



# Republic of Ghana Fisheries and Aquaculture Sector Development Plan

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**2011 to 2016**

## Executive summary

Ghana has valuable fisheries that generate in the order of **US\$ 1 billion** in revenue each year. The fisheries support 135,000 fishers in the marine sub-sector alone. Ghana's fisheries contribute **4.5 percent to annual GDP** and indirectly support the **livelihoods of 2.2 million people** or 10% of all people in Ghana.

Unfortunately the economic benefits available from these fisheries are being drained away. In all probability it costs more to catch and manage fisheries in Ghana than they return to the economy in income. This is because there is too little investment in management and value addition and there are too many vessels catching too few fish.

These economic losses directly impact fishing communities because the costs of fishing are starting to exceed the amount of income that is being generated. **Compared to ten years ago the average income received by each canoe each year in Ghana's important coastal fishery has dropped by as much as 40%.** There is little or no profit left to invest in improving the quality and value of the catch or even replace vessels and equipment. As a result the people reliant on fishing and the communities in which they live are getting poorer.

The fishing industry in Ghana has reached a low level equilibrium that provides little prospect for improving the welfare of fisher people or contributing to the economy as a whole. With effective management this situation could be reversed. International experience shows that well managed fisheries can generate economic returns of between of 30 – 60 % of fishery revenue equivalent to at least **US\$300 million per year for fisheries in Ghana.**

Improving the management of fisheries in Ghana to realize such benefits will however take time and require careful management to ensure impacts on individuals and communities are properly addressed. Based on experience elsewhere it will take 20 or more years to effect such change. A long term commitment and a well planned transition will therefore be required to revitalize Ghana's fisheries sector.

As a step in this direction fisheries in Ghana are expected to contribute to the **Ghana Poverty Reduction Strategy (PRSP) II which aims at doubling the size of the Ghanaian economy by 2015.** The PRSP II envisages that this change will be underpinned by agriculture and fisheries – led growth. The **Republic of Ghana Fisheries and Aquaculture Policy** (the Policy) provides the Government's framework for the fisheries contribution to the PRSP II objectives. The Policy establishes five strategic pillars on which the development and management of fisheries in Ghana will be built and the principles that will be applied to guide this process.

This **Ghana Fisheries and Aquaculture Development Plan (the Plan)** describes the steps that will be taken to implement the Policy over the next five years. The Plan sets seven explicit targets to be met in five years and the program of activities that will be implemented to meet these targets.

The implementation of this plan is targeted at:

- maintaining current capture fisheries production (target 1),
- increasing revenue and profitability in capture fisheries by at least US\$50 million per year after five years (targets 2 and 3),
- increasing aquaculture production from 9000 to 100,000 tonnes per annum within five years (target 4),
- retaining Ghana as a landing and processing hub for the West Africa tuna industry (target 5),
- developing fisheries management to allow effective control of all commercial fishing effort in Ghanaian waters (target 6), and
- ensuring fisheries management costs are sustainable and that the fisheries sector overall makes a fiscal contribution to Government revenues (target 7).

**There is a presumption in this plan that the canoe sector will remain at the heart of the Ghana fishing industry.** The pathway forward is not however prescribed and the Plan leaves wide scope for policies to be developed to best meet the needs of Ghana and ensure that increased revenue and wealth generated from Ghana's fisheries is captured and used to best effect.

## 1. Introduction

This document describes the Ghana Fisheries and Aquaculture Development Plan (the Plan). The Plan sets explicit operational targets, provides an explanation of how these targets were selected, and describes how they relate to the overarching framework of the Republic of Ghana Fisheries and Aquaculture Policy. It then specifies the key activities to be implemented in the fisheries and aquaculture sector over the next five years to realise these targets.

The Plan is structured around 6 sections. Section 2 of this Plan summarises the economic status of fisheries in Ghana. Sections 3 and 4 describe the production and economic potential of fisheries in Ghana. Section 5 describes the seven targets set under this Plan and how these targets link to the overarching policy framework detailed in the Republic of Ghana Fisheries and Aquaculture Policy. Section 6 discusses key priorities that need to be addressed to meet the plan targets and Section 7 of this Plan describes the 'road map' of activities to be completed over the next five years to realise the seven targets.

Also attached to the Plan are a series of annexes that further discuss key issues that will need to be addressed in meeting the seven plan targets.

## 2. The current economic status of fisheries in Ghana

Ghana has access to significant and valuable stocks of fish. Total domestic production, including aquaculture, is roughly 440,000 tons each year. This **fish production is worth in excess of US\$ 1 billion in income** annually. In terms of the overall economy, the fisheries sector accounts for at least 4.5% of GDP. These figures underscore the prominent role that fisheries play in the Ghanaian economy as they have done for many generations past.

The cost of producing fish in Ghana is however alarming. The evidence available suggests that that fish **production costs are approaching or exceeding income** in all inshore marine capture fisheries over recent years. There is also evidence that costs are increasing in inland fishing fisheries and what profitability that remains is being rapidly dissipated. Tuna fishery production and capacity has remained relatively stable but fishers report escalating costs as fish are migrating offshore and business compliance costs are increasing. Investments in management to address these problems are however negligible. Fisheries management expenditure in Ghana (measured as a % of total income) is less than 2% of average expenditure in OECD countries (i.e. 17% of revenue).

Overall, there is little or no surplus of income over expenditure in Ghana's capture fisheries and where some profitability remains it is being lost. This problem has unfortunately been exacerbated by government social interventions and donor activity that has directly or indirectly subsidised fishing effort. Taking into consideration these government social interventions it is likely that Ghana is paying more to catch and produce fish than they are worth. There is therefore a real risk that **current GDP contributions from this sector are unsustainable** into the future and this has macro-economic consequences for Ghana both in terms of increased poverty and in draining wealth from other sectors of the economy to support the ailing fisheries sector.

As many as 2.2 million people are dependent on the fisheries sector for their livelihoods including some 135,000 fishers in the marine sector alone of which 124,000 (or 92%) are artisanal fishers. Many of these livelihoods are based in rural areas that have thus far remained at the margin of the country's economic growth. There is therefore much at stake when considering how to develop fisheries and aquaculture into the future.

Economic losses in Ghana's fisheries have direct impacts on fishing communities because the income generated from fishing is not enough to cover the costs of fishing. As a result there are no profits left to invest in improving the quality and value of the catch and the people reliant on fishing are getting poorer.

In summary, the fishing industry in Ghana has reached a low level equilibrium that provides little prospect for improving the welfare of fisher people in Ghana or contributing to the economy as a whole.

### 3. The production potential of Ghana's fisheries

Domestic fish production in Ghana was about 444,000 tons in 2008. This production is made up of 291,000 tons from marine capture fisheries; 150,000 tons inland capture fisheries and 3,000 tons from aquaculture production. The total amount of this fish exported in 2008 was 94,000 tons. Excluding reported fish exports, about 350,000 tons of domestic production therefore stayed within the domestic market<sup>1</sup>. The Department of Fisheries estimated the amount of fish required by the Ghanaian population in 2008 to be at 810,000 tons. Based on these estimates there is a **current shortfall in the domestic production needed to meet food security requirements in Ghana of around 380,000 tons.**

While some of these estimates may be understated (it is thought that actual production inland fisheries could be significantly higher) it is not thought that any increased production from capture fisheries is likely as these fisheries are being fished at or above sustainable levels already. If anything, Ghana's fisheries are likely to be adversely impacted by climate change which may reduce future production. There is significant potential to increase aquaculture production it is expected that these increases could reach 100,000 tonnes within the next five years. It is therefore clear that **domestic fish production alone in Ghana will not meet Ghana's food security requirements in fish for the foreseeable future if ever.**

The consumption of fish in Ghana was about 540,000 tons in 2008 (23 kg per person on average) leaving a **deficit in domestic production of at least 190,000 tons** (i.e. 444,000 tons production minus 94,000 tons exported minus 540,000 tons consumed). This production deficit was satisfied through fish imports (estimated at 213,000 tons in 2007). As would be expected this excess of demand over supply is putting upward pressure on the price of fish in Ghana such that Ghanaians pay international prices for their fish and it is likely that this situation is further complicated by import tariffs. Ghana's fish economy has consequently become a complex balance between the importation of low value fish (and use of other substitutes) to meet shortfalls in domestic demand and the export of high value fish to generate increased income and profits to the sector. **There is considerable potential in**

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<sup>1</sup> This figures do not adjust for cross border exports.

**Ghana to take advantage these margins to increase the economic returns from fisheries while still meeting Ghana's food security requirements.**

#### **4. The economic potential of Ghana's fisheries**

While the information needed to provide an actual estimate of the potential economic value (i.e. the surplus of income over expenditure) in Ghana's fisheries is not available there is no doubt that significant economic returns could be generated under effective management. International experience suggests that such returns could be in the order of 30 – 60 % of fishery revenue **or at least US\$300 million per year** as a result of efficiency gains (e.g. reducing fishing effort) and value added improvements (e.g. changes in processing techniques to target high value markets and reduction in post harvest losses).

To realize such change in Ghana would require significant investment in management and value added activities. The sector profitability needed to underpin such investment is however being lost. Compared to ten years ago the average revenue received each year by each canoe in Ghana's important coastal fishery has dropped by as much as 40%. This is most likely due to three main factors; i) a redistribution catch to the semi-industrial and industrial sub-sectors, ii) a redistribution of catch to other canoes as the number of boats has increased, and / or, iii) a loss in productivity (mainly in the overfished coastal demersal fisheries). In addition it is estimated that the value of fish is reduced by as much as 37.5 % as a result of post harvest losses.

While improved management can generate significant economic benefits to Ghana it is also recognized that there will be winners and losers in the process of making this transition. There are a growing number of international experiences now available that can provide valuable lessons and insights as to how this change can be implemented to best effect in Ghana. It will however take time and require careful management to ensure impacts on individuals and communities are properly addressed. A long term commitment is therefore required to ensure that the increased benefits are used to best effect.

#### **5. Ghana Fisheries and Aquaculture Development Plan Targets**

Fisheries in are expected to play a particular and important role in leading the growth of the Ghanaian economy over the next five years. The **Ghana Poverty Reduction Strategy II (PRSP II)** aims to **double the size of the Ghanaian economy by 2015** and envisages that this change will be underpinned by agriculture and fisheries – led growth.

The Government's framework for the fisheries contribution to the PRSP II objectives is outlined in the **Republic of Ghana Fisheries and Aquaculture Policy** (the Policy). The Policy establishes five strategic pillars to guide the development and management of fisheries in Ghana into the future and sets operational objectives that are to be pursued under each of these pillars. The Policy foresees that the sector will **"contribute to socio-economic development through food and nutritional security and poverty reduction in a sustainable and economically efficient manner, within the**

**natural limits of capture fisheries resources and environmental protection requirements, and with strongly a strongly established basis for accelerated growth in aquaculture production”.**

Thus the Policy recognises that the fisheries sector is a critical part of the wider economy and must contribute to the Governments macro-economic objectives outlined in the PRSP and elsewhere. Importantly the Policy also establishes development principles to guide its implementation. These principles are wide ranging but have a strong emphasis in reducing poverty, ensuring equity and accountability, and ensuring the sustainability of the resource as well as the management system that underpins it through the adoption of sound fiscal policy.

This Plan provides explicit operational targets for implementing the Policy over the next five years. Table 1 below shows the linkages between the Policy and the seven five year targets. The rationale for each of these targets is described further below.

**Table 1: Plan Targets**

Policy strategic areas of focus	Five year Target
<p><b>Policy Area 1:</b></p> <p>Management of fisheries, conservation of aquatic resources and protection of their natural environment</p>	<p>1. Quantity of capture fishery production maintained (no fish stock collapses)</p>
<p><b>Policy Area 2:</b></p> <p>The promotion of value addition in the fisheries sector and the improvement of livelihood in the fisheries communities</p>	<p>2. Value of annual fish income increased by US\$50 million from value added projects</p> <p>3. Fisheries sector achieving annual surplus of income over costs of US\$ 50 million from value added projects and efficiency gains</p> <p>4. Ghana (the Port of Tema) remains a landing and processing hub within the West Africa tuna fishery</p>
<p><b>Policy Area 3:</b></p> <p>The sustainable development of aquaculture</p>	<p>5. Aquaculture production has expanded ten times by volume (100,000T per annum)</p>
<p><b>Policy Area 4:</b></p> <p>The improvement [and sustainability] of services provided to the sector by the [Fisheries Commission] and other supporting institutions</p>	<p>6. Fisheries management and compliance systems are in place to allow effective control of all commercial fishing effort in Ghanaian waters</p> <p>7. Government of Ghana fisheries management costs are self funding (fisheries sector overall makes a fiscal contribution to Government revenues)</p>

## **Target 1: Volume of capture fishery production maintained**

The starting point for the Plan is to recognise that the current condition of Ghana's fisheries is both vulnerable and unstable. They are vulnerable because they are fully or over-exploited (total catch of 291,000T per annum from existing marine fisheries is at or above maximum sustainable yield). They are unstable because there is a massive amount of latent catching capacity in the inshore marine fishery within all three existing harvesting subsectors (canoes, semi-industrial and trawl fleets). There is nothing to currently prevent the conversion of this latent harvesting potential into actual harvesting activity should costs or prices available to harvesters improve.

The Plan recognises that reducing the level of this latent effort is a necessary first step in improving the management of Ghana's fisheries but this in itself will have little effect on increasing stock productivity over the next five years. The approach taken is to phase in vessel licensing across sectors starting first with the industrial and semi-industrial sectors and then moving onto the canoe sectors. This is why the Plan sets a realistic production target aimed at maintaining capture fishery production at current levels.

**Annex 1** considers in further detail the immediate problem of managing the large amount of latent (unused) effort available in the fishery.

## **Targets 2 and 3: Value of annual fish revenue increased by US\$50 million and the fisheries sector achieving annual surplus of revenues over costs of US\$ 50 million**

As noted above, the marine and freshwater fisheries of Ghana are generally fully or over-exploited. Two small opportunities remain for increased production. The first is the cephalopod fishery currently targeted by trawlers beyond the 30m depth contour. This fishery is coping well with the existing harvesting pressure and could possibly support a small increase. Ideally, this increase should come in the form of a new inshore potting sector that would maximise the product quality of cuttle-fish and octopus for sale.

The second opportunity is provided by the largely unexplored deepwater demersal fishery. It is possible that small populations of orange roughy and other species are present beyond the edge of the continental shelf of Ghana. Experience elsewhere shows that such species (if present) have very low levels of natural productivity and can only sustain low catch levels. Furthermore, the topography of the seafloor in that location is difficult to fish. Nevertheless, there may be some international interest in an exploratory licence over that area.

There seems to be little prospect of adding value simply by pushing up local fish prices. As noted above, demand for fish in Ghana is strong and local fish prices are high. In fact the existence of import tariffs means that Ghanaian consumers pay prices that are above international levels for some fish products. Producers generally receive fair prices for what they sell. Opportunities to add value to fish production therefore fall into three general categories:



1. Reducing physical and value post harvest losses within the existing product range
2. Changing the product range into more valuable forms
3. Reducing costs of harvesting, processing, logistics and sales

**Under current regulatory arrangements, any initiatives within these three categories that have the effect of increasing the prices received by fishers, or conversely reducing their operating costs, will have the effect of stimulating entry of fishers into the affected fisheries.**

In the short term, 'added value' therefore equals 'added effort' rather than added profitability in an open access fishery. It therefore must be recognised that careful phasing of investments and management measures will be required to ensure that value added benefits are captured and not dissipated into increased fishing effort. With that caveat, there are clearly significant added value opportunities in Ghana that can support the achievement of targets (2) and (3) above i.e to increase annual revenue from the fisheries sector by US\$50m and annual surplus for the capture fisheries sector by US\$50m by the end of 2015. This is a modest target given the long term economic potential of Ghana's fisheries and might be revised up as investments are made and this plan is progressed over the five year period. **Annex 2** discussed in further detail how these targets might be met by reducing post harvest losses, changing product mixes, reducing costs and investing in infrastructure.

#### **Target 4: Ghana (the Port of Tema) remains a landing and processing hub within the West Africa tuna fishery**

In contrast to the three inshore marine sectors above, the tuna sector exhibits relative stability in both vessel numbers and catch. However, this stability is perhaps an illusion when the purse-seine tuna fleet is inspected. Very few vessels are less than 30 years old and routine fleet replacement appears to have stalled. The replacement cost of new purse seine vessel is in the order of US\$25m and the cost of a good second hand replacement vessel is more than US\$6m. To the extent that the legal requirement for tuna vessels to be more than 50% owned by Ghanaian interests is enforced, it is likely to inhibit investment, particularly as interest rates on vessel loans charged by local banks are very high by international standards (reportedly 26% in June 2009).

It should be a matter of urgent investigation by the Government of Ghana to discover why these investments are not being undertaken and whether capital expenditure inside canneries in Ghana is also being deferred. These canneries establish Ghana as a regional tuna hub and directly employ approximately 2,500 people. Associated with landings for these canneries are up to 35,000 tonnes of smaller grade tuna that are an important input into the local fish smoking industry or local market. The relocation of the West African tuna hub to another country would be a serious blow to Ghana.

The tuna sector is an exception to the general rule that investment in fishing capacity and added value should be deferred until the ability to manage effort has been established. The level of tuna

landings into Ghana is essentially a function of the processing capacities of Ghanaian canneries. This appears to be no more than 65,000 tonnes per annum presently. In addition, there is no overhang of unutilised harvesting capacity in the Ghanaian tuna fleet. As a consequence there is an uncharacteristically low level of latent harvesting pressure in the sector (relative to the inshore demersal and pelagic fisheries of Ghana).

Even if the demand were greater than it is, pressure would bear on shared stocks under the purview of ICCAT rather than Ghanaian fisheries. The problem for Ghana in the short to medium term is to maintain its current status as a tuna hub, to maintain the current levels of tuna landings in Ghana and thereby underpin its capacity to utilise country specific quotas established by ICCAT.

Possible threats to the maintenance of Ghana as a tuna hub include:

- Adverse cost structure including fuel costs and labour costs;
- Quality and efficiency of fishing port infrastructure;
- Ability to raise capital at competitive rates for fleet upgrading;
- Regulatory complexity and business compliance costs;

## **Target 5: Aquaculture production has expanded ten times by volume (100,000T per annum in 2015)**

Aquaculture development is one of the three major areas of policy initiative set out in the *National Fisheries and Aquaculture Policy*. It proposes the establishment of a regional aquaculture facility at Asamasa to supply fingerlings and aquacultural feedstuffs to local fish farmers. If successful, this project would be replicated in other regional centres.

Annual aquaculture production in Ghana is at present 9000 tonnes with most production coming from a few commercial farms utilising South African expertise to produce tilapia by cage culture. The success of this business has encouraged a large amount of interest from donor and international agencies (FAO, NORAD, DANIDA and GTZ) in supporting aquaculture development. The production potential for aquaculture in Ghana is unquestionable but the commercial potential of aquaculture is much more difficult to calculate.

Opportunities for aquaculture growth in Ghana can usefully be divided into three general categories:

- **fully commercial** internationally / regionally targeted operations (this includes, in particular, large scale development of large scale cage culture tilapia or pond based shrimp with an output of between 1 and 10,000 tons per annum per producer);
- **local commercial** scale operations (encompassing small-medium sized businesses producing tilapia, catfish, seaweeds and shrimp and/or polyculture with an output between 50-500 tons of production per annum per producer); and

- **small scale** aquaculture activities (small scale pond or cage culture across a range of species with an output of 1-20 tons per annum per producer)<sup>2</sup>

Looking to the future, the four fully commercial tilapia cage farming operation in Lake Volta is on track to double production to around within the next year. Other farms have just started production and have plans to build up to 10,000 tons per year. Local commercial and small scale operations are to add significantly to the production. Overall therefore a production target of around 100,000 tons per annum in 5 years was considered appropriate for this Plan. It is nonetheless acknowledged that this target will be highly dependent on the level of investment attracted into this sector over this period.

In this respect the United Nations Food and Agriculture Organisation has recently started implementing a regional project in the Volta Basin in support of aquaculture in the six countries sharing this watershed. As part of this initiative a national Aquaculture Task Force is being established in Ghana which will be informed by the Ghanaian Aquaculture Strategy document. FAO will be seeking to establish coalitions of partners to further this initiative focused on profitable aquaculture ventures. This process provides a clear opportunity to engage further in the development of a dedicated investment program for the aquaculture sector.

This Plan does not further elaborate on the National Aquaculture Policy except to set a target for increased production and address a growing gap in the policy framework for aquaculture. In order to establish a robust foundation for the commercial development of the sector it is recognised that there is an urgent need to address two sources of potential conflict that can be anticipated as aquaculture production expands:

- Conflict between aquaculture competitors for the best development sites;
- Conflict between aquaculture development and existing inland fisheries over access to space and the natural productivity of freshwater ecosystems.

The Government of Ghana needs to develop a plan for aquaculture to address these issues while they are minor. It also needs to address the fundamental issue of the nature of the occupation rights available to underpin aquaculture investments of different types and in different locations ('natural' fresh water bodies, estuarine, ocean and artificial ponds) in Ghana. Natural freshwater bodies in this context would include Lake Volta and its tributaries. The Plan provides for the development of such policy during the next five years.

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<sup>2</sup> This would include livelihood based aquaculture targeting small water bodies such as reservoirs and artisanal coastal aquaculture.

## **Target 6: Fisheries management and compliance systems are in place to allow effective control of all commercial fishing effort in Ghanaian waters**

With an annual fisheries management budget of around US\$1m per annum, the ability of Ghana to exert meaningful management control over its fisheries resources is plainly very weak. However, fisheries management capacity is not simply a matter of finance. Management capacity is multi-dimensional and a weakness in any dimension can undermine the performance of the entire arrangement. For instance, good conservation regulations are of no value unless there are consequences for those people who breach regulations.

The components of an effective fisheries management regime may be summarised as:

- Fisheries Legislation and supporting regulations including penalties
- Organisations established to discharge statutory functions
- Organisations develop appropriate operational plans and have the resources to implement those plans
- Information on fishers, catch and trends
- Support of fishers and communities for the regime
- An ongoing process of review and development of the regime

A brief review of these components in a Ghanaian context is provided in **Annex 3**. This review highlights the areas that require strengthening if a robust fisheries management regime capable of supporting the revitalisation of the fisheries sector is to eventuate. In summary it is recognised that Ghana has a largely robust legal framework but considerable work is required to build the organisational capacity, systems and procedures to properly implement the law both at a policy development and operational level. The Plan outlines steps needed to build this capacity over the next five years.

## **Target 7: Improving the Fiscal Contribution of Fisheries to the Government of Ghana**

The seventh target is that by the end of 2016, fisheries management costs will be self funding and furthermore, the fisheries sector overall would be making a positive contribution to revenues of the Government of Ghana. This is consistent with the user pays principle outlined in the Republic of Ghana Fisheries and Aquaculture Policy. It is implicit in this target that the level of funding of Government Agencies and Statutory Bodies with fisheries management responsibilities is adequate to allow the effective discharge of those responsibilities.

There is currently a broad symmetry between two pairs of fiscal elements that result in a rough form of fiscal neutrality for the fisheries sector of Ghana. This is not to say that there is an actual or

logical connection between these elements. First, the revenue collected tariff on imported fish and the expenditure on the pre-mix fuel subsidy are both approximately US\$10m per annum. The fish consumers of Ghana therefore support fishers in two ways. The tariff on imported fish they pay allows local suppliers to charge more than international market prices for their fish and the money collected from the tariff is theoretically able to fund the pre-mix subsidy (**Annex 4** discusses in more detail the perverse effects tariffs and subsidies have on the fisheries economy and how these effects might be addressed in the long term).

Second, the revenue collected from fishing vessel licences and the funding of the Directorate of Fisheries are both approximately US\$1m per annum. Clearly, this level of funding for the Department is inadequate and the 2008 Annual Report of the Directorate of Fisheries catalogues difficulties in collecting data, assessing the state of fisheries resources and providing of extension and support services. The Fisheries Commission, now supported by the Department, has a range of important statutory functions including responsibility for licensing and has inherited these capacity constraints. In addition, Ghana's ICCAT dues of approximately US\$1m are paid directly by the industry through a levy collected by the Ghana Tuna Association.

Within 5 years, the Government of Ghana should set itself the target of collecting US\$4m per annum from licence fees and levies to support the operation of the fisheries management regime and, in particular, the costs of the Fisheries Commission. The costs of enforcing the law relating to fishing, for instance those costs incurred by the Ghana Navy, should be met from general taxation. Similarly the costs of fisheries policy advice to the Minister for Fisheries should also be funded from general taxation in the medium term.

Over the first five years of this plan while the licensing regime that will be the source of much of this revenue is being established, the government will face considerable policy adjustment costs associated with establishing the Fisheries Commission and its necessary adjuncts. US\$10M has been tentatively identified as the possible level of support for policy adjustment costs over this period.

## 6. Plan Priorities

As detailed above, the Plan establishes seven targets for achievement by the end of 2015. The seven targets are inter-related and to be effective must be phased in sequence. The income, profitability, fiscal and sustainability targets rely upon the prior achievement of target 6 (effective control of commercial fishing effort). Moreover, the implementation of added value initiatives prior to the establishment of rudimentary but effective fisheries management and compliance systems will, in all likelihood, reduce total fishery production from the fishery as well as increase risks to long term sustainability.

The program of work outlined in the Plan is staged to address fishing effort and capacity in the industrial and semi-industrial sub-sectors and improve profitability in the canoe and artisanal subsectors as a priority. There is therefore a presumption in this plan that the canoe sector will remain the heart of the Ghana fishing industry. In an open access competition with semi-industrial and industrial vessels, including large pair trawlers, canoes have proved themselves a successful harvesting technology. Furthermore, beach launched vessels (even if constructed of non-traditional

materials and to non-traditional designs) are a very suitable technology for the coastline of Ghana. The sector has the potential to enter new fisheries (octopus potting) and to integrate with value added practices and marketing structures. This plan will have the effect of making the canoe sector more commercial and economically competitive.

The pathway forward is not however prescribed and the Plan leaves wide scope for policies to be developed to best meet the needs of Ghana and ensure that increased income and profit generated from fisheries is captured and used to best effect. To do this, detailed policies at a sub-sector level will be developed during the process of implementing the Plan. These policies will address important allocation issues and in particular it is anticipated that they will:

- **Determine the beneficiaries of improved management** - how income and profitability gains will be allocated amongst Government / tax payers, fisheries managers, communities, fish traders, processors, vessel owners, vessel skippers, and vessel crew;
- **Determine the nature and extent of effort reductions in the sector** - what reductions are required and whether such reductions should be applied across the sector evenly or differently within sub-sectors;
- **Determine the pace of change** - how effort reductions and value added activities in target sectors will be staged to ensure alternative livelihood and / or compensatory support can be provided to complement such change.

These are all factors that require high level political direction and wide consultation in their development. As noted in Section 5 above, some general policy guidance is outlined in the Policy (see **Annex 5**) but it is recognised that considerable work is still required to properly apply these principles to the specific problem of allocating fisheries benefits.

Overall the Plan recognises that profitability and sustainability are not in conflict. Indeed the conditions necessary for sustainability (constrained access to the fishery) are the same conditions necessary to encourage value added investment. The primary motivation for introducing licensing is to prevent overfishing and to lay the foundation for economic sustainability and growth.

For this reason, resourcing of fisheries management and control through the extension of licensing across all sub-sectors is given priority in the short term over value added projects. To do otherwise is to place the cart before the horse and stimulate overfishing with the attendant risk of fishery collapse. The environment ultimately created by this plan is one where, because of an improved fisheries management regime, Ghanaians who invest in harvesting, processing and marketing investments in the fisheries sector will profit according to the quality and scale of those investments.

## 7. Fisheries Sector Plan Activities

The achievement of the seven targets above by the end of 2016 represents a formidable management challenge. All targets are within the realistic capacity of the Ghana to deliver, provided that available resources are applied to a coherent plan and resource prioritisation reflects the

phasing of activities within the plan. This plan is essentially a package of deliberately phased capacity building investments.

The logic of the phasing can be deduced from the desired outcomes (targets):

1. In order to create a fisheries sector achieving increased revenue of US\$ 50 million and an annual surplus of revenues over costs of US\$50m, value added projects will have to be made.
2. Value added projects will only deliver surpluses if the fisheries subject to those investments are not managed on an open access basis. [Note that these value added investments are not costed in this plan. They are investment opportunities that are contingent on this plan.]
3. Open access can only be addressed if fishers are licensed and fishing without a licence has meaningful consequences.
4. Licensing requires a properly resourced and legally empowered organisation to carry out this major administrative task.
5. The licensing organisation requires a policy and planning framework that makes it accountable to the Government of Ghana

From this logical sequence, a more detailed plan reversing this sequence is developed below.

**Note:** Critical tasks are bolded. Investments outlined below are contingent upon the prior completion of critical tasks highlighted above them in the plan.

<b>Tasks</b>
<p><b>2011</b></p> <p><b>Government of Ghana approves the <i>National Fisheries and Aquaculture Policy</i> and this associated <i>Fisheries Sector Plan</i>.</b></p> <p>A fisheries policy capacity is established to support the Deputy Minister in charge of Fisheries to implement and update the Fisheries Sector Plan</p> <p>Deputy Minister provides written direction to the Commission in the form of the <i>Fisheries Sector Plan</i></p> <p>Attorney General reviews canoe licensing provisions under Section 53 of the Fisheries Act 2002 to ensure they are adequate to limit entry to the canoe fishery (a clearer statutory definition of commercial and non-commercial fishing may be considered as part of this review).</p> <p>Minister Responsible for Fisheries establishes the Fisheries Monitoring, Control, Surveillance and Enforcement Unit. This Enforcement Unit prepares a compliance strategy and resource requirement plan to support licensing</p> <p>A proposal for approval by the Government of Ghana is developed to secure sufficient funding for enforcement operations that would form an effective deterrent to unlicensed fishing</p> <p>Fisheries Commission in consultation with NAFAG, Chief Fishermen, and District Assemblies prepares a canoe licensing plan and timetable including a schedule of licence fees. It is envisaged that licenses would be granted to all incumbent (active) canoe operators, the licenses would be tradeable and possession of a licence would be necessary to qualify for pre-mix subsidy. Licence holders would have</p>



defined catch reporting responsibilities

Canoe Licence registry established capable of recording licence issues, cancellations and trades. Registry is designed with the capacity to cover inland and coastal canoe licenses

The Fisheries Commission, in consultation with NAFAG, would prepare a plan for the rationalisation of the trawl and semi-industrial fleet and the disposal of surplus capacity from those sectors following implementation of a regulatory ban on pair trawling and light fishing.

Value added proposals and projects for the inshore marine sector and the inland fishery sector are identified and analysed with maximum support from donor agencies and international finance institutions. These include new smoker technology, technology to reduce post-harvest losses and fleet rationalisation and improvement.

## 2012

The Fisheries Commission would undertake an enquiry into the condition and international competitiveness of the Ghana Tuna Industry. The objective of this enquiry is to identify policy or infrastructure issues that threaten Ghana's status as a tuna hub and to make recommendations to the Minister of Fisheries on appropriate responses to this issue

The Fisheries Commission would develop a national set of aquaculture policies that provide a framework to manage the potential resource access and allocation conflicts identified in this plan. These policies would possibly form the basis for drafting instructions for legislation clarifying or establishing aquaculture rights

### **The Fisheries Commission would issue vessel licenses to all marine and inland canoes**

The enforcement Unit would actively target any canoe fishers who chose to continue fishing without a licence.

Regional extension/management network initiated built around a nucleus of regional Commission personnel , Chief fishermen and NAFAG representatives or nominees

### **Rationalisation of the trawl and semi-industrial sector undertaken according to NAFAG plan or through cancellation of unused/underutilised licences and more rigorous vessel safety standards**

Value added proposals and projects for the inshore marine sector and inland fisheries are implemented. Aquaculture investments consistent with the new Aquaculture Policy (and legislation if needed) could be expanded

## 2013

Fisheries Commission develops proposed package of regulatory measures to promote conservation of fisheries (2001 proposals are a possible starting point for discussions). The key element is the development of suitable harvester catch units for application to all licensed fishing vessels

The enforcement Unit would continue to actively target any canoe fishers who chose to continue fishing without a licence.

<p>Implementation of value added projects in the inshore marine fishery sector and inland fishery would continue</p>
<p><b>2014</b></p> <p>Fisheries Commission develops proposed package of regulatory measures to promote conservation of fisheries (2001 proposals are a possible starting point for discussions). The key element is the development of suitable harvester catch units for application to all licensed fishing vessels</p> <p>The enforcement Unit would continue to actively target any canoe fishers who chose to continue fishing without a licence.</p> <p>Implementation of value added projects in the inshore marine fishery sector and inland fishery would continue</p> <p>The Fisheries Commission develops, for Government approval, policy to phase out import tariffs on fish and fish products as well as harvesting subsidies , notably the pre-mix subsidy</p> <p><b>Fisheries Commission implements fishing harvesting units in the inshore marine fisheries and inland fisheries</b></p>
<p><b>2015</b></p> <p><b>Tariff and Subsidy reduction programme commences</b></p> <p>The enforcement Unit would continue to actively target any canoe fishers who chose to continue fishing without a licence.</p> <p>Implementation of value added projects in the inshore marine fishery sector and inland fishery would continue</p> <p>Fisheries Commission develops proposals for the extension of the community based network into a framework for community based fisheries management built around defined fisheries management units.</p>

This plan is only an outline. Each activity outlined above requires a detailed project plan and associated budget before accurate costing of the entire plan is possible. A priority for initial funding is to support the completion of policies and the formulation and resourcing of legal and administrative processes necessary to establish and enforce licensing regimes for the marine and inland canoe sectors. In the medium term, licence fees should provide operational funding for the Fisheries Commission. This revenue stream is therefore contingent upon the capacity of the Commission to implement and maintain the envisaged licensing regimes.

Over five years, a 'ball-park' estimate of the level of transitional policy support required to build that capacity is about US\$10m. Value added investment opportunities in the marine, inland and aquaculture sectors that could be pursued subsequent to the successful implementation of suitable management controls could conceivably attract funding from the World Bank and donor sources amounting to several times the value of the initial capacity building outlay.

## Annex 1: Overcapacity and its effects

The figure below shows that total marine fisheries harvest in Ghana has peaked and is in fact declining in spite of an expansion of fisher numbers. Those fishers are experiencing a decline in their individual catch rates. (catch per unit of harvesting effort is falling).

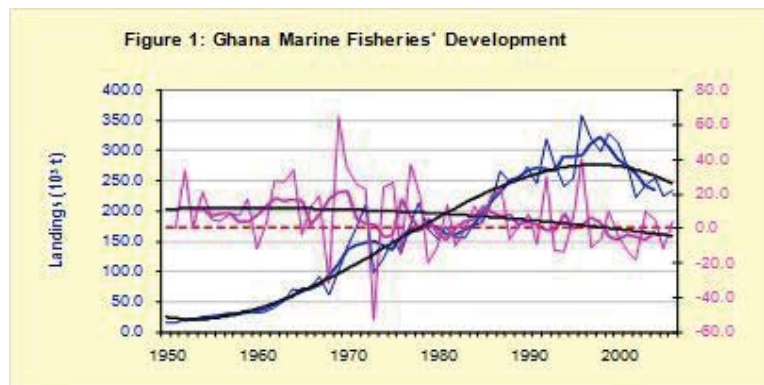


Figure 1

The expansion of fishing effort and signs of declining total landings plus reducing catch per unit of harvesting effort (see figure 1) has been of grave concern to the Department of Fisheries for many years and a suite of bold regulatory measures to reduce effort were proposed in a 2001 fisheries plan. Those measures were never implemented. So, why haven't Ghanaian fisheries collapsed given the essentially open access to them?

The first explanation lies in the robust nature of Ghana's inshore demersal and pelagic fisheries. Although subject to annual productive volatility associated with variations in sea temperature and salinity, these are essentially highly productive and resilient fisheries. The second reason lies in the relatively low efficiency of the harvesting sector that places a natural economic cap on vessel numbers and catch. It is simply good fortune that the current equilibrium point between harvesting costs and returns is at a level of catch that is lower than the level that will collapse these fisheries. Economic inefficiency is the main contributor to resource conservation such as it is.

This chance equilibrium outcome between harvesting effort and biological productivity is not an adequate footing for a sector that accounts for 4.5% of Ghanaian GDP. The major threat to the fisheries sector is somewhat paradoxical in that positive changes to the economic conditions facing the harvesting sector will cause an expansion of effort that could precipitate biological collapse of the fisheries themselves. As the figures below show, there is no cause for complacency about this situation. In all sectors of the inshore marine fishery there is a substantial overhang of surplus harvesting capacity. This overhang represents the primary threat to wealth and sustainability that must be managed over the next five years.

## Canoe Sector

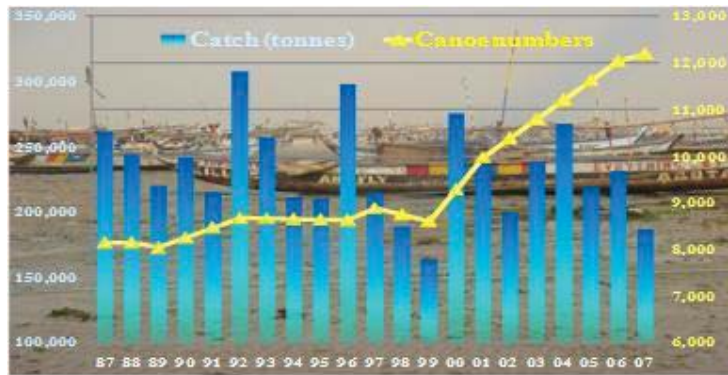


Figure 2

The canoe sector today comprises over 12,000 canoes catching approximately the same volume of fish it took in the 1990s with only 8,000 active canoes. Average catch per canoe over the last 10 years has fallen by one third and most canoes are therefore operating well below their potential harvesting capacity. It is not surprising that canoe fishers report that their livelihoods and living standards are declining. It is also hard to avoid the conclusion that the pre-mix fuel subsidy that was re-introduced in 1999 and now costs approximately US\$10m per annum is a crucial contributor to this trend.

While individual fishers feel that the pre-mix subsidy is underwriting their operating costs and therefore making them better off, a wider view demonstrates this is not actually the case. The overall effect of the subsidy has not been to improve returns to fishers but to support the entry of more fishers.

In fact, the latent harvesting potential in the canoe sector is understated in this graph because it excludes three sources of possible new effort:

- i. The 12,000 canoes above are 'active canoes'. There are many more that are used for occasional artisanal use that could be re-activated and join the "commercial canoe fleet" if the circumstances were right. No reliable estimate of 'inactive' canoe numbers is currently available.
- ii. The graph does not consider the large number of canoes that have transferred from the marine fishery to the inland fisheries over the last decade. The freshwater fishery is also fully to over-exploited and a large number of canoes could conceivably exit in this fishery and re-enter the marine fishery if marine fish prices were to improve.
- iii. It is well known that the Ghanaian canoe fleet operates throughout the region. This fleet is mobile and could re-enter the fishery within Ghanaian waters if harvesting returns available in Ghana improved relative to their existing locations elsewhere.

The only plausible reason why canoes from these three sources do not join the 12,000 active canoes in the inshore marine fishery is that their owners and operators cannot confidently cover the operating costs of fishing, let alone generate any profits that can contribute returns to the capital costs represented by a canoe.

### Semi-industrial Sector

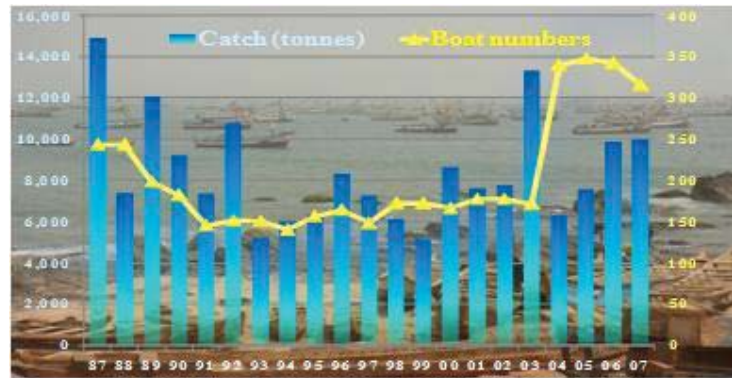


Figure 3

Like the canoe sector, numbers of semi-industrial vessel were relatively constant at around 150 for the 1990s. Numbers and catch spiked sharply upwards in 2003 and while catch fell quickly, vessel numbers have remained at around 350. Average catch per vessel has fallen dramatically to levels that are approximately half that of a decade ago. The most plausible explanation for the change in fleet size in 2003 was the introduction of light fishing that year. The initial success of this innovation caused an influx of nearly 200 vessels into the fishery within 12 months. There are approximately 600 vessels in this class and 250 of them are not currently fishing. If the threatened ban on light fishing is introduced and enforced, a significant reduction of operating semi-industrial vessels can be anticipated. However, if numbers of active vessels fall to pre-light fishing levels, there will still be an astonishing 400 'decommissioned' semi-industrial vessels that could re-enter the fishery if any economic opportunities presented themselves.

### Industrial Trawl Sector

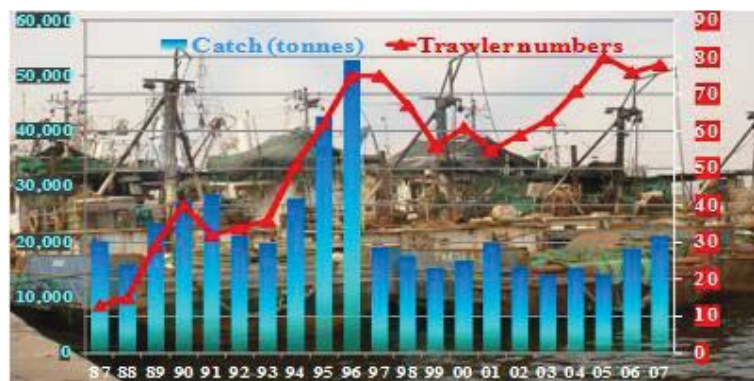


Figure 4

There are currently 84 licensed trawlers in this category. The 2008 *Annual Report of the Directorate of Fisheries* (19 January 2009) shows a total catch from the industrial and pair trawl sector of 17,597 tonnes. Average catch per vessel is therefore a mere 209 tonnes. While the total catch figure excludes transshipping of fish sold directly to canoes (and presumably included in 2008 canoe landings of 211,987 tonnes) it is a remarkably poor average for vessels of this size and power. In a healthy fishery, a fleet of ten or so sound vessels in this class would be sufficient to harvest the reported quantity of 2008 landings.

The graph above shows trawler numbers and catch rising rapidly through the 1980s and 1990s until the collapse of the *balistes* fishery. The present fleet size is roughly the same as it was prior to this disaster when catches were over 50,000 tonnes. In other words, reported average catch per vessel has fallen by over 50% since 1996. Nine trawlers have been re-fitted to operate in the trawl octopus fishery and an unknown number of trawlers are also unserviceable. Generally, this sector presents itself as being in very poor condition and not supporting routine repairs and maintenance, let alone capital replacement.

### Inland Capture Fisheries

Information on the production and performance of inland capture fisheries is poor. The 2008 Annual Report of the Directorate of Fisheries gives production figures of 75,590 tonnes from named locations along the Volta Lake. When the rest of Lake Volta and other inland waterways are included a best guess of inland capture fishery production would be a minimum of 150,000 tonnes. This artisanal fishery supports an estimated 80,000 fishers and a similar number of people in fishery related activities especially the smoking and sale of fish.

Notwithstanding the absence of basic data about catch, anecdotal evidence consistently supports the conclusion that these fisheries resources are fully to over-exploited. The overall situation is therefore similar to that for the inshore marine fisheries where fisheries rents are zero, there is a substantial overhang of latent harvesting capacity and that any change to economic conditions which increased harvesting effort is likely to have an adverse effect on total fish production.

Perhaps the only difference between the two situations is that, unlike Ghana's marine capture fisheries, it is technically feasible to rebuild some of these inland capture fisheries in the event of collapse. Species such as tilapia, Nile perch and catfish can theoretically be rebuilt by restocking. However, the requirement to resort to restocking would indicate that an economic disaster had befallen tens of thousands of people and the first objective of the Government of Ghana must be to avoid such a disaster.

### Overcapacity and its Effects

Based on the numbers above, the current overcapacity of vessels in the inshore marine fishery of Ghana can be conservatively estimated at 4,000 canoes, 400 semi-industrial vessels and 60 industrial trawlers. The 'predators' are therefore completely out of balance with their potential 'prey'. This imbalance not only represents an obvious threat to the sustainability of the fisheries, it has profound economic impacts on every vessel owner in the sector.

An unutilised fishing vessel represents a sunk investment with a current value of zero. The owner of such a vessel would be prepared to use it for harvesting if harvesting returns (before return to capital) were marginally greater than harvesting costs. The fact that so many vessels are not operated is compelling evidence that many harvesters active in the fishery are getting extremely poor returns on their investments in vessels (certainly, their returns are below the current opportunity cost of capital in Ghana for investments with the risk profile of a fishing vessel). The current economic value of the entire Ghanaian canoe, semi –industrial and trawler fleets is a tiny fraction of their replacement cost.

The first hidden cost of harvesting over-capacity is that the investments of Ghanaians in inshore marine fishing vessels are devalued and in many cases practically worthless. The extent of idle over-capacity also suggests that the market for such vessels in other uses or for scrap is also very weak. In the case of the trawl fleet the costs of de-commissioning and disposing of some of these vessels in an environmentally responsible fashion exceeds the returns of doing so. In the case of canoes and semi-industrial vessels the best option for many owners seems to be to hold on to an idle vessel and hope for the emergence of harvesting opportunities somewhere.

The second cost is that financiers who understand the dynamics of open access are only prepared to provide capital to operators in such a fishery at very high interest rates. The reason for this is that even if the party seeking to raise capital can identify returns today able to service the investment, there is a high chance that those returns will be swiftly eroded away by competitors who have written off or written down the value of sunk investments in the fishery. In addition, a risk premium to reflect the danger of biological collapse could also be expected to form part of the required rate of return. This largely explains the run-down nature of the capital base in the Ghanaian fishery. New investment cannot generate the rates of return required by capital markets and sunk investment is stranded.

High required rates of return in open access fisheries lead to two more adverse behavioural responses. First, the imperative to extract maximum revenues today means that the longer term consequences of that behaviour are discounted. Harvesters under severe financial pressures cannot be expected to exhibit a conservation ethic even though they are aware of the damage being done by their collective efforts to a fishery. Second, harvesters will attempt to alleviate their individual levels of financial stress by demanding subsidies from Government. Provision of those subsidies in open access fisheries supports an increase in fisher numbers rather than fisher margins. This outcome leads to calls for further subsidies and so on.

## Annex 2: Added Value and Improved Profits

Revenue Growth will arise from a combination of reduction in post-harvest losses and improving the value of product mix from available harvest. FAO have estimated that the annual value currently lost from post harvest losses alone is US\$70m per annum. It is not thought that this level of loss can be eliminated within the five years of this plan. Value added opportunities include both revenue growth and cost reductions. These opportunities are described in very general terms below. Specific projects under these headings should be initiated once the ability to constrain expansion of fisher numbers and effort has been established.

### Post Harvest Losses

The FAO has estimated that physical post harvest losses are between 3 and 17% of smoked fish production and 16 to 20% of gillnet landings. Qualitative losses are even greater. Two established technologies are available that could reduce these losses.

The first is a new generation small-scale fish smoker to replace the standard *Chorkor* model. The new smoker does not expose the fish directly to flame nor the operator to smoke that is associated with eye problems from extended use. The second is simply to make greater use of ice in the logistical chain from harvest to market or to processor.

### Changing the Product Range

Changing the existing product range entails provision of wider marketing options to harvesters to ensure that different species and grades of fish are allocated by a dynamic market process to the customers that provide the best net returns. The availability of such sales options to fishers is likely to see lower quality pelagic (oily) fish directed towards smokers and an increased volume of higher value pelagic and demersal fish sold in chilled or frozen form. Most canoe fishers presently have very constrained sales options because of the poor shelf life of their fish at landing, and narrow sales channels that are dominated by local buyers who are the owners of nearby smokers and sometimes also canoe owners or canoe financiers.

### Reducing Costs

The most obvious opportunity for cost reduction is through fleet rationalisation. In an over-capitalised fishery, the exit of a vessel basically re-allocates its catch to those vessels that remain. They therefore receive an increase in catch and revenue for a negligible change to their operating expenses. While the annual operating cost of each remaining vessel is the same or slightly higher, total costs fall because the use of capital and the associated cost of servicing that capital have reduced in the fishery. The cost, or more correctly, the opportunity cost of capital is frequently overlooked in the analysis of fishery costs.

### New Ports and Landing Sites

Consistent with the *National Fisheries and Aquaculture Policy* and the manifesto of the current Government, plans are well advanced for the construction of harbours at Jamestown and Elmina and



landing sites at Teshie, Ada, Axim, Dixcove, Winneba, Mumford, Senya-Beraku, Gomoa Fetteh, Moree, Keta, Dzemeni and Tapa Abotoase. These facilities are planned to include, ice making plants, processing facilities, cool stores and crèches.

There are many unanswered questions about who will operate these ancillary facilities and how their ongoing operating costs will be funded. These facilities represent a threat to the existing fish smoking sector in that (if successful) they will divert product from smoking channels into fresh or frozen fish sales and increase the beach prices of fish generally. It is not clear that the proposed facilities associated with the ports and landing sites have the support of 'fish mummies' or at least formidable commercial advocates able to resist any opposition from that quarter.

While the inshore marine fishery remains open access, it is unlikely that the proposed ports and landing sites will achieve their stated aim of improving the incomes of the fisher poor. Rather, for general reasons outlined above, they will increase the numbers of such people.

The landing sites will conceivably increase the safety of canoe launching and landing operations and reduce fatalities in the sector. However, canoe fishing will remain a hazardous occupation. These factors suggest that the development of these landing sites needs to be pursued with care to ensure that they are implemented in phase with key policy developments (i.e. licencing) and that social disruptions are appropriately catered for.

## Annex 3: Fisheries management capacity and institutions

Following is a brief review of institutional and capacity components for effective fisheries management in Ghana.

### Fisheries Legislation

The Fisheries Act, 2002 is a generally well conceived and clearly drafted statute. It envisages the establishment of a Fisheries Commission with a board composed of senior representatives of Government Ministries and agencies connected with marine or fisheries affairs as well as two representatives from the National Fisheries Association of Ghana (NAFAG), the Director of the Commission, a Chairman and one other expert. The Commission shall be supported in the performance of its many functions by a secretariat of public officers. It has considerable flexibility in the organisation and location of this secretariat and can also establish various committees of the Commission itself.

The Commission has broad statutory responsibilities for the licensing of fishers and the preparation of fishery plans. The Act sets out a wide range of operational responsibilities and various matters on which the Commission will provide the Minister responsible for fisheries recommendations and advice. For instance, industrial and semi-industrial vessel licences are issued by the Minister on the recommendation of the Commission and the Minister does not appear to have the power to reject such a licensing recommendation. On non-licensing matters, the Minister is not legally bound to accept Fisheries Commission recommendations.

The second crucial organisational arrangement described in the Act is the establishment of the Monitoring, Control, Surveillance and Enforcement Unit mainly comprised of personnel from the Armed Forces of Ghana and employees of the Commission but also with a representative of the Attorney General's Office. The Minister may appoint public officers as 'authorised officers' under the Fisheries Act with police powers, including the power to arrest persons believed to be committing offences against the Act.

The third crucial capacity envisaged by the Act is not described in detail like those above but can be inferred from section 3.(2) *The Minister may give general directions in writing on matters of policy and the Commission shall comply with the directions.* From this, we can conclude that the Commission is intended to operate within a binding general policy framework imposed by the Minister. In the short term, the key task of such a unit would be to drive through the implementation of a fisheries plan of the type outlined in this report, following Government approval of the plan.

This general legal framework of four parts has much to commend it:

1. The Minister (with the support of a Ministry / Commission) sets general and binding policy but is not involved in day to day operational fisheries management decisions
2. The Commission is responsible for operational matters under the statute and ensures operational co-operation between all parties represented on it

3. Authorised officers of the Monitoring, Control Surveillance and Enforcement Unit are responsible for policing the provisions of the Act
4. The Courts are responsible for determining the guilt or innocence of those charged with fisheries offences as well as the imposition of suitable penalties within the statutory guidelines provided (although Section 116 of the Act allows for compounding of offences where the party has both admitted guilt and a willingness to pay an amount determined by the Commission into the Fisheries Development Fund as a penalty).

The only significant apparent deficiency in the Statute is the requirement in section 53 of the Act to issue canoe licences on demand. Presumably, the rationale for this provision was to ensure that Ghanaians were not barred from subsistence fishing opportunities. Unfortunately, any conflation of the canoe sector with subsistence fishing is not apt. The canoe sector is commercial and is the largest component of the Ghanaian fishing industry by every measure. It is not possible to manage Ghana's fisheries without managing the canoe sector which is the present and future heart of the inshore marine fishery sector. It is therefore essential that the number of canoe licenses can be controlled in future and the legal basis for those controls must be reviewed as a matter of priority.

## Organisational Structures

The analysis above indicates that four distinct functional capacities are required for the Act to operate as intended.

- i) **Judicial capacity:** No special Courts need be established to deal with fisheries offences although every additional statute must inevitably place a greater burden on the Courts and the Attorney General's Office.
- ii) **MCS capacity:** The Monitoring, Control, Surveillance and Enforcement Unit (The Enforcement Unit) could be co-located with the Commission or possibly with the Ghana Maritime Authority or the Ghana Navy. Its personnel are essentially seconded from their respective organisations. The Enforcement Unit is an adjunct of the Fisheries Commission and its establishment would follow from the re-establishment of the Commission.
- iii) **Policy capacity:** The Minister of Fisheries requires a policy capacity to develop general fisheries policies for approval by Government for implementation by the Fisheries Commission. Policy capacity to lead consultations, analysis and monitoring of overall sectoral performance against an approved plan is needed.
- iv) **Fisheries management capacity:** The Fisheries Commission is the primary body established under the Act to implement a range of statutory responsibilities to ensure the effective management of fisheries. It must therefore be established with sufficient and suitable personnel to implement its many statutory operational responsibilities. As

these responsibilities include extension and training to the aquaculture and artisanal sectors, some Commission employees are likely to be based in regional offices. Arguably, these protection and promotion functions under Section 51 of the Fisheries Act could encompass the administration of the pre-mix subsidy scheme at local level. The Act envisages a comprehensive licensing regime wherein all fishing vessels, including canoes used for artisanal fishing are licensed.

## **Operational Planning and Resourcing**

Inadequate resourcing of all aspects of the fisheries management regime has been the historical situation in Ghana. Licence fees extracted from the industrial and tuna sectors are completely inadequate to fund a fisheries management regime that must also support and manage a very large artisanal sector. The shortage of funds is exacerbated by the fact that there has been no overarching plan for the fisheries sector that would support the targeting of what limited funds and resources are available. In addition, recent organisational changes (including the disestablishment of the Ministry of Fisheries) are having notably adverse effects on the morale of Government employees with fisheries sector roles.

## **Information on Fishers, Catch and Trends**

The 2008 Annual Report of Directorate of Fisheries exemplifies the limited extent of reliable data on the fisheries sector available to managers. Perhaps the most glaring example of this is the inability to estimate the level of harvest from inland fisheries. Given the very limited resources of the Fisheries Department it is a creditable performance that an overall picture of the condition of the fisheries sector has been assembled.

However, there is a big difference between collating information that can describe a situation after the fact and collecting and analysing data that can be used to improve the management of a fishery in real time. For instance, the productivity of particular upwelling events can be predicted by the existing monitoring of sea surface temperature and salinity. However, no use is made of this information to manage the subsequent utilisation of that productivity to ensure sustainability and to maximise wealth.

Potentially, the best sources of fisheries management information are fishers themselves. Licensing is a crucial way of identifying who these fishers are but also imposes obligations on licence holders to disclose information about quantity, location and composition of catch so that, when consolidated and analysed in a timely fashion, fisheries managers can detect trends in the state and performance of fisheries. In particular, fisheries managers need the ability to detect adverse trends in catch volume, catch rate and size of fish caught.

In many countries, scientists seek to obtain such information from direct surveys independent from information supplied by harvesters themselves. This approach to the collection of data is completely unrealistic in the case of Ghana on grounds of cost. Furthermore it is a second best approach in any event because no research survey can ever be as extensive as the harvesting effort of fishers.

## Community Management and Fisher Support

Evidence from around the world indicates that fisheries management regimes only work effectively if they have the support of fishers and their communities. After all, the outcome of a fisheries management regime is simply the sum of all of the actions of every single fisher in the fishery. Education about the consequences of over-fishing or environmentally harmful fishing practices plays an important role in gaining such support but the crucial ingredient is the alignment of the economic incentives confronting fishers with imperatives to promote the generation of wealth and sustainability rather than economic incentives to maximise individual catch volumes.

No incentives to support sustainability and wealth creation exist while there are an open access points into a fishery. Communities must therefore accept the need to limit fisher numbers. Such acceptance can generally be obtained if the rights of all incumbent fishers in the community are recognised.

The challenge in the canoe sector is to issue licenses to all canoes (canoe owners). The short-term objective is to introduce an associated prohibition on fishing without such a permit. For this prohibition to work, licensing needs to be supported by canoe operators so that in effect there are 12,000 canoes looking out for unlicensed operators and providing intelligence to the Enforcement Unit that hopefully would lead to their apprehension and prosecution.

Licensing is only the first step towards the establishment of responsible management practices within the canoe sector. Once the number and identity of fishers in a particular site is stabilised, the conditions exist for the development of local codes of practice governing fishing places, times, methods as well as the potential for some collective investments in added-value fish handling and marketing initiatives. This is an evolutionary and local process but some lessons from unsuccessful community management initiatives can be absorbed to encourage it. Briefly, these lessons appear to be:

- Community fisheries management initiatives do not work if there is open access. The primary focus of many canoe communities is on getting rid of competitive effort from pair trawlers and light fishers rather than developing local management practices.
- Community fisheries management initiatives do not work if they are burdened with expectations to manage a wide agenda of social and community development issues. Committees become dysfunctional if there are too many non-fishers involved. They also undermine the traditional status of the chief fisherman.
- Community fisheries management initiatives do not work if they lack technical support and financial resources. In the medium term, funding must come from fishers themselves, which means that fishers must see some obvious benefits from these groups or committees.

Under Section 53 of the Fisheries Act it is the Fisheries Commission that both controls the form of licence applications and determines the nature of information that a licence applicant must provide. It may also direct that an application shall be routed through the District Assembly of the area where

the applicant intends to operate their canoe. The Commission is also responsible for the registration of and marking of canoes (which are intended to be a pre-requisite of licensing).

There are several matters that should be carefully balanced by the Fisheries Commission when considering the best framework for licensing.

- The processes of vessel registration, vessel marking and vessel licensing should all be co-ordinated and lend themselves to consolidated administration.
- As registration and marking are intended by law to be managed directly by the Commission, it seems sensible to manage licensing in the same fashion.
- If District Assemblies, as canoe licensing conduits, retain some or all of the licensing fees, there will be a financial incentive on Assemblies to issue as many licenses as possible. Licensing by District Assemblies is only sensible therefore while an open access policy is retained.

## **Policy and Operational Reviews**

This Options Paper outlines a five year plan for the fisheries sector. Planning is a dynamic process however. Ideally, the initial five year plan would operate on a rolling basis so that outcomes are reviewed against the performance measures and the plan is adapted in out-years as necessary or desirable. This process of review would no doubt also involve consultation with funders of particular projects under the plan who could carry out thorough evaluation of added value opportunities within a process that supports the earliest practical realisation of those opportunities.

## **Fisheries Management Capacity Building**

The discussion above shows the critical gaps in Ghana's fisheries management capacity. In the short term, the priority for the re-constituted Fisheries Commission should be to equip itself for the effective and prompt discharge of its licensing responsibilities, including the extension of licensing to the marine canoe sector. At the same time, it needs to ensure that the Enforcement Unit is in a position to support the integrity and value of those licenses through programmes to apprehend unlicensed fishing.

## **Licensing and Effort Control**

As is evidenced by the existing trawl and semi-industrial sectors, licensing itself does not prevent overfishing or over-capitalisation. However licensing is a crucial precursor to effort control. It prevents the growth of fisher numbers but not the growth of effort by incumbents. Controlling effort and total harvest requires the attachment of fish harvesting units to the licence. These units can take different forms such as a single or multi-species output limit or quota. Alternatively they can be denominated as a limit on inputs such as a designated number of fishing days or hook sets. As the most appropriate definition of fish harvesting unit will vary between the various sectors in the Ghanaian fishing industry, no effort is made to define them in this report. However, their appropriate specification is a crucial element in the design and performance of the fisheries management regime and it is likely that a significant proportion of any policy adjustment support

would target tasks relating to the development and implementation of appropriate harvesting units in the canoe sectors.

Although the evidence suggests that no economic rents are being generated by the canoe, semi-industrial and trawl fisheries, licenses in those fisheries will have a positive value provided the number of those licenses is then limited. This is because in a closed fishery licenses reflect option value, or the potential that fisheries management will one day support the generation of rents through rationalisation and value added initiatives and that of some of those rents would be captured by licence holders. When this point is understood, 'grandfathering' fishers into licenses then closing the fishery to new entrants other than through the purchase of a licence is likely to be a popular policy.

As soon as fish harvest units are attached to licenses, an active market in licenses can be expected as the only way available for an individual canoe operator (say) to expand their business would be to buy a licence from someone who decides to exit the fishery. This process of rationalisation is sound as the seller receives compensation for exiting that presumably assists them in establishing an alternative livelihood and the purchasing party only expands effort in response to real commercial opportunities.

## Global Warming

There are a great many uncertainties about how the phenomenon of global warming might affect the fisheries sector of Ghana. What we can predict is that global warming effects would change the performance and dynamics of aquatic ecosystems and it is probable that an increase in variability in productivity would occur. The general nature of the response required is therefore a capacity to cope with this increased variability. The goal is for managers and economic dependents in the fisheries sector to be able to have the flexibility and resilience to cope with those shocks without adding to sustainability risks.

Ecological and economic resilience depends upon three elements within this fisheries sector plan:

1. The capability of fisheries managers to adjust the level of fishing effort as needed when environmental conditions change. In turn, this implies licensing to limit entry and the imposition of fish harvesting units
2. Data about the performance of fisheries. This data is primarily sourced from harvester reports but collated and analysed in a timely fashion for application against decision rules that will adjust fish harvesting units and other effort controls
3. Profitability. Harvesters will be able to cope with the need to adjust effort if they are not operating at economic subsistence levels. Profitability is a crucial source of resilience and therefore a key measure of the inherent resilience of any regime.

## Annex 4: Tariffs and Subsidies

Demand for fish in Ghana exceeds domestic supply and the shortfall is covered by approximately 200,000 tonnes of imports. About 5% of this volume is transhipped to neighbouring countries in addition to approximately 8,000 tonnes of recorded fish exports. Officially this indicates net imports of 180,000 tonnes primarily consisting of horse mackerel, mackerel and *sardinella*. Even though this amount does not account for significant exports of these species in smoked form to other West African countries, the inescapable conclusion is that Ghana will remain a significant importer of these species for the foreseeable future. Given the central importance of fish as the main protein source in the Ghanaian diet, a policy that forces Ghanaians to pay above international prices for fish would require very compelling justification. On examination, arguments that the tariff will increase domestic supply from the marine fisheries and aquaculture sectors have important flaws.

The local protection and domestic economic incentive provided by the tariff to fishers in the inshore marine fishery cannot lead to increased production because those fisheries are already fully or over-exploited. Indeed, it is quite possible that the tariff is stimulating harvesting effort beyond the MSY point and thereby reducing total production. The tariff may stimulate aquaculture targeted at the protected local market in the short term, but as soon as that market is saturated, Ghanaian producers will find it difficult to export profitably at competitive prices.

The tariff cannot be eliminated in the short term without displacing fishers from their livelihoods. In the long term, however, import tariff elimination should be a goal.

The effect of the pre-mix fuel subsidy is likely to be the same as that of the fish import tariff i.e. it has not led to increased production because the fisheries are already fully to over-exploited (output from these fisheries today is no more than average production during the 1990s prior to the re-introduction of the pre-mix subsidy). Neither has it improved the profitability of operating a canoe. The entry of 4,000 additional canoes into the fishery since 1999 has suppressed the profitability of individual operators to break-even point.

The pre-mix subsidy cannot be eliminated in the short term without displacing large numbers of canoe fishers from their livelihoods. In the long term, however, pre-mix subsidy elimination should be a goal.



## Annex 5: Policy principles

The following national development priorities and general principles, which are subjected to periodic reviews, will inform and guide the National Fisheries and Aquaculture Policy and the implementation of this Plan:

- Poverty reduction: consideration is given to the national agenda for poverty reduction in connection with actions undertaken in the sector;
- Decentralization: in line with current practice, decentralized and community-based institutions play a key role in co-management and development;
- Divestiture of government function: involvement of government in activities that can be carried out by the private sector is avoided;
- Gender equity: the active participation and respective role of men, women and youth in the sector is recognized and accounted for;
- Code of Conduct: actions are guided by the FAO Code of Conduct for Responsible Fisheries, its supporting international fisheries instruments and related technical guidelines;
- Stakeholder participation: the Policy supports stakeholder participation at community and industry level as regard to fisheries management and sector development;
- Sustainability: the Policy seeks to avoid the overexploitation of fisheries and detrimental environmental and economic impacts. In case of uncertainty, a precautionary principle is applied and effective action is taken to reduce the risk of serious harm to fish stock, habitats and the environment in general;
- Conservation: the Policy seeks to ensure appropriate use of fish and fishery resources to conserve genetics and biodiversity;
- Research: the Policy seek to ensure that scientific research should be the basis to drive development and management of the fisheries sector;
- Education, Training and Public Awareness: the Policy will ensure education and training of all stakeholders and also public awareness creation of the fisheries sector;
- Equity: equity guides Government action in general and in relation to the specificities of the sector. Intergenerational equity is sought through resource management and environmental protection. Gender-related equity is sought in participatory and co-management processes. The user pays principle is applied whereby users of common property natural resources such as fisheries pay access fees and contribute towards the cost of managing fisheries for the benefits of future generation;
- Polluter pay principle: integrate pollution and control for fisheries resources; and
- Transparency and accountability: these general principles of good governance also guide Government action.