



LIBYA FISHING INDUSTRY

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Abstract: The objective of this study was to determine the situation of fisheries in Libya. The fishing sector in Libya consists of the following activities; artisanal fishing (Batah, Flouka, Mator), Lampara fishing, industrial trawling, and tuna fishing, most of them concentrated in western region 55% followed by 23%, 22% in the Gulf of Sirt and Jabal-Aghdar respectively. The number of artisanal craft raised up from 220 in 1950 to 2,465 in 2008 including 165 Lampara, while industrial vessels consist from private owned trawlers, they increased from 10 in 1950 to 140 trawlers in 2008. The most commonly used gear, which represents for about 79% of total fishing equipment used, are trammel net, three longlines with small, medium and large hooks (khashin, deshi and rgig) and 40mm mesh size gillnet (mashruah). Most of the Libyan catch is freshly sold on major urban markets, with the exception of a portion of the small pelagic fish that are transported to the canneries. Fishing is not very popular among Libyans, where per capita consumption of fresh fish products is estimated at 9.5 kg/year. During the period after the establishment of the Secretariat of Marine Wealth (SMW) in 1988 for marine industry development, have led to evolution of the fishing activities, as an indicator grew from nearly 6000 tonnes in 1988 to 50000 tonnes in 2000. After the civil war in 2011, fish production was directly affected by the weak security situation and high equipment prices, as well as, the migration of foreign workers, which represent 60% of the employees in the fishing sector. As a result, the total production dropped to the lowest level in 2015 to about 23,012 tonnes.

Keywords: Fishing vessels, trammel net, commercial species, coastal area, exotic fish, fishing landing sites

GİRİŞ

The Libyan economy depends mainly on oil exports, which account for between 75% and 90% of income (Saleh, 2014). Marine fisheries and fishery-related activities are important strip of the economy (Milanese *et al.* 2008), but still one of the smallest national catches in the Mediterranean. In 1980, the Libyan government has begun to further develop the fishery sector by building several ice facilities along the coastline and increasing demand for fishing products. In 1986, a new port was established in Zuwarah (north-western Libya coast). Furthermore, Libyan authorities have signed fishing agreements in joint development with neighbouring countries, such as Tunisia and Spain (Metz, 1989; Khalafallah *et al.* 2015). In 1988, the Libyan government established The Secretariat of Marine Wealth (SMW) for marine industry development. This SMW was funded by the government for managing about 24 marine fishery cooperatives called "Jamaia" (Khalafallah *et al.* 2015). During this duration, the initiative of SMW supported by considerable contributions from the Libyan authorities, has led to the development of the sector, concerning trade, receiving, handling and distribution. Facilities have promoted significantly. Especially in the last few years following the privatization of the most marketing chain (FAO, 2005).

These fishery cooperatives set up to serve as fishing centers over the Libyan coastline, and are purposed to provide the necessary requirements of the craft of artisanal fishing. So that, they were open to all fishermen with good boat and a valid fishing license issued by fishery authorities. Moreover, a fishing agreement between Libya and Egypt had been signed in 1995, that agreement allowed Egyptian fishermen to operate in Libyan water in case 20% of their total catch goes to Libya (European Commission study, 2011). In 2000, the Libyan government implemented a decentralization politics and replaced the SMW, which had delegated its function to the local authorities "shaabiyat" (Reynolds *et al.* 1995; Otman & Karlberg, 2007; Khalafallah *et al.* 2015). As an indicator grew from nearly 6,000 tonnes in 1988 to about 50,000 tonnes in 2000. In February 2005, Libya established an Exclusive Fishing Zone (EFZ), which spanned 62 nautical miles from borders of territorial water, more than 220,000 Km² (Milanese *et al.*, 2008; European Commission study, 2011). In May 2009, Libya announced an

Exclusive Economic Zone (EEZ) at 335.120 Km² (European Commission, 2011). That has been very useful for the artisanal fishery.

The aim of this study is benefiting from previous studies to prepare a summary of the state of fishing activity in Libya in terms of the number of fishing vessels, the quantities of fishing and the most important means and tools used, as well as the problems and difficulties facing the fishing sector in Libya.

Location and population census

Libya is the fourth African country in term of area, it lies between latitude of 19° - 32° N and longitude of 9° - 25° E, it extends from the Mediterranean coast in the north to the Sahara Desert in the south. (Mansor, 2016). The total area of Libya is about 1.775.500 Km² with long costal line on southern Mediterranean Sea about 2000 Km on the north side of country and has a second largest continental shelf on Mediterranean Sea (to 200 m) about 50,000 Km² (FAO, 2005),

The east of the country is bordered by Egypt, Algeria and Tunisia in the west, Chad and Nigeria in the south and Sudan in southeast (FAO, 2005; Khalfallah *et. al.* 2015). According to the 2012 census, the population of Libya around 6.155.000 (Khalfallah *et. al.* 2015). the population growth rate 2.4% with birth rate 27.2 births/1,000 population (Anonymus, 2005), about 80% of Libyan people concentrated in the coastline especially in big cities in the country, a 50% of the population is concentrated in two main cities, Tripoli, the capital of the country in the west, and Benghazi in the east. Most of researches divided Libyan coastline into three main regions, the first one in the west of country, Tripoli region, which extend from the border of Tunisia to Wadi-Kham, second region the middle of Libya, Gulf of Sirt region, stretch from Wadi-Kham to Alzzuaytina and the last one the east side of the country, Jabal-Agdar region, extend from Alzzuaytina to the border with Egypt (Lamboeuf *et al.* 2000). (Fig. 1)

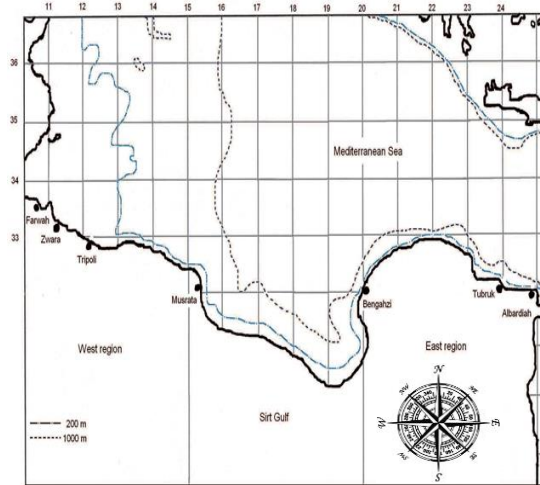


Figure 1. Three main regions of Libyan coast.

Libya fishing vessels

The fishing sector in Libya is based on following main activities; artisanal fishing, (Batah, Flouka, Mator and Lampara fishing), coastal trawling, and tuna fishing. Sponge fishing is modest (Reynolds *at al.*, 1995; FAO, 2005; Khalfallah *et al.*, 2015). Most of catches are carried out by artisanal boats. which use nets (trammel nets and gill nets) or hooks (longlines and handlines). During survey in 2000 a total of 1866 artisanal fleet were counted in 135 landing site (beach, anchorage and harbour), most of them concentrated in western side of country (Tripoli region). Table (1) shows distribution and percentage of fishing vessels on three regions of the coastline, about (55%) of artisanal fishing boats are located in Tripoli section, whereas the other two areas shared by 23% in the Gulf of Sirt and 22% in Jabal-Aghdar (Lamboeuf *et al.*, 2000) as in (fig.2).

Table 1. Show distribution and percentage of fishing vessels on three regions of the coastline

Boat type	Region			Total
	Tripoli	Gulf of Sirt	Jabal Aghdar	
Batah	65	-	3	68 (4%)
Flouka	662	211	262	1133 (61%)
Mator	187	192	149	530 (28%)
Lampara	115	19	1	135 (7%)
Total	1029 (55%)	422 (23%)	415 (22%)	1866

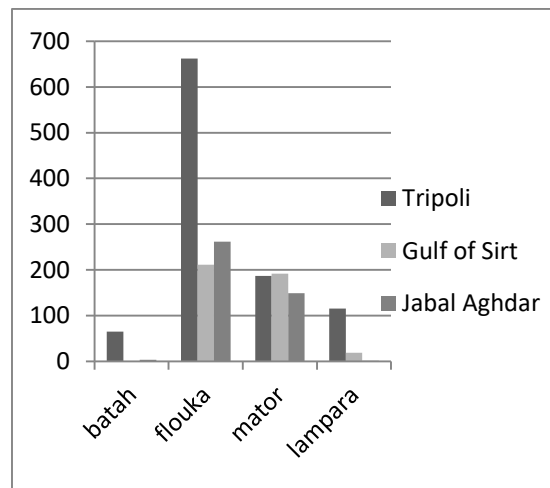


Figure 2. Illustrate artisanal fishing boats by type and regions

In term of length, artisanal craft are composed of 1300 craft of ≤ 10 m LOA (length overall), whereas 566 are >10 m LOA. Approximately two-thirds of the smaller fleet are motorized, usually with outside engines in the range of 10-35 HP, while the large units provided by internal engines.

Batah with flat-bottomed boat represent less than 4% of artisanal vessels, it uses gillnets pots for (octopus) in shallow water. Batah are built on the some designs and almost uniformly 6m in length, most of them are concentrated in Tripoli region (farwah site), a few number of them located in eastern region (Attimimi and Ainghazala sites) (Lamboeuf *et al.*, 2000; (Shakman & Kinzelbach, 2007).

Flouka, a small fishing boats of various size ranging from 4-7m, shape are varied, but mostly with flat transom no deck and provided by outboard motor, its represent about 61% of total artisanal fishing boats with more than half on Tripoli region. Batah and flouka usually supplied by outboard engine ranging from 10-25 HP. Flouka with large motors, up to 55 HP have been recorded (Lamboeuf *et al.*, 2000).

Mator represent about 28% of total craft and distributed almost evenly across the three regions. There are two sizes; small and large units, small units 7-12m in length with deck and roof, while large units 12-18m have wheel house, fish hold and net hauler, shape and design similar to those in Tunisia and Egypt.

Lampara, generally 11-18m with deck, inboard engine, a small roof and seine, Summer is mostly active time. Each Lampara unit followed by one to three small non-motorized lamb boats, known as (Dhgaissa) supported by kerosene or butane lights Which help to attract small pelagic fish at night (Reynolds & Lamboeuf, 1994; Reynolds *et al.*, 1995), during the out of the season some units may switch to net and/or line fishing. Lampara are mostly found in the western part of the country. (Lamboeuf *et al.*, 2000; FAO, 2005). The number, definitions and characteristics of each fishing vessels are summarized in Table (2).

Table 2. Illustrated number of fishing vessels by type, definitions and characteristics (FAO, 2005)

Type of the boat	Total Number	Definition	Characteristics
ARTISANAL FISHING			
Batah	68	Around 6 m length , flat bottom	1-3 people , out board eng. Jars, and it work with gillnets in shallow bays or lagoon.
Flouka	1135	4-7 m length	1-3 people , out board eng. Flat transom, Work close the coastline , multipurpose
Mator <12 m	234	7-12 m with dock and roof	3-5 workers, on board eng. 35-120 HP multipurpose (nets and hocks)
Mator >12 m	294	12-18 m with dock , roof , wheel house and fish hold	4-7 workers , on board eng. 80-200 HP, multipurpose.
Lampara	135	11-18 m, with dock, roof and purse seine winch, followed by two small boats carrying lighting tools fuelled by kerosene and gas using light attraction at night for catching small pelagic fish .	12-17 workers, on board eng. 80-200HP , target small pelagic during season, they work with long strings and gillnets out of the season
INDUSTRIAL FISHING			
Trawler <24 m	74		9-11 workers, eng. 165- 300HP , working at water depth <200 m
Trawler >24 m	49		11-17 workers , eng. 300-900 HP working at water depth > 200 m
TUNA FISHING			
Tuna PS with bag nets	6		They work at Exclusive Economic Zone EEZ
Tuna LL with long strings	9		They work at Exclusive Economic Zone EEZ and high seas.

In 2008, recorded an increase in the number of artisanal craft to reach about 2465, including 165 Lampara and other artisanal boats 2,300, this number is a small compared to Tunisia in the same year where it reached 10,300 boats (Halouani *et al.*, 2015). in addition, the industrial vessels became 140 trawls (Sacchi, 2011; Khalfallah *et al.*, 2015).



The industrial fishing vessels (excluding tuna fishing fleet) is consists of 123 units, which are steel and hardwood trawlers, its length between 11 to 33m LOA, and engine power ranges from 165 to 900 horsepower, most of which are owned by the private sector.

Inland fishing

Libyan inland fishing is measly. Free stocking (carp and some tilapia) was carried out in the past in the dam of Wadi Kaam (Khoms / Zliten) and Wadi Mjinine (Tripoli). Recently, carp were stored in the Abou Dzira Lake near Benghazi. The results do not point to great potential for commercial production (FAO, 2005).

Landing sites

Along Libyan coastline there are 135 landing site, 76 site are considerable active and permanent Table (3), these locations range from shores with less than three fishing boats to harbours with a hundreds of boats, and about 59 seasonal. There are 20 major fishing sites with more than 25 boats for each, they host 76% of the whole fleet, 12 of which have more than 50 boats and host 61% of the fleet. Not all of artisanal fishing craft active (Lamboeuf *et al.*, 2000) Table (4) illustrates the distribution and status of active of artisanal fleet.

Table 3. Frequency of ports by classes of number of boats hosted

Number of Boats	0	1-4	5-9	10-24	25-49	50-99	>100	Total
Ports/Fishing sites	59	23	14	19	8	6	6	135

Table 4. Fishing craft by type and activity

Type and Activity	Fishing craft				Total
	Batah	Flouka	Mator	Lampara	
Operational	57	839	283	87	1266 (68%)
Non operational	9	99	39	7	154 (8%)
Under repair	1	174	200	37	412 (22%)
Unknown	1	23	6	4	34 (2%)
Total	68	1135	528	135	1866

Operational boats represent 68%, while non-working boats and repair boats represent 30%. In contrast, the boats of unknown activity represent 2% of the entire artisanal fishing fleet and consist of at most Flouka. A large part of the Mator is under repair .A possible explication for this situation may be that many of these were purchased / built with SMW incentives and have faced difficulties in continuing to work due to lack of qualified stuff, equipment and spare parts. Moreover, investors could be without or with Limited knowledge of fishing. (Lamboeuf *et al.*, 2000).

Gear used (fishing tools) and target fish species

The five most used fishing tools represent 79% of the total fishing gear used; trammel net (halig), three longlines (bringali) with small, medium and large hooks (deshi, ghashin and rgig) and 40 mm mesh size gillnet (mashruah). Batah use mostly trammel nets and pots. Flouka use fishing gear as following; trammel nets 32%, longlines medium hooks 16%, 40 mm gillnet 13% and longlines large hooks 12%, three fishing gear are used simultaneously by Mator almost in same percentage 26%, trammel nets, longlines hooks and medium longlines



hooks. Lampara boats use their own equipment (Lampara), and may sometimes turn to other equipment when the sardine season ends.

Identifying target species may not be easy, because most fisheries are multi-target and depend on different types of gear and fishing techniques. In such multi-species the target species can also be changed daily. In the case of a volatile market situation, the goal may even change during a fishing operation.

Most of the catch comes from the nets of the artisanal boats that target the demersal fish. Lampara targets small ocean fish, while tuna industrial fishery provide less than 4% of total catch. The catch consists mostly from various sardines (24% of total catches), and in particular round sardinella (*Sardinella aurita*, 20% itself), are most popular in Libyan catches, followed by porgies seabreams (Sparidae, 13%) including (*Diplodus annularis*, *Diplodus sargus*, *Diplodus vulgaris*, *Pagrus pagrus*, *Sarpa sarpa*, *Dentex macrophthalmus*, *Oblada melanura*, *Spondyliosoma cantharus* and *Dentex dentex*), jacks and horse mackerels (Carangidae, mostly *Trachurus spp* 12%), goatfishes *Mullus surmuletus* (Mullidae 7%), Spinefoots *Siganus luridus* and *Siganus rivulatus* (Siganidae 6.8%), European anchovy (*Engraulis encrasicolus* 3.5%) and chub mackerel (*Scomber japonicus* 3.3%) were the other major species caught in Libya. (Shakman & Kinzelbach, 2007; Khalfallah *et al.*, 2015). The target species vary by season and gear, using Longlines for fishing duskt grouper *Epinephelus guaza*, common dentex *Dentex dentex*, dogfish Fam. Carcharhinidae, white seabream *Diplodus sargus*, where they were caught in more than 60 locations common pandora *Pagellus erythrinus* found in about 40 locations. Other non-target species such as painted comber *Serranus scriba*, annular seabream *Diplodus annularis* and weever *Trachinus spp.* are found in less than 20 locations.

In 65 locations. *Serranus scriba*, *Diplodus sargus*, *Pagellus erythrinus*, dogfish, salema *Sarpa salpa*, and *Trachinus sp* were recorded in about 50 locations and Fam. Mugilidae with Trammelnet in 24 locations. Due to its non-selective features, it combines several types of fish.

Set Gillnets (Mashruah 40 mm, Beyatah 50mm and Bdan16-28 mm) are optional according to the openings of the used mesh diameter, and are mainly used for fishing of little tuny *Euthynus alleteratus*, salema *Sarpa salpa*, barracuda *Sphyraena sp*, yellowmouth barracuda *Sphyraena viridensis*, european barracuda *Sphyraena sphyraena* and greater amberjack *Seriola dumerili* (small meal less than 0.5 kg).

Hand lines is used by Flouka and Mator to catch several species including *Spondyliosoma cantharus*, *Pagrus pagrus*, *Pagellus erythrinus* during all year, while *Dentex gibbosus* and *Epinephelus caninus* from June – October. Squid *Loligo vulgaris* and sepia *Sepia officinalis* from December – March (Anonymous, 2014a).

Fishing by Lampara was recorded at 11 sites. For the hunting of round sardine *Sardinella aurita*, chub mackerel *Scomber japonicus*, bogue *Boops boops*, blue runner *Caranx crysos* and false scad *Caranx rhoncus* at night. most of the sites that use Lampara fishing concentrated in the western region of the country. (Anonymous, 2014a)

Sardinella aurita is one of the most abundant fish in Libyan waters, characterized by cheap prices and large demand in the local market and thus can be one of the commercial fish that can be invested in Libyan waters. But this requires more economic and biological researches. Sardines are typically tightly packed in a small can. therefore, it has the virtues of being an easily portable, non-perishable, and self-contained source of food (Abowei, 2009; Saleh, 2014).

In the Libyan waters thirty-four species of crustaceans were recorded, including four species of economic importance and 10 species of cephalopod, of which six species are economic importance. Two commercially important shrimp species, *Penaes kerathurus* and *Penaes longirostris*, were observed in the western region more abundant than the eastern region. The commercial species of Cephalopod are *Loligo vulgaris*, *Illex spp.* (totano), *Sepia officinalis*, *Sepia orbignyana*, *Octopus macropus*, *Octopus vulgaris*, *Eledone cirrhosa*, *Eledone moschata*, genera of Octopus and Sepia are recorded throughout the Libyan coast.



The commercial species of cephalopod (mostly from genera *Sepia* and *Octopus*), crustaceans (shrimp) and five species of sponge are more abundant in the region from Misrata to the Libyan-Tunisian border (Rawag et al., 2004).

The 1950s and 1960s witnessed significant activity in sponge fishing, especially along the eastern region of the coastline (Khalfallah *et al.*, 2015), in a study had been done by (Milanese et al., 2008), the Libyan harvest production set around 20 t/year. on the other hand, most of the data available from traders, scientists and fishermen indicate that stocks are decreasing for several reasons, the most important of which are the pollution, overfishing and the spread of diseases (Gashout et al., 1989; Milanese et al., 2008). especially in the western region of the coast.

Production and demand

Most of Libyan catches are transported to large urban market and sold there except of part of small pelagic fish which goes to canning for local market or fishmeal (FAO, 2005). While Exports of fishery products are still very low, with around 2,000 tonnes of bluefin tuna exported to international markets (mostly to Japan) annually and small quantities of high-quality fish being exported to Tunisia. During high peak production especially in the last few years following the privatization of the marketing chain, total production from Libyan water was reported by FAO in 2000 to be 50,000 mt (tonne) (FAO, 2005), with an estimated value 100 million dollar, this production divided into 21,000 tonnes of small pelagic (sardine, mackerel, horse mackerel and bogue, etc), 2,000 tonnes of Bluefin tuna, about 24 tonne of mixed demersal species (mainly red mullet, breams, groupers, amberjack, common dentex, triggerfish, common panndora, octopus, cuttlefish, squid, shark) and 3,000 tonnes of other fishes. Seven fish processing canning plants belonging to government companies have been established three decades ago that can handle tuna and small pelagic fish with daily raw material capacity of 85 tons of tuna, 51 tons of small pelagic fish and 130 tons of fishmeal. None of these plants appears to be working in a satisfactory condition due to problems in the supply of raw materials and poor equipment condition in some of them. The total production decreased in 2004 to 46,000 tonnes, the decline continues to reach the lowest level in 2007 of approximately 30,563 tonnes. The development of a five-year plan to improve marine fishing resources in Libya (2006/2010) reflects the increased interest of the Libyan public authorities in this wealth and the desire to pay it and the exploitation of the enormous fish resources. Consequently, production started to growing again to reach about 50,210 tonnes in 2009 (Khalfallah *et al.*, 2015). After Libyan civil war in 2011 a total production shortfall to about 30,014 tonnes, then continued to grow gradually to 36,014 tonnes in 2013. As a result of the deterioration of the security situation in the country that directly affected the fishing sector in 2015, production decreased to 26,012 tonnes (CEIC,2018). although, the total catches increased in a study on Derna coast (300 km east of Benghazi) in 2015 carried out by (Abziew, 2016), which indicating an increase a total production from 39,314 kg in 2007 to 25,950 kg in 2015.

Total fish imports in 2003-2005 averaged 11,748 tonnes, while fish exports amounted to 3,375 tonnes. Total fishing imports in 2006 amounted to approximately 33,288 (US \$ 1,000), while exports amounted to 7,647 (US \$ 1,000) with a net balance of - 25,641 (US \$ 1,000). Furthermore, the per caput supply per year increased from 7.2 kg/year in 2001 to 9.5 kg/year in 2005 (FAO, 2005; FAO, 2008).

The value of the Mediterranean discards is about 230, 000 tonnes or 18.6% (13.3-26.8%) of the catch. Demand in the Mediterranean is controlled by market requirements and not by legal restrictions. (Tsagarakis *et al.*, 2013). Due to the high diversity of species in the Mediterranean, there is a high diversity of discards in the bottom trawl fisheries (Damalas *et al.*, 2015; Machias *et al.*, 2001; Tsagarakis *et al.*, 2013). On-commercial species, damaged fish and small fish are most discards (GFCM, 2011), the half of discards correspond to the undersized commercial species (Machias *et al.*, 2001). In addition, (Khalfallah *et al.*, 2015) mentioned that there are quantities of fishing unreported, where the notified artisanal catching(40.6%), notified industrial catching(2.7%), subsistence catching (performed by people who fish for their families, friends, or for sport) (0.5%), artisanal discards (8.8%), industrial discards (25.5%), non-declared industrial catches (5.3%) and non-declared artisanal catches (16.7%), reconstructed catches were 2.3 times the landings reported by FAO (Khalfallah *et al.*,



2015). The unreported fisheries increased significantly at the beginning of the first decade of the twenty-first century due to uncontrolled fishing activities in Libyan waters.

State of industry

Libya's production of fishery had dropped to about 26,012 tonnes in 2015, mainly due to the deterioration of the security situation in the country which has directly affected the fishing sector. Since the 1940s, the Libyan fishing sector has depended on foreign labour (mostly from Egypt), these foreign workers have left Libya because of the complex procedures required by the authorities, as well as the security chaos experienced by the state since the outbreak of the revolution in 2011.

With the lack of employment in the fishing sector and the activity of smuggling due to weak of control led to a decrease in fish supply in the Libyan markets. as a result, fish prices rose to high levels. Moreover, the fishermen become suffering from the cost of equipment (fishing tools), the instability of the market price due to the continuous rise in dollar against the Libyan dinar and the absence of support companies that were providing equipment at a cheap price compared to today's figures.

Since the 1990's There are legal measures to reduce Illegal, Unreported and Unregulated (IUU) fishing in Libya and these measures, as provided for in applicable legislation and implementing regulations. The inspections are carried out by the Coastguard and usually they provide monitoring of the coasts. In addition, information on IUU fishing is provided by fishermen and commercial vessels to the common central operation center of the seaports. (Öztürk, 2015)

In the absence of the role of the Coastguard and the competent security authorities, we have witnessed in the recent years an increase in the use of explosives to catch enormous quantities of fish without much effort, the areas where these explosives are used are no longer suitable for marine life. In addition, the territorial waters of Libya have become permissible by neighbouring and foreign countries. Normally, local fishermen use primitive tools to detect fish at low depths so as not to drain marine wealth, while foreign vessels have the latest sonar equipment, which identifies fish at deep depths and sweeping them completely.

CONCLUSION

Libya with long coastline and second largest continental shelf in Mediterranean sea about 65.000 Km² is not poor in fishing grounds, but this resources not exploited until now, this may be due to fishing is uncommon among Libyans, fishing section Representing less than 0.0025% of the population of Libya (Metz 1989; Reynolds *et al.*, 1995; IUCN 20011; Khalfallah et al, 2015) and about 1% of total national force (FAO, 2005).The contribution of the fishing sector to GDP is estimated at about 9%. However, the Libyan government continued to support the fishing sector through the establishment of cooperatives in 1988. In addition, over the past three decades, seven fish processing plants have been set up by government companies that can handle tuna and small fish, with daily capacity (raw materials), 85 tonnes of tuna, 51 tonnes of small pelagic fish and 130 tonnes of fishmeal. Although the Libyan government decided to adopt a broad privatization policy aimed at phasing out the State from the entire productive section the 1990s, privatization has continued since 2003 for these canning factories.

Fishing in the east of Libya have been less important and backward than in west of country. overall, Fishing is not popular among Libyans with low estimated per capita consumption of fresh fish products of approximately 9.5 kg/year. In comparison with Spain 40 kg/year, France 35 kg/year, Malta 30 kg/year, Italy 24.1 kg/year and Tunisia 12.3 kg/year (FAO 2008; Anonymous, 2014b), this is probably due to high fish prices. Furthermore, some villages near the sea, where the fish is plentiful are not exploitation because of low demand and the transportation to large cities, where most of the population lives, increase the cost.

The high percentage of fish species revealed by the Sparidae and Serranidae families may be due to the presence of a suitable seabed around the Libyan coasts that the members of these two families prefer. Among the families Sparidae and Serranidae, the genera Diplodus and Epinephelus appeared to be the largest in terms of species numbers among the other genera (Al-Hassan & El-Silini, 1999). The most widely used fishing tools in the



coastal area are the trammel nets, which used by Flouka, Mator and Batah. Other fishing tools are occasionally used depending on the season of fishing, fish size and the target species.

The area between Musrata to Libyan–Tunisian border considered as The best areas for trawling. (Rawag *et al.*, 2004) A recent studies on the assessment of the Libyan stock of fish found that the country can annually catch 100 thousand tons of different species of fish without depleting this wealth or exposed to any kind of dangers. In this sector, which employs 11 thousand people among fishermen and fish traders, of which 35% local workers, 113 fishing areas. 17 vocational training institutions in this field. As well as, several ice factories and several canning plants.

The unreported catches increased strongly by the beginning of the 2000s, due to lack of control of fishing activities in Libyan waters. Discards are also very high. The estimated subsistence catch is negligible. Since 2011, many conflicts have taken place in Libya and there is no longer any control over fishing activities, which we believe to be growing significantly, particularly in the form of illegal foreign fishing (El Arbi Houni, 1989; Khalfallah *et al.*, 2015; Manach *et al.*, 2015).

RECOMMENDATIONS

The Libyan authorities must consider the following points to increase the efficiency of the fishing activity

- 1- The enforcement of the issued laws governing fishing operations in order to preserve the sea wealth
- 2- Re-establishing fishermen's associations which provide fishing tools at reasonable prices for fishermen who have fishing License
- 3- Encouraging youths to work in fishing and dispensing with foreign workers by open fishing training centers and Providing loans to people who are interested in fishing.
- 4- supporting the Coast Guard with the necessary equipment to combat illegal fishing in Libyan Territorial waters, especially from foreign vessels.
- 5- Prohibition of the use of explosives in fishing and taking the Strict penalties for violators.
- 6- Facilitate the transfer of fish from fishing sites to the market, which helps to reduce the price in the market, because most of the fishermen in remote areas complain about the costs of transport
- 7- The authorities must take advantage of the experience of neighbouring countries to increase the efficiency of the fishing fleet to meet the needs of the local market and fish canning factories.

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