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CHALLENGES OF ENVIRONMENTAL DEGRADATION – GHANA'S PREPAREDNESS FOR EFFECTIVE OIL SPILL RESPONSE

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ABSTRACT

Besides the anticipated "blessings" of enhanced prosperity, the commercial offshore production of oil and gas in Ghana raises concerns about the level of preparedness of the environmental protection of the coastal communities and habitat. In the fundamental petroleum policy for Ghana, government out-lined its commitment to promote sound and sustainable environmental practices in the management of petroleum operations, and to ensure compliance with environmental health and safety regulations as well as standards. The Ghana Petroleum Development Master Plan, the National Oil Spill Contingency Plan as well as the National Oil Spill Strategic Plan constitute the cornerstones of the policy frameworks for a national response to a possible oil catastrophe and environmental degradation.

This note addresses (a) the extent to which the legal and policy frameworks are adequately positioned to combat any form of environmental degradation arising from the emerging oil industry, and (b) the level of preparedness in terms of human and technical capacity for an effective oil spill response and remediation to protect the vulnerable coastal belt. The paper concludes that an effective response ca-pability requires at the national level a solid base of political support, laws and regulations, institutional responsibility and systematic capacity building through the polytechnics and universities. Early warning systems should be established as a matter of policy and the preparedness. At the regional level, there is the need to harmonize national laws and regulations and to synergize response capabilities.

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1. INTRODUCTION

The discovery in Ghana of oil in commercial quantities in 2007 and the commencement of its production in 2010 is expected to have a positive impact on the economy. On the other hand, the discovery raises a number of crucial and critical questions regarding the extent to which relevant policies, regulatory and monitoring mechanisms and particularly environmental measures have been put in place to effectively respond to any eventual oil disaster. Oil spills are an avoidable but seemingly inevitable aspect of offshore oil operations as evidenced throughout the world. The questions about environmental policies, regulatory and mitigation measures become all the more crucial for Ghana in the light of reported minor spills in Ghana by Kosmos, and especially given the recent major spills in the Gulf of Mexico, the March 1989 catastrophic Exxon Valdex spill off the coast of Alaska, and the periodic experiences in the Niger Delta over the years.

This note examines the level of Ghana's preparedness with respect to legislative and policy instruments, the countermeasures that will ensure environmental preparedness, the environmental standards for the oil industry, the steps towards human resource development and capacity building. Section 2 of the paper outlines the policy, legislative issues and the standards that are to be met. Section 3 examines waste management options and pollution control. The optimal oil response options follow in section 4 and the conclusions in section 5.

2. POLICY, LEGISLATIVE ISSUES AND STANDARDS

In the legal area, Ghana has adopted (by ratification, acceptance, approval or accession) the following key international treaties on environmental protection, namely:

- International Convention for the Prevention of Pollution of the Sea by Oil 1954, as amended in 1962;
- International Convention on Civil Liabilities for Oil Pollution Damage 1969 (Civil Liability Con-vention);
- International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1971, (Fund Compensation);
- International Convention on the Prevention of Marine Pollution by the Dumping of Wastes and Other Matters 1972 (London Convention);
- Convention on Cooperation in the Protection and Development of the Marine and Coastal Environment of West and Central Africa Region, 1981;
- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, 1989;
- Ghana is a signatory to the 1991 Bamako convention on ban of import into Africa and Control of movement of hazardous wastes within Africa;
- International Convention on Oil Spill Preparedness, Response and Cooperation 1990;
- Abidjan Convention: Convention for co-operation in the protection and development of the Ma-rine and Coastal Environment of the West and Central Africa Region (Abidjan Convention, 1981);

However at the national level, the two key legal documents on oil, the National Oil Spill

Contigency Plan (NOSCP), as well as the Ghana Oil Spill Response Strategy, dedicated specifically to the preparation for, and response to, oil spills with the aim to efficiently and effectively minimize the impact of oil pollution on the environment within Ghana's area of responsibility, from ships, oil transfer sites or other sources, are yet to be ratified by Parliament. Work on the legislative instrument on national standards in conformity with international standards on surveillance and tracking, initial response actions, control, mitigation measures, shoreline countermeasures and bioremediation remains incomplete at the time of writing.

3. WASTE MANAGEMENT OPTIONS AND POLLUTION CONTROL

There is currently no single integrated pollution legislation in Ghana. Pollution control exists as part of the environmental and water resource legislation. Marine pollution is dealt with in the Oil in Navigable Waters Act 1964 (Act 235) A Marine Pollution Act is currently in draft stages of the legislative process which, when enacted, will empower the Ghana Maritime Authority (GMA) to regulate marine pollution. Section 2(f) of the Environmental Protection Act 1994 (Act 490) enables the Environmental Protection Agency (EPA) to issue pollution abatement notices for: "controlling the volume, types, constituents and effects of waste discharges, emissions, deposits or other source of pollutants and of substances which are hazardous or potentially dangerous to the quality of the environment or any segment of the environment…"

Fig. 1a

Oblique no. 17
Location: The closed Songor Lagoon (Map 79)
Description: Beach with coarse sand

Fig. 1b

Oblique no. 18
Location: The Volta Estuary (Map 83)
Description: The mouth of the Volta River in the direction to the NE.

Fig. 1c

Oblique no. 19
Location: Approx. 25 km west of Keta (Map 86)
Description: Beach with coarse sand near Wuti. he Keta Lagoon is seen on the horizon.

Fig. 1d

Oblique no. 20
Location: Keta Lagoon (Map 91 and 92)
Description: Coarse sandy beach. In the background the Keta Lagoon

Figures 1a, 1b, 1c and 1d: Coastal Sensitivity Analysis

Ghana has no specific waste law, general waste regulations or hazardous waste regulations (as has South Africa). There are no regulations concerning the handling, treatment and disposal of industrial and hazardous wastes and no full waste classification system. The basis for addressing any breach of environmental regulation therefore needs to be examined and developed to provide the needed assessment baselines. In the absence of hazardous sanitary waste landfill facilities, chemical waste treatment facilities and thermal treatment facilities, it is clear that wastes arising from the oil and allied industries cannot be treated and appropriately disposed of. So far Zoil Oil Services Ltd, a subsidiary of Zoomlion Ghana Ltd, has made significant strides towards the acquisition of oil spill, recovery and treatment facilities. Another important area of concern is Environmental Sensitivity Index Mapping (ESIM). The tasks of the ESIM are to identify and map areas sensitive to oil pollution, prioritize sensitive areas in the operational areas to effect quick oil spill reponse strategy, describe ecosystems and other facilities of special socio-economic importance, and integrate physical, ecological and socio-economic concerns into a comprehensive spill response document.

Figure 2 indicates the extent to which any major spill can spread to neighbouring countries. Coastal communities are most vunerable to any oil hazard and therefore need to be sensitized in understanding how environmentally sensitive their environments are, what impact any oil hazard would have on their environment and livelihoods, what measures are or need to be put in place and what roles will they have to play in any such event.

Figure 2: Tidal Wave Direction

Oil Spill Response

An oil spill means the actual or probable release, discharge, or escape of oil into the internal waters or marine waters of Ghana. It occurs when a significant amount of oil is accidentally released into the environment. This release could be on land or in water bodies, the latter being more common. Oil spills are serious environmental disasters, often leading to significant, long-term impacts on the ecology and socio-economic activities of an area. An oil spill response has to do with actions taken to confirm the presence of an oil spill, stop its flow from the source, contain it, collect it, protect areas from damage by it, mitigate its effects on the environment, and clean up wildlife and areas contaminated by the spill.

So far the discoveries made in Ghana are in the Deepwater Tano and West Cape Three Points blocks, which are all offshore. Oil spills from these offshore areas could eventually end up on the coast and could have devastating environmental impacts on the shorelines of Ghana and beyond (Figure 2). The question here is whether adequate, comprehensive preparations have been made to monitor, inform coastal communities and counter effectively, the outbreak of any major spill. Figure 3 shows the damaging effect of one such spill.

Figure 3: The Damaging Effect of an Oil Spill

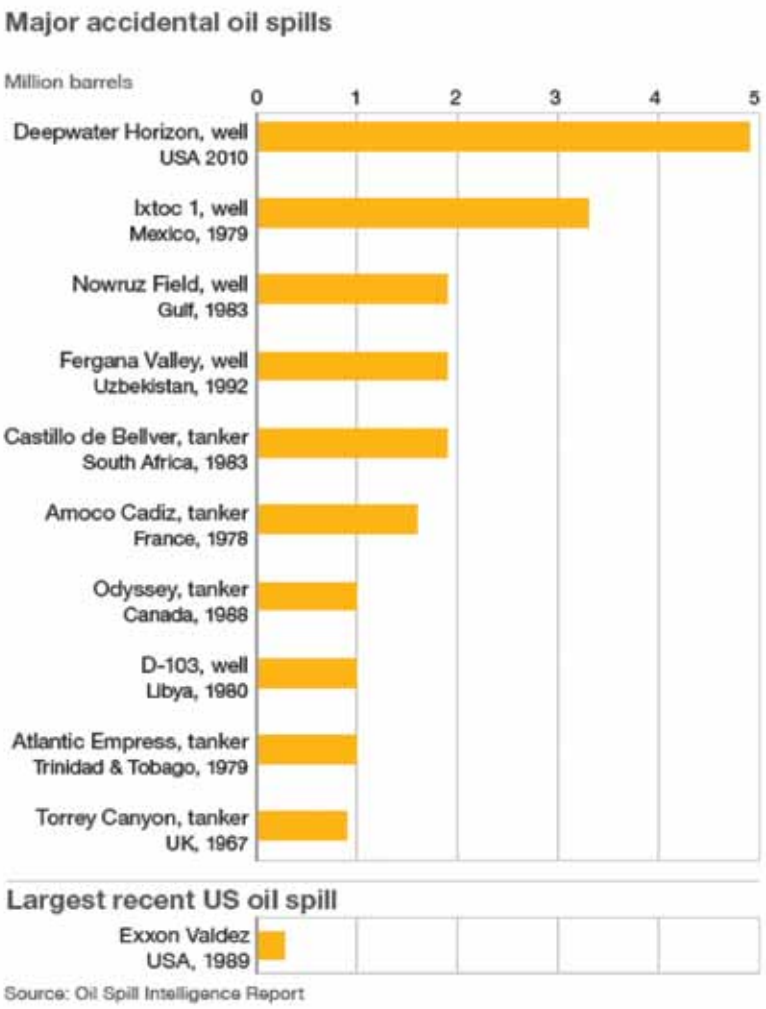

Figure 4: Major Accidental Oil Spills

Figure 4 gives an overview of the major oil spills in recent history, the latest as well as the most mas-sive in scale being the Deepwater Horizon oil spill which occurred in April 2010 as a result of a massive explosion on the BP-run ultra-deepwater semi-submersible oil rig in the Gulf of Mexico killing 11 people. The explosion was caused by a sudden kick of gas through the 5000 feet riser pipe connecting the well to the Deepwater Horizon oil rig that went undetected for several crucial moments. The Macondo well eventually leaked 4.9 million barrels of crude oil into the Gulf of Mexico damaging hundreds of miles of environmentally sensitive coastline before it was capped in July 2010.

The US Commission on BP Oil Spill in its findings came to the conclusions that, the Gulf of Mexico oil spill was an avoidable disaster caused in part by a series of cost-cutting decisions

made by BP and its partners that compromised on an unrelenting commitment to safety as well as the lack of capacity and will by government regulators to demand world-class safety standards. BP neither enforced proper controls nor did it have adequate controls in place to ensure key decisions leading to safe and sound decisions from an engineering perspective are adhered to. The report also found out that a pressure test that indicated that the well had not been properly sealed was misread. Furthermore, BP failed to exer-cise proper oversight over the cementing job and misread a faulty cementing job done at the bottom of the well. The report recommended besides getting better trained inspectors, the creation of a new agency focussed entirely on ensuring safe operations on oil rigs.

BP accepted responsibility for the disaster and committed itself to improve safety standards. The gov-ernment of Ghana will have to draw lessons from the systemic safety and oversight failures caused by BP by ensuring that our laws and regulations take care of such loopholes and commit the companies to pay for clean-up costs before they are granted exploration and production licences on the basis of "pol-luter pays" principle. There is also the need for clarity on the identity and hierarchy of liable parties to ensure that the government and hence the taxpayers do not have to pay for the consequences of off-shore incidents.

Regional Cooperation in Geo-Information for Disaster and Risk Management

Developing countries like Ghana and particularly poor communities are especially vulnerable not only in the event of an oil spill, but also with respect to other natural and anthropogenic disasters. Human fa-talities, extensive marine damage and property losses could be prevented if better information about the assets, the environmental factors in disaster risk and the patterns and behaviour of particular hazards (see Figure 5) were made available to the exposed population. Increasingly, this information is becoming available with the help of technologies such as meteorological and earth observation satel-lites, communication satellites and satellite-based positioning technologies, coupled with hazard model-ling and analysis, and geographical information systems (GIS). When integrated into a disaster risk re-duction approach, and connected to national and community risk management systems, these tech-nologies offer considerable potential to reduce losses to life and property.

The use and exchange of geospatial information in disaster situations is facilitated at the national and international levels by initiatives and programmes on harmonisation of geospatial data and building of spatial data infrastructures, such as GMES and INSPIRE in Europe, the United Nations Geographic Information Working Group (UNGIWG), Homeland Security and Digital Earth. The Global Disaster Alert and Coordination System (GDACS), established in 2004, is a cooperation framework under the United Nations umbrella with the aim to consolidate and strengthen the network of providers and users of dis-aster information worldwide. The goals are to provide reliable and accurate alerts and impact estima-tions after sudden-onset disasters, and to improve the cooperation of international responders in the immediate aftermath of major natural, technological and environmental disasters.

Sensors and in situ data have been increasingly integrated for early warning and hazard monitoring. Systems maintaining geospatial information are becoming more elaborate and multi- functional than ever before. Many of these systems can meet requirements for early warning and real-time response, and provide suitable models for elaborated predictions, simulations and visualizations

Figure 5: Risk Cycle Diagram
Source: GMES

It is imperative therefore that a regional initiative is undertaken with the active participation of Ghana for the establishment and implementation of a geo-information system which is collectively monitored by countries within the sub-region.

Capacity Building Challenges
The high technical nature of oil technology raises concern about local human resource inadequacies and loopholes as exemplified in the lack of a comprehensive programme for training in the sector, inadequate laboratory facilities and technical exposure for Petroleum and Petrochemical Engineering students at KNUST with the result that there is increased dependence on foreign expertise. On the other hand one observes a proliferation of seminars and workshops on oil and gas with questionable academic standards. There is the need to speed up the process of development and promulgation of legislative and policy instruments as well as national standards.

4. CONCLUSION

There is the need for concerted and comprehensive human resource development and sensitization in the sector, the latter particularly for coastal communities. Processes for oil spill response acquisition as well as facilities for treatment and disposal of oil and hazardous wastes have to be accelerated. Finally it is important to activate broad collaboration at the regional level to harmonize national laws and regulations and synergize response capabilities.

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