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CONTENTS

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The Editor wishes to invite comments and suggestions from readers with a view to improving the bulletin in the choice and arrangement of the articles, notes, summary, news briefs etc. It is our aim to see that this publication receives wide acceptance from the reading public and those interested in aquatic both within the country and abroad. It is hoped that this issue will stimulate further contributions from the readers.

We appeal to all concerned to send us regularly such Publications, at the following address:-

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THE EVALUATION OF MARINE FISHERIES RESOURCES OF KENYA

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The Marine Fisheries of Kenya are supported by pelagic and demersal fishes which are exploited by varied crafts and gear. The fishing industry is passing through a phase of changing over from traditional to the modern methods of exploitation, from the use of indegenous sailing crafts and rather less affective gear to fishing with the help of mechanised crafts and the larger powered vessels operating with more efficient types of fish gear and other auxiliary equipment such as radar, fish finders etc. Exploration and harvesting of the Kenya fisheries resources of the ocean and a more intensive applied fisheries research is of considerable importance of the country. The objective of this paper is to present a brief account of the recent findings on the seasonal distribution of the major exploited marine fishery resources, potential fisheries resources available for exploitation and on the influence of the monsoons on the availability of fisheries resources.

The ecological relationship between fishes and their environment is of great practical application in fisheries. For any large scale development of our fishery resources a better understanding of the environmental factors influencing the resources is essential. The marine biological and oceanographical investigations in recent years have provided very interesting information on biological and non-biological factors influencing fisheries include winds, monsoons, currents, nature of bottom, light, temperature, salinity, PH, nutrients, salts etc. Influence of the Southwest monsoon on the surface water is manifested by lowering the thermocline, along the East African Coast. It has been found that the monsoon intensities have direct influence on the fisheries. In view of this it is desirable to discuss the fluctuation in fisheries.

Marine fish production:

Surveys on Marine fisheries resources of Kenya dates back from 1951 when East African Marine Fisheries Research Organization was formed, during which time the emphasis was on pelagic fishes. During the surveys on pelagic fishes between 1951 and 1954 catches of 0.54 kg/line/hr were obtained for 22% of the total catch were mainly *Scomberomorus commerson* (Williams 1956). In the same survey it was observed that tunas especially the yellow-fin tuna *Thunnus albecares* was present throughout the year, but with marked increase during the Southeast monsoon and very close to the shore upto 4 km off-shore. Other tunas which were found in the area were *Thunnus alalunga,* frigate mackerel *Auxis hazard,* the bonito *Gymnosarda Unicolor,* small tuna *Euthynnus affinis,* and skipjack *Katsuwonus pelamis* Although these species were found within the Kenya water, they are unexploited. The stripped marlin *Tetrapterus audax* has been found to form heavy concentration near the

northern tip of Pemba Island and around Malindi. Catch rates have been 0.87/100 hooks/hr and at the peak of the season during the N.E. monsoon catch rates have reached 9.2/100 hooks/hr with average weight of 45 kg. per fish. Majority of the catches have been made below the thermocline (22 -23 C). These heavy concentrations during the N.E. monsoon are associated with postspawning feeding migration. The black marlin *Makaira indica* and the blue marlin *Makaira nigricans*, are mostly caught by sport fishermen during the S.E. monsoon close to the shore.

Kenya has a coastline of about 640 km. The annual marine fish production landed along the coast in Kenya for 1978 - 1981 has been estimated as 4634 (1978), 4070 (1979), 5336 (1980) and 5967 tons in 1981. The overall picture of the present status of the eploited marine fish products give an idea on the fluctuations in fisheries.

In Table 1, some facts on our exploited marine fishery resources are given in order to highlight the trends in marine fish production.

Table 1: FISHERIES DEPARTMENT MARINE FISH CATCH (1978-81) (TONES):

	1978	1979	1980	1981
Demersal	2220	2110	2587	2831
Pelagic	1049	997	1150	1103
Elasmobranchs			21	25
Crustacean	366	256	400	384
Molluscs	17	26	21	25

Fishing is mainly confined to the coastal waters up to 50 metres depth. At Ungwana Bay, fishing has been extended to grounds up to 200 metres for deep water lobster, prawns and demersal fishes.

The larger pelagic fishes comprise of the tuna and tuna-like species and the larger carangids which are caught in large number between 15 - 200 metres depth mostly in June and July. Some of them especially the round scad (*Decapterus spp*) and horse mackerel (*Trachurus spp*) have vertical migration concentrating at the bottom during the day, and rise to the surface as schools depths between 20 and 40 metres below the surface at dusk. Although there are some good catches of sardines and anchovies, amall schooling pelagic fishes are never predominant over areas as in the case of carangids. The local fishermen catch these fishes using deep nets at night and cast net early in the morning. Demersal fishes of importance comprise rabitt fish (Siganidae), the scavengers *Lethrinidae*, rock cod (*Serranidae*) snappers (*Lutjanidae*) The spiny

lobster are common off Ungwana Bay in 200 - 250 metres in June, July and November.

Decapterus macarellus, have been observed to yield 500 kg/hr in June, 532 kg and 1344 kg/hr of D. *Kiliche* in July. The larger carangids *Gnathodon speciosus*, *Carangoides melabaricus* and *Selar crumenopthalmus* yeld between 150 - 230 kg/hr in July. Spawning grounds of these species have not been located and it is possible that spawning takes place in deeper waters, further offshore. Gonad ripening in the ground scads *(Decapterus spp* is observed in January, July and November, spent gonads are observed in March. It is possible that there are two spawning seasons among the carrangids - April to June and September to October but the peak of spawning seems to be in May - June along the coastline.

2. Demersal fishes

The red snappers (Lutjanidae) are very prominent in Kenya and yield catches of up to 220 kg/hr in December, January and March, particularly on the part of the shelf adjacent to the southern part of North Kenya Banks and Ungwana Bay have been recorded during the cruises of R.V. "Professor Mesyastev". Other times of the year the snappers are scarce on the shelf. The emperors (Lethrinidae) are never particularly abundant and catches are around 40 kg/hr on the shelf only in January, March and November. The emperors (Lethrinidae) are never particularly abundant and catches are around 40 kg/hr on the shelf only in January, March and November. The barracudas (Sphyranidae) are very abundant in Kenya waters, the dominant species being *Sphyraena* japonicus. In January yields of 1,080 kg/hr to 2,170 kg/hr have been obtained but in July this drops to 114 kg/hr. *S. Jallo* has given yield of 13 - 26 kg/hr in January, June and November.

The (Pomadasyidae) grunts are prominant in Kenya at all times with good catches in November. The silver bellies (Leiognathidae) are very abundant and form dense local schools. Catches of the commonest species *Leiognathus equulus* are 30 - 270 kg/hr in January. The goat fishes, Mullidae especially *Upeneus* sulphureus yield as much as 1,200 kg/hr in July and 562 kg/hr in November. Other species are more sparsely distributed like with yield of 141 kg/hr in January, during cruises of R.V. "Professor Mesyasterv" in December 1975 - June 1976 and July 1977 - December 1977. The spotted sicklefish *(Drepane punctata)* found around Malindi gave yields of up to 500 kg/hr during the 1979 to 1981 offshore trawling survey of R.V. "Ujuzi".

Artisanal Fishery

The situation of the artisan fishery may be considered as critical to such an extent that the importance of reliable forecast is very important. A preliminary survey carried out at Kilifi area aimed at providing an account of the trends of the traditional fishery was started in 1981 by the Kenya Marine Fisheries Research

Institute. Data collected over a period of 12 months in 1982 were analysed. The annual landing of major groups of fish in 1982 was 51.1 tonnes which showed a monthly variation from 0.76 tonnes in July to 11.6 tonnes in May. The fishermen were estimated to spend 6 to 9 hours a day from fishing to landing the fish. Minimum time spent in the sea was in June and July, which could be attributed to bad wather during the S.E monsoon; during this time the few boats ventured into the sea.

The chief crafts employed for fishing were canoes 4 - 5 metres long with a crew of 2 people and gear employed were shark gill nets,traps and hanlings. From Table 1 it can be noticed that a large variety of fishes support the fishery and fish landings could reflect the gear commonly used. In fact some of the gear are designed to catch a particular group of fishes such as rabbit fish (Siganidae) which enter traps baited with seaweeds and placed in intertidal langoons. The average annual landing for this group at Kilifi was 25.2 tonnes, forming 49.3% of the total fish landed. These fish were landed through the year with best catches in April, May and June. Good landings of rays were in January and February when the sea is calm and fishermen can venture further from shore, scavengers (Lethrinidae) were abundant in December to February and the kingfish from January reaching peak in March. The little tuna, *Euthynnus affinis*, bonito. *Sarda sarda* , sailfish Instiophorus gladius, and the stripped marlin *Tetrapterus audax* were caught in January to March and November to December only, which is due to seasonal migration. Sardines were landed in February when heavy shoals are observed in creeks. There was generally low catches during the S.E. monsoon months (Fig. 1-3) probably due to the prevailing weather conditions. Seasonal migration of fish in and out of the fishing areas and the state of weather conditions at sea restricting most of the fishermen going out at certain periods, is a factor that accounts for the low catches since almost all the kinds of gear and boat the fishermen use are affected by waves and currents at sea.

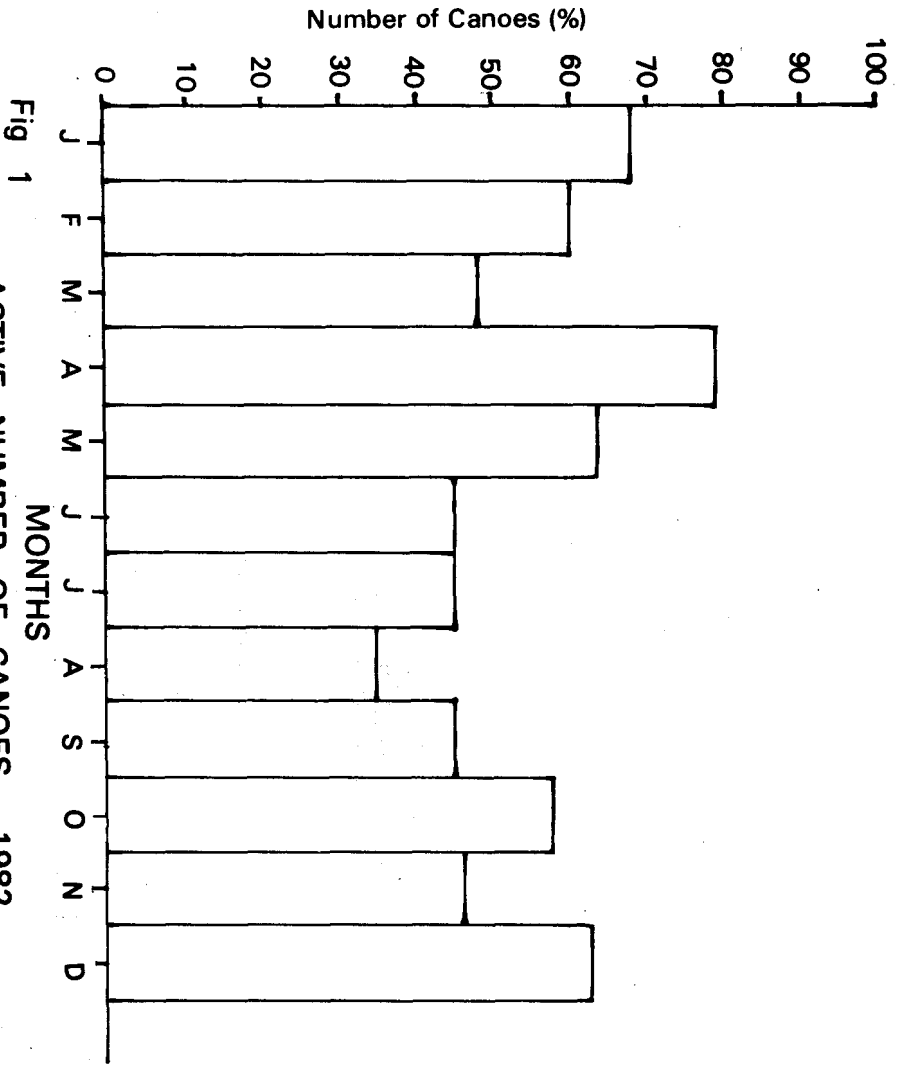
Number of Canoes (%)
0
10
20
30
40
50
60
70
80
90
100
J
F
M
A
M
J
J
A
S
O
N
D
MONTHS
ACTIVE NUMBER OF CANOES 1982

Fig 1

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