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An Analysis of the Range of Approaches to Regulate Environmental Impacts Associated with the Upstream Petroleum Industry: What is the Most Effective Approach?

OHENEWAA BOATENG NEWMAN[1]

ABSTRACT

Various petroleum producing states have enacted laws to regulate its offshore industry. This is due to the fact that petroleum operations especially the upstream sector is fraught with risks of marine pollution although the industry is highly lucrative. An adoption of regulations is therefore dependent on some principles with the view of protecting the marine environment from pollution. This paper seeks to analyse the various approaches to environmental regulation, bringing out their strengths and shortfalls and to ascertain whether any one of the approaches is the most effective.

Keywords: *Upstream petroleum industry, marine pollution, regulation, principles.*

I. INTRODUCTION

Energy demand is increasing and one main challenge that the world faces currently is balancing economic development and environmental protection.[2] The upstream sector of offshore operations has been viewed as a major source of marine pollution and for that reason, various international, regional and national conventions and treaties have been adopted by countries in a bid to minimise the devastating impacts of marine pollution.[3] The upstream oil and gas industry is internationally recognised as one of the polluters to the environments with diverse impacts.[4] There are numerous international conventions and other instruments relating to marine pollution, liability and compensation for oil pollution and maritime safety.[5] The

[1] Author is a Lawyer, Lecturer and an Academic Counsellor at Akenten Appiah-Menkah University of Skills Training and Entrepreneurial Development, Ghana.

[2] Stuart Bell, Donald McGillivray and Ole W. Pedersen, Environmental Law, Oxford University Press, 8th Edition (2013)

[3] Hossein Esmaeili, The Legal Regime of Offshore Oil Rigs in International Law. Dartmouth Publishing Company, 2001

[4] Joint E&P Forum/UNEP Technical Publication, Environmental management in oil and gas exploration and production; An overview of issues and management approaches. UNEP, 1997

[5] Hossein Esmaeili, The Legal Regime of Offshore Oil Rigs in International Law. Dartmouth Publishing Company, 2001

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environment and economic development have therefore been viewed as indivisible challenges.[6] Upstream oil and gas industry is a term commonly used to refer to the searching for and the recovery and production of crude oil and natural gas.[7] Almost a third of the oil and a quarter of the natural gas consumed worldwide come from deep water areas.[8] The BP Macondo 2010 is a fairly recent incident which occurred in the U.S. Outer Continental Shelf (OCS). The explosion and fire took 11 lives, injuring 16 others, and ultimately causing the Mobile Offshore Drilling Unit (MODU) to sink two days after the explosion. [9] Following the 2010 British Petroleum blowout, five million barrels of crude oil continued to spill into the ocean water for almost three months.[10] It affected the entire ecosystem. The Macondo oil spill was a pinnacle of years of oil drilling promotion that gave no concern to the environmental risks.[11] Once a major oil spill has occurred at such offshore areas, it is almost uncontainable.[12] It is for the most part irrecoverable.[13]

In total, marine pollution is a threat to marine life and the ecosystem as a whole.[14] Additionally, it is also usually extremely expensive to restore or clean-up the affected coastal and maritime environment. In West Africa, pollution caused by Shell between 1969 and 1996 resulted in the spillage of at least 2.4 million barrels of oil in the Niger Delta (Ogoniland) and the effect still lingers on as it is difficult to clean up (UNEP, 2011). It is argued that these concerns may have influenced the formulation of environmental treaties, conventions and instruments.[15] Traditional forms of direct regulation (frequently referred to as 'command-and-control') and economic instruments have been adopted by the international community to regulate the

[6] World Commission on Environment and Development, Our Common Future. Oxford University Press, 1987
[7] Mohammed Alramahi, Oil and Gas law in the UK. Bloomsbury Professional, 2013
[8] Julien Rochette, Matthieu Wemaëre, Lucien Chabason and Sarah Callet, Seeing beyond the horizon for deepwater oil and gas: strengthening the international regulation of offshore exploration and exploitation, (10.01.21,11:14)
http://www.iddri.org/Publications/Collections/Analyses/ST0114_JR%20et%20al._offshore%20EN.pdf
[9] National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, Deep Water- The Gulf Oil Disaster and the Future of Offshore Drilling Report to the President, (18.08.20, 20:14) http://www.gpo.gov/fdsys/pkg/GPO-OILCOMMISSION/pdf/GPO-OILCOMMISSION.pdf
[10] Thomas B. Ryerson et al., Chemical Data Quantify Deepwater Horizon Hydrocarbon Flow Rate and Environmental Distribution, (15.08.20,15:15) http://www.pnas.org/content/early/2012/01/04/1110564109.full.pdf
[11] Tim Dickinson, The Spill, The Scandal and The President, Rolling Stone, (15.12.20, 22:18) http://readersupportednews.org/off-site-opinion-section/58-58/2214-the-spill-the-scandal-and-the-president
[12] Naama Hasson, Deep Water Offshore Oil Exploration Regulation: The Need For a Global Environmental Regulation Regime,Washington and Lee Journal of energy, climate and environment 4 (2013) (10.12.20, 16:14) http://law.wlu.edu/deptimages/Journal%20of%20Energy,%20Climate,%20and%20the%20Environment/Hasson.pdf
[13] Rachel Carson, Silent Spring in Diane Ravitch, ed., The American Reader: Words that Moved a Nation. HarperCollins, 1990
[14] D. Brubaker, Marine Pollution and International Law. Belhaven Press, 1993
[15] Stockholm Declaration, 1972; World Charter for Nature, 1982; Brundtland Report, 1987; Rio Declaration on the Environment and Development, 1990; OSPAR Convention, 1992; Kyoto Protocol

environmental impact of the upstream oil and gas industry albeit proposals for an integrated pollution control mechanism.[16] Is one approach efficient to help reduce the environmental impacts from the petroleum industry? What is the most effective approach? There are many environmental concerns to be taken into consideration throughout the operations of the petroleum exploration and production. The aim of this research is to analyse the existing range of approaches underlying environmental regulation of the upstream oil and gas industry in combating potential and actual pollution emanating from the operations of offshore oil and gas companies.

II. ANALYSIS OF RELEVANT PRINCIPLES UNDERLYING ENVIRONMENTAL REGULATION

(A) The principle of sustainability

Although sustainable development is subject to different definitions, the most commonly accepted definition is that of *Our Common Future* which defines it as development that meets the needs of the present without compromising the ability of future generations to meet their own needs.[17] The principle attempts to reconcile the conflicting demands of economic development and the protection of the environment.[18] The concept is central to current and future development of environment law and policy.[19] The definition however has been viewed by Stuart Bell and others to be vague and therefore require further elaboration especially with what is meant by 'needs and aspirations'.[20] They also opine that the definition is anthropocentric. They however admit that the goal of sustainable development has been translated into some form of legal obligation in a number of international, regional and national documents. At the International Court of Justice, this principle has been endorsed. In the Case Concerning the Gabčikovo-Nagymaros Project (Hungary/Slovakia) (Merits) (Gabčikovo-Nagymaros case), the ICJ had to resolve a conflict between the rights to environmental protection and development.[21] The court took note for the first time, 'this need to reconcile economic development with protection of the environment' which is enunciated in the concept

[16] Sands Phillipe and Jacqueline Peel, Principles of International Environmental law, Cambridge University Press, 3rd Edition (2012)
[17] The World Commission on Environment and Development, Our Common Future. Oxford University Press, 1987
[18]John F. McEldowney & Sharron McEldowney, Environmental Law and Regulation. Blackstone Press Limited, 2001
[19] Stuart Bell, Donald McGillivray and Ole W. Pedersen, Environment Law, Oxford University Press, 8th Edition (2013)
[20] Stuart Bell, Donald McGillivray and Ole W. Pedersen, Environment Law, Oxford University Press, 8th Edition (2013)
[21] Case Concerning the Gabčikovo-Nagymaros Project (Hungary/Slovakia) 37 ILM (1998) 162 (Danube Dam)

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of sustainable development.[22] At the regional level, the principle has been incorporated for instance in the European Union Treaty in article 3(3) the TFEU Treaty.[23] This article provides that the Union 'shall work for the sustainable development of Europe based on balanced economic growth and price stability…' Another important document of European policy on sustainable development is the Sixth EU Environmental Action Programme 2010: Our Future, Our Choice' and the EU Strategy for Sustainable Development.[24] The Programme acknowledges that 'a clean and healthy environment is part and parcel of the prosperity and quality of life that we desire for ourselves now and for our children in the future'.

On the national level, the concept of sustainable development is provided in domestic law whether explicitly or implicitly.[25] In the United States National Environmental Policy Act, the Act implicitly recognises 'the critical importance of restoring and maintaining environmental quality to the overall welfare and development of man, [and] declares…to use all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic and other requirements of present and future generations of America.[26] The most permeating aspect of the principle is that for the first time, it makes a state's control of its local environment a case of international concern in a methodical way.[27]

(B) The precautionary principle

The precautionary principle is an attempt to codify the concept of precaution in law.[28] The doctrine can be traced back to Germany in the 1970s with the Vorsorgeprinzip.[29] It is the

[22] Alan Boyle, ' Relationship between International Environmental Law and other branches of International law' in Daniel Bodansky, Jutta Brunnée and Ellen Hey (eds.), The Oxford Handbook of International Environmental Law. Oxford University Press, 2007; See also In Vice President Weeramantry strong opinion in the case. He discussed the role of sustainable development in international law in legal instruments concluding that:-
'The principle of sustainable development is….a part of modern international law by reason not only of its inescapable logical necessity, but also by reason of its wide and general acceptance by the global community'.
[23] Stuart Bell, Donald McGillivray and Ole W. Pedersen, *Environment Law*, (8th edition Oxford University Press 2013) pg 61, Treaty on the Functioning of the European Union 2008 (as amended by the Treaty of Lisbon 2007)
[24]Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions on the Sixth Environment Action Programme of the European Community, "Environment 2010: Our future, Our choice" [COM (2001) 31 final and COM (2001) 264; renewed 2006
[25] Daniel Barstow Magraw and Lisa D. Hawke, 'Sustainable Development', in Daniel Bodansky, Jutta Brunnée and Ellen Hey (eds.), The Oxford Handbook of International Environmental Law. Oxford University Press, 2007.
[26] National Environment Policy Act ss 101, 42 U.S.C ss 4331 (1969)
[27] Patricia Birnie, Alan Boyle and Catherine Redgwell, International Law & the Environment, Oxford University Pres, 3rd Edition (2009)
[28] Jonathan B. Wiener, 'Precaution', in Daniel Bodansky, Jutta Brunnée and Ellen Hey (eds.), The Oxford Handbook of International Environmental Law. Oxford University Press, 2007
[29]Stuart Bell, Donald McGillivray and Ole W. Pedersen, Environment Law, Oxford University Press, 8th Edition (2013)

'Foresight principle' which is a philosophical approach to preventing risk and this involves concepts of good environmental management in taking protective measures against specific environmental threats with the aim of avoiding or reducing environmental risks.[30]

At the international level, this approach was adopted in the 1984 Bremen which recognises that negative impacts to the marine environment can be irremediable and that 'States…must not wait for proof of harmful effects before taking action…..'.[31] The principle is reiterated in conventions like the 1992 United Nations Framework Convention on Climate Change[32], 1992 Convention on Biological Diversity[33]. The most widely accepted articulation of precaution is Principle 15 of the Rio Declaration.[34] Principle 15 was one of the first global codifications of the precautionary approach. It may be noted that the principle has been viewed to be part of international customary law in some cases and has been invoked before the International Court of Justice.[35]

The European Court of Justice ("ECJ") has also adopted the precautionary approach, particularly in respect to environmental risks that pose dangers to human health. The Court held among others '….where there is uncertainty as to the existence or extent of risks to human health, the institutions may take protective measures without having to await the reality and seriousness of those risks to become fully apparent."[36] The Tribunal in the Southern Bluefin Tuna Cases opined that in the light of scientific uncertainty, the parties 'should act with prudence and caution to ensure that effective conservation measures are taken to prevent serious harm to the stock of southern Bluefin tuna. [37] It may be noted that the fulcrum of this principle rests on the element of anticipation.

At the national level, Canada has affirmed the precautionary principle in its revised Canadian Environmental Protection Act 1999. In February 2005, France also adopted the principle as

[30] Stuart Bell, Donald McGillivray and Ole W. Pedersen, Environment Law, Oxford University Press, 8th Edition (2013)
[31] International Conference on the Protection of the North Sea held in Bremen 1984
[32] United Nations Framework Convention on Climate Change1992, Article 3(3)
[33] Convention on Biological Diversity 1992, Preamble
[34] It provides that "In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation."
[35]International Court of Justice Order of 22 September 1995, at p. 342 (Weeramantry, J., dissenting) Judge Weeramantry in his opinion dissenting from the Order of the Court of 22 September 1995 concluded that "…the law cannot function in protection of the environment unless a legal principle is involved to meet this evidentiary difficulty, and environmental law has responded with what has come to be described as the precautionary principle – a principle which is gaining increasing support as part of the international law of the environment."
[36] Judgement of the ECJ in Cases C-157/96 (The Queen vs. Ministry of Agriculture, Fisheries and Food) and C-180/96 (UK vs Commission of the EC)
[37] Southern Bluefin Tuna cases (Provisional measure) 38 I.L.M.1624 (1999) at para. 77

part of its environmental charter and constitution.[38] In United States in some landmark cases like Ethyl Corp v. EPA and TVA v. Hill, it expressly endorsed the notion of 'precautionary' regulation under the Clean Air Act and the Endangered Species Act respectively.[39]

It may be argued that like any principle, the precautionary principle has some weaknesses. One of such is the trigger point of the application of the principle.[40] At which level of uncertainty would demand a precautionary response?[41] Sadeleer recommends that the precautionary principle be applied to situations where there is a 'reasonable scientific plausibility' of the risk.[42] To Cameron and another, there need not be a conclusive scientific proof linking that particular substance or activity to environmental damage for the application of the principle.[43] This confusion is evidenced in the Pfizer case. Pzifer argued that a scientific assessment of risk was a condition precedent to the application of the principle. The court refused this interpretation and noted that the application of the principle could not be based purely on a hypothetical risk but was acceptable in situations in which a risk existed even if the risk could not be fully demonstrated completely'.[44] It may be noted that despite this confusion, there is increased global consciousness giving rise to a developing consensus in favor of the principle. The Fifteenth Session of the UNEP Governing Council have opined that 'waiting for scientific proof regarding the impact of pollutants discharged into the marine environment could result in irreversible damage to the marine environment and in human suffering' and recommended that all governments adopt the 'principle of precautionary action' as the basis of their policy with regard to the prevention and elimination of marine pollution'.[45]

(C) The preventive principle

It had been viewed that prevention of environmental harm should be the "Golden Rule" for the environment, for both ecological and economic reasons.[46] This is because it is frequently

[38] Environment Charter of 2004, Article 5, adopted as part of the French Constitution (attached to the Preamble) on 28 February 2005
[39] Ethyl Corp. v. EPA, 541 F.2d 1 (D.C. Cir. 1976); and TVA v. Hill, 437 U.S. 153 (1978)
[40] Stuart Bell, Donald McGillivray and Ole W. Pedersen, Environment Law, Oxford University Press, 8th Edition (2013)
[41] Stuart Bell, Donald McGillivray and Ole W. Pedersen, Environment Law, Oxford University Press, 8th Edition (2013)
[42] Nicolas de Sadeleer, Environmental Principles – From Political Slogans to Legal Rules. Oxford University Press, 2002
[43] James Cameron and Juli Abouchar, 'The Precautionary Principle: A Fundamental Principle of Law and Policy for the Protection of Global Environment', 14 Boston College International and Comparative Law Review (12-1-1991) (20.01.21, 13:20) http://lawdigitalcommons.bc.edu/cgi/viewcontent.cgi?article=1335&context=iclr . See also H. Hohmann, Precautionary Legal Duties and Principles of Modern International Environmental Law (1994)
[44] Case T-13/99 Pfizer v. European Commission [2002] ECR II-3305
[45] UNEP Governing Council Decision 15/27 Precautionary Approach to Marine Pollution, Including Waste-Dumping at Sea (1989)
[46] United Nations Environment Programme, Training Manual on International Environment Law- Principles and Concepts of International Environmental Law, chapter (15.09.20, 16:20), http://www.unep.org/environmentalgo

impossible to remedy environmental injury to the ecosystem. Even when harm is treatable, the costs of rehabilitation are often prohibitive. One obligation that flows from the concept of prevention is prior assessment of potentially harmful activities. Other preventive mechanisms include monitoring, notification, and exchange of information, all of which are obligations in almost all recent environmental agreements. The preventive approach has also been endorsed in the 1972 Stockholm Declaration.[47] The 1978 UNEP Draft Principles also endorse this principle.[48] The principle is also evidenced in Principle 17 of the 1992 Rio Declaration, article 206 of UNCLOS.

In the EU, there is support for this principle under Directive 2004/35/EC.[49] The arbitral tribunal in the Iron Rhine case recognised that 'today, in international environmental law, a growing emphasis is being put on the duty of prevention'.[50] The Pulp Mill case also affirmed this approach. The International Court of Justice pointed out that 'the principle of prevention, as a customary rule, has its origins in the due diligence that is required of a State in its territory'.[51] Taking prior action and if possible, before damage has actually occurred is the focal point of the principle. [52]

(D) Command -and-control approach

Command and control (CAC) approach can be defined as the direct regulation of an industry or activity by legislation that states what is permitted and what is illegal.[53] The government authority through laws, rules and regulations sets the standards which are to be complied with by the industry and it ensures compliance through its law enforcement agencies. There are sanctions imposed if these standards are violated. For the government to ensure compliance, it sets levels of pollution which must not be exceeded. This approach has been reinforced in some international instruments like Montreal Protocol 1987.[54] Contracting parties of the Montreal Protocol are enjoined to take steps and measures to set standards and to implement the content of the treaty. In the upstream oil and gas industry which has a potential negative

vernance/Portals/8/documents/training_Manual.pdf

[47] Stockholm Declaration 1972, Articles 6, 7, 15, 18 and 24

[48] 1978 UNEP Draft Principles Principle 1

[49] Directive 2004/35/CE of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage. Article 5(1) provides that 'Where environmental damage has not yet occurred but there is an imminent threat of such damage occurring, the operator shall, without delay, take the necessary preventive measures

[50] Iron Rhine Arbitration Belgium v Netherlands Award ICGJ 373 (PCA 2005)

[51] Pulp Mills on the River Uruguay (Argentina v. Uruguay), Provisional Measures, Order of 13 July 2006, I.C.J. Reports 2006, p.113

[52] Phillipe Sands and Jacquelin Peel, Adriana Fabra and Ruth Mackenzie, Principles of International Environmental Law, Cambridge University Press, 3rd Edition (2012)

[53] McManus Phil, Environmental Regulation Australia. Elsevier Ltd, 2009

[54] See also Climate Change Convention 1992; OSPAR Convention 1992, article 1(a)

impact on the environment, like the Macondo spill, it has been argued that this approach has remarkable advantages. In USA for instance, some of the laws which adopt the command and control approach are the National Environmental Policy Act (NEPA) and the Clean Water Act 1972. Command and control approach responds more swiftly as a result of its enforcement nature. That again, industries work more carefully when there are sanctions for low level standards. However, this approach has been criticized as being a political tool. Countries would want to show the international arena, that it is taking swift moves to help eradicate pollution in the upstream oil and gas industry.

Again the approach has been criticised as impeding competition. Its compliance and enforcement may be characterized also as expensive valuing higher than the sanctions for non-compliance. Again, the effect of this traditional approach becomes limited where the source of the pollution is from a diffuse point. It may not be feasible for enforcement agencies to detect the levels of pollution. Under Ghana's Petroleum (Exploration and Production) Act 2016, Act 919 for instance, a licensee, contractor or the Corporation (ie. GNPC) carrying out petroleum operations is strictly liable for any pollution damage caused as a result of petroleum activities.[55] In addition, where several licensees or contractor parties are involved in petroleum activities, the parties are jointly and severally liable for pollution damage caused by the petroleum activities.[56] This provision is welcoming news as it may be seen to be in conformity with the Polluter Pays Principle in Principle 16 of the Rio Declaration which provides that: "National authorities should endeavour to promote the internalisation of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment." The contractor shall take the necessary measures to remedy any pollution or damage so caused and thus making contractors strictly liable for any pollution damage under Act 919. [57]

(E) Economic Instruments

It is defined as any instrument that provides continuous inducements, financial or otherwise, to encourage responsible parties to reduce their releases of pollutants or make their product less polluting'.[58] This approach is a recent phenomenon. The OECD Recommendation of the Council on the Use of Economic Instruments in Environment Policy for example, recommends

[55] Ghana's Petroleum (Exploration and Production) Act 2016, Act 919 Section 83(1)
[56] Ghana's Petroleum (Exploration and Production) Act 2016, Act 919 Section 83(2)
[57] Ghana's Petroleum (Exploration and Production) Act 2016, Act 919 Section 83(4)
[58] USA Environmental Protection Agency, Laws and Regulations, (29.10.20, 15:20) http://www2.epa.gov/regulatory-information-topic/emergencies#spills

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to member states to use economic instruments to check human behavior as well as ensuring sustainable development. Economic instruments are affirmed in national and global instruments.[59] They help reduce problems with property rights that contribute to pollution. They also help to check human activity that affects the environment.[60] Economic instruments in the upstream oil and gas industry may be in the form of charges and taxes, tradeable permits, deposit refund systems, subsidies, trade measures, enforcement incentives etc. The European Union Emission Trading Scheme (EU ETS) is an example of economic tradeable permit. These economic instruments have been found to be more flexible than the Command and Control Policy. It is an incentive to polluters to limit activities that may harm the environment. This approach would be helpful in situations where the source of pollution is from a diffuse area unlike the command and control approach which will be handicapped. There have been divergent opinions on the efficiency of this approach. Some have argued that this approach rather encourages polluters in the upstream oil and gas industry to destroy the environment. It may be argued that so far as oil and gas industries would be subjected to certain taxes or charges for exceeding their regulated limits, then regulating their activities through market based instruments becomes an exercise in futility. The environment will continue to be polluted whilst the polluter continues to benefit financially.

(F) Polluter pays principle

Principle 16 of the Rio Declaration provides: "National authorities should endeavour to promote the internalisation of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment." An early version of the principle was developed by the Organisation for Economic Co-operation and Development (OECD) in the 1970s in an effort to ensure that companies would pay the full costs of complying with pollution-control laws.[61] This principle means that the polluter should bear the costs of polluting the environment to ensure that the environment is in an acceptable state. Some international instruments that include it are: the 1990 International Convention on Oil Pollution Preparedness, Response and Cooperation which states in its preamble that the principle is "a general principle of international environmental law". The 1996 Protocol to the London Convention also provides that the polluter should in principle bear

[59] Rio Declaration on Environment and Development, 1992, article 16; Biodiversity Convention, 1992; United Nations Framework Convention on Climate Change, 1992

[60] UNEP Publication, The Use of Economic Instruments in Environmental Policy: Opportunities and Challenges. UNEP, 2004

[61] OECD, Recommendation of the Council on Guiding Principles concerning International Economic Aspects of Environmental Policies, 26 May 1972- C(72)128

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the cost of pollution. Issues relating to the content of the polluter pays principle are also evident in the 1992 Convention for the Protection of the Marine Environment of the North-East Atlantic.[62]

The fundamental principle of European Union Directive on the principle is that an operator whose activity has caused the environmental damage or the imminent threat of such damage is to be held financially liable, in order to induce operators to adopt measures and develop practices to minimise the risks of environmental damage so that their exposure to financial liabilities is reduced.[63]

There have been differing interpretations to this principle but one positive thing is that its normative quality is not diminished.[64] Maitre argues that the prevention principle induces the polluter to avoid creating a damage which it would have to pay for afterwards.[65] Sadeleer on the other hand argues that if the benefits to the polluter of engaging in the activity outweigh their costs, the polluter nevertheless will engage in the polluting activity.[66] It may be noted that despite these arguments, the principle has been adopted as international law and an example is the well-known Trial Smelter arbitral award, which compelled Canada to pay compensation for damages in the United States caused by a Canadian source of air pollution and to reduce the pollution to avoid further damage.[67] The liability principle not only imposes on the source of pollution a legal liability to pay for the damage caused to innocent victims, but may also require the source, at its own expense, to minimise the pollution in order to reduce its effects on innocent neighbours to an acceptable level.[68]

The polluter pays principle not only imposes on the source of pollution a legal liability to pay for the damage caused to innocent victims, but may also require the source, at its own expense, to minimise the pollution in order to reduce its effects on innocent neighbours to an acceptable level.[69] Before the Act was passed, Ghana, like any other petroleum producing state

[62] According to article 2(2) (b), "The Contracting Parties shall apply: …the polluter pays principle, by virtue of which the costs of pollution prevention, control and reduction measures are to be borne by the polluter"
[63] Directive 2004/35/CE of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage, Preamble
[64] Sanford E. Gaines, 'Polluter-Pays Principle: From Economic Equity to Environmental Ethos', Texas International Law Journal, Vol. 26, Issue 3 (Summer 1991) pg 466
[65] Eléonore Maitre, Environmental Liability and the Protection of Biodiversity: An Analysis of European Union and United States Legal Regimes, Jean Monnet Working Paper Series-Environment and Internal Market Vol. 2012/6 (Nicolas de Sadeleer 2012) (12.12.20, 14:20) http://www.tradevenvironment.eu/uploads/maitre_working_paper_2012_6.pdf
[66] Nicolas de Sadeleer, Environmental Principles – From Political Slogans to Legal Rules. Oxford University Press, 2002
[67] Trail Smelter Arbitration (United States v. Canada) Arbitral Trib., 3. U.N. Rep. Int'l Arb. Awards 1905 (1941)
[68] Sanford E. Gaines, Polluter-Pays Principle: From Economic Equity to Environmental Ethos, Texas International Law Journal, Vol. 26, Issue 3 (1991)
[69] Sanford E. Gaines, Polluter-Pays Principle: From Economic Equity to Environmental Ethos, Texas International

experienced a notable offshore pollution incident. Kosmos Energy operating in Ghana's territorial waters, Tano Basin, spilled 706 barrels of toxic substances into the sea in December 2009 and it was fined 35 million dollars by the Government of Ghana but it refused to pay same claiming it was baseless and unlawful since there was no Act specifically directed to remedy this incident.[70] Following the enactment of this Act, it is expected that Oil companies in Ghana's territorial sea would comply with the provisions of the Act and would be held accountable for polluting the marine environment.

(G) Integrated pollution control/ hybrid approach

The traditional approaches as discussed above have been found to be inefficient particularly in tackling complicated environmental issues. For that reason, there is growing acceptance of this integrated approach. This phenomenon has been captured in the 1991 OECD Council Recommendation.[71] The purpose of this technique is to prevent or minimize the risk of harm to the environment as a whole. This approach focuses on the substance, the source of pollution and the geographical region.[72] However, its implementation may be subject to the individual state's methods which may not be favourable. Many have argued that the best environmental approach to regulate this industry is the adoption of a hybrid of the above-mentioned systems. To sustain development, it would be necessary to make more extensive use of economic instruments in conjunction with regulatory approaches.[73] It has been argued by many scholars that a country cannot exclusively adopt one approach and function properly. The system would collapse. The international community recommends that relevant policies make use of economic instruments appropriate to each country's socio-economic conditions in conjunction with a balanced mix of regulatory approaches.[74] This is practiced in the United States of America (USA).There are various laws adopted and implemented by the US which are in the form of the traditional regulatory system. Among the promulgated laws are the Oil Pollution Act 1990, Comprehensive Environment Response, Compensation and Liability Act 1980 (CERCLA), Spill Prevention, Control and Countermeasure (SPCC) rule, Clear Air Act and the Clean Water Act 1972. These laws provide standards which are to be followed. The SPCC rule for example aims at avoiding the discharge of oil into waters. The Clean Water Act as amended by the Oil Pollution Act 1990 empowers the USA Environmental Protection Agency through

Law Journal, Vol. 26, Issue 3 (1991)

[70] GhanaWeb, Kosmos refuses to pay fine for oil spill off Ghana, (15.11.20, 12:300 http://www.ghanaweb.com/GhanaHomePage/NewsArchive/artikel.php?ID=190803

[71] See also, Appendix to the Recommendation; Action Plan of the Oslo 1992

[72] Annex to Guidance on Integrated Pollution Prevention and Control

[73] The UNECE Bergen Ministerial Declaration May 1990

[74] The 1990 Ministerial Declaration of the second World Climate Conference

its inspectors to visit the various oil and gas production sites. This effort is aimed at ensuring high environmental standards in the oil and gas industry in the US. Oil Pollution Act 1990 and the CERCLA when read together, provide incentives to these industries to take cautious decisions and at the same time making them liable if they should breach the rules. Apart from this traditional approach, the USA adopts market based regulatory systems. It has adopted the marketable permit system, emissions taxes, fees and charges, tax-subsidy combinations etc. Under the permit systems, USA has the Emission Reduction Credits (ERCs) and the Capped Allowance Systems. For the ERCs, no limit has been placed on pollution levels. However, industries earn credits by not exceeding the specified rates. It is an incentive to reduce emissions from the upstream oil and gas industry in the USA. The upstream oil and gas industries are taxed for polluting the environment.[75] This hybrid approach has positively impacted the US environment forum. Energy related emissions for example have declined since 1994.[76] It may be argued that there are benefits in adopting a hybrid of these approaches. Apart from the positive aspect of this best approach, it cannot be overlooked that there may be disadvantages owing to the fact that the traditional approaches have inherent shortfall as discussed above. The new integrated approach is also not devoid of shortcomings.

III. CONCLUSION

The purpose of environmental regulation in the oil and natural gas sector is to establish the framework to ensure that protection of the environment is given the highest consideration with respect to the development of oil and gas resources.[77] Oil and gas exploration and production operations have the potential for a variety of impacts on the environment. These 'impacts' depend upon the stage of the process, the size and complexity of the project, the nature and sensitivity of the surrounding environment and the effectiveness of planning, pollution prevention, mitigation and control techniques.[78] A significant proportion of the world's oil is produced offshore.[79] Experience shows that the best environment for pollution prevention comes from good legislation and enforcement coupled with good and responsible industry performance.[80] There are underlying principles of environmental regulation. The command and control approach for instance is primarily used by governments since laws are basic sources of

[75] National Centre for Environmental Economics, Economic Incentives, (02.10.20, 10:30) http://yosemite.epa.gov/ee/epa/eed.nsf/webpages/economicincentives.html

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legislation and regulation. Industries in the upstream oil and gas sector would be cautious in their exploratory and production works as they may face sanctions for breaching standards. The economic incentive based principle is an approach to induce polluters to reduce their emissions. The integrated approach/hybrid approach may be ideal as it focuses on a more sustainable community. These approaches have individual shortfalls and exclusive implementation of each may be disadvantageous to both the host government and the oil and gas industry. Implementation of a hybrid system may be a win situation for upstream oil and gas companies, government and the environment. Negative impacts of the petroleum industry may be reduced.

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