterinus* (6 %), *P. filamentosus* (17 %), and *L. lutjanus* (8 %), which were below the lower limit (SPR < 20), the unsustainable threshold indicating growth and recruitment overfishing, whereas *P. coeruleopunctatus* maintain a health stock with SPR of 54 %.

The finding of this study recommends a need for management strategies, including gear regulation, protection of spawning areas, and seasonal closures to enhance the sustainability of these critical fisheries.

Keywords

Small-scale Fishers; Multi-gear; Genetic Algorithm; VBGN