ANALYSIS OF THE YELLOWFIN TUNA (*Thunnus albacares*), BIGEYE TUNA (*Thunnus obesus*) and SKIPJACK TUNA (*Katsuwonus pelamis*) CAUGHT IN 2024 BY THE INDUSTRIAL TUNA FISHERY IN KENYA

By Stephen Ndegwa[1], Zachary Ogari[1], Alex Lukhwenda[1], Kelvin Wachira[1], Elizabeth Mueni[1]

Abstract

The paper looks at the spatial temporal distribution of the yellowfin tuna, bigeye tuna and skipjack tuna catches by the Kenyan industrial vessels during the year 2024. The data is from four longline vessels and two purse seiners. While the longliners were mainly focussing on swordfish, the purse seiners catches were mainly tunas. Yellowfin tuna and bigeye tuna catches composition of the total longline catches were 15% and 2% respectively while from the purse seine catches, yellowfin and skipjack tuna composed 50% and 44% of the total catches respectively. In terms of spatial distribution, the catches were both from the EEZ and the high seas. A total of 208 yellowfin tuna were sampled from the longliners an average fork length of 136.7 ±1.24 se (90, 185) cm while for the purse seiners a total of 177 fish were sampled with an average fork length of 93.9 ±2.07 se (40, 168) cm. For the bigeye tuna catches of, a total 161 fish were sampled and the average length was 128.5 ± 1.69 se (50, 179) cm while in the purse seiners, a total of 385 skipjack tuna were sampled with the average length of 51.4 ± 0.54 se (33, 78) cm. In terms of seasonality, the longline catches were mainly from January to June while the purse seine datasets were from August to December.

[1]Kenya Fisheries Service

Introduction

Tropical tuna fishing in Kenya is undertaken by both artisanal and industrial vessels. For the Industrial fishery in Kenya, landings are both from Longliners and purse seiners. During the year 2024, there were four longliners and two purse seiners that reported catches as Kenyan landings. This report looks at the data reported by the Kenyan longliners and the purse seiners in 2024 and compares it with the 2019 and 2023 period. The daily catch reports are as per the recording of the skippers in the logbook. During the reporting period, fisheries observers were deployed on board the vessels and were able to collect lengths of different species caught and are also reported here.

Data collection

The study was undertaken using industrial longline and purse seine catch data in 2024 reported from the logbook data and also based on the data collected by observers on board. The logbook data includes date of fishing, mid operation fishing coordinates for the longliner and actual deployment position for the purse seiner, Species caught, in number and respective weight,

Results and discussion

Catch Composition

In 2024, the catches by longlines were 216 MT. 61% of the catch was swordfish while yellowfin tuna, Blue Shark, Bigeye tuna and Mako Shark composed of 15.3%, 15.1%, 1.9 and 1.9% of the total catch respectively (Figure 1). The catch from purse seiners during the same year was 6,324 MT. Of this catch, two species dominated the landings with 50% was composed of yellowfin tuna while skipjack tuna represented 44% of the total catch (Figure 2). During the period 2019 to 2023, the total catch by the longliner was 2,194 tons. This catch was dominated by swordfish (59%), yellowfin tuna (13%) and blue sharks (12%). The other species reported were Bigeye tuna (6%) and while the other species

accounted for 10% (Figure 3). For the two periods under review, swordfish and yellowfin tuna dominated then overall catches.

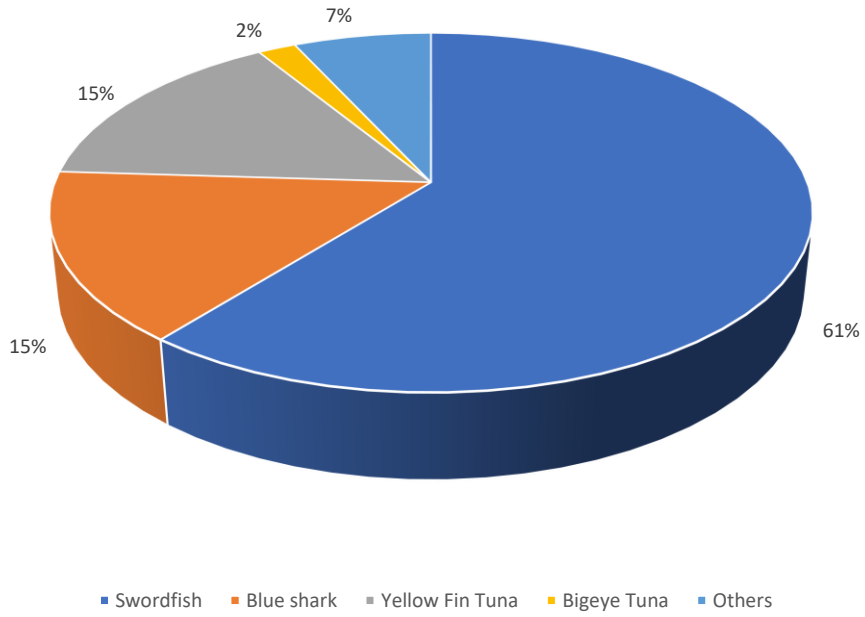

Figure 1: Catch Composition of the longlines in 2024

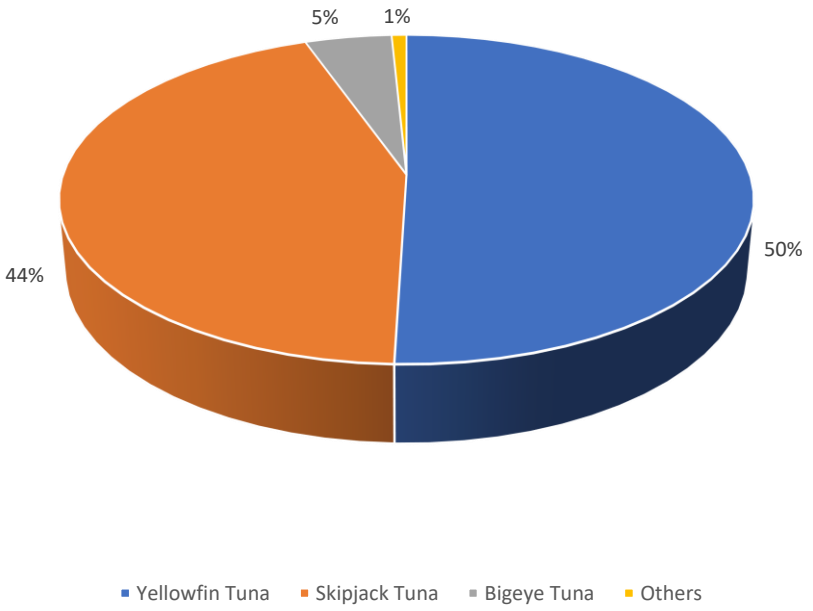

Figure 2: Composition of the purse seine catches in 2024

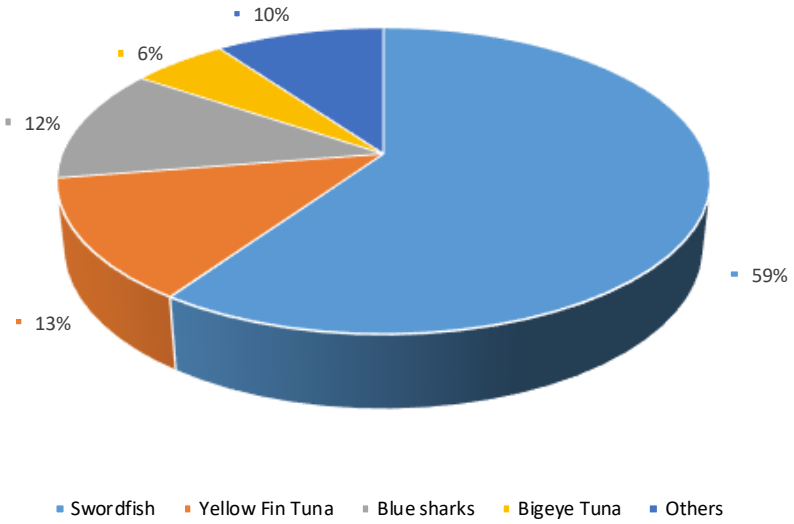

Figure 3: Catch composition of the longline between 2019 and 2023

Monthly catches.

During the year 2024, the longline vessels did not operate between months of June to November. For the remaining months, January and April were the months with the highest catch (Figure 4). The operations of the purse seiners started from August to December with the month of November having the highest catches (Figure 5). During the period 2019 to 2023, the month of July recorded the highest catches ≈ 194 tons followed by May and October ≈ 185 and 179 tons respectively. In the months of November and September were the lowest catches reported as ≈ 65 tons and 109 tons respectively (Figure 3). For the artisanal fishery, the highest landings were reported in March, April and June with ≈ 191, 145 and 110 tons respectively. The lowest catches were recorded in August and October (Figure 6). In terms of monthly species composition from the longliners, yellowfin tuna catches were dominant compared to the bigeye tuna (Figure 7).

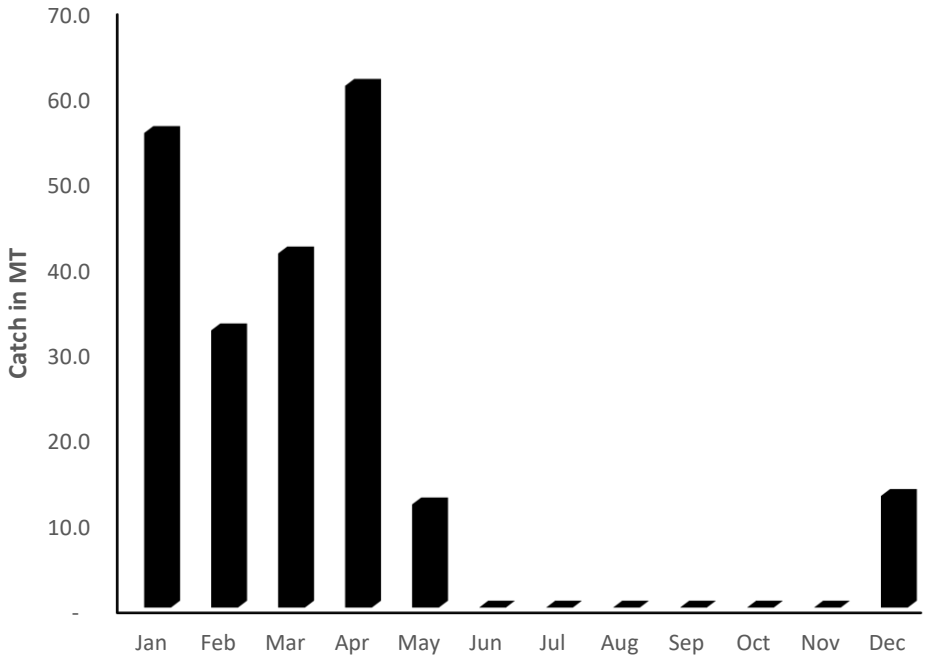

Figure 4: Monthly catches from the longliners in 2024

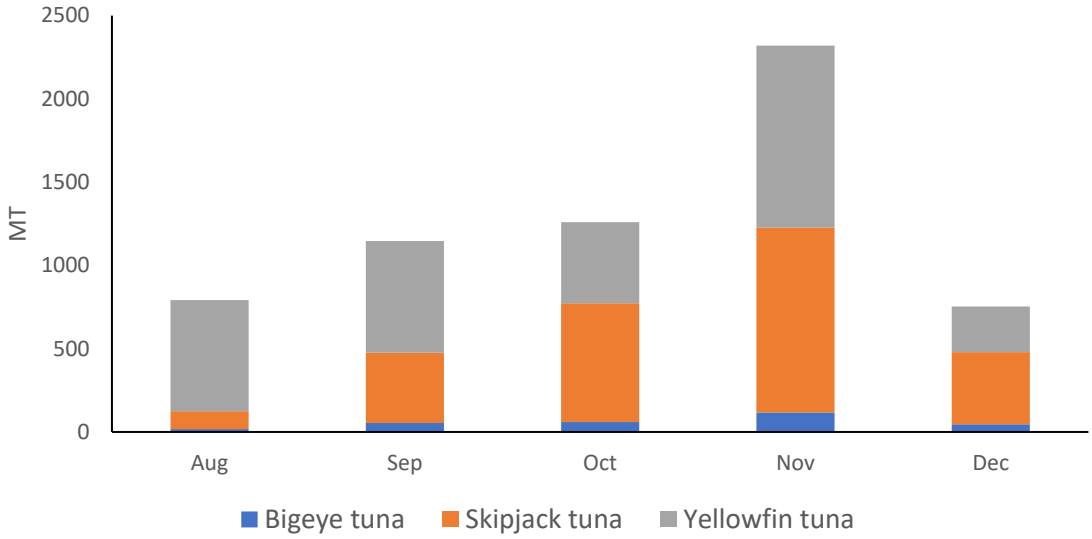

Figure 5: Monthly catch composition of the purse seiners

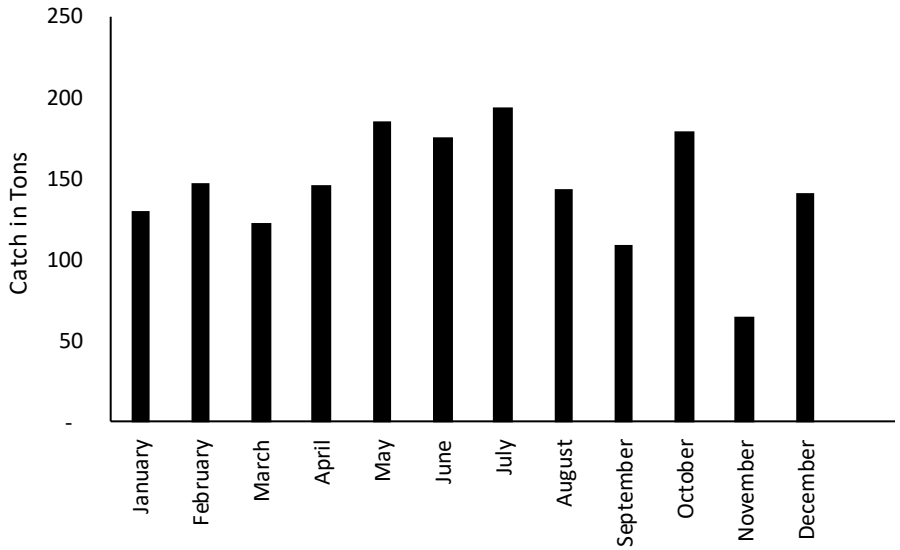

Figure 6: Monthly catches between 2019 and 2023

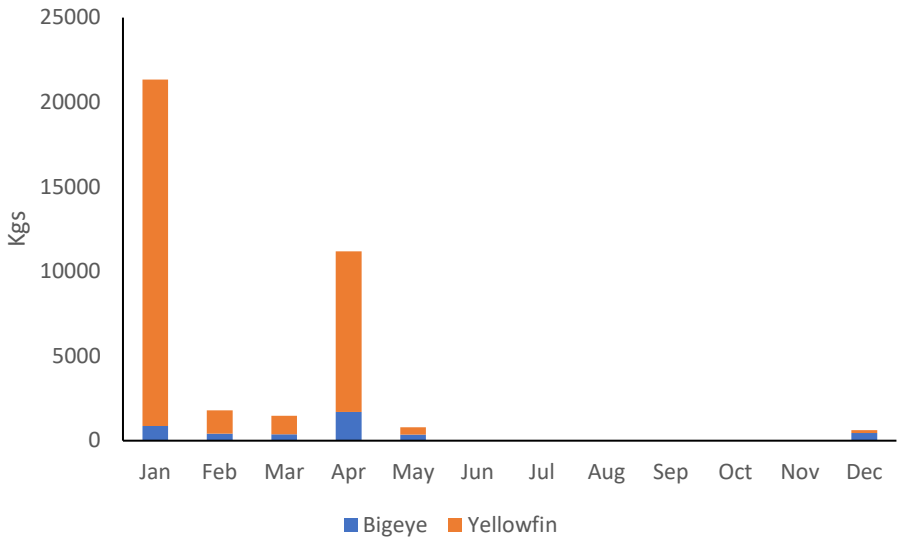

Figure 7: Monthly catches in by species 2024

Length frequency of the catches

During the fishing expedition, an observer was placed on board for species identification and collection of biological data. The length measurement taken for yellowfin tuna, skipjack tuna and bigeye tuna were fork lengths. From the longline catches, the number of fish sampled fish for yellowfin tuna and bigeye tuna in terms of numbers were 208 and 161 respectively while for the purse seiners, yellowfin tuna and skipjack tuna species sampled were 177 and 385 respectively. The average length of bigeye tuna caught in longliners was 128.5 ±1.69 cm (se). with individual size ranging from 50 and 179 cm. The yellowfin from longline fishery measured 136.7 ±1.24 cm (se) with the individual lengths ranging between 90 and 185 cm. For the purse seine catches yellowfin on average measured 93.9 ±2.07 cm (se) with the individual lengths ranging between 40 and 168 cm while skipjack tuna measured 51.4 ±0.54 cm (se) with the individual lengths ranging between 33 and 78 cm.

The length distribution for the bigeye tuna showed a unimodal distribution with a peak at 106 to 120 cm (Figure 10). As similar pattern was also observed in the yellowfin tuna with the peak at 123 to 134 cm (Figure 11). For the purse seine catches, the yellowfin peak size range was between 74 and 91 cm (Figure 12) size

class while from the sampled skipjack tuna, the peak was at 43 to 48 cm class range (Figure 13).

Figure 8: Length frequency distribution of *Thunnus obesus* caught by longliners

Figure 9: Figure 8: Length frequency distribution of longline *Thunnus albacares*

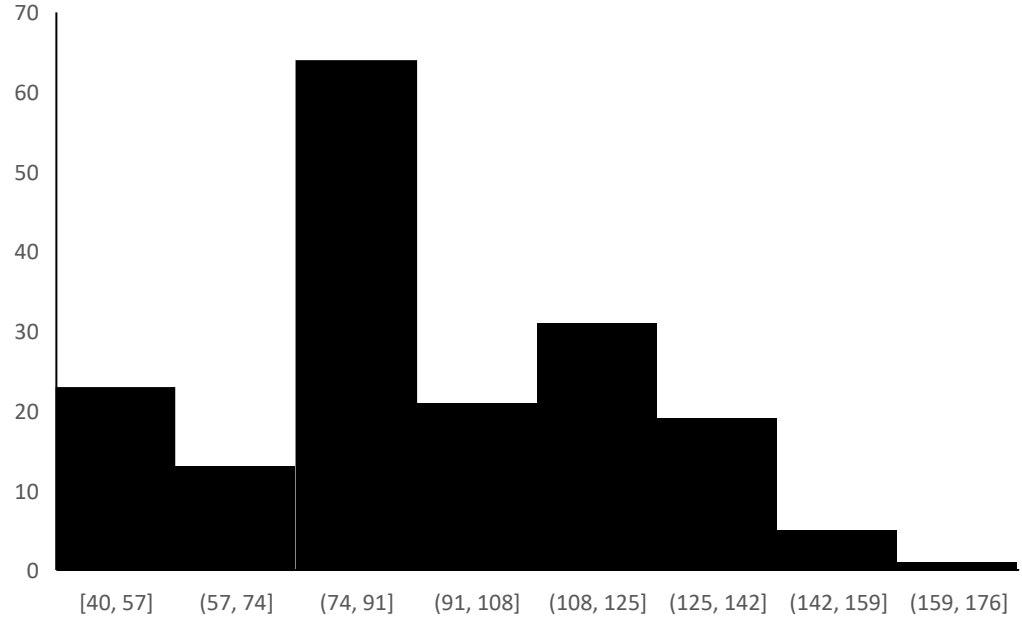

Figure 10: Figure 8: Length frequency distribution of purse seine *Thunnus albacares*

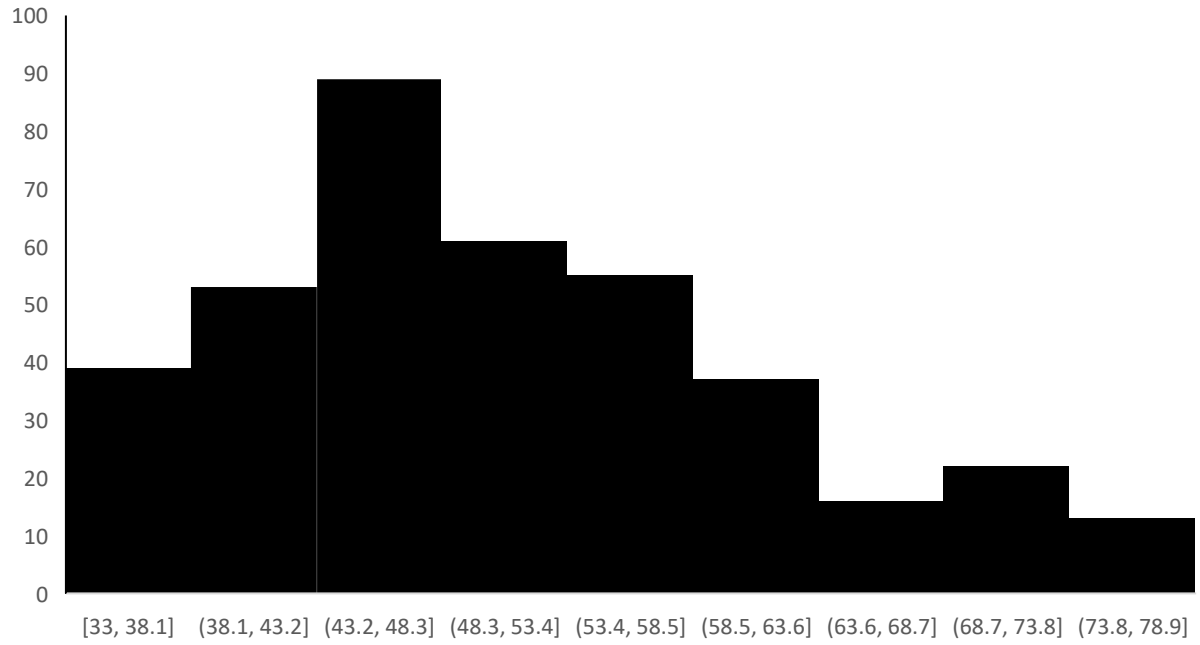

Figure 11: Length frequency distribution of purse seine ***Katsowanus pelamis***

Spatial distribution of the longline catches

The longline catches were mainly in the Kenya EEZ and the high seas with the swordfish catches dominating the catches in most of the areas fished (Figure 14). However, in terms of the tuna, the yellowfin catches dominated in the Kenyan EEZ while the bigeye catches dominated in the high seas (Figure 15). In terms productivity per area, the EEZ catches were higher than the high seas catches (Figure 16).

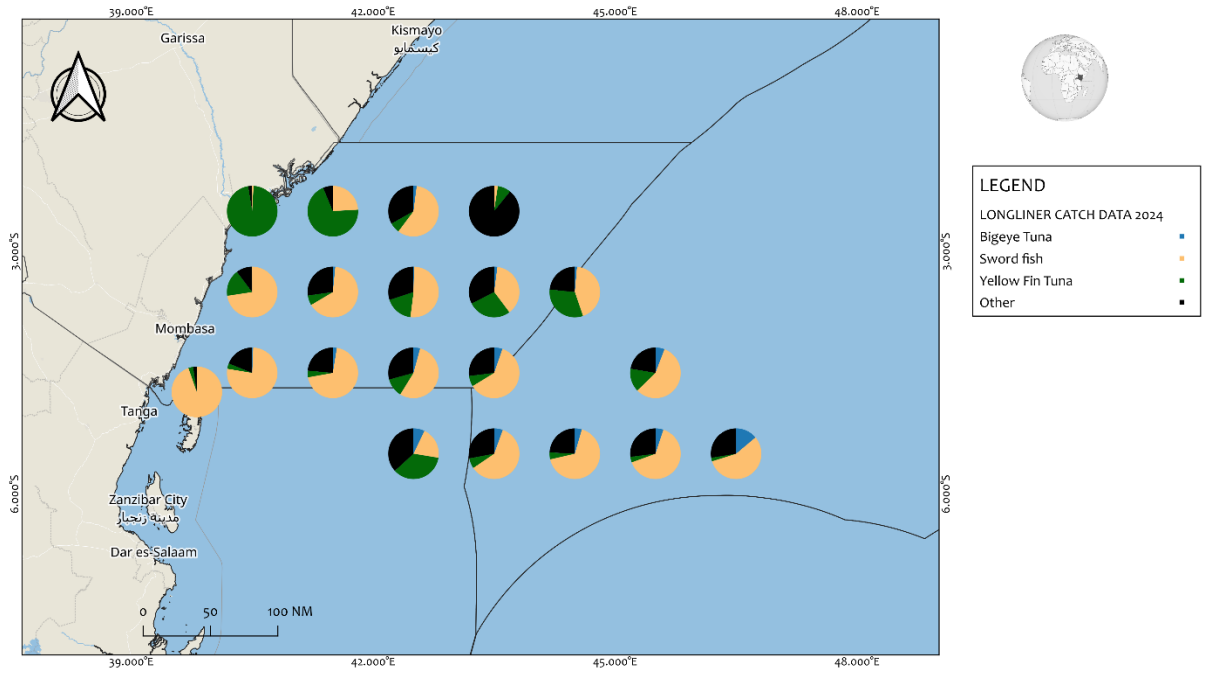

Figure 12: Spatial distribution of longline catches by species

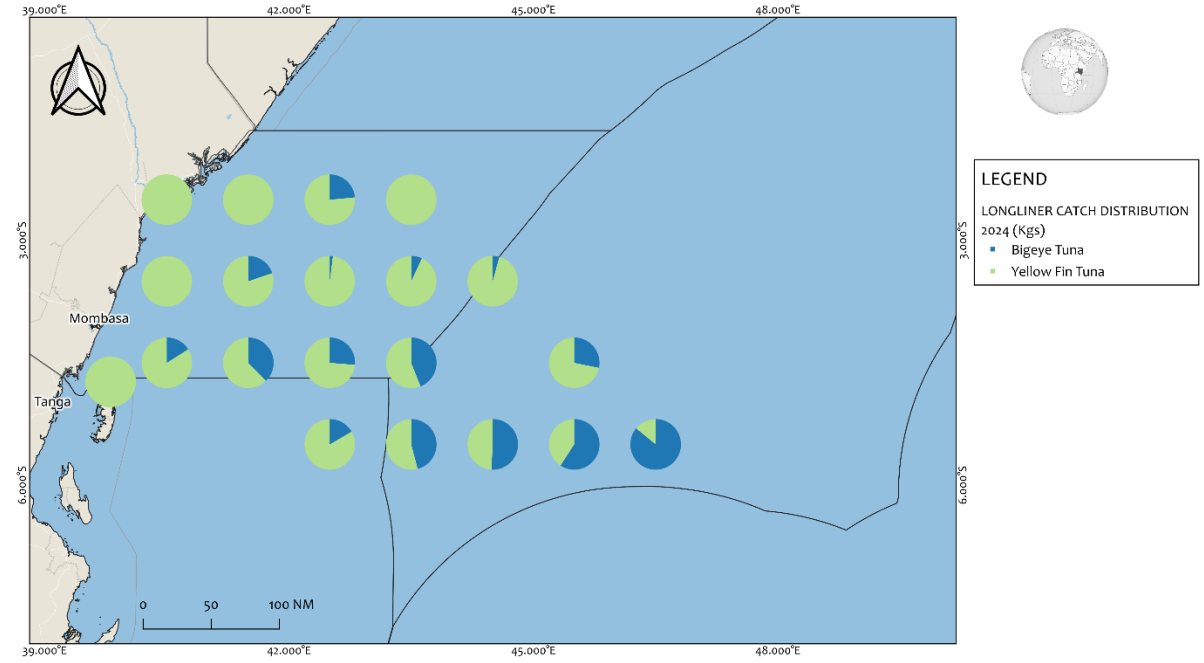

Figure 13: Spatial distribution of longline tuna catches

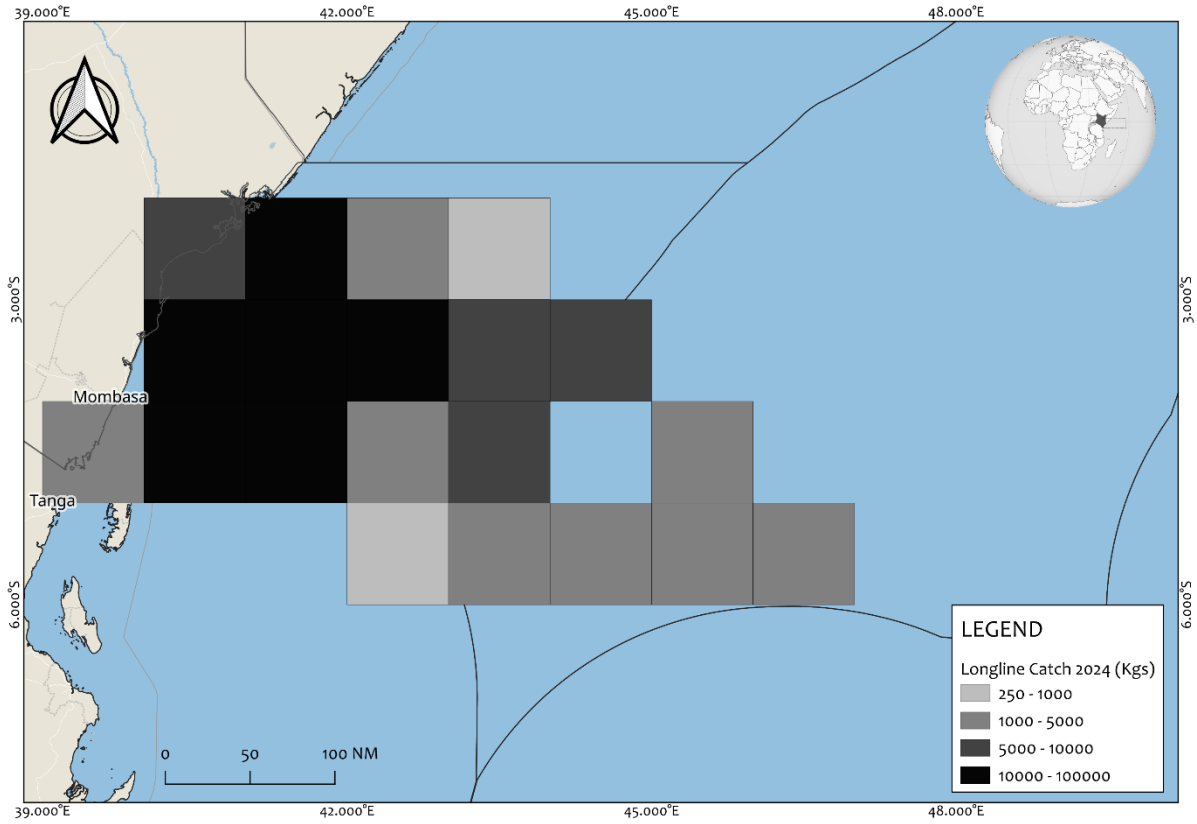

Figure 14: Spatial distribution of the longline catches by grid areas

Spatial distribution catches by purse seiners

The purse seine catches were spread between the high seas EEZs of several countries with the yellowfin tuna dominating in most of the grids except few which skipjack tuna dominated. (Figure 18). In terms of catch concentrations, the catches from high seas were more than those from the EEZ areas (Figure 18).

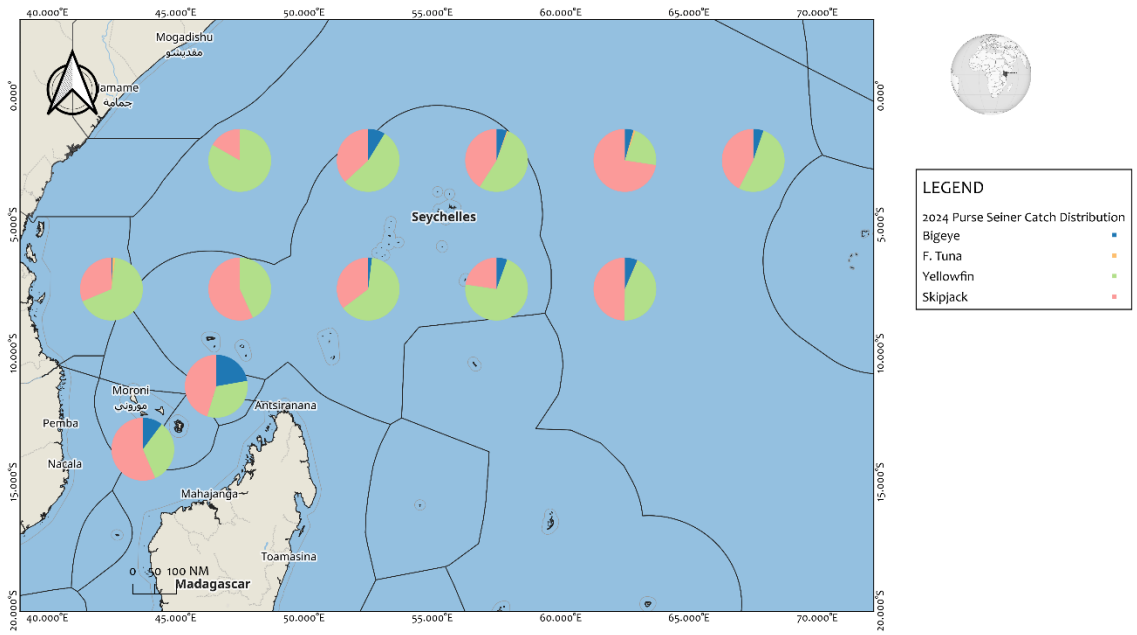

Figure 15: Spatial distribution of the tuna catches by purse seiners in 2024

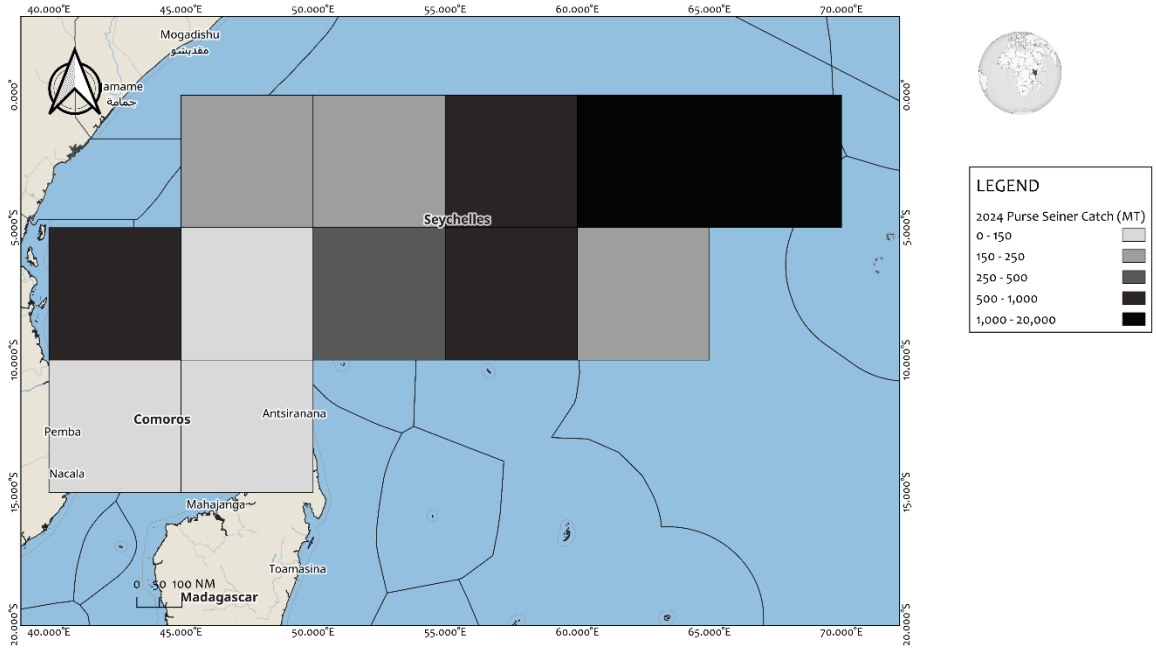

Figure 16: Spatial distribution of the purse seine catches by area

Conclusion

The longline catches were dominated by swordfish, yellowfin tuna, blue sharks and bigeye tuna which combined composed of 90% of the total catches while for the purse seiners, yellowfin tuna and skipjack tuna dominated the catches. The spatial distribution of the tuna catches was distributed between the high seas and the EEZ, with the longline catches showing higher concentrations in the EEZ while the purse seine catches were higher in the high seas. The length structure of tunas from both fisheries showed a unimodal peak with most individuals from the purse seine fishery being smaller those from the longline fishery.