



Ghana's Fisheries Policies; Evolution and Performance

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Authors' contributions

The authors made substantive contributions to the conception and design of study, acquisition, analysis and interpretation of data, drafting of the manuscript, critical revision and final approval of the manuscript.

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ABSTRACT

In 2018, Ghana's fisheries contributed 1.1% to Gross Domestic Product and provided livelihood support to 2.4 million people. It is crucial for Ghana to build a compelling policy model and to safeguard its precious marine resources. For such an objective to be achieved researchers, the state and other stakeholders must particularly reflect on fisheries policies and outcome. Considering how weak and unstable institutions are in Ghana, this article seeks to analyse this acts and policies enacted by various governments in Ghana, concerning its transformation and execution. This research as well analysis the influence of these policies on the accessibility of marine resources in Ghana and transformed habit and livelihood of fishermen. We gathered even though certain policy guidelines were successful, the entire policy arrangement continues to be a pressing need of improvement because, the fisheries sector was undergoing a decreasing trend as

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a result illegal and over fishing. We further, discovered that motorization of canoes impacted positively to volume of fish captured and expansion of fishing areas. Nevertheless, the indication of decreasing in volumes of landings observed through the 1980s, alerted the government to consider the importance of exact procedures and regulations in other the safeguard and restore the marine ecosystem and it resources. We proffered a style of policy blueprint founded on stakeholder theory that act on challenges of illegal, unreported and unregulated fishing. Where all stakeholders in the sector must take part in the process of decision making.

Keywords: Ghana; artisanal; industrial; policy; fishing; performance.

1. INTRODUCTION

The fishing sector in Ghana has a long history and a vibrant fishing industry as well. Fante fishermen from the central region of Ghana embarked on fishing in the waters of Ghana as far back as the 1700s [1]. Secondly, Fantes were known to have being fishing in Benin, and Ivory Coast as early as the 1900s [2]. The earliest Ghanaian fishermen are reported to have been found in the waters of Nigeria in 1916 [3] and in Liberia in the late 1920s [4]. Fishermen from Ghana extended to Congo and as far as Senegal in the 1940s [1]. During the 1950s the country was a known power house in West Africa because of its advancement on semi-industry fishing in international fishing zones [5]. Generally, Ghanaians had influenced fishing in many part of West Africa and as far as Angola since the 1900s. This activities caught the interest of the colonial administration. Therefore, in 1930, the government of the day set up a body to conduct a survey on the fishery sector. This resulted in the passing of the first fishing policy called fishing ordinance cap 165 in 1946 [6]. Subsequently, successive government established policies and programmes after independence from Britain. Such, as policies and programmes to regulate the method of fishing, issuing of fishing right, registration systems for canoes and vessels. From the 1960s to 1980s, governments policies and programmes centered on investing in industrial fishing vessel for large scale fishing in international waters. Secondly, to motivate local businessmen to venture in the fishing sector. Furthermore, the government established the State Fishing Corporation, built the Tema Fishing harbour with the sole aim of mechanizing the sector. In 1962 the government constructed a huge fleet of vessels made from wood measuring 70 feet in length from the newly constructed Tema Boat Yard in 1962 [2].

Consequently, the instability of the political scene made the goals underpinning these policies and programmes to transform time passes. Today

however, artisanal fisheries have a significant part to play if these goals are to be achieved. Problems with smoothly execution of programmes and policies in Ghana is not new. Even though, many fisheries acts and policies were enacted by Ghana, environmental, political, economic as well as technological conditions in relations to the fisheries sector has transformed rapidly within the last 30 years. Ghana's coastline has varied cultural, ethnic diversity and areas which has the potential to influence policy directions and implementations.

Consequently, the country has suffered a huge drop in high valued species like groupers (i.e. *Epinephelus aeneus*) and demersal (e.g. *Octopus vulgaris*). In spite of this, the improvement of the tuna fishery has preserved the catch volume of the industrial sector although this remains comparatively lower as a percentage of the overall catch. The primary known reasons attributed to this development in Ghana's industry fishing ranges between (i) most neighboring West African countries declaring their exclusive economic zone [1], (ii) Extreme fishing effort applied in fishing between industrial and artisanal fisher for the same marine resources thereby leading to conflicts between them [7], (iii) Poor observance of Fisheries Rule and low degrees of protection of marine resources, [7], (iv) Limited data on Biology spawning, maturity distribution of fish stocks [7], (v) illegal, unreported and unregularized fishing and poaching on a large-scale by foreign fleets in the country's economic exclusive zone [8], (vi) prohibitive accessibility cost for Ghanaian fleets in foreign waters is also a limitation [1]. It is extremely important to evaluate the policies and Acts with which the marine resources is steadily decreasing.

A handful of essential studies has been published on the fisheries governance and management in Ghana. However, no study has been published about how implementation of these varied policies has help to safeguard the



Fig. 1. Map of Ghana showing its exclusive economic zone boundary, and its neighbouring countries

fisheries resources with emphasis on policy management in Ghana and its own challenges from 1960 to date. (i) we examine the policies passed by the various civilian and military regimes, (ii) how these policies and programmes were implemented, (iii) we also examine how these policies and programmes affected the habit of fishermen, (iv) what are the exact implications of these varied policies on marine resources, (e.g fish size, licensing to fish etc), and (6) some general policy recommendations were made.

2. POLICIES ENACTED BETWEEN 1960 TO 1976

Fishing policies and programmes in Ghana has evolved over the years as different administration had being implementing different legislations in the sector. In particular between the period 1960 and 1970, fishing activities were governed by

Fisheries Regulations, 1964 (L.I. 364) by the conventions people's party (CPP) government led by Kwame Nkrumah and Fisheries Decree, 1972 (N.R.C.D.87), promulgated the (NRC) military government. These Acts were centered on areas to fish, modification monitoring control and mesh size. Policies on fishing in Ghana has evolved as different government authorities have since independence implemented various legislative interventions in the sector. In particular, in the 1970s and 1960s, fishing activities were governed by the Fisheries Act and the Fisheries Regulations, 1964 (L.I. 364) and Fisheries Decree, 1972 (N.R.C.D. 87), promulgated by the government of the National Redemption Council (NRC). These regulations were centered on the fishing zones, modification, monitoring control, fishing gear and surveillance (sanctioning), authorizations to fish, and size of fish.

In 1961, the government established the State Fishing Corporation, built the Tema Fishing harbour with the sole aim of mechanizing the sector [1], accompanied by bilateral agreements with Angola, Senegal, and Mauritania for Ghanaian fishermen to have access to their waters. The aim of these policies and guidelines targeted at improving the artisanal sector and also increase the production. Furthermore, in 1962, the government constructed a huge fleet of vessels made from wood measuring 70 feet in length from the newly constructed Tema Boat Yard in 1962 [2]. Majority of these fleets were involved in bottom trawling and purse seining. From the year 1960 to 1976, volume of fish catch increased from 38760 tonnes to 254830 tonnes for the industrial sector (Fig. 2). This development according to Haakonsen (2001) can be attributed to investment in the sector.

Artisanal fisheries for the same period recorded 32000 tonnes in 1960 and 118460 tonnes in 1976 (Fig. 2), also as a result of improvement in the capacity of fishermen plying their trade in Ghanaian jurisdiction. Within that same period programmes targeting merging of cooperative bodies, enhancing fish process and expanding markets were passed. For instance, the government made a pact with star Kist company in U.S.A for Ghana to supply it with tuna. The overall amount of fish caught in Ghana waters went up from USD\$21.05 million from 1960 to USD\$ 528.29 million in 1976 for industrial sector. While, artisanal fisheries recorded USD\$ 8.7 million in 1960 and USD\$ 150.48 million in 1976 (Fig. 3). Prices of fish constantly grew despite the growth in the volume of catch because demand for fish was more than the supply.



Fig. 2. Overall landings from industrial and artisanal (tonnes * 103) in Ghana between 1960 and 1976

Source: Data on landings were from (www.seaaroundus.org)

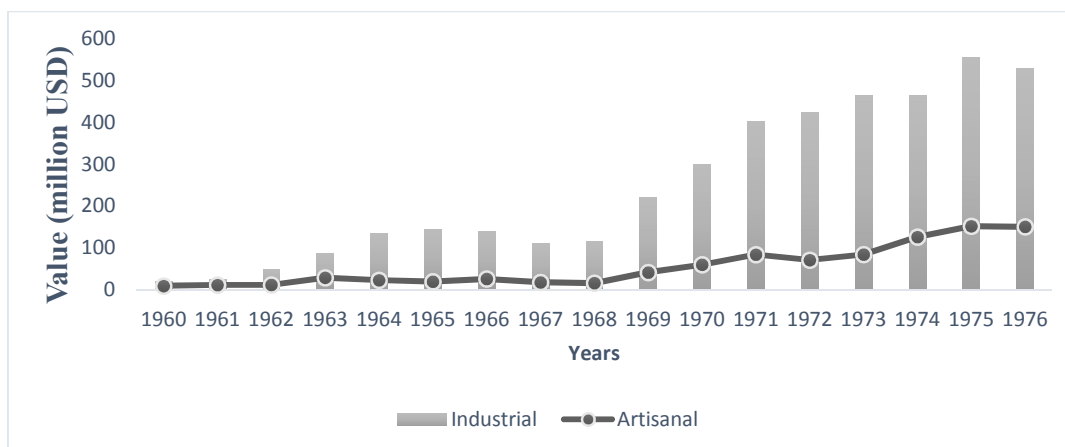


Fig. 3. Value for industrial and artisanal (USD\$) in the waters of Ghana between 1960 and 1976

Source: Value data were extracted from (www.seaaroundus.org)

These policies facilitated the expansion of the and also improved the amount employees in the sector. From 1971, going activities by industrial fishermen has become very effective, yet the worsening economic situation in the country greatly affected the industry of imported goods [6].

3. POLICIES ISSUED FROM 1977 TO 1990

By 1977, the Fisheries (Amendment) Regulations 1977 (L.I. 1106) had been approved to amend the Fisheries Regulations, 1964 (L.I. 364), this policy was promulgated to modify fishing in the country. This new policy aimed at strengthening fish production and capacity of fishermen. Furthermore, a Fisheries Decree was passed by the A.F.R.C. military regime in 1979 (A.F.R.C. Decree .30). For the same reasons in the same year (L.I.1235) was promulgated.

The artisanal sector recorded an increase in catch from 151,390 tonnes to 245,460 tonnes from 1977 to 1990 respectively. However, there was a decrease in landings for industrial fisheries from 278570 tonnes in 1977, to 221690 tonnes in 1982 before decreasing further to 194190 tonnes in 1990 (Fig. 4). Throughout this period the government was the solely responsible for the allocation and managing of marine resources in the country came in with an effort to modify fisheries. The policies at that period were continue to aim at strengthening fishing capacity and fisheries product supply. Furthermore, the government of the Armed Forces Revolutionary Council (AFRC) also enacted the Fisheries Decree, 1979 (A.F.R.C.D. 30). For the reason

that same calendar year, the Fisheries Regulations, 1979 (L.I. 1235) were promulgated. Industrial fisheries catch represented 278,570 tonnes in 1977, to a slight decrease of 221,690 tonnes in 1982, and then to a further decrease of 194,190 tonnes, in 1990 (Fig. 4). Moreover, from 1977 to 1990, there was a rise in the catches from 151,390 tonnes to 245,460 tonnes respectively for artisanal fisheries (Fig. 4). The Fisheries Acts in this period defined fishing zones, fishing vessels, gear, protected species, and fishing licenses. The State at this was the exclusive allocator and administrator of the fisheries resources. Then, during this time period, fishing continued to play a significant role in the economy of Ghana. The total value (US\$) of the fishing sector in the waters of Ghana increased from \$588.63 million US in 1977 to a peak of \$1,736.22 million US in 1982, before decreasing to 265.83 million US in 1990 for industrial fisheries and from \$290.83 million US in 1977 to \$1599.41 million US in 1982 and then, decreased to 225.97 million US in 1990, for artisanal fisheries (Fig. 5). However, the artisanal sector participated in the modernization of fishing technique with the introduction of purse-seine.

In 1986, the government authorities established the Maritime Zones (Delimitation) Law (P.N.D.C.L.159). This Legislation establishes a 12 nautical mile fishing zone, a contiguous zone that might not expand above 24 nautical miles from the baselines from which the breadth of the territorial sea is assessed. Artisanal fisheries at this time period did not require any license or to pay tax.

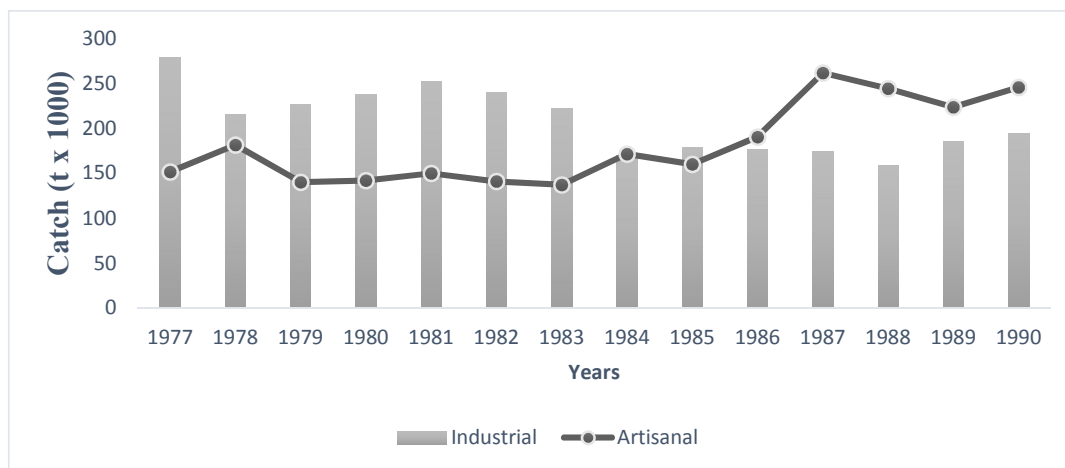


Fig. 4. Overall landings from industrial and artisanal (tonnes * 103) in Ghana between 1977 and 1990

Source: Data on landings were from (www.seararoundus.org)

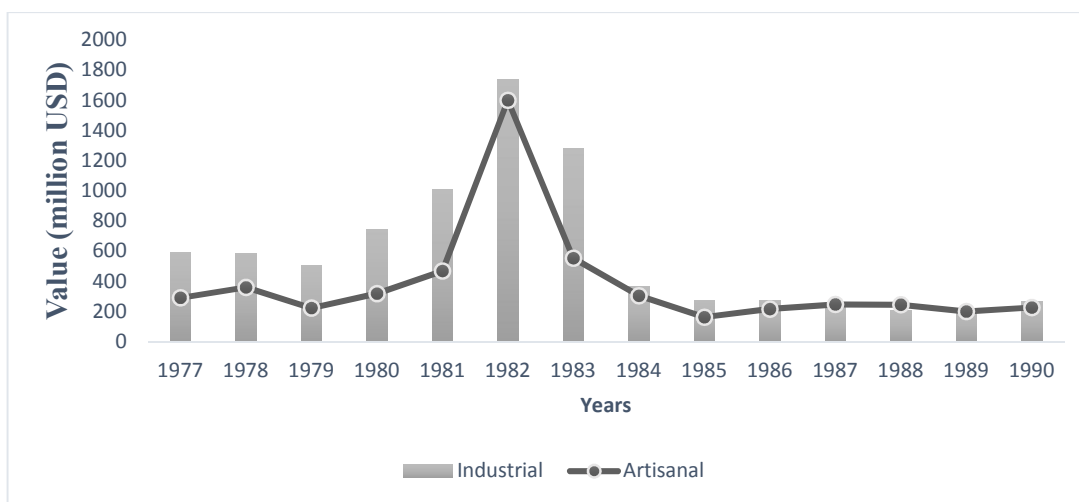


Fig. 5. Value for industrial and artisanal (USD\$) in the waters of Ghana between 1977 and 1990
 Source: Value data were extracted from (www.searoundus.org)

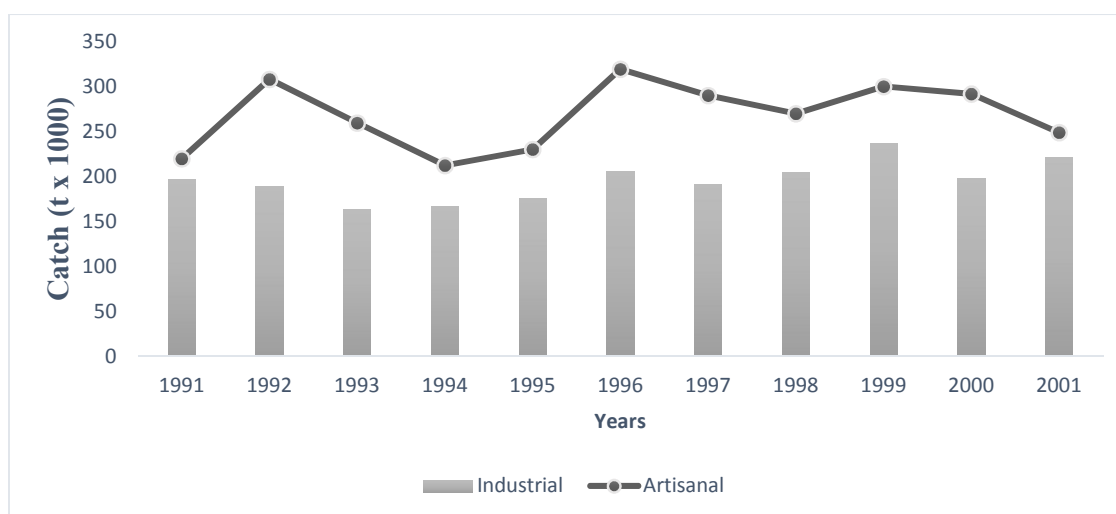


Fig. 6. Overall landings from industrial and artisanal (tonnes * 103) in Ghana between 1991 and 2001

Source: Data on landings were from (www.searoundus.org)

4. POLICIES ENACTED BETWEEN 1991 TO 2001

By 1991, laws governing the fisheries sector was centered on, (Law No. 256 of 1991). This law set up different fishing areas and fishing equipment, permit for construction of boats, license arrangements for fishing vessels and permit to import motor fishing vessels. For instance, the act guaranteed a 3 nautical miles fishing territory for artisanal fisheries. Hence the policy aimed at safeguarding fisheries resources and also prevent conflicts among industrial and artisanal

fishermen. Nevertheless, regardless of the delimitation of the fisheries sector catches from the artisanal sector increased from 219750 tonnes in 1991 to 319,200 tonnes in 1996 before declining to 248,850 tonnes in 2001(Fig. 6). The value of fish in the Ghanaian waters for the artisanal sector was USD\$154.5million in 1991 to USD\$139.24million in representing a marginal decrease in value. Catches for the industrial sector in 1991 was 196440 tonnes and in 2001 it recorded a total of 221,790 tonnes (Fig. 6). Moreover, the value of fish from the industrial sector in 1991 declined marginally from

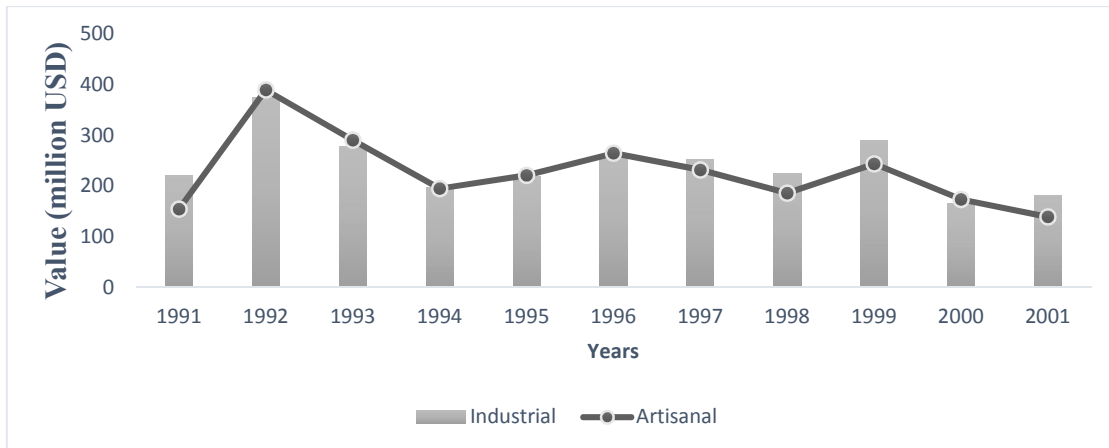


Fig. 7. Value for industrial and artisanal (USD\$) in the waters of Ghana between 1991 and 2002
 Source: Data on value landed were from (www. searoundus.org)

USD\$ 197.9million to USD\$181.61 million in the year 2001. This represented a total of 17.56 % decrease in value over this 10-year period (Fig. 7).

5. POLICIES AND PROGRAMMES BETWEEN 2002 TO 2014 ON THE FISHERIES SECTOR

Policies in this era were enacted to address the rapid decline in the fisheries resources of Ghana. The backbone of the policy was Fisheries act 2002. The Act proposed the establishment of the Fisheries Commission and

defines its powers, functions and organization structure, offers the establishment of the Fisheries Development Fund. The commission is built on these policies: (i) fisheries management, conservation of aquatic resources and safeguarding their ecosystem (ii) value addition promotion and enhancing of the socio-economic condition of fishermen: (iii) aquaculture development: (iv) improving on service delivery to the fisheries sector [9]. In 2010, the government of president Atta-Mills promulgated fisheries regulation 2010 (L.I.1968), purposely, to implement the provisions of fisheries act 2002 [10].

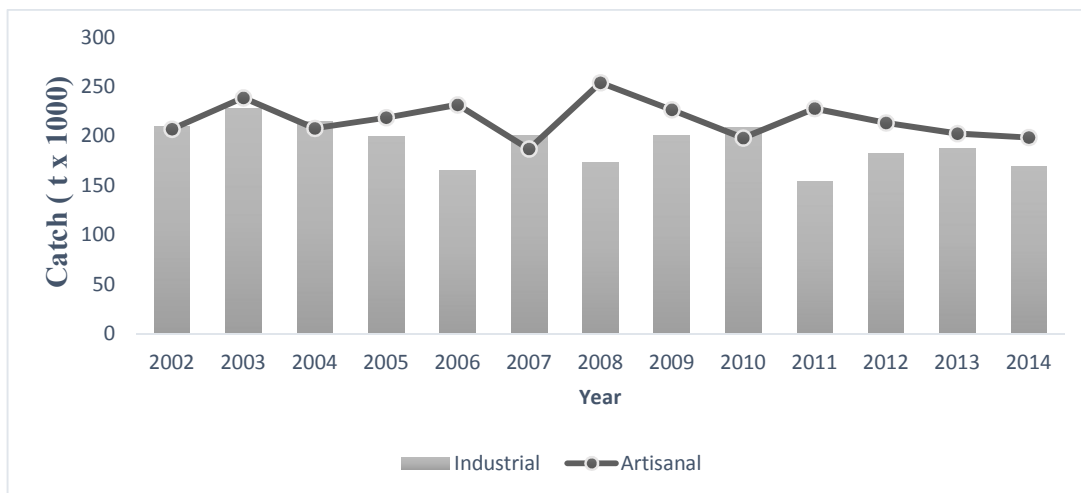


Fig. 8. Overall landings from industrial and artisanal (tonnes * 103) in Ghana between 2002 and 2014
 Source: Data on landings were from (www. searoundus.org)

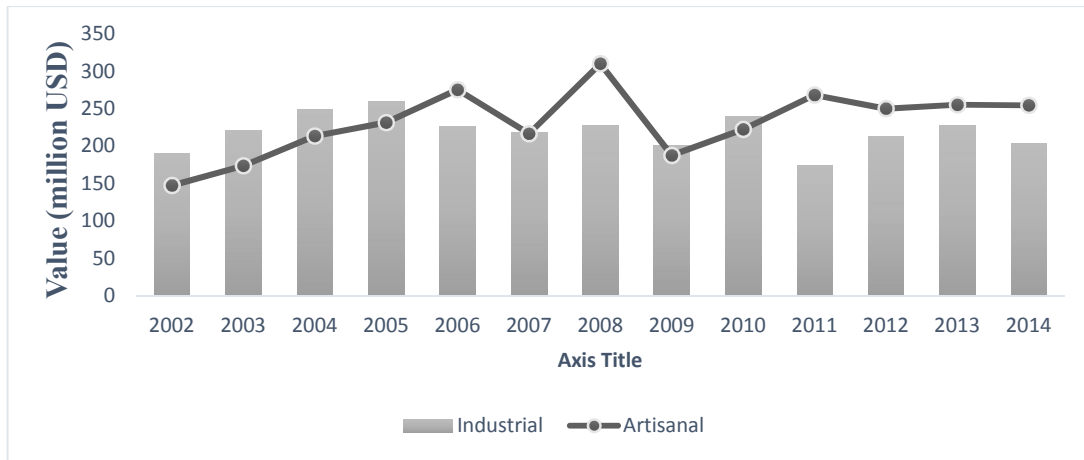


Fig. 9. Value for industrial and artisanal (USD\$) in the waters of Ghana between 2002 and 2014
 Source: Data on value landed were from (www.seaaroundus.org)

Table 1. History of acts and rules and their implication for fisheries from 2002 to 2015 [13]

Important acts, regulations, laws and policies related to fisheries	Implications for fisheries management
Fisheries Law, Act 625 of 2002	The Act makes provision for the establishment of the Fisheries Commission and defines its powers, functions and organizational structure, provides for the establishment of a Fisheries Development Fund and its use and regulates the management and conservation of fishery resources of Ghana including aquaculture and small-scale fishing.
National Fisheries & Aquaculture Policy (2008?)	It was designed to enable Ghana take advantage of its biophysical and socio-economic environment; strong research capacity; to significantly bridge the huge gap between national fish demand and supply in the medium term.
Fisheries Regulations L.I. 1968 of 2010	These Regulations implement provisions of the Fisheries Act, 2002, and make provision with respect to a wide variety of matters regarding fisheries management and conservation, aquaculture and trade in fish products such as: fishery plans prepared under sections 42 to 45 of the Act; registration and marking of local, industrial and semi-industrial fishing vessels; use of fishing gear; fishing licence; dumping or transshipment of fish; fishing in foreign waters; compliance measures and monitoring.
Fisheries (amendment) Regulations, 2015 (I.i. 2217)	These Regulations amend the Fisheries Regulations, 2010 principally concerning measures to deter and eliminate Illegal, Unreported, and Unregulated (IUU) Fishing. Measures include international cooperation, access control, and record of fishing vessels flying the flag of Ghana.

By 2014, the amount of fish landed in Ghana had decreased from 207,070 tonnes in 2002 to 198,660 tonnes in 2014 respectively, for artisanal fisheries and from 209,770 tonnes to 169,930 tonnes accordingly for industrial fisheries. Nevertheless, the value increased from USD\$147.67 million to USD\$254.64 million from

2002 to 2014 for artisanal fisheries. A contributing factor for the decline in total production is an illegal fishing practice call "Saiko". According to a research conducted by Frontiers in Marine Science, coastal countries in west Africa loose around USD\$ 2.3 billion yearly as a result of Illegal Unreported Unregulated

(IUU) Fishing. The indication is that programmes and policies enacted to safeguard the marine resource were ineffective.

6. FISHERIES SECTOR POLICIES AND PROGRAMMES SINCE 2015 TO DATE

Addressing the obstacles from the conflict between socio-economic, political, and environmental aim, policies and programmes during this era were centered on the new fisheries management plan of Ghana (2015 - 2019). In this plan, there was a ministerial directive regarding the implementation of closed seasons for industrial trawlers and artisanal canoes under the fisheries management plan of Ghana (2015 -2019).

In 2009 and 2010, the fisheries sector's contribution to GDP were 2.5% and 2.3% respectively. Moreover, in 2011, it recorded 1.7% as a total contribution to Ghana's GDP [11]. It has however not been able to record any figure above this. In 2016, the sector's contribution to GDP was 1.1%. However, there was a marginal increase of 0.1% in 2017 which recorded 1.2% to GDP (GSS, 2018). Clearly, showing a sector that needs urgent attention. Government in response to address the situation announced a closed season programme in 2018, but was fiercely opposed by the fishermen therefore the programme was suspended [12]. It is imperative to know that the suspension in the implementation of the closed season resulted in the low landings by fishermen in 2018, August bumper harvest season.

According to the FAO overexploitation of the fisheries stock by industrial vessels fishing in areas reserved for artisanal fishermen and their communities as a major role to play for the reduction. Currently, the number of semi-industrial (inshore) vessels are 403, the number of industrial trawl vessels are 107, vessels for tuna bait-boats are 20 in number, and tuna purse seine boat vessels in the waters of Ghana are 17 vessels [14]. The state, has also put in place law enforcement unit called "Fisheries Enforcement Unit "(FEU) that is mandated to monitor fishing activities. Nevertheless, many fishers, think the (FEU) has been ineffective in solving the issue of illegal fishing.

7. FURTHER DISCUSSION

For policies and programmes regarding marine resource to satisfy the balance of the marine

ecosystem, they must be geared towards the sustainability of the fishery resources. From the colonial era several programmes, regulation and policies have been enacted, with the prominent among them being the Fisheries Acts of 1991, 2002, 2010 and 2015. This research however, showed the list of minimum limit of nets for various species of fish in Ghana (Table 2). A lot of fishermen presently use fish with monofilament nets, due to the fact that they cost less compared to the nets made of nylon. But these nets cause a lot of damage to the ecosystem. Even though, Ghana has not banned the use of monofilament nets, they are to be used for aquaculture and not for marine fishing. Nets size used for marine fishing in Ghana ranges from 2- inches upwards, while that for aquaculture ranges between 3/8 to 1/2 inches. Ghana suffered a ban from the European Union Commission for its inability to effectively curb illegal fishing in its waters in November 2013 [15]. Landings of small pelagic complex decreased sharply since 2007 to reach in 2014, about 15% of the maximum landings realized in 1996 (281,096 tonnes). The trend observed from 1980 to 2007 fluctuated with high landings in mid-1990s between 200,000 and 281,096 tonnes. This decline is due mainly to overfishing, and has given rise to illegal activities including Saiko fishing [16]. Moreover, foreign vessels have been looting the African waters of its rich fisheries resources. Due to this phenomenon international organizations are currently joining forces to combat such raids in order to safeguard the livelihood of this fishing communities [17]. The legal and regulatory framework of fisheries management in Ghana is informed by the Fisheries Act (Act 625), Fisheries Regulations (L. I. 1968), National Premix Fuel Committee Regulations (L. I. 2233) and various international fisheries agreements [18]. The Fisheries Act of 2002 provides for regulation and management of fisheries, the development of the fishing industry and sustainable exploitation of fishery resources, and fishery-related matters. The Act established and stipulated the functions of the Fisheries Commission, which is the implementation agency of MOFAD. The Ministry of Fisheries and Aquaculture Development (MOFAD) is responsible for the management of fisheries resources in Ghana and for the development of the fisheries sector. The Fisheries Commission, is one of the two agencies under MOFAD, implements the policies and regulations of MOFAD. Ghana has many fisheries associations, each catering for a particular type of fisheries. A key stakeholder in trawler fisheries is the Ghana

Table 2. List of Minimum size limits for various species of fish in Ghana [17]

Scientific name	Common English name	Minimum size
<i>Panulirus regius</i>	Spiny Lobster	12 cm
<i>Pagellus bellottii</i>	Red Pandora	14 cm
<i>Dentex canariensis</i>	Canary dentex	22 cm
<i>Sparus caeruleostictus</i>	Blue spotted seabream	18 cm
<i>Sepia officinalis</i>	Cuttlefish	14 cm
<i>Lutjanus fulgens/goreensis</i>	Red snappers	16 cm
<i>Galeoides decadactylus</i>	Threadfin	16 cm
<i>Pseudotolithus senegalensis</i>	Cassava fish	18 cm
<i>Pseudupeneus prayensis</i>	Red Mullet	14 cm
<i>Epinephelus aeneus</i>	Grouper	42 cm
<i>Sphyaenna spp</i>	Barracudas	30 cm
<i>Pomadasys incisus</i>	Roncador	14 cm
<i>Pomadasys jubelini</i>	Burro	18 cm
<i>Chloroscombrus chrysurus</i>	Bumper	10 cm
<i>Decapterus punctatus</i>	False mackerel	10 cm
<i>Sardinella aurita</i>	Round sardine	18 cm
<i>Sardinella maderensis</i>	Flat sardine	18 cm
<i>Brachydeuterus auritus</i>	Burrito	14 cm
<i>Scomber japonicus</i>	Chub mackerel	18 cm
<i>Caranx rhocus/crysos</i>	Scad mackerel	21 cm
<i>Engraulis encrasicolus</i>	Anchovy	6 cm
<i>Thunnus obesus</i>	Bigeye tuna	55 cm
<i>Thunnus albacares</i>	Yellow fin	55 cm

Industrial Trawlers Association (GITA), composed of individual and corporate trawler fishing operator. The implementation of this programmes and policy measures focused on enhancing marine resources and safeguarding of the ecosystem which could result in replenishment of depleted resources. However, over exerting of effort by fishermen in order to maximize yield meant that this programmes and policies were ineffective. This research showed the significant role the fisheries sector plays in the livelihood of people in Ghana.

8. POLICY SUGGESTIONS

In Ghana, the state, fisherfolks and other stakeholders must endeavor to join hands forces to fight against illegal fishing in all its forms and shape. Furthermore, measures that put restriction on fishing for certain periods of the year like closed season must be strictly enforced. Nevertheless, for sustainable fishing to be achieved it is suggested that;

- There must be an effective surveillance system to check illegal, unreported and unregulated fishing methods.
- The country needs more fishing and marine protected zones.

- People living in fishing communities must be constantly involved in decision making process.
- Priority must be given to aquaculture production to improve the livelihood of fish farmers and also increase production.

9. CONCLUSION

To safeguard the deteriorating nature of marine and coastal resources of the country, research on the transformation of policies and programmes and their performance are necessary. Over the years policies developed has shown the different priorities several regimes attached to the fisheries sector in Ghana. The different policy blueprint examined over these policy eras are (e.g. law: No. 256 of 1991, P.N.D.C.L.159 of 1986, Act 625 of 2002, Fisheries Decree, A.F.R.C.D. 30 of 1979, Fisheries Regulations, L.I. 1235 of 1979). In all of the laws Acts 625 of 2002 showed more interest in regulation, management and sustainability of marine resources of Ghana, including aquaculture development. However, the policies in the above policy eras were weakly enforced. Corruption and gaps in prosecution of offenders was a hindrance to the fight against illegal fishing [17].

Moreover, the outcomes of these policies augmented the abundance of marine resources. This was achieved the safeguarding of marine and coastal resources [19].

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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