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OIL AND FISHERIES IN GHANA: PROSPECTS FOR A SOCIO-ECOLOGICAL COMPACT

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ABSTRACT

Fisheries play a crucial role in supporting livelihoods and food security in Ghana. While there is a sizable industrial fishing fleet, more than two-thirds of Ghana's total marine fish catch is accounted for by artisanal fishers. These fishers now share Ghana's marine domain with the country's emerging oil sector, an industry that has raised hopes of a significant economic boost for the country while at the same time eliciting concerns around potential environmental and social impacts. This paper explores the relationship between Ghana's oil and gas sector and the artisanal fishery sector, highlighting areas where greater co-operation may support improved trust between stakeholders and contribute to the long-term sustainability of Ghana's artisanal fisheries. The current debate focuses on minimising negative impacts of the oil sector, but the paper argues for a more constructive engagement that would see effective partnerships addressing the broad set of stressors and challenges currently facing the artisanal fisheries sector. Increasingly, stakeholders are accepting that the oil sector is not the most important threat to the long-term sustainability of Ghana's small-scale fisheries. However, more needs to be done to explore opportunities through which the oil sector, together with government authorities and other stakeholders, can support artisanal fisheries in addressing the core challenges facing the sector. These challenges include fleet overcapacity, the widespread use of illegal fishing gears, climate change, pollution, a lack of research to inform fisheries management decision-making, and a lack of marine protected areas to support stock recovery.

ABOUT THE AUTHOR

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ABBREVIATIONS AND ACRONYMS

ABFA	Annual Budget Funding Amount
EIA	environmental impact assessment
EIS	environmental impact study
EITI	Extractive Industries Transparency Initiative
FPSO	floating production storage and offloading vessel
GDP	gross domestic product
GNPC	Ghana National Petroleum Corporation
IMF	International Monetary Fund
MODU	mobile offshore drilling unit
NGO	non-governmental organisation
PRMA	Petroleum Revenue Management Act

INTRODUCTION

In December 2010, at a ceremony hosted on an offshore oil platform in Ghana's Jubilee Field, then Ghanaian president John Atta Mills opened a valve to allow the country's first commercially produced oil to flow. Ghana had joined the ranks of Africa's oil-producing nations. It was a moment that had been awaited with a sense of both hope and trepidation since the 2007 discovery of commercial quantities of oil in Ghana's offshore waters. Ghanaians were all too aware of the many deleterious impacts associated with oil production in their regional neighbour Nigeria, as well as other oil-producing states. Moreover, Ghana had experienced the challenges posed by natural resource exploitation in the development of the country's existing resource sectors such as gold and timber. Yet the transformative potential of oil revenues had also captured the public imagination. The oil platform that produced Ghana's first oil had been named *Kwame Nkrumah*. Now, a full half-century after Ghana's independence, many sensed in Ghana's oil reserves the potential for renewal and prosperity, mirroring the buoyant expectations inspired by the country's first post-independence leader.

The sense of optimism did not stem exclusively from the prospect of oil revenues. In the decade preceding the discovery of oil in Ghana, the country's economy had been growing at over 5% annually, the number of Ghanaians living in extreme poverty had been halved, and debt stocks had been reduced by half through the Multilateral Debt Relief Initiative. The 'commodity supercycle' of the first decade of the 21st century was a period of strong demand and high prices for Ghana's exports of cocoa, gold and timber.

It was clear that Ghana's oil reserves were not as substantial as those of Nigeria, Libya or Angola. With a population of 26 million, potential revenues would further not be as concentrated as in countries such as Botswana that have both significant resource wealth and small populations. Yet despite these cautions, there was a sense that Ghana's oil reserves could provide a significant boost to the economy. Ghana could benefit from decades of experience and research into the relationship between natural resource wealth and development, a discourse still dominated in many ways by the binary conception of natural resource wealth as either a curse or a blessing.

Ghana's developing offshore oil and gas sector shares the maritime domain with one of the country's oldest economic sectors, its fisheries. In addition to industrial fishing vessels, 10 000–12 000 artisanal canoes ply Ghana's waters. This artisanal fleet accounts for as much as 70% of the total marine fish catch, representing not only a crucial source of protein for Ghanaians but also sustaining a network of livelihoods engaged in boat building, trading of fishing supplies, fishing, fishmongery and others. This paper explores the relationship between Ghana's emerging oil and gas sector and the country's artisanal fishery sector, highlighting areas where greater co-operation may support improved trust between stakeholders and contribute to the long-term sustainability of Ghana's artisanal fisheries.

OIL, DEVELOPMENT AND THE RESOURCE PARADOX IN GHANA

There is an extensive literature postulating and testing the economic, political and institutional mechanisms through which resource wealth may negatively affect development. Often referred to by the shorthand term as the 'resource curse' literature, the direction of causality between governance and resource dependence and the empirical validity of these mechanisms continues to be contested.[1] While there are many cases in which resource-wealthy states have failed to show positive developmental outcomes, there are also several cases in which resource wealth has enhanced prosperity at the national level. It is more appropriate then to frame this debate in terms of a set of resource paradoxes, rather than the simplistic binary of resources as either a curse or a blessing.[2] It is important to recognise, however, that natural resource exploitation is often associated with significant social and environmental trade-offs. There is an ongoing debate on what the term 'sustainability' can or should mean in relation to extractive industries that are based on non-renewable resources. Where this term is used in relation to extractive industries, common themes are the minimisation of negative social and environmental impacts and the reinvestment of resource rents in ways that support broader socio-economic development.[3] The government's management of natural resource rents and the channelling of those resources into sustainable development may be understood in terms of two key questions: how effectively does a government generate and capture rents from the extractive industries, and secondly, to what extent is resource wealth invested in a sustainable, pro-development manner?[4]

A major review of the literature on natural resource wealth and development, while noting that the relationship between resource rents and sustainable growth is not necessarily inverse, concedes that 'the stark political reality is that resource rents in developing economies are most often generated and distributed in the context of highly imbalanced and non-inclusive power structures that privilege short-term private enrichment over longer-term collective welfare enhancement'.[5] The exceptions to this general rule – those resource-rich states that have been able to harness resource wealth for sustainable development – are generally characterised by strong institutions that promote inclusive, transparent and accountable governance. In this respect, Ghana was considered to have encouraging prospects.

1 Alexander J, 'The resource curse: A statistical mirage?', *Journal of Development Economics*, 114, 2015, pp. 55–63; Brunnschweiler CN & HB Erwin, 'The resource curse revisited and revised: A tale of paradoxes and red herrings', Journal of Environmental Economics and Management, 55, 3, 2008, pp. 248–264.

2 Barma N *et al.* (eds), *Rents to Riches?: The Political Economy of Natural Resource-Led Development*. Washington DC: World Bank Publications, 2012, p. 27.

3 For a review of this debate, see Wessel GR, 'Beyond sustainability: A restorative approach for the mineral industry', Geological Society of America Special Papers, 520, 2016, pp. 45–55.

4 Barma N *et al.*, *op. cit.*, p. 10.

5 *Ibid.*, pp. 217–218.

Development of Ghana's oil sector governance regime

Following a return to multi-party democracy in 1992 and the adoption of a new constitution in 1993, Ghana has become one of the leading African states across a range of good governance indicators.[6] It has consistently been among the top 10 countries in the Ibrahim Index of African Governance, rates high for press freedom and other civil liberties, and has steadily improved in the Corruption Perceptions Index. Ghana is also the highest ranked African state in the Natural Resource Governance Institute's Resource Governance Index, with particularly high scores for its institutional and legal setting, and for safeguards and quality controls. However, governance assessments have not been uniformly positive.[7] Concerns have been raised regarding transparency and access to information. Draft access to information legislation has been under consideration for several years, yet has not been passed by Parliament. Ghana signed up to the Global Open Government Partnership in 2011, but cabinet has not approved the action plan that would guide the implementation of the initiative. In 2015 Ghana was ranked seventh in Africa in the Ibrahim Index of African Governance, but the index noted that governance in the country has been deteriorating since 2011.

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At the time of the discovery of Ghana's offshore oil reserves in 2007 the country already had institutional and regulatory systems to govern the energy sector. Limited oil production in Ghana had been initiated as early as the 1970s, and the Ghana National Petroleum Corporation (GNPC) was established in 1983 to lead the government's engagement in the sector. However, as Ghana moved rapidly towards production following the 2007 oil find, it was recognised that institutional and regulatory systems would require further development. The Petroleum Commission was established through the Petroleum Commission Act (Act 821) in 2011 to serve as regulator for the upstream oil sector. This was to ensure that the GNPC was not both player and referee in the sector. Revenue management was understandably a key concern for the government and civil society. The Petroleum Revenue Management Act (PRMA) was passed in 2011, through which a Petroleum Holding Fund was established to receive and disburse petroleum revenues. The act establishes that the government shall annually estimate the amount of revenues it will receive after disbursements to the GNPC. Up to 70% of these revenues are permitted to be allocated to the government's annual operating and investment budget, referred to as the Annual Budget Funding Amount (ABFA). The remainder is allocated to the Ghana Heritage Fund (30%) and the Ghana Stabilization Fund (70%).[8] In 2014 the Ghana Infrastructure Investment Fund and the Contingency Fund were established. Amendments

6 Amundsen I, 'The challenges of petroleum revenues: Ghana, corruption and institutions', in Afful-Koomson T & KO Asubonteng (eds.), *Collaborative Governance in Extractive Industries in Africa*. Accra: UN University for Natural Resources in Africa, 2013, pp. 171–172.

7 Ghana Integrity Initiative, *Open Governance Scorecard Country Report: Ghana*, 2016, http://www.tighana.org/dmsdocument/26, accessed 5 March 2016.

8 Armah-Attoh D, 'Ghana's Oil Revenue Management: Convergence of Popular Opinion, the Law and Practice', Afrobarometer Policy Paper, 19, May 2015, http://afrobarometer.org/sites/default/files/publications/ Policy%20papers/ab_r6_policypaperno19.pdf, accessed 8 October 2015.

to the PRMA were passed in 2015 that clarified the linkages between government oil and gas revenues and infrastructure investments.[9] According to the amended PRMA, a minimum of 75% of the ABFA is to be used for public investment expenditure; up to a quarter of this amount is to be allocated to the Ghana Infrastructure Investment Fund. The Contingency Fund was established in line with the Ghanaian constitution, which envisions such a fund to address 'urgent or unforeseen need for expenditure for which no other provision exists to meet the need'.[10]

The process through which a more comprehensive governance regime for Ghana's oil sector was developed after the discovery of the Jubilee Field was marked by extensive public consultations and active civil society participation.[11] Significant contributions were also made by a wide range of international non-governmental organisations (NGOs), multilateral financial institutions, academia and foreign governments. In part these engagements built on earlier participatory processes related to development planning, for example in the development of the Ghana Poverty Reduction Strategy in 2001–2002, as well as governance initiatives related specifically to resource governance, such as the Extractive Industries Transparency Initiative (EITI). Ghana was one of the first participants in the EITI, and the initiative's practice of establishing a national multi-stakeholder forum to promote dialogue on natural resource governance issues has assisted in strengthening civil society's engagement in this area. Ghana, which had been publishing EITI reports since 2007, included the oil sector in these reports for the first time in 2012. To further promote broad engagement on governance issues related to the oil sector, the Public Interest and Accountability Committee was established in 2011 to provide a platform for public debate on and assessment of petroleum revenue management and legislative compliance in the sector.[12]

Civil society is well developed in Ghana and local organisations were able to rapidly develop competencies to engage in oil governance debates. The Ghana Civil Society Platform on Oil and Gas, consisting of 120 individual and institutional members, was established to enhance civil society's ability to engage on issues such as transparency and accountability, legislation and policy development, revenue collection and environmental protection. Civil society organisations have at times been strongly critical of both industry and the government in terms of their engagement in the oil sector. In 2011 a group of NGOs issued a public criticism of the GNPC's handling of its share of oil revenues. More recently, NGOs have questioned the process through which the Ministry of Finance has managed the allocation of oil revenues among the country's various oil funds.

9 Petroleum Revenue Management (Amendment) Bill, 2015.

10 The Constitution of the Republic of Ghana (Amendment Act), 1996.

11 Amoako-Tuffour J, *Public Participation in the Making of Ghana's Petroleum Revenue Management Law*, Natural Resources Charter Technical Advisory Group, October 2011, http://www.agora-parl.org/sites/default/files/ghana_public_participation_in_law_2011.pdf, accessed 20 October 2015.

12 Annan N & F Edu-Aful, 'Confronting the "Oil Curse": State–Civil Society Roles in Managing Ghana's Oil Find', SAIIA (South African Institute of International Affairs) Occasional Paper, 217. Johannesburg: SAIIA, 2015, p. 9.

In both these instances, the GNPC and the Ghanaian government have provided public responses to the issues raised. While no guarantee against abuses, civil society oversight has clearly contributed to an environment where private and public stakeholders consider it necessary to engage publically in governance debates and provide responses to civil society concerns.[13]

Oil for development?

Despite the intense scrutiny of Ghana's emerging oil sector and strong governance institutions, the country has not been able to avoid some of the negative impacts of resource wealth. Shortly after the discovery of commercially viable oil deposits in 2007, and less than two years after Ghana had been granted substantial debt write-offs through the Multilateral Debt Relief Initiative, the Ghanaian government again ratcheted up public debt levels. Public debt to gross domestic product (GDP) ratios escalated from 31% in 2007 to 72% by June 2015, and interest payments as a proportion of overall government spending increased commensurably, more than doubling from 2011 to 2014. At the same time, the Ghanaian government implemented public sector wage reforms that led to a significant increase in the public wage bill. Concerns relating to the government's fiscal management subsequently saw donors reducing their support to the country in 2013 and 2014, while at the same time the economy has been hamstrung by serious electricity shortages.[14] In April 2015 the International Monetary Fund (IMF) approved a $918 million bailout package for Ghana, citing 'policy slippages, exogenous shocks, and rising interest costs', as well as electricity shortages, as important threats to Ghana's fiscal governance.[15]

Despite the intense scrutiny of Ghana's emerging oil sector and strong governance institutions, the country has not been able to avoid some of the negative impacts of resource wealth

Concerns have also been expressed around the contribution of the emerging oil sector to broader economic development and industrialisation within Ghana. Large extractive projects, particularly offshore oil operations, often operate as an enclave with limited linkages to the local economy. In 2013 local content and local participation regulations were promulgated to ensure stronger links between the oil sector and the rest of the economy.[16] The Ghanaian government also partnered with oil companies to establish an

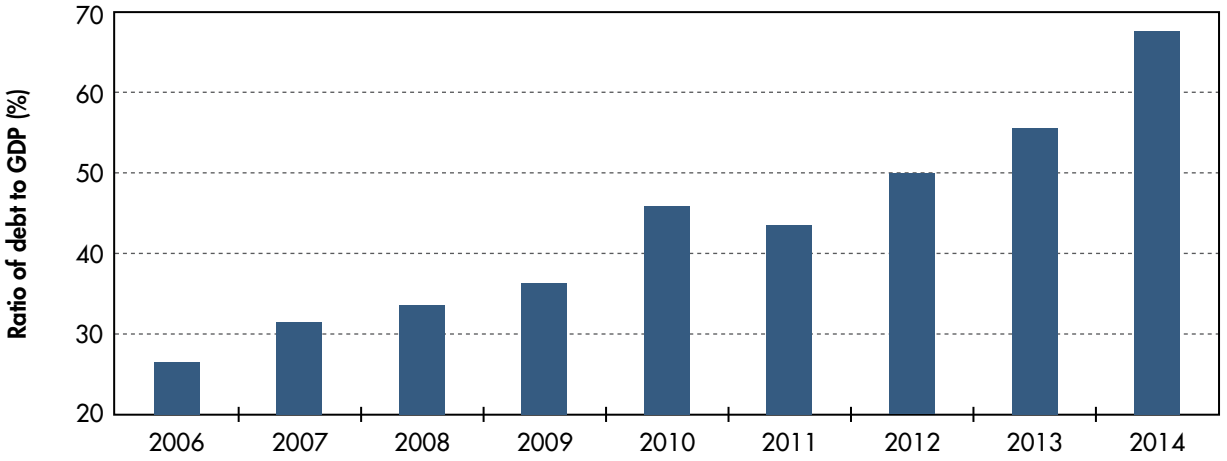
13 Ghana Oil Watch, 'Ghana National Petroleum Corporation (GNPC) rejects allegations of impropriety', 19 July 2012, http://ghanaoilwatch.org/index.php/ghana-oil-and-gas-news/2610-ghana-national-petroleum-corporation-gnpc-rejects-allegations-of-impropriety, accessed 5 October 2015; Ghana Ministry of Finance, 'Re: Parliament must investigate spending from the Ghana Stabilisation Fund', Press Release, 2 June 2014, http://www.mofep.gov.gh/?q=press-release/2014-06-02/re-parliament-must-investigate-spending-from-the-ghana-stabilisation-fund, accessed 5 October 2015.

14 Younger SD, 'Ghana's Macroeconomic Crisis: Causes, Consequences, and Policy Responses', IFPRI (International Food Policy Research Institute) Discussion Paper, 1497. Washington DC: IFPRI, 2016.

15 IMF (International Monetary Fund), 'IMF approves $918 million ECF arrangement to help Ghana boost growth, jobs and stability', Press Release 15/159, 3 April 2015, https://www.imf.org/external/np/sec/pr/2015/pr15159.htm, accessed 12 April 2016.

16 The Petroleum (Local Content and Local Participation) Regulations, 2013, L.I 2204.

FIGURE 1 GHANA GOVERNMENT DEBT TO GDP



Source: Trading Economics, 'Ghana government debt to GDP', http://www.tradingeconomics.com/ghana/government-debt-to-gdp, accessed 15 March 2016

Enterprise Development Centre in the town of Takoradi. Significant investments have been made in providing training and other support to facilitate the participation of Ghanaian companies in the country's oil and gas sector, including a diverse range of support services and products. While there have been some successes in this regard, a review has shown that Ghanaian businesses, particularly small and medium enterprises, face several challenges in securing contracts to supply goods and services to the oil sector.[17]

Unlike other African oil producers such as Angola and Nigeria, Ghana's oil revenues have not been large in relation to total fiscal revenues. Total oil revenues increased steadily from $444 million in 2011 to almost $1 billion in 2014. Even at this point, however, revenues from the oil and gas sector contributed no more than 10% of total government income. In 2015 the dramatic and sustained drop in global oil prices resulted in a significant reduction of oil revenues, with the Ghanaian state accruing just under $400 million from the sector.[18] After half a decade of oil production, a common complaint in Ghana is that oil revenues appear to have brought few visible, positive changes to the country. While the government has provided detailed reports of oil revenue investments in transport,

17 Ablo AD & R Overa, 'Networks, trust and capital mobilisation: Challenges of embedded local entrepreneurial strategies in Ghana's oil and gas industry', *Journal of Modern African Studies*, 53, 3, 2015, pp. 391–413.

18 GhanaWeb, 'Oil revenue dips by US$470m', 24 June 2016, http://www.ghanaweb.com/GhanaHomePage/business/Oil-revenue-dips-by-US-470m-450209, accessed 12 March 2016.

energy and water infrastructure as well as education,[19] these investments have been overshadowed by the rapid increase in public debt, the escalation of the public wage bill, electricity shortages, low oil prices and the 2015 IMF bailout agreement.

Despite the sobering current economic situation, the oil and gas sector is of growing importance to Ghana's future. In addition to the continuing development of the Jubilee Field, by the close of 2016 production from the Tweneboa–Enyenra–Ntomme (TEN) Field will have commenced. Also, in May 2016 construction activities started on the $7 billion offshore Cape Three Points integrated oil and gas project, which will provide gas to Ghana's thermal power plants from the Sankofa and Gye Nyame fields. As Ghana's oil and gas sector continues to develop, so will the debate around the governance of the sector. These governance debates, which began in earnest shortly after the first announcements of major oil finds in 2007, not only focus on revenue management and transparency but also consider the sector's potential positive and negative impacts on other sectors of the Ghanaian economy and on the environment. This has been particularly true of Ghana's fisheries sector, which plays a critical role in supporting livelihoods and contributing to food security, and shares the maritime domain with the country's growing offshore oil and gas industry.

ARTISANAL FISHERIES AND GHANA'S BLUE ECONOMY

Ghana's marine fisheries are among the oldest in Africa, originating in the 18th and 19th centuries when Fante fishers adapted freshwater canoes for fishing in nearshore waters along Ghana's coastline. By the early 20th century Ghana was a major regional fisheries power, with Ghanaian fishers operating as far as Senegal to the north and Angola to the south.[20] Today, fisheries remain a central part of the local economy and make a vital contribution to food security in coastal and inland communities. About 60% of animal protein consumed in Ghana is fish, and three-quarters of total annual fish production is consumed locally. Marine capture fisheries predominate, accounting for 74% of total fish production. The high productivity of the marine ecosystem results from coastal upwellings that introduce nutrient-rich water to the nearshore zone. Freshwater capture fisheries are also significant (22% of total production) and there is a vibrant aquaculture sector focused primarily on tilapia and catfish, which contributes 4% of total fish production. Marine fisheries alone generate approximately $1 billion annually and the sector accounts for about 2.6% of Ghana's GDP.[21]

19 Ghana Ministry of Finance, '2015 Annual Report on the Petroleum Funds', Appendix 3, 2015, http://www.mofep.gov.gh/sites/default/files/reports/petroleum/2015%20Annual%20Report%20on%20the%20Petroleum%20Funds.pdf, accessed 12 March 2016.

20 Atta-Mills J, Alder J & UR Sumaila, 'The decline of a regional fishing nation: The case of Ghana and West Africa', *Natural Resources Forum*, 28, 2004, pp. 13–21.

21 Bannerman P, 'Fisheries Management Plan (Marine Sector) 2015–2019: Highlights of Key Issues & Actions', Presentation to National Stakeholders Validation Workshop, Alisa Hotel, Ghana, 24 March 2015.

Ghana's marine capture fisheries are divided into three distinct sectors: the artisanal, inshore and industrial fisheries. The industrial sector includes bottom trawlers, shrimp vessels and tuna vessels. Vessels participating in industrial fishery must include local ownership and are therefore typically joint ventures. Inshore fishery consists of vessels with inboard engines and wooden hulls, with vessels ranging in length from 8–30m. In 2014 there were 107 industrial and 403 inshore registered vessels operating in Ghana's fisheries sector, operating primarily out of the Tema and Sekondi ports.

Artisanal fisheries are the most significant component of Ghana's fisheries sector in terms of total catch and employment. There are 310 beach landing sites and 198 coastal fishing villages along Ghana's coastline. The artisanal fleet consists of about 10 000–12 000 canoes and accounts for 60–70% of the total marine fisheries catch.[22] The sector is highly diverse, including beach-seine fishers and canoes of various sizes, about half of which are powered by outboard engines. The larger canoes are up to 18m in length and support a crew of up to seven fishers. Among the canoe fishers a range of fishing gears are employed, with the primary categories being hook and line fishers, seine net fishers and gill net fishers. Fishing effort is concentrated from December to February and from July to September, when coastal upwellings support high concentrations of fish. While most artisanal fisheries operate relatively close to shore and will at most spend a single night out at sea, there is a significant group of artisanal fishers using larger canoes who spend several days at sea and travel several miles from shore, preserving their catch with ice.

Co-management: Policy and practice

As with many other African states, the Ghanaian authorities increasingly recognised that the centralised fisheries governance systems implemented in the latter half of the 20th century were inadequate in responding to the needs of the sector. Decentralisation and the promotion of co-management have subsequently been emphasised in fisheries laws and policies, particularly through Ghana's National Fisheries and Aquaculture Policy 2008, which envisions 'the co-management of fisheries through increased active participation of fisherfolks and constitutes a departure from the strictly top-down approach to fisheries management'.[23] Decentralisation of fisheries governance is aided by the fact that traditional institutions, particularly the Chief Fisher and Chief Fishmonger in each fishing community, remain strong. The Chief Fisher plays a key role in managing local disputes, enforcing traditional practices regulating fishing effort and generally overseeing activities at the landing site. Numerous representative bodies have also been established within

22 *Ibid.*

23 Tsamenyi M, 'Analysis of the Adequacy of the Legislative Framework in Ghana to Support Fisheries Co-management and Suggestions for a Way Forward', Coastal Resources Center, University of Rhode Island, USAID (US Agency for International Development) Integrated Coastal and Fisheries Governance Program for the Western Region of Ghana, 2013, http://www.crc.uri.edu/download/GH2009IFISH008_508.pdf, accessed 14 February 2016.

the artisanal sector, such as the Ghana National Canoe Fishermen's Council, the Ghana Inshore Fisheries Association and Ghana's Line Hook Canoe Fishermen's Association. In addition, several local NGOs work with fishing communities, the most prominent of which are Hen Mpoano[24] and Friends of the Nation. Donors have also supported improved fisheries governance and co-management of Ghana's fisheries through, for example, the World Bank's West Africa Regional Fisheries Program, and the US Agency for International Development's Integrated Coastal and Fisheries Governance Initiative project and more recently the Sustainable Fisheries Management Project.

Despite the existence of established representative institutions, progress in developing an effective co-management system in Ghana has been mixed. A recent review concluded that, while fisheries policies and regulations contain numerous commitments to inclusivity and co-management, 'the formulation of fisheries policy and regulations as well as monitoring and enforcement have remained with central authorities and the management system is top-down'.[25]

Governance challenges in the artisanal fisheries sector

While Ghana's artisanal fisheries still reflect many traditional elements, it is a dynamic sector that has developed in important ways over recent decades. Most critically, fishing effort has increased as a result of ever-greater numbers of fishers entering the sector and the adoption of new fishing gears and technologies, including the more common use of outboard engines and nylon fishing nets. The number of canoes operating in Ghana's artisanal fishery sector has increased from about 7 000 in 1980 to around 10 000–12 000 today.[26] While catch records for the artisanal sector do not show dramatic declines, catch per unit effort has been decreasing steadily, indicating that fishers must work far harder to maintain catch levels. Fishers themselves also report that fish have become scarcer and that catches are not what they once were.[27] Furthermore, catch records for the broader fishing industry show that catches have indeed been declining as fleet capacity has grown. As it becomes more difficult to land adequate catches, there are increasing incentives for fishers to turn to illegal fishing gears and practices.

As it becomes more difficult to land adequate catches, there are increasing incentives for fishers to turn to illegal fishing gears and practices

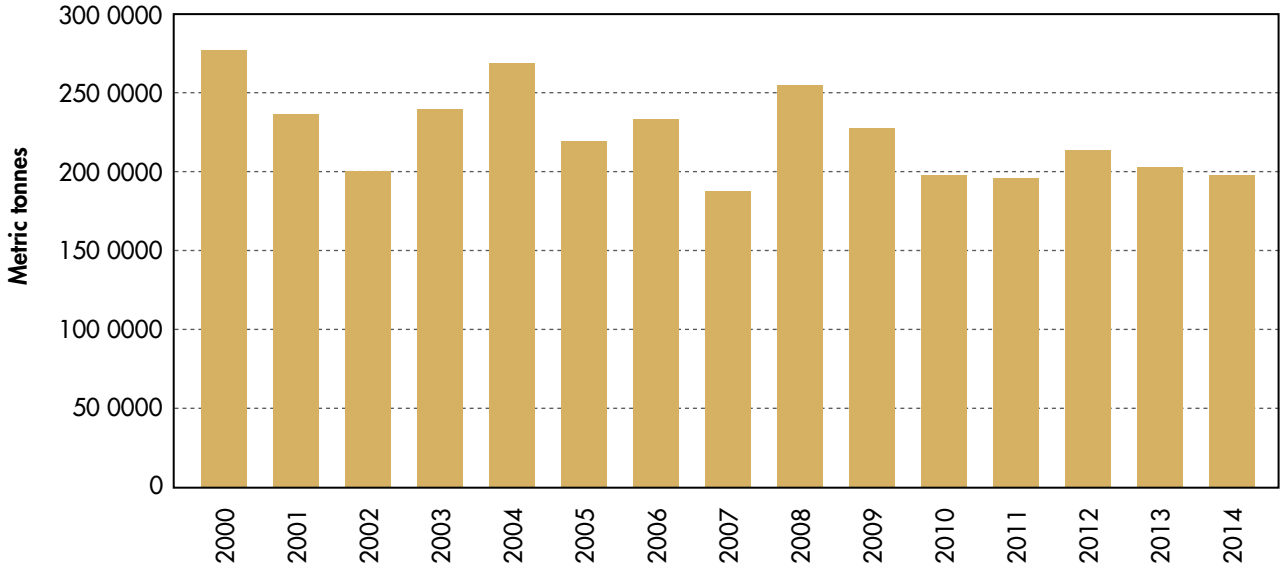
24 Hen Mpoano originated through the Integrated Coastal and Fisheries Governance Initiative project, funded by USAID, but is now a registered NGO.

25 Hen Mpoano, 'A National Framework for Fisheries Co-management in Ghana', Issue Brief, 4, February 2013, http://pubs.iclarm.net/resource_centre/WF_3619.pdf, accessed 12 October 2015.

26 Bannerman P, *op. cit.*

27 Personal interviews conducted in the Ghanaian ports/landing sites of Takoradi, Jamestown and Tema, 16–30 August 2015.

FIGURE 2 MARINE ARTISANAL FISHERIES LANDINGS



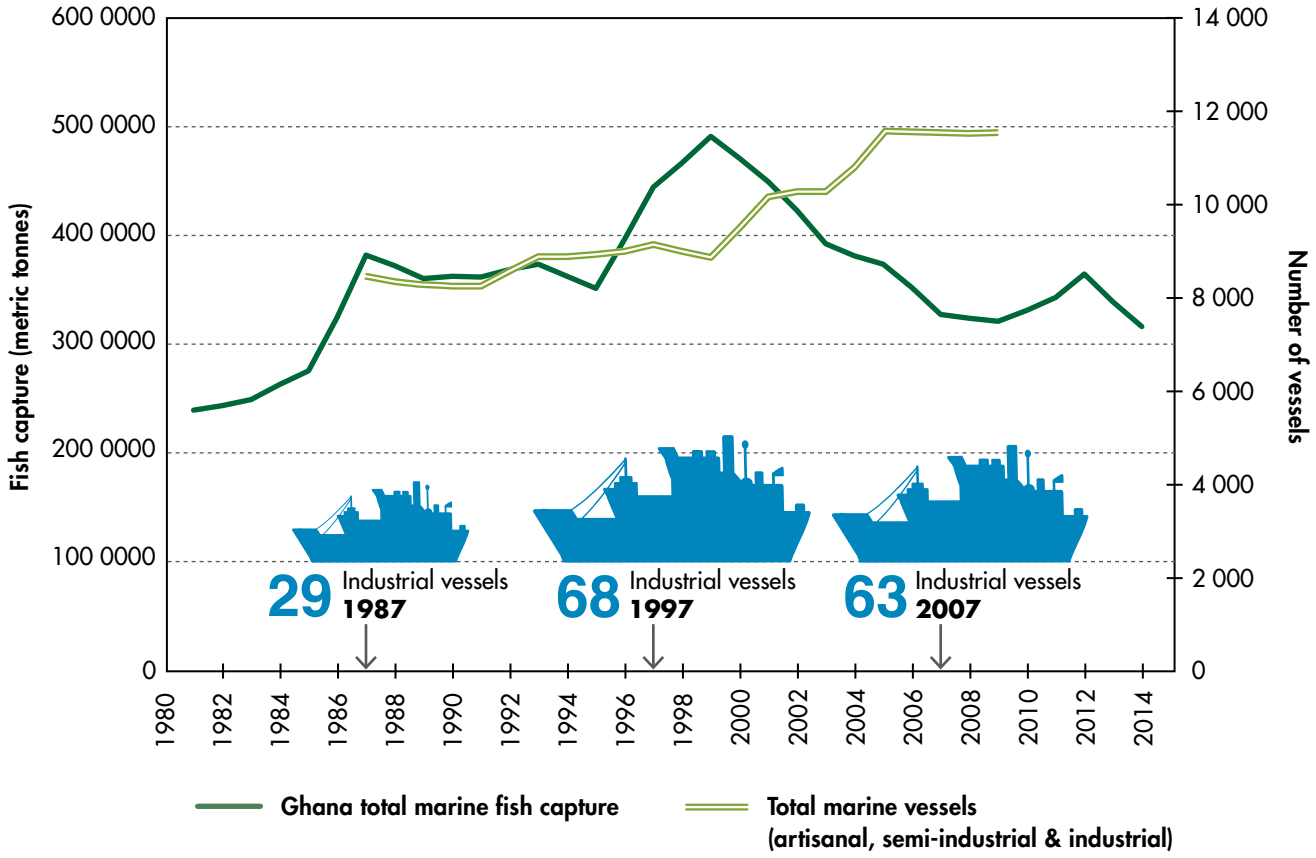
Source: Compiled by author, based on data provided by the Ghanaian Fisheries Commission

Currently there are limited restrictions on fishing practices in Ghana's artisanal sector. Traditionally, no fishing has been permitted on Mondays, and this practice is still enforced by head fishers. The most important restrictions are minimum mesh sizes for nets, the banning of monofilament nets in marine fisheries and the banning of harmful fishing practices such as fishing with poison or dynamite. It is also illegal to practice 'light fishing', whereby fish are aggregated through the use of strong lights when fishing at night. Light fishing has become increasingly common as it allows fishers to use less fuel, increase catches and extend their activities beyond the traditional peak fishing months. The practice is so effective, however, that it was banned due to concerns that it is driving the overexploitation of fish stocks.

Another concern for Ghanaian fisheries authorities is the practice of transhipment. Industrial and inshore vessels are required by law to retain all fish they catch to combat the harmful practice of discarding low-value fish at sea (often dead or injured in the process of capture) and retaining only high-value fish. Rather than discarding low-value fish back into the ocean, in certain regions industrial and inshore vessels commonly sell these fish directly to artisanal vessels while at sea, thus freeing up space in their holds for high-value catch. While this practice does provide income to artisanal fishers, it is also seen as driving the unsustainable exploitation of stocks.

About 60% of the artisanal sector's catch consists of small pelagic species such as sardinellas, mackerels and anchovies. The remainder of the catch consists mostly of demersal species such as sea bream, snappers, groupers and cuttlefish, while some

FIGURE 3 OVERCAPACITY IN GHANA'S FISHERIES FLEET



Source: Acorn International, 'Independent Study of Marine Environmental Conditions in Ghana', 2015, p. 19

artisanal fishers also target large pelagic species such as tuna, swordfish and sharks. The inshore fleet competes most directly with the artisanal fleet as it targets demersal species with trawling gear and also employs purse seine nets for small pelagic species. Some artisanal fishers also compete with the tuna fleet in targeting large pelagic species.

As in many other African fisheries governance systems, an inshore exclusive use zone has been established for artisanal fishers. In Ghana industrial and inshore vessels are not permitted to operate within 12 nautical miles of the shoreline.[28] In the past infringements of this zone by industrial fishing vessels were common, but following the installation of vessel monitoring systems such infringements rarely occur now. As noted above,

28 Where the 30m depth contour extends beyond 12 nautical miles (nm) from shore, this line becomes the border for the artisanal exclusive use zone. There is no restriction on artisanal fishers operating beyond the 12nm exclusive use zone and indeed there is a component of the artisanal fleet that frequently operates in deeper waters.

however, the stocks targeted by the different fishing sectors are not distinct. Therefore, while the effective enforcement of the exclusive use zone has generally improved the relationship between artisanal fishers and the industrial and inshore fleet, overfishing and fleet overcapacity across all three sectors are major threats to the sustainability of Ghana's fisheries. Ghana's Fisheries Management Plan 2015–2019 envisions a fleet reduction of the inshore sector from the current 403 to 272, and a reduction of the industrial trawler fleet from 107 to 48, if fleet overcapacity and overfishing are to be contained.[29]

The Fisheries Management Plan also stresses the need to establish protected areas for fish breeding grounds and other important marine habitats. There are currently no marine protected areas in Ghana.[30] There is growing evidence for the role that marine protected areas can play in protecting marine habitats and, importantly, contributing to increased catches outside of these areas. These protected areas also support the resilience of marine ecosystems to a range of pressures, including climate change.[31]

While Ghanaian fisheries authorities recognise the need to address fleet overcapacity and create protected areas, such measures will not achieve the desired results without adequate monitoring and enforcement. Unfortunately, monitoring and enforcement has been inadequate in Ghana's artisanal fisheries sector, despite the adoption of the National Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing in 2014.[32] In part, this can be ascribed to the common problem of limited resources for enforcement common to most states in Africa and other developing regions. However, even in easily accessible landing sites close to urban centres, illegal small mesh and nylon nets are commonly observed.[33] When fisheries authorities stepped up efforts to deal with illegal practices in the artisanal sector in 2010–2011, including the seizure of illegal nets and light fishing equipment, fisheries enforcement staff were in some cases physically attacked by fishers. In other cases the enforcement staff were themselves accused of using excessive force.[34] Ideally, effective co-management would entail co-operation between

Even in easily accessible landing sites close to urban centres, illegal small mesh and nylon nets are commonly observed

29 Bannerman P, *op. cit*.

30 Estuaries have a measure of protection, as it is illegal to use beach seine nets in estuaries.

31 US National Oceanic and Atmospheric Administration, 'Do "No Take" Benefit Adjacent Fisheries?', MPA (National Marine Protected Areas Center) Science Brief, http://marine protectedareas.noaa.gov/pdf/helpful-resources/do_no_take_reserves_ benefit_adjacent_ fisheries.pdf, accessed 14 April 2016; Sciberras M *et al.*, 'Evaluating the relative conservation value of fully and partially protected marine areas', *Fish and Fisheries*, 16, 1, 2015, pp. 58–77.

32 Government of Ghana, National Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing, May 2014, ftp://ftp.fao.org/fi/DOCUMENT/IPOAS/ national/Ghana/NPOA_IUU.pdf, accessed 14 April 2016.

33 Personal observations when conducting fieldwork in Ghanaian ports/landing sites of Takoradi, Jamestown and Tema, 16–30 August 2015.

34 Asiedu TA, 'Ghana: Minister condemns attacks on fisheries enforcement unit', *AllAfrica.com*, 24 October 2014, http://allafrica.com/stories/201410241536.html, accessed 20 May 2016; *Ghanaweb*, 'Minister apologises to fishermen', 15 June 2011, http://www.ghanaweb.com/ GhanaHomePage/NewsArchive/Minister-Apologies-To-Fishermen-211247, accessed 20 May 2016.

fisheries officials and fishing communities in detecting and acting against the use of illegal fishing gears, but the poor record of enforcement activities and the continued widespread use of illegal fishing gears is testament to a failure in this regard. Fishers point to irregularities in the application of the law, citing cases in which local elites have managed to interfere with inspection duties.[35] They also criticise shortcomings in the legal framework; for example, anchovies, an important target species during certain times of the year, can only be caught using nets with mesh sizes smaller than the legal limit.[36]

POTENTIAL FOR A SOCIO-ECOLOGICAL COMPACT

As Ghana moved towards oil production, fishing communities were apprehensive about the impact that the emerging oil sector might have on their livelihoods. Community surveys showed that many fishers and fishmongers believed the growth of the oil industry would lead to a decline in fish catches.[37] As the number of oil supply vessels and tankers increased, collisions with poorly lit artisanal vessels as well as entanglements of nets became more common. As early as July 2007, a month after oil companies had announced the first discoveries of commercial quantities of oil in Ghana, an oil industry supply ship was reported to have collided with an artisanal fishing canoe, leading to the death of six fishers.[38]

The environmental impact assessment (EIA) process for the first phase of development for the Jubilee Field entailed extensive public consultations;[39] however, concerns were subsequently raised regarding the ability of communities to make meaningful input into the EIA process.[40] The environmental impact study (EIS) that stakeholders were asked to comment on was only presented in English, limited copies were available and the report was voluminous and technical. A participant of one of the public hearings commented:[41]

35 Ngnenbe T, 'Digital fishing, a saviour of Ghana's dwindling fish fortunes', Stop Illegal Fishing, 18 May 2016, http://stopillegalfishing.com/press-links/digital-fishing-saviour-ghanas-dwindling-fishing-fortunes/, accessed 5 June 2016.

36 Personal interviews in Ghanaian ports/landing sites of Takoradi, Jamestown and Tema, 16–30 August 2015.

37 Obeng-Odoom F, 'Black gold in Ghana: Crude days for fishers and farmers?', *Local Environment*, 19, 3, 2014, pp. 259–282.

38 Badgley C, 'Fishing and the Offshore Oil Industry: A Delicate Imbalance', Center for Public Integrity, 2011, https://www.publicintegrity.org/2011/06/10/4859/fishing-and-offshore-oil-industry-delicate-imbalance, accessed 12 October 2015.

39 Tullow Oil, 'Environmental Impact Statement for Jubilee Field Phase 1 Development Project', http://www.tullowoil.com/operations/west-africa/ghana/jubilee-field/environmental-impact-statement, accessed 12 October 2015.

40 Bawole JN, '"Public hearing" or "hearing public"? An evaluation of the participation of local stakeholders in environmental impact assessment of Ghana's Jubilee oil fields', *Environmental Management*, 52, 2, 2013, pp. 385–397; Ellimah R, 'Environmental impact assessment of Jubilee oil field and matters arising', *Ghanaweb*, 8 October 2009, http://www.ghanaweb.com/GhanaHomePage/NewsArchive/Environmental-Impact-Assessment-Of-Jubilee-Field-And-Matters-Arising-169870, accessed 20 October 2015.

41 Bawole JN, *op. cit*.

> They initially brought the environmental impact statement, that big document. We made copies for key people because they were very big documents. What they wanted to tell the people was technical; people didn't understand a whole lot of it. But well, they had the chance to speak their minds and those who had read the documents asked various questions.

Tullow, which led the consultation process on behalf of the Jubilee Field partners, has outlined the numerous efforts that had been made to make the process accessible, including making copies available to the public at the Tullow offices and in public libraries and the production of a non-technical summary of the EIS documents. However, these efforts were perceived by many as inadequate.

One of the key concerns raised by fishers, and also highlighted by the EIS, was the potential for fish to be attracted to the oil industry vessels and structures. Numerous commercially important fish species are attracted to floating and fixed structures; indeed, the use of floating structures referred to as fish aggregating devices is a common practice in many fisheries targeting large pelagic species. Fish are also attracted to light; the well-lit vessels and structures employed by the oil industry would therefore also play a role in drawing fish from surrounding waters closer.

The key surface structure of the oil production system employed on the Jubilee Field is a floating production storage and offloading vessel (FPSO), which is connected by a network of underwater pipelines to the wells. Ghana's first FPSO, the *Kwame Nkrumah*, is a converted tanker 330m in length that is permanently moored and fitted with a variety of treatment plants that separate the oil from natural gas and water. A second FPSO arrived in Ghana in March 2016 and will be employed by Tullow in the development of the TEN Field, while a third FPSO is expected to be completed in the last quarter of 2016 for the development of the Sankofa Field. Oil wells are drilled by mobile offshore drilling units (MODUs), which require approximately 30 days to drill a well but remain on site for extended periods during the development phase of an oil field (the Jubilee Field EIS planned for one MODU to spend 266 days in the field and for a second MODU to remain for 1 092 days between the last quarter of 2008 and the second quarter of 2011).[42]

The exclusion zones around oil structures, particularly FPSOs, have become one of the central contentious issues in the engagement between the artisanal fishing sector and oil companies

Due to safety concerns a 500m safety exclusion zone has been established around MODUs and a 1 000m zone around the FPSO, where no fishing vessels are permitted. The Jubilee Field EIS notes that 'given the area available to fish for the target species that occur in this offshore location, the exclusion from a small area (approximately 3.5km^2) around the project site is not likely to significantly affect catches'.[43] Overall the impact of the operations on fisheries was assessed as minor.[0] Despite these assessments, the exclusion zones around oil structures, particularly FPSOs, have become one of the central contentious issues in the engagement between the artisanal fishing sector and oil companies. There is a widespread belief among artisanal fishers that the oil platforms have drawn fish into the exclusion zone and even drawn near shore species further out to sea towards the oil fields. Not all artisanal fishers target large pelagic species great distances

42 Tullow Oil, *op. cit.*, p. XVII.

43 *Ibid.*, p. 19.

from shore, but those who do travel distances that place them within reach of the oil platforms have at times fished dangerously close to the platforms. Tullow has co-operated with the Ghanaian navy to issue warnings to fishers, escort them from the restricted zone and in certain cases confiscate nets. Despite these actions, artisanal fishers continue to target the area, with a recent review stating that there can at times be 'several incursions occurring around some facilities each day'.[44] There have been several allegations of heavy-handedness on the part of the navy and security personnel in dealing with artisanal fishers, including alleged instances of physical assault.[45]

The Jubilee Field partners have sought to engage with affected communities through a variety of communication and corporate social responsibility initiatives. A major focus has been education and training, which supports efforts to develop human resources for local participation in the oil and gas sector, as well as supporting the development of local companies to provide goods and services or actively participate in the oil and gas sector. These include the Enterprise Development Centre in Takoradi and the Jubilee Technical Training Centre. A Youth Enterprise Centre was also established in Takoradi to train unemployed youth. Significant investments have been made in scholarships to support post-graduate studies in fields relevant to the oil and gas sector. In addition to these education and training initiatives, investments have also been made in a diversity of community projects addressing health infrastructure, sanitation, water provision and other projects. The Jubilee Livelihood Enhancement and Enterprise Development Project and more recently the Livelihood Diversification and Support Project are targeted specifically at fishing communities. In addition to the fisheries community projects outlined above, the Jubilee oil companies have engaged in outreach activities seeking to sensitise fishers to the dangers of fishing near offshore oil structures.

Despite these efforts, Ghana's artisanal fishing communities continued to view the oil and gas sector with suspicion. In addition to declining fish catches, many fishers linked the oil and gas sector with other negative environmental phenomena, including a perceived increase in the prevalence of whale deaths, algal blooms and tar balls. In an effort to address these perceptions one of the leading oil companies in Ghana, Kosmos Energy, partnered with Ghana's Environmental Protection Agency to commission an independent study by a team of Ghanaian and international experts. The study was completed over the latter half of 2014 and included extensive consultations.[46] The resulting report paints a picture of important and broad-ranging environmental challenges facing the Ghanaian fishing industry and coastal communities generally. While recognising that

44 Acorn International, 'Independent Study of Marine Environmental Conditions in Ghana', 2015, p. 36, https://www.itlos.org/fileadmin/itlos/documents/cases/case_no.23_prov_meas/Volume_III/S-TOL/App_TOL-28.pdf, accessed 12 February 2016.

45 Badgley C, 'Fish vs. oil: Officials respond to fishermen', *Pulitzer Center on Crisis Reporting*, 10 June 2011, http://pulitzercenter.org/articles/ghana-oil-fishing-industry-regulation, accessed 10 June 2016; Opoku E, 'Local fishermen accuse army of abuse near oil rig', *News Ghana*, 28 March 2014, https://www.newsghana.com.gh/local-fishermen-accuse-army-of-abuse-near-oil-rig/, accessed 10 June 2016.

46 Acorn International, *op. cit*.

the exclusion zone and increased vessel traffic from the oil and gas sector do impinge on fishing activities, the report also highlights stressors such as overfishing, destruction of mangroves and other important breeding habitats, regional marine pollution and decreased upwellings of nutrients – a biophysical process crucial to the success of Ghana's fisheries. The decline in Ghana's fisheries preceded the emergence of the oil sector and is correlated with fleet overcapacity and fluctuations in the strength of coastal upwellings, rather than the emergence of the oil sector. The report makes 13 recommendations addressing both shortcomings in the performance of the oil sector and broader stressors. These include the development of management plans to mitigate the impact of exclusion zones, strengthened capacity for fisheries governance, the completion of a marine noise study and the implementation of management practices and improvement of waste management practices.[47]

The emphasis of the environmental review on the diversity of stressors to the marine environment, as well as the wide range of actors participating in Ghana's maritime economy, underscored the need for an improved institutional framework to support integrated maritime governance. In 2015 the Ministry of Fisheries and Aquaculture Development established the Marine Fisheries Advisory Committee, which is to play a key role in co-ordinating sector-specific functions performed by a range of institutions. Liaison between the various institutions is to be supported by the Coastal and Marine Coordinating Secretariat, with an Inter-Ministerial Oversight Committee as the overarching decision-making body.

The decline in Ghana's fisheries preceded the emergence of the oil sector and is correlated with fleet overcapacity and fluctuations in the strength of coastal upwellings, rather than the emergence of the oil sector

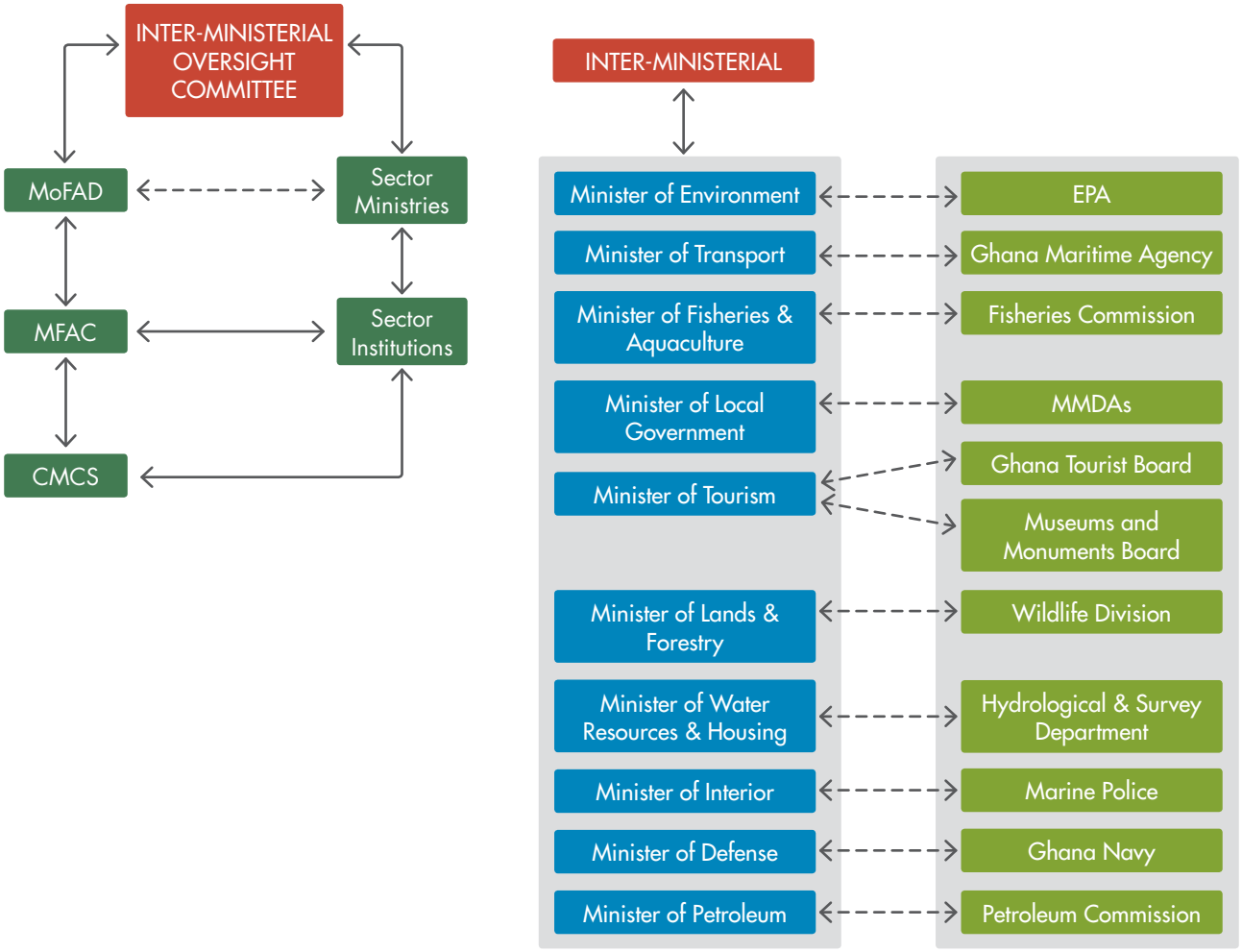
The core mandate of this new institutional structure is derived from a series of action plans that cover seven areas of coastal and marine governance. The action plans provide clear, targeted and time-bound objectives for issues such as marine spatial planning, marine and coastal data generation, and livelihood diversification in coastal fishing communities. If implemented effectively with effective co-ordination, the action plans have the potential to form the basis for a meaningful partnership between fishing communities, government authorities and the oil sector. An important priority for civil society organisations and community organisations, therefore, will be monitoring the actions of all parties against the action plans and holding these parties to account to ensure effective and timely implementation.

CONCLUSION

When significant oil reserves were first discovered in Ghana's waters responses ranged widely. News reports suggesting that oil may be a panacea for the country's socio-economic challenges vied with dire warnings of the resource curse – warnings that carried the weight of the nearby example of Nigeria, as well as the unsettling images of the Deepwater Horizon oil spill in the Gulf of Mexico, which occurred in the same year that Ghana's first oil was produced. The reality, of course, has been more nuanced. Given the size of Ghana's

47 Ministry of Fisheries and Aquaculture Development, 'Coastal & Marine Sector Action Plans', 2015, http://www.acornintl.net/Marine%20Action%20Plans%20-%20Final%20Version_27Nov15.pdf, accessed 5 February 2016.

FIGURE 4 INTER-MINISTERIAL OVERSIGHT COMMITTEE AND SECTOR INSTITUTIONAL ARRANGEMENT



Source: Ministry of Fisheries and Aquaculture Development, 'Coastal & Marine Sector Action Plans', 2015, http://www.acornintl.net/Marine%20Action%20Plans%20-%20Final%20Version_27Nov15.pdf, accessed 5 February 2016

reserves, expectations that oil would radically transform Ghana's economy were never realistic. However, if used wisely, oil revenues can make a significant contribution to its socio-economic development. The fact that this has not happened to the extent that many had hoped can be ascribed to both internal and external factors. Certainly the substantial and sustained drop in global oil prices in recent years has curtailed revenues significantly, but poor macroeconomic management and planning by Ghanaian authorities, resulting in electricity shortages, ballooning debt servicing commitments and an unsustainable public wage bill, have been equally, if not more, significant constraints to realising the potential of the country's oil wealth.

It is important to note, however, that Ghana's oil and gas sector is a relatively young industry. Significant new fields will begin production in coming years and oil prices will recover, albeit not necessarily to the historically high levels seen in the first decade of this century. This will mean that fisheries communities, in partnership with the oil and gas sector, government and other stakeholders, will have to find ways to address the challenges they face in relation to this new sector. This review of the relationship between fisheries communities and the oil and gas sector to date suggests that there have been many missed opportunities to establish effective co-operation and trust. Granted, the issue of fish being attracted to the exclusion zone around FPSOs was recognised in industry impact assessments, and the classification of overall impacts on fisheries as minor was largely corroborated by the later independent study of oil and gas industry impacts. However, comprehensive engagements between the oil companies and fishing communities around the need for the exclusion zones, the danger of fishing close to oil structures and ways to improve navigation and safety at sea only occurred after relations had already deteriorated significantly and some fishers had lost their lives in collisions. To a significant extent, these debates have centred on minimising impacts. What is needed instead is a broader and more constructive debate on how the oil and gas sector may co-operate with fishing communities. Support for navigation and safety at sea measures, for example, not only assists the oil and gas sector to avoid collisions but also assists artisanal fishers in avoiding dangers related to shipping traffic from other sectors as well as storms. It is only recently that the discussion of the oil sector exclusion zones have begun to feed into a broader debate around the need to establish marine protected areas to support fisheries recovery, and there is certainly scope for the oil and gas sector to contribute to enhanced research and monitoring activities to support improved fisheries governance.

Ghana's fisheries will not thrive unless monitoring and enforcement is improved, vulnerable and important habitats are protected, fleet overcapacity is addressed, and harmful practices such as light fishing and transhipment are halted

The coastal and marine sector action plans with the attendant institutional framework are critical elements to promote a more integrated approach to the governance of Ghana's maritime domain. Most stakeholders, including many fishers, have come to acknowledge that the oil and gas sector is not the primary threat to the sustainability of Ghana's fisheries. As the independent study of marine environmental conditions in Ghana emphasised, Ghana's fisheries and other maritime industries face a range of stressors, including climate change, pollution, overfishing and habitat destruction. Some of the most significant threats stem from practices in fishery itself. Ghana's fisheries will not thrive unless monitoring and enforcement is improved, vulnerable and important habitats are protected, fleet overcapacity is addressed, and harmful practices such as light fishing and transhipment are halted. This, in turn, will be impossible to achieve without improved co-operation and trust between fishing communities, fisheries authorities and other important stakeholders such as the navy and the judiciary. In essence, what is required is effective co-management.

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