

Status of Tuna Fishery in Sudan

Authors

Yassine Mubark Ali Gamedinn

yassinemubarak@gmail.com

**Senior Aquaculturist, Head of Hatcheries section, Aquaculture Department, Fisheries
directorates General, Ministry of Animal Resources**

Abstract: tuna fisheries in Sudanese Red Sea Coast under utilization, their catch sorted as by catch in industrial fishery (trawling and purse seine), and in artisanal fishery (traditional fishery), annually estimated in both fishery not more than 400 tons. Seven species record in the Sudanese red sea coast, these were: *Rastrelliger kanagurta* (small eye tuna), *Trachurus indicus* (big eye tuna), *Scomberomorus commerson* (Spanish mackerel), *Scomberomorus guttatus* (indo-pacific Spanish), *Auxis thazard* (Frigate mackerel), *Katsawonus pelamis* (Skipjack Tuna) and *Thunnus albacores* (yellow fin tuna). Tuna catch compose 2.8% to 5% from both fishery annually

Introduction:-

With an area of 1,880,000 Km², a population of 33,419,625, and borders with seven countries, Sudan is one of the largest African countries. It is situated in northern Africa, between Longitude 35 to 37 East and Latitude 16 to 22 North, and embraces different vegetation patterns reflecting various climatic zones where rainfall ranges from 25 to 1,000mm/year.

Sudan sits at the crossroads of Sub-Saharan Africa and the Middle East, with fertile lands, abundant livestock, and manufacturing, however, the country has been beset by conflict for most of its independent history; and in July 2011, under the terms of the 2005 Comprehensive Peace Agreement, the southern states seceded to form the Republic of South Sudan (RSS).

Agriculture and livestock are essential to Sudan's economic diversification (moving it away from oil, which is now mostly located in the RSS) and could contribute to medium-term macroeconomic stability. While these sectors presently contribute approximately 35-40% of gross domestic product (GDP), they could contribute significantly more with greater investment and better governance. This said, Sudan now recognizes the need for greater attention to agriculture and livestock, as reflected in its Interim Poverty Reduction Strategy Paper (I-PRSP) and the Five-year Program for Economic Reforms approved by its parliament in December 2014.

The animal sector in Sudan contributes substantially to food security with provision of red and white meats and more than 60% of milk supply. Its percentage contribution to GDP is approximately 20%, which in turn represents 20% of total export earnings. In comparison, the contribution of fisheries to GDP is currently marginal (estimated to be below 1% of GDP), even though Sudan is endowed with water resources and lands that can support vigorous capture fisheries and aquaculture. At present, fish resources have a limited contribution to food security and their share in exports is still quite limited due to traditional utilization methods, among other problems. The country is in fact still largely dependent on imports of fish and fishery products (USD 5.2 million²⁰¹²).

The Red Sea coastline is 720 Km long, with an EEZ of 91,600 Km², including a shelf area of 22,300Km² 800 of which are deep water, considered suitable for trawling. Population of the Red Sea State (RSS) is estimated at around 800,000 (UNDP, 2005).

Fisheries

The institutions directly involved in fisheries management are the Federal Ministry of Animal Resources and Fisheries, and its Fisheries Administration, the Fisheries Training Institute (Ministry of Animal Resources and Fisheries); at the Red Sea State level are the Ministry of Agriculture, Animal Resources and

Fisheries, Marine Fisheries Administration, the Marine Research Station, and the Faculty of Marine Science. Sudan is also a member of the Committee on Fisheries (COFI), participates in INFOSAMAK, the Centre for Marketing Information and Advisory Services for Fishery Products in the Arab Region, and IOTC.

A set of Laws and By-laws regulate and organize fishing activities, which are practiced by an estimated 7,000 fishers, of which 1,500 are involved in marine fisheries. Approximately 4,000 fishing boats are operated, of which 500 in the Red Sea area. A large majority of these boats are currently equipped with out-board engines.

Red sea species and production:

The Sudanese Red Sea houses quite a great number of commercial finfish species. Available data indicates that at least 450 species are now recognized in the Red Sea.¹¹ Of these 450 species about 93 fish species have been identified from commercial fish catch in Sudan, and of these, approximately 65 are considered of economic importance.

According to the Marine Fisheries Administration (MFA), Ministry of Agriculture, Red Sea State, the current fish production, by artisanal fishermen and very limited trawling fishery, is about 6,000 tons, harvested in the Red Sea coastal area; this even though the artisanal annual fish potential yield for fish in the sheltered coastal zone is estimated to be at least 10,000 MT of various fish varieties.. Despite all these resources, the current production is around 2,000 MT per annum and the fishing is mostly done with simple equipment. Fishers have limited knowledge of large-scale capture methods and poor access to finance and equipments.

Market and distribution

The fish market is a free market and prices are set according to supply and demand. Market information is available and there are no barriers to get into the market or to pull out of it. Trading of fish is conducted in a traditional manner by using primitive types of weighing and measuring ('Koam', Sack, and basket). The kilogram, as a measurement unit, is only used in larger towns. Prices depend on bargaining between sellers and buyers whose bargaining power is determined by the need for liquidity and the possibility of damage incurred due to lack of transportation or adequate storage facilities. In adverse conditions, the seller finds himself/herself obliged to accept an unfavourable deal i.e. to sell at lower-than-market price. In larger towns, selling involves standard weight measurements, and selling prices are high and generally favour the seller - who is in most cases a middleman - not the real producer.

The distribution channels pass in general through a chain of middlemen (between the producer and consumer), which sometimes negatively affect the producers' net return and consumer prices. In markets that are closer to production areas, fishermen try to sell their products independently in order to obtain a better return rate. In reality, this may not always be the case as sometimes producers sell in a limited market or lack adequate storage and transport means. Good potential returns are often to be found in distant markets where demand is high and fish is iced and safely transported by trucks to those markets. In the Red Sea State, where fish is landed in 3 Improved Landing Sites (Swakin, Osife and Mohamed Gol) as well as in several artisanal landing sites; fishing trips are pre-financed by traders who also arrange transport to the Sigala market, through where most of the capture of the region goes through. Exports are very small (mainly Nagil) and were valued at USD 0.2 million in 2012.

Material and method:

The material and methods used in this study were collected from the Red Sea Fisheries Administration and Federal Ministry of Animal Resources and Fisheries data (these include catch in tons and effort number of boats operated), and we used this data to estimate the mean of sustainability production for the tuna fishery from traditional and industrial fishery.

Status:

Many kinds of species of mackerel fishes records in Sudanese coast, the Common known about seven species (Red Sea Fisheries Research Station, 2017), these are:

- 1- *Rastrelliger kanagurta* (small eye tuna).
- 2- *Trachurus indicus* (big eye tuna).
- 3- *Scomberomous commerson* (Spanish mackerel).
- 4- *Scomberomorus guttatus* (indo-pacific Spanish).
- 5- *Auxis thazard* (Frigate mackerel).
- 6- *Katsawonus pelamis* (Skipjack Tuna).
- 7- *Thunnus albacores* (yellow fin tuna).

All these species are commonly caught by trawling and purse seine methods, in addition to a huge number from the traditional fishery. Their percentage catch range between 2 % to 5%, summarize in the below table 1 and 2. According to the catch of tuna during the period (2002 to 2016), most of this catch seem to be obtaining during the winter period (October to February), no target method applied in Sudan for tuna fishery, all the fishing practice made by foreign vessels from Egypt in especial contract between Sudan government and Egypt government. Discard fishes constituted most of the catch (63%) from trawling in the Southern Area, but is disposed Elawad (2002). Usually tuna fishery

considers one type of the discard in trawling fishery. From table 1 and 2, it is appear that the optimum catch and effort for the tuna fishery close to 17 vessels per year and catch seem to be 130.3 tons per year from industrial practice and catch per unit effort for one industrial vessel range between 16 tons to 5tons. While for traditional fishery the optimum catch for tuna fishery near the annually catch (127.8 tons) and the number of boat and effort were 913 boats, from these evidence it is appear that the opportunity to increase the tuna catch from both fishery. Also we see that when the effort increase directly the catch increase. Also chance opening to catch more if direct methods use for obtaining the tuna fishery.

Table 1. Catch and effort for industrial fishery and tuna (big eye and small eye Tuna) from Sudanese Red Sea coast 2017.

Year	No. of vessels	Industrial catch (tons) (Trawl +purse seine)	Tuna catch (tons)	Catch/vessel (for total industrial catch)	Catch/ no. vessels (tuna catch ton/vessel)
2002	10	3594	160	359.4	16
2003	13	2237	100	172.07	7.6
2004	31	3758	170	121.22	5.4
2005	11	3666	155	333.27	14.09
2006	0,0	0.0	0.0	0.0	0.0
2007	0,0	0.0	0.0	0.0	0.0
2008	13	570	50	43.8	3.8
2009	12	800	60	66.6	5
2010	0,0	0.0	0.0	0.0	0.0
2011	0,0	0.0	0.0	0.0	0.0
2012	0,0	0.0	0.0	0.0	0.0
2013	0.0	0.0	0.0	0.0	0.0
2014	0.0	0.0	0.0	0.0	0.0
2015	17	3442	172	197.9	9.9
2016	29	3500	175	204.52	10.2
Mean	17	2695.9	130.3	187.35	9
%			4.8		

Table 2. Show the catch and catch per unit effort for traditional and mackerel catch (*Scomberomous commerson* and *Gymnosarda unicolor*) in Sudanese Red Sea coast 2017.

Year	Number of boats(effort)	Coral reef fishes (ton)	Mackerel fishes (ton)	Catch/effort (coral reefs)	Catch/effort (mackerel)
2002	1000	4510	135.5	0.14	4.51
2003	600	4620	138.6	7.7	0.231
2004	700	4660	139.8	6.7	0.199
2005	650	5660	169.8	8.7	0.26
2006	750	6340	190.2	8.5	0.253
2007	800	3979	119.4	4.9	0.149
2008	900	3904	117.2	4.3	0.13
2009	775	3936	118	5.08	0.152
2010	950	3888	116.6	4.09	0.123
2011	1000	3800	75	3.8	0.075
2012	1100	3600	80.5	3.27	0.07
2013	1050	3450	108.5	5	0.15
2014	1120	3798	115.9	5	0.15
2015	1140	4674	143.2	5.6	0.168
2016	1170	6500	149.5	8.9	0.267
optimum	913	4487	127.8	5.45	0.459
%			2.9		

Problems facing the tuna fishery in Sudan:

Tuna fishery in Sudanese red sea coast not practicing in economic scope, these may be referring to:

- 1- Poor fishing gear and fishing equipments.
- 2- Less experience of the Sudanese fishermen on industrial fishery.
- 3- Limited opportunity of tuna marketing locally and internationally.
- 4- Less knowledge of the local fishermen in fishing tuna.
- 5- The tuna fishing ground too far away from the fishermen villages.

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