Conférence Ministérielle sur la Coopération Halieutique entre les États Africains Riverains de l'Océan Atlantique (COMHAFAT)

The Ministerial Conference on Fisheries Cooperation among African States Bordering the Atlantic Ocean (ATFALCO)

Fishery and aquaculture industry in Ghana

Series Report n°1 of the Review of the fishery and aquaculture industry in the 22 ATLAFCO Member States

October 2012

Acronyms

AAGDS	Accelerated Agricultural Growth and Development Strategy
CAADP	Comprehensive Africa Agriculture Development Program
CBFMCs	Community Based Fisheries Management Committees
CF	Credit Facility
CSP	Country Strategy Paper
DA	District Assemblies
DFI	Designated Finance Institutions
DOF	Department of Fisheries
ECOWAP	Economic Community for the West African States' Agriculture Policy
ECOWAS	Economic Community for the West African States
EDIF	Export Development and Investment Fund
EDPA	Export Development and Promotion Account
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessments
EPA	Economic Partnership Agreement
FAD	Fish Aggregative Device
FAO	Food and Agriculture Organization of the United -nations
FASDP	Food and Agriculture Sector Development Policy
FC	Fisheries Commission
FCWCGG	Fisheries Committee for West Central Gulf of Guinea
FDB	Food and Drugs Board
GDP	Growth Development Products
GEPC	Ghana Export promotion Council
GoG	Government of Ghana
GPHA	Ghana Ports and Harbors Authority
GPRS	Ghana Poverty Reduction Strategy
GSA	Ghana Standards Authority
GSP	Generalized Schemes of Tariff Preferences
GSSL	Ghana Service Survey of the Livelihood
HACCP	Hazard Analysis Critical Control Point
HP	Horse - Power
ICCAT	International Commission for the Conservation of Atlantic Tuna
IEZ	Inshore Economic Zone
IO	International Organization
MCS	Monitoring, Control and Surveillance
MDGs	Millennium Development Goals
METASIP	Medium-Term Agricultural Sector Investment Plan
MFRD	Marine Fish Research and Development
MLGRD	Ministry of Local Government and Rural Development
MOFA	Ministry of Food and Agriculture
MSY	Maximum Sustainable Yield
NAFAG	National Fisheries Association of Ghana
NEPAD	New Partnership for African Development
NTE	Non- Traditional Exports
SPS	Sanitary and Phytosanitary Measures
TBT	Technical Barriers To Trade
QC	Quality Control
UNEP	United Nations Environment Program
UNOPS	United Nations Operating Program System
WRC	Water Resources Commission

ATLAFCO and Fisheries Promotion Fund

The Ministerial Conference on Fisheries Cooperation among African States Bordering the Atlantic Ocean (ATLAFCO) is an intergovernmental organization for cooperation in Africa that brings together 22 States located on the Atlantic coast stretching from Namibia to the south, to, Morocco in the north. It stems from international cooperation imperatives to improve the framework for sustainable management of fisheries for its member states. The mandate of ATLAFCO is:

- To promote and strengthen regional cooperation on fisheries management
- To develop, coordinate and harmonize efforts and capabilities of Member States for the conservation and sustainable exploitation of fisheries resources.
- To revitalize all national economic sectors on the basis of direct and induced effects that may result from the exploitation of fishery resources

ATLAFCO signed on October 29, 2009 a Memorandum of Agreement with the Japanese Foundation for cooperation on fisheries (OFCF, Japan) which enabled the implementation of a Fisheries Promotion Fund (FPF). This fund is intended to finance development projects in the area of capacity building of Member States in fisheries and aquaculture as well as support for the implementation of international regulations.

Within the framework of this Fund, ATLAFCO is to finance a series of studies of the fishery and aquaculture industry in its 22 Member States. The aim is to analyze the fishing industry in the ATLAFCO region in the light of commercial changes at the international, regional and national levels for consideration in policy management and utilization of fisheries resources.

Executive summary

The Ghana fishery sector plays an important role as it contributes significantly to the national economic development objectives relatively to employment, livelihood, foreign exchange earnings, food security and poverty reduction. The fish industry, according to the Ministry of Agriculture, employs estimated 10% of the country's population which represents about 2.6 million people.

Fish is a preferred source of animal protein in Ghana where about 75 percent of the total domestic production of fish is consumed locally this, representing about 60 percent of animal protein intake. The Ghana fishery sector increased considerably in the late 1960s, from 105,100 tons of marine fish caught in 1967 to 389,411 tons in 2010 and the *per capita* consumption is estimated to be about 25 kg per annum. Fish is the country's most important non-traditional export commodity and the fisheries sub-sector accounts for about 5 percent of the agricultural GDP. The total earnings from fish and fishery products accounted for approximately 62 million US Dollars in 2010.

Fish are generally taken from the marine, inland (freshwater) and aquaculture sectors whilst the Volta Lake, reservoirs, fishponds and coastal lagoons are the main sources of freshwater fish. The fishing operations concern three sub sectors: industrial, semi industrial and artisanal sectors. The latter is responsible for over 70% of the total fish landings and it employs over 60% women and links with other sectors in providing raw materials especially the fish curing activities.

The aim of the present work is to analyze the different segments of the Ghana fisheries and aquaculture and recommend measures to be adopted in order to have a sustainable fisheries and aquaculture; reap maximum benefit, contribute to poverty reduction, increase livelihoods of the low income fisher communities and assure fish for future generation.

Among the recommendations, ATLAFCO could assist the country in the following areas:

- Assisting the country in developing a capacity building in subject relating to feasibility study on the competivity of the canned tuna factories.
- Could prepare a feasibility study on setting up animal feed for the development of aquaculture.
- Assisting the country in upgrading the competent authority on quality assurance and food safety.
- Cooperate with FCWC to assist the countries of the region to build up an efficient MCS system and combating IUU fishing.
    - Revitalize RAFISMER for the implementation of joint research for stock assessment, and cooperation with ICCAT and FAO to improve the fish data collection.

Table of contents

Introduction

Ghana a well-known fishery nation is today a net important country. This is due to tow first the application of the UNCLOS by coastal States which extended their jurisdiction to 200 miles. Thus, Ghanaians fishermen who used to fish in neighboring waters had to come back home. Secondly, the overfishing of the main species because of high fish demand due to dramatic population growth, little fisheries law enforcement, bad fishing practices in marine and freshwaters sectors, illegal fishing operations and low production of the aquaculture sector.

The Ghana fisheries Act is modern but Fisheries Commission had admitted they do not have the requisite capacity to handle the very technical document. Also the country does not have MPAs and the FC has never been directly involved in the development of an FIA and would certainly need time to develop the requisite infrastructure and capacity to supervise the process, singularly when dealing with the off-shore oil drilling.

The GOG defended the tuna sector which represents the main components of the exports is recording decreasing, from 5 canneries; it is now reduced to two. The tuna industry has different strengths including the stability of the nation therefore suitable for investments, the room for increasing and the material is available in the Ghana EEZ. However, it heavily hampered by high labor cost despite the low education of workers, high power cost the tuna processing industry, the cans are imported adding to the general cost and the cost of fret to EU is also high. The phase out of the "Cotonou" agreement will lead to less market share because of the Asian canned tuna competing nations.

The Ghana fisheries Act is modern but Fisheries Commission had admitted they do not have the requisite capacity to handle the very technical document and have made it a policy to work closely with the EPA, Ghana Maritime Authority and other institution most of which have representatives on the commission.

To increase the fish supply and satisfying the national demand for fish (domestic landings represents only 59% of the demand) the GOG decided that aquaculture could be an alternative to fish imports; the target is to produce 100,000 MT by 2016.

In line with the need to better manage its fisheries, the government recognized the role of the fisheries in the economy of the country initiated a comprehensive program under the FASD which is supported by a 50 million dollars- World Bank program to address the shortcomings. The program the strategic areas of Good Governance and Sustainable Management of the Fisheries (US$15.2 million IDA; US$3.5 million GEF); Reduction of Illegal Fishing (US$10.9 million IDA); Increasing the Contribution of the Fish Resources to the National Economy (US$12.1 million IDA); Aquaculture Development (US$8.0 million IDA) and Project Management, Monitoring and Evaluation and Regional Coordination (US$4.1 million IDA). Also, the country is pushing forward a strategic agenda to become both a financial hub and tuna harbor hub in West Africa.

1 Geography and population

1.1 Geography

Ghana is a country located on the Gulf of Guinea, only a few degrees north of the Equator, therefore giving it a warm climate. The country spans an area of 238,500 km^2 (92,085 sq. mi). It is surrounded by Togo to the east, Côte d'Ivoire to the west, Burkina Faso to the north and the Gulf of Guinea (Atlantic Ocean) to the south.

Ghana lies between latitudes 4° and 12°N, and longitudes 4°W and 2°E. The Prime Meridian passes through the country, specifically through the industrial city of Tema. Ghana is geographically closer to the "centre" of the world than any other country even though the notional centre, (0°, 0°) is located in the Atlantic Ocean approximately 614 km (382 mi) south of Accra, Ghana, in the Gulf of Guinea.

The country encompasses flat plains, low hills and a few rivers. Ghana can be divided into five different geographical regions. The coastline is mostly a low, sandy shore backed by plains and scrub and intersected by several rivers and streams while the northern part of the country features high plains. Southwest and south central Ghana is made up of a forested plateau region consisting of the Ashanti uplands and the Kwahu Plateau; the hilly Akuapim-Togo ranges are found along the country's eastern border.

Lake Volta in Ghana is the largest reservoir in the world, extending from the Akosombo Dam in southeastern Ghana to the town of Yapei, some 400 kilometers (250 mi) to the north. The lake generates electricity, provides inland transport, and is a potentially valuable resource for irrigation and fish farming

The Volta Basin also takes up most of central Ghana. Ghana's highest point is Mount Afadjato which is 885 m (2,904 ft) and is found in the Akwapim-Togo Ranges. The climate is tropical. The eastern coastal belt is warm and comparatively dry, the southwest corner is hot and humid, and the north is hot and dry. Lake Volta, the world's largest artificial lake, extends through large portions of eastern Ghana and many tributary rivers such as the Oti and Afram rivers flow into it.

There are two main seasons in Ghana: the wet and the dry seasons. Northern Ghana experiences its rainy season from March to November while the south, including the capital Accra, experiences the season from April to mid-November. Southern Ghana contains evergreen and semi-deciduous forests consisting of trees such as mahogany, Odom and Ebony. It also contains much of Ghana's oil palms and mangroves. Shea trees, baobabs and acacias are usually found in the Volta region and the northern part of the country

1.2 Aquatic environment

Ghana has a marine coastline of nearly 343.8 miles and a total continental shelf area of about 24,000 square kilometers that supports a marine fishing industry. The Exclusive Economic Zone (EEZ) in Ghana waters is 200 nautical miles. The marine sub-sector in Ghana is the most important source of local fish production with the annual average domestic catch being 300,000 MT. The marine fisheries sub-sector delivers over 70 percent of the total fish supply in Ghana (MOFA sources).

Marine fisheries in Ghana are affected by a seasonal upwelling (December/January – February and July – September) that occurs in its coastal waters. During the upwelling periods biological activity increases in the sea that result in increased

production of natural food sources and abundance of most marine fishes. Fish become more available for exploitation during these upwelling periods. Therefore large quantities of fish are caught during the major season (July-September) while very little fish are captured during the low or minor season, (December-January/February). According to GOG sources, fish stocks have been declining due to overfishing.

Both the pelagic (migratory fish that feed above ocean bottom) and the demersal (sea bottom-feeding fish) fishery resources are exploited in Ghana. The most common fish captured in Ghana are the small pelagic such as mackerel, horse mackerel, chub mackerel, sardines, sardinella and anchovies. These small pelagic species account for about 70 percent of the total marine fish capture in Ghana. The biomass of the small pelagic resources fluctuates significantly. According to industry and GOG sources the quantities of captured sardinella, chub mackerel and anchovy fluctuate and have reached a point of near collapse. In addition most shrimp vessels have shifted to tuna fishing due to consistently low levels of shrimp catch. The shrimp industry had subsequently collapsed over the past ten years.

The large pelagic type is mainly tuna. There are three types of tuna species of commercial importance and value including the yellow fin, skipjack, and big eye tunas. These tunas undertake long-range migrations in the Atlantic Ocean and across national boundaries. Tuna is the only fisheries resource that can withstand considerable expansion in Ghana.

According to MOFA sources, biomass survey estimates show that the potential yield of the total demersal biomass on Ghana’s continental shelf is 36,000 MT-55,000 MT per year. The demersal species captured in Ghana include the following species: cassava fish, red snapper, sea bream, burrito, cuttlefish, red mullet, and croaker.

Ghana has the potential for both freshwater and brackish water aquaculture and culture based fisheries. The efforts of government so far have mainly been on the development of culture based fisheries in freshwater environments, although in the early 1980's there was a massive campaign to persuade the public to establish pond fish culture. This campaign was effective to the extent that a large number of people responded by building ponds in different parts of the country but especially in the south around Kumasi and Accra. The results of these developments have, however, been extremely disappointing. However, today with the encouraging results recorded with cage cultures and the World Bank fisheries program are boosting the aquaculture sector.

1.3 Population

Ghana has a population of about 24,658,823; this means the country's population has increased by 30.4 per cent from the 18,912,079 recorded in the previous enumeration in 2000, representing an annual demographic growth rate of 2.5 per cent. With respect to sex, there are 12.6 million females, representing 51.2 per cent of the population, and 12 million males, representing 48.8 per cent. This gives a sex ratio of 100 females per 95 males.

The native and largest ethnic group is Akan. 45% of the population are Akan (which includes the Fante (mainly fishermen), Akyem, Ashanti, Kwahu, Akuapem, Nzema, Bono, Akwamu, Ahanta and others).

Ghana is currently inhabited by 52 ethnic groups. Ghana has not seen the kind of ethnic conflict that has created civil wars in many other African countries. The official language is English; however, most Ghanaians also speak at least one local language.

The major minority ethnic groups in Ghana are: Ewe (Population: 2,200,000), Ga-Adangbe (comprising the Ga, Adangbe, Ada, Krobo, and others) (Population: 1,022,144), Gurma (Population: 702,000), Dagaaba (Population: 657,973), Frafra (Population: 635,866), Dagomba (Population: 618,101), Guang (Population: 354,567),[92] Mossi (Population: 341,000),[93] Hausa (Population: 172,000), Gurunsi (Population: 154,000), Bissa (Population: 126,000), Fulani (Population: 12,000), Whites (of mostly Scottish, English, Scandinavian descent, and others), Lebanese, and Sindhi-Indian. The all other ethnic groups currently leaving in Ghana represent approximately 3.6% of the population.

Ghana's 550 km coastal stretch has a population of 2.4 million people or 10 percent of the country's population who are dependent mainly on fisheries resources for their livelihood. Therefore, barring them from fishing in certain portions of the ocean would hamper their ability to cater for their families.

2 Economic, social and political Context

2.1 Political Context

Ghana has continued to consolidate democratic rule, and now enjoys a more open society, with a vibrant media and strong public dialogue. As a result of these and other political achievements, Ghana outperforms most countries in West Africa and in the continent on measures of civil liberty; political rights and political stability.

2.2 Economic Context

Ghana, a country with a population of about 24,6 million people, and a land area of 239,000 km2, is the West Africa's second largest economy after Nigeria, and the Sub-Saharan Africa's twelve largest. The country is highly dependent on a few commodities (gold, cocoa, and more recently oil) for export earnings, a still nascent manufacturing sector, which contributes about 6.8% of GDP, and a labor market characterized by a significant gap between demand and supply leading to high levels of disguised unemployment and underemployment.

The private sector in Ghana is dominated by enterprises in the informal sector, with approximately 90% of the companies being MSMEs and employing less than 20 persons. The private sector is the main employer, and the primary generator of exports. The government has been active in improving the country's business environment and the country has been ranked, at least twice, amongst the top 10 reformers globally by the World Bank's Doing Business team.

2.3 Social Context

According to Ghana statistical Service data, unemployment rate is estimated at 3%. Only about 8.5% of the working population is in formal employment. Of this amount the youth form only 14% of informal sector either in self-employment or as domestic employees, apprentice or unpaid family workers. Ghana has made strides in meeting the Millennium Development Goal (MDG) targets.

Gender is being mainstreamed as a cross cutting theme in all existing and future Bank projects, with many of the projects having gender disaggregated indicators. In the fish industry, women play a vitally important role, one without which the fish trade would not exist. A small minority of women fish alongside men but more commonly women own or part own boats captained by a male relative and crewed by others. However, women's main role comes once the fish has been landed, the management and practice of most of the domestic fish trade, both wholesale and retail.

2.4 Economic and Social factors

Agriculture, forestry and fishing are important sectors of Ghana's economy and improvement in the performance of these sectors is central to the country's current economic recovery program.

In spite of efforts to increase national food production, the country has had to rely to a significant extent on imports, often in the form of food aid, to maintain adequate supplies. Some dependence on imports still exists and the country's relatively high consumption of fish has meant that food imports have included substantial quantities of fish and fish products. Supplies of marine fish from national sources are now limited because of the full exploitation of national stocks and the more restricted access to the waters of other African countries, such as Angola, Namibia and

Mauritania. Against this background and with the prospect of further increases in demand from a growing population, any means of expanding the national production of fish is obviously of interest.

The development of inland aquaculture and culture-based fisheries have for some time now been considered by government to be ways in which the national production of fish can be increased. A New Ghana National Aquaculture Development Plan, designed by the United Nations Food and Agriculture aims at increasing the aquaculture production and reducing the high volumes of fish imports.

2.5 Public policy elements

2.5.1 Interim EPA

West African countries, Côte d'Ivoire and Ghana, initialed bilateral "stepping stone (or "interim") EPAs" with the EU at the end of 2007;covering: duty and quota-free EU market access, gradual liberalization (removal of duties and quotas) over 15 years for 81% of EU imports to Ivory Coast (Côte d'Ivoire) and 80% to Ghana, EU exports are mainly industrial goods, vehicles and chemicals which do not compete with domestic production; safeguard provisions enabling both countries to protect fragile economic sectors by re-introducing quotas or duties; agreement to foster cross-border trade within the region (e.g. more efficient customs procedures); EU support to help local companies become more competitive and meet EU import standards

The interim EPA Côte d'Ivoire was signed on 26 November 2008. The interim EPA with Ghana has not been signed. The two agreements have not been ratified. Recently**,** European Union and ECOWAS negotiators met in Brussels at technical and Senior Official level from 17 to 20 April 2012, to discuss the way ahead in the regional Economic Partnership Agreement (EPA) talks. Progress was made in particular on the text of the agreement, work continues on issues including West Africa's market access offer and the EPA Development Program (PAPED). The next step will concern the regional agreement currently negotiated will cover goods and development-cooperation and include rendezvous clauses for services and rules chapters. The next round will concern the market access negotiations in Accra, Ghana.

2.5.2 Initiative PPTE

Ghana had met the conditions and reached the completion point under the enhanced framework of the Heavily Indebted Poor Countries (HIPC) Initiative on the 1st December 2004.

2.5.3 Ghana Strategic Poverty Reduction

In preparing this Medium-Term Development Policy Framework, Ghana Shared Growth and Development Agenda (GSGDA, 2010-2013), Government responds to the constitutional injunction, which requires that policies leading to the establishment of a just and free society are pursued by the state. Government's *Better Ghana Agenda also* emphasizes the following: expanding access to potable water and sanitation, health, housing and education; reducing geographical disparities in the distribution of national resources; ensuring environmental sustainability in the use of natural resources through science, technology and innovation; pursuing an employment-led economic growth strategy that will appropriately link agriculture to industry, particularly manufacturing; and improving transparency and accountability in the use of public funds and other national resources.

2.5.4 National development Plan

The Fisheries and Aquaculture Sector Development Project (FASDP) recognizes the importance of Ghana's fisheries. However, through over-fishing due to bad fishing practices; lack of investment in management and value added production, the average income per canoe has dropped by up to 40% over the last ten years to the point where it costs as much to fish as the catch is worth. The FASDP II (Box 1), as part of the Republic of Ghana Fisheries and Aquaculture Policy, forecasts that the fishing sector is expected to make a substantial contribution towards doubling the size of the Ghanaian economy by 2015 (GPRS II).

Box 1: Fisheries and aquaculture sector development plan (FASDP)

- Maintaining capture fisheries production at current levels,
- Increasing revenue and profitability in capture fisheries by at least US$ 50 million a year after five years,
- Increasing aquaculture production to 35,000 tons a year after five years,
- Retaining Ghana as a landing and processing hub for the West Africa tuna industry,
- Developing fisheries management to allow effective control of all commercial fishing effort in Ghanaian waters, and,
- Ensuring fisheries management costs are sustainable and that the fisheries sector overall make a fiscal contribution to Government revenues.

The World Bank's program, intended to contribute to FASDP, is estimated at US$53.8 million, of which IDA will finance US$50.3 million and US$3.5 million is being financed by a grant from the GEF. It is set to provide investment which will build the necessary policy and capacity for effective fisheries management designed to reduce fishing effort while maintaining approximately the same catch levels and to address the impacts of change for fishers and the communities in which they live (see Box below).

Box 2 : World Bank Fisheries Program in Ghana

- **Component 1: Good Governance and Sustainable Management of the Fisheries (US$15.2 million IDA; US$3.5 million GEF);** This component aims to build the capacity of the Government and stakeholders to develop and implement policies through a shared approach that would ensure that the fish resources are used in a manner that is environmentally sustainable, socially equitable and economically profitable. It will comprise the following four subcomponents: (i) developing the legal and operational policy to enable the implementation of the Ghana Fisheries and Aquaculture Sector Development Plan; (ii) strengthening fisheries management, including fishing rights and stakeholder-based management and ensuring necessary research activities for sustainable exploitation; (iii) aligning fishing capacity and effort to sustainable catch levels; and (iv) social marketing, communication and transparency.
- **Component 2: Reduction of Illegal Fishing (US$10.9 million IDA)** The component aims to reduce the illegal fishing activities threatening the sustainable management of the country's fish resources by strengthening fisheries monitoring, control and surveillance (MCS) systems.
- **Component 3: Increasing the Contribution of the Fish Resources to the National Economy (US$12.1 million IDA).** The component aims to identify and implement measures to increase the benefits to Ghana from the fish resources, by increasing the

share of the value-added captured in the country. It will comprise the following sub-components: (i) value chain development (fresh/frozen product/trade facilitation); and (ii) fish product trade and information systems.

- **Component 4: Aquaculture Development (US$8.0 million IDA).** This component aims to set the framework for increased investment in inland aquaculture. It will comprise the following sub-components (i) developing the aquaculture policy and legal framework; (ii) improving the genetic quality of Tilapia fingerlings and brood-stock; (iii) catalyzing aquaculture development for medium and large scale enterprises; (iv) marketing and technical studies; and (v) support for small-scale aquaculture development.
- **Component 5: Project Management, Monitoring and Evaluation and Regional Coordination (US$4.1 million IDA).** The component aims to support project implementation and regional coordination with the WARFP, ensuring that regular monitoring and evaluation is conducted, and the results are fed back into decision-making and project management

Ghana's National Aquaculture Development Plan has been unveiled with the aim of providing the capacity for fish farmers to increase production. The plan, unveiled by the Food and Agriculture Organization (FAO), targets 100,000 tons of fish for the country by 2016. The GNADP provides a roadmap where aquaculture will contribute significantly to food and nutritional security, employment generation, increased incomes, economic growth and poverty reduction. The implementation of the five-year comprehensive medium term plan would cost a little over $84 million. Close to $66 million would be contributed by the government while public investment takes care of remaining $18 million.

The plan, among other objectives, aims at providing a geographic information system involving an indicative mapping of high potential aquaculture areas where fish farming is feasible. It is also expected to facilitate increased supply of high quality fish seed by the private sector to fish farmers in high priority aquaculture zones to be established. Furthermore, it is expected to assist more fish farmers to access funds more easily on competitive terms for investment in aquaculture business. When implemented, the plan is expected to increase the market share of commercial fish farming in Ghana from $28,440,000 in 2010 to an estimated $362,000,000 in 2016.

The current annual output from aquaculture is estimated at 10,200 tons as compared to an output of 1,000 tons in 2005; 3,800 in 2007 and 7,100 in 2009 respectively.

2.5.5 Privileged relationship between the EU and Ghana

Political, trade and cooperation relations between the EU and Ghana are based on the ACP-EU Partnership Agreement ("Cotonou Agreement"). Regular political dialogue between the two parties covers a wide range of issues - political, trade, development, and governance including human rights. Bilateral cooperation between Ghana and the EU focuses on: transport connectivity and regional integration, governance and general budget support to help poverty reduction and promote economic growth. Overall EU assistance to Ghana (2008-13) is expected to amount to some €500m – more than originally planned, due to Ghana's good performance. As one of the few countries in West Africa that is not in the least-developed country (LDC) category, Ghana has initialled an interim Economic Partnership Agreement (2007) with the aim of safeguarding access to the EU market and avoiding trade disruptions. Ghana now enjoys full duty-free and quota-free access to the EU (with some transitional restrictions for sugar). Additionally, a regional Economic

Partnership between the EU and West Africa is currently being negotiated. Ghana was the first country to sign a Voluntary Partnership Agreement (VPA) with the EU (in 2009) under the forest law enforcement, governance and trade (FLEGT) initiative. The agreement aims to improve forest governance and ensure that timber exports to Europe are legal and come from the certified place of origin.

Under the Cotonou Agreement, fish products including tuna products are shipped tax free to EU the market. Ghana and EU have not signed a fishing agreement.

2.5.6 Trade relations between Ghana and other countries/regional and internationals Organization

Ghana maintains a relatively open trade regime with the rest of the world. Its Most Favored Nation Tariff Restrictiveness Index (TRI) is 9%, below both the Sub-Saharan African and low income country group average of 11.3% and 11.6% respectively.

Ghana also maintains good relations with its traditional trading partners and donors especially the US and the UK. The GOG is committed to ensure that Ghana strengthens trade relations with all friendly countries on a most-favored nation basis consistent with her membership of the WTO. The promotion of trade with other developing countries particularly, our sister African countries continue to be a major concern in the endeavor to enlarge Ghana's global market and enhance South-South co-operation (e.g. African Union States, Organization of the American States as an observer).

2.5.7 Regional integration policy process

Ghana is an active member of key regional integration arrangements in West Africa and in the continent, including the African Union, the Economic Community of West African States, and the West African Monetary Zone 1. The GSGDA has re-emphasized the country's objective to accelerate economic integration.

In West Africa, both the processes, and degree of regional integration have lagged behind expectations, and many political commitments have either not been translated into policy and regulatory reforms, or reforms are not implemented. The region thus remains weakly integrated, with continuing tariff barriers (for example where restrictive rules of origin cannot be met) and substantial non-tariff barriers. There is still no agreement at the ECOWAS level on the precise structure of the common external tariff, and the existing scheme for regional free trade faces significant challenges.

3 Marine and coastal environment, aquatic ecosystems and fishery resources

3.1 Marine and Coastal Environment

The marine and coastal resources of Ghana exist within a very fragile ecosystem. Current development trends and pressures exerted on these resources are steadily degrading the components of this fragile ecosystem. Landward, the area includes lagoons, marshes, and estuarine swamps together with the intervening interfluve areas. Seaward, the boundary is determined as the limit of Exclusive Economic Zone (200 nautical miles). The area is richly endowed with important resources for the promotion of tourism, fishery, industry and mining. The lagoon, estuary and delta ecosystems provide suitable environments for shellfish and fish breeding, as well as feeding, roosting and resting sites for local and migratory birds and marine turtles.

The coast supports mangroves, which are an important source of fuel-wood to local communities. The beaches, cliffs, lagoons, wildlife, cultural and historical sites and coastal landscape also provide an immense potential for tourism development. In addition, salt, deposits of limestone, silica, feldspar and other minerals have been identified within the coastal belt. There is also the possibility for hydrocarbons, for which prospecting is being undertaken. Furthermore, copra production is also an important economic activity along the coastal belt. Health of the marine and coastal environment - climate change

Ghana's economy is dependent on climate sensitive sectors such as agriculture, fisheries, tourism, and forestry. Evidence of rising temperature abounds in all the ecological zones of Ghana while rainfall levels have been generally reducing and patterns have increasingly become erratic. The adverse impacts of this trend on livelihoods, health and hydropower generation are already being felt and are expected to exacerbate if remedial actions are not taken. Ghana ratified the United Nations Framework Convention on Climate Change (UNFCCC) in September 1995 and, in March 2003, acceded to the Kyoto Protocol. A National Climate Change Policy Framework (NCCPF) has been developed through a consultative process and mainstreamed into the GSGDA. The policy framework and institutional arrangements (see Box below) have three key objectives: adapting to the impact of and reducing vulnerability to climate change; mitigating the impact of climate change; and promoting low carbon growth strategy. However, in spite of having a well-structured institutional arrangement for climate change, Ghana faces a major challenge of lack of long term data on which to base predictions, estimate risk and guide decision.

Box 3: Institutional Arrangements of Ghana for Climate Change

- The Ministry of Environment, Science and Technology (MEST) is the lead institution for Climate Change and UNFCCC activities in the country
- The Environmental Protection Agency coordinates the implementation of Climate Change issues on behalf of MEST
- MoFEP has a Natural Resources and Climate Change desk that oversees, coordinates and manages financing and support in natural resources activities.
- The NDPC in collaboration with EPA and the National Disaster Management Organization (NADMO) are facilitating initiatives to mainstream Climate Change and Disaster Risk Reduction into national development planning at all planning levels. The process is being piloted in 10. District Assemblies.

3.2 Main environmental characteristics of the Gulf of Guinea waters in relation to fish biology

The sub-region is not as rich in fisheries resources as compared to the Northern part of the CECAF region or southern part of the Gulf of Guinea which enjoys the Benguela current. The species identified are composed of small pelagic species (mainly sardines, anchovy and Spanish mackerel); large pelagic like tuna fish; the demersal species, the mollusk and the shellfish (generally the *Penaeus* shrimps). The Spanish sardines are shared by all the countries with exception of Liberia. The abundance of small pelagic species varies greatly from year to year and depends among others on the intensity of the seasonal coastal upwelling which occurs in certain parts of the region. The demersal resources seem to be localized, but they gather in the same way throughout the sub region.

3.3 Main fishery resources in Ghana

Based on their bathymetric distribution, the fisheries' resource in the western Gulf of Guinea may be broadly placed in four categories: small pelagic, large pelagic species, coastal demersal species and deep- water demersal species. The main commercial species targeted in Ghanaian waters are: Clupeid (*Sardinellas, Scombridae - chub- mackerels and Engraulidae* (anchovies). The large pelagic species are represented the *Thunidae* whereas the demersal species are: *Sparidae, Lutjanidae, Mullidae, Pomadasydae, Serranidae, Polynidae and Penaeidae* (Mensah at al 2001).

3.3.1 The Small Pelagic Resources

For the small pelagic resources the biomass fluctuates significantly. It is however estimated that the maximum catch of the small pelagic fishery can sustain is 180,000 MT (DOF 2001). Landings of *sardinellas* fluctuate so much that in some years (e.g. 1973 and 1978) they reached points of near collapse, then from the 1980s, there are a remarkable increase with an all-time high of 140,000 MT in 1992, (Mensah and al. 2001) Ever since, landing declined reaching 64,000 MT in 1997. The abundance of chub mackerel (*S. japonicus*) is so variable from year to year that it is almost impossible to predict its abundance. Similarly anchovy landings fluctuated between 19,000 MT in 1986 and 82,700 MT in 1996, with an all-time high of 93,000 MT in 1987. The author asserts that these rise and fall could be attributed to phases of decline that most pelagic species worldwide experience from time linked *inter alia* to changes in the marine environment.

3.3.2 The Large Pelagic Resources

The main commercial tuna resources which occur in Ghanaian Waters are the yellow fin (*Thunnus albacares*), skipjack (*Katsuwonus pelamis*) and big eye (*Thunnus obesus*) (Mensah et al. 2001, 2003).

A Tuna Task Force set up by the Government of Ghana in 1989 recommended that the country's tuna production be increased from an average of about 36,000 MT to 60,000 MT annually (Koranteng, 1998a).

3.3.3 The Demersal Resources

Surveys estimate the biomass show that the potential yield of the total demersal biomass on Ghana's continental shelf is between 36,000 and 55,000 MT/ per annum with an average of about 43,000 MT (Koranteng, 1998a & 1998b). However, last decade landings (of about 50,000 MT annually) exceeded the potential yield, which clearly demonstrates the stress under which the fishery has been operating (Koranteng, 1998a).

3.3.4 The Shrimp Resources

Even though there is a specialized shrimp fishery in Ghana, shrimp species are caught by all fleets (except tuna fishing vessels) mainly from shallow waters and close to estuaries, (Mensah at all 2003). Artisanal operators catch shrimps mainly in beach seines, these are normally juvenile shrimps of very low commercial value. Through a modeling approach, the maximum sustainable yield (MSY) of shrimps is estimated to be 350 MT/ per annum excluding catches of artisanal fishers (Koranteng, 1998b). Although catches have never exceeded the MSY, the industry showed signs of decline in the last six years (Mensah at al 2003).

3.3.5 Inland and aquaculture resources

The Lake is rich in fish and about 140 species of fish could be identified in the Lake Volta; and landings are dominated by tilapia species (38.1%), *Chrysichtys spp.* (34.4%), *synodrantis sp*. (11.4%), *Labes* (3.4%), *Mormyrids* (2.0%) *Heterotis* (1.5%) *Clarias sp.* (1.5%), *Clarias spp.* (1.5%), *schilbeide* (1.4%), *odaxothrissa mento* (1.4%), *Bagrus spp.* (1.35) and *Citharinus spp*. (1.2%) and the rest which are less than 1% include *Alestes sp*., *Brycinas s*p. *Distichodus spp., Gymnarchus spp.; Hydrocynus spp.* ; and *Lates niloticus*, (Braimah 2001).

The Lagoon Fisheries: there are more than 50 coastal lagoons of various sizes in Ghana. These lagoons provide an important source of protein and other livelihoods for the dwelling communities. The lagoons also contribute significantly to the diversity and status of fish stocks in coastal waters as many fish species spend part of their life cycle in these lagoons. With time, the ecosystem of many of the lagoons has changed as a result of pollution from industries, domestic waste, urbanization and demand for land for other purposes. The mangrove forests that fringed many of the lagoons have been lost and the fisheries in the lagoons are ether overexploited or threatened

3.4 Scientist statements on the level of exploitation of fish resources

Since the two decade, scientists and fishery biologists record regularly huge decline in fish landings despite an increasing fishing efforts. This situation shows that the fishery resources are deeply overexploited. If current trends in overexploitation and

subsequent decreasing profitability in the fisheries continue, the livelihood and food security of more than 2.4 million people depending in fisheries will be compromised.

Studies done in the artisanal fisheries showed that the average income received per canoe has dropped by as much as 40 percent over the last decade. These losses often fall on the most vulnerable, as many of the coastal communities are based in rural areas that have thus far remained at the margin of the country's economic growth.

4 The fisheries context of in Ghana

4.1 The Ghana Economic Exclusive Zone (EEZ)

The coastal and marine zone of Ghana has been defined to include the 200 nautical mile limit which was claimed in 1977 [Territorial Waters and Continental Shelf Act 1973 as amended by the Territorial Waters and Continental Shelf Amendment Decree 1977]. The coastline of Ghana stretches for approximately 550km. It is generally a low lying area, not more than 200m above sea level and has a narrow continental shelf extending outwards to between 25 and 35km except off Cape Coast and Salt pond where it reaches up to 80km.

4.2 The Artisanal fisheries

The artisanal sub-sector is the most important in terms of fish outputs in the marine sector; it in fact contributed 68-70% of the marine fish of the total annual catch mainly composed of small pelagic species such as sardinellas, mackerels and anchovies. There are 10,000 marine artisanal canoes and 123,000 fishers operating from 304 landing centers in 189 fishing villages located along the coast. Many larger canoes are motorized with 40 HP outboard engines whereas smaller crafts still use sail power.

Commonly used fishing gears are purse seines, beach seiners, set nets, draft gill nets and hook and line. Also worth mentioning is the larger canoes, these are a fleet of motorized canoes which specialize in hook and line, using ice to preserve high value fish in insulated containers with some using electronic fish finding devices such as echo-sounders. In the inland sector, a number of 17,500 canoes which operate the following fishing gears: cast and gill nets, hook-and-line, and traps are identified in the inland sector.

The regional distribution of the landing sites in the hinterland is as follows: Upper West (Bagri, Viera, Sankana, Jawia, Bilibor); Brong Ahafo (Yeji); Upper East (Tono, Viera White & Red Volta Rivers); Volta Kpando Torkor, Abotoase, Dzemeni, Dambai); Eastern Region (Kpong, Akosombo, Akateng); Northern (Buipe, Nasia); Central (Dunkwa-on-Offin)

Lake Volta, reservoirs associated with irrigation and potable water projects, and fish ponds are the main sources of freshwater fish in Ghana. The Volta Lake, with a surface area of 8,480 km² and 5,200 km of shoreline, contributes about 90% of the total inland fishery production in Ghana. About 80,000 fishers and 20,000 fish processors and traders engage in the Lake Volta fishery.

4.2.1 Aquaculture

The aquaculture industry has been identified by the Government as having significant potential for boosting the economy against the background of continued declining of marine and inland fisheries production.

This sub-sector is dominated by non-commercial systems (i.e. extensive, small-scale, and subsistence), often using earthen ponds. Tilapia species represent 80 percent of yields with catfish making up for the remainder. In recent times commercial initiatives in cage production have been established and these have provided an increase in production and employment opportunities for the aquaculture sector.

Commercial fish farms comprise about 3 percent of total aquaculture operators. Most large-scale commercial fish farms operate cage culture systems on Lake Volta; others operate both earthen ponds and cage systems. The cages/pens/ponds are stocked with 10 g-30 g fingerlings which are ready for the market in 6-8 months at an average weight of 250 g-350 g. It is expected that the World Bank project will modernized the aquaculture sector and contribute meeting the government target of 100,000 MT of aquaculture products by 2016.

4.3 The Industrial fisheries

The semi-industrial fleet consists of 288 locally built wooden vessels 8-37m in length with in-board engines of between go and 400 HP. Most vessels are dual purpose; they are able to use trawls or purse seines. The latter is more commonly used during the major and minor up welling seasons and trawling is practiced in shallow waters during off-season. In 2010, there were 288 inshore vessels (See Table 1)

In 2010, the industrial vessels, large, steel-hulled foreign-built, are composed of 68 trawlers; 48 tuna pole and line vessels and purse seiners and 3 shrimpers. It is reported that the industrial fleet have undergone radical expansion in number since 1984 when the Government of Ghana policy targeted industrial fishing as a mechanism for promoting non-traditional exports (NTE), such as fish and fishery products.

Table 1: **Number of Marine Fishing Vessels in Ghana**

Type of Vessel	No. of operating vessels (2009)	No. of operating vessels (2010)
semi- industrial	264	288
Trawlers	52	68
Tuna vessels	44	48
Shrimpers	1	3
Carriers	1	2

Source: Marine Fisheries Division MFRD, Tema, and Directorate of Fisheries Accra

The average age of industrial vessels is 25 years; this has a negative impact on the safety at sea and also on the annual yields as well as the profitability of these vessels. The fishing efforts increase but the catches are lower.

4.4 The Illegal fishing activities

The Monitoring, Control, and Surveillance (MCS) Department under the Fisheries Commission is charged with combating illegal, unregulated, and underreported (IUU) fishing. A site visit to the port of Tema highlighted many enforcement challenges facing MCS notably the recent expiration of the company contract to place transponders on vessels. The recent discovery of oil off-shore will also divert needed naval resources from MCS to combat IUU fishing.

The GOG is keenly aware of the economic cost that IUU fishing exacts from the national economy. In a briefing with the Director of MCS numerous measures against IUU fishing were addressed, including: placing transponders on all licensed Ghanaian vessels, limiting inputs through minimum mesh sizes, restricting use on

non-selective gears, prohibiting the use of new vessels, sea observer programs with the Ghanaian Navy, and quayside inspection at the major ports of Tema, Sekondi and Takoradi (See Box 3).

IUU fishing also remains problematic at inland waterways especially at Lake Volta. Community Base Fisheries Management Committees (CBFM) have been used to combat this issue but there have been operational issues establishing them at the local levels and developing methods to resolve conflicts. These Community Committees as well as District Fisheries Management Committees represent a concerted attempt to decentralize fishery management to the local level.

Box 4: How the Fisheries Administration combats IUU in Ghana

The industrial fleet consists of trawlers and tuna boats. Pair trawlers were in the port but decommissioned. All vessels were Ghanaian-flagged and owned but crews were roughly 25 percent foreign and 75 percent Ghanaian. Typically, captains were foreign nationals with the trawlers headed by Chinese and the tuna boats by Koreans. Numerous challenges were stated by the inspectors: an inability to detect illegal nets, a lack of observers on the trawlers, transponders on boats are no longer in use (company contract expired), unloading of fish at non-Ghanaian ports, especially Abidjan (this practice is illegal for Ghanaian-flagged vessels), selling of fish outside of the port to small artisanal boats, observers on board tuna boats only during the moratorium season, no insurance for inspectors, and a lack of political will to prosecute infractions when reports are submitted. Inspectors work from 8:30 AM to 5:00 PM during the week; however, the port is open from 7 AM to 6 PM and on weekends allowing for ships to unload uninspected. Tuna boats were also seen carrying large hauls of bamboo which are used to aggregate the tuna to more easily catch. This is illegal under Ghanaian law and when the inspectors were pressed about this they said that the tuna are caught outside of Ghana's EEZ and therefore out of their jurisdiction. While many regulations are in place under Ghanaian law to combat IUU, implementation remains a major challenge. Outside of the ports, limited MCS is conducted by the Ghanaian Navy using patrol boats and--until recently--monitoring via the transponders on board. With the recent discovery of off-shore oil, the Ghanaian Navy will focus its efforts on securing this new found resource and may further limit enforcement of IUU fishing. Also, artisanal fishermen often congregate near platforms and rigs, creating a hazard for them and for the platform equipment and operators. On the positive side, a sub-regional fisheries committee based in Tema, Ghana for the West Central Gulf of Guinea (Benin, Cote d'Ivoire, Ghana, Liberia, Togo, and Nigeria) aims to pool resources to conserve and sustainably manage biological marine resources, including a newly established IUU permanent working group.

4.5 Conflicts in Ghana fisheries

The majority of conflicts between the artisanal fishery and industrial including the semi-industrial fishers are due to the competition for the same fishing grounds and or common resources. Conflicts arise in the form of collisions of fishing crafts and vessels, which at times leads to loss of life. Other forms of conflicts are: Running over nets of the artisanal fishers by industrial vessels; the destruction of artisanal fishing gear by semi and industrial trawlers transgressing the 30- meter depth contour which is exclusively reserved for canoes appears to be the major cause of conflicts between canoes and industrial vessels.

Surveys and an inventory of accident at sea cases in the past decade indicate that over 60% of complaints by canoe fishermen indicate gear destruction as the prime problem with industrial vessels.

Conflicts between the artisanal fishers and fisheries and the Fisheries Administration appear when fishermen refuse to abide by Act principles.
Conflicts between semi-industrial/industrial fishers and canoe Fishermen Conflicts related to industrial trawlers and canoes are basically due to the non-compliance or enforcement of coastal regimes reserved for the artisanal fishery. Distinct depth zones are reserved for canoe fishers in most coastal states in the West African sub-region.

Conflicts between the Administration and inshore/industrial do occur occasionally between vessel owners and fisheries administration in the areas of renewal of licenses and change of ownership. Most often vessel owners deliberately refuse to renew their licenses and insure their vessels and crew under section 3 of the Fisheries Law PNDCL 256. Most vessels do not inform fisheries administration of a change in ownership at the appropriate time. This creates lapses in administrative records for effective management of the fleet.

Conflicts between foreign officers onboard industrial vessels especially tuna bait-boats and local officers due to hasty attitudes, shouts and often fights have occurred often discouraging and undermining local officers from taking up more responsible positions. Also the use of fish aggregating devices (FAD's) in tuna fishery has led to some conflicts. The inshore fleets have often complained about the destruction of juvenile pelagic fish by the use of FAD's by the tuna purse-seiners. Petitions calling for its ban have been sent to the Fisheries Commission (Ghana) which is being addressed.

4.6 Contribution of the fishery sector to the national economy

The Ghanaian fisheries sector contributes 4.5% to GDP, accounts for 12% of the agricultural GDP and 10% of the labor force. Tuna sales account for 14% of NTE exports from Ghana and are the single largest contributor. Locally, the canneries in Tema provide considerable employment for a largely female workforce.

It is estimated that over 123,000 fishers are engaged in marine capture fisheries and about 2.2 million people rely on and /or provide support to these fishers; these include their wives, children, close relatives as well as canoe carvers, input suppliers and office workers for industrial fleet. Fish workers engage in processing, distribution are estimated to be around 500,000 individuals.

Ghana is a net importer of it is expected that this gap will continue to remain wide for the coming years thus, creating opportunities for fish imports and further growth in aquaculture. The imports and exports of fish are regulated and require a permit from the GOG. Imports of aquaculture fish, however, are prohibited. There are increased fish imports from November to May (lean local fish season), which drop in July-September when there is active local fishing.

The trade balance shows that the imports fetched US$ 108 million (2010) while exports were around US$ 65 million. This trade deficit explains the GOG's strategy to facilitate sound of aquaculture development; responsible fishery practices, sustainable management of the resources and development of value added fish and fishery products. The Ghana's National Aquaculture Development Plan is targeting a 100,000 MT fish harvest from aquaculture development.

5 Fish supply consumption, supply, processing and trade channels in Ghana

5.1 Fish supply and consumption

Fish is recognized as the most important source of animal protein in Ghana (Fynn A., 2001) and in all regions of the country, poor or rich, rural or urban (Anon 2003). Up to 60% of animal protein in the Ghanaian diet is thought to. For domestic consumption fish is often purchased fresh, smoked- salted, dried, salted and dried, canned, fried or grilled. Other than for human consumption, some fish such as anchovy and tuna official are used for fish meal. Average per capita fish consumption in Ghana for the period 2009-2011 is estimated at 22.7 kg higher than the World average of 16 kg (table 2).

The table 2 shows that the total marine fisheries catches recorded a slight increase from 326,109 to 327,144 MT respectively from 2099 and 2011. This rise is due to the high tuna landings in 2011 (better control of statistics) which increased from 66,470 MT to 86,771 MT respectively during the same period.

The inland fisheries production rose from 81,703.4 MT to 114,445 MT because of the high landings in the Volta lakes more than 21,000 MT and the aquaculture production which tripled during the under study. However, despite the strong efforts in aquaculture production, the volume harvested remains below 20,000 MT and this compared to the GOG target of 100,00MT, seems unrealistic.

The national total production fetched 441,000 MT which is an increase of 40,000 MT. Whereas exports dropped from 71,600 to 44,144 MT because of the fish fish exports which dropped by 50% and tuna exports remains around 41,000-46,000 MT.

There are two large tuna canneries in Ghana. These are the Pioneer Food Cannery, and the Ghana Agro-Food Company. Products from these processing plants go to the EU countries, USA, other ECOWAS countries and the domestic market. The export destination is mainly EU countries such as Spain, Portugal and Greece and USA and Japan. Fish exports from Ghana are made up of high value tuna (whole, loins and canned), frozen fish (mostly demersal species), shrimps, lobsters, cuttlefish and dried and smoked fish. The Fisheries Act 625 of 2004 requires that at least 10% of landings of the tuna vessels be sold in Ghana.

Fish imports grew from 182,400 to 191,428 MT. Frozen horse mackerel, chub mackerel, yellowfin as well as sardinella are imported through the Tema and Takoradi Ports and distributed through the internal trade channels, during the lean season November to May (FAO 2004b). The five top suppliers of fish are Mauritania (20%), UK (14%), Poland (8%) and Netherlands (6%). Other suppliers are Morocco, Norway, the Netherlands, Belgium, Senegal, Namibia, and the Gambia.

Many local Ghanaian fishing companies, such as Mankoadze Fisheries, which prospered throughout West Africa in the 1960s and 1970s, have either ceased operations or are engaged in the importation and retailing of fish. The only fishing businesses that are profitable under current economic conditions are those that import fish from Europe and other West African countries into the country for domestic consumption.

The balance between supply and demand shows the country satisfies only 59.4% of the demand and rely heavily on imports to keep the per capita around 23.7 kg. Consequently, more efforts should be done in the aquaculture sector to fill the gap.

Table 2: Evolution of fish production, imports and exports from 2009 to 2011

MARINE	2009	2010	2011
CANOES	226,755.3	213,000.00	209,200.28
INSHORE VESSELS	12,047.7	9,823.30	9575.99
INDUSTRIAL TRAWLERS	20,836.7	18,859.30	21,596.90
PAIRED TRAWLERS	0.0	0.0	0
SHRIMP VESSELS	0.0	0	0
TUNA VESSELS	66,470.0	77,875.50	86771.6
TOTAL MFP	**326,109.7**	**319,558.1**	**327,144.8**
INLAND			
VOLTA LAKE	74,500.0	83,127	95,353.30
PONDS, CAGES & PENS	**5,826.0**	**10,200**	**19,091.97**
RESERVOIRS, DUGOUTS & DAMS	1,377.4		
TOTAL IFP	**81,703.4**	**93,327**	**114,445**
TOTAL DOM. CATCH	**407,813.1**	**412,884.7**	**441,590.0**
EXPORTS			
TUNA	41,211.4	46,725.30	
FISH	30,389.5	15,724.70	
SHRIMP	0.0	0	
TOTAL EXPORTS	**71,600.9**	**62,450.0**	**44,144.80**
FISH IMPORTS	**182,400.0**	**199,798.40**	**191,428.90**
TUNA SOLD LOCALLY	25,258.6	31,150.20	
FISH SUPPLY /CONSUMPTION	518,612.2	550,233.1	588,874.1
POPULATION (M)	23.9	24.2	24.8
REQUIREMENTS (MT)	956,000.0	968,000.0	992,000.0
% ACHIEVED	54.2	56.8	59.4
PER CAPITA CONSUMPT'N (KG)	**21.7**	**22.7**	**23.7**

Source : Fisheries Commission

5.2 Main fish trade channels in Ghana

5.2.1 Fish Traders

The fish traders (also known as fish mothers or "konkofo") pre-finance fishing trips and purchase fish from fishermen for distribution to other actors in the fish value chain, most of whom are smoked fish processors. They also sell directly to fresh fish retailers, "momone" processors, and individual consumers. Particularly in smaller landing sites, the Queen Mother ("konkohene" – the fish mothers' leader) negotiates a price with the first boat that arrives and this price is generally valid for the rest of the day. In larger landing sites like Sekondi harbor, this role has allegedly lost its importance and prices are negotiated on a boat-by-boat basis14. The konkohene is appointed by the fish mothers. She remains in power indefinitely or until her elders and fish mothers advise her to step down.

Exchanges between fish mothers and processors/consumers are typically carried out at the landing site where the fish is purchased (although, as noted above, fish mothers sometimes travel to the large landing sites to buy fish). Apart from acting as intermediaries at the various fishing harbors, fish mothers can also play important roles in informal finance. They almost always pre-finance the fishing trips with fuel, gas oil, kerosene, and food, thus securing access to that boat's catch. Depending on the financial position of the fish mothers and fishermen's need for credit,

5.2.2 Domestic trade channels

The major inland fish trading centers on Lake Volta are Yeji, Kpandu-Tokor, Buipe,Atimpoku, Agormenya and Kete Krachi. Nearly 40,000 MT of fresh fish are cured and transported from these towns annually to the urban markets, especially in Southern Ghana.

The most important domestic market and consumption center is Accra, the capital of Ghana. Other important centers are Kumasi, Tarkwa, Tema and Sekondi-Takoradi. Neither farmed fish products nor fish seed are exported from Ghana because production is low, below 20,000 MT/year.

Aquaculture production (*Oreochromis niloticus* and *Clarias gariepinus*) and species of tilapia such as *Heterotis niloticus* are sold fresh at the farms, and any unsold stocks are fried or salted and dried and sold later. Fish 'mammies' may also buy the fish in bulk from the farms and retail it in the towns. Data on quantities that are sold as fried or salted and dried fish is not available.

The Kadjebi fish farmers association (FFA) began have their own sales outlet in the town and employed a sales assistant to run it. These direct sales of fish by the associations are attempts to cut out the fish 'mammies' who make a large profit by buying the fish very cheaply from the farmer, and selling at a high mark up to the public. Tilapia, for instance, costs about ¢15 000 (US$ 1.63)/kg in the rural areas compared to the ¢35 000 (US$ 3.800)/kg in Accra. The fish is sold fresh and as a whole product to the public. It is put on ice if it has to be carried from one town to the other provided ice is available.

5.2.3 Regional trade channels

Whilst most fish sold is for domestic consumption, some of it ends up crossing international borders. Processors from Shama, Cape Coast (Duakoro) and Elmina (Bantuma) sell their produce in Denu, a market on the Ghana-Togo border. Trucks are loaded with baskets of fish from various processors and only a few of them actually travel to Denu. There, they sell their own fish and others' fish. This collaboration works in other ways too. Processors from Duakoro and Bantuma have a mutual agreement whereby they travel to Denu on alternate market days (periodic markets which fall on every fourth day) so as not to flood the market with too much smoked fish – which would reduce prices and, in turn, profits. Language works in favour of this arrangement too – since Ewe is spoken on both sides of the border (but not typically in Western or Central Region) and some of the Ghanaian border traders also speak French

The fish here is sold to retailers coming from Togo, Nigeria, and Benin. It has a better quality appearance than the fish sold domestically. During the high season, smoked marine fish also passes through Tamale – serving both domestic markets and Burkina Faso. It is very rare for processors to travel there to sell their fish but some retailers travel to Takoradi and Kumasi to source smoked fish.

5.3 Fresh fish trade

About 10,000 MT of fresh fish are harvested from other smaller rivers and lakes each year, and processed for sale in urban markets. Inland fishing centers in remote areas are not easily accessible to the major consuming centers. This factor impedes internal as well as intra-regional fish trade. Bad roads from major fish producing towns make fish distribution in Ghana very difficult. These constraints make inland fish products expensive, and also result in deterioration in quality during distribution.

During the main fishing season, the consumption of fish and in particular fresh fish increases in coastal and inland areas. In the lean season fish is mostly sold and purchased for consumption in smoked form from local sources and frozen form from imports. A number of consumers prefer pelagic fish with a high fat content. As regards to price, the small pelagic (sardinella, anchovies and mackerel) is of low value therefore they are relatively cheap, popular and consumed by the majority of Ghanaians. Species like sea bream; snapper; shrimp; lobster; grouper; and cuttlefish are demersal fish species sold to and consumed by the wealthiest.

5.4 Cured fish trade

Processors mostly purchase fish from the fish traders, but there are cases where they purchase directly from fishermen. If there is insufficient supply of fish, processors travel to other landings to purchase fish. Processing of fish, which represents an important sector for women, seems to be concentrated at the small- and medium-scale levels. Fish is processed using several methods (smoking, drying, salting, frying and fermenting and various combinations of these), of which smoking is the dominant. The main species smoked traditionally are the anchovies, sardinella, chub and horse mackerels Most of the processing takes place at the individual or household level and the most common species of fish processed is sardinella, known locally as “ɛban” (also known as “Amane” in some areas), though it is common to see other types of smoked fish.

Smokers use so-called Chorkor kilns and utilize various inputs such as baskets, basins, grills, basket nets, fuel wood, and brown paper. In Ghana, smoking is the most widely practiced method; practically all species of fish available in the country can be smoked and it has been estimated that 70-80 percent of the domestic marine and freshwater catch is consumed in smoked form.

Women are particularly active in Ghana’s fishing industry. In marine canoe fisheries, only men fish but women are crucial as intermediaries in processing, distribution and exchange. In some cases women who act as itinerant traders go to processors in their communities to buy the fish, which they sell to retailers in central markets. Retailers sell smoked fish to consumers (individuals and food vendors) at the same (central) markets or in smaller, surrounding markets whilst others transport it to villages for retailing. While the majority of these traders deal solely in smoked sardinella, a few sell other types of smoked fish as well.

Dried anchovies are mostly sold and consumed in the north of the country and remote rural areas. Areas far from major sources of fish protein, fish is mostly sold and consumed in smoked form.

6 Regulatory framework of fisheries and fish trade

6.1 Fishery management framework in Ghana

6.1.1 Fisheries policy

There is currently a serious scarcity of fisheries resources, disputes over jurisdiction, inadequate conservation and management measures and a high influx of foreign fishing vessels in Ghanaian fishery waters, impacting heavily on the country's ability to meet domestic demand, threatening fish food security and the livelihood of many Ghanaians, as well as the country's economy.

The Fisheries Act of 2002 (Act 625 is the regulation currently governing the fisheries sector. It amends, consolidates and attempts to streamline all the existing fisheries laws to address chronic and emerging issues whilst conforming to national and international fishery resource development and management strategies.

An examination of the Act revealed that it provides a potentially sound framework that is suitable for a sustainable management of Ghana fisheries. The FASDP and the World Bank program are designed to achieve this policy.

6.1.2 Fisheries legislation

The main regulation is the Fisheries Act, 2002 (Act 625) which application is intended through the Fisheries Regulation, 2010(L.I.1968). By its very definition, the Act sets out to integrate international fisheries agreements into Ghanaian national legislation. It emphasizes the importance of the Fisheries Commission by strengthening the legislation establishing the Commission

The fisheries industry in Ghana is regulated by this Act which is supposed to consolidate with amendments of all the foregoing laws on fisheries Acts, Decrees, Laws, Legislative Instruments (and other subsidiary/subordinate legislation) on or relating to the sector that are still in force. The Act includes provisions for the regulation and management of fisheries, the development of the fishing industry, the sustainable exploitation of fishery resources and to provide for related matters.

In accordance with the Act all the fishing vessels operating along the marine coast of Ghana must be registered. According to the GOG, this registration and the Identification Number would become useful instruments to assist the Fisheries Commission to build a national Fishing Vessel Register and help to compile statistics and data on fish capture, information on number of fishing vessels including canoes, and fishing gear used.

The Fisheries Regulations, 2010 (LI 1968) Sections 11 (1), (2) and (3) prohibits for any person to use any fishing method that aggregate fish either by light attraction, use of bamboo for purposes of aggregating fish, or use of explosives, or any obnoxious chemicals for fishing, or operating pair trawling. It is also an offence under Sections 12 (a) and (b) of LI 1968 for anyone to use un-prescribed mesh net sizes for fishing.

Aquaculture development is also governed by the Fisheries Act of 2002 (Act 625). The permits required under the law for aquaculture operations are:

1. An Environmental Impact Assessment report approved by the Environmental Protection Agency;

2. A permit from Water Resources Commission (WRC) to use water;

3. An approval from the Director of Fisheries;

4. A letter of consent or a no objection to the project from the chief and people of the area (community);

5. No objection from District Assembly of the area (community);

6. A permit from the Volta River Authority to locate on the Lake Volta to produce fish;

The Food and Drugs Law, 1992, prohibits the sale of unwholesome, poisonous or adulterated and unnatural substances and lays down penalties for breaching the law.

6.2 Involved institutions

6.2.1 The Ministry of Food and Agriculture (MOFA):

In charge of the preparation of Fisheries laws and policies fall under the responsibilities of the MOFA which in turn delegates functions, including implementation to a semi-autonomous body; the Fisheries Commission.

The Fisheries Commission (FC) was established under the Fisheries Commission Act (625, 2002 now the Fisheries regulations, L.I. 1968). It oversees management, regulation and utilization of the fisheries resources of Ghana drawing on the powers set out in the Fisheries Law (PNDC 256, 1991). Fisheries Act 625 (L.I., 1968/2010) provided for the establishment of a more full-bodied FC which is an amalgamation of the previous FC and Department of Fisheries. Due to the crucial role it is to play in the development and management of the fishery resources of Ghana, it is important to have an understanding of the makeup of the Commission and the provisions made for it under the Fisheries Act.

Specifically, Section 1 of the Act establishes the Fisheries Commission, and subsequent Section 2 states the main object of the Commission as “to regulate and manage the utilization of the fishery resources of Ghana and co-ordinate the policies in relation to them”. Considering the interdependence of the various sections and the role of the fisheries sector in the economic growth of the country, the composition of the Commission is such that it must include the most important stakeholders in the sector. Thus, Section 4 (1) establishes the composition of the Commission as:

1. A chairman (appointed by the President of Ghana in consultation with the Council of State);

2. One representative of the Ministry responsible for Transport;

3. One representative of the Ministry responsible for Defense;

4. One representative of the Ministry responsible for Environment;

5. One representative of the Ghana Marine Fishing Officers Association;

6. One representative of the Water Research Institute;

7. One representative of the Ghana Irrigation Development Authority;

8. Two representatives of the National Fisheries Association of Ghana – one representing artisanal fishermen and the other representing industrial fishing vessel owners;

9. One other person with requisite knowledge of the fishing industry or natural resources renewal management; and

10. The Director of the Commission.

The Divisions of the Commission are established under Section 15. This section gives the Commission the power to establish such divisions in the secretariat as it considers necessary for the effective achievement of its objects and functions. The Divisions established are:

1. Marine Fisheries Division;
2. Inland Fisheries Division;
3. Fisheries Scientific Survey Division (i.e. Fisheries Research);
4. Monitoring Control and Surveillance Division; and
5. Finance and Administration Division.

The Fisheries Act in including this wide scope of institutions not only ensures full participation of all the players in the fisheries sector (transport, environment, defense, research, fisheries, etc.), but also fulfills the duties of a coastal State as required by the UNCLOS with respect to, *inter alia,* exploring and exploiting, conserving and managing natural resources, duty to conserve living resources, protection of shipping, marine scientific research as well as pollution control and response.

The Fisheries Act 625 empowers the Commission to appoint committees it considers necessary for the effective implementation of its functions. Procedure for acquiring a Fishing License to operate a Fishing Vessel in Ghana is detailed in Box 4.

Box 5 : Procedure for acquiring a Fishing License to operate a Fishing Vessel in Ghana

Register a company in Ghana at the Registrar General's Department and get the certificate of registration and company's code. Shareholding should be 100% Ghanaian for trawler and shrimper operation and at least 50% Ghanaian for tuna vessel operation. Apply for a permit from the Hon. Minister of State in charge of Fisheries, and attach to the application, a copy of the registration certificate of the company. (Fishing should be one of the activities to be carried out by the company), class certificate, survey report, tonnage certificate of the vessel intended for importation and operation and Oil Pollution Prevention Certificate. Gross registered tonnage (g.r.t.) of a trawler and a shrimper should not exceed 450 and 300 respectively and for a tuna vessel, should not exceed 600 for a tuna purse seiner and 500 for a tuna pole and line. Application with documents are sent to Hon. Minister for Roads and Transport for vetting ie. For class and sea worthiness. Minister for Roads and Transport responds to Minister for Fisheries as to whether the said vessel should be allowed into the country or not.

Minister for Fisheries grants the permit for the importation of the vessel if it was found out to be of class and sea worthy. Validity period of a permit is one (1) year and permit is not transferable. When the vessel is imported, it would first be registered by the Shipping Commissioner at Takoradi under the national flag and it would be issued with a certificate of registration and an official number issued which would be boldly embossed on the vessel. Fishing registration number is then issued to the vessel after the submission of the following documents and inspection of the vessel by FC :

- Certificate of registration of the company
- Company's code - Survey report of vessel
- Purchase agreement/Bill of sale
- Picture of the vessel
- Certificate of Ghanaian registry

- Insurance cover for vessel and crew
- Filled MCS forms and report on inspection of vessel by MCS duly signed and stamped
- Safety equipment certificate
- Tonnage certificate
- Radio and communication equipment certificate

Fishing license is then issued upon payment of license fees which varies according to type and g.r.t of the vessel. Crew composition should be at least 75% Ghanaian in any case. Fishing license is renewable quarterly or annually ending 31st December. Renewable of license for shrimp vessels are issued quarterly.

Conditions for renewing fishing license :

- Apply for renewal of fishing license to the Director of Fisheries and attach the following documents.
- Submit catch returns trip by trip to the Head of Marine Fisheries Research Division (MFRD).
- Filled MCS form duly signed and stamped - Valid safety equipment certificate.
- Valid radio and communication equipment certificate - Valid Insurance covers for Hull and Machinery.
- Valid Insurance covers for crew - License fee paid by Banker's Draft in the name of 'Director of Fisheries'
- Show receipt for payment of a log book from DOF

6.2.2 Collaborative institutions

Ghana Standards Authority (GSA): The GSA established in 1965, as the Industrial Standards Institute, and is now, as an independent corporate body since 1973. GSA's mandate is to set standards, and ensure that goods and services conform to the standards and are of acceptable quality both for local consumption and export. GSA issues Export Certificates to assure importers that the Ghanaian products meet the required health, safety and sanitary standards. It is recognized by the EU as the Competent Authority and its QC laboratories is upgraded and well equipped and recently accredited through support of World Bank financing.

*Food and Drugs Board (FDB***):** The Food and Drugs Board (FDB) is the GOG regulatory body with the responsibility of implementing Food and Drugs Law of 1992, (PNDCL 305B) to regulate the manufacture, importation, exportation, distribution, use and advertisements of food, drugs, cosmetics, medical devices and household chemicals with respect to ensuring their safety, quality and efficacy. The FDB‟s mandate is to protect and promote public health by ensuring that food and drugs consumed in Ghana are wholesome and safe. The FDB was established and became fully operational in August 1997. All food products imported, advertised, sold or distributed in the country must first be registered with the FDB under Section 18 and 25 of the Food and Drugs law, 1992 (PNDCL 305B) and Section 4 (b) of the Food and Drugs (Amendment) Act 523, 1996. A certificate with a registration number is then issued with respect to the product.

Export Development and Investment Fund (EDIF): It was established in 2001, the mandate is to provide funds on concessionary terms to exporters to finance export-costs. It operates through two main facilities: a) The Export Development and Promotion Account (EDPA) only providing loans to institutions, organizations and trade associations both in public and private sectors, and b) The Credit Facility (CF) for the provision of loans at 15% interest rate through Designated Finance Institutions (DFI) to producers and exporters. The GoG is in the process of reviewing the scheme, for more efficient delivery of credit.

Ghana Export Promotion Council (GEPC): The GEPC, in collaboration with line ministries, is mandated to assist exporters to identify products, which have potential for export. The institution provides strategic market information, sponsorship, equity participation and sourcing of inputs. The Council also facilitates foreign trade and organizes participation in trade fairs, provides technical assistance, collects statistics and participates in policy formulation. GEPC currently has registered over 3,000 exporters organized into 15 Product Associations. The Council receives 75% of its financing from GOG and the other 25% from donors. GEPC has long experience as a facilitator of business but there is a need for further coordination of activities with other stakeholders.

Environmental Protection Agency (EPA): The EPA, (see Box 5), formulates the national environmental policy, and co-ordinates and monitors activities that could have an impact on the environment. EPA ensures that development plans and programs take into account environmental concerns through Environmental Impact Assessments (EIA). EPA also ensures that there is regular monitoring of pre-determined environmental indicators. Where necessary, EPA enforces the environmental law. It disseminates public information on the state of the environment and carries out non-formal education programs. The agency has the necessary manpower and capacity to undertake the responsibilities entrusted to it.

BOX 5: In exercise of the powers conferred on the Minister responsible for the environment under section 28 of the Environmental Protection Agency Act 1994 (Act 490) i.e. L.I. 1652, and on the advice of the Environmental Protection Agency Board, regulations were made for the conduct and submission of environmental reports and impact statements. Schedule 2, regulation 3 of the Environmental Assessment Regulations, 1999, prescribes land-based aquaculture as one of the undertakings for which an environmental impact assessment (EIA) is mandatory. In the same legislative instrument, schedule 5, regulation 30(2) contains the provisions to regulate the activities associated with fish cage culture. It characterizes water trapped for domestic purposes, water within controlled and/or protected areas and that water which supports wildlife and fishery activities as environmentally sensitive areas the use of which is governed by EIAs.

National Fisheries Association of Ghana (NAFAG): NAFAG is active in the fisheries sector, it provides various services relevant to fishing, processing and trading activities, such as extension services, training and limited credit services.

6.2.3 Marine Protected Areas

The Marine protected areas (% of total surface area) in Ghana was last reported at 0.01 in 2010, according to a World Bank report published in 2012. Marine protected areas are areas of intertidal or sub tidal terrain--and overlying water and associated

flora and fauna and historical and cultural features--that have been reserved by law or other effective means to protect part or all of the enclosed environment. This page includes a historical data chart, news and forecasts for Marine protected areas (% of total surface area) in Ghana.

6.2.4 Community based management

Operating under PNDC Law 327 of 1993, the Ministry of local Government and Rural Development (MLGRD) is the key institution with responsibility for facilitating the establishment and development of a vibrant and well-resourced decentralized system of local government. MLGRD is responsible for managing fishers, fish processors and fishery resources at district and sub-district levels.

Recently, the District Assemblies in collaboration with FC, have been mandated to facilitate fishery resource management by: helping in forming and sustaining CBFMCs; cooperating with the FC/ MCS units; providing legal and financial support to the CBFMCs; and approving levies proposed by the CBFMCs.

A Community-Based Fisheries Management Committee (CBFMC) is defined as a local committee, formed in a fishing community, based on existing traditional leadership authority and local government structures, legally empowered by Common Law, and comprising all stakeholders, to oversee the management and development of the fishing industry. The genesis of the CBFMCs was derives from FC's interest in ensuring a more sustainable national fishery resources through co-management.

The principal responsibility of the CBFMCs is to enforce national fisheries laws at community level, as well as to enact and enforce their own by-laws to the same end.

6.3 Regional fishery management framework

Ghana is member and host of the Fisheries Committee for West Central Gulf of Guinea (FCWCGG). The FWCGG is the regional body mandated to work towards a regional collaboration on management of the shared stocks and the regional integration of the national fisheries policies. On the other hand, Ghana and Cote D'Ivoire have a bilateral arrangement for the management of and data sharing on Sardinella stocks which migrate between the two countries.

GOG also is implementing in its country the West Africa Regional Fisheries Program Project (WARFP). The development objective of the First Phase of the is to support the sustainable management of Ghana's fish and aquatic resources by: (i) strengthening the country's capacity to sustainably govern and manage the fisheries; (ii) reducing illegal fishing; (iii) increasing the value and profitability generated by the fish resources and the proportion of that value captured by the country; and (iv) developing aquaculture.

6.4 International fishery management framework

Ghana is member to the International Commission for the Conservation of Atlantic Tunas (ICCAT). This Commission is an inter-governmental fishery organization responsible for the conservation of tunas and tuna-like species in the Atlantic Ocean and its adjacent seas. ICCAT compiles fishery statistics from its members and from all entities fishing for these species in the Atlantic Ocean, coordinates research, including stock assessment, on behalf of its members, develops scientific-based management advice, provides a mechanism for Contracting Parties to agree on management measures, and produces relevant publications.

6.5 Main international agreement/conventions

6.5.1 Vessels monitoring

The Vessel Traffic Management and Information System (VTMIS) consists of eight Remote Sensor Sites to be sited along the entire coast of Ghana from Keta to Half Assini; three Remote Base Stations (RBS) along the Volta Lake (for the inland waterways); three manned Area Control Centers (ACC) for the west, central and east sectors, and one National Control Centre (NCC). The latter will be located at Ghana Maritime Authority Headquarters in Accra.

VHF frequencies and in compliance with the International Maritime Organization (IMO) mandated Global Maritime Safety and Distress Systems (GMDSS) and Long Range Identification and Tracking (LRIT) requirements for receiving regular ship reports will also be installed.

All data from the Remote Sites will be transferred to the manned Control Centers where operators will have display screens depicting vessel traffic. In addition, there will be provision for ten Monitoring Stations (MS) for selected stakeholders to monitor vessel traffic. Such stakeholders include National Security, Fisheries Commission, Narcotics Control Board, Ghana Immigration Service, and Customs Division of the Ghana Revenue Authority, Ghana Ports Harbors Authority, Regional Maritime University and others.

The VTMIS will also combat pollution, especially from vessels that illegally flush out their tanks at sea. Apart from monitoring activity at sea, the VTMIS is also equipped with sensors to provide information on weather conditions.

6.5.2 Catch declaration

Under the Fisheries Act 625, Article 100 states that: Observers shall perform such functions as the Minister may determine: - *(i)* collection of catch and effort data; (ii) taking reasonable samples of fish for scientific purposes; and *(iii)* reporting violations of this Act and Regulations made under it.

Concerning tuna, Ghana uses the ICCAT catch data form. In 2009, the Commission requested Ghana to submit to ICCAT an action plan in order to strengthen the collection of statistical data (Task I and II, including size composition) and to develop control measures so as to ensure the full implementation of conservation and management measures (paragraph 5, Rec. 09-01). Thus, Ghana presented the document “Ghana’s action plan to strengthen the collection of statistical data (Task I and Task II) and control measures to ensure the full implementation of conservation and management measures”. In order to assure that all Ghanaian flag vessels are covered under this action plan, Ghana has signed a MoU with Côte d’Ivoire to sample vessels that unload tuna at the port of Abidjan.

6.5.3 The 2010 Plan of action to eradicate IIU fishing

The new National Fisheries and Aquaculture Policy could provide an invaluable solid base for elaborating a National Plan of Action on Illegal, Unreported and Unregulated fishing. The FAO IPOA-IUU as has been noted by many authorities on the subject, the IPOA-IUU provides a ‘toolbox’ of measures for States and RFMOs to adopt in their fight against IUU fishing. The idea here is for each coastal State to select from the measures provided those that are best suited to their particular circumstances.

Ghana is in the process of setting up a vessel traffic management and information system (VTMIS) to provide electronic monitoring of its entire coast in an effort to counter piracy and armed robbery at sea. The Ghanaian fisheries industry has to cope with more fishing vessels "border hopping" into Ghanaian fishery waters from neighboring countries than these same countries have to deal with Ghanaian fishing vessels due to the better MCS capability of Ghana. For this same reason Ghanaian fisheries authorities are to a higher extent, though not very efficiently, better able to detect and act against foreign fishing vessels involved or suspected to be involved in IUU fishing activities.

Ghana acquired four new patrol boats for the Navy of which two bought by the MOFA. The Ministry of Transport, the Ghana Maritime Authority and the Ministry of Defense are establishing a Vessel Traffic Monitoring Information System (VTMIS) along the entire coast of Ghana. This would include coastal radar stations with command and control centers (Box 6). The system is fully established it would be complemented with naval ships and maritime patrol aircraft.

Box 6: Preventing piracy in Ghana waters

Ghana has been reviewing measures to safeguard its waters, most importantly to protect our oil installations from pirate attacks. Piracy in the Gulf of Guinea is not on the scale of that off Somalia, but analysts say an increase in scope and number of attacks in a region ill-equipped to counter the threat could affect shipping and investment. For instance, Cameroon blamed piracy for part of a 13 percent drop in oil output in 2009. Other maritime problems include piracy and drug trafficking. The United Nations estimates that US$1 billion worth of cocaine, destined for Europe from Latin America, passed through West Africa in 2008.

6.5.4 Community base actions for shark management and conservation

Ghana had signed the Memorandum of Understanding on the Conservation of Migratory Sharks is an international instrument for the conservation of migratory species of sharks. It was founded under the auspices of the Convention on the Conservation of Migratory Species of Wild Animals (CMS; also known as the Bonn Convention). After two initial meetings in 2007 and 2008, the Memorandum of Understanding (MoU) was signed into effect on 1 March 2010, in the city of Manila, meeting the required amount of 10 signatures,] and taking effect immediately for each signatory. It has been adopted by over 40 states in total. However, the shark management and conservation activities are yet to come into effect because of the high prices given for dried shark fins in Asian markets (more than 200$/kg) compare to the declining fish catches and prices.

6.5.5 Sanitary Regulation applied to fish and fishery products exported to the EU market

The fisheries ACT 625 does not include health and sanitary aspects whereas the Ghana Fishery Products Regulation - 2006 (FPR) which covers the relevant EU legislation governing fish and fishery products complies with international sanitary regulations and the WTO Agreements SPS and TBT.

6.6 Fisheries agreement

Ghana has not signed a Fishery agreement with the EU.

7 Main constraints and opportunities to the development of Ghana fisheries

7.1 Institutional Constraints

The GOG has supported the fishery sector through various means such as subsidy of fuel for outboard motors; controlling large trawlers via licensing; legislation that requires Ghanaian majority ownership of fishing enterprises landing their catch in the country; and attempts to stimulate investment in fisheries related infrastructure. Most tuna vessels are operated on joint-venture basis with Ghanaians having at least 50 percent shares as required in the Fisheries Act 625 of 2002 (see below). These measures have been open to corruption and abuse, and are not easy to enforce.

Since the exercise started in 2010 industrial and semi-industrial fleets have been compliant, but the artisanal canoes operators have not.

The law also provides for a regulatory body, the Fisheries Monitoring, Control, Surveillance, and Enforcement Unit, as well as a fisheries advisory council. In November 2005 the GOG procured a vessel monitoring system to check illegal fishing in Ghana. Unfortunately, the monitoring, control and surveillance of the Exclusive Economic Zone (EEZ) and enforcement of the relevant fisheries laws are weak, making it difficult to assess the level of illegal fishing.

Inadequate legal provisions; apart from the mention in the section 93 of the Act 625, there is no legislative instrument or regulation defining processes for the development of the FIA.

7.2 Sanitary Constraints

The European Commission's (EC) Food and Veterinary Office (FVO) in September 2010 audited the fish inspection and quality system of Ghana. It reported that Ghana is not Meeting EU Export Standards. The Ghanaian Competent Authorities and the control system implemented only offers partial guarantees concerning the sanitary conditions of the production of fishery products for EU export. Also many shipments of smoked fish have been tested with above the PAHs standard limits.

The main issues are related to budget constraints, laboratory accreditations and plant quality assurance skills to prepare workable HACCP plans

7.3 Constraints in implementing MCS

The major challenges facing MCS operations in Ghana include lack of resources to police the waters, lack of well trained and equipped personnel, lack of comprehensive database on vessels operating in the sub-region, weakness of the WTCWG / RFMOs. These problems, though being addressed, may prevent the effective functioning of the MCS in Ghana and other African nations as well.

These notwithstanding, there is likely to be a marked improvement if solutions targeting the following areas:

- Finance
- Capacity building (especially of technical staff, i.e. inspectors and observers)
- Expanding coverage, improving and enforcing vessel monitoring system requirements

- Improving land-based enforcement including port state control
- Establish and maintain a permanent inter-agency collaboration for MCS
- Expand and make maximum use of observer programs
- Seek and establish international collaborations, especially with immediate neighboring states and RFMOs in the West African sub-region

These are the major areas that need immediate attention if there is to be an improvement in the MCS situation for Ghana.

7.4 Environmental Constraints

Overexploitation; Local demand for fish already outstrips supply, and the gap between supply and demand is expected to increase, placing increasing pressure on fish stocks that are already considered some of the most overexploited in the region. Combined with little or no enforcement of regulations, this situation sees individual fishermen losing economic ground, and an important component of the nation's and sub-region's food security becoming increasingly at risk.

Threats to biodiversity assets: It's not just the fisheries that are under threat. Ghana's rich biodiversity is also shrinking. Ghana is in the process of setting up a vessel traffic management and information system (VTMIS) to provide electronic monitoring of its entire coast in an effort to counter piracy and armed robbery at sea.

Unfortunately, there are no marine protected areas within Ghana's waters to help preserve this biodiversity. The six districts of Ghana's coastal zone represent less than seven percent of the land area of the country, yet they are home to 25 percent of the nation's total population. The combination of increasing food and livelihoods insecurity, population growth, and environmental degradation continues to impact negatively on the quality of human life in this coastal zone. In addition, rapidly evolving extractive industries in the region, including fisheries, plantation crops, hard minerals and petroleum, present challenges that regional governments are not equipped to handle.

The coastal and marine ecosystem is under threat from a variety of man's actions which include :

- Increases in urbanization caused by migration and high rates of population growth.
- Greater infrastructure along the coast, industrialization and heightened
- economic activities
- Provision of transportation facilities including extensive road networks, rail, air and water

7.5 Business climate

7.5.1 Key constraints facing the industry

The cost of employing labor in the canneries in Ghana is high compared to its competitors. This is governed not so much by the level of wages but by the cost of employment (benefits, cost of uniforms, laundry services - demanded by UK supermarkets). Active and powerful labor unions within Ghana have also contributed

to the rise in labor costs through demands concerning working hours, working conditions and leave entitlements.

Ghanaian energy costs are high. Ghana has no domestic oil reserves so all oil products are imported, driving up costs. Cannery managers are not able to rely 100 per cent on the national grid and have to run their own back-up power units in case of failure. This adds more costs to the overall production.

Despite their proximity to Europe, the coastal nations of West Africa are no longer on major shipping routes. Shipping goods from Tema to Europe is thus far more expensive than comparative costs from Asia.

Ghana's freedom to purchase tuna at the best price is constrained by regulations laid down by the EU regarding product origin. It is able to produce its own cans for use in the canneries (a distinct advantage over some other ACP producers) but still has to import the sheet metal to make those cans, which contributes to the overall high costs of production. The main strengths and constraints in the Ghana tuna industry is presented in Table 3.

Table 3: Summary of main strengths and constraints of the tuna industry in Ghana

STRENGTHS	CONSTRAINTS
Potential to increase catch rates: local stocks are not overexploited	Comparatively high labor costs
Ghanaian tuna is not shipped in from elsewhere, so there is an opportunity to market tuna as from identifiable sources	Comparatively high shipping costs to Europe
Ghana has a long-standing stable political environment and relatively stable economy, both of which may encourage further foreign investment	Little room to increase exports of canned tuna within the region
Comparatively well-established infrastructure	Power supply has to be supplemented on site, utilities not well organized, labor force not well educated and infrastructure could be better
Well placed in development terms in the ECOWAS region	Energy costs are comparatively higher
	Cost of producing cans: sheet metal has to be imported
	Distance from richest fishing grounds
	Productivity of workers (which is low in comparison to Asia)

Source IDDRA: Analysis of the impact on ACP countries of opening up the EU import market for canned tuna

At regional level, removing barriers to trade in Africa show the following key findings:

- The African market remains highly fragmented; preventing enormous opportunities for cross-border trade from being exploited and in turn generating new jobs.
- Effective regional integration is more than simply removing tariffs—it is about addressing the barriers that undermine the daily operations of ordinary producers and traders of both goods and services.

- The incidence of barriers to regional trade fall most heavily, and disproportionately, on the poor and on women, and is preventing them from earning a living in activities where they have a comparative advantage—catering for smaller, local markets across the border.
- Action is required at both the supra-national and national levels. Regional communities can provide the framework for reform but responsibility for implementation lies with each member country.
- The donor community can help countries understand the political economy resistance that lies behind the fact that despite public pledges for integration, actual barriers to trade remain in place.
- The aquaculture industry has been identified by the Government as having significant potential for boosting the economy against the background of continued declining of marine and inland fisheries production.

7.6 Environmental Opportunities

Tuna catch can be expanded, the potential annual tuna fish resource and sustainable catch in Ghana EEZ average yield is 70,000 MT (GOG). This area has been given a further boost by the construction of a tuna-landing bay at Tema, the main harbor in Ghana by the Japanese Government.

Sound aquaculture development and Good Aquaculture Practices can be developed in the country's land because availability of water

7.7 Opportunities deriving from MPAs creation

Marine Protected Areas benefit fisheries, people, and the marine environment. MPAs are areas that are used to safeguard marine species and stocks in a natural ecosystem habitat. They protect the natural marine environment and contribute largely to sustainability.

Fishers and local coastal communities often have conflicting ideas about Marine Protected Areas. Often MPAs are seen as restricting them from areas within their coastal communities. However, Marine Protected Areas are beneficial for both local coastal communities and fishers. These benefits range from short-term to long term solutions which make MPAs a sustainable management option for coastal areas.

Marine Protected Areas benefit coastal communities by opening new opportunities for income, such as tourism. It also provides services to the local communities dependent on coastal and marine resources. More importantly, it increases food security for coastal communities by further securing their livelihoods. The protected areas are able to develop healthier fish stocks. It is also a fact that Marine Protect Areas secure livelihoods by contributing to the sustainable use of fish stocks and hence improving food security, and contribute to reducing poverty in the coastal communities. But is this always the case, as there are many coastal communities that have been experiencing poverty for many years?

Ghana needs to develop a plan of action on MPAs. In this line it needs the assistance of the Convention on Bio-Diversity on training of government personnel, district assemblies and EPA staff on survey, inventorying and monitoring, law enforcement, technical assessment and funding for coordinating PAs and support for community livelihood around PAs

8 Conclusions et recommendations

8.1 Conclusions

Ghana has demonstrated its commitment to strengthen governance. The country's good performance is reflected in most governance assessments carried out recently, including the Mo Ibrahim Index where Ghana ranked the 7th best performing country after Mauritius, Cape-Verde, Botswana, Seychelles, South Africa and Namibia. Significant steps have also been taken to improve transparency and accountability including the submission to parliament of the Freedom of Information Bill, the commitment of Government to extend the Extractive Industries Transparency Initiative to the oil and gas sector.

Ghana a well-known fishery nation is today a net important country. This is due to tow first the application of the UNCLOS by coastal States which extended their jurisdiction to 200 miles. Thus, Ghanaians fishermen who used to fish in neighboring waters had to come back home. Secondly, the overfishing of the main species because of high fish demand due to dramatic population growth, little fisheries law enforcement, bad fishing practices in marine and freshwaters sectors, illegal fishing operations and low production of the aquaculture sector.

The Ghana fisheries Act is modern but Fisheries Commission had admitted they do not have the requisite capacity to handle the very technical document. Also the country does not have MPAs and the FC has never been directly involved in the development of an FIA and would certainly need time to develop the requisite infrastructure and capacity to supervise the process, singularly when dealing with the off-shore oil drilling.

The GOG defended the tuna sector which represents the main components of the exports is recording decreasing, from 5 canneries; it is now reduced to two. The tuna industry has different strengths including the stability of the nation therefore suitable for investments, the room for increasing and the material is available in the Ghana EEZ. However, it heavily hampered by high labor cost despite the low education of workers, high power cost the tuna processing industry, the cans are imported adding to the general cost and the cost of fret to EU is also high. The phase out of the "Cotonou" agreement will lead to less market share because of the Asian canned tuna competing nations.

The Ghana fisheries Act is modern but Fisheries Commission had admitted they do not have the requisite capacity to handle the very technical document and have made it a policy to work closely with the EPA, Ghana Maritime Authority and other institution most of which have representatives on the commission.

To increase the fish supply and satisfying the national demand for fish (domestic landings represents only 59% of the demand) the GOG decided that aquaculture could be an alternative to fish imports; the target is to produce 100,000 MT by 2016.

In line with the need to better manage its fisheries, the government recognized the role of the fisheries in the economy of the country initiated a comprehensive program under the FASD which is supported by a 50 million dollars- World Bank program to address the shortcomings. The program the strategic areas of Good Governance and Sustainable Management of the Fisheries (US$15.2 million IDA; US$3.5 million GEF); Reduction of Illegal Fishing (US$10.9 million IDA); Increasing the Contribution of the Fish Resources to the National Economy (US$12.1 million IDA); Aquaculture

Development (US$8.0 million IDA) and Project Management, Monitoring and Evaluation and Regional Coordination (US$4.1 million IDA). Also, the country is pushing forward a strategic agenda to become both a financial hub and tuna harbor hub in West Africa.

8.2 Recommendations

8.2.1 Recommendations at national level

- Assist the country to modernizing the existing fisheries and aquaculture regulatory framework;
- Assist the country in .developing a map of the suitable areas for sound aquaculture development;
- Assist the country in preparing a feasibility study competivity of the tuna canning factories introducing benchmarking, value chain analysis, value addition, competivity of the Ghana ports authorities and renewal of the old fishing vessels;
- Assist the country in preparing a feasibility study on setting bankable project on aqua food plants;
- Assist the Ghana Fish quality system Competent authority in terms of training of fish inspectors and accreditation of the standard board laboratories.

At this level, ATLAFCO can provide a support by :

- Assisting the country in developing a capacity building in subject relating to feasibility study on the competivity of the canned tuna factories
- Could prepare a feasibility study on setting up animal feed for the development of aquaculture and
- Assisting the country in upgrading the competent authority on quality assurance and food safety

8.2.2 Recommendations at regional level

- The Partners in Development could prepare and implement a regional capacity training program to reinforce the capacities (resource persons and financial resources) of the fishery administration and the research institutes;
- Sound micro credit scheme directed for the small scale fishery sector (processing and trade for the region could be developed;
- Regional RFMOs could work jointly to draw a capacity building program for researchers and enumerators and development of MPAS creation;
- Partners in development and international organizations to set up a regional program for a regional workable Monitoring, Control and Surveillance system to combat IUU fishing;
- Revitalizing RAFISMER and design a joint research studies on the stocks evaluation and sustainable management of straddling and shared stocks; financing the use of available research vessels of the region (e.g. Guinea and Namibia).

At this level, ATLAFCO can provide a support by encouraging the coperation with FCWC to assist the countries of the gulf region north to build up an efficient MCS system and combating IUU fishing.

8.2.3 Recommendations international level

- Cooperation between FAO and ICCAT on improving the data collection system from the region;
- Countries could participate as member countries to Convention on the Conservation of Migratory Species of Wild Animals (CMS); including shark species and on the Convention on Biodiversity.

At this level, ATLAFCO can provide a support by revitalizing RAFISMER for the implementation of joint research for stock assessment, and cooperation with ICCAT and FAO to improve the fish data collection.

9 Références bibliographiques

African Dev. Bank, 2005. Ghana Country strategy paper 2005-2009

African development Bank, Country strategy paper 2012-2016

Anon, 2005 Ghana export marketing and quality awareness project, Appraisal report

Anon. 2004 Analysis of the impact on ACP countries of Opening up the EU import market for Canned tuna

Anon. 2010for ACP-EU, 2010Establishing standards for responsible and sustainable aquaculture development in Ghana – Follow-up to IND049GHA

Anon; 2009 Guinea Current Large marine Ecosystem : fisheries management plans a guide to formulation and implementation

Anthony S. Tettey, 2007 Women's activities in the Ghanaian fishery; The role of social capital

Arthur Neiland, 2006 contribution of fish trade To development, livelihoods and

Asante , 2010 national environmental, economic and Development study (needs) for climate change: Ghana country report

Audun, L (2002); 'Fisheries issues in the ACP-EU negotiations'. A paper presented at a workshop in Accra on February 16, 2005. Internet material available at

Directorate of Fisheries, (2010); 'Compilation of National Fish Production, Imports,

Exports and Consumption in Metric Tons (2006-2010)'. Fisheries Commission,

Fact sheet on the interim Economic Partnership Agreements, 2011, West Africa: Ivory Coast and Ghana

FAO, 2005. Results of the 2003-2004 Baseline Survey of Ghanaian Fish Farmers. The FAO Regional Office for Africa based in Accra Ghana pp. 77.

Food and Agriculture Organization (2007); 'Country Profile: Ghana. FID/CP/GHA

Food and Veterinary Office (2005): 'Mission Report on Ghana: An outcome of a Food and Veterinary Office (FVO) Mission's Review'.

Food security in west Africa: Key issues for future policy debate

Friends of the Earth (2005); 'WTO: hands off our natural environment. Key

Government of Ghana. Environmental Assessment Regulations.1999. L.I. 1652.

Government of Ghana. Environmental Protection Agency Act. 1994. Act 490.

Government of Ghana. Fisheries Act. 2005. (Act 625). Government printer, Assembly Press. Accra.

http://www.globefish.org/files/Accra2005LemMian_207_226.ppt

IMM. 2004a. Post-harvest fisheries and poverty in Ghana. IMM Ltd Exeter, UK.

IMM. 2004b. Poverty, the poor and post-harvest fisheries in Ghana. IMM Ltd Exeter, UK.

IND050GHA Albert Wireko Osei, 2004 Ghana fisheries policy, economy and change World Bank, 2008, project appraisal on fisheries in Ghana

Medium-term national development policy framework Ghana shared growth and development agenda (gsgda), 2010-2013 Volume I: Policy framework

Mensah, M.A., Koranteng, K.A., Yeboah. D. & Bortey, A. 2003. Study of the impact of international trade in fishery products on food security – the case of Ghana.

Orchard JE & Abban EK, 2011 Financial Services for SME Aquaculture and isheries

ProducersGhana Case study

recommendations for the sixth ministerial conference of the World Trade Organization'.December 2005. *pg.1-14*.

Rev.3. Food and Agriculture Organization of the United Nations (FAO), Rome.

Rubis Asma, 2008 Development potential and financial viability of fish farming in Ghana

Sumail Rachid and John Atta- Mills,2004:The decline of a fishing nation the case of Ghana fisheries Natural resources forum 28 pp 13-21

Tall Amadou, 2006 Obstacles to trade in West Africa

Technical Report. Accra, Ghana

The IDL group, 2011 Environmental and social safeguard assessment Environmental and social management framework, West Africa regional fisheries program in Ghana (WARFPG)

Theodore Kwadjosse, 2007-08. The law of the sea: impacts on the Conservation and management of Fisheries resources of developing Coastal states – the Ghana case study

USAD Report, 2011, assessments of commodity and trade issues

USAID-West Africa,2005: Fishery profile

ANNEX 1: National legislation (list of texts)

Environmental-Related Conventions

Environmentally related conventions ratified by Ghana include:

• International Convention for the Prevention of Pollution of the sea by Oil: 21 October 1962
• Convention on the Africa Migratory Locust: 25 May 1962 Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water: 5th August 1963
• International Convention for the Conservation of Atlantic Tunas: 4 May 1966
• Africa Convention on the Conservation of Nature and Natural Resources: 15 September 1968
• International Convention on Civil Liability for Oil Pollution Damage: 29 November 1969
• International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Causalities
• Convention on Wetlands of International Importance, Especially as Waterfowl Habitats:

2 February 1971
• Treaty and Prohibition of the Emplacement of Nuclear Weapons of Mass Destruction on the Seabed and the Ocean Floor and in the Subsoil Thereof: 11 January 1971
• International Convention on the Establishment of an International Fund for Compensation of Oil Pollution Damage: 18th December, 1971
• Convention Concerning the Protection of World Cultural and Natural Heritage: 16 November 1972
• Convention on International Trade on Endangered Species of Wild Fauna and For a: 3 March 1973
• Convention on the Military or Any other Hostile Use of the Environmental Modification Techniques: 10 December 1976
• Convention on the Conservation of Migratory Species of Wild Animals: 23 June 1979
• Convention for the Cooperation in the Protection and Development of the Marine and Coastal Environment of the West and Central African Region,1981(Abidjan Convention)
• United Nation Convention on the Law of the Sea: 10 December 1982
• Montreal Protocol on Substances that Deplete the Ozone Layer: 24 July 1989
• Convention to Combat Drought and Desertification
• Framework Convention on Climate Change: June 1992
• Convention on Biological Diversity, 1992

National Legislation

The principal national legislation that affects fisheries in Ghana is listed below:
1. Fisheries Regulation 1984 LI 1294; 2. Fisheries (Amendment) Regulation 1977 3. Maritime Zones (Delimitation) Law, 1986; 4. PNDC Law 256 of 1991; 5. Fisheries Commission Act of 1993; and 6. Fisheries Act 625 of 2002. 7. Fisheries Regulations passed in 2010, LI 1968
Other laws that have relevance to the fisheries sector include:
Wild Animals Preservation Act, 1961 (Act 43); 2. Volta River Development Act, 1961 (Act 46); 3. Ghana Water and Sewerage Corporation Act, 1965 (Act 310); 4. Oil in Navigable Waters Act, 1964 (Act 235); 5. Irrigation Development Authority Decree, 1977 (SMCD 85); 6. Minerals and Mining Law 1986 (PNDCL 153); 7. Environmental Protection Agency Act, 1994 (Act 490); 8. Ghana Highway Authority Act, 1997 (Act 540); 9. Timber Resources Management Act, 1998 (Act 547); and 10. Minerals and Mining Act, 2006 (Act 703

Policies

A number of Environmental related Policies exist in Ghana however there is no specific policy on the coastal zone. These include:

• The National Environment Policy
• National Wetlands Policy
• Agricultural Policy
• Tourism Development Policy

• Land Management Policy
• National Health Policy
• Energy Policy
• Minerals Policy
• Wildlife Conservation Policy

The main thrust and orientation of national policies on the protection, management and development of the marine and coastal environment focuses on the following three major areas:
• Integrated coastal zone management and sustainable development
• Marine environmental protection, both from land-based activities and from sea-based activities; and • Sustainable use and conservation of marine living resources (both of the high seas and under national jurisdiction).
Specific plans have been developed to ensure the realization of prudent management of the marine and coastal environment. These include:
• Coastal Zone Management Indicative Plan, 1990
• National Environmental Action Plan, 1994
• Draft Integrated Coastal Zone Plan, 1998
• Coastal Zone Profile of Ghana 1998
• National Oil Spill Contingency Plan with specific reference to the marine environment, 2002
• Environmental sensitivity map of the coastal areas of Ghana, 1999 and 2004.

Despite the existence of these plans active integration and coordination has been lacking in practice at local level.

Regulations
Though several legislations exist on coastal protection and sustainable development, there is no omnibus legislation on the environment. Legislation relating to the area include the following:
• Beaches Obstruction Ordinance, 1897 (Cap 240)
• The Mineral and Mining Law, 1986 (PNDC 153)
• Rivers Ordinance, 1903 (Cap 226)
• Land Planning and Soil Conservation Ordinance No 32 of 1953 as Amended by the
• Land Planning and Soil Conservation (Amendment) Act, 1957 (No. 35 of 1957)
• Maritime Zones (Delimitation) Law 1986 (PNDCL 159) urban planning and development
• Town and Country Planning Ordinance (Cap 84)
• Wild Animals Preservation Act, Act 235 1964
• The Towns Ordinance (Cap 86)
• National Building Regulations 1996 (LI 1630)
• Volta River Development Act, 1961
• Fisheries Act 2002, Act 625
• Fisheries Law, 1991 (PNDC 256)
• Fisheries (Amended) Regulations, 1977 and 1984
The sustainable use and conservation of marine resources is encouraged through legislation, regulations, education and awareness creation programmes as well as the enforcement of existing regulations and legislation The legal framework for coastal zones issues and management in the country are contained in the following documents
• The 1992 constitution
• EPA Act, 1994 (Act 490)
• Environmental Assessment Regulations, 1999 (LI 1652)
• Local Government Act, 1993 (Act 462)
• Environmental Standards and Guidelines.

In addition, there are other specific legal frameworks, which include:
a) The legal framework for Ecosystem Protection, which are:
• Wild Animals Preservation Act 1961 (Act 43)
• Wildlife Conservation Regulations 1971 (LI685)
• Wild Reserves Regulations 1971 (LI 740)
• The Wetland Management (Ramsar sites) Regulation, 1999
• Oil in Navigable Waters Act, 1964 (Act 235)
b) The legal framework for Fisheries Resources, which are:
• Fisheries Law 1971 (PNDCL 256)
• Fisheries Act 2000
c) The legal framework for Oil and Gas Industry
• Petroleum (Exploration and production) Law 1984 (PNDCL 84)
• Mineral (Offshore) Regulations 1963 (LI 257)
• Mineral (Oil and Gas) Regulations 1963 (LI 256)
• Oil and Mining Regulations, 1957 (LI 221)
d) The legal framework for Tourism Promotion (including coastal tourism)
• Ghana investment Promotion Centre Act 1994 (Act 478)
• Companies Code 1963 (Act 179)
• Free Zone Act 1995 (Act 504)
• Ghana Tourism Board
• Ghana Commission on Culture development
• Town and Country Planning Ordinance (Cap 84)
• Wild Animals Preservation Act, Act 235 1964
• The Towns Ordinance (Cap 86)
• National Building Regulations 1996 (LI 1630)
• Volta River Development Act, 1961
• Fisheries Act 2002, Act 625
• Fisheries Law, 1991 (PNDC 256)
• Fisheries (Amended) Regulations, 1977 and 1984
The sustainable use and conservation of marine resources is encouraged through legislation, regulations, education and awareness creation programmes as well as the enforcement of existing regulations and legislation The legal framework for coastal zones issues and management in the country are contained in the following documents
• The 1992 constitution
• EPA Act, 1994 (Act 490)
• Environmental Assessment Regulations, 1999 (LI 1652)
• Local Government Act, 1993 (Act 462)
• Environmental Standards and Guidelines.

In addition, there are other specific legal frameworks, which include:
a) The legal framework for Ecosystem Protection, which are:
• Wild Animals Preservation Act 1961 (Act 43)
• Wildlife Conservation Regulations 1971 (LI685)
• Wild Reserves Regulations 1971 (LI 740)
• The Wetland Management (Ramsar sites) Regulation, 1999
• Oil in Navigable Waters Act, 1964 (Act 235)
b) The legal framework for Fisheries Resources, which are:
• Fisheries Law 1971 (PNDCL 256)
• Fisheries Act 2000
c) The legal framework for Oil and Gas Industry
• Petroleum (Exploration and production) Law 1984 (PNDCL 84)
• Mineral (Offshore) Regulations 1963 (LI 257)

• Mineral (Oil and Gas) Regulations 1963 (LI 256)
• Oil and Mining Regulations, 1957 (LI 221)
d) The legal framework for Tourism Promotion (including coastal tourism)
• Ghana investment Promotion Centre Act 1994 (Act 478)
• Companies Code 1963 (Act 179)
• Free Zone Act 1995 (Act 504)
• Ghana Tourism Board
• Ghana Commission on Culture

ACTIVITIES RELATING TO FISHERIES INTERESTS

Over the years, several activities have been undertaken which are of relevance to protection of the marine environment and fisheries. These include:
• Ghana Environmental Resource Management Project in Coastal Wetlands Management Component
• Gulf of Guinea Large Marine Ecosystem Project
• Fisheries Sub-sector Capacity Building Project
• Establishment of a Protected Wetland Ecosystem on the coast
• Development and Implementation of Oil Spill Contingency Plan
• Monitoring of fish stock levels and associated oceanographic parameters
• Institution of a programme of Monitoring, Compliance and Surveillance of the marine environment
• Development of industrial pollution standards
• Development of University course on Coastal Zone Management
• Increased public education on sound coastal and marine environmental practices

RELEVANT INSTITUTIONS

With regards to protection, management and development of the marine and coastal environment, a number of ministries and agencies have been identified as potential stakeholders. Those shown with an asterisk are likely to have a particularly active role:
• Ministry of Environment and Science*****
• The Environmental Protection Agency*****
• Ministry of Tourism*
• Ministry of Local Government and Rural Development*****
• Ministry of Ports*.
• District Assemblies *
• Ghana Ports and Harbours Authority*
• Hydrological Services Department
• Ministry of Food and Agriculture
• Ghana Tourist Board
• Ghana Investment Promotion Centre
• Fisheries Commission Ministry of trade, Industries and PSI*
• Ministry of Lands, and Natural Resources Forestry and Mines
• Ministry of Energy
• Ministry of Health
• Ministry of Education, Youth and Sports
• Ministry of Defence
• Ghana Navy*
• Ministry of Works and Housing
• Ministry of Women and Children's Affairs*
• Ministry of Roads and Transport
• National Development Planning Commission
• Council for Scientific and Industrial Research

• Universities and Research Institutions
• Ghana Meteorological Agency
• Town and Country Planning Department
• Water Resources Commission

Ghana National Petroleum Corporation*
• Volta River Authority*
• Geological Survey Department
• Forestry Commission (Forestry and Wildlife Division)
• Traditional Rulers and their analogous ministry and laws
Non-Governmental Organizations including Resource Development & Environmental Oriented Development Organization
• Friends of the Earth
• Green Earth
• Wildlife Society
• Recerca e Cooperazione
• Centre for African Wetlands

• National Oil Spill Contingency Plan with specific reference to the marine environment, 2002
• Environmental sensitivity map of the coastal areas of Ghana, 1999 and 2004.

Despite the existence of these plans active integration and coordination has been lacking in practice at local level.

Regulations

Though several legislations exist on coastal protection and sustainable development, there is no omnibus legislation on the environment. Legislation relating to the area include the following:
• Beaches Obstruction Ordinance, 1897 (Cap 240)
• The Mineral and Mining Law, 1986 (PNDC 153)
• Rivers Ordinance, 1903 (Cap 226)
• Land Planning and Soil Conservation Ordinance No 32 of 1953 as Amended by the
• Land Planning and Soil Conservation (Amendment) Act, 1957 (No. 35 of 1957)
• Maritime Zones (Delimitation) Law 1986 (PNDCL 159) urban planning and development
• Town and Country Planning Ordinance (Cap 84)
• Wild Animals Preservation Act, Act 235 1964
• The Towns Ordinance (Cap 86)
• National Building Regulations 1996 (LI 1630)
• Volta River Development Act, 1961
• Fisheries Act 2002, Act 625
• Fisheries Law, 1991 (PNDC 256)
• Fisheries (Amended) Regulations, 1977 and 1984

The sustainable use and conservation of marine resources is encouraged through legislation, regulations, education and awareness creation programmes as well as the enforcement of existing regulations and legislation The legal framework for coastal zones issues and management in the country are contained in the following documents

• The 1992 constitution
• EPA Act, 1994 (Act 490)
• Environmental Assessment Regulations, 1999 (LI 1652)
• Local Government Act, 1993 (Act 462)
• Environmental Standards and Guidelines.

In addition, there are other specific legal frameworks, which include:
a) The legal framework for Ecosystem Protection, which are:
• Wild Animals Preservation Act 1961 (Act 43)
• Wildlife Conservation Regulations 1971 (LI685)
• Wild Reserves Regulations 1971 (LI 740)
• The Wetland Management (Ramsar sites) Regulation, 1999
• Oil in Navigable Waters Act, 1964 (Act 235)
b) The legal framework for Fisheries Resources, which are:
• Fisheries Law 1971 (PNDCL 256)
• Fisheries Act 2000
c) The legal framework for Oil and Gas Industry
• Petroleum (Exploration and production) Law 1984 (PNDCL 84)
• Mineral (Offshore) Regulations 1963 (LI 257)
• Mineral (Oil and Gas) Regulations 1963 (LI 256)
• Oil and Mining Regulations, 1957 (LI 221)
d) The legal framework for Tourism Promotion (including coastal tourism)
• Ghana investment Promotion Centre Act 1994 (Act 478)
• Companies Code 1963 (Act 179)
• Free Zone Act 1995 (Act 504)
• Ghana Tourism Board
• Ghana Commission on Culture

ACTIVITIES RELATING TO FISHERIES INTERESTS
Over the years, several activities have been undertaken which are of relevance to protection of the marine environment and fisheries. These include:
• Ghana Environmental Resource Management Project in Coastal Wetlands Management Component
• Gulf of Guinea Large Marine Ecosystem Project
• Fisheries Sub-sector Capacity Building Project
• Establishment of a Protected Wetland Ecosystem on the coast
• Development and Implementation of Oil Spill Contingency Plan
• Monitoring of fish stock levels and associated oceanographic parameters
• Institution of a programme of Monitoring, Compliance and Surveillance of the marine environment
• Development of industrial pollution standards
• Development of University course on Coastal Zone Management
• Increased public education on sound coastal and marine environmental practices