Analysis of fisheries management practices in the European Union and the Gulf of Guinea countries: effectiveness and perception of resource users

Guy Irene Mimbang

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ANALYSIS OF FISHERIES MANAGEMENT PRACTICES IN THE EUROPEAN UNION AND THE GULF OF GUINEA COUNTRIES: EFFECTIVENESS AND PERCEPTION OF RESOURCE USERS

By

MIMBANG GUY IRENE
Cameroon

A dissertation submitted to the World Maritime University in partial Fulfilment of the requirement for the award of the degree of

MASTER OF SCIENCE
In
MARITIME AFFAIRS
(Integrated Coastal and Ocean Management)

2006
DECLARATION

I certify that all the material in this dissertation that is not my own work has been identified, and that no material is included for which a degree has previously been conferred on me.

The contents of this dissertation reflect my own personal views, and are not necessarily endorsed by the university.

(Signature): ............................................

(Date): ..............................................................

Supervised by: Professor Olof Linden
World Maritime University

Assessor: Dr. Jan-Åke Jönsson
Institution/Organisation: World Maritime University, Malmö, Sweden

Assessor: Dr Henrik Sparholt
Institution/Organisation: ICES, Copenhagen, Denmark
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ABSTRACT


Degree: MSc.

This dissertation is a study of fisheries management practices in the Gulf of Guinea and the European Union countries. It focuses on the access and the conservation measures and looks at their effectiveness concerning the conservation of the resource. The perception of resource users towards fisheries management practices is analyzed and so is the impact of this perception on the enforcement.

The concept of fisheries management is briefly introduced and considerations are given to the new trends.
Fisheries management practices in the European Union are analyzed through the Common Fisheries Policy and its tools, the total allowable catch and the quota system. The effectiveness of the system towards the conservation of the resource is assessed. The measures the Gulf of Guinea countries take to manage their fisheries resources including the fisheries agreements are looked at and assessed vis a vis the resource conservation.
Resource users perception towards management approaches undertaken in both zones is analyzed and their impact on the compliance displayed. The resources users have similar perception, which influence their willingness to comply with decisions. Propositions are made in both zones to consider the view of resource users and reinforce the enforcement bodies for a better conservation of fisheries resources.
KEYWORDS:

Fisheries resources, fisheries management measures, fishermen perception, total allowable catch, rules and regulations, enforcement, resource conservation
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<tr>
<td>CPUE</td>
<td>Catch per Unit of Effort</td>
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<tr>
<td>EEZ</td>
<td>Exclusive Economic Zone</td>
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<td>FAO</td>
<td>Food and Agriculture Organization</td>
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<td>GESAMP</td>
<td>The Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection</td>
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<td>GNP</td>
<td>Gross National Product</td>
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<td>GDP</td>
<td>Gross Domestic Product</td>
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<td>GIWA</td>
<td>Global International Waters Assessment</td>
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<td>GOG</td>
<td>Gulf of Guinea</td>
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<td>GRT</td>
<td>Gross Registered Tonnage</td>
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<td>Ha</td>
<td>Hectares</td>
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<td>HP</td>
<td>Horse Power</td>
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<tr>
<td>ICES</td>
<td>International Council for the Exploration of the Sea</td>
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<td>ICCAT</td>
<td>International Commission for the Conservation of the Atlantic Tuna</td>
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<tr>
<td>Km²</td>
<td>Square Kilometers</td>
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<tr>
<td>Kg</td>
<td>Kilogram</td>
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<tr>
<td>MINEPIA</td>
<td>Ministry of Livestock, Fisheries and Animal Industries</td>
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<tr>
<td>SFLP</td>
<td>Sustainable Fisheries Livelihoods Programme</td>
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<tr>
<td>UN</td>
<td>United Nations</td>
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<tr>
<td>UNDP</td>
<td>United Nations Development Programme</td>
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<td>United Nations Environment Programme</td>
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CHAPTER ONE

INTRODUCTION

1.1 Background and Justification

The fishery sector and fisheries resources play an important role for humans all over the planet. They provide a primary source of proteins for millions of people worldwide as seafood and constitute one of the major food items in many countries. The average apparent per capita food fish consumption was estimated at 16.2kg worldwide in 2002 (FAO, 2004).

This fish consumption is, however, unequally distributed around the world; there are significant differences among countries, depending on the availability of the fish, the availability of other food, traditions and eating habits. It is rather high in poor coastal countries as compared with other sources of animal proteins. For instance, the per capita per year consumption can rise to 50kg or more in South East Asia countries and in low laying coral islands, where soils are poor to support intensive agriculture (King, M., 1995, p.8). The Food and Agriculture Organization has reported that the annual consumption of 21.3 kg of seafood per year represents 61.3 of animal protein intake in the Comoros Islands (FAO, 1998).

The sector has, as well, a substantial social and economic importance. It employs and provide livelihood to several millions of people either directly as fishermen or indirectly in related activities. The Food and Agriculture Organization has estimated that the number of people earning an income from direct employment from the
fishing and aquaculture sector was about 38 million, while 200 million people were depending indirectly on fisheries for their livelihoods in 2002 (FAO, 2004).

“These rough figures are for people earning all or part of their living from the fishing industry and should be multiplied by at least three to give the number of dependant family members” (Garcia et al., 1999, p.372).

The sector is equally an important source of income for many countries. In some countries of the Gulf of Guinea such as Senegal for instance, fisheries products constitute the most important source of foreign currency, being one of the main export products of the country and employing 15% of the active population (Dahou, K. & al., 2002).

However, the important role of the sector is under threat today. The fisheries production systems are recognized as declining, especially for single species fisheries (FAO, 1995).

Countries have therefore adopted various fisheries management approaches to ensure the sustainability of their resources. The European Union countries have on the one hand opted for a Common Fisheries Policy (CFP). This is an “output limitation scheme” where the total allowable catches (TACs) for particular fishing species are decided by the Council and each member country is allocated quotas, which is a share of the TACs through the principle of relative stability. Each member state will thereafter distribute the quota decided by the Council to their fishermen according to criterion that differs from one country to another (Malvino, C. & al., 2002). In this system, the role of the research is important by determining the total allowable catch, based on the Council’s final decision.

In the Gulf of Guinea countries on the other hand, there is no common global fisheries policy. Countries apply individual fisheries management measures, extensively based on the “input limitation scheme”, where fishing effort is controlled through licenses (Garcia, 2002). However, in some countries, which have exclusive
economic zones rich in resource, the fishing rights are granted to foreign fishing companies through fisheries agreements (Kaczynski, 2001).

Despite all these efforts on resource management, the trends of landings show that there is a progressive decline of the production (FAO, 2004). The relative scarcity of fisheries resources is becoming more generalized and this trend will rather continue in the future due to the increasing demand, associated to the world population growth and the technological development of fishing methods. GESAMP has therefore argued that the amount of fish caught for direct humans consumption may fall by a fifth from 50 million tonnes in 2002 to 40 million tonnes in 2010 (GESAMP, 2002).

This indicates that the management measures undertaken by many countries, including the European Union and the Gulf of Guinea countries, do not in reality give the expected results for the conservation of the resource. This is also the case with the equity objectives of fisheries management, which are rarely successfully met (Boude, J.P., 2001).

It becomes therefore important to look at the management approaches that are implemented in both regions and to access their effectiveness in achieving the conservation of the fishing resource. Furthermore, the perception of the stakeholders on the issue of resource management and conservation will be analyzed.

The present study will consider and attempt to answer the following questions:

- What are the fisheries management measures applied in the European Union and the Gulf of Guinea?
- How effective are these measures in achieving the objectives of resource conservation?
- How do fishermen perceive these measures and how does this perception impact on the enforcement?
- What recommendations can be provided for a better management of fisheries resources in both regions?

1.2 Organization of the research

This dissertation is divided into six chapters. The first chapter justifies the research, identifies its objective and methodology and displays the limitation of the study. The second chapter describes the fisheries management practices in the European Union with a particular emphasis on the principal tools of the Common Fisheries Policy including the total allowable catch and the quota system. The effectiveness of these tools in achieving the conservation objective is also analyzed. The third chapter describes the fisheries management practices in the Gulf of Guinea, highlighting particularly management in internal waters, the fisheries agreements and their impact on the conservation of the resource in the zone. The fourth chapter attempts to analyze the point of view of the resource users as concerns the management measures and how it impact the conservation of the fisheries resources in both areas. The summary of the study and the propositions of amelioration of the management approaches conclude the study.

1.3 Methodology

This dissertation is based primarily on relevant literature from books, periodicals, journals and publication from the Food and Agriculture Organization and ICES. The author has also sought and used good information from Internet sources. Further information was gathered during discussions with World Maritime University (WMU) professors, visiting professors and some experts during field trips.

A four-week field trip was undertaken in Cameroon in July 2006, during which face to face discussions were organized with fishermen association representatives, in four fishing coastal fishing villages (Limbe, Batoke, Tiko and Youpwe). Equally, a discussion was conducted with the master of three fishing vessels as they were
landing to offload and sell their caches. The aim of the face to face discussions was to gather information on the resource users’ perception towards management measures. The discussions were supported by a guide, which determine the topics so as to ensure that all the areas are covered (Appendix I).

The local representatives of the ministry in charge of fisheries were also visited, so as to exchange information and have a global picture of the activity in the area.

1.4 Scope and Limitations

This study was to benefit from the insight of the reports from the various institutions in both areas of studies. This was not, however, the case especially for the countries of the Gulf of Guinea where information was difficult to get.

The information on the resource users’ perception was gathered from four fishing villages; which may not significantly represent the entire Gulf of Guinea countries. Similarly, for a proper comparison, the interview planned with fishermen in Histshals, Denmark could not take place; limiting the analysis to secondary information. These shortcomings have therefore put a limit to the scope of this study.
2.1 Definition and concept

A clear definition of fisheries management is not widely accepted. The numerous proposed definitions usually describe the set of activities that are developed under the concept. The following definition is proposed by the Food and Agriculture Organization (FAO).

Fisheries management is the integrated process of information gathering, analysis, planning, consultation, decision-making, allocation of resources and formulation and implementation, with enforcement as necessary, of regulations or rules which govern fisheries activities in order to ensure the continued productivity of the resources and accomplishment of other fisheries objectives.

FAO (Fisheries management, 1997, p.7)

This definition suggests that to give an optimal benefit to local users, states or regions for the sustainable utilization of marine resources to which they have access, fisheries management should include two levels of activities: the strategic level and the operational level.

The strategic component is concerned with the development, setting of policies and the formulation of legislation for the fisheries or stock to manage, which take into account the scientific knowledge available on the resource such as the biological characteristics of the stock, the existing or potential fisheries and the contribution to
local or national social and economic needs. This stage is arguably the most critical element in the fisheries management process. It shows the way that fisheries management should go and the implementation that follows is done to achieve the policy. Therefore a wrong policy may lead to wrong management measures, which can have disastrous socio-economic and fish stocks impact. This was the case with the Canadian cod fishery sector, which collapsed in the early 1990’s due to the federal Canadian Government failing to take an appropriate policy following a visible decline in Newfoundland cod fisheries, resulting in the closure of the fisheries in 1992 and over 40,000 lost jobs (Parson, 1993).

The operational stage on the other hand will determine and implement the necessary actions, which guide fisheries to keep within the overall strategic goals and policy directions.

According to Charles, A. (2001, p.85) the required actions should include the development and the implementation of a management plan of all managed stock; the determination of the level of fishing effort or the catch corresponding to the objectives set at the strategic level; the determination of the management measures that can feasibly achieve the above effort or catch level and which are compatible with the strategic management policy choices and the implementation of the set of chosen management measures, including the enforcement of the corresponding regulations.

The FAO (1997) went further by suggesting the tasks that should be undertaken at the operational level of fisheries management, which should ensure that the stocks and the ecosystem within which they occur are maintained in the productive state. In fact, the concern of the ecosystem health is the basis of the ecosystem based management approach of fisheries management currently advocated by many International Organizations and Non Governmental Organizations as a way to reverse the declining trend of fisheries resources (FAO, 2003; Lundin, 2006). In addition, the scientific data necessary for the assessment, the monitoring, the control and surveillance of fisheries activities should as well be collected and
analyzed at this stage. These activities are the outcome of fisheries research aiming at providing advice to fisheries managers in the form of a range of possible management actions (King, M., 1995, p.269).

The operational level should, however, adopt and promulgate appropriate and effective laws, regulations and management measures necessary to achieve the objectives and ensure that fishers comply with them, achieving therefore the overall policy set out at the strategic phase. The laws and regulations as well as the management actions should therefore be effective, widely accepted, and enforceable by all the stakeholders. Consequently, it is of overall importance that the tasks at both the strategic and operational levels should be done with the participation of all the stakeholders including the policy makers, the fishermen, the fisheries researchers and the non-governmental organizations.

This approach is clearly advocated by the Food and Agricultural Organization, which advises a broad consultation with all the interested parties when developing the tasks aiming at working towards the identified objectives (FAO, 2003, p.7). The consultation here is supposed to integrate the view of all the interested parties and therefore enhances the enforcement.

Some studies conducted to identify the impact of fishermen participation in policy formulation and the setting of management measures on the enforcement of conservation measures came to a conclusion that the fishermen are more willing to follow conservation measures when they have participate in the decision making rather than when the measures are imposed by the policy maker. This participation gives them incentives to adopt long-term conservation strategies (EU, 2002). Indeed, as suggested by Mc Cay, fisheries management is not the management of fish but the management of fishermen (Bryceson, 2006).

However, various degrees of participation in decision-making results in different management strategies by fishermen. Malvido, C. I. et al. (2002), while looking at the management systems in the European Union fisheries, considered the change in the behavior of the resource users in the presence of different properties regimes
and their participation in the definition of that property. They found that long term efficient and conservationist behaviors depend on property rights held by the fishermen and their effective role in the shaping of the rules that regulates it; the sole owner being the reference for their optimum exploitation.

2.2 Objectives

The objectives of fisheries management are many and vary from a fishery to another. Three categories of objectives are often viewed as falling into fishery management: biology (conservation), economy and social (equity) (FAO, 1983, p20; Charles, A., 2001, p.71).

2.2.1 Conservation objectives

The conservation objectives of fisheries management are concerned with the sustainability of the resource. They ensure that the fullest sustainable advantage is derived from the living resource base and that the exploitation is so initiated and conducted that the resource base is maintained. These objectives imply that the exploitation of the resource should be done in a way to which safeguards ecological processes, productivity and genetic diversity for the maintenance of the resource concerned.

King (1993) maintained that conservation is sometimes viewed as synonymous with preventing over fishing. He however distinguished two types of over fishing: growth over fishing and recruitment over fishing and argues that the conservation objectives should aim at preventing the recruitment over fishing so as to ensure that the survival of a stock or group of stocks is not threatened.

These biologically based objectives may include the aim of maximizing the yield either in weight or in revenue by maintaining a particular level of stock in order to provide a buffer against poor recruitment years or maintaining a minimum spawning stock.
Many management tools are used to achieve conservation objectives. They may be an output control scheme that place limitations on catches or an input control scheme that puts limitations on gears or fishing vessels. However, one of the most used conservation objectives is the maximum sustainable yield as it was recognized that maximizing the long-term sustainable yield is the most important aim of fisheries management.

Consequently, King (1995) suggested that the main task of fisheries management is to follow strategies and objectives, which ensure the long term sustainability of fisheries resources and which prevent both biological over fishing and the disruption of the marine ecosystems.

This approach advocated by biologists and conservationists aims at ensuring the preservation and the sustainability of the resource, and hence fishing activities. In this approach, fisheries research is very important in advising managers with a good and accurate stock assessment so as to adopt appropriate regulations that ensure optimum fishing effort and catches resulting in the sustainability of the resources.

However, to these biological and environmental concerns, fisheries management objectives have extended to address additional economic and social concern such as fishermen welfare, economic efficiency, and the allocation of the resources. The broad objectives of fisheries management may therefore include, in addition to the conservation of fisheries resources and their environment, the maximization of economic return from the fishery and payment of the fees to the community from profits made by the exploitation of public resources.

### 2.2.2 Economic objectives

Fisheries economists who argue that the appropriate management objectives should focus on economic efficiency of the fishing industry have criticized conservation approaches of fisheries management. Considerations are therefore given to the contribution of the fishing industry to the local or national economy. The tools used
to achieve these objectives may include the maximum net economic yield (MEY), which is considered to be the most important; the entry licensing coupled with restrictions, an output control in the form of taxation and individual transferable quotas.

The maximum economic yield and individual transferable quotas seem the most used tools to foster economic viability particularly in fishery where, the resource is relatively stable, the number of enterprises is relatively small and the number of landing points is small.

2.2.3 Social Objectives

Fisheries are a vital source of employment and income for coastal communities. The Food and Agriculture Organization has estimated 200 millions people depending on fisheries for their livelihood worldwide (FAO, 2004).

Despite this importance, Parsons (1993) indicates that social objectives for fishery policy have rarely been clearly articulated, although social considerations have often strongly influenced fisheries management decisions. Therefore, fisheries management objectives have often been called to serve social goals of maximizing employment and supporting communities’ in areas where there are few alternatives employment opportunities (PMEDP, 2004). Moreover, the issue of equity, which includes the equitable distribution of the resource among users, is often considered in designing fisheries management objectives.

This is the case with the European Union common fishery policy, where the relative stability principle was established to ensure the equitable access of fisheries resources by all the countries (EU, 2001).
2.2.4 Conflict of objectives

The aims pursued by a set of objectives might conflict with others. For instance, the conservation objectives adopted for a particular fishery might conflict with the economic objectives that focus on economic return of the activity.

Conflicting objectives may therefore lead to bad management decisions. It is then of overall importance to have a hierarchy of objectives in a fishery where many set of objectives is applied. Pearson (1993) has argued that in the absence of a clear systematic hierarchical set of objectives, there cannot be any rational fishery management.

Sinclair et al. (2002), when reviewing the choice of management objectives by fisheries managers over years, concluded that the interest of fisheries managers for economic and conservation concerns have waxed and waned.

However, the most important criteria underlying the choice of management objectives are the resource status. There is therefore, a general agreement that conservation should take precedence over economic or social considerations when the future of the resource is jeopardized. On the contrary, economic and social factors will take precedence over conservation objectives when the survival of the resource is not at stake.

There is, however, no inherent contradiction between “conservation” and “economic” objectives or between steps to safeguard ecosystem processes, productivity and biodiversity on the one hand and the economic return of the activity and its contribution to sustainable development of coastal economies and communities on the other. Consequently, certain extreme conservationist or preservationist objectives can be both anti-people and anti-development and extreme reductionistic economic policies and objectives for example the one emphasizing economic return and growth may be harmful to the fish stocks but also harmful to the interests of coastal communities in the long term (Bryceson, 2006).
Moreover, any particular regulatory technique can have multiple effects and impact on more than one objective of fisheries management. Charles, A. (2001, p.72) considers that although in theory it is assumed that there is only one single objective in fisheries, the reality shows that there are multiple strategic, undeclared objectives pursued simultaneously.

2.3 New Trends

Fisheries management practices have changed over time. Caddy et al. (2001), while reviewing the development of fisheries management, have recognized that the practice has evolved from the 1900s, where the debate was centered on whether or not the apparent boundless fish stock of the ocean could be depleted by fishing, to a more recognition of the harmful effect of fishing activities on the resource.

The concept of fisheries management today, which incorporates more science including biology, economics, social and institutional issues, is far more holistic and self-critical than ever (EU, 2002).

2.3.1 Ecosystem-based management

The fisheries operations and fishing gear used usually have bad effects on the fish, fish habitats and marine ecosystem. Zeller (2004) argues that traditional management approaches have failed to maintain sustainable levels of catches as well as controlling unaccepted impacts on the ecosystems in which fisheries are embedded (Zeller, 2004).

The ecosystem-based management tries to incorporate ecosystems considerations into fisheries planning and implementation. Therefore, it is of utmost importance to clearly understand the ecosystem dynamics, the spatial and functional pattern of marine ecosystems as well as the role of man in marine ecosystems (Sinclair et al.,
However, there is not only one type of ecosystem in the marine environment. Linden (2006), giving the typology of marine ecosystem on a global scale distinguishes interalia, pelagic ecosystem, demersal ecosystem, benthic ecosystem, mangrove ecosystem, salt march ecosystem and argues that management concerns should be addressed accordingly. This view is supported by Sinclair (2002, p.258), who asserts that to protect the diversity of marine ecosystem types there is a need to limit ocean activities to spatial scales corresponding to the relevant ecosystem.

Moreover, the fact that there are many types of marine ecosystems, and that there is interconnectivity among them, implies that any activity developed in one particular type of ecosystem might impact on other activities and ecosystems. The ecosystem considerations in fisheries management therefore imply that fisheries is considered in the context of other ocean and coastal zone uses such as oil and gas exploration and extraction, aquaculture, marine transportation, coastal zone habitation, and the release of contaminants, in a form of integrated and holistic management of ocean uses (Linden, 2006).

This new approach, focusing on the ecosystem’s health for a sound management of the resources is currently advocated by many International Organizations and Non Governmental Organizations (FAO, 2003; Lundin, 2006). Indeed, the global framework for this ecosystem health approach was laid down in the Food and Agriculture Organization’s Code of Conduct for Responsible Fisheries (FAO, 1995).

### 2.3.2 Precautionary approach

The precautionary principle elaborated initially in Germany in the 1970s states in the general form that scientific uncertainty should not be a reason to postpone measures to prevent environmental harm (Linden, 2006).
The application of the precautionary principle to fisheries management was endorsed after the 1992 Rio summit into the UN Fish Stock Agreement and into the FAO Code of Conduct for Responsible Fisheries (FAO, 2004). The UN Fish stock Agreement contains the practical application of the precautionary approach. It requires States to take complex decisions on two types of precautionary reference points.

One is the limit reference point, which is associated with danger: if a fish stock fall below this level, pre-agreed conservation and management actions should be undertaken to support the stock recovery. The overall of management strategies is therefore to ensure that the risk to exceed reference point is very low. The other the target reference point in which the management strategies should ensure that these are not in average exceeded.

However, given the risk, the uncertainty and the political pressure associated with fisheries; Stokke et al. (2004) considers that the precautionary approach requires adaptations in the generation of scientific advice but also in the decision making process.

2.3.3 Community-based fisheries management

The community based fisheries management, also known as co management in a joint management through a cooperative organization of government and resource users.

It therefore involves decentralized control in which the government and the community share management responsibilities. Communities participate in the decision making process, make and implement regulations, determine fisheries management measures, supervise their implementation and invoke penalties when management measures and guidelines are ignored (Trisk, 2005).
The community-based fisheries management therefore puts more management responsibility on the shoulder of the stakeholders. It has the advantage to give incentives for the enforcement of management decisions by the stakeholders as they participate in their design and implementation.

This approach, although not new, has come as an alternative to the failure of centralized management and the evidence of stock depletion (Grossling, 2006). However, not all the fisheries co management practices have been successful. Conflicts among member of the community for the resource use and for the leadership are among the problems that lessen the success of the approach (Chircop, 2006).
CHARTER THREE

FISHERIES MANAGEMENT PRACTICES IN THE EUROPEAN UNION

The fisheries resources in the European Union countries are managed at the level of the Union Council through the common fisheries policy.

3.1 The Common Fisheries Policy

3.1.1 The Concept of the Common Fisheries Policy

The concept of the Common Fisheries Policy was established in the treaties, which created the European community. It states that there should be common fisheries rules adopted at the Community level and implemented in all member states (Stokke et al., 2004).

It was, however, agreed that community fishermen should have equal access to member states waters, except for territorial waters (12 nautical miles), that was reserved to local fishermen who have traditionally fished in the areas and is managed by the countries authorities. The European community instead of member states manages the fishing resources in EEZs.

The Common Fisheries Policy was established in 1970. Since then, it has undergone several reviews, the last one being the 2002 reform. Boude et al. (2001), while revisiting the two CFP reforms of 1992 and 2002 maintained that although some changes in policy were clearly noticed, the focus was still in the area of the conservation of the resource particularly in the determination of a safe level of catches without upsetting the balance and the renewal of the stock.
The first review in 1992 noted that there were too many vessels for the available resources and that technical measures and control alone could not prevent over fishing and that the amount of fishing was to be regulated too. Control measures were therefore developed to ensure that rules are respected throughout the industry.

The second review in 2002 tried to adjust enforcement and marketing measures, in particular the provisions, which restrict access of fishing vessels to the inshore waters of other countries (12 miles), which cease to apply at the end of 2002. In addition to the conservation of the resource, other areas were taken into account including structures, common organization of market and external fisheries.

The management system in the EU today is subject to the rules of the CFP which encompass four key areas:

(a) Conservation of the stocks- to provide management measures, mainly by imposing a maximum catch per key species on a yearly basis, to maintain stocks at sustainable levels while best satisfying the needs of the fishing industry economically and socially;

(b) Organization of markets – to provide for a common market inside the EU and to balance production and demand of fish for both producers and consumers;

(c) Structural measures – to provide for the adaptation of the catching sector primarily to best utilize the stock available for both the short and the long term interests of the industry;

(d) International agreement - to provide and maintain fishing opportunities for the European Community fleets operating outside the EU.

(Mardle, S. et al., 2002, p421)
3.1.2 Objectives

The Green paper on the future of the common fisheries policy produced by the European Commission reported that despite the fact that there is no specific chapter on fisheries; the Treaty assigns to the CFP the same objective as the Common Agricultural Policy (CAP) in its Article 33:

. to increase productivity by promoting technical progress and by ensuring the rational development of production and the optimum utilization of the factors of production, in particular labor;

. to ensure a fair standard of living for the fishing community, in particular increasing individual earnings;

. to stabilize markets;

. to assure the availability of supplies;

. to assure that supplies reach the consumers at reasonable prices;

. to ensure the principle of non-discrimination.

The specific objectives of the CFP, however, include environmental and consumer protection concerns.

The article 2 of the Council Regulation No 3760/92 (OJ L 389/1, 31.12.92) stipulates that the exploitation activities pertaining these general objectives shall include the protection and the conservation of available and accessible living marine resource ensuring a rational and responsible exploitation on a sustainable basis taking in account its implication for the marine ecosystems and economic and social condition of the sector.

The CFP as it stands today aims at:
(a) ensuring the conservation of increasingly fragile fish stocks while promoting the continuation of fishing activities;
(b) modernizing the mean of production while limiting fishing effort;
(c) ensuring the proper implementation of conservation measures while member states retain responsibility in the field of monitoring and monitoring and sanctions;
(d) maintaining employment while reducing fleet capacity;
(e) ensuring a decent income for fishermen even though the community own supply of fish products is declining and the EU market depend more heavily on import each year and;
(f) acquiring rights in waters of third countries without threatening the sustainable exploitation of fisheries.

(European Commission, 2002, p6)

These objectives, stated in the green paper of the European Commission during the preparation of the 2002 reform, are not prioritized, which can result in a clear dilemma and management problems.

Symes (2005) considers that the principal objectives of the CFP after the 2002 reform could be grouped into three: (i) responsible and sustainable fisheries contributing to healthy marine ecosystem, (ii) economically viable industry serving the interests of consumers, and (iii) a fair standard of living for those dependent on the fishing industry. He further argues that these objectives were not too different to those that guided the previous CFP, but their detailed interpretation and the way they were to be achieved have changed.

To achieve the conservation of the resource, three key elements were introduced in the new Regulation 2371/2002.

Firstly, the introduction of multiannual management plans including recovery plans for cod and hake, to avoid the uncertainty of annual stock assessments and therefore to assure greater continuity and stability of the management system.
Secondly, the possibility to move the basic mechanism for the limitation fishing pressure from the one based on catch quotas to a more flexible system of effort allocation in the form of day at sea.

Thirdly, a more representation of fishing sector interests and the possibility of management at a regional level through the creation of the Regional Advisory Council (RACs), so as to give to the industry a sense of ownership of the policy decisions ensuring therefore total adhesion and enforcement in the field (Symes, 2005, p260).

In addition to these written objectives, Boude et al. (2001) argues that the Common Fisheries policy has an “unwritten” more important objective, which is to preserve social peace.

### 3.1.3 Organization

The European Union CFP decision-making process (Figure 1) is characterized by the participation of various institutions within which different actors play different roles. The decision making process begins with a proposal from the Commission. A proposal is the result of studies and advices proposed by different relevant groups. The main institution to prepare the recommendations is the Scientific Technical and Economic Committee of Fisheries (STECF) of the Commission. The proposals of this group are eventually prepared after consultation with ICES Advisory Committee on Fisheries Management (ACFM) that produce scientific advice to the European Commission.

The Commission then forms a proposal in light of the scientific advice and the discussions with various relevant departments and committees, including the Scientific Technical and Economic Committee of Fisheries and the European Parliament Fisheries Committee.
Considering the various actors involved, it is often difficult to find a compromise on a proposal; hence the Commission uses its monopoly of initiative to try and forge compromises around the proposals (Reyntjens and Wilson, 2004).

The proposals are then sent to the Council of Ministers, made-up of national ministers from members’ states, which have the final authority to decide on the policy. The decisions on total allowable catch and quotas and any related measures are taken by the ministers at the end of year meeting of the Council. At this stage, negotiation may be required to reach a political agreement on a given measure.

Thereafter, the Commission monitors the implementation of the policy by individual Member States.

3.1.4 Resource management: access and conservation measures

Fisheries resource management in the European Union waters is an exclusive Community competence. However, the management of the resource in member countries coastal waters, which can be up to 12 nautical miles wide, is done by member states as far as they are delegated powers by the Community (Reyntjens and Wilson, 2004).
3.1.4.1 Access

The structure of the access rights to European fisheries is influenced by the common fisheries policy. Among the first community measures for the access to fishing grounds, it was agreed that community fishermen should have equal access.
to member states waters, except for the coastal zone, which is of 12 miles wide, reserved for local fishermen who have traditionally fished in the zone (Boude, 2001).

Despite these possibilities, many countries have opted to keep this zone narrower. This is the case with the United Kingdom inshore waters, where the Sea Fisheries Committees manage fisheries within six miles (Mardle et al., 2002).

In addition, measures taken by the states within the coastal zone may not be in conflict with the overall Common Fisheries Policy. Moreover, some individual countries through the increase regulation such as increasing landing size might tighten the EC policy.

The fishing resources out of the territorial sea are reserved to the community fishermen and are managed by the community instead of members’ states. Fishing activities here are open to all fishermen but are restricted in some specific areas determined by the community; for instance the Plaice Box or the Shetland box.

Mardle et al. (2002) have therefore identified three levels of management in the European Union fisheries, which correspond to different access conditions, different management tools and different stakeholders: the European Union level, the national level and the regional level.

The European Union set the total allowable catch through the Council of Minister and allocates the quotas for some key species to member States according to the principle of the relative stability, which corresponds to the quantities of fish the fishermen of the country can have access to and fished within one year.

The management at the national level is done by country organizations including fisheries administrations, government authorities, fishers associations and other professional organizations. These institutions decide on the access of their share of the overall quota. They divide and allocate the country quota to local fishermen through approaches that may be different from one country to another.
Local communities or local government authorities can also be in charge of the management of fisheries resources at the local level.

3.1.4.2 Conservation measures

The technical policy of the community is based on a variety of actions including technical measures, fisheries access restrictions and fleet reduction schemes.

3.1.4.2.1 Access restrictions (Norway pout box, Shetland box)

The access to waters and resources are restricted in some areas of the European community waters. These restrictions were established to protect the biologically sensitive species that are found in the area on the one hand and on the other hand, to limit the effort on the resource (Karagionnakis, 1995).

In addition, the setting of the Shetland box helped in reaching acceptance of the equilibrium established between the different fleets and the fishing communities (EC, 2002). Indeed, the development of the stock in this box does not allow any increase in the fishing effort. The European Commission has therefore maintained the current restriction on fishing activities so as to keep the balance between the fishing communities and the fishing fleet.

The Norway pout box, which was introduced in 1986, covered an area of 95,000 km². It was designed for juveniles stock of haddock, which were produced as by catch during the massive exploitation of the Norway pout. However, explicit management for the Norway pout box has not clearly been defined. The EU and Norway have therefore adopted a precautionary approach by adopting some technical measures such as closed Norway pout box, minimum mesh size regulation and by-catch regulation ensuring that the stock is remained high to provide food to predators (ICES, 2006).
Further measures limiting the access to the waters other than the Mediterranean Sea were imposed on Spain and Portugal during their accession in 1985, for a period up to December 2002 (Karagionnakis, 1995).

All these measures that control “input” to the fishery sector restrict access aimed at the conservation of the resource; therefore balancing the fishing effort to the available stock.

3.1.4.2.2 Technical measures

The European community, to ensure the conservation of the resource, has put into place a variety of technical measures, which, based on scientific advice, covers the following areas:

- Regulation on mesh sizes and fishing nets;
- Regulation on fish sizes that may be retained on board, landed or offer for sale;
- Regulation on fishing gear and appliances;
- Establishment of open, closed areas and seasons;
- Restriction of access to certain areas for licensed vessels according to their capacity and sizes;
- Regulations of time spend at sea for certain type of vessels.

These regulations contained in the Council regulation No 3094/86 of the 7 October 1986 are applied individually or in combination (Karagionnakis, 1995).

The bulk of technical measures have since then undergone some changes in 1996, aimed at harmonizing the mesh sizes over the whole areas covered by the regulation; reducing the mandatory discarding; increasing the selectivity of the fishing gear and to simplify the rules, making them easier to control and monitor. The, basic rules established in 1986 were not changed (Mardle, 2002).
The new framework applicable from the 1 January 2000 constitutes some improvement of fishing practices, particularly in respect of the protection of young fish. Indeed certain fishing gear, which results in the high mortality of young fish, is prohibited. This is the case with the drift net banned since the 1st January 2002, following the Council regulation No 850/98, aiming at protecting the juvenile marine organisms, ensuring therefore the sustainability of the resource. This worldwide ban for the Community vessels except for the Baltic Sea, according to the European community was to have a major beneficial effect on the conservation of small cetaceans and some species of fish (EC, 2002).

The technical measures are not however uniform in the European waters or in all the EU countries. For instance, in the Baltic Sea there are specific technical measures that were adopted by the International Baltic Sea Commission including the seasonal closure to protect the cod and salmon; the establishment of technical specifications of the fishing gears (meshes sizes, escape windows in trawls). The measures are expected to contribute to rebuild the stocks.

Similarly, the Council has adopted Regulation No 1624/94 for Mediterranean fisheries, laying down the specific technical measures for the conservation of fisheries resources in this area. Additional measures were introduced by the International Commission for the Conservation of the Atlantic Tuna (ICCAT), to manage the blue tuna and the sword fish, including landing sizes, seasonal closures and restriction on the use of aircraft as aid for fishing operations (EC, 2002, p.10).

Moreover, some individual countries and some local governments have adopted some specific measures to reinforce in their areas by making the Community technical measures more stringent. For example, the management unit of the fishing resources in the English Channel has adopted measures including the increase of the EC minimum landing size for given species; limits on boat sizes in the district and temporary fishing closures (Mardle et al., 2002).
3.1.3.2.3 Fleet reduction scheme

The fishing capacity of the EC is recognized as being above the required rational exploitation of the available resources, resulting in overexploitation (Symes, 2005). The European Community has therefore adopted the Multi Guidance Programme for the fishing fleet (MAGP), a capacity reduction scheme, to ensure that the fishing capacity and the exploitation rate are consistent with the long term management objectives (EC, 2003).

The report of the first MAGP III, which covers the period from 1991 to 1997 shows that the fishing fleet from the EC was reduced by about 15% Gross tonnage (GRT) and 9.5% in Kilowatts. The implementation by Member States of this input control scheme was, however, below the global objectives by tonnage and by power (Malvino, 2002).

The MAGP IV adopted by the commission in 1997 was less ambitious and proposed a reduction of 5% over a 5-year period. Despite the fact that this objective is less stringent, it is likely not to be achieved by member states. In fact, the EC reported that as from the 1st January 2000, the Community fleet was already 17% below the objective in terms of tonnage and 6% below the objectives in terms of power (EC, 2003).

Consequently, the reduction rate was recognized to be less to counter the technological development of the fleet resulting from the improvement in technology, the efficiency of fishing boat or the technological progress of fishing gear.

3.1.5 Total allowable catch and the quotas management system

The European Community system of fisheries management is based on the total allowable catch (TAC). Along with the quotas system, it is the cornerstone of all the conservation measures of the Common Fisheries Policy (Karagionnakis, 1995).
The Council Regulation 170/83 of the EC legally established the system, which controls output into the fisheries, in 1983. The Council of the European Union establishes yearly the total allowable catch for the major species, including Cod, Haddock, Whiting, Saithe, Plaice, Mackerel and Herring, based on the scientific advice from the STECF, after some input from the ICES Advisory Committee on fisheries management.

The new framework put in place by Regulation 2371/2002 has introduced the multiannual management plan including recovery plans for stocks outside biological limit such as hake and cod, to avoid the uncertainty of annual stock assessments and therefore to assure greater continuity and stability of the management system.

The predetermined decisions or harvesting rules are expected to end the practice that had resulted in priority being given to avoid restricting fishing that were politically unpopular in the short term (Stokke et al., 2004). It will as well permit the fishermen to program their work far ahead in time such as to take a full advantage of the quota and therefore adopt conservation strategies. However, for the time being, in the absence of the pre-arranged rules TACs are still set annually.

The agreed overall quota is divided among the member countries according to the principle of “relative stability”. The relative stability principle, the maintenance of a fixed quota per stock of the available resource for each Member State in the EU takes into consideration three key factors:

- The traditional fishing pattern for the community fleet and the catches for the 1973-1978 period used as a reference point;
- Certain preferences termed “Hague preference” to applied to certain fishermen in some regions, where there were and still are few jobs opportunities for alternative employment;
- The losses suffered by the member States fishing vessels in third countries after the introduction of the 200 nautical miles EEZ.

Karagiannakos, 1995, p.236
Mardle et al. (2002) consider, however, that the most important key factor for the relative stability is historic participation in the fishery concerned. For the future allocation of quota, the distribution of 1982 was to be the “reference allocation”, which was made resilient to cope with the changes in the fish stock population and the economic parameter of the fishing industry.

Despite this, some quota trade does exist during the process of quota allocation, showing therefore one of the EC major concerns of the concept of relative stability in the common market arena (Newell, G. et al., 2005).

Similarly, the enlargement of the EC in 2004 from 15 to 25 Member States and the probable further expansion to 28 with the accession of Bulgaria, Romania and Turkey, will render the distribution of quotas among states more complex (Symes, 2005).

The quota decided for each Member State is thereafter distributed to their various fishermen according to criteria that are specific to each country.

Malvido et al. (2002) while describing the way in which the fishing rights are allocated to national fishermen, in the countries whose fleets work in the Community Atlantic waters including Portugal, France Belgium, Germany, Denmark, Sweden, Finland and Ireland, argues that the system of resource management in most of them is centralized and interventionist, since the authority principle is generally used to allocate quotas decided in Brussels.

The Government agencies decide both on what the TAC and the license allocation criteria are for fishermen, in such a way that they cannot modify the initial allocation. Each fisherman just has to catch his quota in the fishing ground granted in his license.

This approach is slightly different for Spain, where the fishing rights, right of access (measured in fishing days) and quotas although given by the government agencies can be transferred.
3.2 Effectiveness of the management approaches

The tools to manage the Community fisheries resources are many and varied including the setting up of the total allowable catch and the quotas management system, the access limitations and technical measures, the fleet policy and the recovery and management plans; but how effective are these measures to achieve the objective of resource conservation ensuring therefore the sustainability of the activity? The effectiveness criteria therefore allow the comparison between the projected and the actual outcomes and the analysis of the problems arising from the implementation of a given management measure (Boude et al., 2001).

3.2.1 TACs and quota management system

The Council, based on scientific advice produced by the Scientific Technical and Economic Committee of Fisheries (STECF) of the Commission after consultation with ICES Advisory Committee on Fisheries Management (ACFM) that produce scientific advice to the European Commission, sets the TACs annually. However, the overall quotas agreed on do not all the time reflect the scientific advice, as they are almost always set beyond the level of the advice. This fact is well shown in the study conducted by Karagiannakos in 1995, who after comparing the recommended TACs, the agreed TACs, the catches and the biomass for the major demersal species of the north sea for the period from 1980 to 1994, shows that the agreed TAC do not follow the recommended TAC and is almost all the time set above it for all the species under consideration including Cod, Haddock, Saithe, Whiting and Sole. He also found that the catches follow the biomass rather than the recommended TACs. He concluded that the TAC system has failed to attain its conservation objective, which is to maintain the resource for the species concerned as it does not represent the current catch situation which is more affected by the condition of the stocks in nature rather than the imposition of catch.
In addition, the difference between the landings and the agreed TACs displays a failure of fishermen to comply with the TAC, which diminishes the effectiveness of the system. The discrepancy between the biomass, the landings and the recommended TAC is well observed in the Swedish Cod fisheries (Figure 2), where catch rather the status of the stock.

The fact that the settings of TACs do not follow the recommended TAC is induced by the political pressure involved; which has lead Boude et al. (2001) to argue that the CFP has an “unwritten” more important objective, which is to preserve social peace. In fact, considering the various actors involved, it is often difficult to find compromise on a proposal; hence the Commission uses its monopoly of initiative to try and forge compromises around the proposals (Reyntjens and Wilson, 2004). Moreover, the decision on TACs is supposed to be based on the scientific advice available, which in turn reflects the actual status of the stocks. The stock assessment is, however, far from being a precise science taking into consideration the uncertainty in the fish community interactions, the problem of by-catch, the often non involvement of the industry in the assessment, the susceptibility of the stock assessment techniques and the scientist’s working environment.

Daw et al. (2005) have also reported that three types of uncertainty are inherent to fisheries science: apparently random fluctuation in fishery characteristics; uncertainty in the parameters that describe the behavior of the fishery and the lack of the scientific understanding of interactions within ecosystems that control their behavior. They therefore argue that stock assessment may typically have error margins of up to 50%.
In addition, the quota system, which defines the amount of a particular fish to be landed by a given boat, favors the phenomenon of “high grading”. Fishermen are encouraged to adopt economic strategies and retain the larger and more valuable fish in order to maximize the economic benefit of their quotas, increasing therefore the discards at sea and the production of by-catch (Shepherd, 2003).
The management of the EU fisheries is done at three levels: the Council for the setting of TACs; the national authorities for the distribution of national quota to fishermen and the local level by local government or producers organizations. This situation of many levels of management has lead Boude et al. (2001) to believe that the European Union, with the Common Fisheries Policy and the various local or national access conditions and management schemes, could hamper the effectiveness of the resource conservation.

Moreover, the different ways in which the access rights are granted has an impact on the one hand on the enforcement and appropriation of the management measures by fishermen and on the other hand on the conservation of the resource. Malvino et al. (2002), while studying the management systems in the European Union, describe the Common Fisheries Policy as a centralized and interventionist system, where the initial allocation of operational rights, the right of access and that of withdrawal are defined by the Commission. For instance, the fisherman, after receiving his license and his quota, has no instrument to change the initial right allocation, nor is there a mechanism to take part or have an influence on the design of this right. The allocation of the resource does not meet the competition or a cooperative criteria, but it just result from the authority discretion (Malvino et al., 2002).

In this system the fisherman has no influence on the allocation of rights and becomes a simple user in a system that is recognized as a top down approach and do not therefore have any incentive to enforce management measures and adopt long term management strategies that result in the conservation of the resource (EC, 2002).

The advent of a more representation of fishing sector interests and the possibility of management at a regional level through the creation of the Regional Advisory Council (RACs), so as to give to the industry a sense of ownership of the policy decisions ensuring therefore total adhesion and enforcement in the field may not give the expected results due to the fact that the RACs do not have any real power.
of decision and fishermen may be less willing to comply with policy decisions (Symes, 2005, p.260).

3.2.2 Fleet policy and financial support

The European Community, to reverse the overcapacity of its fleet has adopted the Multi Guidance Programme for the fishing fleet (MAGP); a capacity reduction scheme, to ensure that the fishing capacity and the exploitation rate are consistent with the long term management objectives (EC, 2003).

The MAGP III, which covers the period from 1991 to 1997, shows a reduction of about 15% Gross tonnage (GRT) and 9.5% in Kilowatts of the Community fleet while the Gulland report recommended a reduction of 40% in fish mortality (Daw et al., 2005). The implementation by Member States of this input control scheme was, however, below the global objectives by tonnage and by power (Malvino, 2002).

Further, the MAGP IV adopted by the Commission in 1997 was less ambitious and proposed a reduction of 5% over a 5-year period. Despite the fact that this objective is less stringent, it is likely not to be achieved by member states. In fact, the European Community reported that as from the 1st January 2000, the Community fleet was already 17% below the objective in terms of tonnage and 6% below the objectives in terms of power (EC, 2003). Consequently, Symes (2005) has maintained that the low reduction rate associated with the reluctance of the member States to implement these policies will be less effective to counter the technological development of the fleet resulting from the improvement in technology, the efficiency of fishing boat or the technological progress of fishing gears.

In addition, the future development of the European fishing industry may rather worsen the situation of the stocks. For instance, under the present FIFG programme (2000-2006), new vessel construction and the modernization of existing vessels was to account for Euro 833 million compared to an allocation of Euro 454 million for the removal of the vessels from the fleet. Symes (2005) has therefore argued that
fishing capacity remains significantly above that required for the rational exploitation of the available resource.

Moreover, with the present difficulties resulting from the increase in the price of the fuel, a proposal of the European Commission to help EU fishermen install new engines that use fuel efficiently was tabled to the EU fishing Ministers meeting in Luxembourg last April 2006 after pressure from the major fishing countries. The proposal was not, however, approved by the Ministers, claiming that the new engine will be more efficient and will increase the fishing capacity; jeopardizing therefore the conservation of an already overexploited European fish Stocks (Kuchler, SAMUDRA NEWS alert 2 May 2006).
CHAPTER FOUR

FISHERIES MANAGEMENT PRACTICES IN THE GULF OF GUINA

4.1 DELIMITATION AND CHARACTERISTICS OF THE ZONE

4.1.1 Delimitation

The Gulf of Guinea is located in the narrow protrusion of the eastern Atlantic Ocean between latitude 2°S and 5°N and longitude 8°W and 12°N.

Figure 3 Map showing the Gulf of Guinea countries

The area extends from the northern border of Mauritania to the southern border of the Namibian Republic, including the islands of Sao Tome and Principe and Cape Verde; for a coastline of 7600km (Ukwe et al., 2006).

The following West and Central African countries are part of the Gulf of Guinea: Mauritania, Senegal, Gambia, Guinea Bissau, Guinea, Sierra Leone, Liberia, Cote d’Ivoire, Ghana, Togo, Benin, Nigeria, Cameroon, Equatorial Guinea, Gabon, Congo, Democratic Republic of Congo, Angola, Namibia and Islands of Sao Tome and Principe and Cape Verde (Figure 3).

4.1.2 Oceanography of the zone

The predominant features of this shallow ocean bordering the countries of western and Central Africa is the Guinea current. The Guinea Current is well defined by McGraw Hill as the counter current, which flows in an easterly direction between the south and the north equatorial current (as cited by Ukwe et al., 2003).

This implies that the north and the south equatorial currents contribute greatly to the circulation of waters, which flow in pretty much the way as the major surface winds (Giwa, 2003).

The northern subsystem of the Gulf of Guinea is thermally instable and is characterized by intensive seasonal upwelling while the southern half depends on nutrients inputs originating form land drainage, rivers flows and turbulent diffusions (Ukwe & al., 2003). Indeed, the southern zone of the gulf receives many rivers that constitute the Congo basin and feed the area with sediments from coastal erosion.

However, the circulation of waters in the swampy forest inside the creeks on the coastline is very slow due to the presence of roots of the dominant mangrove vegetation in the area (Folack, 1995).
These characteristics make the Gulf of Guinea one of the world’s most productive marine areas, which is rich in fisheries resources, oil, gas reserves, precious mineral, and reservoir of marine biodiversity (Ukwe & al., 2003).

The surface temperature of sea in the Gulf of Guinea is generally $1^\circ$ Celsius warmer than the air temperature, which is always high. The vertical transport in upwelling zones and the horizontal water transport in the region can however change this pattern. The salinity of the water varies between 3.7% in the high latitudes and 3% in the equatorial area of the GOG, due the hydrographical input from the rivers.

4.1.3 Main coastal ecosystems and biodiversity

The mangrove forests exist and are scattered along the whole coast of all the countries of the Gulf of Guinea area. The mangrove forest here is mainly composed of Rhizophora, Conocarpus and Avicenna species. The most important reserve of mangrove in Africa is located in the delta of the river Niger in Nigeria. It is ranked the first largest mangrove area in Africa and the third largest in the world and can be up to 50km wide.

The mangrove ecosystem constitutes a very important spawning area and is the breeding grounds for many demersal and shrimp species as well as for many trans boundary fish species (Ukwe & al., 2003). They are however regressing all over the area. A study conducted in Cameroon by Tsiotsop (2002) show that due to the cutting down of the mangrove forest related to urbanization and its use as a fuel food, 1,100 ha are being destroyed every year loosing therefore its important biological role including the reproduction and spawning zones for the major commercial fishes and the protection of coastal areas. He reported that this depreciation rate is far less than what is observed in Guinea Republic with 22,500 ha per year, displaying therefore the gravity of the situation.

In addition to the mangroves, some coral formations are distributed along the coast of some Central and West African countries. They occur in Sierra Leone, Liberia,
Cote d’Ivoire, Ghana, Gabon and around the island of Sao Tome and Bioko (GIWA, 2003).

Besides, the region has a high biological value with the presence of some endangered marine mammal species classified in the red list of the UICN such as the African manatee, the Humpbacked dolphin and four over the seven remaining turtle species in the world that use to select places along the coastline to lay eggs (Ukwe & al., 2003).

4.1.4 Fisheries resources

The Gulf of Guinea receives sediments from the vast river network and from coastal erosion. These characteristics, associated with the seasonal upwelling in the northern part of the region make it a zone rich in fisheries resources and a precious reservoir of marine biodiversity.

As a result, the fishing industry is well developed in the GOG, exploiting locally important and migratory stocks and supports the economy of most of the countries in the area. Table 1 show that the fisheries sector participates in the GDP of all the countries of the region. This contribution varies from country to country depending on the relative importance of the water body.

The contribution of the sector to the GDP is very low in inland countries such as Burkina Faso (0.1%), and relatively high in countries with extensive EEZ such as Senegal, Mauritania, the Gambia and Sao Tome; where the sector produces more than 5% of the country’s wealth and constitutes more than 20% of the primary sector (See figure 1).

Dahou, K. & al. (2002) have reported that in Senegal the fishing sector is the first and the most important source of foreign currencies. This is also the case with the Islamic Republic of Mauritania. Indeed as clearly shown in table 1, the commercial balance between export and import of fishing products is by far positive for Senegal,
Mauritania and Gabon, displaying therefore the important role of the sector as a source of foreign income. These countries and many others of the GOG zone have declared extensive EEZ; which are highly rich in fisheries resources. Mauritania, Gabon and Sao Tome have EEZ of more than 200,000 km² (table 1); where a large fishing fleet under fisheries agreements exploits large banks of transboundary and high migratory fish species including tuna, herring, anchovy, crustaceans and flatfishes (GIWA, 2003).

Figure 4: Fisheries sector in the Gulf of Guinea countries national economy (2002)
Source: SFLP/ FAO (2006)
Between 1994 and 2003, the overall catches in the countries of GOG ranged from 1,590,612 to 2,196,176 tonnes, with the highest catches in 1999 and 2003 (Table 2). These figures generally show an increasing trend with occasional variations. However, the production became more stable from 1998, when it exceeded 2 million tons (Figure 2).

The production of marine fishes has almost followed the same pattern. During the same period of time, the annual fish catch of the marine zone ranged between 1,111,682 and 1,534,475 tonnes (Table 3).

Figure 5: Fish catches statistics in the Gulf of Guinea
Source: Adapted from FAO (2005)
Table 1: Fisheries data and contribution to the national economies of GOG countries

<table>
<thead>
<tr>
<th>Country</th>
<th>GDP/capita (US$)</th>
<th>GNP/capita (US$)</th>
<th>IDH</th>
<th>Life expectancy</th>
<th>Pop. pov. level (%)</th>
<th>EEEZ (km²)</th>
<th>Cont. shelf. (km²)</th>
<th>Area cont. wat (km²)</th>
<th>Prod° domestic (tonnes)</th>
<th>Prod° continental</th>
<th>Value Production (1 000 $)</th>
<th>… fisheries continental</th>
<th>… fisheries maritime artisinal</th>
<th>Food security</th>
<th>National wealth</th>
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</thead>
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<td>Benin</td>
<td>1 070</td>
<td>240</td>
<td>0,42</td>
<td>51</td>
<td>33 %</td>
<td>20 000</td>
<td>3 100</td>
<td>316</td>
<td>37 136</td>
<td>49 %</td>
<td>45 %</td>
<td>36 284</td>
<td>6 604</td>
<td>1 607</td>
<td>7 324</td>
</tr>
<tr>
<td>Burkina Faso</td>
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<td>610</td>
<td>0,30</td>
<td>46</td>
<td>45 %</td>
<td>n.d.</td>
<td>14 000</td>
<td>n.d.</td>
<td>11 700</td>
<td>100 %</td>
<td>100 %</td>
<td>n.d.</td>
<td>n.d.</td>
<td>0</td>
<td>8,8</td>
</tr>
<tr>
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<td>2 000</td>
<td>500</td>
<td>0,50</td>
<td>47</td>
<td>37 %</td>
<td>6 070</td>
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<td>6 037</td>
<td>180 000</td>
<td>41 %</td>
<td>316 %</td>
<td>8 026</td>
<td>0,61 $/kg</td>
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</tr>
<tr>
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<td>12 000</td>
<td>n.d.</td>
<td>77 366</td>
<td>20 %</td>
<td>20 %</td>
<td>72 032</td>
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<td>24 %</td>
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</tr>
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<td>1 060</td>
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<td>77 366</td>
<td>1990</td>
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<tr>
<td>Gabon</td>
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<td>57</td>
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<td>43 986</td>
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<td>114 241</td>
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<td>213 000</td>
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<td>n.d.</td>
<td>44 496</td>
<td>429 310</td>
<td>429 310</td>
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<td>15 861</td>
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<td>10 500</td>
<td>n.d.</td>
<td>n.d.</td>
<td>44 496</td>
<td>142 620</td>
<td>142 620</td>
<td>110 000</td>
<td>n.d.</td>
<td>16 000</td>
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</tr>
<tr>
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<td>142 620</td>
<td>142 620</td>
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</tr>
<tr>
<td>Mali</td>
<td>930</td>
<td>240</td>
<td>0,33</td>
<td>48</td>
<td>52 %</td>
<td>24 000</td>
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<td>n.d.</td>
<td>44 496</td>
<td>142 620</td>
<td>142 620</td>
<td>110 000</td>
<td>n.d.</td>
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</tr>
<tr>
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<td>410</td>
<td>0,46</td>
<td>70</td>
<td>65 %</td>
<td>56 000</td>
<td>n.d.</td>
<td>n.d.</td>
<td>44 496</td>
<td>142 620</td>
<td>142 620</td>
<td>110 000</td>
<td>n.d.</td>
<td>16 000</td>
<td>3,3 %</td>
</tr>
<tr>
<td>São Tome</td>
<td>1 317</td>
<td>280</td>
<td>0,65</td>
<td>53</td>
<td>46 %</td>
<td>0</td>
<td>n.d.</td>
<td>n.d.</td>
<td>44 496</td>
<td>142 620</td>
<td>142 620</td>
<td>110 000</td>
<td>n.d.</td>
<td>16 000</td>
<td>3,3 %</td>
</tr>
<tr>
<td>Senegal</td>
<td>1 580</td>
<td>530</td>
<td>0,44</td>
<td>70</td>
<td>53 %</td>
<td>n.d.</td>
<td>1 460</td>
<td>n.d.</td>
<td>44 496</td>
<td>142 620</td>
<td>142 620</td>
<td>110 000</td>
<td>n.d.</td>
<td>16 000</td>
<td>3,3 %</td>
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1 Human development report (2004), UNDP. The data are from 2002.
2 The primary sector includes products values added from agriculture, livestock, hunting, fisheries, and aquaculture.
3 The two types of available contributions: fishing licenses and commercial taxes.

(Source: Adapted from SFLP/ FAO (2006))
Therefore, the steady increasing annual pattern observed on the overall production is justified by the continental artisanal catches, which has gain a relative importance in the zone with the exploitation of the rich continental hydrology (Figure2). In fact, in addition to large natural and artificial lakes, large river basins are present in each country of the zone, in which fisheries activities are being developed (GIWA, 2003).

The development of inland fishing is gaining some importance in countries such as the Democratic Republic of Congo, Cameroon or the Republic of Congo in which the production of this sector is higher than that of the maritime sub sector. In the Democratic Republic of Congo for instance, the production of the continental fisheries accounts for 98% of the total fish production of the country with more than 200 thousands tonnes of fresh fishes catches annually. In Cameroon as well, the production of the continental fisheries has steadily increased over years and accounts for 47% of the country total production in 2003 (Table1).

Despite the importance of the sector for the Gulf of Guinea countries, the potential of fishery resources in the area is not well known. The last stock assessment was carried out between June and July 2006 in the GOG zone, by the Norwegian scientific boat NANSEN. The result of this stock assessment, which covers almost all the countries of the Gulf of Guinea from Ghana to the Congo Republic, is yet to be published.

However, a former survey conducted in 1990 to assess the resources of the Gulf of Guinea maritime zone had shown that the coastal area of the region although poor in demersal commercial fish stocks was rich in small pelagic species including Sardinella, Ethmalosa, Anchovy ssp (FAO; 1991). This relative poverty of the zone as compared with other fishing zones in Africa is related interalia to its oceanography. The zone witnesses a high thermo cline, which prevents the nutrient rich deep water to mix with the surface water, lessening therefore the primary productivity (Linden, 2006).
Table 2: Marine and fresh water fish catches (tonnes) in the GOG countries from 1994-2003

<table>
<thead>
<tr>
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(Source: FAO, 2005)
Seasonal upwelling does occur in the upper area of the GOG between July to September; however limited in scale due to the influx of warm, low salinity water originating from the Bay of Biafra and the Guinea coast (GIWA, 2003).

This situation favors the development of small-scale artisanal fisheries that exploit small pelagic species. Indeed, the majority of the marine production is done by artisanal fishermen, whose catches account for 60% of the overall landings in the zone (Ukwe & al., 2003). The figure is rather high in Cameroon for instance; where the production of the artisanal fishermen have accounted for 95% of the total production of fish in the country during 2003 (MINEPIA, 2004).

Another characteristic of the fisheries in the continental shelves of the Gulf of Guinea is coastal fish assemblage (croackers), located principally in nutrient-rich estuarine and inshore areas (Koranteng, 2002). Moreover, a study conducted by Folack (1995) describes GOG maritime resources as a multispecific type characterized many commercial species of fishes living together in the same areas. Consequently, the quantity of non-targeted fishes caught in the fishing gear as by-catch is rather high for both the artisanal and industrial fisheries.

A study conducted by Njifounjou et al. (1999), assessing the level of by-catch and discards in shrimp trawling in Cameroon concludes that the activity produce more than 60% of by-catch, that are then generally discarded into the sea. This production of by-catch is not only limited to the industrial but also extends to the small scale fisheries where gear with small mesh sizes are used and catch immature and small fish species.

Another characteristic of the Gulf of Guinea is that some areas of the coastal shallow water constitute a mixed zone use by many commercial species as nursery and breeding areas. Moses, B. (1992) maintains after analyzing the distribution of the fishes in the zone that fisheries resources in the coastal waters of the Gulf of Guinea are concentrated between the depths of 20 to 40 meters and are constituted of a mix of young and adult animals.
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</table>

(Source: FAO, 2005)
This clearly shows that a coastal narrow zone in the Gulf of Guinea supports the fish stock and receives the majority of the fishing effort.

Djama T. (1992) while discussing the interaction between artisanal and industrial fishermen echoes the same characteristics of the fisheries in the area. He observes that the conflict between artisanal and industrial fishing in the coastal area of the Gulf of Guinea stems from the fact that they compete in the same fishing grounds. These grounds are located near the shore in shallow waters. This characteristic implies that any unsustainable fishing method and gears will automatically destroy young and adult animals; leading to the depletion of the fishing resources as it may jeopardize their renewal capacity.

The fishing resources in the Gulf of Guinea are already recognized as being under extreme pressure. The presence of the offshore commercial fishing fleet as well as the important artisanal sub sector has placed fisheries at risk of collapse (Ukwe et al., 2003).

Although the catch statistics show a steady increase in production during the last decade in the Gulf of Guinea countries (Figure 2) in reality there is an important shift in their composition. Indeed, the analysis of landings reveals that the species diversity and the average body total length of most important fish assemblages have declined in the zone while the catch per unit of effort (CPUE) is exceeding sustainable yield in some countries (Ajayi, 1998; Ukwe et al., 2006). In Cameroon for instance, the quantity of big sizes of commercial high valued fish such as Scianides ssp, flat fish and shrimps has decreased over time to constitute a relatively small part of the landings, less than 5% (MINEPIA; 2003).

The causes of the decrease of the catch value are related to the unsustainable fishing practices, which include the use of fishing gear with small mesh sizes; the use of poison such as pesticides and the use of explosives to catch fish; as well as inadequate fisheries management approaches (GIWA, 2003).
4.2 Management measures

The management of the fisheries resource in the Gulf of Guinea countries is done by fisheries authorities of individual countries in the waters under their jurisdiction. There is however a difference in approaches according to the zones of the Sea under consideration: the coastal zone or the EEZ.

4.2.1 Management in the coastal zone

Garcia (2002) while studying the evolution of fishing management approaches over years maintained that fisheries management in the Gulf of Guinea coastal waters is done by each country in their areas of jurisdiction and is extensively based on the “input limitation scheme”, where fishing effort is controlled through licenses.

4.2.1.1 Access

The maritime fisheries in the Gulf of Guinea are not open access resources; the individual countries regulate the access to ensure their sustainability. The access to coastal fisheries grounds in all the countries of the zone is subject to the authorization granted by the fisheries authorities. These authorizations include fishing permits and fishing licenses (Table 4).

The condition of access differs according to the class of fisheries, the countries, and the fishing zone to be exploited. Fishing activities in the Gulf of Guinea are divided into two main categories including artisanal fishing and industrial fishing (Table 4). Some countries however distinguish an intermediary third category, which is the semi industrial fishing. This is the case for the Republic of Cameroon, Gabon and the Islamic Republic of Mauritania.

The distinction between these categories differs from one country to another and is generally based on the power of the vessel and the fishing techniques used.
<table>
<thead>
<tr>
<th>Country</th>
<th>Artisanal fisheries</th>
<th>Semi-industrial fisheries</th>
<th>Industrial fisheries</th>
<th>E EZ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benin</td>
<td>Fishing permit (5 nautical mile)</td>
<td>_</td>
<td>Fishing license .demersal fish</td>
<td>_</td>
</tr>
<tr>
<td>Guinea Bissau</td>
<td>Fishing permit (up to 60 HP)</td>
<td>_</td>
<td>License (more 100 HP)</td>
<td>Fishing agreements EU, China, ivory coast,</td>
</tr>
<tr>
<td>Cote d’Ivoire</td>
<td>Fishing permit</td>
<td>_</td>
<td>Licence . Demersal species . Shrimp . Tuna ,sardine</td>
<td>_</td>
</tr>
<tr>
<td>Cameroon</td>
<td>Fishing permit (less 40 HP) 3 nautical mile</td>
<td>Fishing permit (more 40 HP)</td>
<td>License . Fish trawler . Shrimp trawler</td>
<td>_</td>
</tr>
<tr>
<td>Congo</td>
<td>Fishing permit</td>
<td>_</td>
<td>Licenses demersal trawler . Shrimp trawlers pelagic (sardine)</td>
<td>_</td>
</tr>
<tr>
<td>Mauritania</td>
<td>Fishing permit</td>
<td>Fishing permit</td>
<td>License (nationals) Cephalopods Polyvalent demersal</td>
<td>Fishing agreement UE (90%) Russia, Ukraine, Lituania</td>
</tr>
<tr>
<td>Cap vert</td>
<td>Fishing permit</td>
<td>_</td>
<td>Licenses (nationals) Demersal pelagic</td>
<td>Fishing agreements EU (90%) Japan, Mauritania Senegal Guinea Bissau</td>
</tr>
<tr>
<td>Gabon</td>
<td>Fishing permit</td>
<td>Fishing permit</td>
<td>License Demersal, pelagic</td>
<td>Fishing agreement EU Japan</td>
</tr>
<tr>
<td>Nigeria</td>
<td>-Free (Up to 5miles)</td>
<td>_</td>
<td>Licenses Fish trawlers Shrimp trawler</td>
<td>Fishing licenses Tuna</td>
</tr>
<tr>
<td>Togo</td>
<td>Fishing permit</td>
<td>_</td>
<td>License demersal trawler</td>
<td>_</td>
</tr>
<tr>
<td>Guinea</td>
<td>Free (up to 12 miles)</td>
<td>_</td>
<td>License Fishing trawlers</td>
<td>_</td>
</tr>
</tbody>
</table>

Source: Compiled by the author (based on FAO data)
The industrial fisheries involve the use of large fishing boats powered with inboard engines using mechanic active fishing gears such as the bottom trawls and purse seine. Those boats generally have onboard conservation equipments including deep freezers and cold store rooms to support a long period at sea.

The artisanal fisheries on the other hand use small canoes powered or not by an outboard engine and using passive fishing gears such as gillnets and traps. The power of the outboard engine in that case might be different from one country to another. For instance, small boats powered with outboard engines of less than 60 horse power (HP) are classified in the artisanal fisheries sub sector in Guinea Bissau; whereas the maximum engine power required to be classified in the artisanal fisheries in Cameroon is 40 HP (Table 4).

In between these two categories, some countries including Mauritania, Cameroon and Gabon have created an intermediary semi industrial fisheries class. For instance, in Cameroon small boats powered by an outboard engine of 40 HP or more are classified into this category. Similarly, a small fishing boat powered with outboard engine of less than 40 HP but using active fishing techniques is also classify into this category. For example, the “Awasha” fishing boat, which is a traditional wooden or plank made fishing canoe of 18 to 22m long, 2 to 3m wide, operated by 20 to 23 men and propelled by a 40 HP outboard engine. The gear use is the purse seine and the main species targeted are *Ethmalosa fimbriata*, *Sardinella madarensis* and other small pelagic species (Njifounjou, 1996).

In Cameroon and Gabon the “awasha” are generally operated by fishermen from Nigeria or those from Ghana as the local fishermen do not handle this technique very well.

The access to fisheries in the coastal zone of the Gulf of Guinea countries are in the majority of cases subject to the authorization of the government authorities in the form of a fishing permit in the case of artisanal and semi industrial fisheries and a fishing license in the case of industrial fisheries.
The access by artisanal fishers to fisheries of almost all the countries of the zone is subject to the fishing permit, which is delivered by the fisheries authorities. However, two countries in the GOG have free access to national artisanal fishermen, Nigeria and the Guinea Republic (Table 4). The situation is changing in Guinea, for instance, where foreign artisanal fishermen from Senegal and Ghana, who exploit high valued fish, are required as from 2005 to get fishing licenses (FAO, 2006).

The industrial fishing case is different. The access of the industrial fishing vessels to the fishing grounds is subject to the delivery of a fishing license in all the countries of the Gulf of Guinea. The fishing licenses are, however, different depending on the target species, the fishing gear used and the country (Table 4).

4.2.1.2 Access restriction

The access to waters and resources are restricted in some areas of the Gulf of Guinea. These restrictive aims are on the one hand to ensure the sustainability management of fisheries resources by protecting the spawning and the growing zone and on the other hand to protect the interests of the artisanal fishermen who generally have less means to compete with industrial fishermen.

Many countries of the zone have therefore prohibited the trawling activities of the industrial fishermen to a certain zone from the shoreline, which correspond to the exclusive zone allocated to the artisanal fishermen. The dimension of this area is different from one country to another. For instance, in the Guinea Republic the zone is 12 nautical miles wide, while it is 5 nautical miles in Benin and Nigeria and 7 miles for Senegal (FAO, 2004). Furthermore, the Cameroonian fisheries Law clearly states that trawling activities are prohibited within the three nautical miles from the shore exclusively reserved for the artisanal fishermen.

However, the countries generally encounter some difficulties in the enforcement of the access restriction measures. The characteristics of the Gulf of Guinea coastal waters show that the highly productive areas are located, in shallow water near the shore, which in most countries is the zone reserved for artisanal fishmen (Djama,
The industrial vessels in the search of more productive area usually make incursions into this zone exclusively reserved for artisanal fisheries in profound violation of the Law resulting in the destruction of artisanal fishermen gear resulting in conflicts.

4.2.1.3 Technical conservation measures

The Gulf of Guinea countries, to ensure the conservation of the fisheries resources have adopted a variety of technical measures, which include:

- Regulation on mesh sizes and fishing nets;
- Regulation on fish sizes to be landed
- Regulation on fishing gear and appliances;
- Establishment of open, closed areas and seasons;
- Restriction of access to certain areas for licensed vessels according to their capacity and sizes;
- Prohibition of certain types of fishing methods and gear.

There is not however a common agreement on the effects of various gears or fishing methods on the marine fisheries among countries of the GOG region. For instance, the twin trawling system is recognized as being a bad-fishing method for the conservation of the resource and therefore is banned in all the countries waters; whereas the purse seine banned in the Republique of Guinea are allowed in other countries.

This difference may be due to the specificity of the coastal zone in the various countries. The Gulf of Guinea coastal areas is very shallow and in the countries such as the Guinea Republic the average depth for almost 70% of the continental shelf is 40m (FAO, 2000). In that case, some fishing gear and methods will be very destructive for the marine resources and environment.
Similarly, the mesh sizes for the same gear might be different among countries. For instance, the maximum mesh size allowed for the bottom gillnet in Guinea is limited to 35mm, while it is of 40 mm in Cameroon.

The closed seasons and areas are well established in fisheries regulations of the GOG countries, so as to ensure the reproduction of the target species. However, some countries such as Guinea have chosen not to have closed seasons in relation to the specificity of the oceanography of their coastal zone, which witness recurrent upwelling phenomenon; consequently, can support fishing activities all year round (FAO, 2005). Conversely, many countries including Senegal, Mauritania or Cote d’Ivoire, Gabon have established and are respecting the closed seasons, periods within which all the fishing activities in the zone under consideration are banned. These periods vary from one country to another and may extend from 2 to 4 months. In Gabon for instance, the closed season for the shrimps is from the 1\textsuperscript{st} January to 30\textsuperscript{th} April and that of the sardines (*Ethmalosa fimbriata*) from the 1\textsuperscript{st} September to the 31\textsuperscript{st} October (Ngwe, A., 2006).

Another group of countries have put in place regulations on closed seasons, which are not yet implemented. This is the case in Cameroon where the Law establishes the closed seasons in principle; however, its application is yet to be undertaken as there is no clear determination of the zones as well as the periods. This lack in regulation may be due to the absence of the preliminary work of the research to determine the reproduction period of the target species and the specific zones of reproduction.

Another tool used by fisheries managers of the Gulf of Guinea countries to control the activities of the industrial fishing fleet is the use of Monitoring, Control and Surveillance System (MCS). They include the installment of telemetric systems on board licensed vessels, to monitor their movements and therefore ensure that they respect the fishing zones and to embark fishing observers on board vessels.

According to Caddy F. et al. (2001) the requirement to embark scientific observers as well as the requirement to install compulsory telemetric systems involving direct
monitoring via satellite of fishing operations via telemetric systems installed into fishing vessels has progressively become a condition for licensing. This move has already been made by the Gulf of Guinea countries where control of fishing activities via satellite and the use of in board fisheries controllers have been adopted and included in the countries fisheries regulations. In Cameroon for instance, a Ministerial decision signed in December 2005 made compulsory the installation of telemetric tools, which is the Argos systems as a requirement to be granted a fishing license.

The control of fishing activities is less difficult in coastal waters near the shore with the application of technical measures; however, the situation in the EEZs of the GOG countries is rather complicated.

4.2.2 Management in the EEZ: fisheries agreements

Some of the countries of the GULF of Guinea have declared Exclusive Economic Zones (See Table 1), rich in fisheries resources. Due to the lack of capacity from the coastal state, foreign fleets from Europe and Asia generally undertake the exploitation of these resources under fisheries agreements.

The coastal States generally sign individually agreements with their foreign partners in the form of fishing rights and they receive financial compensations in return. The financial compensations are sometimes very important for the economies of these countries. In fact, the collection of the licenses fees from the European Community for instance, in the form of a single lump may give to the country a good amount of foreign currency that can be used in the State emergency expenditures such as the payment of salaries of the country officials. It was shown by Kaczynski (2002) that the total amount of compensation paid by the European Community to the Gulf of Guinea states within the last 25 year period until 2006 is USD 674 million.
The agreements signed between GOG countries and their European or Asian partners are generally based on catch capacity in the form of gross tonnage and do not contain catch quotas.

4.3 Effectiveness of the management measures

4.3.1 Effectiveness of the management measures in the coastal areas

4.3.1.1 Access restriction

The characteristics of fisheries in the GOG coastal areas shows that the coastal assemblages of some target species mainly Croackers are located in the estuarine and inshore areas (Koranteng, 2002). Moreover, the zone is rich in many commercial species of mix adult and young fish living together in the same areas in depth (Folack, 1995; Moses, 1992). Consequently, the areas restriction measure prohibiting the trawling activities in areas near the shore may successfully contribute to the conservation of the resources.

However, this area limitation is not fully enforced in almost all of the countries of the zone. Incursions of fishing trawlers inside the prohibited zone, exclusively reserved to the artisanal fishermen are reported in most countries, resulting in loss of fishing gears, loss of canoes and even loss of lives (Zantou, P., 2006; Diallo, M. et al., 2003; Njama, 1992).

4.3.1.2 Technical conservative measures

This lack of enforcement and compliance with this management measures have along with other factors contributed to the decline of coastal fisheries in the zone.

The countries of the GOG, to ensure the conservation of the resources in the coastal areas have adopted a bulk of technical measures, including the prohibition of destructive fishing methods and practices such as the use of pesticide and blast fishing; the limitation of the mesh and the fish to be landed sizes and the closed areas and season. These technical measures are not, however, comply with by the
fishermen. In fact, the small scale fishermen have rather adopted destructive fishing practices including the undersize meshes, poisoning and blast fishing (Ukwe et al., 2006).

The consequence of non enforcement of the management measures has led to the overexploitation of the resource, resulting in a progressive decline of commercially valuable fish. Ukwe et al. (2006) indicate that in some countries of the GOG, the artisanal as well as the industrial commercial fisheries are about to or have already exceeded the point of sustainability.

Therefore, the management measures in the coastal areas are not effective not because they do not in principle address the issue of resource conservation; but rather, because they are not enforced and comply with by both the artisanal and industrial fishers.

4.3.2 Effectiveness of fisheries agreements

The agreements signed between the GOG countries and their European or Asian partners for the exploitation of the fishing resources in their EEZs are based on catch capacity and do not contain catch quotas (Kaczynski, 2002).

The access rights are established based on the vessel size measured into gross registered tonnage (GRT), which can lead to over harvesting when it is well known that the capacity of a vessel to fish is not related to its GRT, but rather to the technology and the gears used. Therefore, the fisheries agreements promote excessive pressure on the resources that heavily harm the marine resources in the region (Ukwe et al., 2006). The fact that countries do not have the capacity to monitor the activities in their EEZs is worsening situation.

Further, in most of the agreements, the EU negotiates the right to increase the harvesting capacity without any consent of the coastal State. This situation, associate to the fact that there is no scientific research undertaken prior to the access negotiations to ensure that the fishing effort fixed in the agreement may be
adequate for the conservation of the resource, have result into a degradation of fish stock in the GOG countries EEZs (Kaczynski, 2002). Significant changes towards smaller fish size classes have been observed in the offshore demersal and pelagic species usually exploited by foreign fishing fleet under agreements, related interalia to the pressure on the offshore resources by the foreign trawlers (Fonteneau et al., 1999).

The result of these “favorable” fisheries agreements, driven by the poverty of the GOG countries, has led to over harvesting, which have hampered the stock and diminish the attractiveness of the EEZs. For example, Senegal has had favorable fisheries cooperation with the European Union for more than 15 years including attractive access and less restrictions. The result is a negative impact on both the environment and the society with a depleted stock, a disrupted artisanal fisheries and a substantial decrease in access fees (Kaczynski, 2002).

Consequently, the fisheries agreements signed between the Gulf of Guinea countries and their European, or Asian partners do not in reality favor the conservation of the resource.
Chapter Five

Perceptions of Resource Users Towards Fisheries Management Measures and Enforcement

5.1 Fishermen perception towards fisheries management in the GOG

There are many ways to manage fisheries, but the approach adopted by the Gulf of Guinea countries is a combination of measures that regulate the input into the fishery including licenses and fishing permits, limits on areas and time, limits on gears and limits on mesh and fish sizes. These measures, put in place by the policy maker may be perceived differently by the stakeholders and this perception may influence the level of enforcement.

5.1.1 Perceptions towards areas

The Gulf of Guinea countries, to ensure the sustainable exploitation of their living marine resources have enacted areas restriction regulations, which prohibit industrial commercial vessel’s activities in a certain zone close to the shore (Table 4).

In Cameroon for instance, the Law N° 94/ 01 of the 20 January 1994, and its Decree of application N° 95/413/ PM of the 20th June 1995, which regulate fisheries activities, have prohibited trawling activities within the three nautical miles from the shore, to protect the fisheries resources; dedicating, therefore, this zone to the artisanal fishermen. This area restriction regulation is not fully enforced by industrial trawlers, who usually make incursions into these zones, especially at night, resulting into the destruction of fishermen gears and conflicts. In fact, the fishermen of the four fishing villages, interviewed complained about the industrial trawlers destroying
their fishing nets and cutting down their lines inside the three nautical-miles; confirming therefore that the industrial fishers usually breach that Law.

The face to face discussions with the representative of fishermen associations in the four Cameroonian fishing villages where the study was conducted shows that all the fishermen (artisanal and industrial), do agree with this management decision.

However, there is a difference in perception of the rationale of the decision between artisanal and commercial industrial fishermen.

For most of the artisanal fishers, the decision of the Government to prohibit the trawling activities inside the three nautical zones is to protect the juveniles' fish and the fish spawning zone. This was clearly points out by the Nigerians fishermen representative in “Limbe” fishing village who maintained that:

The Government decision to prohibit the activities of the big fish trawlers near the coast is good, it protect small fish being destroyed by those trawlers. The fish will then grow and we and our sons and their sons will continue the activity and still catch fish”.

Effiong, E., Nigerian fisherman, (Limbe, 10/07/2006)

This intervention also displays the social dimension of such a decision, which is to protect the artisanal fishermen interests and livelihood against the industrial trawlers. For some of them this was the rationale behind the decision and, therefore, argues that the Ministry in charge of fisheries should not only increase the breadth of this zone but also ensure that the industrial fishermen do not make incursions into it.

Similarly, two of the fishing trawlers captains interviewed believe that the prohibition of the trawling activities into the three nautical miles zone is more a decision to protect and help the artisanal fishermen rather than a measure to protect young fish.

This perception of the role of the three nautical mile zone prohibition, which for the industrial fishers is more a social (protection of artisanal fishers interests) rather than
a biological (protection of spawning and growing areas) decision, may therefore justify their culture of non compliance with this rule, which often result in artisanal fishermen gears destruction and conflicts.

Moreover, the characteristics of fisheries the in the GOG coastal zone may give incentives to this perception and the subsequent behavior of rule breaching. Indeed, Koranteng (2002) indicates that the fish assemblages (croakers) on the continental shelves of the GOG countries are located in the coastal areas, principally in nutrient-rich estuarine and inshore areas; consequently in the restricted area of most of the countries. This characteristic may act as an “incentive” that reinforces the behaviour of the fish trawlers, in search of productive fishing grounds.

This situation of non enforcement of the area limitation rule is not limited to the Cameroonian coast and extends to other countries of the GOG. A report from the Sustainable Fisheries Livelihood Programme shows that the recurrent incursions of industrial trawlers into the 10 nautical miles zone reserved to the artisanal fishermen in Guinea Republic have led to the loss of artisanal fishermen lives, in addition to the destruction of their fishing gears and canoes (Diallo, M. et al., 2003).

Similarly the 7-mile zone allocated to artisanal fishermen in Senegal is not all the time comply with by the industrial fishing trawlers resulting in conflicts that are not in general easy to settle (Zantou, P., 2006).

However, the industrial fishers' perception of the area limitation and their subsequent behaviour may not be the only reason that encourages them to breach that rule, but also the absence of an effective enforcement body. The discussion with the Master of one industrial fishing trawler revealed that they voluntarily enter the prohibited zone as they know that fisheries surveillance system does not exist.

Indeed, effective fishing surveillance is still at its infancy in the Gulf of Guinea countries. Although activities are being carried out in some countries such as Senegal, Mauritania or the Guinea Republic with few good results, effective enforcement bodies are absent in almost all the countries of the Gulf of Guinea.
Furthermore, the move towards the satellite approach of surveillance is being made in a slowly pace in many countries of the zone. In Cameroon for instance, the authorities are still looking at the best way to make the industry accept to install telemetric tools onboard industrial vessels, so as to start to monitor them; while Gabon is still encountering logistics and technical problems (Ngwe, A., 2006).

The poor behaviour of “rules breaching” of the GOG industrial trawlers is partly justified by their perception of the area limitation rule and the absence of an effective enforcement body. This conclusion joins Mc Clanahan (2005) analysis concerning the perception of Kenyan reefs fishermen towards rules. He asserts that a fisherman will continue to use a method he thinks give him more yield unless he is stopped by the enforcement body.

5.1.2 Perception towards gears

In the GOG, certain fishing gears and methods are prohibited. However, these management measures are not fully enforced and the fishermen do not in reality comply with them.

The perception of fishermen towards gear restriction was also looked at during the discussions with the artisanal fishermen of the Batoke fishing village (Cameroon). A previous study conducted by the MINEPIA in 2002, within the framework of the Sustainable Fisheries Livelihood Programme (SFLP), has shown that more than 90% of the fishing gears used in that fishing village was beach seine, prohibited by a Ministerial Arrete as part of the conservation measures to ensure the sustainability of the resource (MINEPIA, 2003).

The discussions with the fishermen revealed that they are aware that the fishing method is discouraged by the Government. Nevertheless, they explain that they have been using this method for years resulting in good yields and argue that the Government should focus in fighting against the use of poison or the incursion of fishing trawlers into the three nautical miles zone. The end result is that this fishing
community continues to use the beach seine technique and do not therefore enforce the Law.

This intervention clearly shows that the fishermen continue to use that fishing method because they perceive, it continues to sustain catches. The underlying rationale behind this behaviour is the economic return of that particular fishing gear, although the policymakers think it is very destructive. Therefore, any management that will try to discourage the use of this type of fishing gear will not be successful unless it is accompanied with sanctions and penalties.

This conclusion is also supported by Mc Clanahan et al. (2005), who studied the perception of resource users and managers towards management options in Kenya coral reefs and maintained that the acceptance of these restrictions by stakeholders can vary for a variety of reasons including legal, economic, cultural, technological reasons and may lead to confusion, conflicts, poor enforcement and unsustainable use unless efforts are made to understand and rationalize the multiple type of possible management. They concluded that the persistence of prohibited seine fishing techniques is the result of a competitive advantage and unlikely to be eliminated without enforcement by the Government and pressures from others (Mc Clanahan et al., 2005).

This economic based perception of resource users may also justify the sustainability of destructive fishing methods, such as, poisoning or the use of blasts. Ukwe et al (2006) maintained that the decline of the fish availability in the subsistence sector of the GOG countries has led to the adoption of destructive practices.

Another case that illustrates how the discrepancy in perception can lead to poor compliance in the Cameroonian context is the actual misunderstanding between policy maker and industrial fishermen as concerns the installation of telemetric tools on board fishing vessels as part of the Monitoring Control and Surveillance System.

A ministerial decision, signed in 2005 made compulsory the installation of telemetric tools on board each fishing trawler as part of the requirements for the fishing license.
However, this decision, to be implemented as from the 1st January 2006, has not yet been enforced. All the fishing vessels have not complied with the decision and in return, none of them have received a fishing license for 2006.

The fisheries administration, on the one hand, justifies the decision by arguing rightly that the activities of the fishing vessels will be well monitored on the field, which will therefore enhance the implementation of the regulation pertaining to the respect of fishing zones and participe in the overall effort towards the conservation of the resources. The industrial fishing owners on the other hand, did accept the benefices of the approach for the conservation of the resources. They, however, consider that the Government being in charge of the management of the resource and the surveillance activities should bear the cost of the installation of the telemetric tools. The result of this discrepancy of perception is that the management decision is poorly enforced.

This situation illustrates as well the difficulty of enforcement within a situation of a top down approach where there is a government authority that take decisions and the fishing industry oblige to implement the decisions without a prior consultation. The stakeholder consultation and involvement in the decision making is recognized as being a good incentive for them to comply with the rules (Grossling, 2006).

5.2 Fishermen perception towards fisheries management in the EU

The fisheries management in the European Union is undertaken at the level of the European Community through the Common Fisheries Policy; which is basically an output limitation scheme, where fishing effort is controlled through total allowable catch and quotas.

The perception of the European stakeholders towards the common fisheries management policy was clearly summarized in the speech made by Mr Dermot Ahern, President- in- Office of the Council, before the Fisheries Committee of the European Parliament on Tuesday 20 January 2004 during the adoption of the regulation on the Regional Advisory Councils. He maintained that:
Fishermen are often sceptical about scientific advice and do not always feel "ownership" of the decisions that determine their livelihoods;
- Scientists too often wonder whether managers hide behind scientific advice to avoid taking difficult political decisions;
- There is a perception in some quarters, not always justified, that decision makers are too removed from those affected by their decisions.

Mr Dermot Ahern Speech, Tuesday 20 January 2004

The fishermen of the European Union do not always feel the ownership of management decisions. They do not therefore, have any incentive to enforce them and adopt long term management strategies that result in the conservation of the resource (EC, 2002).

This can be seen in the discrepancy between the official regulation (quotas) and actual fish mortality. For example, Karagiannakos (1995) compares the trends of landings and the agreed TACs from 1980 to 1994. He concluded that the landings do not follow the agreed TAC but rather the status of the fish stock. Equally, data from the Swedish Cod fishery, from 1974 to 2004, shows that the landings follow the fish biomass. The fact that the landings do not follow the agreed TAC shows that EU fishermen are violating the output control set by the EU.

Rossitier et al. (2003) reported from a study conducted in Scotland that, many fishermen find it difficult to accept a management system that instructs them to return marketable fish dead at sea.

This perception has certainly led to the development the illegal landing of "black fish". Richie as cited in Daw et al. (2005) points out after a study conducted on UK landings that, there were a culture of “breaking rules” amongst fishermen and a high reliance on illegal landings. The fishermen were violating the EU quota requirement because of economic reasons and because the system was flawed and inefficient.
Similarly, the phenomenon of “high grading”, in which fishermen retain larger and more valuable fish and throw the others at sea, is wide spread in the EU waters in total breath of the EU rules (Shepherd, 2003).

The perception of the fishermen towards management measures in the EU influence greatly their willingness to enforce those rules.
CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

There are many ways to manage fisheries. The European Union countries on the one hand, have opted for a common policy on fisheries management, which is extensively based on the control of the “output” from fisheries through the total allowable catch and the quota management system. The Gulf of Guinea countries, on the other, have preferred to manage the fisheries resources at the national level, based on measures that control “input” into fisheries through licenses and permits.

The analysis of the Common Fisheries Policy effectiveness concerning the conservation of the resource reveals many problems that might jeopardized the sustainability of the resource. The setting of the total allowable catch is surrounded by political pressure and does not therefore always reflect the scientific advice provided by the ICES; the fishing fleet policy, which aimed at reducing the fishing capacity, is overbalanced by grants for new building and the modernization of the existing fleet sustaining, therefore, the overcapacity and the subsequent overexploitation; the quota system has encouraged, the “high grading” phenomena where, big and valuable fish are retain on board and the others are thrown overboard, increasing the discards at sea.

The perception of the fishermen towards the management measures shows that they do not always feel the “ownership” of the measures that determine their livelihoods and therefore do not feel bound by them. These perceptions have led fishermen to adopt behaviour of rules breaching including landings of illegal fish and misreporting.
Conversely, the analysis of the effectiveness of management measures undertaken by the Gulf of Guinea countries shows that they might result “in principle” in the conservation of the resource. In relation to the characteristics of the resources in the coastal zone, there are measures limiting the access of trawlers; measures prohibiting certain type of fishing methods and fishing gears; measures limiting the mesh and the fish sizes. However, these management measures are not fully enforced, resulting in the degradation of fish stocks in the zone.

In addition, the management of the offshore resources, done through fishing agreements signed with the EU or Asian countries, generally encourages the overcapacity and the subsequent overexploitation of the resource.

Moreover, the study conducted in some fishing villages in Cameroon reveals that the fishermen perception towards management measures varies according to the measure in question and to the class of fishermen (industrial or artisanal). The industrial fishermen perceive the area limit rule as a social decision in favor of artisanal fishermen and are, therefore, not willing to enforce it. Further, the artisanal fishermen consider some gear prohibition as a threat to their high yield harvesting tool, sustaining therefore the activity.

The analysis of the perception of the fishermen towards management measures in the European Union and in the Gulf of Guinea show that fishermen are willing to breach any measure perceived as reducing their income or the economic return of their activity. Consequently, their willingness to comply with the management measures are more influenced by the economy rather than any other factor including the conservation of the resource or their participation in the decision making.

Therefore, in both areas, any management measure adopted to ensure the conservation of the resource, regardless the way that it was enacted: by the law making body alone or with the participation of the resource users should be accompanied by an effective enforcement tool.
6.2 Recommendations

Based on the above conclusions, certain recommendations can be made for a better management, which ensures the conservation of the resource.

6.2.1 For the European Union countries

The management of the resource under the CFP should move from the indirect control of the fishing effort through total allowable catch and quota management to a more direct control of the effort through the number of days at sea.

This system has some advantages. The fishermen would be able to land and sell all the marketable sizes of fish caught. Therefore, the phenomenon of discards of over quota fish at sea and “high grading” will disappear (Shepherd, 2003).

Furthermore, the misreporting of catches and the illegal landings of fish will be reduced, enabling the scientists to have accurate data on the fisheries and therefore, enhancing their capability to give relevant advice.

Moreover, the approach will help to solve the problem of mixed fisheries, by allowing the landings of all the species cached, reducing therefore the discards at sea. Fishermen may, therefore reduce the fishing effort by deducing the number of fishing days and still have economic return of the activity (Rossitier et al., 2003).

However, such a system to give expected results should put in place effective enforcement tools, which monitor the compliance with the number of days at sea by each fishing vessel. For example, the European Community could put in place a regional enforcement body that use satellite instruments to monitor activities of the fishing vessels. Accurate information on the movement of each vessel will then be available including effective days at sea and days of rests.

In addition to this input approach of management, decommissioning should really play its role of reducing the fishing capacity. Therefore, the EU should make the funds available for the decommissioning scheme equal to those available for the building of new vessel or for the modernization of the existing fleet. This will reduce
or avoid increasing the capacity and therefore, enhances the conservation of the resource.

6.2.2 For the Gulf of Guinea countries

The Gulf of Guinea countries should keep the actual management approach based on input into the fisheries. However, in each country of the zone, the enforcement need to be strengthened and some technical conservative measures should be changed.

The countries of the Gulf of Guinea should put in place effective Monitoring Control and Surveillance Systems preferably based on satellite aids, to ensure that the management measures are fully comply with by the industrial fishermen.

There is a need to increase the zone prohibited for the trawling activities, so as ensure a proper protection of the spawning and growing areas, ensuring therefore the renewal of the resource.

The collaboration between the fisheries authorities and the fishing communities should be enhanced in the form of co-management or a collaborative enforcement body, to ensure that resource users views are taken in account during the setting of the management measures and that they comply with those measures. This approach can be done through "fishing villages management committees", which include a "local enforcement body" to avoid the use of destructive fishing method and gears by fishermen themselves.

The countries of the GOG should attempt to harmonize their fishing legislation concerning the access to the resource and the management measures, which can be done through a regional organization. In fact an attempt is being made by the Regional Fisheries Committee for the Gulf of Guinea, with less success and do not even include all the countries of the zone.

The countries should equally adopt a regional enforcement body for the surveillance of the fishing activities in their EEZ and their boundary areas. This joint body could take the responsibility to negotiate with the European Union and the Asian countries for the fisheries agreements, to secure advantageous agreements that help the national economies and ensure the conservation of the resource.
REFERENCES


Douglas Clyde Wilson , Troels Jacob Hegland (2005). An analysis of some Institutional aspects of science in support of the Common Fisheries Policy. *Institute for Fisheries management, publication No. 126*


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APPENDIX I

Guide for the discussions conducted with fishermen

- Knowledge about fishing management measures
- Limits on areas
- Point of view about limits on areas
- Gears prohibition
- Point of view on gear prohibition
- Economic consequences
- Social consequences
- Adhesion to measures
- Propositions