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EVALUATION OF THE ROLE OF SMART ALTERNATIVES IN POLLUTION CONTROL AND MANAGEMENT IN THE GULF OF GUINEA

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ABSTRACT: *In the Gulf of Guinea, marine pollution has received scant attention from the people and their governments. It is only recently that few Gulf of Guinea countries started to show concern to the dangers of pollution to the environment. The adverse impacts of marine pollution on marine ecosystems and the environment, at large, are becoming clear to all. These negative externalities have grave implications on the productivity of the ecosystem as well as the health and livelihoods of people dependant on it. Thus, the purpose of this paper is to examine the difficulties associated with the use of command and control as a standalone approach to solving the environmental challenges facing Gulf of Guinea. It is canvassed in this paper that the wide use of command and control (CAC) approach/design in national marine regulations as a standalone mode of regulation has not been able to solve the problems of marine pollution in the Gulf of Guinea. Indeed, it is argued that CAC seems to be very ineffective and inefficient in regulating or controlling marine pollution. This is partly because of the problems of compliance and implementation facing it (CAC). As a result, other approaches considered complementary ("smart alternative") to CAC – such as economic instruments and voluntary agreements between industries and governments – are canvassed to be used alongside the CAC for effective control and management of marine pollution in Gulf of Guinea.*

KEYWORDS: Marine Pollution, Gulf Current Large Marine Ecosystems (GCLME), Pollution Regulation and pollution Management

INTRODUCTION

Historically, oceans seemed infinitely able to accept anything humans dump into them, and equally offer valuable services which are often taken for granted because they are free (Costanza et al, (1997); Chukwuone, et al, (2009); World Resources, (1998); & Capistrano et al., (2005)). Usually water bodies dilute and disperse pollution of all kinds among other functions, but with increase in human population, especially in the coastal areas with its accompanying industrialization and other human activities, coastal and marine waters are increasingly unable to cope with massive inputs of pollutants (Hill, 2007). These introductions of pollutants have led to a chronic and catastrophic deterioration in water quality (Adekule et al., (2007), Taiwo, (2010), Orebiyi et al., (2010), Adedeji and Ako, (2009))., resulting in decline of fish stocks, eutrophication and harmful algae blooms or introduction of invasive species, habitat destruction, loss of indigenous species, and the degradation of coast-scape among other impacts. Together, these impacts have adverse implications for overall marine ecosystem health, its productivity, and on socio-economic activities that depend on its services.

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The challenges facing the marine environment, resulting from the pollution of the water bodies and the alteration of the natural state of the oceans, can be attributed to the problem of increasing population, industrialization and urbanization along the shores and coast-lines of the marine environment. Hill (2007) reports that about two billion people, a third of humanity, live within a hundred kilometres of a coastline and that an increasing number of world's people live in mega cities – cities with a population of 10 million or greater; indeed 13 of the world current 19 megacities are coastal. This increasing industrialization along the coastline, and the accompanying development: involving land clearing, channelization of flood and tidal water, port development, mining of the beach sand for construction, and waste disposal among other activities, contributes to the degradation and loss of habitat as well as resulting to pollution of the water bodies, which affects water quality meant for human consumption and other use.

The GG is made up of four coasts namely: the concave coast between cape palmas and cape three points of Ghana; the coast from cape three point to the western extremity of the Niger Delta; and the Niger Delta to the proximity of mount Cameroon; the coast of Ivory Coast and parts of the coast of Cameroon (Egge & Weil, 1993). Notably, these coasts are all part of one system; just as natural processes across the borders and the effects of human interventions do freely affect the environment. GG region is also considered to include the Exclusive Economic Zones (EEZ) of sixteen countries namely, Angola, Nigeria, Ivory Coast, Togo, Sao Tome & Principe, Democratic Republic of Congo, Ghana, Benin, Cameroon, Equatorial Guinea, Guinea, Guinea Bissau, Liberia, Sierra Leone and Gabon. These coasts together form the Gulf Current Large Marine Ecosystems (GCLME).

GCLME is among one of the world's most productive large marine ecosystems LME, with the most productive coastal and offshore waters, rich marine biodiversity, fishery resources, oil & gas reserves, precious minerals, a high potential for tourism and serves as important reservoir for marine biodiversity of global significance. Specifically, fishery resources in the GCLME includes over 300 fish species, 25 crustaceans, 17 species of Cephalopods and 3 species of turtles. The marine ecosystem, apart from it natural resources, provides for billions of people living in this region. Western Africa is increasingly becoming the fish basket of Western Europe, Russia, and China. And throughout western Africa, coastal and offshore marine resources are most times the remaining source of potential long-term sustained economic growth as well as a source of cheap protein (Alder and Sumaila, 2004). More importantly, this region is of global importance, contributing to the energy and other needs of the global population. See the table below for the value of GCLME outputs.

Table 1.0: Summary of the Value of Some Outputs from Gulf Current Large Marine Ecosystems

Item	Value ($) in Million	Percentage Contribution
Marine Fishery	17, 783.4	35.61
Offshore Oil Production	29, 861.9	59.79
NTFP-Non Timber Forest product (One major)	1,941.3	3.89
Mining	354	0.71
Total	49.941.4	100.00

Source: Chukwuone et al. (2009)

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The value of the offshore production for the GCLME countries remains very significant especially in the area of economic development and has since been recognized on the world stage. See table 2.0 below.

Table 2.0: Value of Offshore Oil Production for GCLME Countries (2004)

Country	Offshore oil production (bbl/d)	Value of Production in millions ($)
Cameroon	–	–
Congo Democratic	16,169	1.13
Republic of Congo	–	–
Angola	653,233	45.73
Benin	–	–
Gabon	15,000	1.05
Ghana	6000	0.42
Guinea	–	–
Guinea-Bissau	–	–
Nigeria	278,360	19.49
Equatorial Guinea	200,000	14.00
Sao Tome and Principe	–	–
Liberia	–	–
Togo	–	–
Sierra Leone	–	–
Côte d'Ivoire	–	–
Total/day	1,168,762	81.82
Total/year	426,598,130	29,861.87

Source: Chukwuone et al. (2009)

Despite the importance of the GCLME on the global stage, it has continually faced several problems and challenges. Chukwuone, et al. (2009) identified population explosion, urbanization, fisheries depletion, water pollution, public health and sanitation issues, habitat degradation, coastal erosion, loss of biodiversity, and land use issues as some of the major challenges faced by this region. These challenges have been have been exacerbated by human activities. For instance, in Nigeria's major coastal cities such as Lagos, Port Harcourt and coastal towns like Bonny are experiencing steady increase in population. This increasing population has its accompanying effects such as increase in waste production and sanitation problems. Generally, GG region approximately 40% of the GCLME region's 300 million people live in coastal areas and depends on the natural resources from the lagoons, estuaries, creeks, wetlands and inshore water ways for their domestic and industrial needs (Ukwe et al., 2006).

Current State of Marine Pollution Impacts in Gulf Guinea Current Large Marine Ecosystems

Researchers and organizations with interest in GG have identified and analyzed the severity of marine pollution in GG, and emphasized the need for sound pollution management in the area. For instance, the assessment report by the UNEP programme on Global International Water Assessment (GIWA) and the Transboundary Diagnostic Analysis for the Guinea Current Large

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Marine Ecosystem (GCLME) project, the major pollution problems in the GCLME are degraded water quality, the loss of critical habitats for migratory and non-migratory species, effluents in rivers flowing into the LME, the risk of offshore spills, marine debris and beach pollution, and industrial and solid waste. The report also expressed special concerns for oil and related pollution in the area, describing it as a major potential danger for coastal and marine fisheries.

Ukwe and Ibe (2010) posit that that pollution from industrial and domestic sources among other issues have resulted in rapid degradation of vulnerable coastal and offshore habitats, which have deteriorated water quality chronically and catastrophically, as well as resulted in increasing algae blooms and eutrophication in the GCLME. These have serious implication in the overall ecosystem health/marine environmental quality. Marine environmental quality is said to be condition of a particular marine environment (shoreline, estuary, bay, harbour, near shore and offshore waters, open ocean) measured in relation to each of its intended uses. It is usually assessed quantitatively but requires both indices of condition and change as well as established guidelines and sets of objectives by environmental, health and resource agencies (Harding, 1992). In other words, if the marine environmental quality is affected, the productivity - loss or decline in yields - and aesthetics of that particular marine environment is affected.

In Ivory Coast for instance, according to the pollution assessment conducted by Scheren, et al. (2004) on the Ebrie Lagoon shows that the major driving forces causing pollution in the lagoon are domestic and industrial activities in Abidjan and agricultural activities in the wider catchment area. High level of eutrophication and increased water temperature were noticed according to the assessment, occurring as a result of increase in nutrient input (nitrogen and phosphorous) in the lagoon. Without question, this has tremendous impact on the quality of water, causes depletion in oxygen required for the survival of various fish species, and also results in algae blooms. This increase in temperature and eutrophication encourages the growth of pathogenic organism that causes outbreak of epidemics and water borne diseases of Typhoid, Salmonella and Cholera (Scheren, et al., 2004).

Similarly, in Cameroon, Alzheimer's disease, lung and kidney problems, damage to central nervous systems, dementia, loss of memory listlessness, severe trembling, and pulmonary fibrosis have been linked with long exposure to significant concentration of Aluminum. The aluminum emanating from the industrial activities along the coast of Cameroon specifically Bassa industrial zone have inflicted wide range of complications to the surrounding marine ecosystems exposing inhabitants of the area to abdominal and respiratory tract infections (Alemagi, et al., 2006).

Smart Alternative Approaches to Marine Pollution Management

In the face of several challenges facing the marine environments industrialized countries have continued to develop other complimentary instruments to control marine pollution such as tradable permits, discharge fees and voluntary programs; while the control of marine pollution in the GCLME remains heavily reliant on Command and Control (CAC) mode of regulations. CAC method of regulation involves direct regulation and relies primarily on regulatory instruments, such as standards (ambient environmental quality standards, effluent or emission standards, technology based-standards, performance standards, product standards and process standards), permits, licenses, as well as, water and land use controls (Bernstein, 1993). It entails wholesome compliance with rules and the use of fines - such as noncompliance fee - when

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flouted. Usually, in implementation of CAC, various standards serve as a reference for evaluation and target for legislative action. Indeed standard setting *presupposes* the existence of monitoring agencies with enforcement powers, so as to impose penalty for noncompliance (Bernstein, 1993).

Although CAC has achieved significant success in pollution management amongst developed economies it has been largely unsuccessful in developing regions. It has been criticized for being inefficient, inflexible, difficult to enforce, and designed based on a one-size-fits–all approach. Osborn & Datta (2006) suggest that the outcomes of CAC method of regulation are not what policy makers intended, with many undelivered environmental benefits. They noted that coercive CAC regulation is economically inefficient, adversarial and administratively cumbersome (Osborn and Datta, 2006). But on the other hand, various economic instruments such as pollution charges, marketable permits, subsidies, deposit and return systems, and enforcement incentives introduce more flexibility, efficiency and cost-effectiveness into marine pollution control measures (Bernstein, 1993).

While CAC provides little or no incentives for industry to do better than the law requires, such as experimenting with new technology, equipment or management systems that may lead to greater environmental performance, economic instruments, on the other hand, function as incentives to polluters who can decide the most cost-effective and efficient ways for achieving environmental targets. Further, Bernstein states that they have the feature of a polluters-pay principle to various degrees: where a polluter pays a financial penalty for higher levels of pollution and pays a smaller penalty or receives financial rewards for lower levels of pollution (Bernstein, 1993).

Similarly, Regas et al., (2004), argue that market-based incentives through economic instruments such as taxes, fees, subsidies, and marketable permits provide financial incentives for pollution abatement and are therefore promising for developing countries in terms of affordable pollution control. They also noted that theses market-based strategies do not specify the use of any particular pollution control technology, giving polluters flexibility in choosing the most convenient option, which is quite contradictory to standards set by CAC requiring all polluting factories to toe the same line, regardless of abatement costs and local environmental conditions (Regas et al., 2004). Introduction of economic instrument in pollution management in GG might not receive an entirely positive response from industries operating in the area, but when companies realize that the benefits from the incentive outweighs the cost of pollution abatement, they may reconsider their position.

Besides other formal alternative pollution controls measures (CAC and economic instruments), Voluntary Agreements and public disclosure programs, when properly designed and implemented, also have promise to encourage marine pollution reduction. However some continue to argue that VAs do not spur the emission cuts in the absence of strong regulatory design features that can leverage its pressure (Blackman, 2010). Indeed, the difficulty of getting industries or companies to actually comply with VA programs is also a major challenge. But they have been shown to be effective in building the much needed environmental capacity. Equally, studies have shown that the use of voluntary agreement programs such as performance evaluation and ratings programs (PERPs) as public disclosure measures have resulted in an increase in regulatory compliance (Blackman, 2010). It is important to note that the difference between VAs and public disclosure programs can be murky sometimes due to overarching objectives and approaches to design content. All seek to give industries opportunities to regulate themselves.

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The Organization for Economic Co-operation and Development (OECD) in 1999 conducted a comprehensive assessment of voluntary approaches to environmental policy, with the objectives of analyzing their characteristics, nature, use and role on OECD countries, and their performance. In the report, they categorize voluntary instruments to environmental approaches into four types, namely: unilateral commitments made by polluters; agreements achieved through direct bargaining between polluters and polluted environmental agreements negotiated between industry (polluters) and public authorities; and voluntary programs developed by public authorities (e.g. environmental agencies) to which individual firms are invited to participate (OECD, 1999).

Voluntary agreements (VAs) provide opportunities for companies to agree to a certain standards related to their performance, technology or management with various rewards such as subsidies, reputation building or awards. VAs and public disclosure programs can assist companies/firms who intend to appeal to environmental conscious consumers and when well implemented in GG countries, and can also help rebuild lost-trust by the public for industries, particularly multinationals, operating in the area and will relive the pollution burden on the GCLME. Thus, Gunningham (2009) suggests that free market approaches and voluntarism have value where public interest and self-interest largely coincide. Voluntary programs apart from spurring regulatory compliance, building trust and capacities, they equally encourage cooperation and mutual understanding between industries, government agencies and the general public in the GG. VAs and public disclosure, if implemented in GG countries, will surely represent a step in the right direction.

CONCLUSIONS AND RECOMMENDATION

Combinations of regulatory mechanisms have been advocated in handling pollution control and prevention strategies. There is no explicit or formal way of implementing economic instruments and voluntary strategies, but countries have the obligation to determine the component and the design of the form of CAC alternatives suitable to their economic, political, and social conditions. It is important therefore to build capacities needed for marine pollution control in GCLME through: the implementation of mix of regulations mechanisms (Regas et al, 2004), designing complementary combination of instruments "smart regulation" (Gunningham, 2009) and development of strategic "cocktail" of instruments in protecting coastal and marine environment (Osborn and Datta, 2006). The idea behind this combination of different instrument/approaches is to ensure that they compensate for each other's weaknesses and work together towards achieving efficiency and effectiveness in GCLME pollution management This ***"smart alternative"*** **(as I choose to call it)** to stand alone CAC is what this paper is proposing for GCLME. It will enable them to take leverage of their flexible economy in achieving regulatory goals of marine and environmental protection.

"Smart alternative" approaches which entails use of economic instruments (taxes, pollution charges, subsidies, fees, marketable permits, subsidies, deposit and return systems, and enforcement incentives), voluntary agreements (VAs) and public disclosure programs all provide viable complementary alternatives to the CAC method of regulation in developing economies. That is, these approaches may strengthen ties and capacities needed for future engagement and co-operation, provide incentives or resources for government and industries to control pollution, help increase information flow from industries operating developing economies, which is currently lacking; offer efficient and cost effective options for industries

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to manage and control pollution; and furnish opportunities for industries operational in these countries to build their reputation. However, individual countries research needs to be conducted to determine the right mix of smart alternative options, taking into account the specific country's political, economic and social conditions.

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