Final Technical Report

Project ref. N° CU/PE1/SN/10/001

FORMULATION OF IMPLEMENTING TEXT OF THE DRAFT FISHERIES LEGISLATION IN BENIN AND REVIEW AND UP-DATING OF THE MARINE FISHERIES MASTER PLAN IN GHANA

GHANA

This assignment was implemented by AGRER

May 2011
PROJECT TITLE

Formulation of Implementing Text of the Draft Fisheries Legislation in Benin and Review and Up-Dating of the Marine Fisheries Master Plan in Ghana

Project ref. N° CU/PE1/SN/10/001

Region: Country: GHANA

Final Technical Report

This assignment was implemented by S.A. AGRER N.V.

Team composition: BREUIL Christophe (Expert 1)

Team Leader: BREUIL Christophe

"The content of this publication are the sole responsibility of the author and can in no way be taken to reflect the views of the European Union".
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This document reports the findings of an ACP Fish II project, undertaken between January 24th and 30th May 2011, aimed at assisting the Fisheries Commission in the preparation of a Strategy for marine fisheries management in Ghana. The mission team comprised Mr C. Breuil (Team Leader) and Mrs P. Markwey (Focal Point).

During this time, the team met with representatives from the public and private sector and visited fishing communities in each of the four coastal Regions of Ghana. Two national meetings were held that bring together about 25 resource persons from public and private institutions who contributed significantly to the preparation of the Strategy.

The team would like to express their sincere appreciation of the help and kind and frank support given by the Chairman of the Fisheries Commission, Hon. M. Akyeampon, and the Director of the Fisheries Commission, Mr S. Quaatey, and their team. The team would like also to offer their thanks to the Head of Research Division, Mr P. Bannerman, the Head of MCS Division, Mr S. Avoke, and the Head of Administration Division, Mr N.N. Pengyir.

Finally, the team would like to thank the members of the fishing communities and the producer’s organizations from the canoe, semi-industrial and industrial sub-sectors for their time, patience and frankness.
### ABBREVIATIONS AND ACRONYMS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ACP</td>
<td>Africa Caribbean Pacific</td>
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<tr>
<td>CBFMC</td>
<td>Community-Based Fisheries Management Committee</td>
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<td>CECAF</td>
<td>Fishery Committee for the East Central Atlantic</td>
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<td>CRC</td>
<td>Coastal resources Center</td>
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<td>DA</td>
<td>District Assembly</td>
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<tr>
<td>DFMC</td>
<td>District Fisheries Management Committee</td>
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<td>EEZ</td>
<td>Economic Exclusive Zone</td>
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<td>EU</td>
<td>European Union</td>
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<td>FAO</td>
<td>Food and Agriculture Organization of the United Nations</td>
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<td>FCWC</td>
<td>Fisheries Committee for the West Central Gulf of Guinea</td>
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<td>FC</td>
<td>Fisheries Commission</td>
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<td>FEU</td>
<td>Fisheries Enforcement Unit</td>
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<td>FMP</td>
<td>Fisheries Management Plan</td>
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<td>FMU</td>
<td>Fisheries Management Unit</td>
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<td>GDP</td>
<td>Gross Domestic Product</td>
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<td>GIFA</td>
<td>Ghana Inshore Fisheries Association</td>
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<td>GITA</td>
<td>Ghana Industrial Trawler Association</td>
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<tr>
<td>GMA</td>
<td>Ghana Maritime Authority</td>
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<tr>
<td>GRT</td>
<td>Gross Registered Tonnage</td>
</tr>
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<td>GTA</td>
<td>Ghana Tuna Association</td>
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<tr>
<td>GNFCFA</td>
<td>Ghana National Canoe Fishermen Association</td>
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<td>ICCAT</td>
<td>International Commission for the Conservation of Atlantic Tunas</td>
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<td>IEZ</td>
<td>Inshore Exclusive Zone</td>
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<tr>
<td>IUU</td>
<td>Illegal, Unregulated and Unreported</td>
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<td>MCS</td>
<td>Monitoring, Control and Surveillance</td>
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<td>MFMD</td>
<td>Marine Fisheries Management Division</td>
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<td>MFRD</td>
<td>Marine Fisheries Research Division</td>
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<td>MSY</td>
<td>Maximum Sustainable Yield</td>
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<td>MOFA</td>
<td>Ministry of Agriculture and Fisheries</td>
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<td>NAFAG</td>
<td>National Fisheries Association of Ghana</td>
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<tr>
<td>SST</td>
<td>Sea Surface temperature</td>
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<tr>
<td>VMS</td>
<td>Vessel Monitoring System</td>
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<td>VTMIS</td>
<td>Vessel Traffic Management Information System</td>
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EXECUTIVE SUMMARY

The objective of the present ACP Fish II assignment (Project ref. N° CU/PE1/SN/10/001) is to assist the Fisheries Commission in the preparation of a Strategy for marine fisheries management in Ghana. The assignment was conducted during the first half of 2011 and involved close collaborative mechanisms and partnership arrangements between the Fisheries Commission and the consultant, including the holding of two national workshops.

The Strategy document is composed of two parts. Part I analyses the current marine fisheries management framework in Ghana. Part II makes concrete proposals for the Strategy itself. This second part is structured around the following three sections:

1. Major guiding principles for the Strategy
2. Objectives of marine fisheries management in Ghana to considered for the Strategy (i.e. maximize fish production and increase the economic return from whilst giving priority to the canoe sub-sector in the allocation of fishery resources)
3. Measures and Actions supporting the Strategy for Marine Fisheries Management in Ghana

The combination of the general high level of exploitation of fishery resources and related decline in landings, the overcapitalization and the steady increase of fishing effort has led to a continuous decline in the individual catch rates whatever the sub-sector (canoe, semi-industrial, industrial) in Ghana waters.

In addition, there is little or no profitability (or wealth) being generated from fisheries at the present time and what profits do exist are being steadily dissipated, and fisheries are in all likelihood a net drain on national wealth after the costs of subsidies are taken into account. This has macro-economic consequences for Ghana both in terms of increased poverty and in draining wealth from other sectors of the economy to supposedly absorb the economic crisis in the fisheries sector through subsidies.

Nowadays marine fisheries in Ghana are vulnerable because they are fully or over-exploited (at or above sustainable levels) and unstable because of the massive amount of latent catching capacity in the marine fishery within all the three existing harvesting subsectors (canoe, semi-industrial and industrial sub-sectors).

The objective of the Strategy for marine fisheries management (the Strategy) is to adequately address these crucial issues that affect the sustainability of the sector. The Strategy also takes into due consideration the general principles, objectives and approaches as stated in the Fisheries Policy, 2008, and the draft Fisheries Development Plan, 2010. A World Bank project in preparation whose objective is to support the implementation of the (draft) Plan also has been considered when devising the Strategy.

The Strategy can be seen as a road-map towards the responsible management of marine fisheries in Ghana. Total duration of the Strategy would be 5 to 6 years maximum. But only an indicative timetable is proposed for the fisheries management process whereby some measures and actions
should be promoted in the short to medium term (year 1 to year 3) and others in the medium to long term (year 3 to year 5-6).

The objective in the **short to medium term** would be to set-up minimum functions and mechanisms for marine fisheries management in order to start stabilizing fishing capacity and effort and to envisage in a longer term an effective regulation of fishing capacity and effort (=**towards better governance in the fisheries management process**). The outlines of the measures and actions proposed in the short to medium term are as follows:

1. **Enhancing Fishing Vessel Licencing** with different approach depending on the sub-sector
2. **Enhancing Fishing Rights and Licences** with different approach depending on the sub-sector
3. **Consolidating Critical Management Functions and Institutions to Support Fisheries Management**
   - 3.1. Enforcement
   - 3.2. Research
   - 3.3. Strengthening the Fisheries Commission
   - 3.4. Enhancing the capacities of fishers and local Government to be further involved in co-management
4. **Starting Addressing Specific Technical Issues for Improved Marine Fisheries Management**
   - 4.1. Assessing the feasibility of controlling transshipment activities (if allowed by law)
   - 4.2. Reducing beach seine activities in sensitive area
   - 4.3. Development of marine protected areas
   - 4.4. Harmonization of major regulations at sub-regional level
   - 4.5. Review of the existing measures for the protection and conservation of marine fishery resources and coastal ecosystems

The objective in the **medium to long term** would be to reach the objective of well managed marine fisheries in terms of satisfaction of societal objectives in the sector through effective fish harvesting control (=**towards adequately managed fisheries**). The outlines of the measures and actions proposed in the medium to long term are as follows:

5. **Improving alignment of fishing capacity and effort with marine fishery resources** with different approach depending on the sub-sector
6. **Expanding fisheries enforcement** for comprehensive compliance of fishing vessels and canoes with existing regulations and Promoting Fisheries management plans
   - 6.1. Expanded fisheries enforcement
   - 6.2. Fisheries Management Plans

The Strategy does not contain any costing and recommendations for its implementation. It is however assumed that the Strategy will contribute to guide the implementation of the forthcoming World Bank project with reference to project activities relating to marine fisheries management (excluding tuna fisheries).
1. BACKGROUND

The fishery sector plays a major role in the national economy of Ghana. The fishing industry is based on resources from the marine waters and to a lesser extent, from inland waters and aquaculture. Total production in Ghana in the fishery and aquaculture sector is around 410,000 t per year of which almost 75% from marine waters. About 100,000 tons is exported annually. The production deficit is covered by fish imports of about 200,000 tons annually.

Fish is the most important non-traditional export commodity in Ghana and the fisheries sub-sector accounts for about 4.5% to annual GDP. In 2007, export earnings from fish and fishery products amounted to over 185 million US Dollars (source: Ghana Export Promotion Council). This accounted for about 50% of total earnings from non-traditional exports.

Marine fisheries support more than 125,000 fishers if we refer to the last canoe frame survey carried out in 2004. Ghana’s coastline also supports a vibrant marine fisheries sector and in fact, is one of the few countries in the West African sub-region with the entire coastline (550 km), more or less, evenly inhabited. Inter-town/village distance along the coast seldom exceeds 5 km.

The marine fishery sector has been however confronted with serious biological and economic problems for the last 15 years resulting from the combination of declining resources and increased number of boats and fishers. This has led the Government to strengthen the legal and institutional framework, notably through the enactment of the Fisheries Act 2002 that officially established the Fisheries Commission (FC). Several policy and planning documents also were prepared with a view to improving governance of the fisheries, including in particular the following:

- Fisheries Management Plan, 2001 (FMP, 2001), that concerns only marine fisheries;
- National Fisheries and Aquaculture Policy, 2008 (the Policy);
- (draft) Fisheries and Aquaculture Sector Development Plan for the period 2010-2015 (the Plan)

The Fisheries Regulations (L.I. 1968) published in 2010 also are to complement the legal framework, notably to support fisheries management. Furthermore, Ghana is currently evaluating a World Bank funded project aimed at supporting the Policy and the Plan implementation. This project would be financed through the West African Regional Fisheries Program which comprises four distinct and interrelated technical components: Good governance of the fisheries; Reduction of illegal fishing; Increasing the contribution of the fish resources to the local economy; and Aquaculture development. The project in Ghana would have a budget averaging US dollars 50 million and hence is believed to strongly influence the governance of the marine fisheries in the country in the next 5 years.

The general objective of ACP Fish II Programme is to assist ACP countries in strengthening their fishery sectoral policies with a view to contributing to the sustainability of their fisheries.
The Programme is composed of five major components:

1) Improvement of fisheries policies and management plans at national and regional levels;
2) Capacity building in control and implementation;
3) Consolidation of national and regional strategies and initiatives for fisheries research;
4) Creation of enabling regulatory frameworks to support the sector and incentives for investments for the private sector;
5) Improvement of knowledge sharing in fisheries management at regional level.

The ACP Fish II Programme is demand driven and it is intended to meet the need as expressed by countries and Regional fishery bodies (RFB). The Programme provides assistance to various fisheries stakeholders including national fisheries administrations, private sector/civil society, RFB and regional economic organisations.

The present ACP Fish II assignment (Project ref. N° CU/PE1/SN/10/001) was formulated on the basis of priority needs as expressed by Ghana representative in the course of the ACP Fish II regional workshop on the identification of West Africa needs (Dakar, October 2009). In particular, the objective of this project was primarily defined as follows: “to assist the Fisheries Commission in the revision and up-dating of the Marine Fisheries Master Plan”. The term ‘Master Plan’ actually corresponds to the translation of ‘Management Plan’ in the Terms of reference available at the beginning of the assignment that were in French. However, Ghana representative in the Dakar meeting held in 2009 was actually making reference to the Fisheries Management Plan, 2001 (FMP, 2001).

In the course of the first Project Monitoring Committee (PMC) that was held in Accra at project start on 28 January 2011 at the Fisheries Commission, it was agreed upon that the specific objective of the assignment should be changed and the methodology adapted while using the same inputs provided by the project. The PMC agreed that the specific objective of the project should be: “to assist the Fisheries Commission in the preparation of a Strategy for marine fisheries management in Ghana (the Strategy)”, possibly including a roadmap towards fisheries management plans.

Note that the PMC also agreed that the Strategy should only addresses the management of marine fisheries that involve canoe, semi-industrial and industrial (trawlers) sub-sectors, thereby excluding tuna fleet considering that management of tuna fisheries is guided by the International Commission for the Conservation of Atlantic Tunas (ICCAT) procedure and recommendations. It also stressed that the Strategy should be in accordance with the Fisheries Policy, 2008, and the (draft) Fisheries Plan, 2010.

The rationale underpinning the change in project objective is briefly given as follows:

- The FMP, 2001, defines two fisheries management units (demersal species and small and large pelagic species) and provides for each of the two group of species a list of short term and long term measures aimed at reducing fishing effort and facilitating recovery of fish stocks. The FMP also contains some recommendations aimed at strengthening major management functions, including MCS.
- The FMP, 2001, was technically adopted by the Minister of State for Fisheries through a ministerial note dated 25th September, 2001. But it is not clear whether this note could be considered as an official document with reference to the Fisheries Act, 2002.
- The FMP, 2001, was prepared in a context of poor data and information and it seems that situation regarding data and information available to support decision-making has remained unchanged. Furthermore, the overall level of implementation of this first marine fisheries management plan in Ghana has been very poor. Note that a major lesson learned from the poor implementation of FMP is that unless a minimum set of services and mechanisms in support of marine fisheries management (e.g. MCS, Research, Consultative mechanisms) is in place, management measures will be hardly implemented. In this context what would be the rationale to up-date such a document?
- In addition, promoting the formulation of a sound fisheries management plan would require much more time and means than those that are available through this project. This would involve in particular proper collection and analysis (notably through modelling) of biological, economic and socio-economic data, as well as consensus building among major stakeholders.
- All the recently prepared documents (see above) contain general principles and strategic options to support sound management of marine fisheries. A few elements are however missing with reference in particular to Illegal, Unreported and Undeclared (IUU) fishing and the Strategy could fulfil the gap.
- Also, it appears that there are some missing gaps between the Fisheries Act, 2002, the regulations, the current institutional framework and the current situation in the marine fishery sector. This refers to in particular the need of encouraging the effective implementation of the existing legal and institutional arrangements and to shift from a poorly managed to a well-managed situation in the marine fishery sector.

It is in this context that the Fisheries Commission expressed the wish to prepare a strategic document dealing specifically with the management of marine fisheries (excluding tuna) and that could serve as a guide to support public policies in the marine fishery sector. In particular, the Strategy should include concrete proposals and recommendations aimed at promoting priority institutional reforms to establish an enabling environment including setting-up minimum requirements and functions (such as research, MCS, monitoring system, administration, consultative mechanisms) so as to support at a later stage the promotion of marine fisheries management plans.
2. APPROACH TO THE ASSIGNMENT

The assignment involved the setting-up of project structures and several project inputs. Structures of the project were as follows:

- The Focal point of the project represented the Fisheries Commission and acted as counterpart to the consultant. The Fisheries Commission designated the Focal Point.
- The Project monitoring committee (PMC) was an *ad hoc* committee that was set up in accordance with section 4.1.1 of the Terms of reference of global assignment. The mandate of PMC was to discuss any issues and proposals aimed at facilitating the overall project implementation. In particular, PMC facilitated the permanent liaison between beneficiary institutions and the consultant and validated the following results: methodology as proposed by the consultant, the two ITR reports and the present Final report.

Project inputs included the following:

- Expert 1 (39 working days including 35 working in Ghana in 3 missions and 4 working days at home), to coordinate the overall planning exercise in close consultation with the Focal Point of the project.
- Technical Meeting (2 days, 7-8 April 2011), to discuss major issues relating to marine fisheries management and to review the outlines of the Strategy for marine fisheries management document – see report in Annex F2.
- National Validation Workshop (2 days, 25-26 April 2011), to examine and validate the draft Strategy for marine fisheries management – see report in Annex F3.
- Technical Working Groups (three), to provide technical assistance for the two above meetings, including preparing reports to contribute to the preparation of working papers for meetings – see reports of technical working groups in Annex F4.
- Field visits in each of the four coastal Regions in Ghana (5 working days in total): Tema, Takoradi, Cape Coast, Elmina, Keta.

As can be seen, the Strategy formulation process involved ownership of the planning process by the beneficiary country and intensive consultations with major stakeholders at different stages of the process. The outlines of the Strategy were discussed during a Technical Meeting. This was followed by the holding of a National Validation Workshop and the outcomes from this workshop were fully integrated to finalize the Strategy. Detailed information on methodology, including terms of reference of technical working groups and timeframe and budget of the project, is provided in the inception report given in annex C. Note that three phases were distinguished in the project. Each phase started with the beginning of each of the three missions of Expert 1:

- Phase 1 - Starting of project activities with emphasis on preliminary analysis of the marine fisheries management framework in Ghana;
- Phase 2 - Preparation of the outlines of a Strategy for marine fisheries management in Ghana;
- Phase 3 - Finalization and validation of the Strategy for marine fisheries management in Ghana.
3. COMMENTS ON TERMS OF REFERENCE

The major difficulty in relation to TORs has to be put in relation to the confusion that appeared at the beginning of the assignment concerning the specific objective of the project, i.e. master plan versus management plan versus strategy. A consensus could however be rapidly achieved to take into due consideration the priority needs as expressed by the Fisheries Commission and the inputs provided by the project. It is believed that this decision of supporting the preparation of a Strategy for marine fisheries management in Ghana was highly appreciated by each of the partners including the Fisheries Commission, the ACP Fish II programme management unit and the consultant.

Apart from this, another comment on TORs can be given that is in relation with time constraints as regards to the procedures involved for the adoption or clearance of the reports. In particular, it can be stressed that the delays between each of the field mission were too short when considering the necessary time that is needed for each of the partners involved in the project, to adopt or clear the reports.

4. ORGANIZATION AND METHODOLOGY

4.1 DELIVERY OF TERMS OF REFERENCE

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<table>
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<tbody>
<tr>
<td>1</td>
<td>Briefing by the ACP Fish II programme and Fisheries Commission</td>
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<tr>
<td></td>
<td>- No briefing by the ACP Fish II</td>
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<td></td>
<td>- Briefing with the Director of Fisheries made on day 2 of 1st mission of Expert 1</td>
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<tr>
<td>2</td>
<td>Establish a Project Monitoring Committee (PMC) in cooperation with the Fisheries Commission</td>
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<td></td>
<td>- PMC established by the Director of fisheries on day 3 of 1st mission of Expert 1 based on discussions with the Focal Point and Expert 1</td>
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<td>3</td>
<td>Develop a working strategy and appropriate methodology to be approved by the PMC</td>
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<tr>
<td></td>
<td>- inception note developed by Expert 1 including proposed methodology to perform the assignment</td>
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<td></td>
<td>- 1st meeting of PMC held on day 5 of 1st mission of Expert 1 (the meeting reviewed and made suggestions that was taken into consideration to finalize the methodology)</td>
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<td>- final methodology approved during the debriefing meeting with the Fisheries Director held on day 15 of 1st mission of Expert 1 (see final methodology approved in the 1st ITR Report)</td>
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<td>4</td>
<td>Research and collect existing documentation on the fishery sector and perform review and analysis</td>
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<td>- collection process in close collaboration with the Focal Point (from day 2 to day 6 of 1st mission of Expert 1)</td>
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<td></td>
<td>- review and preliminary analysis undertaken during 1st mission of Expert 1 (see 1st ITR Report)</td>
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<td>5</td>
<td>Conduct the review and analysis of the marine fisheries management framework since 2000 (instead of “Conduct the review and analysis of the Fisheries Master Plan prepared)</td>
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<td></td>
<td>- Discussions with the Director of fisheries on the World Bank</td>
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### Project Funded by the European Union

**CU/PE1/SN/10/001 - Review and up-dating of the Marine Fisheries Master Plan in Ghana**

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<th>6</th>
<th>Consult the authorities, organizations, fishing communities and other persons involved in Accra and in other Regions</th>
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<tr>
<td>7</td>
<td>Prepare the outlines of a Strategy for Marine Fisheries Management (instead of ‘Update the Fisheries Management Plan’ stated in the preliminary version of TORs)</td>
</tr>
<tr>
<td>8</td>
<td>Organize and facilitate a two days National Validation Workshop to examine and validate the draft version of the Strategy (instead of Plan)</td>
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<tr>
<td>9</td>
<td>Finalize the Strategy for marine fisheries management (instead of the Fisheries management Plan) based on the suggestions and recommendations of the National Validation Workshop</td>
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<tr>
<td>in 2000’ stated in the preliminary version of TORs)</td>
<td>project in preparation</td>
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<tr>
<td></td>
<td>- Review and preliminary analysis of the management framework done in the 1st ITR Report</td>
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<tr>
<td></td>
<td>- Organization of and support to 3 Technical working groups to contribute to the review of marine fisheries management framework (see reports in annex F4)</td>
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<td></td>
<td>- More in-depth analysis done during preparation of the Strategy for marine fisheries management done during 2nd mission of Expert 1, including consultation of technical working groups</td>
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<td></td>
<td>- see list of persons and institutions met in annex 6</td>
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<tr>
<td></td>
<td>- field visit in the Greater Accra area Region on day 7 and day 8 of 1st mission of Expert 1</td>
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<td>- field visit in the Eastern and Central Regions on day 9 and day 10 of 1st mission of Expert 1</td>
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<td>- field visit in the Volta Region on day 6 of 3rd mission of Expert 1</td>
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<td></td>
<td>- draft outlines prepared from day 3 to day 8 of the 2nd mission of Expert 1</td>
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<tr>
<td></td>
<td>- holding of a 2 days Technical Meeting to review the draft outlines of the Strategy, during days 9 and 10 of the 2nd mission of Expert 1</td>
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<td></td>
<td>- finalisation of draft outlines Strategy based on the outcomes from the Technical Meeting (see 2nd ITR Report)</td>
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<td></td>
<td>- draft version Strategy prepared from day 1 to 5 of 3rd mission of Expert 1</td>
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<td></td>
<td>- working paper prepared on day 7 of 3rd mission of Expert 1</td>
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<tr>
<td></td>
<td>- National Validation Workshop held on day 8 and day 9 of 3rd mission of Expert 1</td>
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<td></td>
<td>- suggestions and recommendations of the National Validation Workshop (including reports of working groups) taken into consideration</td>
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</table>
4.2. **CONDUCT AND DETAILS OF THE ASSIGNMENT**

The assignment could be conducted in accordance with the methodology and time frame of the project that was approved by the PC, thanks to the highly appreciated contribution of the Focal Point in the preparation and monitoring of project activities, including organizing the field visits and the two meetings. The final timeframe of the project activities is given below.

**Table 2: Final timeframe of the project**

<table>
<thead>
<tr>
<th>Phase 1 (starting 24 January 2011)</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>June</th>
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<tbody>
<tr>
<td>Starting of the project including preparation and approval of methodology</td>
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<tr>
<td>Preliminary analysis of major issues relating to the management of marine fisheries</td>
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<td>Field visit (Greater Accra, Central and Eastern Regions)</td>
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<td>Technical Working groups (preparation of reports in view of the 2 meetings)</td>
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<th>Phase 2 (starting 28 March 2011)</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>June</th>
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<td>Analysis of working papers and complementary investigations to support preparation of Strategy for fisheries management</td>
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<tr>
<td>Preparation of the outlines of the Strategy for Marine Fisheries Management</td>
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<tr>
<td>Technical meeting (06-07 April 2011)</td>
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<thead>
<tr>
<th>Phase 3 (starting 16 May 2011)</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>June</th>
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<tbody>
<tr>
<td>Preparation of the draft Strategy for Marine Fisheries Management</td>
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<tr>
<td>Field visit (Volta Region)</td>
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<tr>
<td>National Validation Workshop (25-26 May 2011)</td>
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<tr>
<td>Finalization including clearance process of the draft Strategy for Marine Fisheries Management (PMC, ACP Fish II)</td>
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<tr>
<td>Meetings of PMC</td>
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<tr>
<td>Missions of Expert 1 in Ghana</td>
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<tr>
<td>1st Interim Report</td>
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<tr>
<td>2nd Interim Report (including outlines of Strategy)</td>
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<tr>
<td>Final report (cleared)</td>
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<tr>
<td>Strategy for Marine Fisheries Management (approved)</td>
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The reports prepared by the three Technical Working Groups, also, were very appreciated in the process of analysing the current marine fisheries management framework. Report of WG 1 on ‘Key figures and major trends in the marine fishery sector’ contributed to a better understanding of major trends in the marine fishery sector and major issues relating to fisheries. Report of WG 2 ‘Marine
Fisheries Management Systems’ contributed to a better understanding of the strengths and weaknesses of the current marine fisheries management systems (including registration, permits, technical measures, fisheries management plan, etc.). And report of WG 3 ‘Marine Fisheries Monitoring, Control Surveillance and Enforcement’ contributed to a better understanding of current MCS and enforcement system in the marine fishery sector and prospects for improved system. The reports of the three Technical Working Groups are provided in Annex F4.

Finally, it should be stressed that the holding of the two meetings (Technical Meeting and National Validation Workshop) could be seen as two important steps in the project implementation in general, and in the preparation of the Strategy in particular. This has to be linked with the large attendance of representatives from both public and private fisheries stakeholders in each of the two meetings and their very active, frank and friendly participation. It is to note that participants accepted to attend the two days National Validation Workshop in spite of the fact that Day 1 of the workshop was an official non-working day (African Unit Day) in order to take into consideration time constraints of the consultant. This is another indicator of the interest shown by public and private fisheries stakeholders in the project.

Three unexpected results from the two meetings should also be underlined. First, most of participants gave a very positive appreciation regarding the informative nature of the meetings. Second, the meetings are believed to have contributed significantly to the strengthening of the links between the Fisheries Commission and the Ghana Maritime Authority, on the one hand, and between the Fisheries Commission and fishers, on the second hand. Finally, the workshop gave the opportunity to discuss very specific issues such as the emerging oil exploitation, its possible impact on marine fisheries and the institutional approach to encourage to preventing and mitigating possible negative impacts.

The reports of the Technical Meeting and of the National Validation Workshop are given respectively in annexes F2 and F3.

The itinerary, institutions and individuals consulted by Expert 1 are given in Annex B.

The findings of the analysis of the current marine fisheries management framework (Phase 2 and 3 of project) have been directly included in Part I of the Strategy document whereas the Strategy by itself is given in Part II of the Strategy document. The Strategy document is structured around three sections: Guiding principles for the Strategy; Objectives of fisheries management in the marine sector; and Measures and actions supporting the Strategy.
The Strategy does not contain any costing and recommendations for its implementation. It is however assumed that the Strategy will contribute to guide the implementation of the World Bank project that is expected to start during the second half of 2011.

The Strategy is provided as a separate document to the present report for easier reference. Annex F1 only gives the table of contents of the Strategy document.

5. CONCLUSIONS AND RECOMMENDATIONS

The project could reach its specific objective that was to assist the Fisheries Commission in the preparation of a Strategy for marine fisheries management in Ghana. The Strategy has been reviewed by a National Validation workshop and later on by the Project Monitoring Committee.

In order that the Strategy could serve its purpose of influencing future public policies in the management of the marine fishery sector (excluding tuna), it is recommended that the Strategy be formally adopted by the Fisheries Commission. This could be envisaged, as the Chairman of the Fisheries Commission said to the consultant, following a final review of the final version of the Strategy prepared under the ACP Fish II Programme by the board of the Fisheries Commission.

As regards to the ACP Fish II Programme, and considering that improved governance in fisheries is a continuous process that may need further external institutional support, it is recommended the ACP Fish II Programme support in the near future a small intervention aimed at assessing the level of implementation of the Strategy and at formulating possible recommendations to improve its operationalization and integration in public policies regarding marine fisheries management.
ANNEXES

List of Annexes:

A. Terms of Reference
B. Itinerary, institutions and individuals consulted
C. Inception Report
D. List of reports and documents consulted
E. Photographs of key activities and events
F. Technical outputs
   F1. Strategy for Marine Fisheries Management in Ghana
   F2. Report of Technical Meeting
   F4. Reports of Technical Working Groups
   F5. CD including data collected or used (given as a separate output)
ANNEXE A. TERMS OF REFERENCE  
(Below are extracts from the official TORs concerning Ghana only)

BACKGROUND INFORMATION

Beneficiary country
The direct beneficiaries of this project are the Republic of Benin and the Republic of Ghana.

Contracting Authority
ACP FISH II Coordination Unit (CU)
36/21 Avenue Tervuren
5th floor
Bruxelles 1040
Tél: 32(02)7390060
Fax: 32(02)7390068

Relevant country background
The Republic of Ghana has a surface area of 239,000 km² and an estimated population of around 24 million. The areas in which the active population work demonstrate the dominance of rural areas as places of residence: 60% in agriculture, 15% in industry and 25% in services. The GNP is made up of agriculture (34.3% of which 5.1% fisheries), industry (24%) and services (41.4%). Ghana is one of the largest consumers of fish in West Africa. With the exception of certain species such as cuttlefish, shrimp and sea bream for example, 80-100% of products landed are consumed locally (FAO, 2009). This is illustrated by the extent to which fish is consumed by Ghanaians, estimated at 20-25kg/pers/year. There are around 2.2 million people whose main income derives directly or indirectly from fisheries, amounting to some 10% of the total population of Ghana.

Current state of affairs in the relevant sector
In Ghana, fisheries are subdivided into four sub-sectors: inland fisheries, small-scale marine fisheries, semi-industrial fisheries and industrial fisheries. As regards inland fisheries, Lake Volta is the primary source of freshwater fish, providing up to 90% of Ghana’s total inland catch (FAO, Ghanaian fisheries profile, 2009). According to the same sources, the survey conducted in 1998 by the fisheries department reported the existence of 24,000 small-scale vessels and 71,000 fishers. In inland areas, the gears used are gillnets, lines and traps. The principal species caught is the cichlid.

Small-scale marine fisheries have an active fleet of some 10,000 vessels making use of the following gears: purse seines, beach seines, set nets, fixed nets and lines. The most traded species are: sardine, anchovy, mackerel, sea bream and small tuna. Stocks have deteriorated in recent years. Due to having to compete for space and technology with semi-industrial fisheries for the same stocks, they have gradually collapsed during recent years. The catch per unit of effort for vessels targeting small pelagics (sardine, anchovy and mackerel) has fallen dramatically during the last 15 years.

The semi-industrial fleet is composed of around 230 wooden vessels built locally. The length of the vessels varies between 8 and 37 metres, with them using mainly trawl or purse seine. Finally for
industrial fisheries, foreign-built trawlers are utilised, making use of pole and line, longline and shrimp vessels.

The total production in Ghana is unable to meet internal demand for fish products. Indeed, with a total annual production of a little over 400,000 metric tonnes, characterised by seasonal fluctuations, overall demand for fish products stands at 600,000 metric tonnes; resulting in a deficit estimated at an average of 265,000 metric tonnes (Mensah et al, 2001-2003).

Since 2009, the fisheries administration has been part of the Ministry of Food and Agriculture (MOFA). Created in 2002, the Fisheries Commission was put in place to advise the fisheries administration as to the choices and options aiming to ensure the sustainability of Ghana’s fisheries. With the institutional changes of 2002 and with the adoption of the Fisheries Act No. 625 of the same year, the Fisheries Commission became the executing agency of the Fisheries Department. The Ghanaian state has set ambitious and crucial objectives to ensure the sustainability of its fisheries, given its multiple roles: contribution to national wealth, creation of income and contribution to food security. Although several national fisheries policies have been adopted in Ghana, no specific fisheries policy has been implemented before the recently-developed National Fishery Policy, which had the assistance of the FAO (Ghanaian fisheries profile, FAO, 2009). Despite these advances, there is a key instrument without which these efforts may be in vain. This is a specific marine fisheries Management Plan which would reflect the overall vision of the Government of Ghana in this field. In 2000, the Fisheries Commission, with the assistance of the World Bank, drafted a Marine Fisheries Management Plan. This plan was never adopted and since then has become obsolete. The aim of this contract is to review this document and update the information underpinning it.

Related programmes and other donor activities:

Benin and Ghana, as members of the Regional Fisheries Committee of the Gulf of Guinea (CPCO), have benefited from fisheries projects. First, there is the “Ecosystem Approach” to Fisheries Nansen Programme (EAF) FAO/Norwegian development cooperation agency (NORAD). There is furthermore the programme aiming to strengthen the knowledge base for the implementation of an “Ecosystem approach to marine fisheries” in developing countries (EAF-Nansen) which is built on the vast experience and the network of cooperation developed since 1981 by the researcher Dr. Fridtjof Nansen (UNDP/FAO programme). This programme, which targets both Benin and Ghana aims to: (i) support the formulation of coherent policies including the principles of the EAF at the national and the regional level; (ii) support for the inclusion by those responsible for the management of fisheries, of considerations relating to EAF in the planning and the implementation of fisheries management systems; (iii) evaluate and monitor the ecosystem; (iv) scientific and management capacity building with a view to attaining a sustainable EAF at the national and the regional level. Another initiative is the Fish Code STFP Programme which began in the region in 2007. At the regional level, the programme has allowed for the installation of an ad hoc working group and for the creation of a web site for the coordination and exchange of information at country and sub-regional level.

OBJECTIVE, PURPOSE & EXPECTED RESULTS

Overall objective
The overall objective of the project of which this contract will be a part is to contribute to the sustainable and equitable management of fisheries in ACP regions, thus leading to poverty alleviation and improving food security in ACP States. The specific objective of the ACP Fish II Programme is to strengthen fisheries sectoral policy development and implementation in ACP countries.

**Purpose**
The purposes of this contract are as follows: In Ghana to support the Fisheries Department in the updating of the Marine Fisheries Management Plan.

**Results to be achieved by the Consultant**

**In Ghana:**
- The Marine Fisheries Management Plan is reviewed and updated.
- An implementing strategy for the Fisheries Management Plan is formulated.

**ASSUMPTIONS & RISKS**

**Assumptions underlying the project intervention**
The need for the project was expressed by both sides – by the Republic of Benin and the Republic of Ghana – at the regional Needs Assessment Workshop held in October 2009 in Dakar, Senegal. Consequently, it follows that the host and beneficiary institutions of both countries will take all the measures that are necessary to facilitate the carrying out of the various activities of the project and is already covered by these institutions

**Risks**
The risk that could compromise this project lies in a possible change in the managing teams of the Ministries targeted. In the sub-region, a change in management is enough to jeopardise the decisions taken by preceding governments.

**SCOPE OF THE WORK**

**General**

**Project description**
The implementation of this project aims to remove the constraints to the sustainable development of fisheries in Benin and Ghana. The assistance provided by ACP Fish II will be provided through Technical Assistance (TA).

This TA will consist, first, in the formulation of the implementing regulations for the draft fisheries framework legislation in Benin and second, in reviewing and updating the Marine Fisheries Management Plan in Ghana. In both Benin and Ghana, the project will be carried out in two phases. During the first phase in Benin, there should be a review of the relevant policy instruments and an analysis of the draft fisheries framework legislation with a view to determining, in strict collaboration with the Fisheries Department, the implementing regulations that need to be formulated. The drafting of these texts will be on a participatory basis through a consultative process involving those affected in the identified regions in collaboration with the Fisheries Department. For Ghana, there will also be a first phase of review and analysis of the relevant documentation relating to the government’s general marine fisheries policies, with a view to defining the context and framework within which the Marine
Fisheries Management Plan should be carried out. The review process of this Management Plan will be implemented in strict collaboration with the Fisheries Commission and in consultation with those affected in the identified regions/districts in collaboration with the latter.

In the second phase, a national workshop will be organised to present to the authorities and those affected the draft texts which will have been written in each country. These national workshops will be the occasion for the authorities and the people affected not only to amend the texts presented and to validate the work carried out, but also to take ownership of the project.

For the start-up of the project, the administrations responsible for fisheries should facilitate the creation of a Project Monitoring Committee (PMC). The PMCs will be a permanent link between the beneficiary institutions and the experts, and will be tasked with validating the following products: the methodology proposed by the consultant, the timeline of activities foreseen by the consultant for the implementation of the project, and both draft reports due before the final report.

**Geographical area to be covered**
The project covers all regions where fishing takes place in Benin and Ghana as well as the waters that fall under their jurisdiction.

**Target groups**
The immediate target groups are, amongst others, the institutions responsible for fisheries in Benin and Ghana, policy makers, fisheries administrations, fishing communities, NGOs and all stakeholders associated directly or indirectly to the sector.

**Specific activities**
The Consultant will carry out the following activities:

**In Ghana:**
(a) Briefing with the Programme Management Unit (CU and/or Regional Facilitation Unit), outreach visits with the fisheries authorities and an initial meeting with the project team.
(b) Establish a Project Monitoring Committee (PMC) in cooperation with the Fisheries Department.
(c) Develop a working strategy and appropriate methodology to be approved by the PMC.
(d) Research and collect existing documentation on the fisheries sector (reports, policy documents, scientific information) and perform review and analysis.
(e) Conduct the review and analysis of the Marine Fisheries Management Plan prepared in 2000.
(f) Consult the authorities, organisations, fishing communities and other people involved in Accra and in other regions of the country to have been selected in conjunction with the fisheries authority.
(g) Update the Marine Fisheries Management Plan.
(h) Organise and facilitate a national validation workshop to last two days, aiming to discuss the draft Marine Fisheries Management Plan prepared by the Consultant.
(i) Finalise the draft Marine Fisheries Management Plan taking into account the suggestions and recommendations made at the national workshop.
In addition to the reports mentioned in section 7.1 of these terms of reference, the consultant must prepare a certain number of draft technical reports, in French for Benin and in English for Ghana, notably:

(a) An interim technical report, 15 days after the start of the project, which presents, among other aspects, the results and conclusions of the review and analysis of the relevant documentation and which indicates the methodological approach, the places to visit, the actors to meet, the precise timing of the mission and the plan of the study report.

(b) A first provisional technical report (PRT), presenting the proposals formulated regarding the implementing regulations for the fisheries framework legislation of Benin on the one hand, and the Marine Fisheries Management Plan of Ghana on the other. This first RPT should be distributed with a view to its validation during the national workshop planned in both the countries.

(c) A second provisional technical report, following the national workshops. This 2nd provisional report should be distributed before the Consultant leaves the country, and comments and observations of the editors (PMC, fisheries authorities, CU/RFU) should be received within 14 days at most.

(d) A final technical report (FTR). This report should take into account all the comments and observations of the PMC, the fisheries authorities and of the CU/RFU that were communicated. The FTR should be sent to the CU/RFU no later than 30 days after the Consultant has left the country.

**Project management**

**Responsible body**
The Coordination Unit of the ACP Fish II Programme (CU), representing the ACP Secretariat, is responsible for the management of the implementation of this project.
Management structure
The ACP Fish II Programme is implemented through the Coordination Unit (CU) in Brussels and six Regional Facilitation Units (RFUs) based in ACP countries. The RFU in Dakar, covering Western African countries, will support the implementation and the monitoring of the project linked to these terms of reference. All contractual issues should be addressed to the CU with the RFU in copy. For this contract, the Programme Coordinator of ACP Fish II will act as project manager.

Facilities to be provided by the Contracting Authority and/or other parties
Not applicable.

LOGISTICS AND TIMING

Location
Project activities will be carried out in Benin (Cotonou) and in Ghana (Accra). The host authority is the Fisheries Department [Direction des pêches] for Benin and the Department of Fisheries for Ghana. Field visits will be conducted according to the timeline and the plan of activities presented (strategy and methodology) by the Consultant.

Commencement date & Period of implementation
The intended commencement date is 15 November 2010 and the period of implementation of the contract will be 5 months from this date. Please refer to Articles 4 and 5 of the Special Conditions for the actual commencement date and period of implementation.

REQUIREMENTS

Personnel

Key experts
All experts who have a crucial role in implementing the contract are referred to as key experts. The profiles of the key experts for this contract are as follows:

Key Expert 1: Team Leader – Specialist in fisheries management/Economist
- Qualifications and skills
  - Advanced university degree (Masters or higher) in fisheries science, fisheries management or economics;
  - Fluent spoken and written English and French
- General Professional Experience
  - At least 10 years of experience in inland and marine fisheries management;
  - Previous experience as team leader in projects of the EU or other similar international organisations;
  - Excellent communication, report drafting and project management skills.
- Specific Professional Experience
  - Experience in the formulation of fisheries policy instruments (preferably at more than 5 missions but at least 2 missions are required);
- Experience as a consultant for the EU or other similar international organisations (preferably more than 8 missions but at least 3 missions are required);
- Experience in the sub-region. Experience in Benin and Ghana is an advantage;
- Good knowledge of the institutional and legal systems of West African states.

The maximum number of working days for this expert is 69.

The maximum number of missions outside of the normal place of posting and requiring overnights is 5.

Field visits not requiring overnights are also foreseen.

The first key expert will take the role of Team Leader and of technical expert for Ghana, with the second key expert taking on the legal work in Benin.

### Indicative number of days allocated to each key expert by activity

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<tr>
<th>Activities</th>
<th>Key Expert 1 (days)</th>
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<tr>
<td>Preparatory work (Visits making contact with fisheries authorities, initial meeting with project team, creation of PMC)</td>
<td>5</td>
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<tr>
<td>Literature review</td>
<td>6</td>
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<tr>
<td>Field visits, stakeholder consultation, data collection and analysis</td>
<td>16</td>
</tr>
<tr>
<td>Coordination missions</td>
<td>5</td>
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<tr>
<td>Development of implementing regulations of the Benin fisheries legislation and formulation of Marine Fisheries Management Plan in Ghana, and provisional report</td>
<td>16</td>
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<tr>
<td>Arranging and conducting national workshop</td>
<td>9</td>
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<tr>
<td>Review of the report taking into account changes</td>
<td>4</td>
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<tr>
<td>Preparation and submission of Final Technical Report (FTR)</td>
<td>8</td>
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<td><strong>Total</strong></td>
<td><strong>69</strong></td>
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Note that civil servants and other staff of the public administration of the beneficiary country cannot be recruited as experts, unless prior written approval has been obtained from the European Commission.

**Other experts**

Not applicable.

**Support staff & backstopping**

Backstopping and support staff costs must be included in the fee rates of the experts.
Office accommodation
Office accommodation of a reasonable standard and of approximately 10 square metres for each expert working on the contract is to be provided by the beneficiary countries.

Facilities to be provided by the Consultant
The Consultant shall ensure that experts are adequately supported and equipped. In particular it shall ensure that there is sufficient administrative, secretarial and interpreting provision to enable experts to concentrate on their primary responsibilities. It must also transfer funds as necessary to support its activities under the contract and to ensure that its employees are paid regularly and in a timely fashion. If the Consultant is a consortium, the arrangements should allow for the maximum flexibility in project implementation. Arrangements offering each consortium member a fixed percentage of the work to be undertaken under the contract should be avoided.

Equipment
No equipment is to be purchased on behalf of the Contracting Authority / beneficiary country as part of this service contract or transferred to the Contracting Authority / beneficiary country at the end of this contract. Any equipment related to this contract which is to be acquired by the beneficiary country must be purchased by means of a separate supply tender procedure.

Incidental expenditure
The Provision for incidental expenditure covers the ancillary and exceptional eligible expenditure incurred under this contract. It cannot be used for costs which should be covered by the Consultant as part of its fee rates, as defined above. Its use is governed by the provisions in the General Conditions and the notes in Annex V of the contract. It covers:
- Travel costs and subsistence allowances for missions, outside the normal place of posting, to be undertaken as part of this contract. If applicable, indicate if the provision includes costs for environmental measures, for example CO2 offsetting.
- The costs of the organisation of national consultations and workshops, including the experts’ travel (hire, car), accommodation, mission cost (DSA) of participants and the hiring of meeting rooms.
- The Provision for incidental expenditure for this contract is EUR 34,810. This amount must be included without modification in the Budget breakdown.
- Any subsistence allowances to be paid for missions undertaken as part of this contract must not exceed the per diem rates published on the Web site: http://ec.europa.eu/europeaid/work/procedures/index_en.htm at the start of each such mission.

Expenditure verification
The Provision for expenditure verification relates to the fees of the auditor who has been charged with the expenditure verification of this contract in order to proceed with the payment of further pre-financing instalments if any and/or interim payments if any.
- The Provision for expenditure verification for this contract is EUR 3,200. This amount must be included without modification in the Budget breakdown.
REPORTS

Reporting requirements
Please refer to Article 26 of the General Conditions. There must be a final report, a final invoice and the financial report accompanied by an expenditure verification report at the end of the period of implementation of the tasks. The draft final report must be submitted at least one month before the end of the period of implementation of the tasks. Note that these reports are additional to any required in Section 0 of these Terms of Reference.
Each report shall consist of a narrative section and a financial section. The financial section must contain details of the time inputs of the experts, of the incidental expenditure and of the provision for expenditure verification.
Three copies of the reports referred to above must be submitted to the Project Manager identified in the contract. The reports must be written in English and French. The Project Manager is responsible for approving the reports.

MONITORING AND EVALUATION

Definition of indicators
The expected results are mentioned in paragraph 2.3. Progress made in achieving these results will be measured using the following indicators:
The quality of consultants in the field and their rapid mobilisation in the country concerned indicates a positive start to the mission;
Identification of questions and problems as indicated in the provisional technical report;
Creation of a Project Monitoring Committee (PMC);
Report on the participation of stakeholders in the formulation of the Marine Fisheries Management Plan of Ghana and in the writing of the draft fisheries framework legislation in Benin;
Number of consultative meetings held;
Organisation of two national validation workshops planned in Benin and Ghana;
Participation rate in the workshop and in the consultative meetings;
Number and nature of comments and observations received following the sending of the provisional technical report.
Approval of the final products during the national workshops.

Special requirements
Not applicable.

* * *
ANNEXE B. ITINERARY, INSTITUTIONS AND INDIVIDUALS CONSULTED

Itinerary and work program of Expert 1

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<tr>
<th>Phase</th>
<th>Work Day</th>
<th>AM</th>
<th>PM</th>
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<tr>
<td>Monday 24/01</td>
<td>Departure from Paris</td>
<td>Arrival in Accra</td>
<td>Documentation analysis</td>
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<tr>
<td>Tuesday 25/01</td>
<td>Briefing meeting with George Hutchfull, Fisheries Commission (former Focal point)</td>
<td>Meeting with the Director of Fisheries</td>
<td>Documentation analysis</td>
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<tr>
<td>Wednesday 26/01</td>
<td>Working session with Mrs Patricia Markwey, Head of Marine Fisheries Management Division, Focal point</td>
<td>Preparation of a project Inception note</td>
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<tr>
<td>Thursday 27/01</td>
<td>Preparation of a project Inception note</td>
<td>Working session with the Focal point</td>
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<tr>
<td>Friday 28/01</td>
<td>Documentation analysis</td>
<td>Participation in the 1st PMC meeting</td>
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<tr>
<td>Week-end (29-30/01): Departure to Cotonou on 29/01 (other assignment of the project in Benin)</td>
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<tr>
<td>Monday 07/02</td>
<td></td>
<td>Arrival in Accra</td>
<td>Documentation analysis</td>
</tr>
<tr>
<td>Tuesday 08/02</td>
<td>Field visit in Tema: ✓ Main Fisheries Research Division ✓ Ghana Inshore Fisheries Association</td>
<td>Field visit in Tema (Ctd): ✓ Main Fisheries MCS Division</td>
<td>Documentation analysis</td>
</tr>
<tr>
<td>Wednesday 09/02</td>
<td>Field visit in Tema (CTd): ✓ Regional fisheries office, Great Accra ✓ Stakeholders consultation (validation meeting of draft Development plan)</td>
<td>Field visit in Tema (Ctd): ✓ Ghana Industrial Trawler Association (GITA) Travel to Takoradi</td>
<td></td>
</tr>
<tr>
<td>Thursday 10/02</td>
<td>Field visit in Takoradi: ✓ Regional fisheries office, Western ✓ Coastal Resource Center ✓ 1 Fishing company in Sekondi harbor</td>
<td>Field visit in Takoradi (Ctd): ✓ Inshore fishermen in Sekondi harbor ✓ Ghana Canoe association in Sekondi harbor Travel to Elmina</td>
<td></td>
</tr>
<tr>
<td>Friday 11/02</td>
<td>Field visit in Elmina: ✓ Regional fisheries office, Central ✓ Visit of Elmina fishing harbor</td>
<td>Field visit in Elmina (Ctd): ✓ Canoe fishermen in Elmina harbor ✓ Inshore fishermen ✓ Debriefing at Regional fisheries office</td>
<td></td>
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<tr>
<td>Week-end (12-13/02)</td>
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<td></td>
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<tr>
<td>Monday 14/02</td>
<td>Field notes analysis</td>
<td>Meeting with Director of Fisheries</td>
<td>Documentation analysis</td>
</tr>
<tr>
<td>Tuesday 15/02</td>
<td>Documentation analysis</td>
<td>Project management</td>
<td>Documentation analysis</td>
</tr>
<tr>
<td>Wednesday 16/02</td>
<td>Drafting of TORs of Technical Working Groups</td>
<td>Report writing</td>
<td>Working session with the project Focal point</td>
</tr>
<tr>
<td>Thursday 17/02</td>
<td>Report writing Meeting at the Ghana Maritime Authority</td>
<td>Meeting with Head of MCS Division</td>
<td>Report writing</td>
</tr>
<tr>
<td>Friday 18/02</td>
<td>Report writing</td>
<td>Working session with project Focal point Debriefing meeting with Director of Fisheries Departure to Paris</td>
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</tr>
<tr>
<td>Week-end (18-19/02)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monday 20/02</td>
<td>Preparation of 1st ITR Report</td>
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### Phase 2

<table>
<thead>
<tr>
<th>Work. Day</th>
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</thead>
<tbody>
<tr>
<td>Monday 28/03</td>
<td>Departure Cotonou</td>
<td>Arrival in Accra</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Documentation analysis</td>
</tr>
<tr>
<td>Tuesday 29/03</td>
<td>Briefing meeting with Director of Fisheries</td>
<td>Analysis of reports of Working Groups (ctd)</td>
</tr>
<tr>
<td></td>
<td>Analysis of reports of Working Groups</td>
<td>Analysis of reports of Working Groups (ctd)</td>
</tr>
<tr>
<td>Wednesday 30/03</td>
<td>Analysis of reports of Working Groups (ctd)</td>
<td>Drafting of the outlines of Strategy document</td>
</tr>
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<td>Complementary investigations at the Commission</td>
<td>Analysis of reports of Working Groups (ctd)</td>
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<tr>
<td>Thursday 31/03</td>
<td>Preparation of draft outlines Strategy</td>
<td>Working session with the Focal point</td>
</tr>
<tr>
<td>Friday 01/04</td>
<td>Preparation of draft outlines Strategy (ctd)</td>
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<tr>
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<td></td>
<td>Organization of Technical Meeting</td>
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<td>Week-end (02-03/04)</td>
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</tr>
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<td>Monday 04/04</td>
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<td>Preparation of draft outlines Strategy (ctd)</td>
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<td>Complementary investigations</td>
<td>Complementary investigations</td>
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<tr>
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<td>Preparation of draft outlines Strategy (ctd)</td>
</tr>
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<td></td>
<td>Complementary investigations at the FC</td>
<td>Complementary investigations at the FC</td>
</tr>
<tr>
<td>Wednesday 06/04</td>
<td>Preparation of draft outlines Strategy (ctd)</td>
<td>Preparation of working papers</td>
</tr>
<tr>
<td>Thursday 07/04</td>
<td>Technical Meeting</td>
<td>Technical Meeting</td>
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<td>Friday 08/04</td>
<td>Technical Meeting</td>
<td>Working session with project Focal point</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Departure to Paris</td>
</tr>
<tr>
<td>Week-end (09-10/04)</td>
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<tr>
<td>Monday 11/04</td>
<td>Preparation of 2nd ITR Report including finalizing the draft outlines of the Strategy</td>
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### Phase 3

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<td>Monday 16/05</td>
<td>Departure Cotonou</td>
<td>Arrival in Accra</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Documentation analysis</td>
</tr>
<tr>
<td>Tuesday 17/05</td>
<td>Briefing meeting with Director of Fisheries</td>
<td>Preparation of draft Strategy</td>
</tr>
<tr>
<td></td>
<td>Preparation of the National Workshop</td>
<td>Preparation of draft Strategy (Ctd)</td>
</tr>
<tr>
<td>Wednesday 18/05</td>
<td>Preparation of draft Strategy (Ctd)</td>
<td>Preparation of draft Strategy (Ctd)</td>
</tr>
<tr>
<td></td>
<td>Complementary investigations with MFRD</td>
<td>Preparation of draft Strategy (Ctd)</td>
</tr>
<tr>
<td>Thursday 19/05</td>
<td>Meeting at the Ghana Maritime Authority</td>
<td>Preparation of draft Strategy (Ctd)</td>
</tr>
<tr>
<td>Friday 20/05</td>
<td>Preparation of draft Strategy (ctd)</td>
<td>Preparation of draft Strategy (Ctd)</td>
</tr>
<tr>
<td>Week-end (21-22/05): Departure to Keita on 22/05</td>
<td></td>
<td></td>
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<tr>
<td>Monday 23/05</td>
<td>Field visit in Volta Region:</td>
<td>Return to Accra</td>
</tr>
<tr>
<td></td>
<td>✓ Fisheries office, Keta</td>
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</tr>
<tr>
<td></td>
<td>✓ Meeting canoe fishermen at Keta beach</td>
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</tr>
<tr>
<td></td>
<td>✓ Meeting canoe fishermen at Vodza</td>
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<tr>
<td>Tuesday 24/05</td>
<td>Meeting with the Focal Point</td>
<td>Preparation of working paper in view of the National workshop</td>
</tr>
<tr>
<td></td>
<td>Data collection in view of the Final Report</td>
<td>National Validation Workshop</td>
</tr>
<tr>
<td>Wednesday 25/05</td>
<td>National Validation Workshop</td>
<td>National Validation Workshop</td>
</tr>
<tr>
<td>Thursday 26/05</td>
<td>National Validation Workshop</td>
<td>Working session with project Focal point Debriefing meeting with Director of Fisheries</td>
</tr>
<tr>
<td>Friday 27/05</td>
<td>Departure to Cotonou</td>
<td>Departure to Paris</td>
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<tr>
<td>Week-end (28-29/05)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monday</td>
<td>Preparation of Final Report including finalization of the Strategy</td>
<td></td>
</tr>
<tr>
<td>Work. Day</td>
<td>AM</td>
<td>PM</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------------------------------------</td>
<td>-----------------------------------------</td>
</tr>
<tr>
<td>30/05</td>
<td>Preparation of Final Report including finalization of the Strategy (Ctd)</td>
<td></td>
</tr>
<tr>
<td>Tuesday</td>
<td></td>
<td>Preparation of Final Report including finalization of the Strategy (Ctd)</td>
</tr>
<tr>
<td>31/05</td>
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</table>

**Institutions and individuals consulted (not including individuals consulted during the Technical Meeting and the National Validation Workshop – see Annexes F2 and F3)**

<table>
<thead>
<tr>
<th>Name</th>
<th>Position/Association</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hon. Mike Akyeampong</td>
<td>Chairman, Fisheries Commission</td>
</tr>
<tr>
<td>Samuel Quaatey</td>
<td>Fisheries Director</td>
</tr>
<tr>
<td>Ms P. Markwey,</td>
<td>Head of Marine Fisheries Management Division</td>
</tr>
<tr>
<td>Setor Avoke</td>
<td>Head of MCS Division</td>
</tr>
<tr>
<td>Paul Bannerman</td>
<td>Head of Marine Fisheries Research Division</td>
</tr>
<tr>
<td>Peter Azuma</td>
<td>General Director, Ghana Maritime Authority</td>
</tr>
<tr>
<td>Nii Tackey</td>
<td>President of National Fisheries Association of Ghana (NAFAG) and President of Ghana Industrial Trawler Association (GITA)</td>
</tr>
<tr>
<td>George Hutchfull</td>
<td>(Former) Head of Fisheries Administration Division</td>
</tr>
<tr>
<td>Nemonius Pengyir</td>
<td>Head of Fisheries Administration Division</td>
</tr>
<tr>
<td>Loby Agbey</td>
<td>Inshore Fisheries Association, Tema</td>
</tr>
<tr>
<td>Ms Rebecca Sockey-Mensah</td>
<td>Marine Fisheries Management Division</td>
</tr>
<tr>
<td>John Scott</td>
<td>Regional Fisheries Officer, Greater Accra Region (Tema)</td>
</tr>
<tr>
<td>Mr Ampratown</td>
<td>Ghana Industrial Trawler Association (GITA)</td>
</tr>
<tr>
<td>Mr Ofori</td>
<td>Ghana Industrial Trawler Association (GITA)</td>
</tr>
<tr>
<td>Mr Mensah</td>
<td>Ghana Industrial Trawler Association (GITA)</td>
</tr>
<tr>
<td>Alex Sahah</td>
<td>Regional Fisheries Officer, Western Region (Takoradi)</td>
</tr>
<tr>
<td>Theodore Kwadjosse</td>
<td>MCS Fisheries Officer, Western Region (Takoradi)</td>
</tr>
<tr>
<td>Peter Azuma</td>
<td>Director General, Ghana Maritime Authority</td>
</tr>
<tr>
<td>A. A. Akanteyam</td>
<td>Ghana Maritime Authority, Accra</td>
</tr>
<tr>
<td>Gormey Balertey</td>
<td>Coastal resources Center (CRC)</td>
</tr>
<tr>
<td>Daniel Kwache</td>
<td>Officer, ‘Mass Fisheries’ fishing company</td>
</tr>
<tr>
<td>Francis Kwesi Eshun</td>
<td>Ghana Inshore Association</td>
</tr>
<tr>
<td>John Kodina Assakomeh</td>
<td>Chairman, Ghana Canoe Association (GCA) of Sekondi/Takoradi</td>
</tr>
<tr>
<td>Papa Yaw Atobrah</td>
<td>Regional Fisheries Officer, Central Region (Cape Coast)</td>
</tr>
<tr>
<td>-</td>
<td>Canoe fisherman (hook&amp;line), Elmina fishing harbor</td>
</tr>
<tr>
<td>-</td>
<td>Canoe fisherman (gillnet), Elmina fishing harbor</td>
</tr>
<tr>
<td>Mr Mensah</td>
<td>Canoe and Inshore boats owner, Elmina</td>
</tr>
<tr>
<td>M. Francis K. Kpodo</td>
<td>Volta Region Chief Fisherman</td>
</tr>
</tbody>
</table>
ANNEXE C. INCEPTION REPORT

The Inception report included two sections. The first section was dealing with the rational underpinning the change in specific objective of the project (see section 1 of the present Final Report). The second section was addressing methodological aspects. Some of these methodological aspects that are given in section 2 of the present Final Report were further developed in the inception report that was presented and discussed during the 1st PMC meeting that took place at the Fisheries Commission on the 28th of January 2011. The full inception report, inclusive of the comments and recommendations expressed by the PMC meeting, is given below.

Structures of the project

Focal Point
The Focal point of the project represents the Fisheries Commission and acts as counterpart to the Consultant. The Fisheries Commission has designated Ms Patricia Markwey, Head of the Marine Fisheries Management Division, as Focal Point.

Project Monitoring Committee
The Project monitoring committee (PMC) is an ad hoc committee that was set up in accordance with section 4.1.1 of the Terms of reference of global assignment. The mandate of the PMC is to discuss any issues and proposals aimed at facilitating the overall project implementation. In particular, the PMC will facilitate the permanent liaison between beneficiary institutions and the Consultant and validate the following results: methodology as proposed by the consultant, timeframe of the project, the two Interim Technical Reports (ITR) and the Final Report.

The PMC is composed of 5 persons representing policy, management, research, MCS, and industry in addition to the focal point of the project, i.e. 6 persons in total as follows:

- Hon. Mike Akyeampong, Chairman Fisheries Commission
- Samuel N.K Quaatey, Director of Fisheries
- Ms Patricia Markwey, Head of Marine Fisheries Management FM Division,
- Setoo Avoke, Head of MCS Division,
- Paul Bannerman, Head of Marine Fisheries Research Division
- Nii Tackey, President NAFAG (National Fisheries Association of Ghana)

Project inputs

Expert 1
Expert 1 will coordinate the overall planning exercise in close consultation with the Focal Point of the project. In particular, he will prepare and facilitate the two meetings/workshops and prepare the different project reports (1st ITR, 2nd ITR and Final Report) based on:

- the findings of his own investigations (field visits, meetings, analysis of existing literature) while giving emphasis on institutional aspects;
- the reports that will be prepared by Technical working groups (see after) in the context of the preparation of both Technical meeting and National workshop;
the findings and recommendations of both Technical meeting and National workshop.

Technical Meeting
The purpose of the Technical Meeting will be to discuss major issues relating to marine fisheries management and to review the outlines of the Strategy for marine fisheries management document. The number of participants in the National meeting should not exceed 20 persons, and participants will be selected on the basis of the relevance of their technical background with regards to marine fisheries management. It is believed that most participants will be identified within the members of the Technical Working Groups (see below), but not only. Duration of the meeting will be 2 days. Note that no official opening ceremony will be organized for this meeting.
The Technical Meeting will take place in Accra from 6 to 7 April 2011.

National Validation Workshop
The purpose of the National Validation Workshop will be to give the opportunity to a broader public to be sensitized on the results of the project and to validate the draft Strategy for marine fisheries management. Participation will be both technical and political, thus including representatives of private sector (producers organizations, NGOs, etc.) and public institutions which are not forcibly depending upon MOFA (e.g., Ghana Maritime Authority, Port authorities, Ministry in charge of environment, Ministry in charge of finance and planning, Ministry in charge of decentralization, donors, etc.) but which are directly or indirectly concerned by marine fisheries management. Total number of participants will not exceed 40 and duration of the workshop will be 2 days.
The National Workshop will take place in Accra from 18 to 19 May 2011.

Technical Working Groups
Three (3) Technical Working Groups have been set up with the aim of providing technical assistance for the two meetings, including preparing reports that will contribute to the preparation of working papers for meetings. Each of the working groups is composed of a maximum 5 resource persons, including persons coming from the private sector such as boat owners and representatives from producer organisations.
The three Working groups are as follows:
- **WG 1** - Key figures and major trends in the marine fishery sector. The general mandate of Group 1 will be contribute to a better understanding of major trends in the marine fishery sector and major issues relating to fisheries.
- **WG 2** - Marine Fisheries Management Systems. The general mandate of Group 2 will be to contribute to a better understanding of the strengths and weaknesses of the current marine fisheries management systems (including registration, permits, technical measures, fisheries management plan, etc.).
- **WG 3** - Marine Fisheries Monitoring, Control Surveillance and Enforcement (MCS&E). The general mandate of Group 3 will be to contribute to a better understanding of current MCS and Enforcement system in the marine fishery sector and prospects for improved system.

The project will assist the Technical Working Groups through the provision of a certain amount aimed at supporting meetings and field investigations (transport costs and per diem). The reports to be prepared by the Technical Working groups will be sent to Expert 1, at least one week before his next missions, through the Focal point of the project.
Terms of reference of working groups, including composition of groups, are given in the annex of the inception report (see below).

**Timeframe of the project**

<table>
<thead>
<tr>
<th>Event</th>
<th>Jan</th>
<th>Feb</th>
<th>Marc</th>
<th>April</th>
<th>May</th>
<th>June</th>
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</thead>
<tbody>
<tr>
<td>Starting of the project</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Preliminary analysis of major issues relating to the management of marine fisheries</td>
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<td>Technical Working groups (preparation of reports in view of the 2 meetings)</td>
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<td>Analysis of working papers and complementary investigations to support preparation of Strategy for fisheries management</td>
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<td>Technical meeting (06-07 April 2011)</td>
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<tr>
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<td>Missions of Expert 1 in Ghana (*) (*Phase 1: 24-28 January 2011 and 07-18 February 2011; Phase 2: 28 March-08 April 2011; Phase 3: 09-20 May 2011)</td>
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<td>Final report</td>
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<td>Strategy for Marine Fisheries Management</td>
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# Budget

**Budget Ghana - ACP Fish II - Marine Fisheries Management Strategy (Euros)**

<table>
<thead>
<tr>
<th>Designation</th>
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<th>2nd Phase</th>
<th>3rd Phase</th>
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<td>Frequency</td>
<td>Total</td>
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<td>3 National Workshop</td>
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<td></td>
<td></td>
<td>7 160</td>
</tr>
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<td>3.1 Preparation (transport+per diem members technical groups)</td>
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</tr>
<tr>
<td>3.2 Transport costs participants from Accra</td>
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<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3.3 Transport costs participants from outside Accra</td>
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<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3.4 Per diem participants coming from outside Accra</td>
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<td>0</td>
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<tr>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3.6 Publication (photocopy of working documents)</td>
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<td>50</td>
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<tr>
<td>4.3 Per diem driver</td>
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<tr>
<td><strong>Grand Total</strong></td>
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<td>-</td>
<td></td>
<td>1 663</td>
</tr>
</tbody>
</table>

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**Project Funded by the European Union**

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A project implemented by
Annex to the Inception Report: Terms of reference of Technical Working Groups

Context (common to the three Technical Working Groups)
The objective of this ACP Fish II project in Ghana is to assist the Fisheries Commission in the preparation of a “Strategy for Marine Fisheries Management including a Roadmap towards Fisheries Management Plans”. The major objective of the Strategy will be to contribute to marine fisheries management process, while making due consideration to the following reference documents:
- Review of and recommendations to operationalize marine fisheries policy and management plan for Ghana, FMOC 2000;
- Summary of management measures recommended by the FMOC and reviewed by the Fisheries Commission, Minister of fisheries, Sept. 2001 (called “Fisheries Management Plan, 2001”);
- Fisheries Act, 2002
- Fisheries Regulations, L.I. 1968, 2010
- National fisheries and aquaculture policy, Ministry of fisheries, 2008
- Fisheries and aquaculture sector development Plan: 2010 to 2015 (draft version, Nov. 2009)

The Strategy is expected to emphasize on three sub-sectors (Marine canoe, Semi-industrial, Industrial) considering that the management of tuna fisheries (the fourth marine sub-sector) is to be in conformity with ICCAT recommendations.

During the project, two meetings will be organized: one Technical Meeting to be held in April 2011 and one National Workshop to be held in May 2011. The purpose of the Technical Meeting will be to discuss major issues relating to marine fisheries management and to review the outlines of the Strategy for Marine Fisheries Management document. The purpose of the National Workshop will be to give the opportunity to a broader public to be sensitized of the results of the project and to validate the draft Strategy for Marine Fisheries Management.

In this context, three Technical Working Groups have been set up with the aim of providing technical assistance in view of the meetings, including preparing notes/reports that will contribute to the preparation of working papers by the Expert. Each of the working groups would be composed of a maximum 5 resource persons, including persons representing the private sector. They are as follows:
- Group 1 - Key figures and major trends in the marine fishery sector
- Group 2 - Marine fisheries management system
- Group 3 - Marine Fisheries Monitoring, control, Surveillance and Enforcement (MCS&E) system

Mandate of WG 1
The general mandate of Group 1 will be to contribute to a better understanding of major trends in the marine fishery sector and major issues relating to fisheries. In particular, Group 1 will:
1. Gather data and information on the following:
   o Number of fishing boats (active and latent) for each of the six Ghana marine fleet sectors (over the last 10 years)
   o Characteristics of fishing boats (lengths, GRT, KWH, motorization, fishing technology used, target species, age, etc.) for each of the 4 marine sub-sectors (over the last 10 years)
   o Number of licenses in each of the 4 marine sub-sectors (over the last 10 years)
MSY and current status of marine fish stocks
- Catch figures in each of the 4 marine sub-sectors (over last 10 years)
- Fishing strategy for each of the 4 marine sub-sectors (duration of fishing trips, importance of by-catch, eventual practice of transshipment, etc.)
- Magnitude of transshipment activity from trawlers to canoes
- Employment (national and foreign) in each of the 4 marine sub-sectors (10 years series)
- Fish utilization: methods for fish processing and marketing, share between fresh fish and processed fish, general trends in market
- Fish import and export: quantity, value and type of product (fresh, frozen, processed) (over the last 10 years)
- Fish consumption (over the last 10 years and projections for the next 10 years)

2. Key issues relating to marine fisheries development and management for each of the 4 marine sub-sectors

3. Major expectations regarding the future Marine Fisheries Management Plan

4. Key issues in marine fish processing and marketing

5. Contribute to the preparation of the National workshop (activities will be further specified after the Technical meeting)

6. Prepare a report based on the above (not exceeding 25 pages)

Mandate of WG 2
The general mandate of Group 2 will be to contribute to a better understanding of the strengths and weaknesses of the current marine fisheries management system. In particular, Group 2 will:

1. Briefly describe measures and procedures for controlling the access to resources in each of the 4 marine sub-sectors (including boat registration and fishing licenses) and analyze strengths and weaknesses in terms of their relevance for fisheries management and their implementation

2. Briefly describe and analyze strengths and weaknesses in terms of their relevance for fisheries management and applicability of the technical marine fisheries management such as IEZ, mesh-size of nets, minimum size of fish, ban of certain fishing methods, etc. (based on the recently published fisheries regulations, 2010)

3. Assess the impact of other policy tools that have been promoted for the last 10 years on fisheries management (e.g., subsidize, taxation, etc.)

4. Analyze the possible effect of climate change and environmental degradation (inshore, lagoon and inland) on the productivity and sustainability of marine fishery resources

5. Identify gaps and improvement needs of current fisheries regulation with reference to recent developments including plans (regional/FCWC 2009 and draft national) for fighting against IUU fishing, and EAF approach to fisheries management

6. Analyze the reasons why the Fisheries Management Plan, 2001, has been poorly implemented in general and appreciate the bio-ecological and socio-economic effects that this has had in the marine fisheries sector

7. Identify actions aimed at improving functions in support of marine fisheries management (including statistics, research, MCS and consultative mechanisms among the key public and private stakeholders)

8. Major expectations and proposals regarding the future Marine Fisheries Management Plan

9. Contribute to the preparation of the National workshop (activities will be further specified after the Technical meeting)

10. Prepare a report based on the above (not exceeding 25 pages)
Mandate of WG 3

The general mandate of Group 3 will be to contribute to a better understanding of current Monitoring, Control, Surveillance and Enforcement (MCS&E) in the marine fishery sector and prospects for improved system. In particular, Group 3 will:

1. Describe the current marine fisheries MCSE system (organization, logistical means, personnel, financing, collaborative mechanisms with other institutions, etc.)
2. Based on the existing marine fisheries regulatory framework, assess the levels of compliance by each of the 4 sub-sectors of major fisheries management related measures such as boat registration, licensing and illegal fishing practices (e.g. non-compliance with the IEZ, use of damaging techniques including dynamites and light fishing, transshipment), through analysis of existing administrative documents (fleet registry, license registry, periodic reports of MCS Division, periodic reports of Navy if existing, etc.) and field observations
3. Assess the strengths and weaknesses of the current marine fisheries MCSE system, including analyzing the institutional, technical, financial and/or socio-economic reasons that may hamper the enforcement of certain important measures (enforcement include inspection, investigation, prevention and court proceedings to enforce the law)
4. Assess the constrains and opportunities associated with the building of voluntary compliance
5. Identify priority needs for improved MCSE in marine fisheries
6. Contribute to the preparation of the National workshop (activities will be further specified after the Technical meeting)
7. Prepare a report based on the above (not exceeding 25 pages)

Composition of Working Groups

Group 1 will be composed of five persons max, from public and private sectors, including the leader of this group, namely Paul Bannerman (Head of Marine Fisheries Research Division), 1 person from the Industry, 1 person from the University of Ghana and Ms Patricia Markwey (Head of Marine fisheries management Division)

Group 2 will be composed of five persons max, from public and private sectors, including the leader of this group, namely Samuel Quattee (Director of Fisheries Commission), 1 person from CRC (Coastal Resources Center), 1 person from the Industry, 1 person from the NGO ‘Friend of the earth’.

WG 3 will be composed of five persons max, from public and private sectors, including the leader of this group namely Setor Avoke (Head, MCS Division), 1 person from the Attorney General / Police, 1 person from the Navy, 1 person from GMA (Maritime Authority), and 1 from NAFA (National Fisheries Association).
ANNEXE D. LIST OF REPORTS AND DOCUMENTS CONSULTED

FAO (2004) Information on Fisheries Management in Ghana
FAO (2007) Fisheries Country Profile – Ghana
FMOC/WB project (2000) Review of and recommendations to operationalize marine fisheries policy and management plan for Ghana
Fisheries Act, 2002
Fisheries Regulations, L.I. (Legal Instruments) 1968, 2010
Fisheries Research Division (recent) PowerPoint entitled “Profitable and Sustainable Management of Ghana’s Fisheries”
Minister of fisheries (Sept. 2001) Summary of management measures recommended by the FMOC and reviewed by the Fisheries Commission
Ministry of fisheries, 2008 National Fisheries and Aquaculture Policy
Nunoo FKE and A. Bortey (2011) The Beach Seine Fishery in Ghana – EAF Baseline Study. FAO/EAF Nansen Project
World Bank consultant (Crothers & Sutinen) (Dec. 2010) Five Year Operational Plan for Monitoring, Control and Surveillance Activities (draft version)
World Bank consultant (2009) Revitalizing the Ghanaian Fisheries Sector for Wealth and Sustainability - Scoping study
World Bank (2011) Project description (first draft)
ANNEXE E. PHOTOGRAPHS OF KEY ACTIVITIES AND EVENTS

Canoes at ElMina harbour

Industrial trawler at Sekondi harbour

Maintenance of fishing nets (semi-industrial) at Sekondi harbour
National Validation Workshop, 25-26 May 2011 (Plenary session)
ANNEXE F. TECHNICAL OUTPUTS

List of technical outputs:

- F.1. Strategy for Marine Fisheries Management in Ghana
- F.4. Reports of Technical Working Groups
Annexe F.1. Strategy for Marine Fisheries Management in Ghana

The Strategy document is provided as a separate document for easier reading. Below is the table of content of the document (32 pages in total).

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Annexe F.2. Report of Technical Meeting (7-8 April 2011, Accra)

1. Introduction and Approach to the Technical Meeting
The purpose of the Technical Meeting that took place in the Conference Room of the Fisheries Commission in Accra on 7th and 8th of April 2011 was to discuss major issues relating to marine fisheries management (excluding tuna) in Ghana and to review the outlines of the Strategy for marine fisheries management document prepared by the consultant under Phase 2 of the ACP Fish II project. The meeting was opened by the Chairman of the Fisheries Commission. In his opening statement (see also annex below) the Chairman reminded that the Fisheries Commission is a newly established institution (inaugurated in September 2009) and that the forthcoming World Bank project is expected to significantly enhance its capacities to support sound fisheries planning and management. In this context, the Strategy for marine fisheries management, in preparation under the ACP Fish II project, also is expected to contribute to capacity building of the institution and to serve as a guide for delivering services in support to marine fisheries management.

The meeting brought together 25 resource persons coming from both public and private key institutions. List of participants is provided in annex below.

The approved Agenda (see annex below) left a considerable room to discussions. The methodology for the meeting consisted of presenting short working papers based on extracts from the draft Strategy followed by discussions in plenary. Day 1 of the meeting emphasized on the diagnosis of the marine fisheries management framework in Ghana. Day 2 of the meeting was entirely dedicated to the outlines of the proposed Strategy.

The working papers presented by the consultant were prepared on the basis of the reports of the three Technical Working Groups (see Annex F4 of the present document), the findings of field visits to the Greater Accra, Central and Western Regions and the outcomes from several individual meetings conducted in Accra with different fisheries stakeholders.

2. Major Results of the Technical Meeting
The Technical Meeting constituted a nice forum to review and improve the preliminary analysis of the marine fisheries management framework in a participative manner.

In particular, during day 1, the meeting emphasized the need of adequately addressing the following issues in the Strategy:

- Inadequate registration system of fishing vessels;
- Inadequate statistical systems and lack of assessment of fish stocks;
- Lack of information system within the Fisheries Commission for improved governance;
- Weakness of fishing licensing system;
- Poor collaborative mechanisms between the Commission and GMA (Ghana Maritime Authority) on boat registration with regards in particular to the construction of wooden local boats;
- Inadequate approach to fisheries management considering that management units should be based on resource or ecosystemic considerations rather than on sub-sectoral considerations;
- Uncleared definitions regarding semi-industrial vessels whilst considering that some wooden vessels under construction could be considered as industrial trawlers;
- Insufficient involvement of Local Government would in fisheries matters in general and fisheries management in particular, and there is a need to develop close partnership between the Commission and District Assemblies to enhance their capacities in fisheries management.
During day 2, the meeting emphasized the need for the Strategy to take into due consideration the following suggestions:

- The Commission should give priority to the cleaning of the industrial fishing vessel registry when considering its obsolescence and usefulness with regards to fisheries management needs
- Coordination of registration by GMA (or permit for vessel under 24 m) with fisheries licencing by the Commission should be strengthened
- The role and functioning of CBFMCs should be reconsidered so that they could effectively become a major stakeholder in fisheries co-management
- Licensing system for semi-industrial vessels should distinguish at least two options, i.e. one option for purse-seining and one option for trawling
- Effective fisheries management would mostly rely on strong political will and commitment both at central and local levels (including District Assembly and fishers), hence the need to develop sensitization and lobbying activities at the most appropriate levels.
- The Fisheries Commission should considerably strengthen its capacities to meet the needs of promoting well managed marine fisheries.

In conclusion it can be stressed that a significant number of crucial issues in relation to marine fisheries management could be raised by the meeting. More specific/technical discussions also served the purpose of developing the outlines of the Strategy during Phase 3 of the project.

In his closing statement, the Chairman of the Fisheries Commission reiterated the expectation of the Fisheries Commission vis-à-vis the Strategy for marine fisheries management that is believed to serve as a useful tool to stimulate and serve as a reference for the fisheries management process. He also confirmed that the present ACP Fish II assignment is not overlapping but complementing the World Bank support to fisheries management.

3. Annex
3.1. Opening Address by the Chairman of the Fisheries Commission at the Technical Meeting of ACP Fish II project (7th April 2011)

“Good morning ladies and gentlemen,
I deem myself privileged to be part of this group and to open and chair this meeting. This project to prepare strategies for the implementation of the marine fisheries management Plan has come at the right time when the commission has just had the Fisheries Regulation 2010, LI1968 enacted by parliament. It has come at the right time when illegal activities by fishermen (Operation of trawlers in the IEZ, use of lights in fishing, pair trawling, use of under sized mesh nets, use of monofilament nets in the marine sector and transshipment at sea) are on the increase. Ladies and Gentlemen, research document has it that the stocks are declining steadily and if nothing is done about it, some fishery could collapse in the near future. I am therefore grateful to the consultant and the EU for this laudable intervention. I encourage all participants gathered here to take this work more seriously to find an effective strategy to manage our fishery resources. On this note, I declare this meeting open. Thank you very much.”
3.2. Final Agenda

Day 1
09.00  Registration of participants
09.30  Opening ceremony (Chairman of Fisheries Commission)
       Welcome Address (Director of Fisheries Commission and Focal Point of the project)
09.45  Presentation of the preliminary analysis of the current marine fisheries management framework (Expert 1, ACP Fish II)
10.15  Discussions
11.00  Coffee break
11.15  Discussions (ctd)
13.00  Lunch break
14.00  Presentation of the preliminary analysis of the current marine fisheries management framework – ctd. (Expert 1, ACP Fish II)
14.30  Discussions
16.30  End of day 1

Day 2
09.00  Presentation of the outlines of the proposed draft Strategy for marine fisheries management (Expert 1, ACP Fish II)
09.30  Discussions
11.00  Coffee break
11.15  Discussions (ctd)
13.00  Lunch break
14.00  Conclusion and recommendation of the Technical Meeting
15.00  Closing
### 3.3. List of participants in the Technical Meeting

<table>
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1. Introduction and Approach to the Technical Meeting

The purpose of the National Workshop that took place in the Conference Room of the Fisheries Commission in Accra on 25th and 26th of April 2011 was to examine and validate the draft Strategy for marine fisheries management, prepared by the consultant under Phase 3 of the ACP Fish II project.

The workshop was opened by the Chairman of the Fisheries Commission. In his opening statement, the Chairman informed the participants that the negotiation with the World Bank that was held the day before the workshop was successful and that consequently the World bank-financed project on fisheries would start during the second half of 2011. In this connection, he kindly asked the participants to carefully review the Strategy that is expected to influence the implementation of project activities dealing specifically with marine fisheries excluding tuna. The Chairman also insisted on the need to promote a real change in the governance of the marine fisheries based, whilst considering that the Strategy will serve this purpose. Finally, he expressed its sincere gratitude to ACP Fish II project for the support provided in devising a Strategy for marine fisheries management in Ghana. The opening statement is provided in annex below.

The meeting brought together 27 resource persons coming from both public and private key institutions. List of participants is provided in annex below. Note that the attendance was high in spite on the fact that day 1 of the workshop was an official holidays (African Unit day). This could be a good indicator of the interest shown by major fisheries stakeholders regarding the validation of the Strategy, as it was underlined by the Chairman of the Fisheries Commission in his opening statement. The approved Agenda (see annex below) left considerable room for discussions in working groups. The methodology for the workshop consisted of introducing the discussions through the presentation of the draft Strategy. Note that the draft document was made available to participants two days before the workshop, as requested during the Technical Meeting held in April 2011. The presentation was followed by discussions in plenary. Three working groups were then organized to review the draft document and to make concrete suggestions and possible recommendations for its improvement and finalization. The three working groups were organized by sub-sector (WG 1: Industrial; WG 2: Semi-industrial; WG 3 canoe), but each of the working group was asked to review cross-cutting issues such as Research, MCS, livelihood diversification, etc. The results of each working groups were presented and discussed in plenary (see reports of working group in annex below).

2. Reports of Working Groups Results of the Technical Meeting

Report of WG 1 - Industrial

5.3.1.1 Industrial

- Vessel audit should be quickly done.
  - Re-registration of vessels
  - Vessels should be taken out of the register after two years without lice
- In agreement, although comprehensive work would be informed.
- All characteristics should conform to the GMA /FC and standard board.
  - Security should be on permits and license
5.3.2 Enhancing Fishing Rights and Licences (industrial)
- All comments accepted by group.

5.3.6 Improved Alignment of fishing capacity and effort with fishery resources
- The group accepted the position in bullet 1 and 2
- bullet 3: position should be expunge since it will eventually be over exploited. NB: this is not in conformed to our Fisheries Act.
- Buy back and decommissioning not viable alternatives. A need to cap the system and stop further licensing and replacement.
  - Thin-out the fishing industry by training based on age range fishers for alternative livelihood and schooling processes.
  - Prevent children of school going age from accessing the beaches.
  - Trained fishers to be provided with resources and tools to be functional.

Research
- Group agreed with the position of the report

MCS
- We agreed with bullets 1-3 but proposed that bullet four (4) should be reframed as; “strengthen at sea surveillance” and bullet 5 to read as; “develop aerial surveillance mechanism”.
- Bullet five (5) and (6) was also accepted by the group.

Structure of the Fisheries Commission
- Structure should be implemented in accordance with the provisions of Act 625 of 2002 and must be all levels. Particular attention to paid to section 141(6) of Act 625.

5.3.3.4 Co-management
- Group agreed with all submission however bullet four (4) should read; promote an information programme of different key institutions including the Das in fisheries management process.

5.3.4.1 Transhipment
- Group agreed with bullet 1 and 2 for the regulations of the transhipment (Seiko)
- Group suggested legislation with mechanisms to regulate as in page 14 in the report “Note that international laws involved in transhipping should be considered to support vessel and be licensed.

Beach seine and close season
- Group agrees with position on beach seine.
- Explore a possibility of opening up the estuaries of the lagoons and declare them as MPAs.
Harmonization of sub-regional laws
- Position was accepted by group although this should not be limited to the industrial sector alone.
- Bullet one (1) to be spited into two and read as;
  - Review the regulations relating to the IEZ
  - Review the type and size of gear used by the industrial and semi-industrial fishing vessels, on the basis of ecosystemic and socio-economic considerations and of their applicability.

Oil and Gas
- Implement section 93 of the Fisheries Act.

Report of WG 2 – Semi-Industrial

Fishing vessel licencing
- Need for an MOU between Fisheries Commission and GMA to harmonize mandates where they overlap on construction and licencing of vessels.
- Lack of data as to exact numbers of semi – industrial vessels warrants a frame survey.

Oil and fisheries
- Emerging oil sector has the potential to undermine fisheries.
- Need to develop a voice plus space to elevate the role of fisheries vis – a vis the oil
- Need monitoring.
- Fisheries impact assessment.

Transhipment
- Seiko operations should not be encouraged.

Safety and sanitation
- Enforcement of safety and sanitation measures for the semi – industrial and canoe sectors.
- Standard Board standards on sanitation should be enforced for all fishing fleets and education strengthened to ensure compliance.
- New designs for inshore vessels should incorporate toilet facilities.

MCS
- VMS system should be extended to canoes (in the long term) using appropriate and affordable technology.
- Develop career paths for MCS personnel.

Research
- Infrastructure for research must be improved to facilitate high levels of performance.
- Lack of logistics is a major issue regarding research.
Introduction of simplified log book system should be complemented with training and certification of semi – industrial operators.

Structure of the fisheries commission
- Develop a human resource development strategy to conform with current and emerging fisheries management needs.
- Fisheries Commission should develop decentralized structures to support its mandate.

Enhancing Fishing Rights and Licences
- Set up a moratorium cutting across all three fishing sectors taking cognizance of other sectoral policies that impact on the fisheries sector (e.g. trade, science and technology).
- Computerized registry must be networked to ensure access to authorized users at all levels of the Fisheries Commission. (ie. National, Regional).
- Need to enhance processes for engagement of the semi – industrial sector in the management of the resource.
- Computerized registry should include all levels of the Fisheries Commission. (ie. Regional and possibly district)
- There should be specialized capacity development to service the semi – industrial sector. (eg. net construction, etc.)

Report of WG 3 – Canoe

Enhancing Fishing Vessel Licencing (Canoe – 5.3.1.3)
- The Fisheries Commission (FC) is the competent authority in licencing canoes and not the District assemblies (DA). Section 52(b) (act 625) of the Fisheries act 2002.
- There is a need for registration for canoes and also canoe frame survey.
- Evaluate the canoes embossment process under the pilot scheme before the launching
- Bullet (1) Community Based Fisheries Management Committees (CBFMC’s) as at now are not functioning and are also part of the producer’s organisation. Reputable NGO’s should be added.
- Bullet (2) Capacity building of FC, DA’s in boat registration and FC, DA and Fishers in marking.
- Bullet (3) Add Regional level

Enhancing Fishing Rights and Licencing (Canoe – 5.3.2.3)
- Bullet (1) Add Reputable NGO’s

Improved alignment of fishing capacity and effort with fishery resources (Canoe - 5.3.6.2)
- Expand more on what FMU’s are eg. Sp, area, gears etc.

Structure of FC
- See p 14 (section 3.4 ‘Institutions and services in support to fisheries management’):
  - FC was inaugurated in Sept 2009 not 2010
  - The role of the FC should be clearly defined in relation to MOFA
  - No representative of the marine canoe fisheries association on the board of FC
Paragraph 4, should read “… whilst there are few district offices along the coast

Research

• Change MFRD in text to FSSD
• Sentence on “another issue regarding research is lack of highly qualified personnel (up to Phd level)……” should read “another issue……… is inadequate highly qualified personnel and also further training for personnel is required”
• FSSD should be semi-autonomous

MCS

• 5.3.3.1 Enforcement - Bullet (2) Reword the sentence. E.g. “prosecution system is slow, prosecution system is not fast etc.”

Strengthening the FC

• NAFAG in FC is not a major innovation
• Bullet (1) should read “….. Organisational structure in accordance to MOFA rules not organisational chart”

Alternative Livelihoods

• Agree to promote alternative livelihoods

Assessing the feasibility of controlling transhipment

• Transhipment must be controlled
• Observers should be placed on vessels to monitor activities.
• Operators should hire a carrier to collect and land catch.

Reducing beach seine activity in sensitive areas

• Agree to continuous studies on establishing close season
• Education and awareness of fisheries communities is necessary

Close Season

• A good scientific information on the fishery is needed in the establishment of a close season

5.3.4.5 Conservation Issues

• Review, Assessing and Revision are laudable ideas but how do we enforce them?

5.3.4.3 MPA’s

• Agree to establishment of MPAs.

5.3.4.4 Harmonisation of major Regulation at sub – regional level

• In short to medium term should be done in conformity to what pertains in the region.

Oil and Gas

• Baseline report on biological and environmental parameters in the marine environment is essential for monitoring and proper management of the resources.

Sanitation

• Education on proper disposal of waste.
3. Conclusion

The National Workshop could reach its objective that was to review and validate the draft version of the Strategy for marine fisheries management in Ghana. The participants recommended that comments and suggestions expressed in plenary and by working groups should be taken in due consideration by the consultant in the context of the finalization of the proposed Strategy.

In his closing statement, the Chairman of the Fisheries Commission underlined that the workshop could give an opportunity to learn a lot on major issues affecting the marine fishery sector from the representatives of fishers and to identify concrete actions to adequately address critical issues in a participatory manner. In the meantime, he stressed the need for every stakeholders involved in the marine fishery sector to increase their observance of provisions given in the Fisheries Act, 2002. He concluded his statement by giving his appreciation on the work done by the ACP Fish II project through preparing technical documents and providing institutional support for the preparation of the Strategy on marine fisheries management in Ghana.

4. Annex

4.1. Opening Address by the Chairman of the Fisheries Commission at the National Validation Workshop of ACP Fish II project (25th May 2011)

“Good morning ladies and gentlemen,
I feel honored to be here once again to open and chair this national work shop of the ACPFISH II project.
Last month you remember we were here for a technical meeting and today we are going to continue with what we were doing last month.
I wish to express my gratitude to all gathered here today for this important workshop. Why? Because today is AU Day and as such a statutory holiday in Ghana. I am really impressed with the attendance and this shows the extent to which this workshop is on our hearts. We are all in a hurry to find lasting solutions to the challenges facing the marine fishing industry in Ghana.
I wish to thank you very much, the consultant, Christophe and the EU for their timely intervention.
We are going to have a look at the strategies, short to medium term and then medium to long term strategies and comment on them.
As you can see there are strategies for the canoe fishery, the semi industrial fishery and the industrial fishery and I am glad that we have representatives of the various groups here to do just that.
I thank you for your dedication and devotion. On this note I wish to declare this national workshop duly opened.
Thank you very much.”

4.2. Final Agenda

Day 1
09.00  Registration of participants
09.30  Opening ceremony (Chairman of Fisheries Commission)
10.00  Presentation of the draft Strategy and preliminary discussions in plenary by the consultant
11.00  Coffee break
11.30  Formation of working groups
12.00  Starting of working groups
13.30  Lunch break  
14.30  Working groups (ctd)  
16.00  End of day 1  

**Day 2**  
09.00  Presentation and discussion in plenary of the results of working groups  
11.00  Coffee break  
11.30  Conclusions and recommendations of the workshop  
12.00  Closing ceremony  
13.00  Lunch and departure  

### 4.2. List of participants in the National Validation Workshop

<table>
<thead>
<tr>
<th>No.</th>
<th>NAME</th>
<th>ORGANIZATION</th>
<th>E-MAIL</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SCOTT APAWUDZA</td>
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<td>NANA ASAMOAH ENTSIE I</td>
<td>GNCFC</td>
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<td>054 1809364</td>
</tr>
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</table>
Annexe F4. Reports of Technical Working Groups

GROUP 1 - KEY FIGURES AND MAJOR TRENDS IN THE MARINE FISHERY SECTOR

Composition of the Group:

- Paul Bannerman  MFRD-Research
- Patricia Markwei  MFMD-Management
- Robert Ashong  Industry
- Serwah Asante  Fisheries Commission
- Solace Quarshie  Industry
- Victor Avorkyila  Academia/Industry
- Samantha Osei  Fisheries Commission

1. Introduction
Ghana is located on the west coast of Africa, about 750 km north of the equator and approximately between latitudes 4° to 12° N and longitudes 3° W and 1° E. Ghana is bounded on the north by Burkina Faso, on the west by Côte d'Ivoire, on the east by Togo and on the south by the Gulf of Guinea.

Ghana has a tropical climate with ambient temperature generally between 21 and 32 °C (70-90 °F). There are two rainy seasons, from March to July and from September to October, separated by a short cool dry season in August and a relatively long dry season in the south from mid-October to March. Annual rainfall in the south averages 2,030 mm but varies greatly throughout the country, with the heaviest rainfall in the south western part of the country. The dominant wind in Ghana is the southwesterly monsoon which is a relatively weak wind reaching a maximum speed of only 5 ms⁻¹.

The population of Ghana is estimated at about 24 million (2010) with an annual growth rate of 2.5% per annum. Most of the population is concentrated in the southern part of the country with the highest density occurring in urban and cocoa producing areas.

The economy of Ghana traditionally depends on primary production and exports of cocoa and minerals. Agriculture remains the dominant sector of the Ghanaian economy. About 60 % of the Ghana labor force is employed in agriculture, with production concentrated on staple food crops and cocoa. Agriculture contributes 45-50% of the GDP and about 75% of export earnings of Ghana. It provides a livelihood for about 70% of the population and raw materials for agro-industries. The service sector is the second largest employer consisting largely of trade and public sector services. The industrial/manufacturing sector is next in importance.

2. Fisheries Sub-Sectors
Fish is a preferred source of animal protein in Ghana, and about 75 percent of the total domestic production of fish is consumed locally. Fish is expected to contribute 60 percent of animal protein intake. The per capita consumption is estimated to be about 25 kg per annum.

Fish is the country’s most important non-traditional export commodity and the fisheries sub-sector accounts for about 5 percent of the agricultural GDP. In 2002, export earnings from fish and fishery products amounted to over 95 million US Dollars. This accounted for over 50% of total earnings from non-traditional exports.
The fishing industry in Ghana is based on resources from the marine and to a lesser extent, inland (freshwater) and aquaculture sectors. The Volta Lake, reservoirs, fishponds and coastal lagoons are the main sources of freshwater fish.

Ghana has a coastline of 550 km and relatively narrow continental shelf that breaks around 75 – 120 m depth and total continental shelf area of 24300 km². Marine fishing activity in Ghana is strongly linked with the seasonal upwelling that occurs in the coastal waters. Two upwelling seasons (major and minor) occur annually in Ghanaian coastal waters. The major upwelling commences when sea surface temperatures (SST) fall below 25°C and usually occurs between late June or early July and late September or early October. The minor upwelling occurs either in December, January or February, and rarely lasts for more than three weeks, except in 1986 when it lasted for ten weeks. High biological activity takes place during this time to increase production of fish food. Most fishes spawn during this period and stocks are more readily available to the fishers for exploitation and landing. For the rest of the year, fishing is poor and catches are made sporadically. Figure 1 shows the coastal map of Ghana.

**Figure 1 - Coastal map of Ghana**

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**Fishing Fleets**

The Ghanaian marine fisheries is classified into three main sectors: canoe (artisanal), inshore semi-(industrial), and industrial. Based on the fishing fleet, there are six categories viz. canoes, inshore, trawlers, shrimpers, tuna purse seiners and tuna bait boats.

**The artisanal Fishery**

The artisanal sector of the industry accounts for over 70% of marine fish production annually, creating employment in the coastal rural communities, as well as providing a cheap but rich source of protein. There are over 13000 dug out wooden canoes of which approximately half are motorized by low powered out-board motors. Fishermen in the artisanal sector carry out various methods of fishing using different types of fishing gears. The main types of fishing gears used by the fishermen viz. encircling nets (Poli and Watsa), beach seines, set net (Ali), bottom set nets, line and drift gill nets have different geographical distributions along the coast. The dominance of a particular type of gear in a particular area is influenced by the target species sought. For example, the beach seine is widely used in the Volta Region, particularly around the mouth of the Volta River and other estuarine areas, to exploit...
mainly juveniles of fish species. Purse seine nets are prominent in the Greater Accra and Central regions where the small pelagics are heavily exploited, whilst drift gill nets and set-nets are predominant in the Western and Central regions. The type of fishing gear used confers its name on the canoe.

The dominant fish species which are caught in sizeable quantities by the artisanal fleet within the EEZ of Ghanaian coastal waters are the small pelagics. Four small pelagic species of high economic value in Ghana are: the round sardinella (*Sardinella aurita*), flat sardinella (*S. maderensis*), anchovy (*Engraulis encrasicolus*) and chub mackerel (*Scomber japonicus*). These species usually account for over 80% of total landings of the small pelagic resources annually. Sparids (*Pagellus bellottii* and *Sparus caeruleostictus*) and big-eye grunt (*Brachydeuterus auritus*) are also landed in appreciable quantities. Table 1 summarizes the characteristics of the artisanal fishery as well as the corresponding target species.

**Table 1 - Characteristics of the Artisanal Fleet and their Target Species**

<table>
<thead>
<tr>
<th>Type of Canoe</th>
<th>Length /m</th>
<th>Motor Power Rating</th>
<th>Target Species</th>
<th>No of Days per Fishing Trip</th>
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</thead>
<tbody>
<tr>
<td>Ali/Poli/ Watsa</td>
<td>12—19.5</td>
<td>25-40 horsepower</td>
<td>Small pelagics e.g. Sardinellas, mackerels, anchovies</td>
<td>1</td>
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<tr>
<td>Beach seine</td>
<td></td>
<td>Mostly propelled by paddles</td>
<td>All types of fish</td>
<td>1</td>
</tr>
<tr>
<td>Bottom Set net</td>
<td>4—11</td>
<td>25-40 horsepower</td>
<td>Demersals e.g. seabreams, croakers, groupers, snappers, grunts, crustaceans, cephalopods</td>
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<tr>
<td>Line</td>
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<td>25-40 horsepower</td>
<td>Demersals e.g. sea breams, snappers, grunts, croakers, snappers,</td>
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<tr>
<td>Drift Gill Net</td>
<td>12—19.5</td>
<td>25-40 horsepower</td>
<td>Tuna, sharks, Sail fish</td>
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</table>

**The Inshore Fishery**

There are presently approximately 350 active semi-industrial vessels involved in this sector. The inshore fishery consists of medium to large sized motorised vessels of between 8 and 25 m. Majority of these semi-industrial boats are wooden, built locally, and fitted with inboard engines of up to 400 hp. They mostly used to be dual purpose vessels (purse seine/trawler) used for purse seining, mainly during the months of July to September (the upwelling period) and trawling for the remaining part of the year. Currently, majority of the vessels practice purse seining. Most purse seine nets employed during the major fishing season (July to September) measure 400-800 m long and 40-70 m wide and have a mesh size of approximately 25-40 mm. A few of the vessels (usually those of size 8m) trawl during the lean season. Bottom trawl gears have a mesh size of 40 mm. The two fishing harbours at Tema and Sekondi, and moors at Winneba, Apam, Mumford and Elmina, serve as landing facilities for these vessels.

Major fish species caught by the purse seiners are the small pelagics, i.e. sardinellas (*Sardinella aurita, Sardinella maderensis*), chub mackerel (*Scomber japonicus*), and *Sparus caeruleostictus*, big-eye grunt (*Brachydeuterus auritus*). When they trawl, target species are sparids (*Pagellus bellottii*) cassava fish (*Pseudotolithis senegalensis*), threadfin (*Galeoides decadactylus*) and cuttlefish (*Sepia officinalis*), shrimps (*Penaeus duararum*).
Semi-industrial fishermen spend about three days per fishing trip when they take ice to sea; when they don’t, they spend a day.

The Distant Water Fleet
This fleet consists of trawlers, shrimpers and tuna boats and a normal fishing trip lasts up to one month. Fishermen of the industrial sector of the marine fisheries use imported steel vessels for fishing.

Trawlers
The industrial trawlers are usually 21 m to over 50 m in length and have engines of over 600hp and a GRT of over 299 tons. Dominant catches are sparids (*Pagellus bellottii* and *Sparus caeruleopectus*), carangids (*Caranx rhonchus*), cuttlefish (*Sepia officinalis*), mullets (*Pseudupeneus prayensis*) and cassava fish (*Pseudotolithus senegalensis*). Currently trawlers spend an average of two weeks at sea.

Shrimpers
The industrial shrimpers are normally up to 40 m in length with engines up to 400 hp and GRT of over 220 tons. Shrimp vessels operate in designated areas within Ghanaian waters between Shama and Axim. In a normal trip, significant proportions of by-catch comprising small inshore fishes including the bumper (*Chloroscombus chrysurus*) and big-eye grunt (*Brachydeuterus auritus*) are caught.

Tuna Fleet
Based on the type of gear used, tuna fleet is designated as tuna purse seine and tuna bait boat. The tuna bait-boat fleet (pole and line) comprises about 48 vessels currently. These vessels are normally of about 43–58m, has an engine of about 1800hp and a GRT of 300 to over 600 tons. Their target species are mainly the skipjack (*Katsuwonus pelamis*), yellowfin (*Thunnus albacores*) and big-eye (*Thunnus obesus*). Exploitation of these resources is mainly offshore. Various techniques such as the bird radar technique and ‘payaols’ (rafts) are being used to enhance the capture of the species (Kwei & Bannerman, 1992). The bait resource is the anchovy (*Engraulis encrasicolus*). Tuna bait boats spend 35 to 40 days per fishing trip.

The purse seine fishery was reintroduced in 1995 and has grown to 18 vessels in 2009. These vessels with gross tonnages between 500-1000 tons employ a lot of modern hydraulic gadgets enabling the vessel to maneuver whilst encircling shoals of tuna fish for capture. They also target mainly the yellowfin and bigeye and skipjack species and collaborate extensively with bait boats, often sharing their catch at sea. Tuna purse seiners currently spend 45 to 50 days per fishing trip. Table 2 shows the number of fishing crafts (active and latent) for each of the fleet in the sector from the year 2000 to 2009.

3. Marine Fish Production
Catch assessment surveys conducted by the Marine Fisheries Research Division of the Fisheries Commission (Ministry of food & Agriculture) have been carried out over the past four decades. Sample bases surveys are conducted for the artisanal and inshore fleets based on frame survey data whereas total counts are used for the industrial fleet. Reliable statistics requires hence the establishment of a permanent system which may be modified over time to adapt to changing circumstances and objectives. Canoe frame surveys are conducted every 2-3 years acting as a sort of inventory survey of the fishery economic units, such as fishing canoes and fishermen. The purpose of the surveys is to prepare a complete list of fish landing sites for the catch assessment survey. Frame survey data and positional analysis of the fleet are shown in table 2 below.
Table 2 - Fishing Fleet Population from 2000 to 2009

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<td>41</td>
<td>40</td>
<td>43</td>
<td>44</td>
<td>45</td>
<td>48</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td>Tuna Bait.</td>
<td>4</td>
<td>3</td>
<td>6</td>
<td>7</td>
<td>7</td>
<td>6</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Tuna P. Sein</td>
<td>10</td>
<td>12</td>
<td>12</td>
<td>13</td>
<td>11</td>
<td>14</td>
<td>16</td>
<td>14</td>
<td>14</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>Tuna PS</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Total fish landings in the last ten years, arranged by fleet, are presented in Table 3 below.

Table 3 - Annual Fish Landings (mt) by Fleet for the Period 2000-2009

<table>
<thead>
<tr>
<th>Year</th>
<th>Artisanal</th>
<th>Inshore</th>
<th>Industrial</th>
<th>Shrimpers</th>
<th>Tuna</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>275964.70</td>
<td>8668.06</td>
<td>15454.84</td>
<td>1224.03</td>
<td>53255.00</td>
<td>354566.60</td>
</tr>
<tr>
<td>2001</td>
<td>236355.30</td>
<td>7605.54</td>
<td>19644.25</td>
<td>310.02</td>
<td>88806.49</td>
<td>357933.30</td>
</tr>
<tr>
<td>2002</td>
<td>200769.20</td>
<td>7784.55</td>
<td>15159.23</td>
<td>249.03</td>
<td>66046.10</td>
<td>290008.10</td>
</tr>
<tr>
<td>2003</td>
<td>238796.30</td>
<td>13318.70</td>
<td>13847.90</td>
<td>295.90</td>
<td>65152.70</td>
<td>331411.50</td>
</tr>
<tr>
<td>2004</td>
<td>267909.78</td>
<td>6331.35</td>
<td>14010.49</td>
<td>291.96</td>
<td>62741.93</td>
<td>351285.51</td>
</tr>
<tr>
<td>2005</td>
<td>218871.85</td>
<td>7591.28</td>
<td>12494.01</td>
<td>442.98</td>
<td>82225.85</td>
<td>321625.88</td>
</tr>
<tr>
<td>2006</td>
<td>231680.63</td>
<td>9877.17</td>
<td>17419.08</td>
<td>297.35</td>
<td>63252.44</td>
<td>322526.67</td>
</tr>
<tr>
<td>2007</td>
<td>187088.00</td>
<td>10009.00</td>
<td>19893.00</td>
<td>143.00</td>
<td>67746.02</td>
<td>290686.00</td>
</tr>
<tr>
<td>2008</td>
<td>254133.00</td>
<td>6140.00</td>
<td>18289.00</td>
<td>124.00</td>
<td>64095.00</td>
<td>343960.00</td>
</tr>
<tr>
<td>2009</td>
<td>226755.00</td>
<td>12048.00</td>
<td>20837.00</td>
<td>-</td>
<td>66470.00</td>
<td>326109.00</td>
</tr>
</tbody>
</table>
Figure 2 below shows a graphical representation of landings for the period. Total fish landings from the table and figure show undulating trends in marine fish landings since 2000.

**Figure 2 - Graphical representation of landings for the period 2000-2009**

4. Fishing Licence
All semi- and industrial vessels are to obtain fishing licences before they operate. Table 3 shows a summary of fishing licences issued to the semi-industrial and industrial vessels. There was a general increase in the number of licences issued to operators in the fishing industry. For the semi-industrial fishery, there was a 140% increase in the number of licences issued over the 10-year period. There was a 26% increase in the number of licences issued to the tuna fleet, while licences to the trawlers increased by 13% over the 10-year period.

**Table 4 - Number of Fishing Licences granted from 2000 to 2009**

<table>
<thead>
<tr>
<th>YEAR</th>
<th>SEMI-INDUSTRIAL</th>
<th>TUNA</th>
<th>TRAWLERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>167</td>
<td>35</td>
<td>46</td>
</tr>
<tr>
<td>2001</td>
<td>178</td>
<td>35</td>
<td>45</td>
</tr>
<tr>
<td>2002</td>
<td>178</td>
<td>36</td>
<td>55</td>
</tr>
<tr>
<td>2003</td>
<td>172</td>
<td>33</td>
<td>57</td>
</tr>
<tr>
<td>2004</td>
<td>177</td>
<td>35</td>
<td>67</td>
</tr>
<tr>
<td>2005</td>
<td>183</td>
<td>37</td>
<td>75</td>
</tr>
<tr>
<td>2006</td>
<td>153</td>
<td>31</td>
<td>72</td>
</tr>
<tr>
<td>2007</td>
<td>273</td>
<td>35</td>
<td>74</td>
</tr>
<tr>
<td>2008</td>
<td>339</td>
<td>42</td>
<td>73</td>
</tr>
<tr>
<td>2009</td>
<td>400</td>
<td>44</td>
<td>52</td>
</tr>
</tbody>
</table>

The values of the various licences are as shown in Table 5. Over the 10-year period, licence fees obtained from all the vessels increased, with the exception of shrimpers. This reflects the increase in the numbers of these vessels, and a decrease in the number of shrimpers, which are even not operating currently.
5. Status of Marine Fish Stocks

In Ghana Fishery resources can be classified as small pelagic, large pelagic, and demersals. The small pelagics cover a wide range of species and are the most abundant marine resources in Ghanaian waters. The most important small pelagic fish species are Sardinellas, anchovy, and chub mackerel. The main demersal fish species are of the families Sparidae, Pomadasidae, Mullidae and Sciaenidae. Other demersal stocks are molluscs e.g. cuttlefish (*Sepia officinalis*), squid (*Loligo vulgaris*); and crustaceans e.g. octopus (*Octopus vulgaris*), lobsters (*Panulirus regius*) and shrimps (mainly *Penaeus notialis*, *Penaeus kerathurus*, *Parapeneopsis atlantica* and *Parapeneus longistrostris*).

Small Pelagics

Large variations in landings of sardinellas are experienced from year to year due to changes in both anthropogenic and natural factors. The abundance of the chub mackerel (*Scomber japonicus*) is also variable from year to year. Table 6 and 7 show the biomass estimates of the small pelagics (Pelagic 1& 11) from FAO/NANSEN surveys.

**Table 5 - Value of fishing licenses obtained from the Industrial vessels**

<table>
<thead>
<tr>
<th>YEAR</th>
<th>TRAWLERS</th>
<th>TUNA</th>
<th>SHRIMPERS</th>
<th>CARRIERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>16147.1</td>
<td>20941.8</td>
<td>36,012</td>
<td>2536.0</td>
</tr>
<tr>
<td>2001</td>
<td>15926.5</td>
<td>21535.8</td>
<td>15,284</td>
<td>3686.0</td>
</tr>
<tr>
<td>2002</td>
<td>93818.8</td>
<td>127184.0</td>
<td>55,182</td>
<td>20400.00</td>
</tr>
<tr>
<td>2003</td>
<td>286050.2</td>
<td>383674.4</td>
<td>16473.80</td>
<td>13912.50</td>
</tr>
<tr>
<td>2004</td>
<td>304633.59</td>
<td>469746.37</td>
<td>16505.72</td>
<td>15542.25</td>
</tr>
<tr>
<td>2005</td>
<td>297060.80</td>
<td>552488.31</td>
<td>19443.10</td>
<td>2057.10</td>
</tr>
<tr>
<td>2006</td>
<td>340714.00</td>
<td>459020.00</td>
<td>27848.00</td>
<td>0</td>
</tr>
<tr>
<td>2007</td>
<td>336137.56</td>
<td>546738.60</td>
<td>12578.18</td>
<td>0.00</td>
</tr>
<tr>
<td>2008</td>
<td>358434.25</td>
<td>685917.50</td>
<td>13960.00</td>
<td>0.00</td>
</tr>
<tr>
<td>2009</td>
<td>314692.50</td>
<td>1,155,117.00</td>
<td>2,232.00</td>
<td>29,148.00</td>
</tr>
</tbody>
</table>

**Table 6 - Acoustic biomass (tonnes) estimates of main pelagic groups Sardinellas and anchovies surveys with “Dr. Fridtjof Nansen”**

<table>
<thead>
<tr>
<th>Survey Year</th>
<th>Survey Period</th>
<th>Ghana</th>
</tr>
</thead>
<tbody>
<tr>
<td>1981</td>
<td>June</td>
<td>40 000</td>
</tr>
<tr>
<td>1989</td>
<td>12.10 – 20.10</td>
<td>41 000</td>
</tr>
<tr>
<td>1999</td>
<td>19.4 – 8.5</td>
<td>40 000</td>
</tr>
<tr>
<td>2000 $^2$</td>
<td>29.8 – 15.9</td>
<td>56 500</td>
</tr>
<tr>
<td>2002 $^2$</td>
<td>16.7 – 9.8</td>
<td>73 000</td>
</tr>
<tr>
<td>2004</td>
<td>16.5 – 9.6</td>
<td>68 000</td>
</tr>
<tr>
<td>2005</td>
<td>4.5 – 27.5</td>
<td>54 000</td>
</tr>
<tr>
<td>2006</td>
<td>19.5 – 5.6</td>
<td>57 000</td>
</tr>
</tbody>
</table>
Table 7 - Pelagic 11 Biomass estimates (ton) (Carangids, Scombrids Hairtails etc) from Nansen surveys

<table>
<thead>
<tr>
<th>Year</th>
<th>Month</th>
<th>Biomass (ton)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1981</td>
<td>June</td>
<td>57,000</td>
</tr>
<tr>
<td>1989</td>
<td>12-20October</td>
<td>50,000</td>
</tr>
<tr>
<td>1999</td>
<td>19 April-8 May</td>
<td>61,000</td>
</tr>
<tr>
<td>2000</td>
<td>29 September -15 October</td>
<td>52,000</td>
</tr>
<tr>
<td>2002</td>
<td>17 July – 9 August</td>
<td>37,000</td>
</tr>
<tr>
<td>2004</td>
<td>16 May – 9June</td>
<td>46,000</td>
</tr>
<tr>
<td>2005</td>
<td>4-27 May</td>
<td>37,000</td>
</tr>
<tr>
<td>2006</td>
<td>19May – 5 June</td>
<td>-</td>
</tr>
</tbody>
</table>

The potential yield of the four most important pelagic is estimated around 200,000 per annum.

**Large Pelagics**

The main commercial tuna resources which occur in Ghanaian Waters are yellowfin tuna (*Thunnus albacares*), skipjack tuna (*Katsuwonus pelamis*) and bigeye tuna (*Thunnus obesus*). Other lesser known tuna-like species such as the Atlantic bonito (*Sarda sarda*), Wahoo (*Acantocybium solandri*), Frigate tuna (*Auxis thazard*), and the Billfishes i.e. Swordfish (*Xiphias gladius*) are also present. Their maximum sustainable yield (MSY) computed by ICCAT are shown in Table 8.

Table 8 - Maximum Sustainable Yields for Large Pelagics

<table>
<thead>
<tr>
<th>Group</th>
<th>Skipjack</th>
<th>Yellowfin</th>
<th>Bigeye</th>
<th>White-marlin</th>
<th>Blue marlin</th>
<th>Sailfish</th>
<th>Swordfish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Yield</td>
<td>143,000-170,000</td>
<td>124,000-136,500</td>
<td>90,000-93,000</td>
<td>600-1320</td>
<td>1000-2400</td>
<td>1250-1300</td>
<td>17,000</td>
</tr>
</tbody>
</table>

**Demersal Biomass Estimates**

Table 9 shows the biomass estimates from Fritjof Nansen surveys from 1999-2006. Changes in demersals catches are exemplified by changes in fishing effort and fishing strategies.

Table 9 - Biomass estimates (tons) of valuable demersal species and some other groups from swept-area bottom trawl hauls on the shelf (0–100m) from the 1999-2006 surveys.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Seabreams</td>
<td>8,478</td>
<td>13,346</td>
<td>14,181</td>
<td>16,187</td>
<td>15,690</td>
<td>15,166</td>
</tr>
<tr>
<td>Grunts</td>
<td>1,431</td>
<td>4,397</td>
<td>1,168</td>
<td>326</td>
<td>2,261</td>
<td>140</td>
</tr>
<tr>
<td>Croakers</td>
<td>125</td>
<td>1,046</td>
<td>850</td>
<td>286</td>
<td>812</td>
<td>664</td>
</tr>
<tr>
<td>Groupers</td>
<td>557</td>
<td>1,921</td>
<td>254</td>
<td>220</td>
<td>235</td>
<td>674</td>
</tr>
<tr>
<td>Snappers</td>
<td>151</td>
<td>5,322</td>
<td>422</td>
<td>200</td>
<td>413</td>
<td>1,366</td>
</tr>
<tr>
<td>Sum dem. val.</td>
<td>10,743</td>
<td>26,032</td>
<td>16,876</td>
<td>17,219</td>
<td>19,420</td>
<td>18,010</td>
</tr>
<tr>
<td>Bigeye grunt</td>
<td>70,341</td>
<td>9,120</td>
<td>21,182</td>
<td>13,866</td>
<td>27,896</td>
<td>7,296</td>
</tr>
<tr>
<td>Carangids</td>
<td>6,860</td>
<td>47,054</td>
<td>45,332</td>
<td>7,405</td>
<td>19,226</td>
<td>11,831</td>
</tr>
<tr>
<td>Barracudas</td>
<td>1,084</td>
<td>915</td>
<td>999</td>
<td>1,589</td>
<td>2,201</td>
<td>2,554</td>
</tr>
<tr>
<td>Cephalopods</td>
<td>4,400</td>
<td>4,900</td>
<td>2,000</td>
<td>2,600</td>
<td>2,181</td>
<td>3,208</td>
</tr>
</tbody>
</table>

1) 2000 estimates corrected

Nb: 2000 and 2002 surveys are in the upwelling season.
Table 10 shows that biomass estimates of valuable demersals in the outer shelf of the coast (i.e. 51-100 m depth contour) was higher, indicating more fish resources within deeper waters.

**Table 10 - Biomass estimates (tons) of important species/groups on the shelf by depth**

<table>
<thead>
<tr>
<th>Group/species</th>
<th>0-30 m</th>
<th>31-50 m</th>
<th>51-100 m</th>
<th>Sum</th>
<th>95% confidence limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seabreams</td>
<td>551</td>
<td>1 631</td>
<td>12 985</td>
<td>15 166</td>
<td>2 916</td>
</tr>
<tr>
<td>Grunts</td>
<td>99</td>
<td>41</td>
<td>0</td>
<td>140</td>
<td>0</td>
</tr>
<tr>
<td>Croakers</td>
<td>127</td>
<td>41</td>
<td>495</td>
<td>664</td>
<td>5</td>
</tr>
<tr>
<td>Groupers</td>
<td>14</td>
<td>248</td>
<td>413</td>
<td>674</td>
<td>166</td>
</tr>
<tr>
<td>Snappers</td>
<td>155</td>
<td>0</td>
<td>1 210</td>
<td>1 366</td>
<td>0</td>
</tr>
<tr>
<td>Sum dem.val.</td>
<td>946</td>
<td>1 961</td>
<td>15 103</td>
<td>18 010</td>
<td>5 397</td>
</tr>
<tr>
<td>Bigeye grunt</td>
<td>4 208</td>
<td>1 878</td>
<td>1 210</td>
<td>7 296</td>
<td>1 902</td>
</tr>
<tr>
<td>Carangids</td>
<td>1 878</td>
<td>3 488</td>
<td>6 465</td>
<td>11 831</td>
<td>6 690</td>
</tr>
<tr>
<td>Barracudas</td>
<td>890</td>
<td>1 032</td>
<td>633</td>
<td>2 554</td>
<td>1 207</td>
</tr>
<tr>
<td>Cephalopods</td>
<td>99</td>
<td>991</td>
<td>2 118</td>
<td>3 208</td>
<td>733</td>
</tr>
</tbody>
</table>

Comparison of the trends of biomass estimates of the demersals and pelagics are shown in Figures 2 and 3. Mean catch rates of the main groups “Demersal” and “Pelagic” for the whole shelf area from 0 to 100 m in the six last surveys are shown in Figures 2 and 3. The “Demersal” group had quite similar mean catch rates in all surveys, but slightly higher and with much larger confidence intervals in 1999 due to one large catch of B. auritus (>5 t/h). Pelagic fish had similar high mean catch rates in 2000 and 2002, but much lower in the four other years, especially in 1999 when the estimate was outside the 95% confidence intervals of the two former.

**Figure 3 - Mean catch rates of the main group ‘demersal’ from 0-100 m in Ghana 1999-2006**
6. General Trends in the Marine Fishery Sector
During the period 2000-2010, the artisanal sector landed on the average 230,000mt of fish annually, representing about 70.91% of the total annual marine fish catch. This is made up of mainly small pelagic fish species-sardinellas, mackerels and anchovy.
The semi-industrial fleet exploits sardinellas, mackerels and various demersal species. The average total landing of the fleet over the past decade (2000-2009) is about 8,937 mt per annum, representing 2.74% of the total annual marine fish catch.
The industrial fleet (including trawlers, shrimpers and pair trawls) landed on the average 16,704 mt annually, representing about 5% of the total annual marine fish catch. About 60% of the fish landed by the industrial vessels are demersal species like seabreams, cuttlefish and cassava fish.
The shrimps representing a minute 0.1% of the total catch on average for the past decade are mostly exported to Europe and the Far East. Shrimp production has been on the decline over the past few years and some of the shrimping companies are converting their vessels into trawlers.
The main species caught by the tuna vessels are skipjack, yellow fin and big eye. On the average tuna landings in the past decade (2000-2009) has been around 67,979 mt annually, representing 22.76% of the total annual marine fish catch. The Fisheries Act 625 of 2002 authorizes that at least 10% of landings of commercial tuna vessels should be processed into loins or canned mainly for export.
With the exception of the tuna fleet, all other sectors of the marine fishing industry show fluctuations with overall declining trends. Causes of these among others have been mainly due to human activities (over exploitation, the use of unorthodox methods in fishing etc). Natural factors such as upwelling patterns and unexpected interactions with the marine ecosystem have also culminated to the decline in fish abundance.

Maximum Sustainable Yields
From surplus yield model; the maximum sustainable yield (MSY) is calculated as: \[ MSY = \frac{-a^2}{4b} \] (4b), where a is the intercept and b is the slope from a plot of the yield (annual landings) against the fishing effort. Data from MFRD (1986-2009) were used in the computations.
Figure 5 - Surplus yield analysis of data for the artisanal fishery showing a plot of catch against effort

The parameter estimates from fitting the surplus yield model to the data from the artisanal fisheries are: $a = 52.75; b = 0.0029; MSY = 240,000\text{ mt}; F_{msy} = 9,000$ canoes.

Figure 6 - Surplus yield analysis of data for the inshore fishery showing a plot of catch against effort (1986-2009 data was used)

Parameters estimated from the plot of the inshore catch and effort data are: $a=100.6; b=0.1845; MSY=137,132$ mt; $F_{msy}= 300$ Vessels (250 – 500 hp).
Figure 7 - Surplus yield analysis of data for the industrial fishery showing a plot of catch against effort.

Parameters estimated from the plot of the industrial catch and effort data are: $a = 1268; b = 13.124; \text{MSY} = 30,367\text{mt}; F_{\text{msy}} = 60\text{ vessels}$

7. Regulatory Framework for Fisheries
The fishing industry of Ghana is regulated by the fisheries Act 2002 (Act 625 of 2002) and LI 1968 of 2010. The Act and Regulations provide for the management of fisheries, development of the fishing industry, sustainable exploitation of fisheries resources and related matters. The major policies of fisheries sector are as follows:
- To increase production of fish for domestic consumption and for export.
- To create more employment in the fisheries sub-sector.
- To alleviate poverty in the fishing communities.

The legal basis for fisheries management in Ghana involves ordinances, laws and regulations. The first legal backing for the rules controlling fisheries was the Fisheries Ordinance enacted in 1946 as Cap 165. This was followed by Fisheries Regulations to give effect to Cap 165. With time revisions were made to meet the challenges of the fast-developing fishing industry. Currently, the law has been consolidated into the Fisheries Act 625 of 2002.

The law was continuously reformed to:
- better regulate and sustain the national fishery resource;
- improve Ghana’s access to international markets within the domain of the international fish trade,
- obtain optimum benefits for Ghanaians as owners of fish-related enterprises, as employers of the fishing industry, as consumers of fish products and as beneficiaries of foreign exchange earnings from fish trade;
- enhance investment in a private sector-driven industry; and
- improve the fishery management system.
As regards fish production it is noteworthy to observe that the current Fishery Act (2002) conforms to the relevant sectors of the FAO Code of Conduct for Responsible Fisheries with particular emphasis on gear selectivity and an effective institutional framework. The Fisheries Act also gives legislative backing to the recently established Monitoring, Control and Surveillance Division with clearly defined legal powers to regulate fishing operations. The membership of the Division draws strength from the inclusion of a number of security agencies including the Ghana Navy.

The Directorate of Fisheries under the Ministry of Food and Agriculture has also elaborated fishery management plans for marine fisheries. A new set of Fisheries Regulations to give effect to the Fisheries Act 625 (2002) is under preparation.

8. Employment and Ancillary Trades

Presently, the fisheries sub-sector is dominated by the private sector in fish production, processing, storage, marketing, trading, boat building and maintenance experts. It is estimated that there are about 500,000 people employed in the sub-sector. Table 11 shows the trends in export, import fish consumption and other socio-economic indicators.

**Table 11 - Some Fishery Socio-economic Statistics**

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Exports</td>
<td>10078</td>
<td>5674</td>
<td>3828</td>
<td>5920</td>
<td>7399</td>
<td>62,448</td>
<td>45,347</td>
<td>56,948</td>
<td>50,097</td>
</tr>
<tr>
<td>Imports</td>
<td>64024</td>
<td>105620</td>
<td>144580</td>
<td>197903</td>
<td>197255</td>
<td>166003</td>
<td>165559</td>
<td>212945</td>
<td>169000</td>
</tr>
<tr>
<td>Fish Cons.</td>
<td>494,511</td>
<td>536,741</td>
<td>516,989</td>
<td>611,970</td>
<td>632,314</td>
<td>593,780</td>
<td>592,259</td>
<td>658,177</td>
<td>662,962</td>
</tr>
<tr>
<td>No. Canoe Fishers</td>
<td>103340</td>
<td>123156</td>
<td>123156</td>
<td>123156</td>
<td>124219</td>
<td>124219</td>
<td>124219</td>
<td>124219</td>
<td>124219</td>
</tr>
<tr>
<td>Empl. Part time</td>
<td>80000</td>
<td>100000</td>
<td>100000</td>
<td>100000</td>
<td>120000</td>
<td>120000</td>
<td>120000</td>
<td>120000</td>
<td>120000</td>
</tr>
<tr>
<td>Pop Million</td>
<td>16.2</td>
<td>18.7</td>
<td>19.0</td>
<td>19.8</td>
<td>20.6</td>
<td>21.56</td>
<td>22.12</td>
<td>22.69</td>
<td>23.00</td>
</tr>
<tr>
<td>Per Cap. Cons.</td>
<td>30.5</td>
<td>28.7</td>
<td>27.2</td>
<td>30.9</td>
<td>30.7</td>
<td>23.6</td>
<td>23.8</td>
<td>23.4</td>
<td>28.0</td>
</tr>
</tbody>
</table>

**Fish Processing and Marketing**

The main fish processing activities are smoking, salting, drying and frying, and is done by women. Prices of fish continue to be high especially locally produced fish as compared with imported fish. The price of firewood, used as fuel for smoking is also very high. Fish caught with light attractants are usually smaller and of poor quality. Such fish spoil faster and are more suitable for salting, rather than smoking which gives greater value.

On the industrial side tunas are canned for the export market. Approximately 60% of tunas caught from tuna surface fleets are processed by the 2 main canneries (Myroc and Pioneer Food Cannery). This trend has been for the past 4-5 years.
Most fish processors market their produce in various markets across the country. Buyers now prefer imported fish to the freshly landed ones because it is cheaper. Due to the seasonality of the pelagic fishery, most women in the fish processing sector have alternative livelihoods. Some fish processors form cooperatives, and are able to access credit from some financial companies. Access to credit depends on how credible a group is perceived by the companies, so those who have a good record of repaying loans do not find it difficult to obtain loans the next time. The spoilage has been a major concern to fishers, researchers and traders at large. The main causes still as a challenge to the industry are poor handling, lack of ice and poor icing practices, lack of cold storage facilities, incorrect packaging and transportation. Also insect infestations due to poor packing are hindering reduction in post-harvest losses.

**Transshipment**

Some canoes go out to sea not to fish, but to buy the discards which are sometimes retained onboard industrial vessels. These discards are normally the pre-adult fish caught up in the haul. Some of the species termed by catch are the juveniles of the Burrito (*Brachydeuterus auritus*) Threadfin (*Galeiodes decadactylus*), Roncador (*Pomadysus incisus*) Red Pandora (*Pagellus bellottii*) and Cassava fish (*Pseudotolithus senegalensis*) among others. This form of transshipment is termed Seiko fishing. It used to be prevalent in the Central region, in the mid-2000’s but of late, it is catching up in the Greater Accra Region. It is practiced on a small scale, and no official records are available. Transshipment of tuna species also occurs and under the Act 625, it is allowed at high seas only with the supervision of a designated officer onboard. This law also pertains to the International Commission for the Conservation of Atlantic Tunas (ICCAT). It is however prescribed by law that fishing vessels should land at port and after the necessary procedures at port are done transshipment can then take place and cargo sent outside. In Ghana there are currently two registered Carriers who are mainly into transshipment of tuna fish and they are owned by Ghanaian registered tuna companies.

**9. Key Issues relating to Marine Fisheries Development and Management**

The fishery industry is fraught with issues which threaten the very sustenance of the industry. Overcapitalization, outmoded/harmful fishing practices and political influences are some issues that threaten the survival and success of the fishing industry in Ghana.

**Canoe Sub-Sector**

Currently, there are about 13,000 canoes in the country. There is open access to the artisanal fishery, where anyone can enter without any restriction whatsoever. The Government of Ghana grants subsidies on fishing inputs such as outboard motors and premix fuel; and artisanal fishermen are not made to pay tax or fishing licence. This enabling environment has led to the overcapitalization of the sector. Consequently, catch per unit of effort by the many canoes are relatively small. Because of the keen competition among the many fishers, they are forced to improvise new methods of catching fish and these methods are rather harmful and illegal. Fishermen resort to the use of nets with reduced mesh sizes, carbide and dynamite, monofilament nets, etc. The overcapitalization and practice of harmful fishing practices has led to extra pressure on targeted fish stocks.

Notwithstanding the laws in place to oversee the fishery industry, there is a lack of enforcement on the part of Government agencies due to lack of personnel, training and logistics. The political will is also often lacking. So most often, offenders get away with their misdeeds.
Semi-Industrial Sub-Sector
This sector also runs on the open access system. It is more capital intensive; hence the players in this sector are fewer than the artisanal sector. Currently there are over 300 boats in the sector. Initially, in the 1970-late 1980, the Government controlled boat building and fishing crafts could be built only at the Government institution (Tema and Sekondi boatyards). But in recent times, these boatyards are no more, and so some individuals, both Ghanaians and Chinese, have turned themselves into boat builders, especially in Elmina and Sekondi, building boats without any laid down standards and/or regulation. As a result, registration and licence of vessels has not been done properly over the years. Currently the Government is trying to streamline the boat building industry, the registration and licensing of every boat in this sector.
As with the artisanal, overcapitalization of the semi-industrial fishery has led to fishermen improvising fishing methods. Lack of capital, resulting from overcapitalization and its attendant problems prevails. Operators in this sector no longer use marine engines, because they cannot afford them. Rather, they use the engines of articulated trucks ment for land based activities. This greatly reduces the output of the boats and compels the fishermen to improvise. Light fishing is one such method, which has created conflict between the semi-industrial and the artisanal fishermen, and also with government over the past decade 2000-2010. A cycle of low income, low purchasing power, lack of capital unorthodox/illegal fishing, low fish landing has befallen fishermen in this sector.
Technical assistance by way of new improved methods of fishing and fishing inputs (e.g. fish finding devices and nets) are not available. Weak enforcement of fisheries regulations and laws is another key issue in this sector.

Industrial Trawlers and Tuna
A key issue in this sector is the high input and operational costs. Thus all vessels are co-owned by Ghanaians and foreigners. Most of the vessels are old and even not operational. There are stronger, new vessels operated by the Chinese, and these are very expensive. The Fisheries Law prohibits the use of fishing vessel of 50 gross registered tonnage or more to use bottom trawl in waters of depth less than 30 meters. It has pegged the size of bottom trawlers and shrimpers at not more than 450 gross registered tonnage. However most of these trawlers trawl within the 30-50 meter depth, often creating a lot of conflict with the artisanal fishermen. Surveillance and control by Government is weak.

10. Major Expectations of Future Fisheries Management Plans
- For all the sectors of the fishery, government must make the management regimes already established work. The government must enforce laws and regulations in the fishery.
- Overcapitalization of all sectors must be checked. Access to the sector must be restricted. Government must not allow addition to the current population of all fishing fleet.
- The local fishing industry must be protected. The government must not allow foreigners to fish in Ghanaian waters; rather, the government must encourage the transfer of modern fishing technology from foreigners.
- The government must reinforce education of artisanal fishermen.
- For artisanal and semi-industrial fishermen, the government needs to offer technical assistance into modern fishing methods and gear.
- The effect of oil exploration on the fishery industry should be closely monitored to prevent and/or correct disasters.
GROUP 2 - MARINE FISHERIES MANAGEMENT SYSTEM

Composition of the Group:

- Samuel Quattey, Director of Fisheries Commission - President
- Noble Wadza, Friends of the Earth (NGO) - Member
- Nii Tackey, President NAFAG (National Fisheries Association of Ghana) - Member
- George Hutchful, Coastal Resource Centre (CRC-Ghana) - Member
- Alabi Bortey, Policy Planning, Monitoring and Evaluation Directorate, MOFA - Member

1. Brief Description and Analysis of Measures and Procedures for Controlling the Access to Marine Fishery Resources

Policy / Legislative Control
The policy development direction of the fisheries sector is to establish the long term sustainability of the fisheries resources and thereby maximize its contribution to the economy, to achieve accelerated and healthy capture fisheries and aquaculture growth, promote value addition to primary produce and vehicle poverty in fishing communities.

The Fisheries Regulations 2010 LI 1968 which supports the policy contains provisions for controlling access to fisheries resources in each of the four (4) marine sub-sectors namely artisanal, semi-industrial, industrial and tuna. Some of the key stages of the processes include Permit Registration and Licensing

Issuance and renewal of fishing licence is subject to such condition as the Fisheries Commission may determine. The Commission has control over vessels that violate the fisheries law by considering such acts as serious infractions on the Fisheries Law, which may attract a sanction like non-renewal of the vessel operating licence. Policy control to access is manifest in sectoral ministry and administrative processes.

There are few cases that industrial vessels have operated without licence and have been arrested by the Ghana Navy. With respect to the inshore vessels most of them operate without licence.

Traditional Control Measures
Ban on fisheries during festive occasions are well established cultural norms where there is either a complete or partial ban on fishing another tradition access control measure is the institutionalization of the closed season regime. Though the strict observance of this option has suffered some setback due to modernization and social change.

Declaration of Marine Protected Areas

The Fisheries Commission in collaboration with from CSOs comprised of FOE Ghana and the Coastal Resources Centre have initiated a programme to developing MPAs. In 2009 a Ghanaian Team from the Fisheries commission undertook a study tour of MPA sites in Senegal facilitated by FOE and WWF Senegal. The fish resource management value of MPA has been well recognized and being pursued. Semblance of MPA mechanism may exist in some traditional fishing areas, a well-coordinated approach in its promotion is urgently required. Currently the management approaches for the five Ramsar sites is pro-MPA.
Strengths of the Current Management System

Generally a major strength of the marine sector management systems can be presented as below:

- Diversity of academic and civil society to understand Management issues.
- International linkage, FAO, ICCAT, INFOFISH, World Fish Centre etc.
- Emerging local, regional and global knowledge and experience can be applied to the management of the resource.
- Existence of social professional bodies for management of the resource and local traditional management structure including civil society programs on sustainable resource management and livelihoods and environmental protection.
- Integrating FAO of Code of Conduct for Responsible Fisheries.
- Bye laws enacted by the District Assemblies (all the 22 coastal districts have had their bye laws enacted eg. Keta, Danme West, Ga South, Shama and Jasikan Districts).
- Good institutional support for the sector in research (JICA and Friedjof Hansen).
- There are provisions for controlling access to resources in each of the sub-sectors: artisanal, semi-industrial, industrial and tuna.
- Existence of institutions to support sustainable management on the resource and enforcement and prosecution of infraction - Ghana Navy, Ghana Air Force, Ghana Maritime Authority, Fisheries Commission, Environmental Protection Agency.

Weaknesses of the Current Management System

- Inadequate information for each fishing unit necessary for enforcing management measures.
- Limited professional Officers and ill equipped and poorly managed office environment.
- Inadequate budgetary allocation from central government.
- The prosecution systems for infraction are very slow as there are no designated judicial system to deal expeditiously with infraction of the fisheries laws and regulations.
- Weakness institutional capacity to deal effectively with management issues at the local government level.
- Poor institutional coordination and fragmentation: There are many institutions that are concerned with the fisheries sector local, national and global levels yet their synergy and coordination remain a challenge to effectively impact on goals and objectives. Poor coordination have also accounted for policy conflicts eg. Ghana Maritime Authority is mandated to give permits for the construction and importation of vessels without reference to the Fisheries Commission. Operators take advantage of the seemingly gap and exploit the system to their advantage.
- Limited support from the lower level governance structures; at the local government (District level) there is also limited capacity to understand and address concerns of the fisheries sector.
- High rate of illegal fishing in these waters, the arrest and conviction of fishing vessels committing offences is very low as a direct result of the lack of means for effective maritime patrols.
- Breakdown in regulation enforcement of traditional Authority and the general weakness in Laws and regulation enforcement. Ineffective policing from MCS partly due to the Expensive joint MCS and Ghana Navy patrol systems.
2. Brief Description and Analysis of the Current Technical Fisheries Management Measures

Though Inshore Exclusive Zone (IEZ) is defined by the applicability of the IEZ is for the exclusive use of the artisanal fisheries and small inshore vessels enforcement of the IEZ is very weak making it possible for semi industrial and industrial vessels operate in the IE Zone with impunity. Lack of capacity and logistics have also been cited as a crucial challenge undermining effectiveness. Some of the key issues raised in the Fisheries regulation with respect to the management of the resources are: Demarcation of Inshore exclusive zones and fishing in the IEZ, Permits to construct or purchase a vessel, prescription of mesh and net sizes. Others include minimum size of fish, ban on unapproved fishing methods such as pair trawling, light fisheries and the use of chemicals in fishing. The measures are based on scientific recommendations. For example, research has shown that mesh size less than 25 mm catch mostly juvenile fishes. The IEZ has also been found to be nursing areas and therefore trawling is not allowed. These measures are applicable for conservation of the resources. All these measures are clearly indicated in the Fisheries Act 2002, Act 625 and Fisheries Regulations 2010, LI 1968. The only challenge is the enforcement of the measures. Largely the regulatory abilities of the mechanisms have not yielded desired outcomes. These are largely as a result of the absence of enforcement is apparently because of serious consideration being given to expected cascading effect of this policy.

Beach seine for example is considered a destructive fishing method what selects producers of commercial and non-commercial species (Petralug 2001). Nunoo 2005 observed that over 90% of fish caught by the hear were relatively small-sized and juveniles of commercially important species. (Nunoo, FKE (2003).

Presently the government has a challenge to effectively address these problems due to capacity issues. Without an effective MCS system, the management of fisheries on a sustainable basis risk being a dream due to the eminent threat of collapse of the fishery because the fisheries resources are likely to be at risk of being depleted and may lead to the failure of development projects and programs. In this way The Fisheries Commission may not be able to achieve the goals and objectives.

3. Brief Assessment of the Impact of Other Policy Tools

Premix Fuel Economic Liberalization Policy

The most consistent socio-economic policy pursued by governments over the last three decades is the economic liberalization policy. The policy largely deregulates state control in the business, leaving the market to determine prices, labor etc.

Taxation

Fishing inputs such as nets, ropes, twines cork/floats are tax free. These are imported by private companies. There has been agitation by the fishermen over the prices indicating that they do not enjoy the zero tax on these commodities as would have been expected.
Subsidy
Government have subsided the importation of outboard motors through the Agricultural Development Bank. It has been established that the Agricultural Development Bank sometimes ago sold subsided fishing equipment to fishermen on credit, also rural banks lend money for gear purchase, there was, however, wide-spread default among fishermen was still recorded which fishermen blamed on high costs associated with the products in reaction, fishermen expressed widespread concerns over this liberalization policy which aspect they claim have imperil their livelihoods security, their concerns have been based on price instability and the high fishing inputs. Studies conducted under the SFLP (PIP study 2000) confirm that economic liberalization had exposed fishermen to high input costs (a 40hp outboard costs around 2000 cedis, and a beach seine may cost 2500 cedis) which in turn forced them to seek credit which were difficult to access

Inter-Ministerial Committee for Premix Fuel Administration and Distribution was created, with the mandate to distribute premixed fuel to artisanal fishermen for use in outboard motors nationally. Though laudable, the irregular supply of premix in the required quantity have created availability problem in all the designated coastal stations. Especially during the major fishing season and the level of subsidy is 50%

These circumstances have created an avenue for a few social influential to hijack the distribution system with profit motivated intentions and thus culminated into unlimited control and abuse by these operators at the communities to the detriment of general socio-economic wellbeing of the target end users, raising an issue for governance and accountability.

The extent to which this subsidy will be sustained raises question, while it is generally felt that the subsidies are unsustainable and a drain on state economy, the premix fuel system though well intended has enabled increase fishing efforts with attendant implications for the resources’ protection. The subsidies have adverse impact on fisheries management efforts as it contributes to overcapacity.

Decentralization policy
The Government of Ghana’s commitment to a policy of decentralization is known as the district assembly concept. Dates back to the late 80’s but continue to be in force. The policy is backed by Act 562.

This is implemented through the Ministry of Local Government and Regional Development (MLRID), the ministry through ITPS decentralized administrative structures, the District Assembly (DA) is ultimately responsible for the establishment and maintenance of a micro level network of decentralized administration. The DAS are in turn supported by a range of decentralized specialists, service providers. The DAS controls the lower lever sub-structures reaching into communities through the area councils and the unit committees. At the macro level MLGRD is responsible for the negotiation and securing of Common Fund upon which the District Assemblies rely to top up the income generated from local taxes and levies.

The Common Fund which was 5% of all national income has been increased to 7.5%. The MLGRD operates a formula which determines how much of the quantum % each District Assembly receives. The formula includes assessments of the needs (e.g. poverty) of the District, and also the capacity of the District to raise revenue in its own right. All locally generated revenues are retained by the DAS. Fishing communities operate under the decentralization scheme and potential beneficiaries of the DAS plans programs and action, however many studies reports and consultations validated the portion that fishing populations very often constitute an appreciable marginalize group in benefits.
In order to bridge this gap the concept of the community Based Fisheries Management Committees (CBFMCs) was forcefully encouraged by the Fisheries commission and civil society groups. The first and foremost role of the CBFMCs is co-management. The committees are to enforce the management measures in the Fisheries Act, the Fisheries Regulations and the Bye Laws. Therefore, they constitute a local fisheries governance institution. Their roles also cover conflict resolution between and among fishers, regulating the use of destructive fishing practices and gear control through locally imposed fines and prohibitions, etc. as well as promoting beach cleaning. The CBFMC is however incomplete process in most places on the coast. The functionality of the CBFMs probably requires a revisit as a matter of priority. The distribution of the outboard motors and premix fuel are channeled through the District Assemblies

Growth and Poverty Reduction Strategy (GPRS)

The central government development policy is the poverty reduction strategy. This represents the local version of the Millennium Development Goals. The second phase of this policy referred to as the Growth and Poverty Reduction (GPRS) was developed in 2002 – 2004. This places emphasis on stabilizing the economy and laying the foundation for sustainable, accelerated socio-economic growth. The GPRS embarrasses livelihoods, and special programmers to support the vulnerable and the excluded, it further extends focus on good governance and capacity of the public sector while involving the private sector as the main engine of growth. Flowing from this a number of sectoral policies and legislations have been developed

4. Analysis of the Possible Effect of Climate Change and Environmental Degradation on the Productivity and Sustainability of the Marine Fishery Resources

The fishing sector in Ghana is largely unprepared for the impacts climate change could bring. That is in part because much of the initial focus on climate change impacts looked at land, crops, deforestation and freshwater supplies rather than oceans, which are carbon sinks. Rising vulnerability and poverty can force these families into more desperate coping strategies, such as high risk fishing or migration or child labor to compensate for lost incomes, either short term or permanently. Children from the fishing communities are virtually being ‘sold’ to fishermen on the Volta Lake where they are engaged in hazardous fishing activities at the peril of their lives. Fishing households these communities already under stress from overfishing, habitat degradation and pollution are expected to face added pressure from climate change. Many fishing households rely on the fish they produce for basic income and typically have very little options for alternatives almost all the agricultural lands along the coast have been taken over for tourism and other residential activities. Any loss or disruption places their already precarious livelihoods in further danger. A loss of fishing livelihoods could also have a knock-on effect on the nutritional value of people's diets. And other protein sources, even if available, do not provide all the benefits of eating fish, Artisanal fishing constitutes very important activity for the people of the coastal communities both as source of income and the main source of protein. The people derive their fish meals directly from the sea and the adjoining coastal water bodies. The fish production involves a complex chain to take the fish from the sea to the landing grounds, processing mostly by the women, and then to the consumer. Climate change has led to huge reduction of fish catch by the coastal communities, significantly reducing fish availability as well as fishing related economic activity. The incessant sea erosion of and flooding of the coastal grounds and community settlements due to climate change, does not only
take over coastal agriculture lands but also cleared away landing beaches/grounds for the fisher folks and also their fishing net, disrupting the hitherto smooth fishing activities by the people.

**Coastal Livelihoods Issues**

Ghana’s coastline supports a vibrant marine fisheries sector and in fact, is one of the few countries in the West African sub-region with the entire coastline, more or less, evenly inhabited. Intertown/village distance along the coast seldom exceeds 5km. Analysis of environmental and livelihoods impacts along this coastal corridor which supports over 80% of the countries fisheries production indicate the following major issues: coastal erosion, over-exploitation and degradation of marine resources, pollution of coastal waters and deteriorating sanitation in urban areas. Efforts made at governmental level for improved management of coastal resources and fisheries systems have gained increased attention in more recent times than ever due to the realization of the challenges posed by climate change with attendant effect on the fisheries sub-sector. Options targeted at sustained integrated management of the fisheries resources have similarly received attention. These efforts are pitched against the background that, climate change is disrupting rural livelihoods including the fisheries communities and the environment thereby creating a spiral condition of worsening poverty among populations on one hand, while jeopardizing the stability of the fisheries ecosystem base.

**Poor information and Data on climatic issues and resources**

Ghana faces major challenges with information and data flow on climate Change and fisheries. Data availability and access is currently scanty or poor, thus obscures a coherent data base for effective management planning in view climate change. Often a times research on climate change is project driven, short-term and uncoordinated. Current surveys reveal the lack of research in climatology and meteorology. This has potential implication for the fisheries sub-sector, just like other sectors of the economy.

Comprehensive Research and data on climate change are significant to inform predictable possible climate impact projections. This will enhance effective knowledge systems to inform strategy, planning and practice towards the marine fisheries resources management. Currently data on physical and climatic factors for the coastal zone on issues pertaining to temperature, humidity, precipitation, wind speed, river discharges, soil types, ground water availability are poor though these may be available, with reliability and accurate Its accessibility and comprehension as well as usability remains an issue for local circumstances.

Climatic related information like temperature dynamics, rainfall and humidity for many years now remains a gap, however, may exist in certain areas, for example, studies on wave characteristics which remain an issue for climate change are poor or lacking. Segregated information on types and levels on pollutants, particularly organic types, may exist, yet remains with certain gaps or inaccessible. Climate change impact are implicating factors for understanding yields of the marine fish stocks. Though at interregional levels, there may be available information, yet its adequacy and appreciation for local use and adaptation are require to improved local based action. Another challenge rest with the extent to which we establish a coherence and dialogue between the climate change based research outputs and the end users of the knowledge Identifying appropriate opportunities to address this issue is primarily important to the fisheries sector due to the peculiar nature of the sector, both in terms of the people involved, the psycho-social factors such as social...
exclusion an marginalization, vulnerability and resource scarcity and the general the notion of fatalism (attitude) among fishers.
Fisheries sector communities require quality information to map their interactions and feed backs between its inter-intra complex social systems and arrangements.

Coastal Erosion

Coastal erosion is a characteristic feature along the entire Ghana’s coastline where marine fisheries activities are active. Studies suggest that as many as 25 locations have been cited as serious points of erosion (Nai et al 1993). This is expected to raise over time The causes and patterns of erosion in Ghana have been examined by other scholars (Armah 1991; Anthoinio 1993; Nai et. al. 1993). These studies identify the following key areas of main causes are:

- Sand and pebble winning.
- Hydrographic conditions like reinforcement of onshore waves due to wave refraction from adjacent headlands.

Disappearance of hydraulic groynes at the mouths of fast flowing rivers due to dams constructed on them. Sand and pebble extraction from beaches for building purposes, although illegal, is a widespread practice and is a contributory factor in all the areas where shoreline erosion is critical. Examples of the hydraulic groyne effect could be found at Ada (0° 37’ E and 5° 48’ N), Labadi (0° 10’ W and 5° 33’ N), Bortianor and Kokrobite (0° 21’ W and 5° 30’ N). Reinforcement of waves due to adjacent headlands and man-made structures like breakwaters seem to be the commonest cause of erosion with examples at Princess Town (2° 8’ W and 4° 48’ N), Adjua (1° 48’ W and 4° 52’ N), Nkontompo (1° 42’ W and 4° 59’ N), Essipong (1° 42’ W and 4° 59’ N), Komenda (1° 30’ W and 5° 3’ N), Elmina (1° 30’ W and 5° 4’ N), Jamestown beach (0° 13’ W and 5° 33’ N), Tema (0° 0’ and 5° 38’ N) and Prampram (0° 2.5’ E and 5° 43’ N).

The causes of erosion at Keta (0° 59’ E and 5° 55’ N) is still being debated and appear to be a combination of several factors including the geomorphology, hydrography, angle of incident waves. At Keta, sand winning though appears not to be one of the causes since the practice stopped several decades ago and yet erosion has been on the ascendancy. These are being further enhanced by climate change manifestations leading to increasing rates of erosion which is occurring at an average rate of 2m per year in critical areas. Coastal erosion destroys life in the inter-tidal area as well as disturbs life in near-shore coastal waters. For instance, essential sandy habitats for sea turtles may be lost. Extensive coastal erosion is also not only detrimental to the activities of artisanal .In the worst hit areas east of Keta, rates are even higher and sometimes up to 4m per year. Erosion has implication for human settlement and food security. This can have enormous implication for the many fisher populations.

Fisheries

Fishing, perhaps, is the most important activity in the entire coastal zone in terms of the number of people involved directly as well as those who dependent on it indirectly A canoe frame survey conducted estimate the number of canoes operating in the artisanal sector as 8,688. This canoe operated from 306 landing sites along the entire 550km length of the coastline. The average number of canoes and fishermen over the period were 8,318 and 97,500 respectively (Koranteng et al., 1993). Currently, there are 156 semi-industrial vessels operating from 8 landing sites along the coastline. The estimated number of semi-industrial fishermen is 6,500. The number of industrial trawlers in 1995 was 40 while that of shrimpers 17. The number of industrial fishermen is estimated to be 2,000.
The fisheries sub-sector which accounts for about 3% of Ghana’s GDP and 5% of Agriculture GDP, providing a total of 8,839.29 of fish both frozen and cured valued at US$11,384,344.67 have come under severe climate change related challenges. Sea level rise and temperature dynamics have been noted as contributing factors that alter fish movement and stability and thus influence the migration pattern of fishes. Population movement has caused certain species to drift further afar or nearer their natural habitats and environment. The process thus predisposes some species to dangers, as they become exposed to wider circumstances and ultimately become targets for other predators and fishers. In instance where stocks are far from capture efforts, fishermen use increase their energies and technology in order maximize on catches. This have in turn added to the favorable factors for overfishing.

The varying impact of climate change poses potential threat to the Tuna fishery which constitutes an important component of the fishery granted its value in export earnings and employment through the processing and canning factories.

**Wetlands and Mangroves**

There is clear evidence that, many of Ghana’s wetlands ecosystems and the associated lagoons and estuaries are recording decrease results of in productive capacity. Wetlands constitute an important fish production hub within the coastal zone setting in particular, and the marine sector in general. It has been established that climate change impacts have special meaning for wetlands. Climate change impacts have been indicted for disrupting the symbiotic relationship and interconnection between wetlands, mangroves and fish production. This position has been further supported by views expressed by coastal marine fishers in selected coastal districts and communities in Ghana. Outcomes of interaction with fisheries population under the Climate Change and Coastal Area Governance Project, implemented by FOE Ghana (2010) under the NREG facility refers.

Wetlands and mangroves contribute to the sustenance of the coastal fishing industry by providing critical spawning and nursery grounds for many marine and freshwater organisms. Estuarine and lagoon fisheries are also major sources of livelihood for many fisheries dependent communities. Climate change impact and variability have enormous implications for these fish productive ecosystems.

In spite of the acknowledged high values place on wetland resources, there is still much to be done both locally and nationally. Actions and programs capable of translating climate change resilient measures into realistic pro wetlands management options are uncoordinated. The overall socio-economic and ecosystem including fishery values of the wetlands resources will continue to remain a challenge in matters of marine fisheries management advice.

Early study results put the total area of land occupied by mangroves around 10,000ha (Saenger and Bellan, 1995). The mangrove stands in most areas are of secondary and tertiary growth. The mangroves, in addition to providing physical protection for the shoreline against erosion, are also useful source for fuel wood and smoking in fish processing. Mangroves serves as breeding grounds for fishes but are however, under serious threat of over-exploitation and degradation. Just like wetlands, mangrove ecosystems have similarly come under the influence of climate change directly. On the other hand existing poverty levels, again accentuated by climate change induced pressures dictate conditions that undermine efforts oriented at conservation and resources protection. Such unfavorable conditions further support actions leading to the spate of mangrove harvesting. Conversion of
mangroves, lagoons and their alteration are implicating factors, ultimately threatening the fisheries resources. There is the general lack of effective information communication and education to connect the mutual benefit and a strategic interdependence of these ecosystems among fisheries populations.

Pollution
Climate change exacerbate flooding and sea level rise, movement of sediments from land based locations through flooding empties into the sea and becomes toxicant which in turn affect fisheries and related species in the marine environment. Pollution of the coastal marine waters comes from two main sources, domestic and industrial. Domestic sources are from sewage and garbage and constitute a major source of pollutant which are either directly deposited in lagoon banks and beaches or reach the coastline through surface run-off, drains. Classic examples are the Korle and Chemu lagoons which have deteriorated as a result of industrial pollution leading to unspecified levels of degradation and ramifications for fish biology.

Synthesis
International conventions and protocols provide the tools and ingredient capable of transforming the Ghana marine fishery sector into climate friendly socio-economic activity than today, translating the values of the three key international protocols and processes. The Biodiversity Convention (CBD), the Ramsar Convention (RAMSAR) of 1972 and the UN Convention to Combat Desertification (UNCCD) require increased elaboration in order to impact on ecosystems and fisheries exploring further the benefits of other conventions such as the UNCLOS could serve a useful impetus.

In many coastal towns, fisheries represent the nucleus of the social organization and in fact the most single source of animal protein to the entire population. Climate change implication for fisheries makes a strong case for a holistic review of existing national actions directed at defining climate change target setting. Generating ideas from fisherfolk perspectives in formulating benchmarks is important. This has the potential for strengthening and increasing the frontiers of cross knowledge and consensus to support the appropriate climate target and action frameworks or guidelines. In support, linkages with decentralized fisheries administrative units and other lower level institutions constitute key an option. To realize this, adequate resources both financial and otherwise remain an important mechanism to achieve positive outcomes.

In so doing, there is the urgent need to map up, classify and clarify areas where local based knowledge exist within the contexts of the scientific instruments, so that existing opportunities can be blended with existing knowledge in order to ensure management acceptability and reliability. This may not require a rigid framework but be curved in a manner that integrate local based values
5. **Gaps and Improvement Needs of Current Fisheries Regulation with Reference to Recent Developments including Plans on IUU fishing and EAF Approach to Fisheries Management**

The ever-increasing international demand for fish has brought about over capacity in both large and small-scale fisheries. Over capacity in fisheries has given rise to a series of problems of profound and disastrous consequences. The competition for fish in the absence of appropriate management practices continue to increase and intensify resulting in the rapid depletion of the resources; the destruction of ecosystems and fish habitats and, diminishing economic returns. In the midst of increased entry and competition, ignorance of existing regulations and control mechanisms, cases of IUU fishing practices arise. Plans are far advanced to adopt the National Plan of Action in line with the FAO International Plan of Action to combat, deter and eliminate IUU in fishing. This will complement the Fisheries Law and the Fisheries Regulations and contribute to the FAO Code of Conduct for Responsible Fisheries implementation.


The Fisheries Management Plan (FMP), 2001, presents an introduction of a management tool aimed to bring sanity into the fishing Industry. The FMP was however not implemented. The FMP is fashioned out along the lines of short and long term goals.

**Short Term Measures**

The following short term measures are recommended to reduce fishing pressure and facilitate recovery of the demersal fish stocks:

a) Establishing permits regimes to regulate vessels for the importation of trawlers, shrimpers and other vessels that can operate as trawlers should be discontinued forthwith.

b) Under the provisions of PNDCL 256 (Part IV section 17), imposition of closed season for trawl and shrimp fisheries and the readiness to cease trawling and industrial shrimp activities in the EEZ, when the a stated period earmarked for accessing progress indicate negative result between 5-10 years, to be replaced by a new management measure.

c) Prohibition of beach seining and encouraging fishing responsible activities like hooking, netting, long lining and jigging as well as training of the fishers and assistance for the procurement of appropriate fishing gear were in focus. The plan further recognized the value of establishing the Monitoring, Control, Surveillance and Enforcement (MCSE) Unit as mandated by the present Fisheries Law. Also a plan prescribes a ban on shrimp fishing at the mouth of estuaries to allow juvenile shrimps to migrate to deeper waters to grow.

**Long Term Measures**

The FMP proposed the following as key measures for the long term management of the demersal fisheries:

a) Establishment of a body to provide technical support to manage permits for import, fishing imports and vessels.

b) Encourage the provision of training in other vocational skills e.g. piggery, aquaculture, poultry, masonry, carpentry and bee-keeping with a view to alleviating poverty among coastal communities as well as easing pressure on fishing as the principal avenue of employment.
The FMP also gives emphasis on the intensification on studies and research. Furthermore, with specific reference to pelagic fisheries, the FMP reflects on mesh size regulation such as the 25 mm minimum mesh size limit for multifilament netting and 75 mm minimum mesh size limit for monofilament netting. The FMP integrates the involvement of the CBFMCs, District Assemblies and other relevant local institutions in the determination and collection of appropriate licence fees on large pelagic species. It also stresses Ghana’s countries obligations to ICCAT.
Finally, the FMP recommends other measures, such as the minimization of post-harvest losses, the creation of an enabling environment, especially the provision of credit facilities to entrepreneurs in fish processing.

The non-implementation of the plan has had multiplier effects. Some biologically considerations of the effect bother on the uncontrolled capture of juvenile marine fishes. The over concentration of fishing efforts in the marine in-shore waters by all categories of fleet- canoe semi-industrial and industrial , often with the use of illegal but highly profitable small mesh size nets has resulted in the decline of fishery resources, especially the demersal stocks. All fleets of the marine fishing industry exploit juvenile fish in one way or the other. The artisanal purse-seine exploits adult sardinellas and chub mackerels during the upwelling periods when these species move into coastal waters to spawn. During the non-upwelling periods, the poli gear targets the anchovies and juvenile sardinellas, which are in coastal waters. The beach-seines operate from the beach and exploit adult sardinellas during the upwelling periods, and anchovies, juvenile sardinellas and juvenile demersal fishes during the non-upwelling periods.

In the past, neither fisherman nor governments paid much attention to fisheries management. However in more recently times a series of initiatives dating from the late 1980’s to the present have enhanced management attention significantly. Such initiatives have included the following:

- Running of the Fisheries Sub sector Capacity Building Project
- Establishment of the Monitoring, Control and Surveillance Division (MCSD)
- Establishment of the Fisheries Ministry from 2005-2008 for better budgetary allocation
- Reconstitution of the Fisheries Commission mandated for the management of the resources
- Enactment of the Fisheries Act 2002, Act 625
- Enactment of the Fisheries Regulations 2010, LI 1968
- Use of Vessel Monitoring System (VMS)
- Formation of CBFMCs for Co-Management.

A strong decline in marine fish supply in terms of volume and catch per unit of effort has been established. The resultant impact on fishermen income has been similarly established. These are blamed on the combined effects of poor resource management, increased competition, rising input costs the depletion of resource, loss of biodiversity and habitat destruction (Dary 1999, Campbell and Townsley 1995). With all these it is widely agreed that the fishing industry in Ghana has reached a low level equilibrium that provides little prospect for improving the welfare of fisherman. The income generated as a result of declining resources is not enough to cover the cost of their operations. The people relying on the fisheries are reeling poorer and poorer in poverty.
7. Proposed Actions for Improved Functions in support of Marine Fisheries Management

- Establishment of marine protected in collaboration with CSOs representation to identify opportunities and map up strategies for the development of MPAs.
- The VMS should be operationalised the Unit equipped with the necessary logistics including patrol vessels and Communication equipment.
- Collaboration with the Ghana Navy, air force and Attorney-General should be strengthened.
- The government should provide adequate budgetary support to the Unit to carry out is functions efficiently.
- Beach combing, part inspections and observer programmes should be revived and intensified.
- Offices in Tema, Takoradi and Cape Coast should be adequately staffed and equipped.
- Political interference/control in the management of the resources should be curtailed.
- Capacity building of the fishing communities in alternative Livelihoods should be carried and trainees equipped to research the pressure on the resources.
- The Marine Fisheries Research Unit should be provided with a dedicated research vessel to provide timely and adequate information to drive development and management of the fisheries sector.

8) Expectations regarding Marine Fisheries Management

Expectations include the following:

- Granted the expectation that the artisanal fishermen would experience an improvement in their fish harvests in the future an immediate of the ban on trawling activities, instead using more desirable fishing techniques has been proposed similarly a ban is being proposed on seine activities though in the short term would disrupt income and employment to unspecified number of fishers yet such an initiative is capable of providing support for the common good of all in the future.
- Aggressive strategies to introduce alternative employment opportunities, combined with better education and greater accessibility to population management, information and Resources would help to alleviate social consequences of the Change.
- Devolution of fisheries management to local institutions such as District Assemblies and CBFMCs is expected to enhance prudent control of access to the fishery.
GROUP 3 - MARINE FISHERIES MONITORING, CONTROL, SURVEILLANCE AND ENFORCEMENT (MCS&E) SYSTEM

Composition of the Group:
- Setor Avoke MCS – Chairman
- Christian Nii Aponsah MCS – Member
- Charles Teye MCS – Member/Secretary
- ASP Mavis Nortey - Ghana Police - Member
- Leonard Henyo - Agnespark Fisheries - Member
- J H Farmer – Ghana Tuna Association/NAFAG – Member
- Samuel B Ayertey – Ghana Tuna Association –Member

1. Description of current MCSE system

Organization of legal framework
The Fisheries Commission was established in 2002, with the enactment of the Fisheries Act 2002 (Act 625). The Commission works under the Ministry of Food and Agriculture (MOFA). Other legislations that give backing to the activities of divisions under the Commission include the Fisheries Regulations (L. I. 1968). The Republic of Ghana fisheries and Aquaculture Policy, which was adopted by the Government in 2008, and further updated in 2010, provides the overall framework for managing the sector to ensure its long term sustainability. The Fisheries and Aquaculture Development Plan further outlines actions and investments towards achievement of the policy.

Organizational set up
The Minister of Food and Agriculture has Ministerial responsibility over the Fisheries Commission. The Commission is composed of an 11 member board, with a chairman as the head. The Director if Fisheries, who is also a member of the board, heads the secretariat of the Commission. There are five Technical Divisions under the Commission, made up of the following:
- Marine Fisheries Division (MFD)
- Inland Fisheries Division (IFD)
- Fisheries Scientific Surveys Division (FSSD)
- Monitoring, Control, and Surveillance (MCS) Division
- Finance and Administration Division (F&AD)

There are regional offices, one in each of the ten regions of Ghana, while there are several District Offices in most of the districts with fisheries potentials.

Logistical means available:
Office Accommodations: The MCS Division has three main offices from which it operates. Two of these are in Tema (one is situated within the Tema fishing harbor) while the other is in Takoradi.
Vehicles: There are three double cabin pickups, two of which are very old and frequently undergoing repairs, while one is in very good condition. These are used for field work.
Patrol Vessels: There is currently only one six (6) meter patrol vessel on the Volta Lake and this is in good working condition. There are no vessels for marine patrols even though, two 46 meter patrol vessels have been ordered and being constructed in China and would be ready for delivery by the third quarter of 2011. The navy however has seven (7) inshore defender class boats located at Takoradi and Tema which are used for fisheries patrols within the inshore area.

Vessel Monitoring System (VMS):- A vessel monitoring system with transponders was acquired in 2002, worked for a few years but has not been operational since 2004 due to non-satellite reception.

Computers, accessories and Internet Access: - There are four working computers with printers located in the offices for use and entry of data, one new photocopier is available at the main Tema office, while broadband internet access is available in all the offices, both in Tema and Takoradi.

Other equipment: - Life jackets, and other working equipment exist in limited quantities and in pretty good condition.

Personnel
The MCS Division of the Fisheries Commission has ten (10) officers posted in Tema and Takoradi offices. However, fisheries enforcement is also undertaken in collaboration with personnel of the Ghana Navy, Ghana Police Force, and they command large numbers.

Financing
Funds for MCS activities are from two sources. Funds allocated through the Government of Ghana (GOG) treasury which are very meager and not capable of funding any meaningful MCS activities, and funds from the Fisheries Development Fund which are released sparingly. Sea patrol operations undertaken by the Navy are funded through their budgetary allocations from government sources.

Collaborative mechanisms with other institutions
There is close collaboration between the MCS Division of the Fisheries Commission and personnel of the Ghana Navy, Ghana Police Service when it comes to fisheries enforcement. There are joint patrols where the navy invites MCS personnel to be part of the team that go to sea. The Attorney Generals Department is consulted closely when it comes to legal issues and prosecution. There are joint operations and patrols between the Ghana Police and MCS where random swoops are made to arrest people using illegal gears at landing beaches, while arrested culprits are handed over to Police investigators for taking of statement and putting together evidence and dockets to be forwarded to the Attorney Generals Department for advice, before proceeding to court.

2. Assessment of levels of compliance by each of the following subsectors

Vessel Registration
There are three (3) categories of vessels operating in Ghanaian waters. These are:

- Industrial vessels
- Semi-industrial vessels
- Artisanal vessels
Industrial vessels (110) are fully registered at the Fisheries Commission in Accra, and are given registration numbers which are legibly embossed on the hull. Actually, two sets of registration numbers are given each industrial vessel. One is given by the GMA on acquiring the flag and the other number, by the Fisheries Commission when a license is applied for. This number is boldly written on the hull. Semi-industrial vessels (400) are also fully registered at the Regional level, and given registration numbers which are embossed on the vessels.

Artisanal vessels (12,000) are not registered, even though an attempt has been made to issue numbers to each canoe. Currently, there is a pilot programme to emboss registration numbers on plates and attached to the canoes. A number of canoes were embossed with new number plates in all the four coastal districts. Observation showed that the screws used in attaching the aluminum plates to the boat started falling out, resulting in the plates falling off after a few weeks.

**Licensing**

Industrial vessels are enjoined by law to acquire license quarterly, half yearly or yearly as required by law. In 2009, all operational vessels (99) made up of 52 trawlers, 44 tuna vessels, one shrimper and two carriers obtained license, i.e. 100% compliance. Except for vessels that are broken down or are undergoing repairs and which have duly informed the Commission, all others take license.

Semi industrial vessels on the other hand default greatly in obtaining license before operating at the regional level. In 2008, out of the 399 semi-industrial vessels that operated in all the three coastal regions, only 54 obtained license. This puts compliance at only 14%.

No artisanal vessels however, even though the law requires them to obtain license, ever do so, i.e. (0% compliance).

**Illegal practices**

The main illegal activities encountered at sea include, Inshore Exclusive Zone (IEZ) infractions, use of destructive fishing methods (explosives, poisons, light aggregation, etc.), use of under sized mesh nets, use of monofilament nets in marine waters.

Among all the infractions listed above, the most prevalent are the use of monofilament nets. Estimation shows that over 70% of artisanal fishers use these monofilament nets for fishing.

This is followed by the use of light aggregation for fishing. Due to the costs involved in acquiring the equipment for light aggregation 40% of artisanal fishers and 50% of semi-industrial fishers are engaged in the act.

Recent evidence also shows that a few industrial vessels particularly the tuna bait boats, under the pretext of collecting bait, have engaged in the act.

The use of explosives, poisons and other obnoxious substances in fishing is also quite common, however, few people are ever arrested due to lack of information.

**Observer activities**

Observer activities are undertaken by both MCS staff and fisheries personnel outside the MCS. The fisheries law, Act 625 outlines the functions of observers as follows:

- Collection of catch and effort data
- Taking reasonable samples of fish for scientific purposes
- Reporting violations of the laws and regulations on board the vessels and of other vessels encountered on the trip.
Note that the law does not distinguish scientific observers from enforcement observers. However, it is a normal practice that MCS Division sends out enforcement observers while the Fisheries Research Division, sends scientific observers. It is however not impossible for scientific observers to give out intelligence reports that could lead to enforcing the laws. However for the past two years, due to budgetary constraints, no MCS staff has been sent out on observer duties. The only observers sent out are those monitoring the ICCAT moratorium and are mostly staff of the Fisheries Scientific Surveys Division (Fisheries Research).

3. Analysis of the strengths and weaknesses of the current MCSE system:

STRENGTHS

Institutional framework-

Legal framework – The three main legislations that give support to the operations of the MCSE system are i) The Fisheries Act 2002 (Act 625), ii) the Regulation 2010 (LI1968) and the CBFMC by-laws existing in all District Assemblies.

- The Fisheries Act 2002 (Act 625) established the Monitoring Control and Surveillance and other Divisions of the Commission. The same Act also gave authority for the establishment and composition of the Monitoring, Control, Surveillance and Enforcement MCSE Unit whose membership is to be derived from personnel of the following organizations: - Fisheries Commission, the Ghana Navy, the Ghana Air force, and any other organization that the Minister of Fisheries deems necessary to enhance the performance of the unit e.g. Ghana Police.

- The Act also clearly outlined the powers of the unit and its duties and responsibilities which are very similar to those of a Police Officer.

- The Fisheries Regulation 2010 (L. I. 1968) gives additional support to the powers and operation of the MCSE Division and Unit.

- Community Based Fisheries Management Community (CBFMC) by-laws existing in all Municipal, Metropolitan and District Assemblies (MMDA) along the coast also contain sections that give support to enforcement of laws geared towards co-management of the fisheries resources.

Public sector governance and management arrangements

- Fisheries Commission coming under the Ministry of Food and Agriculture with the sector Minister being responsible for sending requests such as budgets to Parliament for approval. Other collaboration agencies such as the Ghana Navy also fall directly under the Ministry of Defense.

- Additionally all agencies and stakeholders in the marine fisheries sector, such as fishermen groups and the navy, have representatives on the Fisheries Commission board such that the concerns of their members are quickly forwarded to the Commission for resolution.

- There are existing legal and court arrangements for adjudication of fisheries cases, including arbitration and out of court arrangements. Recently, the Chief Justice ordered that Fisheries cases should be handled by Circuit Courts that are available at all District Capitals.

- There exist very strong fisher organizations both at traditional level and at association level. The Chief Fishermen and their advisors have traditional jurisdiction at community level and control large numbers of fishermen. There are also several fishermen organizations including the
following: National Fishermen Association of Ghana (NAFAG) which is the umbrella organization for all fishermen associations, Ghana Tuna Association (GTA), Ghana Inshore Fishermen Association (GIFA), and Ghana Canoe Fishermen Association (GCFA). All these can be used to disseminate information to the operators, and effect voluntary compliance.

**Technical capabilities**
- Few but well trained and hardworking Fisheries Commission staff who are willing to work at all hours
- Ghana Navy staff willing to continue to put in fisheries patrol duties as part of their national responsibilities.
- Ghana police personnel willing to participate in fisheries enforcement activities (land based patrols) and to investigate and prosecute arrested offenders.
- A few equipment such as patrol vessels (small boats for patrolling in inshore areas), VMS that can be rehabilitated, and other working equipment available for MCSE.

**Financial**
- Limited funds made available through regular government releases through the Ministry of Food and Agriculture to the Fisheries Commission for administrative purposes.
- Funds from the Fisheries Development Fund released for some limited MCSE activities.

**Socio-economic**
- Traditional establishments like Chief Fishermen and their group of advisors help in the enforcement and dissemination of laws and regulations.

**WEAKNESSES**

**Institutional framework**
- Rampant disregard for fisheries laws by fishers and other operators
- Prolonged court procedures discouraging arresting officers
- Fisheries enforcement unit not in place, nine years after passage of the Act 625
- Undefined and not very clear-cut procedures for out-of-court settlement of cases

**Public sector governance and management arrangements**
- Lack of political commitment and support for prosecution of offenders
- Unbridled political influence over fisheries associations

**Technical capabilities**
- Lack of education for fishers groups on laws and regulations
- Lack of adequate practical marine training for police and other personnel engaged in MCSE activities
- Low number of MCS staff to undertake numerous activities

**Financial**
- Lack of equipment and other logistical support (patrol vessel, VMS, vehicles) for MCSE activities
Socio-economic

- Fishing communities are very closely people and are usually unwilling to volunteer information about colleague fishermen that will help in apprehending culprits.
- Extreme poverty in fishing communities have made them prone to the use of illegal but cheap fishing methods which when enforced will increase hunger.

4. Constraints and opportunities associated with building of voluntary compliance

CONSTRAINTS

Discussions listed the following as constraints militating against building of voluntary compliance:

i) There is diminishing fisher support for voluntary compliance.
ii) Due to the fear of loss of voter support in the fishing communities, there is loss of political support for the Fisheries Commission.
iii) Support from donor agencies not being used to support programs that will engender voluntary compliance.
iv) There is a lack of alternative sources of income for fishers to resort to when they cease to use illegal means of fishing.
v) Widespread poverty in fishing communities tends to lead to the use of illegal gears which are comparatively cheaper to acquire.

OPPORTUNITIES

i) The following opportunities were realized:
ii) There is support from quite large groups of fishers and other stakeholder groups, who are willing to support voluntary compliance.
iii) World Bank and other donor agencies are willing to support programs geared towards encouraging voluntary compliance.

5. Priority needs for improved MCSE in marine fisheries

After in depth discussions, the following priority needs were identified:

i) Intensified education of fishers and other stakeholders (Police, Fisheries Commission staff, Navy, Judges and Prosecutors) on the Fisheries Laws and Regulations, and the usefulness of such measures, and in other areas such as enforcement and prosecution.
ii) Capacity building and resource acquisition such as patrol vessels, VMS, aircraft, and other essential equipment.

As regards specifically to institutional needs for MCS and Judicial for prosecution, there is a need to set up the Monitoring Control and Surveillance Enforcement Unit (Fisheries Enforcement Unit – FEU) which is provided for in the law. This Unit which is to be made up of personnel from the Fisheries Commission, Ghana Navy, Ghana Air Force, and any other agency. This could include the Ghana police, Customs, Excise and Preventive Service, Ghana Immigration Service) that may be decided on by the Minister, will be able to operate more efficiently. The training envisaged will therefore be directed at the membership of this unit.
For the purpose of successful prosecution, it was agreed that Judges from the High Courts and Circuit Courts which are designated to adjudicate fisheries cases should be given education on the rationale behind the Laws and Regulations.

There is a need also for all who participate in fisheries enforcement and prosecution to be taken through the process of evidence gathering for building up a successful case. Operators (fishers and processors), also have to be sensitized on the Fisheries Laws and Regulations.