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IUU as a legal framework with reference to UNCLOS and other international architecture for better fisheries resources management)

[EMMANUEL OKINE NEOKYE]

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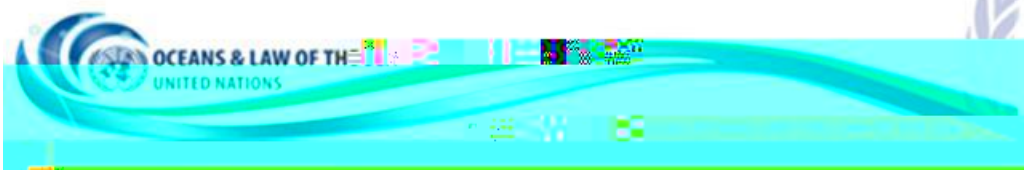

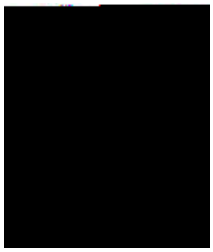

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UNEP.....United Nations Environmental Programme

UNFSA.....United Nations Fish Stocks Agreement

UNGA.....United Nations General Assembly

UNODC .....United Nations Office on Drug and Crime

USAID.....United States Agency for International Development

UNCLOS.....United Nation Convention of the Law of the Sea

VMS.....Vessel Monitoring System

List of Table

flat Sardinella (*S. maderensis*) which are exploited in the entire Gulf of Guinea[4]. It is estimated that the fisheries, mostly artisanal, employ over 250,000 fishers with over 29300 fishing canoes.

addressed by Ghana; (v)To review Ghana's fisheries management policies and recommend better ways to improve it.

Part 1:

Africa's blue economy concept seeks to enhance economic growth, social inclusion, and the improvement of livelihoods at the same time ensuring environmental sustainability of the oceans and coastal areas[7].It also refers to the decoupling of socioeconomic development through oceans-related sectors and activities from the environment and ecosystems degradation. The blue economy relates to scientific findings that, ocean resources are limited and that the health of the oceans has drastically declined due to anthropogenic activities[8]. These changes are already being profoundly felt, affecting human well-being and societies, and the impacts are likely to be amplified in the future, especially in view of projected population increase.

The blue economy has diverse components, these includes fisheries, tourism, and maritime transport. There are also new and emerging activities, such as offshore renewable energy, aquaculture, seabed extractive activities, and marine biotechnology and bioprospecting of deep-sea minerals. There are a number of services derived from the ocean ecosystems, which contribute significantly to the economic and other human developmental activities such as carbon sequestration, coastal protection, waste disposal and the existence of biodiversity.

Activities of the

economy should provide social and economic benefits for current and future generations; restore, protect, and maintain the diversity, productivity, resilience, core functions, and intrinsic value of marine ecosystems. Therefore, these activities should be based on clean technologies, renewable energy, and circular material flows that will red

international assistance, and remittances. In 2010, Africa lost about 1.3 billion USD through illegal fishing. In addition, the direct foreign investment in flow was about USD150 billion. The financial loss from the continent is detrimental to the development of the member countries. This is because monies for infrastructural development are lost through illegal activities. Furthermore, leaving some part of the continent in abject poverty and starvation.

The blue economy in Africa covers aquatic and marine resources. This includes the oceans, seas, coasts, lakes, rivers, and underground water. It also comprises a range of productive sectors, such

a gradual increase from 2013 to 2016. The highest production was recorded in 2017 with a value of about 82,000(MT). Then in 2018 the production decreased slightly to a value of 73,627.8 (MT). Ghana's offshore oil fields plays a major role in the blue economy. According to Article 257(6) of the 1992 Constitution of the Republic of Ghana, every natural resource on land or under rivers, streams, water courses within Ghana, the exclusive economic zone and the territorial sea or continental shelf is the property of the Republic of Ghana. Therefore, the constitution gives exclusive rights to the exploration of minerals and natural resources by Ghanaian nationals with the requisite licences[14]. However, for the exploration of crude oil and natural gas, the government of Ghana sold the licences to different international companies for offshore oil exploration and production in 2004[15]. In July 2007, through a collaborative effort of Tullow Oil and Kosmos Energy, crude oil was discovered in commercial quantities in the western region of Ghana[16]. This was named the Jubilee Oil Field. The first production of the project, the Twenneboa, Enyenra, and Ntomme (TEN) fields, with an estimated 240 MMbbl and 396 Bcf of gas, started in August 2016. Ghana became a commercial oil and gas producer with the discovery of the offshore Jubilee field estimated capacity of 700 Tm0 2 792pw 72.024 349.97 Tm0 g0 G[(Gha)6(na)4( )-9(be)4(c)-5(a)4(me)-7(cQqi6

MMbo and 100 Bcf of gas[17]. Fig.6 is a bar chart representing the percentage contribution of offshore crude oil to the GDP of Ghana from 2012 to 2019.The highest percentage in value in terms of GPD was in 2012.This was in total of about 5 percent. Then it declined until 2016 with a value of about 1 percent. Furthermore, from 2017 it began to rise until 2019 when it reached the second highest percentage over the period.

Beach tourism also plays an important role in the blue economy of Ghana. Ghana is one of the most preferred tourist destinations in Africa. This is because of the record of peaceful democratic transitions over the years. The country can boast of beautiful sandy beaches as well as rocky shores. Beach tourism is a subsector of the mainstream tourism industry in Ghana which plays a vital role in the services sector. The serenity of the beach environment gives pleasure and leisure for holiday makers and visitors. Beach tourism contributes immensely to the GDP of the country. The beaches in Ghana are great resources for coastal tourism development. They attract a large number of

1,956,833mt, whilst transit/transshipment exports recorded 86,910mt. Trade (% of GDP) in Ghana was reported at 58.43 % in 2021, according to the World Bank[20].

There are enormous challenges associated with the blue economy of Ghana with respect to fisheries; notable amongst them are; plastic and debris pollution, sand winning, oil pollution, sea level rise (climate change), Illegal Unregulated and Unreported Fishing (IUU), Piracy, Armed robbery at Sea and kidnapping.

The annual imports of raw plastic materials are estimated to be 2.58 million metric tonnes and about 73% of the total plastic imports end up as waste materials[21]. “Plastic recycling represents an insignificant 0.1% while re-use plastics represent 19% of the total imported plastic materials”. Furthermore, the daily average solid waste generated per head in Ghana is 0.47 kg and it sums up to an estimated value of 12,710 tonnes per day for the population. Ghana's annual imports of raw plastics amount to 2.58 MT. However, 1,883,400 MT representing 73% end up as waste materials. In 2015, the daily amount of solid waste generated by every individual in Ghana was 0.47 kg, and the total solid waste generated daily by Ghana was estimated to be 12,710 MT. In the marine ecosystem, plastics and debris clog the gills of marine fish species and at times results in fatalities. This happens during filter feeding. This results in mortalities when they end up in the gonads of these fish species. In 2021, Ghana recorded the death of several marine mammals which became one of the worst in the history of the country. Amongst the fish species that died includes dolphins and other pelagic fish species. All these deaths could be linked to the extent of water and debris pollution and other associated environmental effects along the coast of Ghana. In addition, due to

[20] World bank report; Ghana Maritime trade Review,2021

[21] Baba Imoro Musah, Lai Peng1, Yifeng Xu1: Plastic waste menace in Ghana, a serious threat to marine ecological

sea level gradually rises from January and reaches its first maximum in April with 60(mm). Then it decreases until August. Then there is a gradual rise until it reaches its second maximum in November with a value of 90(mm). Fig.7(b) is another historical graph of sea level rise in Ghana using observed anomalies from interannual relative mean from 1993-2012. From 1993 to 1998, there was a low and a steady rise in terms of the mean annual anomaly. Then from 1998 to 2003 there was a steady rise from 20(mm) to about 45(mm). From 2003 there was a steady rise until it goes to the maximum in 2010 with a value of 75(mm). Then the sea level declined slightly until 2015 when it began a rise. Comparatively, there has been a steady rise in seal level along the coast of Ghana from 1993 to 2015 from about 20(mm) to 70(mm) over the years. The sea level rise is as results of global climatic change and other adverse environmental effects. The rise of the sea level has become a major concern which needs to be addressed nationally and globally.

There are several IUU fishing methods which are infraction to the fisheries laws of Ghana. Notable amongst them are; the use of undersize mesh size, the use of light fishing at night, pair trawling, fishing within the 30-meter depth and in the EZZ by trawlers, illegal transhipment at sea, 'Saiko', fishing without the required license, dumping of fish (discards) at sea. It is much perceived that much of the IUU fishing is conducted by foreign vessels, including fishing in the EEZ of coastal West African States. However, in Ghana, a large part of the IUU fishing problem can be attributed to the Ghanaian flagged fishing fleets. Moreso, in recent times IUU fishing has been associated with large quantities of by-catch because of non-compliance to regulations, particularly the use of smaller mesh size. Ghana was issued a yellow card warning on June 3, 2021, by the European Commission in relation to IUU[28]. This was because there were noncompliance's and IUU fishing activities in the fisheries sector. The decision was based on various shortcomings in Ghana's in

[28] https://iwatchafrica.org/2021/06/03/ghana-given-yellow-card-by-the-european-commission-following-iwatchs-investigation-on-illegal-fishing/

ability to comply with its duties under international law as flag, port, coastal or market State. The yellow card is precautionary measure for Ghana to react and take measures to rectify the situation within a reasonable time. However, with the current situation, it does not affect exports nor trade. Furthermore, in cases of prolonged non-compliances Ghana will stand a chance of being given a red card, which entails sanctions such as the prohibition to export of its fishery products to the EU market. Ghana previously received a yellow card in November 2013, which was then lifted in October 2015, after Ghana addressed the shortcomings. IUU sanctions has serious economic implication on the economy of the country since the EU is the world's biggest importer of fisheries products. The global value of IUU fishing is estimated at 10-20 billion euros per year which corresponds to 11 and 26 million tonnes of fish being caught illegally every year, representing at least 15% of world catches[29]. Illegal, Unreported and Unregulated (IUU) fishing is a detriment to conservation and fishery management practices. IUU is as a serious threat to sustainability of capture fisheries due to its negative impact on biodiversity of the oceans and economy of fishing nations. IUU cost about US$10 billion and US$23.5 billion per year globally[30]. West African coastal countries have the highest levels of IUU in the world, representing up to 37 percent of the region's catch and estimates about US $ 100,000 per day. [31] Most of these catches occurs not only in the high seas but in coastal waters under national jurisdiction. Transhipment of fish is banned in some West African countries, including Senegal, Cote D'Ivoire and Guinea. There is now a new form of transhipment developed between industrial vessels and the artisanal canoes, with the

[29] EU Policy on illegal fishing in Ghana.https://www.iai.it/en/pubblicazioni/empty-oceans-eu-policy-and-illegal-fishing-ghana

[30] https://www.minderoo.org/global-fishing-index/news/estimating-the-worlds-vulnerability-to-illegal-fishing-is-the-first-step-now-we-need-to-act/

[31] OECD (2012), Development Co-operation Report 2012; Lesson linking to sustainable OECD Publishing. http://dx.doi.org/10.1787/dcr-2012-en

occurring in 2018. Furthermore, Fig.9 represents incidence of fishing in the EEZ from 2015-2018.The highest incidence of occurrence was in 2018 with four vessels engaging in fishing in the EEZ. The least occurrence was in 2015 and 2017 with one incidence recorded in each case. Fig.10 represents a graph of infractions of fishing with under size mesh from 2015 – 2018. The highest incidence occurred in 2015 and 2017 with the least years being 2016 and 2018. Moreso, Fig.11 shows a graph of infractions of dumping of fish (discards) into the sea from 2015 – 2018. This infraction was steady from 2015 until 2017. However, it rose astronomically in 2018. This infraction is in contravention to ICCAT and other international regulations since by catches are supposed to be landed and recorded. This menace could have a huge biodiversity impact on the fisheries in Ghana. This is because of lots of non-targeted fish species are lost in the ecosystem which could disrupt the food chain and leads to complete elimination or extinction of a particular fish species. Fig.12 shows a graph of infractions on illegal transhipment at sea from 2015 – 2018. Since 2015 there has been a steady rise of illegal transhipment with the highest incidence recorded in 2018. Illegal transshipment is in contravention to the Fisheries laws of Ghana (Fisheries Act 625 of 2002 and other international legal frameworks such as the fish stocks agreement, ICCAT regulatory framework etc. In Fig.13, the graph shows an infraction of taking on board undersize mesh from 2015 – 2018. The incidence increased from 2015 until the 2017 then it dropped slightly in 2018.

The UN Convention on the Law of the Sea (UNCLOS), Article 101 indicates that maritime piracy is any unlawful act of violence committed for private ends by the crew or passengers of a private ship and directed on the high seas, or outside the jurisdiction of any country. The Gulf of Guinea has been noted recently as the hot spot for kidnappings and hostage-takings in according to global maritime piracy watchdog the International Maritime Bureau (IMB); there have been 70

of Guinea is one of the most dangerous maritime area in terms of the success rate of attacks and violence. This has led to UN Security Council Resolutions expressing grave concern about the insecurity within the West Africa region. In addition, it has larger implications for regional and global security. The first resolutions also called for regional and global counter-piracy measures. In June 2013, Gulf of Guinea States adopted the code of conduct for the repression of piracy at Yaoundé, Cameroon. This was very welcomed and had wide international support. Secondly, piracy in the Gulf of Guinea region remains a serious threat even in the face of regional and global initiatives. In the month following the adoption of the Yaoundé code of the conduct a Maltese-flagged vessel named Cotton, was hijacked off the coast of Gabon. This was the first attack of its kind in that coast, portraying a widening of the piracy threat southward. It is also note-worthy that at the close of 2013 the Gulf of Guinea recorded more incidents of attacks in the high seas than in previous years[36].

Another challenge facing the blue economy of Ghana is sand mining. This poses threats to coastal regions of Ghana. The sand is wined for construction of buildings and making block for housing. These are very detrimental to the coastal environment. Therefore, aiding coastal erosion which lead to displacement of town during high tides. Sand mining over the years has led to the Municipal and district assembly taken a precautionary approach by making by laws to deter the populace from desisting from such activities. Furthermore, sand mining from rivers banks and marine ecosystems, leads to significant environmental impacts. Which includes coastal and river erosion,

excessive sand mining is a threat to riverbanks and nearby structures. Sand mining also affects the adjoining groundwater system and its uses by surrounding community. In addition, sand mining can have other costly effects leading to loss fertile land annually. This also include valuable wildlife habitats in the riparian areas. It also leads to degradation of habitats resulting in loss of fisheries productivity, biodiversity, and recreational potential of coastal beaches.

Moreso, oil pollution has serious environmental implications on the ocean and the environment as well as biodiversity. Oil pollution results in death of aquatic animals due to the deoxygenation of the aquatic environment. Oil is denser than water therefore, covers the surface of the ocean and renders aquatic animals the inability to take in oxygen. This leads to suffocation which results in death. Oil pollution has serious implications on sea birds who are usually soaked in the oil and are unable to fly. It is in this response that, Ghana have implemented the Ghana Petroleum Development Master Plan, the National Oil Spill Contingency Plan, as well as the National Oil Spill Strategic Plan as a policy framework for a national response to a possible oil catastrophe and environmental degradation. Oil spillages and gas flaring are two key dangers to human security. Unlike Nigeria's oil and gas industry, Ghana's offshore is 60km away from the coast. Therefore, the effects of spills are not expected to pose significant threats. The Environmental Protection Agency Act (EPA) (490) regulates the release of wastes into the environment while guaranteeing the quality of the environment. They have provision dealing with events like oil spills and has a generic responsibility for regulating the environment. The sea serves as a source of leisure for coastal dwellers which is reflective in the rate of swimming along the coastal communities in Ghana.

Section A: The blue economy and the negative impact of IUU fishing and linkages to crimes at sea.

IUU fishing has an enormous impact on Ghana's Economy. The International Plan of Action (i.e., IPOA-IUU) was developed as a voluntary instrument, within the framework of the Code of Conduct for Responsible Fisheries, in response to a call from the Twenty-third Session of the

(iii) “Unregulated”: fishing activities that are carried out by foreign fishing vessels without a nationality; or vessels with flags of a State which is not party to that organization or by a fishing entity, in a manner that is not consistent with or contravenes measures for the conservation and management of the organization[37].

IUU fishing and the impact on Ghana’s economy (statistical trends)

There are linkages associated with IUU fishing and crimes at sea. Notable among them are piracy and armed robbery, human trafficking, theft, kidnapping, Illegal boarding, and weapons firing recorded along the coast of West Africa. Article 101 of the UN Conve3 0 612 79nQplW*3(re)7 Lacw3(t-ETQ 6

world's 28 recorded kidnapping at sea incidents occurred in the Gulf of Guinea [40]. The number of

[redacted]

threat anywhere else. Secondly the Gulf of Guinea is the second world's piracy hotspot. The incidence of piracy and robbery at sea are no longer concentrated in the waters near the Niger Delta. In recent times, incidents are occurring farther from Nigeria than ever before, as an ever-increasing share of attacks is happening outside Nigerian internal or territorial waters, and even beyond Nigeria's exclusive economic zone. Thirdly, 50 of the region's 106 incidents of piracy and armef‰/F3 12f‰s6f‰irW*n.15/3ir

unregulated artifacts are used in fishing it results in the deterioration of the marine ecosystems. For example, the capture of fish larvae and juvenile fish is associated with smaller mesh seize. Moreso, the cutting of mangroves along the coastal shoreline causes spawning grounds and habitat destruction.

Secondly, IUU fishing has negative repercussion on the economy of Ghana. Ghana loses about $200 million annually due to IUU fishing according to survey by Environmental Justice Foundation. Inadequate monitoring, surveillance and control of the Ghanaian coastal waters is one of the contributing factors. Some local and foreign unlicensed vessels make away with a lot of illegal fish catch which are undetected. The socio-economic impacts of IUU in Ghana cannot be under emphasized. This is because it leads to poverty in the coastal regions of the country. The scarcity of fish causes fisher folks to migrates to other neighboring countries causing irregular migration. The low fish catch can be attributed to illegal fish catch by trawlers in the near shore coastal areas which are reserved for the artisanal fishery. Artisanal fishermen in Ghana rely on a small pelagic fish especially *Sardinella spp*.; they constitute 70% of the total marine catch in Ghana and play critical role to food security and livelihoods[42]. Some Industrial trawlers enter prohibited zones and illegally adjust their fishing gear to target sardinella, which are in high demand for local consumpti o-M

caught via this trade is estimated at 67 percent. However, in some extreme case reaching 100 percent. Already, scientists have predicted the collapse of the small pelagic fishery within West Africa region in the next decade with FAO recommending closure of the sardinella fishery shared by Cote D'ivoire, Ghana, Togo, and Benin to allow for fish populations recovery. Until proper fishery recovery plan is made, Ghana could experience small pelagic fish stock collapse. This is because over exploitation, overcapacity coupled with IUU fishing which results in the fish catch exceeding the maximum sustainable yield (MSY).

The most frequent hot spot of arm robbery in the Gulf of Guinea are Nigeria and Liberia. Fig.18 is a graph on the number of piracy/armed robbery at sea reported in West Africa. The activity of piracy decreased slightly from 2016 to 2017. However, in 2018 the region recorded a high value of eighty (80). Progressively, a maximum value of ninety (90) was recorded in 2020. The activity of piracy and armed robbery at seas is usually linked with trans organized crimes such as money laundering, human trafficking, and other related crimes. Most of these pirates are sponsored in their operation by people involved in business who are affluent and use these as a means to transact their illegal business and enrich themselves.

Ghana economy significantly depend on the fishing industry and it's estimated that 10% of the population derive their livelihood from it. The fishing industry is capital-intensive and operational cost in terms of remuneration of crew, fuel, lubricants, and equipment's repair, are equally heavy on the operators of the fishing vessel. Protection of sea fearers is a shared responsibility and derives from the concept of maritime domain awareness which is defined by the International Maritime Organization (IMO) as the effective understanding of anything associated with the maritime domain that could impact the security, safety, or marine environment. The maritime domain is described as all areas relating to the sea, or the ocean and navigable waterways as well as all maritime related activities, infrastructure, people, cargo and vessels and other conveyances. The Ghana Maritime authority (GMA) superintends over the Ghana Maritime Security Act, 2004 (Acts

in ensuring safety and security in the Ghanaian maritime domain. The Ministry of Fisheries and Aquaculture Development in accordance with the Fisheries Act, 2002(Act 625), has established the Fisheries Enforcement Unit (FEU) which comprises of personnel from the Fisheries Commission, Ghana Navy, Marine Police, and the Attorney General for the purpose of elimination IUU. The system in use to combat maritime crimes includes electronic surveillance such as the (i) Vessel Traffic Management Information System (VTMIS), (ii)Vessel Monitoring System (VMS), (iii)Automatic Identification System (AIS) and (iv) Radar system. Other modes of surveillance include sea patrol, land patrols and aerial surveillance using aircraft. There are international cooperation arrangements such as the Inter-Regional Coordination (ICC) concerning the repression of piracy, armed robbery against ships and illicit maritime activity in West Africa. Furthermore, the West Africa Task Force (WATF) of the Fisheries Committee for West Central Gulf of Guinea (FCWC) is mandated to share intelligence amongst agencies in member countries and actions taken at various locations in response to prevailing incidence through the Multinational Maritime Coordinating Centre Zone F in Ghana.

There has been series of piracy and arm robbery incidence which has occurred in the past years in Ghana. One of such was reported on 4th June 2014, on Marine 711(AFT 28). The fishing vessel was attached and the marine fuel was siphoned from it in Nigerian waters. However, the vessel returned to Ghana without any fatalities on June 5. Moreover, the vessels could not fish making the company lose a lot of revenue and income. Also, in 2018, the fisheries commission released report that Marine 711(AFT 28) a fishing vessels was attacked and the arm robbers took the fishing vessel towards the eastern borders of Benin-Nigerian coastal waters. The MCS Division indicated that the vessels were abducted by armed robbers; as a result, three Korean crew including the

captain were abducted and the where about was unknown leading to a probable ransom for release[43].

Another armed robbery involving Ghanaian fishing trawler Lu Rong Yuan Yu 917(AF 736) was also attacked on January 2015. A report from the Fisheries Commission Ghana, says four crew members lost their lives and the entire crew, except the captain were forced to jump off the vessel into the sea at the command of the armed robbers when the Togolese Navy confronted the hijacked vessel in Togolese waters until the vessel was rescued with the only survivor the captain. Furthermore, there were reports of two-armed robbery attacks on fishing vessel Meng Xin2(AFF 660) in Ghanaian waters. The armed robbers assaulted the crew, stole marine fuel, personal belongings, and navigation equipment. However, there were no casualties. Further report from the Fisheries Commission indicated that in 2018, three oil tankers were hijacked at the Tema Port anchorage. This situation causes fear and panic among players in the fishing industry[44].

The activities of piracy and armed robbery along the Ghanaian coast have several effects on Fisheries in Ghana. Notable amongst them is the financial loss to local companies. Piracy and armed robbery activities increase the operation of fishing vessels and amount to thousands of dollars. Therefore, an unsuccessful trip makes the company lose a lot in terms of money and logistics. Some of these compan

be substituted for anything. This has great repercussion on the sub region and drive away investors who could have helped in building the economies of the sub region. Thirdly, when ransoms are demanded for the release of hostages it places a financial burden on fishing companies. Another concern is the hiring of private security operatives on board to combat piracy and armed robbery

(amendment act), 2014. Lastly, the Fisheries (amendment) regulations, 2015 (L.I. 2217)[45]. These laws and regulation were implemented to address and solve some of the management issues in the fisheries sector.

The Fisheries Regulations L.I. 1968 of 2010 make provision with respect to a wide variety of matters regarding fisheries management and conservation, aquaculture production and marketing of fish products: under the fishery plans prepared under sections 42 to 45 of the Act; also registration and marking of local, industrial and semi industrial fishing vessels; the use of fishing gear; fishing licences, dumping (discards) or transshipment of fish; fishing in foreign waters; compliance and monitoring measures.

Furthermore, the Fisheries Law, Act 625 of 2002 makes provision for the establishment of the Fisheries Commission and defines its powers, functions, and organizational structure, provides for the establishment of Fisheries Development Fund and its use. In addition, to regulate the management and conservation of fishery resources in Ghana. These includes aquaculture and small-scale fishing.

The Fisheries (amendment) Regulations, 2015 (L.I. 2217) was amendment to Fisheries Regulations, 2010 principally concerning measures to deter and eliminate Illegal, Unreported, and Unregulated (IUU) Fishing. These measures include international cooperation, access control, and record of fishing vessels flying the flag of Ghana.

There are regulations enacted in the constitution of Ghana for the purpose of management of fisheries resources. These regulations are the Legislative Instruments and Ministerial Directives. They contain other related legislations such as the Local Governance Act, which contains provisions related to fisheries. Some of the regulations includes the i) Ghana Fisheries Regulations

[45]Ministry of Fisheries and Aquaculture Development Ghana, refer https://www.mofad.gov.gh/publications/laws-and-regulations/.

2010 (L.I. 1968), ii) Ghana Fisheries (Amendment) Regulations 2015 (L.I. 2217), iii) Fisheries Regulations of 1979, iv) Fishing Boats (Certificate of Competency First Class and Second-Class Engineers), and v) Regulations of 1974 Fishing Boats (Certificate of Competency as Skippers and Second Hands). Other directives issued from the office of the Minister of fisheries for the purpose of fisheries management included the; Ministerial Directive on closed season for Trawlers dated (15-06-2016) for 2015-2019. Moreso, the Ministerial Directive on minimum sanitary requirements issued on (31-5-2016).

In recent years, there has been other related inter sectorial legislations towards the management of the fisheries sector and they include the (i)Ghana Shipping Act 2003 (Act 645) Section 13, and the (ii) Ghana Maritime Authority Act 2002 (Act 630) Sections 4 and 13.

Ghana's fisheries sector is currently governed by the Fisheries (amendment) Act, 2015. An act to amend the fisheries acts, 2002 (Acts 625) to give effective international conservation and management obligations, to empower the Minister to make regulations to combat Illegal, Unreported and Unregulated (IUU) Fishing. Which is in accordance with the international obligations of the republic of Ghana. Other measures include international cooperation, ac(mend)cs.7s

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 and (iv) improving on service delivery to the fisheries and aquaculture areas.

Ghana's management policies and the sets backs

In recent years, Ghana have had fisheries policies and management plans. Notable amongst them include the: (i) National Fisheries and Aquaculture Policy 2008, (ii) Fisheries Management Policy 2015, iii) Ghana Fisheries and Aquaculture Development Plan, and the (iv) Co- management policy for the fisheries sector in 2020.

Some of the fisheries development plans implemented by the Ministry of fisheries and aquaculture in recent years include: (i) MOFAD Sector Medium Term Development Plan from (2014-2017). (ii) Ghana Fisheries and Aquaculture Sector Development Plan 2011-2016, (iii) Coastal and Marine Sector Action Plans MOFAD 2015, (iv) Fisheries Management Plan of Ghana – Marine Sector (2015-2019), (v) Ghana National Aquaculture Development Plan MOFAD-FC 2013, (vi)

Policy Area 2: The promotion of value addition in the fisheries sector as well as the improvement of livelihood of people living in the fisheries communities.	2.Value of annual fish income increased by US$50 Million from value added products.

Ghanaian-flagged vessels resulted in the imposition of import restrictions on Ghana's fisheries products by European countries in 2012/2013 and recently on June 2, 2021.

Ghana's fishing industry is characterized by changes and innovations with respect to fishing vessels, fishing methods, fishing gears and fishing grounds. This makes it challenging for fisheries monitoring, control and surveillance mechanisms to keep up with these changes, especially for the

(vii) Lack of provisions enabling Ghana to implement its regional fisheries management organization (ICCAT) obligations.

(viii) Lack of provisions to implement catch verification and certification for the export of fisheries products.

(ix) Inadequate satellite vessel monitoring system legislation, particularly tampering with monitoring device.

(x) Insufficient prosecution and judicial capacity to support fisheries law enforcement.

There are a number of improvements that are required in Ghana's fisheries management practice so as to

Secondly, the current laws on IUU focus more on the industrial fishing vessels. As a result, there

The United Nations Convention of the law of the sea resulted from the third United Nations

Legislation and implementation of UNCLOS and the Fish Stock Agreement

UNCLOS establishes varying degrees of rights and duties of States with respect to the conservation and management of fisheries resources in accordance with the maritime zone where such resources are located. UNCLOS provides for the determination of the allowable catch and the establishment of conservation measures on the basis of best scientific evidence available which maintains or restores populations of harvested species at levels which can produce the maximum sustainable yield, as qualified by relevant environmental and economic factors. This determination should take

record of fishing vessels entitled to fly its flag and authorized for use on the high seas, and to take such measures are necessary to ensure that all such vessels are entered on that record. It also provides for international cooperation, specifically exchange of information, port state cooperation, and for parties to enter into cooperative agreements or arrangements of mutual assistance on a

was approved by the FAO Conference at its Thirty-sixth Session on 22 November 2009. The objective of the Agreement is to prevent, deter and eliminate IUU fishing through the implementation of effective port State measures, and therefore ensuring the long-term conservation and sustainable use of living marine and ecosystems resources. The Port State Measures Agreement respects the sovereignty of Parties over their internal, archipelagic, and territorial waters or their sovereign rights over their continental shelf and in their EEZs. The agreement also allows Parties to exercise their sovereignty over ports in their territory in accordance with international law, including their right to deny entry thereto as well as to adopt more stringent port State measures than those provided for in the Agreement.

In addition, the FAO Code of Conduct for Responsible Fishing (COFI) was initiated in 1991[52].This legal framework was unanimously adopted on 31 October 1995. While the Code is voluntary in nature, parts of it were based on relevant rules of international law, including those in UNCLOS. Moreso, involving all persons concerned with the conservation of fishery resources and management and development of fisheries, such as fishers, and those engaged in processing and marketing of fish and fishery products. It also involves other users of the aquatic environment in relation to fisheries. This Code provides principles and standards applicable to the conservation, management and development of all fisheries resources. This covers the capture fishery, trade and processing of fish and its products. Moreso, fishing operations, aquaculture, fisheries research, and the integration of fisheries into coastal area management.

Within the framework of the Code of Conduct for Responsible Fisheries, four International Plans of Action (IPOAs) have been developed till date. First, the International Plan of Action for the Management of Fishing Capacity (IPOA-Capacity). The plan addresses the issue of excess fishing

[52] Food and Agricultural Organization; refer https://www.fao.org/3/v9878e/v9878e00.htm.

capacity. This problem contributes substantially to IUU fishing, overfishing, the degradation of marine fisheries resources, the decline of food production potential, and remarkable loss in economy. The objective of the IPOA-Capacity is for States and regional fisheries organizations, to achieve an efficient, equitable and transparent management of fishing capacity. In order to

fisheries should conduct an assessment of these fisheries to determine if a problem exists with respect to incidental catch of seabirds and adopt a National Plan of Action (NPOA) for reducing the incidental catch of seabirds in longline fisheries, in cases where it exists. It also stipulates that, States which determine that an NPOA is not necessary should review that decision on a regular basis, particularly reviewing the changes in their fisheries, such as the expansion of existing fisheries or the development of new longline fisheries. The IPOA-

sharks in non-directed fisheries. The IPOA-Sharks provides that States should carry out a regular assessment of the status of shark stocks to determine if there is a need for development of a shark plan. It provides that, States which implement the Shark-plan should regularly assess its implementation at least every four years for the purpose of identifying cost-effective strategies for increasing its effectiveness. In contrast, States which deem it not necessary to implement the shark plan must review that decision on a regular basis considering the changes in their fisheries, with data collection on catches of sharks, landings, and trade. Lastly, the International Plan of Action to Prevent, Deter, and Eliminate Illegal, Unreported and Unregulated Fishing (IPOA-IUU) was adopted by consensus at the Twenty-fourth Session of FAO Committee on Fisheries (COFI) on March 2, 2001.This was endorsed by the Hundred and Twentieth Session of the FAO Council on 23 June 2001. The objective of the IPOA-IUU is to provide measures to prevent, deter and eliminate IUU. This entails providing all States involved in fishing with comprehensive, effective, and transparent measures to combat IUU. This involves appropriate regional fisheries management organizations established in accordance with international law.

Section B: International legal framework and SDGs

There are a lot of international framework which has been initiated by regional organisations to combat IUU and piracy in West Africa. One of such is the Yaoundé code of conduct architecture. On June 25, 2013, 25 Heads of States of the Economic Community of West African States (ECOWAS), the Economic Community of Central African States (ECCAS) and the Gulf of Guinea Commission (GGC) gathered at Yaoundé, Cameroon to sign the Yaoundé Code of Conduct (YCOC). This is a comprehensive regional maritime security framework aimed at enhancing

cooperation and information sharing in the wider Gulf of Guinea. In principle, piracy and armed

fisheries resources are poorly managed. The declining in catches create incentives for illegal and unsustainable practices, which can range from fishing in closed areas to using illegal gears or even using forced labor at sea to offset declining revenue. The YCOC signatories agreed to share and report relevant information on maritime crimes, interdict ships and aircraft involved in illicit activity, investigate, and prosecute individuals suspected of carrying out illegal activities at sea, and provide adequate care for seafarers, fishers, and others who are victims of violent maritime crimes.

Ocean governance framework at the international level (RFMO's)

The code of conduct concerning the repression of piracy, armed robbery against ships, and illicit maritime activity in West and Central Africa (referred as the 2013 code of conduct, was developed between ECOWAS and ECCAS and the Gulf of Guinea Commission (GGC) with assistance with IMO, pursuant to the United Nations Security Council resolution 2018(2011) and 2037(2012)[55].They also expressed concern about the dangers that piracy and armed robbery at sea in the Gulf of Guinea pose to international navigation. In addition, it affects security and the economic development of states in the region. Article1 paragraph (5): defines trans organized crime in the maritime domain which includes but is not limited to any of the following acts committed at sea:(i) money laundering (ii) illegal arms and drug trafficking (iii) piracy and armed robbery at sea (iv) illegal oil bunkering (v) crude oil theft (vi) human trafficking (vii) human smuggling (viii) maritime pollution (ix) maritime pollution (x) IUU fishing etc. Under this Code of conduct, all signatories were to implement and develop as necessary; (a) Appropriate national maritime security policies to safeguard maritime trade form all unlawful acts (b) National legislation, practices,

and secure operation of port facilities and ships at all security levels and (b) Secondly, national legislation which will ensure successful protection of the marine environment.

The code of conduct gives the legal backing for any signatory to seize a pirate ship beyond the outer limit of any states territorial sea and

crime in the maritime domain, maritime terrorism, IUU fishing and other illegal activities at sea with a view towards; (i) sharing and reporting relevant information; (ii) interdicting ships or aircraft suspected of engaging in such illegal activities at sea (iii) ensuring that persons committing or attempting to commit illegal activities at sea are apprehended and prosecuted and (iv) facilitate proper care, treatment and repatriation for seafarers, fishermen, other shipboard personnel and passengers subject to illegal activities at sea, particularly those which have been subjected to violence.[56]

The code promotes regional cooperation and recognizes the sovereign equality, the territorial integrity of states and that non-intervention in the domestic affairs of other states. In addition, the successful implementation is executed to stimulate economic development in the countries that are party to it and develop sustainable fisheries sectors and promote the overall enhancement of West Africa Maritime sector.

SDG (e.g.,12,13,14) and its relevance to the blue economy of Ghana

The Sustainable Development Goals (SDGs) is interrelated with much relevance to the blue economy of Ghana. The (SDGs) were adopted by the United Nations in 2015[57] as a global action to end poverty, protect the earth and its natural resources and ensure that by 2030 all people regardless of race or color enjoy peace and prosperity. There are 17 SDGs which are incorporated. This encompass and recognizes that actions in one area affects the outcomes of others. Therefore, development must balance with respect to social, economic, and environmental sustainability. All countries have made an obligation to prioritize for the progress of those left behind in the SDG

[56] Code of Conduct Concerning the Repression of Piracy, Armed Robbery Against Ships, and Illicit Maritime Activity in West and Central Africa, 2013, available online: <http://www.cfr.org/piracy/code-conduct-concerning-repressionpiracy-armed-robbery-against-ships-illicit-maritime-activity-West-central-africa/p31200

[57] United Nation SDG goals, refer; https://sdgs.un.org/goals

goals. Furthermore, the SDGs are designed to end hunger, AIDS, and discrimination against women and girls. In addition, for creativity, knowledge, technology,

integrate sustainability information into their reporting cycle. As a result, all nations should ensure and promote public procurement practices that are sustainable in accordance with national policies and priorities. Also, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature. Moreso, supporting developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production. SDG 12 aims

(FCWC), Fishery Committee for the Eastern Central Atlantic (CECAF),(PESCAO), Ministerial Conference on Fisheries Cooperation Among African States Bordering the Atlantic (COMHAFAT-ATLAFCO) and Intergovernmental Organization for Marketing Information and Cooperation Services for Fishery Products in Africa (INFOPECHE).

The fisheries laws of Ghana seek to manage the resources of Ghana and for management purposes. It also gears towards the sustainability of the fisheries resources, so as to ensure that the resources are managed well for the future generations. In this regard, each government over the years have amended the fisheries laws based on recommendations from stakeholders and international organisations.

Ghana has made a significant progressed from enacting its fisheries laws even before the colonial era to the era of independence. The first of the conservation related laws was the PNDC Law 256 of 1991 which was passed to begin the process of tightening and streamlining licensing regimes in the fisheries sector. This was an effort to promote conservation of both the marine and inland fisheries resources. The fisheries Act 625 (2002), covered a wide range of issues as well as most aspect of international fisheries and environmental laws. Provisions in the Act was modeled around

Commission.

Chapter 1: Ghana fisheries laws on IUU and the shortfalls

The Fisheries (Amendment) Act, 2014, [60]

punitive measures associated with tempering with the monitoring devices when installed on a Ghana-flagged industrial vessel. This emboldened the fishermen or vessel operators to disable the device installed on the vessel when engaged in IUU fishing- related activities without being caught. Although Ghana now recognizes and prioritize the impact of IUU fishing on its depleting fish stocks, a lot more is needed to amend the Fisheries Act 625 of 2002 with new provisions.

(c) the fishing vessel has been used to fish in a closed area, during a closed season, without or after attainment of quota or beyond a closed depth.

(d) the owner, operator, character, or master of the fishing vessel has falsified documents relation to the fishing vessel.

(e) the fishing vessel has engaged in fishing a stock which is subject to moratorium or which fishing is prohibited.

(f) the fishing vessel used a prohibited or non- compliant fishing gear in their operation;

(g) the fishing vessel has a falsified or concealed its markings, identity, or registration;

(h) the owner, operator, character, or master of the fishing vessels has concealed, tampered with, or disposed of evidence relating to an investigation concerning the fishing activities of the fishing vessel.

(i) the owner, operator, character, or master of the fishing vessel for compliances with the applicable conservation and management measures or the work of observer in the exercise of duties under this Act.

(j) the fishing vessel has undertaken on board, transshipped, or landed undersize fish in contravention of this Act or Regulations made under this Act or the conditions of licences in force;

(k) the fishing vessel has engaged in operations that may be classified as IUU fishing under this Act or has engaged in transhipment with other fishing vessels that have been identified as having engaged in such activities.

(l) the fishing vessel has carried out fishing activities in the areas identified under a regional fisheries management organization in a manner inconsistent with or in contravention of the conservation and management of that organization and it’s flagged to a state not party to that organization, or not cooperating with that organization as established.

(m) the fishing vessels is used for fishing activity but has no nationality and is a stateless fishing vessel, in accordance with international law.

(n) the fishing vessel is engaged in a fishing activity with another fishing vessel which is on the IUU list or register of a regional fishing management organization; or the owner, operator, character, or master of the fishing vessel conducted business directly and Unregulated fishing including trading in or the importation of fishery products.

Furthermore, section (2) of the acts stipulates that: A person who takes an action of the activities identifying summary conviction as IUU fishing under subsection (1) commits an offence and its liable to:

(a) a fine of not less than one (1) million USconducted busine4(onduc)-5(ted)-127(busi40 G[(inci40 GF3 12 T7

(b) i

(j) the mounded depth of the vessel.

(k) the beam of the fishing vessel.

(l) the International Maritime Organization number of the fishing.

(m) a record of the gross registered tonnage of the fishing vessel;

(n) a record of the horsepower of the main engine of the fishing vessel.

(o) the description of navigation and position fixing equipment of the fishing vessel;

(p) the specifications of the vessel monitoring system on the fishing vessel,

(q) processing equipment on the fishing vessel if any and

(r) any other information that the commission may require for the purposes of registration and for giving effect to the international obligation to the Republic.

Furthermore, to this amendment, there is a statutory declaration regarding the IUU fishing history of the fishing vessel (Section 24B). In the case of a fishing vessel which has previously registered on another registry, the application under regulation 24A shall be accompanied by a statutory declaration signed by the owner, operator master or character declaring that;

(a) the fishing vessel's previous registry has not been removed.

(b) there are no outstanding or pending penalties from the flag state of that registry.

Also, under section 24E; the Commission shall cooperate with the authorities of any foreign state and regional fisheries management organization that the commission considers appropriate, in the investigation of alleged IUU fishing activities of a foreign vessel and a vessel flying of Ghana.

Possible gaps on fisheries management policies in Ghana

The Ghanaian fisheries have progress over the years from the pre-colonial era until the current dispensations. There are some few short comings of the fisheries management policies in Ghana. One of the major setbacks in the management policies is the lack of monitoring and evaluation.

Canadian fisheries resources play an important role in Canada, providing food and income for both Aboriginal and non-Aboriginal peoples. In 2003, about 115,000 people were engaged in the fisheries sector in Canada, and they landed 873,000 tonnes of fish in the Atlantic region and 218, 000 tonnes of fish in the Pacific region[65]. In 2003, the total value of the catch exceeded $2.9 billion. Canada ranked fifth in the world for exports of fish and seafood in 2003 with estimated exports of $4.5 billion. Canada has one of the world world's largest Exclusive Economic Zones (EEZ) equivalent to approximately 31 per cent of the country's land mass. Most of the industrial fishing vessels engage in offshore fisheries. In addressing the many threats to Canada's fisheries resources over such a vast area presents a serious challenge to the fisheries managers. Some of the key threats to the fish stocks within Canada's EEZ include:

(i) fishing for species under moratorium;

(ii) exceeding the allowable bycatch for species under moratoria;

(iii) exceeding quotas or the amount of fish that vessels are permitted to catch;

(iv) harvesting undersized fish;

(v) misreporting catches;

(vi) fishing in an area that has been closed to fishing; and

(vii) ineffective control by flag States over their vessels on the high seas.

The Canadian fishing industry has faced difficulties and changes for the past decade. Fisheries resources in Canada such as the ground fish and salmon stocks on the Atlantic coast have failed to recover from their low levels of the past decade. Pacific salmon stocks, although showing signs of improvement as a result of management measures introduced in the late 1990s, remain unrecovered. For better fisheries recovery, of these and other fish stocks, there is a need to

[65] Refer: https://www.dfo-mpo.gc.ca/npoa-pan/index-eng.html.

underscores the importance of effective conservation measures. There is also a demand for access to these stocks which continue to highlight the need to balance between harvesting the resource and protecting it to ensure its sustainability use.

On November 7, 2003, Canada sent its UNCLOS ratifi

legislative framework[66], identify examples of Canada's efforts to strengthen its fisheries policies. Moreso, Canada's legislative and regulatory framework is designed to:

(a) manage and protect fisheries resources in a biologically sustainable manner; and

(b) outline potential action to be taken, when necessary, to prevent destructive practices while continuing to seek effective international solutions. The following legislative tools are intended to help Canada achieve its goals for its fishery resources:

(i) the Department of Fisheries and Oceans Act;

(ii) the Oceans Act;

(iii) the Fisheries Act;

(iv) the Coastal Fisheries Protection Act; and

(v) the Species at Risk Act.

Furthermore, the Department of Fisheries and Oceans Act, establishes the powers, duties, and

coasts. Furthermore, in recognition of rights with respect to the Continental Shelf. It also covers Canada's right to harvest sedentary species in or on the Shelf, and the jurisdiction over the exploration and exploitation of minerals and non-living resources of the seabed and subsoil. Finally, the Oceans Act is a declaration of Canadian jurisdiction over its 12-nautical-mile Contiguous Zone, which extends from the outer of Canada's 12-nautical-mile Territorial Sea and its 200-nautical-mile EEZ.

and proponents would be required to submit plans for review if any activities are proposed within these areas. It is imperatives to know that there

vii) Authorizations Concerning Fish and Fish Habitat Protection (iv)Regulations (SOR/2019-286).

(viii) Ballast Water Regulations (SOR/2021-120).

(ix) Experimental Lakes Area Research Activities Regulations (SOR/2014-95).

Coastal Fisheries Protection Act (Section 18) and the Coastal Fisheries Protection Regulations specify the maximum penalty for foreign vessels. There is no distinction depending on the vessel's country of origin. Examples of maximum penalties are:

(i) fishing

In addition, Part VI section 44 of the Canadian fisheries regulation, SOR/93-53[69] gives guidelines for assisting a fisheries officer for landings of catch by vessels: In Section 44; it provides the following suggestions for helping a fisheries officer: According to Section 44, a fishing vessel's master must offer any reasonable aid to a fishery officer or fishery guardian, such as:

(a) if an inspector requests to board the vessel, permission; must be granted by the master of the vessel and

(b) Upon request, give the inspector any and all assistance that is deemed appropriate to enable the inspector to conduct an inspection of the fishing operations, such as;

(i) the fishing gear used by the vessel must be available for inspection and for that purpose hauling in such gear and thawing the nets, where necessary,

(ii) permitting of photographs by fisheries officers during the fisheries operations. Including fishing gear and equipment's, and

(iii) where the inspector is on board for more than four consecutive hours, there must be provision of food and accommodation equivalent to that provided to officers of the vessel.

In (2.1) of the regulation, where an inspector sends the Signal SQ 3 to a fishing vessel, no person on board that vessel shall retrieve any gear from the water. This is within the period of 30 minutes after the signal is sent.

Also in (3) , during an inspection in the regulatory area, if an inspector finds any fishing gear or

Moreso in (4), no person other than a fishery officer shall remove a mark or seal placed on any fishing gear or equipment in accordance with subsection (3). Furthermore, in (5) where a mark or seal has been placed on any fishing gear or equipment in accordance with subsection (3), no person shall:

(a) alter or tamper with that mark or seal; also

(b) not destroy or dispose any fishing gear or equipment unless the mark or seal has been removed by a fishery officer.

Furthermore, the fisheries laws make provisions for monitoring activities under 46 (1) (SOR/95-242). This involves the use of observers onboard the vessel. However, this section does not apply with respect to foreign fishing vessel. In (2), fishing vessel owner or master at the request of the Regional Director-General shall;

(a) Allow an observer who has been given the responsibilities outlined in paragraph 39(2)(a) to board the vessel, perform those responsibilities, and stay there for the time period provided in the request; and

(b) also make arrangements for the observer's boarding or disembarkation at the time and location indicated in the request.

Additionally, under (3), the master of a fishing vessel shall offer an observer assigned the responsibilities outlined in paragraph 39(2)(a), all the necessary assistance, including:

(a) providing a comfortable workspace with a and sufficient lighting;

(b) supplying any information regarding any item described in subsection 61(2) of the Act at the observer's request;

(c) providing, at the request of the observer, the geographical position of the vessel in terms of latitude and longitude;

(b) provide the observer the necessary reasonably assistance to enable the observer to perform those duties, including;

(i) making available the fish at the landing station readily accessible to the observer,

(ii) providing the observer with a suitable work area,

(iii) permitting a scientific observer to remove a whole fish or portions of fish from the fish landing station free of charge for in accordance with his duty.

Moreso, the fisheries laws make provisions for embarking and disembarking assistance. Under Section 49, a fishery officer, fishery guardian, inspector or observer has to climb up or down more than 1.2 m to embark or disembark from a fishing vessel. In sections 4 to 16 of the Pilot Ladder Regulations apply to the master of the fishing vessel, with such modifications as the circumstances may require.

Furthermore, PART VII of the general fisheries regulation makes provision for fishing for experimental, scientific, educational, aquatic invasive species control or public display purposes. In addition, in section 50, defines licences as a means to fish for experimental, scientific, educational, aquatic invasive species control or public display purposes. Also, in section 51, no person shall fish for experimental, scientific, educational, aquatic invasive species control or public display purposes unless authorized to do so under a licence. Additionally, if fishing is being done for experimental, scientific, educational, or aquatic invasive species control, the Minister may issue a licences under Sections 52, and any requirements of any of the regulations specified in subsection 3(4). Moreover, using exhibits for the general public would be consistent with the correct management and control of fisheries.

Finally, Part VIII includes provisions for "licence" for live fish transfer to a fish rearing facility and release into fish habitat. Section 54 provides the interpretation. In this section, the term

"licence" refers to a permit allowing the discharge of live fish into fish habitat or the transfer of live fish to a facility for fish rearing.

Also, Section 55(1) states that no one shall, unless expressly permitted by a licence, save as provided in subsection (2);

(a) release live fish into any fishery habitat or grounds; or

(b) transfer any live fish to any fish breeding facility.

Additionally, (2) Subsection (A) does not apply to fish that is immediately returned to the waters from whence it was taken. Furthermore, in section 56 the Minister may issue a licence if;

(a) the fish would be released or transferred in accordance with the correct management and control of fisheries;

(b) the fish are free of any illness or disease agent that can compromise fish protection and conservation; and

(c) the genetic makeup of fish or the size of fish stocks will not be negatively impacted by the release or transfer of the fish.

Review of fisheries management policies in Canada

The Canadian government have several fisheries management policies implemented to safeguard the fisheries of its oceans: Some of the policies showing Canadas commitment to the precautionary approach and principles of ecosystem-based fisheries management[70] include:

(i) Fishery Monitoring Policy.

(ii) Introduction to the procedural steps for implementing the Fishery Monitoring Policy.

(iii) Policy on Managing Bycatch.

(iv) Guidance on Implementation of the Policy on Managing Bycatch.

[70] https://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/overview-cadre-eng.htm

(v) Policy for Managing the Impacts of Fishing on Sensitive Benthic Areas.

(vi) Policy on New Fisheries for Forage Species.

Other conservation and sustainable policies include: the Wild Salmon Policy (Pacific) and the Conservation of Wild Atlantic Salmon.

Furthermore, there are planning and monitoring tools applied to ensure sustainable of the fisheries resources. Some of the policies tools used fisheries management include:

(i) Sustainability survey for fisheries.

(ii) Integrated fisheries management plans.

(iii) Application of the sustainable fisheries framework through the integrated fisheries management planning process.

(iv) Sustainable fisheries framework work plan.

There are other policies concerning commercial fishing which are:

(i) A Guide to the Atlantic fisheries licence appeal process.

(ii) Atlantic sharing arrangements.

(iii) Canadian code of conduct for responsible fishing operations (1998).

(iv) Commercial fisheries licensing policy for eastern Canada.

(v) Commercial fisheries licensing policy for the Gulf Region.

(vi) Commercial fisheries licensing policy for the Maritimes Region.

(vii) Commercial fisheries licensing policy for Newfoundland and Labrador Region.

(vJETt54.38 23 12 Tf1 0 0 1 72.024 211.97 Tm00.95 27.6 ref*EMC /P <</MCID 64>BDC q0.00000912 0 61C1

(xi) Policy on issuing licences to companies (for Canada's Inshore Atlantic Fisheries).

(xii)

Another significant policy is the Atlantic Fisheries Policy Review (AFPR)[71] with the objective to modernize fisheries policy framework. This will ensure governance and management of the Atlantic fisheries.

This framework provides policy direction for the management of fisheries on the Atlantic coast over the long term. Although the objective of the document is on commercial harvesting. In the AFPR Phase II, Fisheries and Oceans Canada will continue to pursue excellence in fisheries science and stock assessment. It will also implement objectives-based management consistent with the comprehensive risk management framework. Specific actions include:

(i) adopting new and more cost-effective strategies to determine stock and ecosystem status, including increased use of traditional knowledge, and expanded opportunities for collaboration between government scientists and the fishing industry.

decisions. Canada participates in seven regional fisheries management groups[72]. Additionally, Canadian is also a member of numerous bilateral agreements including:

(i) Pacific Salmon Commission (PSC) – Canada-US.

(ii) International Pacific Halibut Commission (IPHC) – Canada-US

Marine Fisheries Service of the United States of America, 30 percent of the stocks in that nation's oceans were overfished. In the waters of the European Community, it was estimated that in 1990, 57% of the stocks were ‘heavily exploited’. Therefore, it is likely that fish stocks throughout the rest of the globe are likely to be in a similar condition.

The FAO Code of Conduct for Responsible Fisheries was produced in response to global concern with the issues of over-exploitation of fish stocks. In addition, to recommend new approaches to fisheries management which included conservation, environmental, social, and economic considerations. This was developed by the FAO and approved as a voluntary instrument at the 28th Session FAO Conference in October 1995.

The code of conduct has six thematic articles in addition to the one general principle and five introductory articles.

This includes Fisheries Management, Fishing Operations, Aquaculture Development, Integration of Fisheries into Coastal Area Management, Post-Harvest Practices and Trade, and Fisheries Research. Overall, it combines the important factors in responsible fishing and offers advice on how to deal with them to ensure sustainable fishing. A number of Technical Guidelines on various facets of the Code have also been issued by FAO. Additionally, the FAO Technical Guidelines for Responsible Fisheries No. 4: and Fisheries Management, which focuses on Article 7, of the Fisheries Management of the Code, are among the Technical Guidelines.

The following Technical Guidelines had been produced as follow up to the Guidebook in 2001:

(i) No. 1 Fishing Operations.

(ii) No. 1, Suppl.1 Fishing Operations and Vessel Monitoring System.

(iii) No. 2 Precautionary approach to capture fisheries (marine fishery) and species introductions.

(iv) No. 3 Integration of fisheries into coastal area management.

(v) UN Fish Stocks Agreement (1995). (6) The Code of Conduct for Responsible Fisheries (1995).

(vi) The International Plan of Action for the Management of Fishing Capacity (IPOA-Capacity) (1999).

(vii) The International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries (1999).

(viii) The International Plan of Action for the Conservation and Management of Sharks (1999).

(ix) The International Plan of Action on Illegal, Unregulated and Unreported fishing, 2001.

(x) FAO Port State Measures Agreement, 2009.

(xi) Convention on International Trade in Endangered Species of Wild Fauna and Flora (1973).

(xii) Voluntary Guidelines for Flag State Performance (2014).

(xiv) Voluntary Guidelines on Catch Documentation Schemes (15) IUU fishing guidelines on methodologies for estimating IUU catches (2016).

It is also recommended that these laws be implemented into national fisheries legislation so that the international effort can be legally coordinated amongst the international community, civil society, and RFMOs. The international response to IUU fishing has been greatly aided by cooperation between countries and international organizations. The focus of this cooperation has been on MCS operations, scientific information gathering, and data sharing. The Joint FAO/IMO Ad Hoc Working Group[75] on IUU Fishing, meetings of other international organisations like the ILO, WTO, and UNODC, as well as expert meetings of the International Monitoring, Control and Surveillance (IMCS) Network, are just a few of the partnerships and collaborations in which the FAO, a significant part of the UN system, actively participates. The FAO has created the Global

[75] See the FAO regional workshop on the elaboration of national plans of action to prevent, deter and eliminate illegal, unreported, and unregulated fishing – certain countries of the near East Region (2005). FAO Fisheries Report No. 793

Data and Information Sharing Framework. In addition, the records of fishing vessels, refrigerated transport vessels, and supply vessels. The purpose of this coordinated global initiative is to compare data quickly and precisely from one source with another by making information on vessel identification and other pertinent data available. Furthermore, this programme enhances data distribution, traceability, and transparency about international fishing vessels and their operations. The United Nations General Assembly (UNGA) passed a resolution designating June 5, as World IUU Fishing Day in an effort by the international community to raise public awareness of the dangers and devastation caused by IUU fishing. The Food and Agriculture Organization served as the lead organisation for the first which was observed in 2018. The date was chosen because the FAO Port State Measures Agreement and the first international convention intended to prevent illegal fishing both went into force on June 5, 2016[76].

Best fishing practices

For best fishing practices at the global level, the UN and the FAO have enacted several policies concerning input and output controls, as well as technical (operational regulations) for the purpose of conservation and management of fish stocks.

There are guiding principles of UNFSA, which ensures precautionary approach, conservation, and management measures[77] which are established and give the necessary requirement to:

(a) adopt measures for long-term sustainability.

(b) ensure that certain actions are based on the most up-to-date scientific data and intended to maintain or restore stocks at levels capable of delivering the highest possible sustainable yield.

[76] FAO (N. F. General fisheries commission for the Mediterranean. http://www.fao.org/gfcm/news/detail/en/c/1096102/

[77]

(c) apply the precautionary approach.

(d) evaluate how fishing affects target populations and with species belonging to the same ecosystem.

(e) adopt conservation and management measures for species belonging to the same ecosystem.

(f) protect marine biodiversity.

(g) ensure that levels of fishing capacity and fishing effort do not exceed those commensurate with the sustainable use of fishery resources.

(h) additionally, gather timely, accurate, and complete information about fishing activity.

(i) promote and carry out scientific research as additional measures which contribute to conservation and management; and

(j) implement and enforce additional conservation and management measures through efficient surveillance, control, and monitoring.

Additionally, UNFSA provides the guidance on how to adopt conservation and management measures through these principles:

(a) Management shall be more cautious when information is uncertain, unreliable, or inadequate.

(b) Precautionary target and limit reference points shall be established for stocks. Moreso, fishery management plans must make sure that the possibility of exceeding a limit is very negligible.

(c) When reference points are approached, they will not be exceeded; and if they are exceeded, there will be action without delay to restore the stocks.

(d) New or exploratory fisheries shall use cautious conservation and management measures until there are sufficient data to allow the identification of measures for the long-term sustainability and gradual development of the fisheries.

(e) If natural phenomena have a significant adverse impact on the stocks, conservation and management measures shall be adopted to ensure that fishing activity does not exacerbate that impact.

(f) It will be ensured that fisheries do not have a harmful impact on living marine resources as a whole.

Fisheries management control measures

There are inputs and output controls which can be adopted to ensure best fishing practices and ensure sustainable use of fisheries resources. Input controls are restrictions[78] put in place with regards to

Aggregating Device (FAD) for tuna fishery as implemented by The International Commission for the Conservation of Atlantic Tuna (ICCAT). Other input control includes;

(i) restriction on the number of vessel.

(ii) restriction the tonnage of vessel.

(iii) restriction the operating period.

(iii) restriction on engine power of vessels.

In contrast, output controls are specific restrictions on the quantity of fish that can be caught from a fishery. This includes finfish and shellfishes. Furthermore, it includes any qualitative restrictions on the various categories of the catch. The forms of output control are limits placed upon the tonnage of fish or the number of fish that may be caught from a fishery in a period of time e.g., Total Allowable Catches (TAC)[79]; in reality, usually total allowable landings, Individual Quota (IQ) system and trip limits. Another form of output control is the restrictions of the number of fish that may be landed in a day as used in many recreational fishing. In addition, limiting bycatch can also be seen as an output control. Additionally, Individual Quota (IQ) ensure fisheries management and sustainability. In principle, output controls also refer to the limits placed upon other vital supplies of fishing such as the amount permitted catch. In addition, Total Allowable Catch (TAC) is another form of catch management practices to ensure proper fisheries management. After establishing a total allowable catch (TAC), it is necessary to manage the fishery to prevent it from overexploitation. A number of approaches are possible, which include:

(i) free fishing until the TAC is reached and then the fishery is closed;

[79] A. K. Morison: Management and Ecological Note Input and output controls in fisheries management: a plea for more consistency in terminology. Fisheries Management and Ecology, 2004, 11, 411–413

(ii) allocating catch by period and then shutting down the fishery for the remainder of each period when the allocation is caught;

(iii) distributing portions of the TAC to different sectors, then allowing them to handle their own shares independently.

(v) allocating sections of the TAC to people or specific vessels.

Another best practices to endure fisheries management is technical control (operational regulations). Some examples of technical control include:

(i) fishing gear regulations or catch size.

(ii) measures to prohibit during spawning seasons.

(iii) establishment of protected areas around spawning sites.

(iv) closed season,

(v) limit on licence.

These are multiple strategies to control fishing effort. These are measures or catch management methods. Additionally, it is common for countries to require a license for fishing vessels before operation. In cases where they fish on the high seas, the UN Fish Stocks Agreement (Article 18) requires that the Flag State control its vessels through licences, authorizations or permits. However, typically such simple registration methods are not necessarily intended to limit the number of vessels but for records. Which in turn is useful in terms of statistics. Restrictive licensing scheme ensures limit the total number of vessels engaging in a particular fishery together with their fishing power. Therefore, in order to reduce resistance to restrictive schemes, licensing lists are initially inclusive. This include all fishing vessels which are registered and engage in fishing operation.

addition, instead of having a general policy which covers all aspect of the fisheries, policy makers can focus on e.g.,

(i) monitorial policy to control discards and bycatch.

(ii) policy to regulates mesh size.

(iii) a policy to control and prevent light fishing.

(iv) a policy to control and deter the use of chemical used in fishing.

(v) a policy to manage small pelagics such as *Sardinella sp*.

(vii) a policy to control and prevent IUU (Saiko fishing).

(viii) a policy to control and prevent transshipment.

These exemplary policies will ensure that specific problems of the sectors are tackled and monitored through the monitoring and control unit of the Fisheries Commission.

Strategies to strengthen the laws and policies.

There are several strategies Ghana can be adopted to strengthen the laws and policies on fisheries management. This means incorporating the laws and regulations as stipulated in the international regulations to ensure that these are implemented in the fisheries laws of Ghana. As it stands, Ghana has several international laws that need to be enacted in its fisheries laws. Examples of these are the inputs and output controls as discussed. In addition, catch size regulations, reduction of fishing efforts, engine size regulation. These inputs and output regulations will ensure that sustainability of the resources. Furthermore, Ghana could learn from the Canada experience with the adoption of regulations on by catch and discards.

To be able to strengthen the fisheries laws and regulations in Ghana, these new regulations need to be incorporated to make it wholistic so that every aspect of the IUU fishing is tackled.

initially documented. This was because the Monitoring and Evaluation Division were not resourced enough to ensure completion of the management policy. The timely intervention could have brought the policy into fruition.

Strategies to deter IUU fishing and sustainable ways to harness the blue economy of Ghana.

Apart from the stricter laws to curb the IUU fishing, Ghana can only get the breakthrough in the fight against IUU if there is no political influence. Especially, when it comes to court and arbitration cases involving vessels engaging in IUU. There have been several court cases involving IUU that went into arbitration and did not yield the requisite outcome. This is because, as the cases progress, there are political influences from top government officials which affects the outcome of decisions. As a results, IUU fishing cases under die out prematurely. For Ghana to make headway in the fight against IUU fishing, the arbitration option which the law stipulate should be amended. This is because most of the out-court settlement cases have not yielded any result. Most of the fines were not paid due to political interference. In my opinion a competent court of jurisdiction should be made to preside over such cases and the final judgement made. This is because the arbitration option has not yielded any meaningful results to recoup fines from offenders into the Government of Ghana consolidated fund.

Another strategy to deter IUU fishing is the strengthening and resourcing the MSC Division of the Fisheries Commission. This includes capacity building and provision of logistics. With constant monitoring of the coast which could be done through aerial or patrol vessel and the activity of VMS, and AIS. This will make it difficult for fishermen to engage in IUU. This could be achieved through resourcing the MSC Division of the Commission. If the Government of Ghana makes it a priority to fight IUU fishing as stipulated by the international bodies, then there is a need to channel resources in areas of monitoring and control and well as surveillance. This is because the

Nation losses a lot of money through IUU activities. Those monies could have been used for

(ii) The development of new economic sectors based on existing marine resources (for example marine based aquaculture, offshore petroleum and marine biotechnology creating products and processes).

(iii) More effective sectoral cooperation, the deployment of protective measures, increased use of surveillance and enforcement mechanisms, and other measures will result in stronger protection for ocean spaces and resources.

The blue economy policy will facilitate research, innovation,

Integrated cross-sectoral spatial planning, which includes coastal zone management, would be in place for all ocean users at the national level, therefore;

(i) Optimisation of and sustaining revenues derived from fisheries and fisheries related products;

(ii) Established and increasing sustainable use of bio-resources, including biotechnology (bioprospecting, access, and benefit sharing) and marine ecosystem services.

(iii) Greater production and utilisation of renewable energy from the ocean would occur and renewable energy strategies would be engaged in development initiatives/activities.

(iv) Disaster risk management practices and adaptation planning would be in place for rising sea levels and foreseeable climate change impacts.

(iv) Increased marine domain awareness would boost offshore water surveillance, and existing rules would be strictly implemented.

(v) Also “blue” tourism destination would be used to promote the nations comparative advantage in this sector.

(vi) Knowledge generation and collaboration will be facilitated to assist with capacity development and enhanced/informed/joint decision making.

The Ghana Government need to play a leading role in promoting the Blue Economy concept nationally, regionally, and internationally.

Another, significant recommendation is the drafting of maritime security policy for Ghana. Oceanic and coastal waters are affected by marine and terrestrial activities. The beaches and ocean waters are impacted by land-based pollution, shipping, intensive fishing, and development. Maritime security is a general term for the protection of vessels both internally and externally in the maritime domain. The sectors from which maritime operations need protecting includes; terrorism, piracy, robbery, illegal trafficking of goods and people, illegal fishing, and oil pollution.

Therefore, maritime security policy is needed by the nation Ghana. Although there is maritime security Act, 2011, Acts (824)[82].There exist no maritime security policy for the nation. The maritime security policy will be one of the strategic ways to combat piracy and armed robbery attacks on vessels in Ghanaian maritime domain. The Multinational Maritime Coordination Centre (MMDC) Zone F has been doing their best in instances of monitoring the maritime domain for vessels engaging in IUU and piracy as well as armed robbery. The maritime security policy will foster their operation and collaboration with other inter-governmental agencies. The maritime security policy will ensure that threats such as piracy and arm robbery, smuggling, stowaway and illegal immigration, safeguarding ships in conflicted water, Terrorist attacks, Environmental disasters are tackled through the policy framework.

Presently there exist no maritime security policy for Ghana. For effective response to the maritime security related this policy is very essential. In addition, response to maritime disasters such as oil spill or pollution. The policy framework will determine which government sector is responsible to act in terms of specific maritime security related issues. For example, the policy will stipulate which governmental agency is respond in case involving oil pollution, piracy, and arm robbery.

In Addition, maritime security policy will give the legal framework as well as the working documents for stakeholders to be able to achieve the set targets.

Furthermore, to be able to combat IUU fishing, there is a need to incorporate within the Ghana's fisheries laws, the legal frameworks formulated in the FAO, IPOA document. This will strengthen the fisheries laws.

Additionally, i

In addition, the fisheries laws need amendment to incorporate the recent FAO legal instruments such as the Legal Frameworks for Sustainable Fisheries and Aquaculture[83].

There is a need for a more comprehensive and practical national legal framework. This will drive needed change and pragmatic approaches towards sustainable resource management. This will ensure livelihoods for the local people. In addition, achieving food security and nutrition and poverty alleviation. This is vital for global concerns for inter alia:

(i) ensuring sustainable use and conservation of biodiversity within and beyond areas of national jurisdiction;

(ii) securing sustainable marine and inland fisheries including small scale fisheries (SSF);

(iii) promoting sustainable aquaculture including ensuring biosecurity;

(iv) addressing illegal, unreported and regulated (IUU) fishing;

(v) removing harmful subsidies in fisheries;

(vi) promotion of the ecosystem approach to fisheries (EAF);

(vii) securing safe and fair conditions of work for fishers and fish workers;

(viii) ensuring fish food safety; and,

(ix) promoting responsible, legal, traceable, and sustainable trade in fish and fishery products.

In addition, to ensure proper prosecution of offenders, the government must priorities in training more lawyers and judges in fisheries and maritime law. Also, the out of court settlements in the fisheries laws has not yielded any good results. This is because of political influence during the arbitration process**.** Therefore, that section of the law should be amended, if there are competent lawyers and Judges who can preside over those cases involving IUU fishing in court.

Furthermore, Fisheries Enforcement Unit (FEU), the Ghana Marine police should be equipped

[83]FAO; Legal Frameworks for Sustainable Fisheries and Aquaculture. Committee on fishers 34TH Session. February 2021.

with the necessary logistics to combat IUU. In recent times, the Ghana government purchased vessels for monitoring our coast. This is a step in the right direction. However, more prioritization of the maritime domain should be at the centre of government agenda. Since this will ensure the sustainability of the marine resources. The FEU have made efforts to prevent, deter and eliminate IUU fishing but have achieved little due to lots of mitigating factors. Furthermore, the personnel of the FEU should be resourced logistically and motivated to fully combat IUU fishing in the various coastal communities in Ghana.

Another strategic plan to harness the full potential of the fisheries sector and the blue economy of Ghana is the involvement of civil societies and stake holders in educational campaign. One nongovernmental organization (NGO) spear heading this is the 'HEAN MPOANO' a local NGO in Ghana. To ensure that coastal communities understand the value of the ocean and its fisheries resources, more work must be done. Especially, to stop IUU fishing such as Saiko. The educational campaign can be done through seminars. The government should also start a civic educational campaign through the media and local radio stations to create awareness of the dangers of depleted fisheries resources due to IUU fishing.

Furthermore, the MSC Division should be fully resourced with VMS and constant provision of internet for 24hr surveillance of Ghana maritime domain (EEZ). In the year 2021, there were instances where[(inst)-4(a)4(nc)4(e)4(s)19(whe)6(r)-6(e)] TJETQq0.0000Fq01 k.00002.024 60 1 200.69 681.21

instances where

farming, salt production etc. This will provide alternative livelihood and lessen the pressure on the fish stocks. Moreso, fishmongers should also be trained on alternative livelihood such as cloth making, soap making to help especially during the closed season period. This will ensure that there is alternative income during closed season.

In conclusion, the nation Ghana has the full potential of its blue economy especially the fisheries sector of if these recommendations will be put into good use.

Annexes :

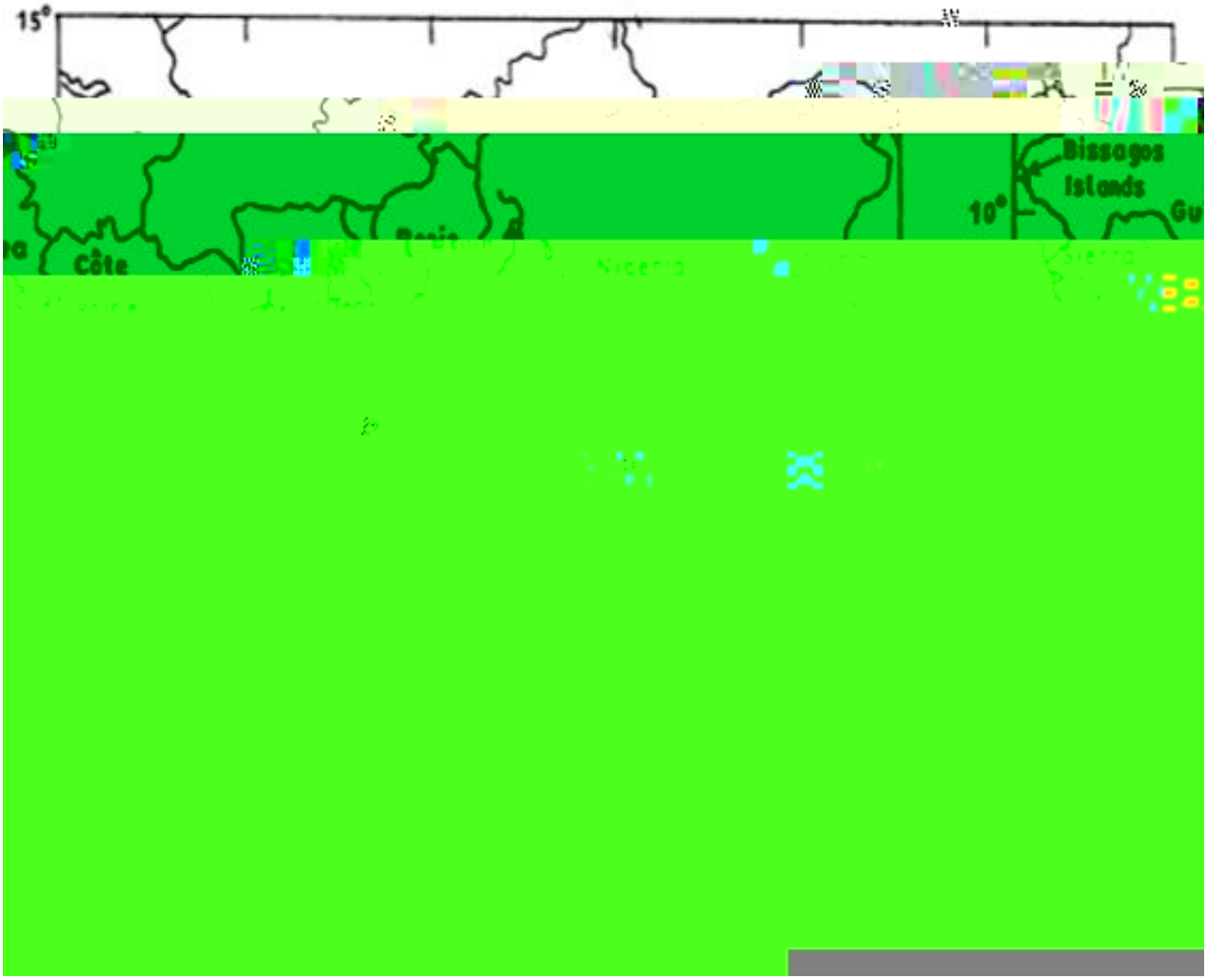

Fig.1 Map of West Africa showing Ghana (Neokye et all., 2021).

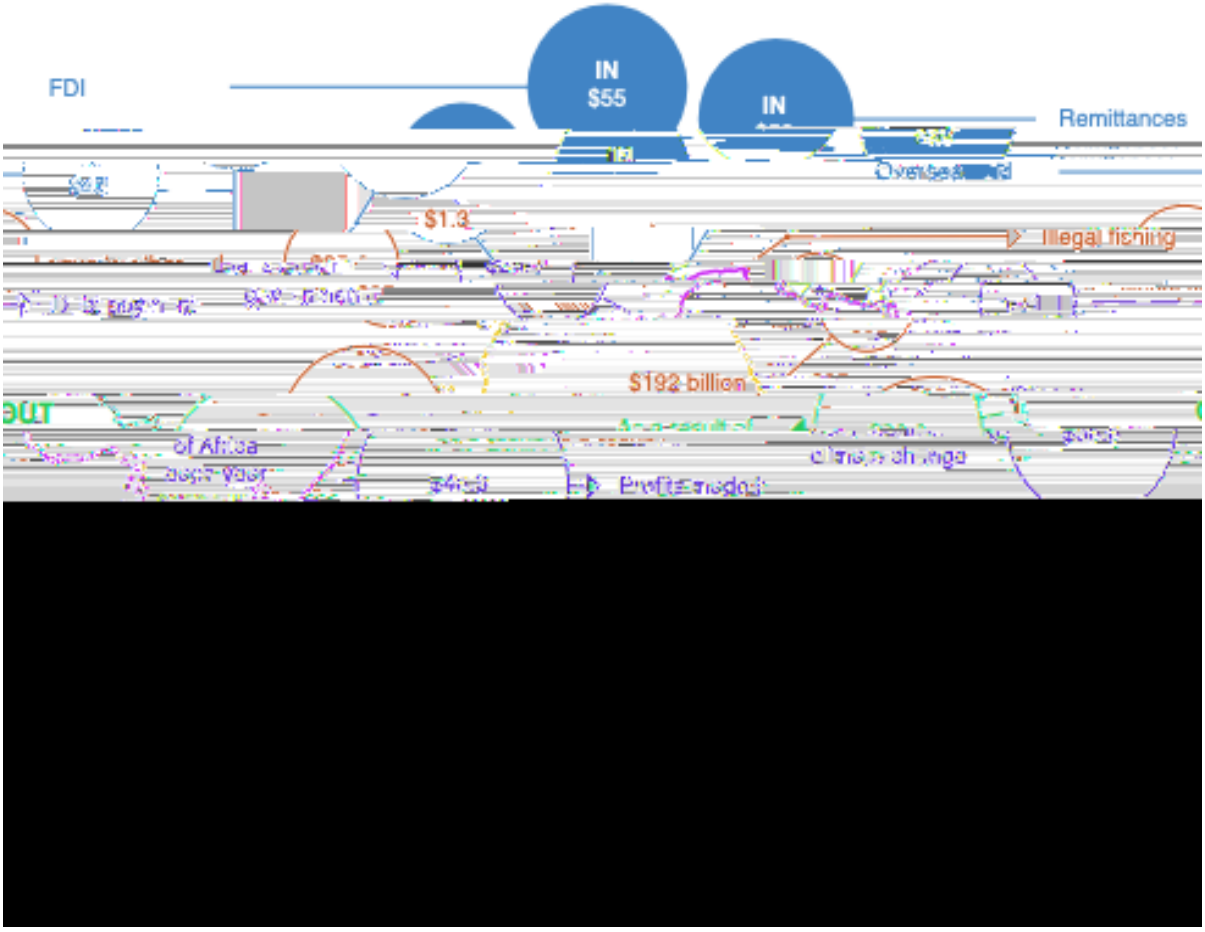

Fig.2 Financial resources into and out of Africa in reference to foreign direct investment (FDI), international assistance, and remittances (2010). (Sources : KPMG, World Bank, BBC (17/4/13).

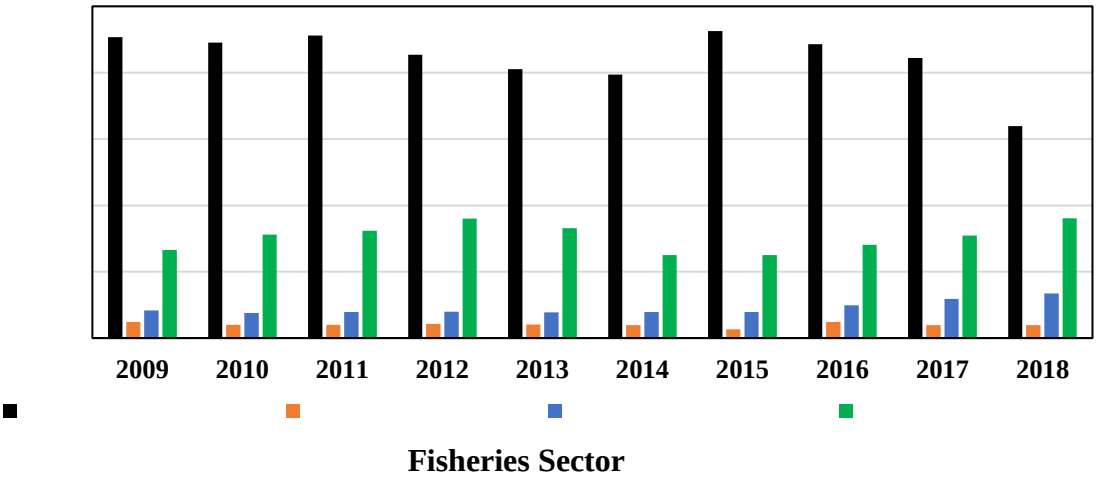

Fig.3 A graph of Marine sector fisheries production in Ghana from 2009-2018. (Source : Fisheries Scientific Survey Division, FC, Ghana).

Fig.4 A graph of inter annual Inland fisheries production in Ghana from 2013 - 2018. (Source : Fisheries Scientific Survey Division, FC, Ghana).

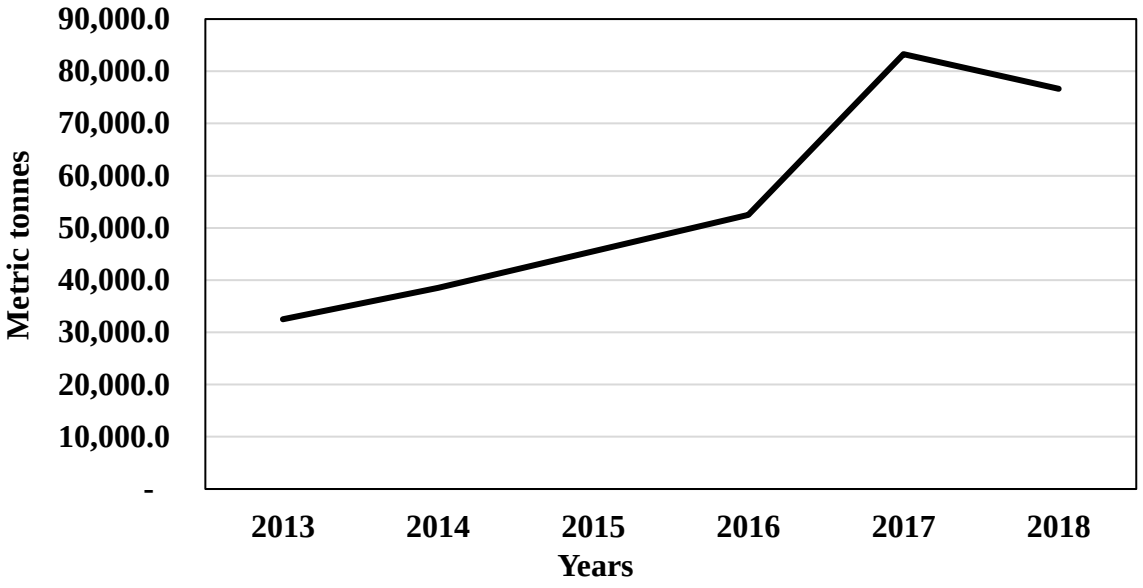

Fig.5 A graph of aquaculture(ponds/reservoirs) production in Ghana from 2013 to 2018. (Source : Fisheries Scientific Survey Division, FC, Ghana).

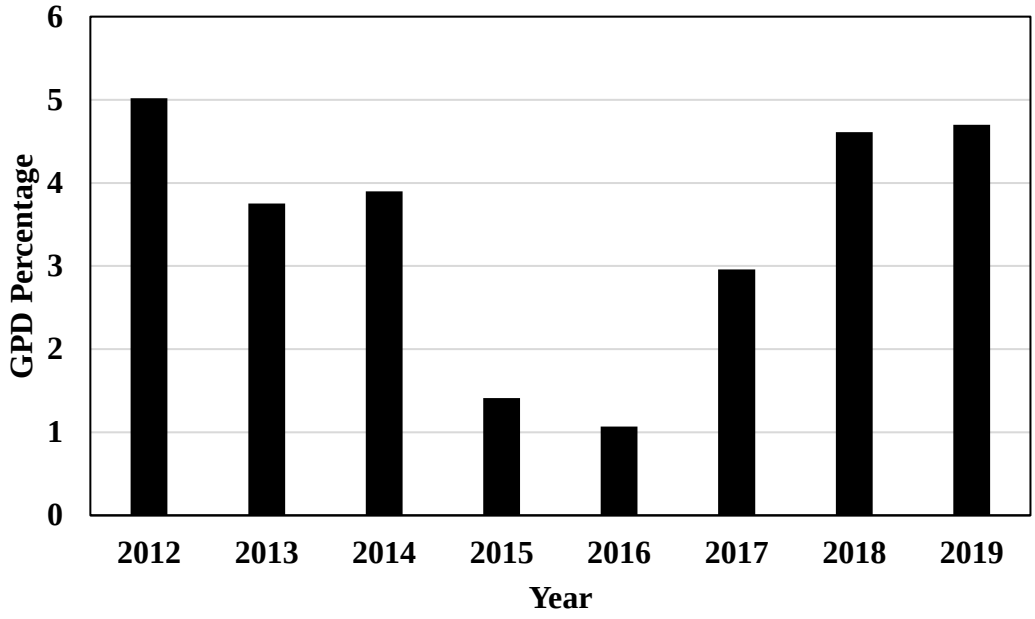

Fig.6 Percentage contribution of offshore oïl to the GDP of Ghana. (Source ; the world Bank).

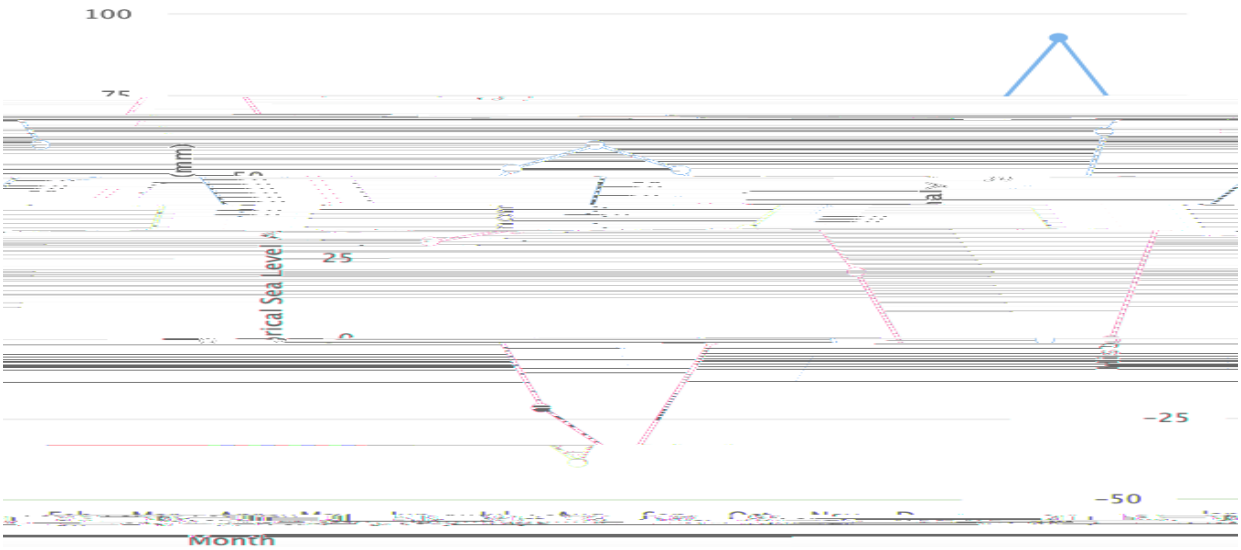

Fig.7 (a) Historical Seal level for coastal Ghana from 1993-2015 ; observed anomalies relative to mean 1993-2012 (Source : World Bank report 2021).

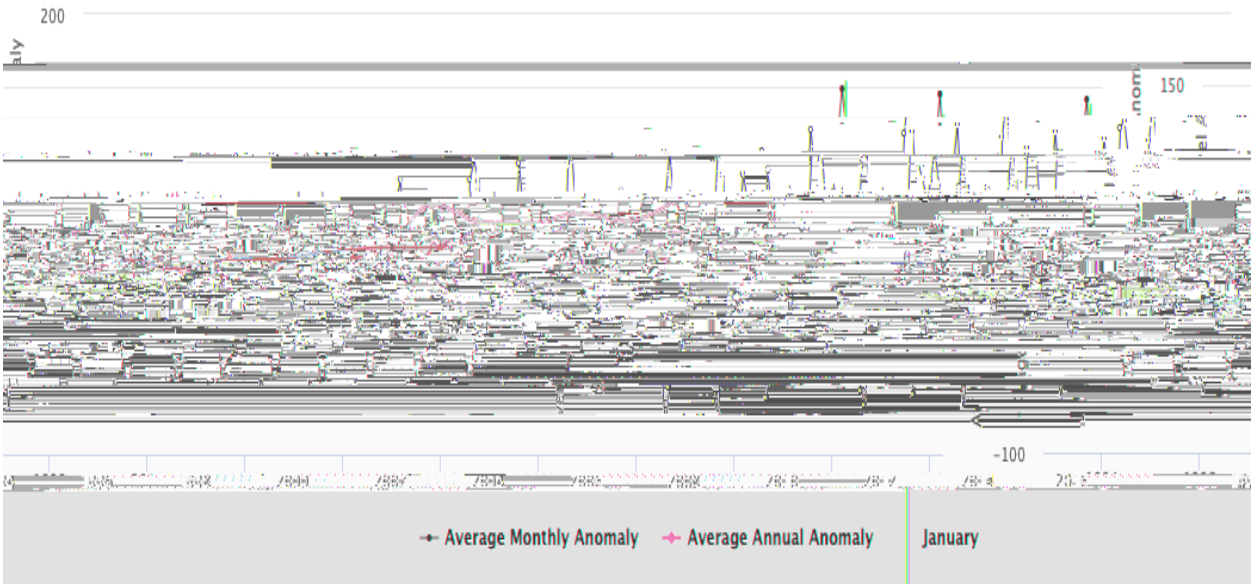

Fig.7 (b) Historical Seal level for coastal Ghana from 1993-2015 ; observed anomalies relative to mean 1993-2012 (Source : World Bank report 2021).

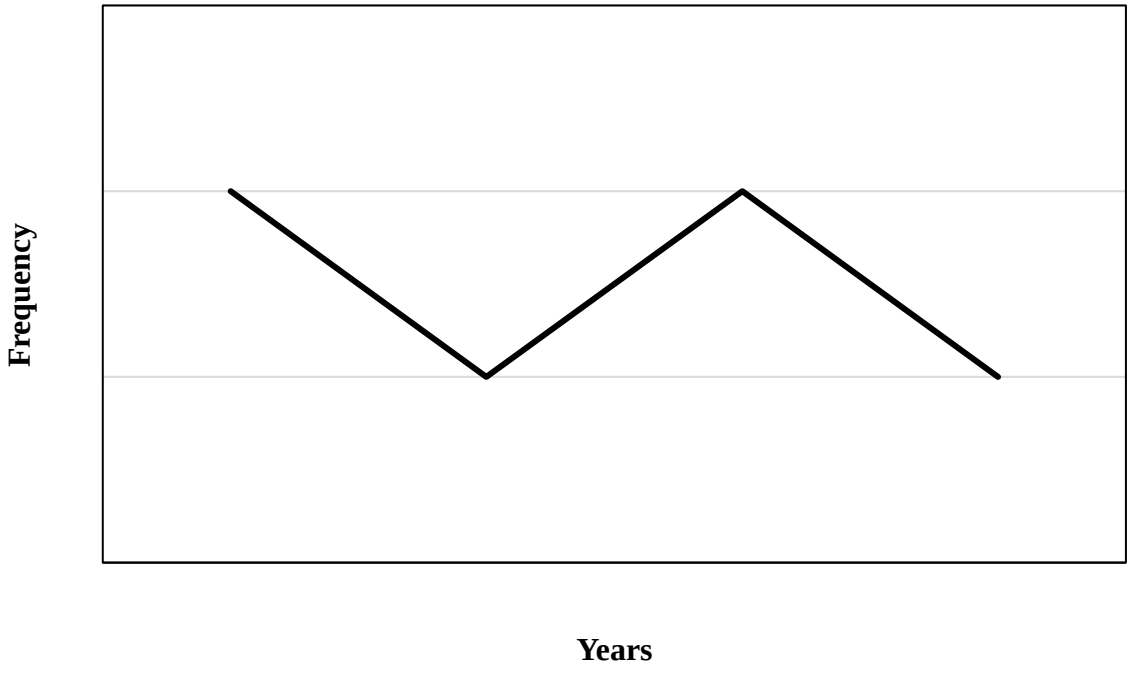

Fig.10 A graph of infractions of fishing with under size mesh from 2015 2018. (Sources : Monitoring, Control and Surveillance Division, F.C Ghana. (MCSD).

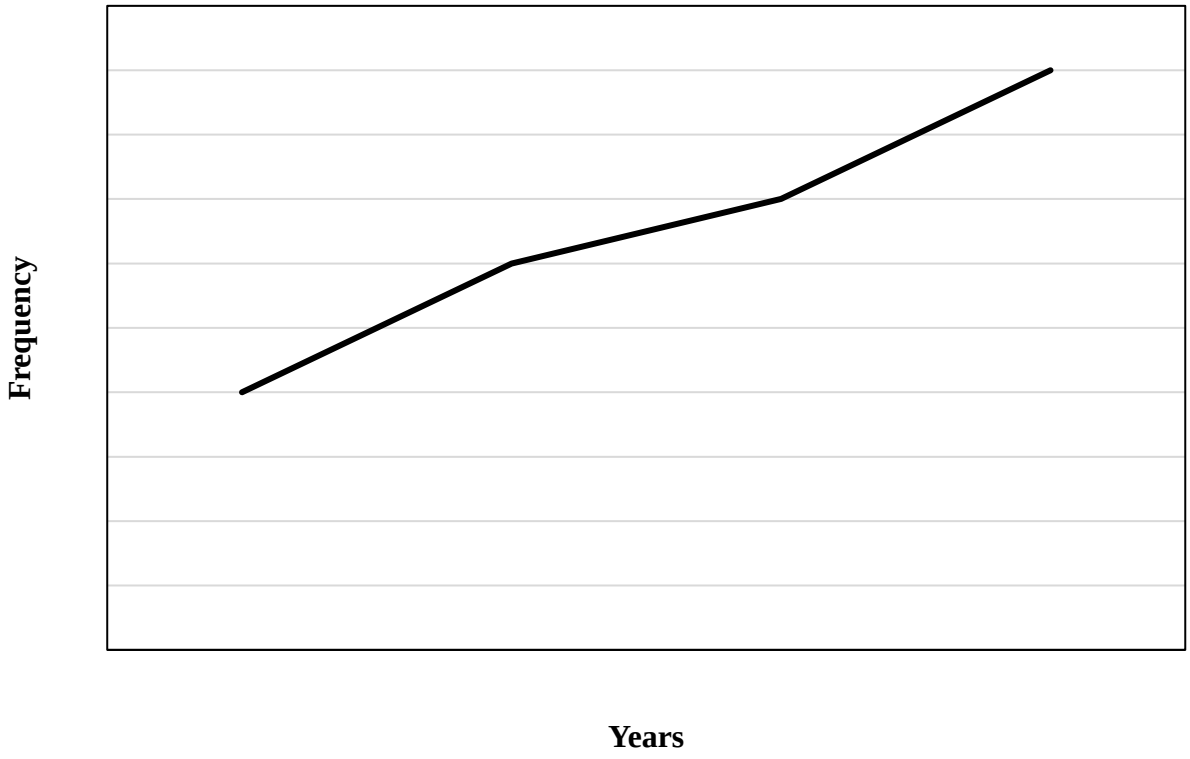

Fig.12 A graph of infractions on illegal transhipment from 2015 2018. (Sources : Monitoring, Control and Surveillance Division, F.C Ghana. (MCSD).

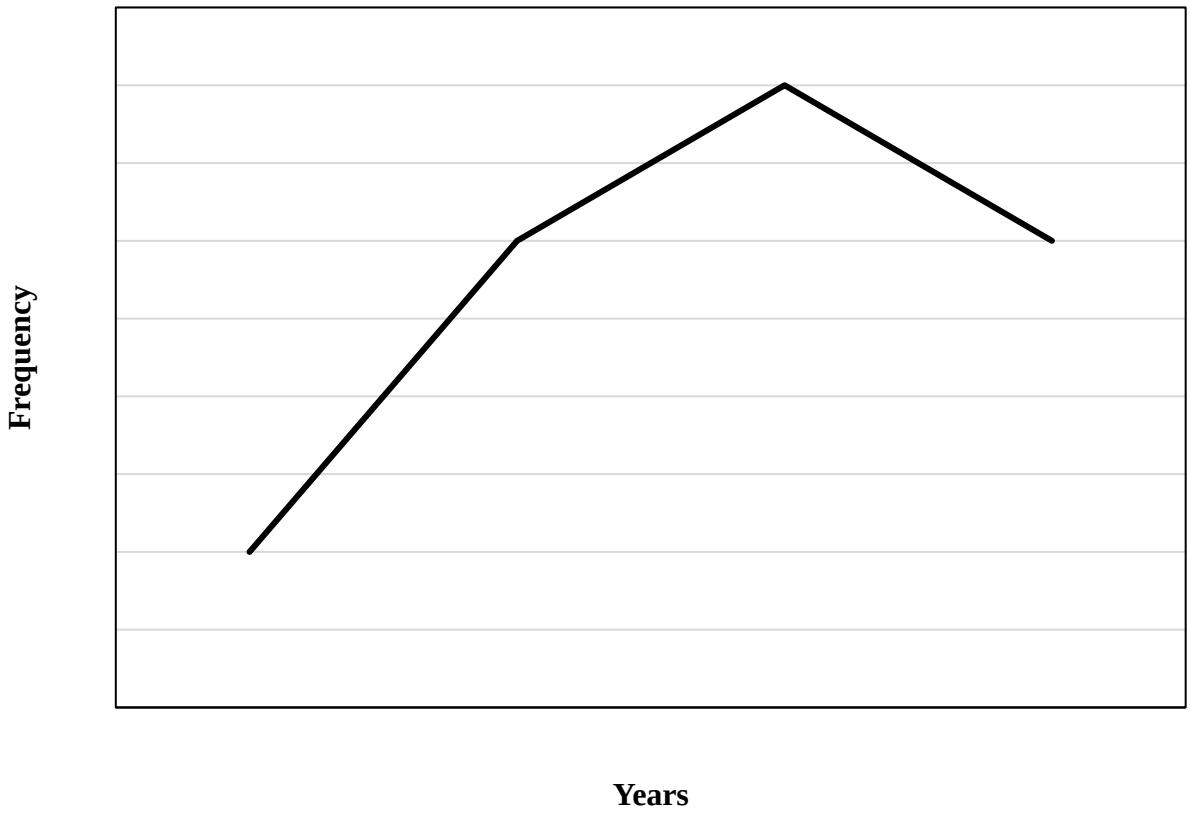

Fig.13 A graph of infractions of taking on board undersize mesh from 2015 2018.

(Source : Monitoring, Control and Surveillance Division, F.C Ghana. (MCSD).

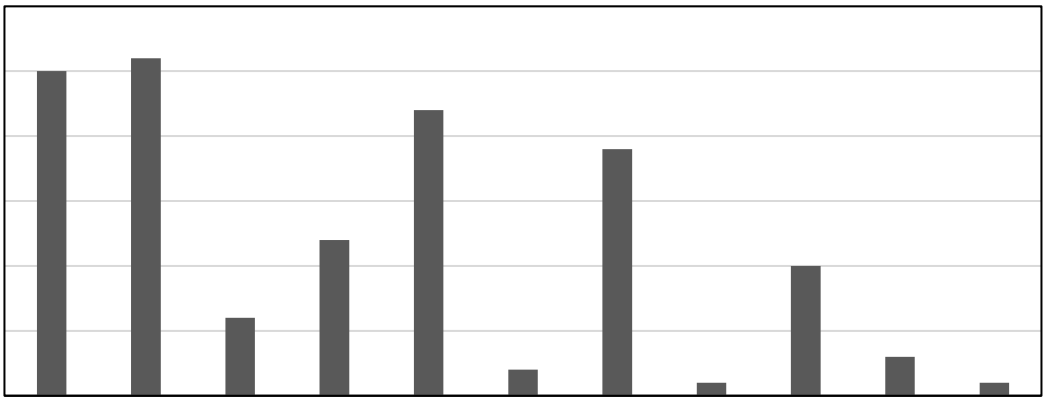

Fig.14 A graph of maritime incidents in the Gulf of Guinea 2019. (Source ; Multinational Maritime Coordination Centre (MMCC) Zone F, Ghana).

Fig.15 A graph of maritime incidents in the Gulf of Guinea 2020. (Source ; Multinational Maritime Coordination Centre (MMCC) Zone F).

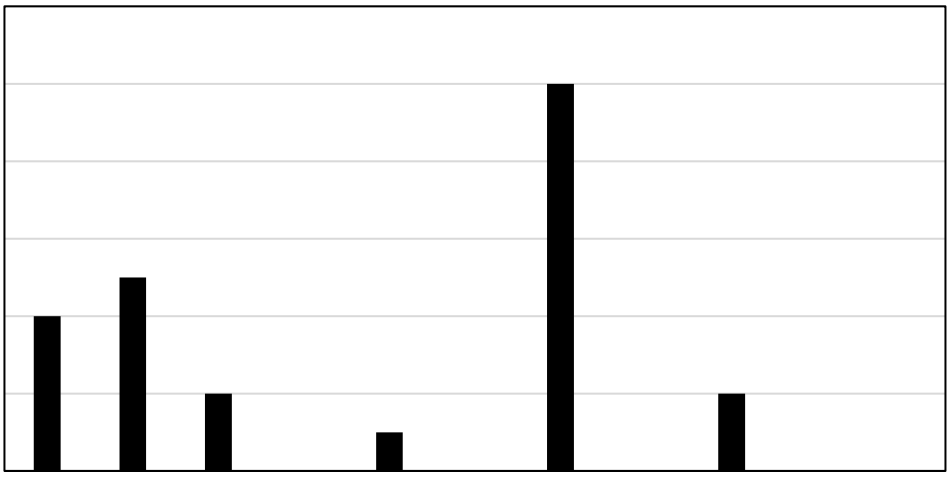

Fig.17 A graph of maritime incidents in the Gulf of Guinea 2022 (till July). (Source ; Multinational Maritime Coordination Centre (MMCC) Zone F).

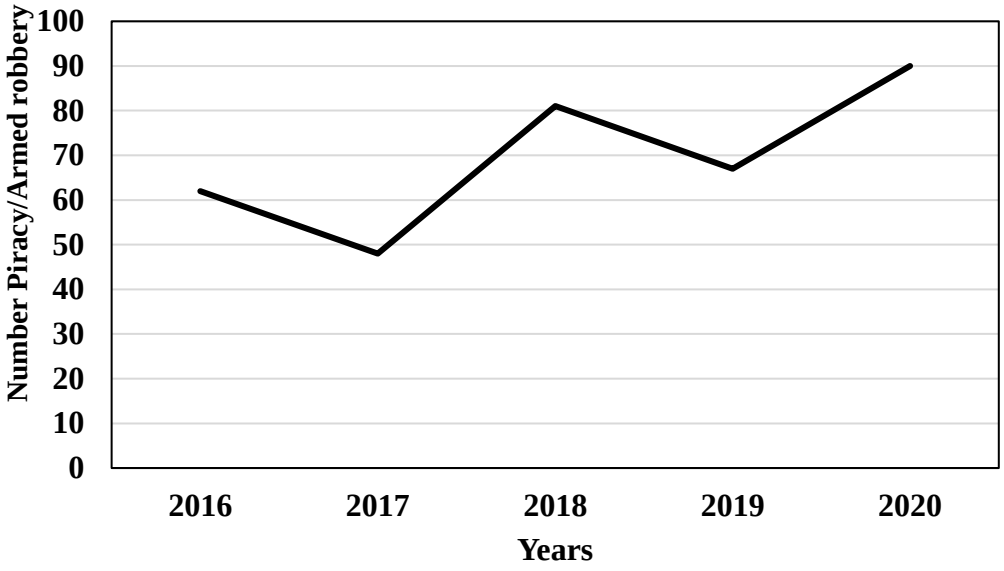

Fig.18 A graph of number of Piracy/Armed robbery at sea reported in West Africa (Gulf of Guinea). (Source ; IMO 2016-2020).

Table1: Major Inland water bodies in Ghana and their fishery potential. (Source; Bank of Ghana 2008 report on the fisheries subsector).

Lake /Reservoirs	Area(km^2)	Fisheries Potential (MT/Year)
Volta	8482	40000
Lake Bosomtwi	49	600
Weija	37	420
Kpong	36.5	-
Tano	18.6	22.5
Barekese	6.4	80
Others	117	145
Total	8746.5	412675.5

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