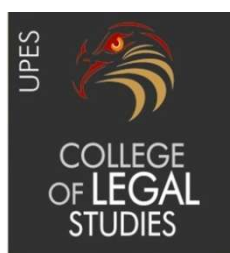


**REGULATION OF ENVIRONMENTAL CONCERNS FROM
UPSTREAM OIL AND GAS ACTIVITIES: AN ANALYSIS**

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*This dissertation is submitted in partial fulfillment of the degree of
B.A., LL.B. (Hons.)*



**College of Legal Studies
University of Petroleum and Energy Studies
Dehradun
2015**

CERTIFICATE

This is to certify that the research work entitled “**Regulation of Environmental Concerns from Upstream Oil and Gas Activities: An Analysis**” is the work done by **Aprna Kadian** under my guidance and supervision for the partial fulfilment of the requirement of B.A., LL.B. (Hons.) degree at College of Legal Studies, University of Petroleum and Energy Studies, Dehradun.

(Mr. Rajkumar)

Designation

Date

DECLARATION

I declare that the dissertation entitled “**Regulation of Environmental Concerns from Upstream Oil and Gas Activities: An Analysis**” is the outcome of my own work conducted under the supervision of Mr. **Rajkumar**, at College of Legal Studies, University of Petroleum and Energy Studies, Dehradun.

I declare that the dissertation comprises only of my original work and due acknowledgement has been made in the text to all other material used.

Signature & Name of Student

Date

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ABBREVIATIONS

ANG: Associated Natural Gas

B.P.: British Petroleum

BCM: Billion Cubic Meters

CBD: Convention on Bio Diversity

CBM: Coal Bed Methane

CNG- Compressed Natural Gas

CPCB: Central Pollution Control Board

CSR: Corporate Social Responsibility

DGH: Director General of Hydrocarbons

DGMS: Director General of Mines and Safety

E&P: Exploration and Production

EIA: Environmental Impact Assessment

EITI: Extractive Industries Transparency Initiative

FOC: Foreign Oil Companies

G.A. General Assembly

GDP: Gross Domestic Product

GGFR: Global Gas Flaring Reduction

GOI- Government of India

HIV- Human Immuno Deficiency Virus

HSE- Health Safety and Environment

IMO- International Maritime Organization

MARPOL- Marine Pollution Convention

MMS- Mineral Management Service

Mmscmd- Million Standard Cubic Metres per Day

MMT - Million Metric Tonnes

MOEF- Ministry of Environment and Forest

MoPNG- Ministry of Petroleum and Natural Gas

NELP- New Exploration Licensing Policy
NEPA- National Environmental Policy Act
NOC- National Oil Company
NOSDCP- National Oil Spill Disaster Contingency Plan
OCS- Outer Continental Shelf
OISD: Oil Industry Safety Directorate
OMR- Oil Mines Regulations
ONGC- Oil and Natural Gas Corporation
OPSC- Oil Pollution Preparedness, response and co-operation
PEL- Petroleum Exploration License
PML- Petroleum Mining Lease
PSC- Production Sharing Contract
RES. Resolution
STD- Sexually Transmitted Diseases
UN : United Nations
UNEP- United Nations Environment Program

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1. INTRODUCTION

Petroleum and natural gas apart from being an important energy source also serve as feedstock for several consumer goods and therefore, play a pivotal role in people's lives. At the same time, oil industry has potential of causing hazards to the various limbs of the environment for e.g. water, soil, air etc. ¹ The exploitation of oil and gas has always been detrimental to the ecology and has obvious ill-effects such as oil spills, fires, accidents, damaged land, polluted water and the like.² With growing concern about environment, hydrocarbons are now viewed with growing agnosticism for their environmental consequences. Environmental problems start away with exploration activities and continue even after the abandonment of the block. Oil spills, damaged lands, accidents and fires and incidents of air and water pollution have been recorded from time to time. There is a wide range of emissions and discharges associated with various offshore oil and gas activities, some of which require specific management measures. The key issues include oil and chemicals in produced water, impacts from historical cuttings piles and atmospheric emissions. Noise and light are also potentially of concern.³ Oil and gas constitute the important segment of energy consumption in the country. As per International Energy agency Report, India is fourth major consumer of energy, first three being the United States, China and Russia. 25% of India's energy needs are met through crude oil and natural gas and more than 60% of that is imported.⁴ Therefore, owing to such huge energy consumption, oil and gas production as well as imports cannot be curtailed and the challenge is to meet the world energy demands, whilst minimizing adverse impact on environment and hence, the situation demands for striking a delicate balance between development and protection of the environment. This idea normally alluded to as maintainable advancement is of awesome pertinence and hugeness in the present connection. Additionally, when the issue is seen through the viewpoint of feasible

¹ Jacqueline Barboza Mariano, *Environmental Impacts of the Oil Industry*, available at <http://www.eolss.net/sample-chapters/c08/e6-185-18.pdf>.

² UNEP, *Environmental Management in Oil and Gas Exploration & Production: an overview of issues and management approaches*, available at <http://www.ogp.org.uk/pubs/254.pdf>.

³ OSPAR Commission, *Assessment of impacts of offshore oil and gas activities in the North-East Atlantic*, available at http://qsr2010.ospar.org/media/assessments/p00453_OA3-BA5_ASSESSMENT.pdf.

⁴ Energy statistics 2012 by central statistics office
<http://www.eia.gov/countries/cab.cfm?fips=in>.

improvement, the financial ramifications can't be overlooked at any expense. Particularly this inquiry on social maintainability can't be forgotten in the setting of creating and slightest created nations. The danger in these nations is that, aside from the routine natural issues, that these frail administrative administration cause, there emerge extensive variety of financial repercussions extending from giving sufficient remuneration to the separated, recovery, privileges of indigenous individuals and different other human rights issues that are never considered in the vast majority of the activities. Specifically, India's reliance on different countries for its vitality is an extraordinary reality. With its GDP developing at a rate of at least 5% every annum, with a general normal of 7.45% development amid the time of 1999-2011⁵, actually amid the time of stoppage demonstrates the financial force it has picked up. This humongous monetary development is joined by change in the personal satisfaction and resulting interest for quality vitality.⁶ The connection between the natures of the way of life of a country to the vitality devoured by them is unquestionable, which perpetually demonstrates the enormous interest for 'quality vitality' that this nation is going to see sooner rather than later.⁷ In this way, India alongside China and other creating nations have turned into the standard purpose behind expansion sought after for raw petroleum and common gas around the world. Despite this pummeling need India is in close finish reliance on different nations for its vitality needs⁸ be it crude oil or natural gas, to beat this circumstance the Indian government was in urgent need of both trusts and specialized skill in the

⁵ India Macro- Economic Summary 1999 to 2013-14, at http://planningcommission.nic.in/data/datatable/1612/table_1.pdf.

⁶ Cesar Pastenn & Juan Carlos Santamarina, *Energy and Quality of Life*, ENERGY POL'Y 468-476 (2012).

⁷ *Id* at 468

⁸ India holds just 0.7% of the world's proven oil reserves while accounting for 3.9% of the global oil consumption- thus importing 73% of its oil consumed. Similarly, the country has 0.8% of the worlds proven natural gas reserves, while accounting for 1.9% of the worldwide gas consumption, which results in India importing nearly 20% of its natural gas consumed through LNG. Further, rising oil imports impact our trade deficit. Notably, the import of crude oil and oil products rose from US\$50.3 billion in FY 2006 to US\$115.9 billion in FY 2011. *See* India's Energy Security- Key Issues Impacting the Indian Oil and Gas Sector at [http://www.ey.com/Publication/vwLUAssets/Indias_energy_security/\\$FILE/Indias_energy_security.pdf](http://www.ey.com/Publication/vwLUAssets/Indias_energy_security/$FILE/Indias_energy_security.pdf). *See also* generally Eshita Gupta, *Oil Vulnerability Index of Oil-Importing Countries*, Energy Pol'y 1195-1211 (2008).

field to investigate the so far untouched hydrocarbon assets in the nation.⁹ This was promptly accessible from the Foreign oil Companies (FOC). Then again, the speculators were not intrigued by contributing because of extreme administrative obstacles, present amid the scandalous permit period. The Indian government thought of an answer in the structure New Exploration and Licensing Policy in 1997-98 with a point of giving a level playing field to both open and private division players.¹⁰ Much has advanced from that point forward, the development direction of Indian oil and gas investigation situation is in an ideal situation in the late decades, particularly as a result of decently organized administrative system offered through NELP.¹¹ It has opened up cluster of chances for both remote and Indian private players to investigate the unfathomable stretch of unexplored domain in our nation, which was prior a selective area of open segment oil organizations like Oil and Natural Gas Corporation.¹² With a specific end goal to guarantee reasonableness for both private and outside players the Indian government made the Directorate General of Hydrocarbons as a controller to regulate the upstream investigation exercises likewise guaranteeing decency in execution, accordingly shielding the premiums of the country.¹³ This step was basically made to ingrain trust in the psyche of speculators. Since 1999, when offers for recompensing squares for investigation through NELP was welcomed shockingly, nine rounds of NELP were directed for granting pieces for investigation, with the ninth one led in 2010. From that point forward the local creation of oil has expanded impressively,

⁹ Shilpa Kannan, *Foreign Investment in Indian Oil Exploration waning*, BBC News, 26 May 2011, at <http://www.bbc.co.uk/news/business-13559082>.

¹⁰ Under the First round of New Exploration Licensing Policy, Government of India invited bids on 8th January 1999 for 48 blocks for exploration of oil and natural gas. The PSC's were signed for 24 exploration blocks comprising seven deepwater, 16 shallow offshore and 1 on land. At present nine exploration blocks are under operation and 15 block have been relinquished. See Ministry of Petroleum and Natural Gas, *Basic Statistics on Indian Petroleum and Natural Gas 2011-2012* available at <http://petroleum.nic.in/petstat.pdf>.

¹¹ *Id*

¹² See Petrofed, *Review of E&P Licensing Policy, 73-75* available at <http://petrofed.winwinhosting.net/upload/Part3.pdf>.

¹³ Prior to the establishment of DGH, all the upstream activities were regulated directly by the Ministry of Petroleum and Natural Gas. Without a specialized agency, the sector was marred with many practical and policy issues. The need was realized culminating in the establishment of DGH, with the DGH on the scene, the need to create a level playing field for all the investors was soon realized with the help of NELP.

however not to the degree of fulfilling India's need totally.¹⁴ With assessed oil and gas stores of 760 MMT and 1330 BCM¹⁵ separately the possibility to investigate is humongous, and it is doubtlessly that the investigation and creation exercises are situated to increment in the years to come.

This ought to be seen alongside the extraordinary truth that the characteristic way of action in the petroleum investigation and generation segment makes ecological harms unavoidable. Additionally, the increment in the interest and supply crevice will drive numerous to investigate more in geographically difficult zones of the nation which are more than frequently in naturally delicate regions like sea-ward profound water squares. Consequently, at this point it is vital to survey exhaustively the natural security system, which is honed starting now, to cop up with the new flow that will be made by unavoidable increment in the investigation and creation (E&P) exercises.

India, in the same way as other different nations, has multi statutory style for controlling the ecological aspect of oil and gas exercises.¹⁶ Having a to a great extent hypothetical methodology, it embraced numerous ideas of natural insurance in this space from global conventions¹⁷. Aside from the regular natural insurance enactments and different enactments that manage the oil and gas segment, the upstream E&P exercises are majorly administered by the Production Sharing Contract (PSC) which structures the administrative establishment. Dissimilar to most created countries, the legitimate administration for the ecological assurance in India is obviously lacking to offer a complete spread of insurance to the earth. This absence of consideration regarding the ecological issues will cost much later on, given the development that this division is going to see in the years to come.

¹⁴ *supra n.12.*

¹⁵ *Id.*

¹⁶ Statutes like Environmental (Protection) Act, 1986 and various other environmental legislations have an overriding effect on the provisions of the PSC. Apart from the mandate of the contract, the contractor should comply with the multitude of other legislations as well.

¹⁷ The very concept of a Production Sharing Agreement is nothing but an adoption from many other developing countries like Indonesia, where it attained maturity. Likewise, all the environmental statutes are nothing but a result of host of international conventions Stockholm, Rio Conventions..

The mission for an answer will unavoidably end in a require a stricter administrative system. By and by, the special instance of oil and gas extraction industry is that the control over the organization that is applied by government is generally gotten from the agreement that it enters with it. In this way, investigating the blemishes in the lawful framework representing different upstream and downstream exercises will be the best arrangement of all. Through this paper, I am endeavouring to research those deficiencies to offer a compelling answer for revise them inevitably.

2. AN OVERVIEW OF ENVIRONMENTAL CONCERNS ARISING FROM OIL & GAS

Over the past few years, governments and international oil companies¹⁸ have given increasing attention to the environmental and social issues¹⁹ arising as a consequence of oil and gas operations.²⁰ They have recognized that the reputation and credibility of both government as well as the oil companies are at stake if these sensitive aspects are not responded properly. At the danger of over disentanglement, this developing attention to environmental and social issues developed out of starting thoughtfulness regarding health, safety and environment (HSE) by oil organizations for inner operational practices and specialized techniques. After some time, more noteworthy and more prominent consideration was given to outside variables influencing performance of the companies, including express concern about social issues and the significance attached to Corporate Social Responsibility (CSR). Universal media consideration regarding oil slicks and contamination, antagonistic social effects on local groups and relocated individuals, and unjust monetary development connected with oil incomes incited by privately owned businesses and governments alike to re-examine where their obligations to ecological and social concerns start and end and the more extensive connection in which they must act.²¹

In order to understand the various adverse impacts caused by numerous activities of oil and gas sector, it is first necessary to understand the various activities involved in the sector. The entire oil and gas industry can be divided into two segments i.e. upstream and downstream. Exploration and production activities are divided into various phases such as:

1. Seismic identification of potential Hydrocarbon reserves.

¹⁸Amy Myers Jaffe & Ronald Soligo, *The International Oil Companies*, available at http://bakerinstitute.org/media/files/Research/3e565918/NOC_IOCs_Jaffe-Soligo.pdf.

¹⁹ International Association of Oil and Gas Producers, *Key Questions in Managing Social Issues in Oil & Gas Projects*, available at <http://www.ogp.org.uk/pubs/332.pdf>.

²⁰ UNEP Technical Publication, *Environmental Management in Oil and Gas Exploration & Production: An overview of management issues and approaches*, available at <http://www.ogp.org.uk/pubs/254.pdf>.

²¹ United Nations Development Program, *Getting it Right: Lessons from the South in Managing Hydrocarbon Economies*, available at http://ssc.undp.org/content/dam/ssc/documents/partnership/Getting_it_right.pdf.

2. Exploratory Drilling
3. Construction
4. Development and production
5. Maintenance
6. Decommissioning and Reclamation

All these phases of exploration and production activities adversely affect the various components of the environment and the impacts can be clearly categorized as²²:

- Atmospheric Impacts
- Aquatic Impacts
- Terrestrial Impacts

Below is a brief description of the adverse environmental impacts of various upstream activities.

Exploration:

The very first step in commencement of oil and gas operations is searching for hydrocarbon bearing rock formations and locating the reservoir rocks. This is done by reviewing geological maps for major sedimentary basin identification followed by field geological assessment. Detailed information is then obtained by carrying out either of the three survey methods i.e. magnetic, gravimetric and seismic.²³ The acoustic waves are generated generally through shot holes, air or water guns or vibroseis techniques. Various biodegradable and non biodegradable wastes generated in this process result not only in pollution (Air, water, noise and soil) but also cause less or more severe disturbances in the soil, vegetation, fauna and heritage of the place where the survey is being carried out.²⁴ Common wastes generated during the identification of hydrocarbon reserves are:

²² *Infra n.24*, the UNEP report provides for atmospheric, aquatic and terrestrial impacts because of upstream oil and gas activities.

²³ Yousif K. Kharaka & Nancy S. Dorsey, *Environmental Issues of Petroleum Exploration and Production: Introduction*, available at <http://toxics.usgs.gov/pubs/KharakaIntro.PDF>.

²⁴ International Association of Oil and Gas Producers, *Guidelines for Waste Management with Special Focus on Areas with Limited Infrastructure*, Report No. 413, Rev1.I (September 2008), available at <http://www.ogp.org.uk/pubs/413.pdf>.

- domestic waste,
- sewage,
- explosive wastes,
- lines, cables and vehicle (including ship) maintenance wastes;

Seismic surveys might therefore disturb spawning fish away from territory where they have chosen to aggregate for spawning purposes and this could, in extreme circumstances, be harmful to stock productivity. Disturbing fish away from traditional areas may also affect fishermen's catches.²⁵

Drilling:

After identification of a geological structure, the exploratory borehole is drilled to confirm the presence of hydrocarbons and thickness and internal pressure of the reservoir. Once the drilling activity commences, the drilling mud is continuously circulated through the drill pipe and back to surface equipment to act as a lubricant to the drill bit and also to balance the underground hydrostatic pressure.²⁶ But it is to be kept in mind that the drilling mud circulated back to the surface equipment contains lots of impurities and cannot be reused again without reprocessing and removing the impurities.²⁷ Common wastes generated in this process are²⁸:

- Drilling discharges (drilling mud, cementing wastes) and cuttings;
- Atmospheric emissions;
- Well completion;
- Production testing wastes
- Power unit and transport maintenance wastes;
- Excess drilling chemicals and containers;
- Domestic and sewage wastes;

²⁵ Fisheries Research Services, *Environmental Impacts of Oil and Gas Industries*, available at <http://www.gov.scot/uploads/documents/ae09environmental.pdf>.

²⁶ Craig Freudenrich & Jonathan Strickland, *How Oil Drilling Works*, available at <http://science.howstuffworks.com/environmental/energy/oil-drilling5.htm>.

²⁷ John Kennedy, *Technology Limits Environmental Impacts of Drilling*, available at <http://www.iadc.org/dcp/dc-julaug00/u-doe.pdf>.

²⁸ Department of the Army, U.S. Army Corps of Engineers, *Known and Potential Environmental Effects of Oil and Gas Drilling Activity in the Great Lakes* (November 2005), available at http://www.mcecc.org/documents/Great_Lakes_Oil_Gas_Effects.pdf.

- Noise

The direct impact of these problems can be seen in the interference caused in farming, shipping, fishing etc. drilling discharges result in land as well as water pollution which affects not only the marine life but also the plants and vegetation on land as well as the soil reducing its usefulness and thus disturbing the entire vegetative cycle. Accidental oil spills and waste disposal end up in polluting land, air and water²⁹ which in turn affect the health of living beings. Noise pollution that is the by-product of the exploration activity creates disturbance and nuisance for inhabitants and animals.

Construction:

Construction is an implied activity undertaken during the exploration and production of oil and gas. Construction includes construction of roads, canals, pipelines and the like. Common wastes generated from construction of these facilities include³⁰:

- excess construction materials;
- used lubricating oils, paints, solvents;
- sewage;
- Domestic wastes

All these end-products result into pollution (Air, water, Soil, Noise) which in turn affect living beings.³¹

²⁹ Cristina Gómez & David R. Green, *The Impact of Oil and Gas Drilling Accidents on EU Fisheries*, available at [http://www.europarl.europa.eu/RegData/etudes/note/join/2014/513996/IPOL-PECH_NT\(2014\)513996_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/note/join/2014/513996/IPOL-PECH_NT(2014)513996_EN.pdf),

³⁰ Construction activities potentially impact the soil and the impacts that may result from poor design and construction include mainly soil erosion, changes in surface hydrology and drainage patterns, increased siltation and habitat damage, reducing the capacity of environment to support vegetation and wildlife.

³¹ OSPAR Commission, *Assessment of Impacts of Offshore Oil and Gas Activities in the East Atlantic*, available at http://qsr2010.ospar.org/media/assessments/p00453_OA3-BA5_ASSESSMENT.pdf.

Development and Production:

Initially, only a small area is developed using one or more or exploratory wells. Further development of the reservoir may be done through additional wells. A separate facility may be required for storage, processing and transporting produced fluids. Common wastes generated in this process are:

- Wastes listed under exploratory drilling
- Discharged produced water
- Flare and vent gas³²
- Production chemicals
- Work over wastes

Decommissioning:

Decommissioning generally involves permanently plugging and abandoning all wells, and may include removal of buildings and equipment, transfer of buildings and roads to local communities or host government entities, implementation of measures to encourage site re-vegetation and site monitoring.³³ The primary wastes produced as a result of decommissioning of oil installation include:

- Construction materials
- Insulating materials
- Plant equipment
- Sludge
- Contaminated soil
- Waste disposal
- Dumping at sea
- Leave in situ (partial total)

These wastes cause both on as well as offshore pollution hazard to human activities such as fishing and navigation.

Apart from these environmental impacts, oil and gas upstream and downstream activities have a negative impact on the socio-cultural life of the local and indigenous people such as Local population levels, as a result of immigration

³² Flaring of produced gas is the most significant source of air emissions, particularly where there is no infrastructure or market available for gas.

³³ Ayoade Morakinyo Adedayo, *Environmental Risk and Decommissioning of Offshore Oil Platforms in Nigeria*, available at <http://www.nials-nigeria.org/journals/ELJ%20Original%20corrected%20copies.pdf>.

(labour force) and in-migration of a remote population due to increased access and opportunities and socio-economic systems due to new employment opportunities, income differentials, inflation, and difference in per capita income, when different members of local groups benefit unevenly from induced changes etc.

Socio-economic and Cultural impacts:

The oil and gas activities undertaken by the companies may directly or indirectly affect the various interests of the local communities who may at times have a particular interest in project planning and implementation. Therefore, the manner in which the oil and gas companies ought to interact with the local communities should be prescribed by various laws and regulations. And hence, in order to identify their concerns, an early and ongoing interaction with the locals is necessary so that their concerns get adequately addressed. Community support is crucial for success of the project and hence it is vital for the community to be independent and free in order to give informed consents. Because it's the local and indigenous people who are likely to be affected the most by the extent of these changes because they may get their traditional life style affected. Major impacts can be discussed as follows³⁴:

- Land use patterns, such as agriculture, fishing, logging, hunting, as a direct consequence (for example land take and exclusion) or as a secondary consequence by providing new access routes, leading to unplanned settlement and exploitation of natural resources.³⁵
- Local population levels, as a result of immigration (labour force) and in-migration of a remote population due to increased access and opportunities.³⁶
- Socio-monetary frameworks because of new business opportunities, wage differentials, swelling, and distinction in every capita salary, when distinctive

³⁴ *Supra n.21*

³⁵ Thomas W. Stephens, *Environmental and Social Challenges in Oil Sector Management*, available at http://www.un.org.kh/undp/images/stories/special-pages/extractive-industries/docs/environmental_and_social_challenges_eng.pdf.

³⁶ Dr. Samuel Famiyeh, *Environmental Disasters of Oil and Gas Exploitation - Lessons from the Gulf of Mexico*, available at http://tu-freiberg.de/sites/default/files/media/imre-2221/Alumni/2009_2010_environment_of_the_off-shore_oil_exploitation.pdf.

individuals from nearby gatherings advantage unevenly from instigated changes.

- Socio-social frameworks, for example, social structure, association and social legacy, practices and convictions, and optional effects, for example, impacts on common assets, privileges of access, and change in worth frameworks impacted by non-natives.
- Availability of, and access to, products and administrations, for example, lodging, training, medicinal services, water, fuel, power, sewage and waste transfer, and buyer merchandise brought into the district;
- Planning systems, where clashes emerge in the middle of improvement and security, characteristic asset use, recreational utilization, tourism and authentic or social assets;
- Aesthetics, due to unattractive or boisterous offices; and
- Transportation framework, because of expanded street, air and ocean base and related impacts e.g. clamour mischance dangers, expanded support necessities or change in existing administrations).
- Wellbeing: Spread of new illnesses to indigenous groups, affects on strength of operations faculty, effect of neighbourhood sicknesses on labourers and the spread of pandemics, for example, Sexually Transmitted Diseases and Human immune-deficiency virus etc.³⁷

Some positive changes will probably also result, particularly where proper consultation and partnership are to be developed for e.g. improved infrastructure, water supply, sewerage and waste treatment, health care and education etc. are likely to follow. However, the uneven distribution of benefits and impacts and the inability, especially of local leaders, always to predict the consequences, may lead to unpredictable outcomes. With careful planning, consultation, management, accommodation and negotiation some, if not at all, of the aspects can be influenced.

From the above impacts, it is obvious that with the progress of the project i.e. from Geological survey to production and decommissioning of oil reserve, the

³⁷ IPIECA. *A Guide to Social Impact Assessment in the Oil and Gas Industry*, available at <https://www.commdev.org/guide-social-impact-assessment-oil-and-gas-industry>.

environmental problems also tend to culminate. Apart from the traditional problems, exploration and exploitation of oil generally results into displacement of local people from the site of exploration which forces them to face various social, cultural and economic issues. With the increasing role of Amnesty International and growing concern and awareness about human rights among the citizens, these issues have become very much debatable from past few decades. The world being so much dependant on oil and gas, it's impossible to stop carrying of oil and gas production operations and protect the environment from any further destruction. Therefore, although it is not possible simultaneously carry out oil and gas production operations and also to reduce the adverse environmental impacts arising out of E&P activities in oil and gas sector to nullity, these adverse impacts can be reduced and made good to a great extent by effective regulatory and legal framework. There are ample national as well as international laws governing the oil and gas sector various activities thereof.

3. INTERNATIONAL LEGAL REGIME GOVERNING ENVIRONMENTAL ISSUES

This chapter will mainly focus on international environmental law as it relates to the oil and gas industry. International environment law jurisprudence affecting the oil and gas industry has its basis in the *sic utere* principle which provides:

*No state has the right to use or permit its territory to be used in such manner as to cause injury on, or to the territory of another or the properties of persons therein.*³⁸

International law has also developed around the concept of trans-boundary resources. G.A. Res. 1803/XVIII of 1962 and G.A. Res. 3281/XXXIX of 1974 recognize the right of each country to freely dispose of its natural resources in accordance with its national interests and in conformity with rules and regulations which its people freely consider to be necessary or desirable.³⁹ Therefore, it can be said that environmental regulation of oil and gas sector is a phenomenon of recent origin. The development of this phenomenon will be obviously credited to a combination of National, Regional and International legislations, agreements, treaties respectively and part played by National laws in the growth of environmental regulation of Oil and gas sector is predominantly significant.

There are numerous international treaties that have been signed by India for protection of Environment from various operations carried out during exploration and production of oil and natural gas. It is fairly impossible discuss about all of them within the limited scope of this paper. However, leading international conventions and regional agreements that have resulted in affective development in the frame-work of international law affecting offshore industry have been discussed below.

Geneva Convention:

The 1958 Geneva Conventions, known to include the Continental Shelf Convention, 1958⁴⁰ and the High Seas Convention 1958⁴¹, includes a number of

³⁸ See, *The Corfu Channel Case (United Kingdom v. Albania)*, 1948 ICJ Rep. 22. The International Court of Justice held that states are obliged not to use its territory contrary to the rights of other states. This principle has been upheld in *Trail Smelter Arbitration* in 1941, as well.

³⁹ Zhiguo Gao, *Environmental Regulation of oil and Gas*, p.p. 65, available at <https://books.google.co.in/books?id=tv6VYR5plv0C&pg=PA63&lpg=PA63&dq=Int>.

⁴⁰ Convention on Continental Shelf, 1958, entered into force on 10th June, 1964, United Nations, Treaty Series, Vol. 499, p. 311.

provisions binding the state parties to prevent marine pollution from offshore exploration. The relevant provision provides as follows:

a) The exploration of the continental shelf and the exploitation of its natural resources must not result in any unjustifiable interference with navigation, fishing or the conservation of the living resources of the sea, nor result in any interference with fundamental oceanographic or other scientific research carried out with the intention of open publication.

b) The coastal State is entitled to construct and maintain or operate on the continental shelf installations and other devices necessary for its exploration and the exploitation of its natural resources, and to establish safety zones around such installations and devices and to take in those zones measures necessary for their protection.

c) The safety zones may extend to a distance of 500 metres around the installations and other devices which have been erected, measured from each point of their outer edge. Ships of all nationalities must respect these safety zones.

These regulations provide for member states to undertake all appropriate measures for the protection of the living resources of the sea from all harmful agents; and to entirely remove any installations which are abandoned or disused.⁴²

The High Seas convention also has a provision which requires state parties to draw up regulations to prevent pollution of the seas by the discharge of oil from ships or pipelines or resulting from the exploitation and exploration of the seabed and its subsoil, taking account of existing treaty provisions on the subject.⁴³

The Geneva conventions have been replaced by the Law of the Sea Convention 1982, and provisions of the Geneva Conventions continue to apply only on those countries, that have not ratified the LoS Convention, 1982.

⁴¹ Convention on the High Seas 1958, entered into force on 30th September, 1962, United Nations, Treaty Series, vol. 450, p. 11, p. 82

⁴² Article V, Convention on the Continental Shelf, 1958.

⁴³ Art. 24, Convention on High Seas, 1958.

Marine Pollution Convention, 1973/1978⁴⁴:

The MARPOL Convention is aimed at preventing marine pollution from shipping industry and hence in a great way influences the offshore petroleum operations. The term ‘discharge’ as defined in the convention provides as follows⁴⁵:

Discharge does not include release of harmful substances directly arising from the exploration, exploitation and associated offshore processing of sea-bed mineral resources;

Therefore, an obvious interpretation that follows from the above definition is that the convention excludes its jurisdiction over pollution caused by such activities as blowout, structural failure of installations, collision with structure, or accident of a pipeline. However, **Annex 1** of the convention is an exception to the above rules and provisions contained therein are applicable on ships of 400 Tons or above, also become applicable on fixed and floating rigs engaged in the exploration and exploitation of seabed resources.⁴⁶

Law of the Sea Convention, 1982⁴⁷:

The LoS Convention has been designed to consolidate all the customary and conventional rules and principles of International law into a single framework convention. Section XII of the convention specifically and comprehensively provides the measures to be taken by the state parties to prevent, reduce, control the pollution of the marine environment. As far as offshore petroleum operations are concerned, it provides as follows⁴⁸:

“Pollution from installations and devices used in exploration or exploitation of the natural resources of the seabed and subsoil, in particular measures for preventing accidents and dealing with emergencies, ensuring the safety of operations at sea,

⁴⁴ International Convention on the Prevention of Marine Pollution from Ships and its 1978 Protocol, reprinted in 12 International Legal Materials (ILM) 1319 (1973), 17 ILM 546 (1978).

⁴⁵ Article 2(3), International Convention for the Prevention of Pollution from the Ships, 1973.

⁴⁶ The International Convention on the Prevention of Marine Pollution from Ships and its 1978 Protocol, reprinted in 12 Int'l Legal Materials (ILM) 1319 (1973), 17 ILM 546 (1978), Reg. 21 of MARPOL, Annex 1.

⁴⁷ United Nations Convention on the Law of the Sea, UN Doc. A/CONF.62/122, 7 October 1992.

⁴⁸ *Id.*, Art. 194.3(c)

and regulating the design, construction, equipment, operation and manning of such installations or devices.”

The convention further provides that states shall adopt laws and regulations, which are no less effective than international rules, standards and recommended practices and procedures, to deal with pollution from or in connection with offshore activities; and shall cooperate in the protection of the marine environment on a global and regional basis.⁴⁹

However, since the convention focuses on providing a framework for future legal developments with respect to the law of the Seas, a set of complementary working rules for offshore exploration and production activities must be developed in order to implement the convention in its true spirit.

The Climate Change Convention⁵⁰:

The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.⁵¹ Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner and the parties are required to develop national inventories of emission; formulate and implement national and regional programmes of mitigation measures; all developed-country parties and the EC are specifically obliged to take measures to limit greenhouse gas emission by the year 2000 to 1990 level.⁵² With regard to member states dependant on fossil fuels and associated energy intensive products, the convention provides as follows:

“The Parties shall, in accordance with Article 10, take into consideration in the implementation of the commitments of the Convention the situation of Parties, particularly developing country Parties, with economies that are vulnerable to the

⁴⁹ *Id.*, Art 208 (1& 5)

⁵⁰ The United Nations Framework Convention on Climate Change, reprinted in 31 ILM 849 (1992).

⁵¹ *Id.*, Art. 2.

⁵² *Id.*, Art. 4(1&2).

adverse effects of the implementation of measures to respond to climate change. This applies notably to Parties with economies that are highly dependent on income generated from the production, processing and export, and/or consumption of fossil fuels and associated energy-intensive products and/or the use of fossil fuels for which such Parties have serious difficulties in switching to alternatives."⁵³

The actual application of treaty obligations will have an impact on petroleum production and consumption because fossil fuels account for 90% of energy demand and are an important cause of global warming. It is hopeful that climate change convention is likely to have far reaching impacts on petroleum operations in the long run; however the scope of these implications is yet to be determined.

The Biodiversity convention 1992⁵⁴:

The stated objectives of the CBD are 'the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.'⁵⁵ However, the language and the legal content of this convention are such that they make the means for attaining its objectives exceedingly vague. For example, the convention enjoins party-states 'to develop programs for the conservation and sustainable use' of biodiversity⁵⁶, and to 'establish a system of protected areas'⁵⁷. These objectives may be given more meaning through the recognition of the various 'movements' from which the different parts of the biodiversity convention derived, all of which have come together for the first time in order to generate the various terms and obligations set out within the biodiversity convention. The obligations of the treaty have a direct implication on upstream operation as upstream operations have an apparent interference with biological sources such as land, vegetation and forests and various environmental problems ranging from environmental pollution to climate change.

⁵³ *Id.*, Art. 4(10).

⁵⁴ The 1992 United Nations Convention on Biological Diversity, reprinted in 31 ILM 822 (1992).

⁵⁵ *Id.*, Art. 1.

⁵⁶ *Id.*, Art. 6.

⁵⁷ *Id.*, Art. 8.

Apart from these key international treaties, there are several regional agreements i.e. agreements concluded at the regional level providing for environmental protection from oil and gas operations. More prominent ones include the following:

1. The 1972 Oslo Convention⁵⁸;
2. The 1992 OSPAR Convention⁵⁹;
3. The Energy Charter Treaty, 1994⁶⁰;
4. The UNEP Regional Seas Programme;
5. Environmental Law Directives of the European Commission; etc.

Since the legal framework for international environmental law is dominated more by the national legislation therefore, to analyse the efficacy of the entire legal framework, it is necessary to first analyse the municipal laws of India providing for environmental protection. But before, doing it is imperative to analyse the legal framework of developed countries specially U.K. and U.S. in order to get an insight of the sensitivity with which environmental issues are dealt there.

⁵⁸ The Oslo Convention on the Prevention of Marine Pollution by Dumping from Ships and Aircraft, 1972, reprinted in 11 ILM 262 (1972).

⁵⁹ The Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention) replaced the Oslo Convention for the Prevention of Marine Pollution by Dumping from Ships and Aircraft and the Paris Convention for the Prevention of Marine Pollution from Land-Based Sources. The OSPAR Convention establishes the modern framework for environmental protection of the North-East Atlantic, reprinted in 32 ILM 1069 (1993).

⁶⁰ The Energy Charter Treaty and its Protocol on Energy Efficiency and Related Environmental Aspects (ECT) cover energy investments, trade, and freedom of energy transit, energy efficiency, and resolution of state-to-state or investor-to-state disputes, reprinted in 34 ILM 360 (1995).

4. ENVIRONMENTAL PROTECTION REGIME IN DEVELOPED COUNTRIES

The United States and the United Kingdom follow a statutory approach i.e. environmental concerns are regulated by a myriad of statutes and hence, it can be aptly said that these states follow multi-statutory approach. Let's take a brief look at the environmental regulation in each of these countries.

United States:

The United States is a birthplace for oil industry since the first phase of oil industry began when Colonel Drake struck oil in northern Pennsylvania in 1859.⁶¹ The United States environmental regulation undoubtedly praiseworthy as it has the most pioneering and innovative environmental laws and regulations. At the federal level, there are approximately 25 legislations with varying applicability to environmental regulation of oil and gas industry.⁶² These legislations form part of the command and control approach of the U.S. government whereby the government 'commands'⁶³ pollution reductions by setting standards and control⁶⁴ how these reductions are achieved through the installation of specific pollution control technologies.⁶⁵

Some of the prominent legislations regulating upstream operations can be enumerated as follows:

- ✓ Oil Pollution Act, 1990⁶⁶: The OPA provides a comprehensive framework governing pollution of U.S. Waters and addresses issues such as legal liability, payments for monitoring and responses to oil spills, federal authority to order

⁶¹ Andrew Inkpen, *The Global Oil and Gas Industry 2010*, available at http://cdn2.hubspot.net/hub/127537/file-27391528-pdf/docs/the_global_oil_gas_industry.pdf.

⁶² *supra* n.40.

⁶³ Richard B. Stewart, *United States Environmental Regulation: A falling paradigm*, (1996) 15 J.L. & COM. 585, 587.

⁶⁴ Bruce A. Ackerman, Richard B Stewart, *Reforming Environmental Law: The Democratic Case for Market Incentives*" (1987-1988) 13 Colum. J. Envtl. L 171, available at <http://heinonline.org>.

⁶⁵ Patson W. Arinaitwe, *Environmental Regulation of Upstream Sector of Oil and Gas Industry*, available at https://www.academia.edu/2573032/Environmental_Regulation_of_Upstream_Sector_of_Oil_and_Gas_Industry.

⁶⁶ Jeffery D. Morgan, *The Oil Pollution Act of 1990: A look at its Impact on Oil Industry*, 6 Fordham Envtl. L.J. 1 (1994).

removal of oil, pollution prevention plans for onshore and offshore locations, and criminal and civil penalties for the failure of those responsible to obey its provisions;

✓ The Outer Continental Shelf Lands Act⁶⁷: Under the OCSLA, the Secretary of the Interior is responsible for the administration of mineral exploration and the development of the OCS. The Act empowers the Secretary to grant leases to the highest qualified responsible bidder on the basis of sealed competitive bids and to formulate regulations as necessary to carry out the provisions of the Act.⁶⁸

✓ National Environmental Policy Act⁶⁹: NEPA's basic policy is to assure that all branches of government give proper consideration to the environment prior to undertaking any major federal action that significantly affects the environment. Environmental Assessments (EAs) and Environmental Impact Statements (EISs), which are assessments of the likelihood of impacts from alternative courses of action, are required from all Federal agencies and are the most visible NEPA requirements.⁷⁰

✓ Clean Water Act⁷¹: The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. The basis of the CWA was enacted in 1948 and was called the Federal Water Pollution Control Act, but the Act was significantly reorganized and expanded in 1972.⁷²

✓ Clean Air Act⁷³ etc: The Clean Air Act (CAA) is the comprehensive federal law that regulates air emissions from stationary and mobile sources. Among other

⁶⁷ Outer Continental Shelf Lands Act, 43 U.S.C.A 1331 et seq. (1953).

⁶⁸ *Outer Continental Shelf Lands Act*, available at <http://coast.noaa.gov/data/Documents/OceanLawSearch/Summary%20of%20Law%20-%20Outer%20Continental%20Shelf%20Lands%20Act.pdf?redirect=301ocm>.

⁶⁹ National Environment Policy Act; 42 U.S.C.A 4321 et seq. (1969).

⁷⁰ United States Environmental Protection Agency, *Summary of the National Environmental Policy Act, 1969*, available at <http://www2.epa.gov/laws-regulations/summary-national-environmental-policy-act>.

⁷¹ The Clean Water Act, 33 U.S.C. §1251 et seq. (1972).

⁷² United States Environment Protection Agency, *Summary of the Clean Water Act*, available at <http://www2.epa.gov/laws-regulations/summary-clean-water-act>.

⁷³ The Clean Air Act, 42 U.S.C. §7401 et seq. (1970).

things, this law authorizes EPA to establish National Ambient Air Quality Standards (NAAQS) to protect public health and public welfare and to regulate emissions of hazardous air pollutants.⁷⁴

Therefore, with passage of time U.S. legal system has evolved remarkably and presently it consists of a highly comprehensive, complex, sophisticated set of environmental laws to address issues from all phases of the petroleum fuel cycle. However, effectiveness of U.S. legal system should be analyzed in the context of BP Oil Spill, a tragedy that left a question mark on the U.S. regulatory system for offshore oil exploration.

BP Oil Spill⁷⁵:

The 2010 Gulf of Mexico victory conveyed more than oil to the surface. It's a narrative of a season of anguish and alarm, profound vulnerabilities, and the enthusiastic geography of the victory. April 20, 2010 however a touch uncertain, the time, more or less 9:50 P.M., marks the chain of game changing occasions that changed the life of numerous. Oil titan BP gotten the Deep water Horizon's manager, Transocean, and different organizations and groups to penetrate profound into the ocean bottom forty-odd miles southeast of the Louisiana coast. The target had additionally been named: they called it the Macondo development. An agitating bore was sent from a universe of light and warmth and living creatures for a profundity of more than three miles under the ocean surface, to a universe of interminable dimness, unfathomable weight. The bore met a gas pocket. That minor pinprick, that weight, simple air pockets, a mellow bubble from profound inside abruptly changed over into a sudden flood of gas into the well, hurrying up the funnel, growing like insane, through the open doors on the ocean bottom, one more mile to the ocean surface. The creatures above were thinking that it hard to oversee it. A mixture of individuals confronted a progression of fluctuated choices. They didn't make all the right ones. And after that abruptly there was a blast. 11 men passed on the spot. Seventeen individuals were extremely harmed. One hundred and fifteen get by with bits of riddle

⁷⁴ United States Environmental Protection Agency, *Summary of the Clean Air Act*, available at <http://www2.epa.gov/laws-regulations/summary-clean-air-act>.

⁷⁵ Carl Safina, *A Sea in Flames: The Deepwater Horizon Blowout*, available at http://sunsetridgemsbiology.wikispaces.com/file/view/A_Sea_in_Flames_-_Carl_Safina.pdf.

held up in their grasp. According to the chain of occasions clarified by BP, the whole circumstances and end results relationship is as per the following:

The bonds neglected to keep the oil and gas from entering the well. Staff of both Transocean and BP inaccurately translated the negative weight test by unfortunately clarifying without end the weight they were seeing on one gage. This drove them to discharge the descending liquid weight on the well by supplanting the heavier liquid with seawater in a well that they erroneously accepted in light of the fact that the murder line was stoped up with the "nasty" spacer—was not applying upward weight. It was. The weight in the drill funnel, which they decided to overlook, was letting them know that the concrete had fizzled. They didn't recognize other cautioning signs in light of the fact that they by passed gages and steered uprooting liquid and their sporadically prepared spacer over the edge. In any case as gas came to the apparatus, when the team may have anticipated debacle, they steered the stream to a mud-gas separator whose limit was soon overpowered. Gas owing straightforwardly onto the apparatus got sucked into generators, making them surge and flash, touching off a progression of blasts. Fire and gas crisis frameworks that ought to have kept those blasts fizzled. The victory preventer ought to have naturally fixed the well however it, as well, fizzled.

IMPACTS:

The marshlands and estuaries found all through the Gulf Coast give essential reproducing grounds and nurseries for the angling and shrimping businesses. In 2008, as indicated by the National Marine Fisheries Service, the business fish and shellfish harvest from the five U.S. Inlet states was evaluated to be 1.3 billion pounds esteemed at \$661 million. Anyway since oil slicks are greatly unsafe to marine life as they cause covering of ocean fowls and point of confinement their flying capacity and harm fisheries by harming marine organic entity's frameworks

identified with breath, vision and multiplication. Also, henceforth, evident outcomes followed.⁷⁶

- ✓ Oil coated birds' feathers, causing birds to lose their buoyancy and the ability to regulate body temperature.
- ✓ Sea turtles were covered in oil;
- ✓ Dead and dying deep sea corals were discovered seven miles from the Deepwater Horizon well;
- ✓ Sick dolphins: As part of the official investigation into impacts of the Deepwater Horizon disaster, a team of scientists did comprehensive physicals on dolphins in Barataria Bay in 2011, a heavily-oiled area of the Louisiana coast. Nearly half the dolphins studied were very ill; 17 percent of the dolphins were not expected to survive.
- ✓ Sea turtles stranding: Since the spill, each year roughly 500 sea turtles have been found stranded, most of which were the much endangered Kemp's ridley sea turtles.
- ✓ Unbalanced Food Web - The Gulf oil disaster hit at the peak breeding season for many species of fish and wildlife. The oil's toxicity may have hit egg and larval organisms immediately, diminishing or even wiping out those age classes. Without these generations, population dips and cascading food web effects may become evident in the years ahead.
- ✓ **Decline in Recreation** - The Gulf Coast states rely heavily on commercial fishing and outdoor recreation to sustain their local economies. According to NOAA, commercial fisheries brought in \$659 million in shellfish and finfish in 2008, and just over 3 million people took recreational fishing trips in the Gulf that year. After the spill, recreational fishing from the Atchafalaya Delta to Mobile Bay was shut down from May to August, and state park closures dealt a serious blow to the parks' summer revenue.

⁷⁶*How does the BP Oil Spill Impact Wildlife and Habitat, available at <http://www.nwf.org/what-we-do/protect-habitat/gulf-restoration/oil-spill/effects-on-wildlife.aspx>.*

Earlier, BP people confessed that 5000 barrels of oil were being wasted every day. However, there were speculations that the actual spilling of oil was 10 times more than what was admitted by BP officials. In the blowout, 206 million gallons of oil mixed with the Gulf's 660 quadrillion gallons of water. That volume of water could greatly dilute the oil. But the carbon dioxide that was being added to the atmosphere wasn't getting diluted; it was building up. The spill changed the atmosphere, the world climate, and altered the heat balance of the entire planet, destroyed the world's polar systems, killed the wildlife of icy seas and the tropics' coral reefs, raised the level of the sea, turned the oceans acidic, and dissolved Shell fish.

Judgment: (United States v. BP Exploration & Prod. Inc.)⁷⁷

The Government asserted civil penalties against the Defendants pursuant to Section 311(b) (7) of the **Clean Waters Act**. The second claim sought a declaratory judgment that the Defendants are liable to the United States under **Oil Pollution Act** for past and future removal costs and damages resulting from the discharge of oil.

The court held:

“Because the DEEPWATER HORIZON, a MODU, was being used as an offshore facility at the time of the incident, BP and Anadarko, co-lessees of the area in which the offshore facility was located, are responsible parties with regard to the discharge of oil that occurred beneath the surface of the water. Transocean, as owner/operator of the MODU, is not a responsible party under OPA for the discharge that occurred beneath the surface of the water (though it may be liable for removal costs under Section 1004(c) (3)). Liability for OPA removal costs and damages is joint and several vis-à-vis BP and Anadarko and the subsurface discharge. The Government is not entitled to summary judgment on the issue of whether liability is unlimited under OPA. The Government is entitled to a declaratory judgment against BP and Anadarko.

⁷⁷

Available at <http://www.laed.uscourts.gov/OilSpill/Orders/9042014FindingsofFactandConclusionsofLaw.pdf>.

For purposes of CWA Section 311(b) (7) and with respect to the subsurface discharge, oil discharged from the Macondo Well, an offshore facility, conversely, the Court finds that the subsurface discharge was not from the vessel, the DEEPWATER HORIZON. Furthermore, because it is undisputed that BP and Anadarko were owners of the offshore facility, BP and Anadarko are liable for civil penalties under the Section 311(b) (7).”

BP consented to pay \$4.5 billion in legislative punishments. Of the punishments, \$4 billion will resolve criminal indictments. An extra \$525 million will be paid to determine claims brought by the Securities and Exchange Commission that BP misled financial specialists by downplaying the measure of oil streaming into the Gulf. Separate from the corporate homicide allegations, a government great jury gave back an arraignment charging the two most astounding positioning BP managers on board the Deepwater Horizon upon the arrival of the blast with 23 criminal numbers. The two men were accused of sailor's homicide and automatic murder for each of the 11 men executed in the impact, and additionally a criminal infringement of the clean water act. The fabulous jury likewise charged BP's second-most elevated positioning agent at the organization's brought together order post with concealing data from Congress and purportedly deceiving law requirement authorities. The organization likewise will concede to a lawful offense check of hindrance of Congress, a misdeed number under the Clean Water Act and a wrongdoing tally under the Migratory Bird Treaty.⁷⁸ BP, in concurrence with the US government, set up a \$20-billion trust to give certainty that finances would be accessible. The trust store was created to fulfill cases settled by the Gulf Coast Claims Facility (GCCF), last judgments in prosecution and suit settlements, state and nearby reaction expenses and cases, and regular asset harms and related expenses.

In 2011, BP contributed an aggregate of \$10.1 billion to the store, including our second year duty of \$5 billion to the trust and the money settlements got from MOEX USA Corporation (MOEX), Weatherford US., LP (Weatherford), and Anadarko Petroleum Company (Anadarko). This brings the aggregate sum

⁷⁸ Chris Isidore, Charles Riley and Terry Frieden, “BP to pay record penalty for Gulf oil spill,” CNN money, November 15, 2012.

added to the trust to \$15.1 billion. The staying submitted commitments totalling \$4.9 billion are planned to be made in 2012 which incorporates the \$250 million settlement with Cameron. The trust dispensed \$3.7 billion in 2011 and the aggregate paid out since its foundation added up to \$6.7 billion before the end of 2011.⁷⁹

Therefore, in all the blow out resulted in a release of 4.9 barrels of oil into the gulf of Mexico The Deepwater Horizon accident has likely cost BP more than \$40 billion, for example, but the official liability cap for oil-spill damages remains a ridiculously low \$75 million. As a result, in the congress many bills had been introduced. Several sought to punish BP. A few did it by raising the liability limit of offshore accidents to April 15 from \$75 million to \$10 billion.⁸⁰ Others did it by preventing firms that has an accident history similar to BP's from future exploration and production of oil in the U.S. Other bills changed U.S. government institutions. One, for example, created a special purpose organization in charge of responding to future oil spills.⁸¹ Consequently, U.S. has witnessed several regulatory changes since 2010. The Minerals Management Service (MMS), the much criticized federal agency that had been tasked with overseeing energy exploration, is no more, and has been replaced by the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE). The agency has been split up into two parts, to separate the revenue-collection office from the drilling regulators and reduce the conflicts of interest that had plagued MMS and the agency has been slow and very deliberate about approving new deepwater drilling permits.⁸² And hence, it would be justified to say that the U.S. legal system has evolved a lot.

⁷⁹ BP was determined to respond swiftly and fairly to claims from individuals, businesses and government entities, retrieved from <http://www.bp.com/sectiongenericarticle800.do?categoryId=9036584&contentId=7067605>, accessed on 22nd October 2012.

⁸⁰ Senate Hearing 111-679, Part 3, available at <http://www.gpo.gov/fdsys/pkg/CHRG-111shrg61828/html/CHRG-111shrg61828.htm>.

⁸¹ Julio J. Rotemberg, *BP's Macondo: Spill and Response*, The Harvard Business School Case 711-021, (September 2010).

⁸² Bryan Walsh, *The BP Oil Spill, One Year On: Forgetting the Lessons of Drilling in the Gulf*, (Apr. 20, 2011), available at <http://content.time.com/time/health/article/0,8599,2066233,00.html>.

United Kingdom:

United Kingdom in 1990 introduced a comprehensive legislation in the form of Environmental Protection Act, 1990. The said Act is a consolidation of various existing legislations. Interestingly, in United Kingdom as well, there are as many as twenty- five major legislations governing the oil and gas industry along with many government agencies regulating the environmental aspects of the industry.⁸³

The upstream oil and gas industry is divided into two components i.e. onshore and offshore and both the activities are regulated slightly differently. Onshore operations are subject to general planning control i.e. planning of land use and specific licensing.⁸⁴ Environmental impact assessments are also required for production activities and in case of exploration in sensitive areas. Apart from EIAs, pollution control authorizations are also mandated under the Environment Protection Act, 1990.

As far as offshore operations are concerned, they are mainly regulated through government licensing. Therefore, environmental implications of offshore activities are regulated primarily through contractual terms and effective regulation depends on effectiveness of the terms of contract. Generally the key clauses in the contract pertain to:

- Stabilization Clauses
- Environmental Standard Clauses
- Environmental Impact Assessment Clauses
- Clauses on Access to Protected Areas
- Clauses on Access to Water and Other Natural Resources
- Clauses on gas flaring
- Clauses on Responding to Emergencies and Accidents
- Clauses on Liability, Indemnity and Insurance

⁸³ The Major ones include, the Continental Shelf Act, 1964; The Prevention of Oil Pollution Act 1971, the Petroleum & Submarine Pipeline Act, 1975; The Merchant Shipping Act 1983, Etc. For a list of these statutes, *See Oil & Gas U.K., available at http://www.ukooaenvironmentallegislation.co.uk/contents/topic_files/offshore/decommissioning_in_stallations.htm*.

⁸⁴ The land planning is governed by the Town and Country Planning Act 1990 (for England and Wales) and the Town and Country Planning Act 1972 (for Scotland). Petroleum operations fall within the definition of ‘development’ of Land in the Environment Protection Act 1990, for which specific planning is required.

- Clauses on Decommissioning and Remediation

The effectiveness of Indian Model Production Sharing Contract is to be analyzed in the light of the above clauses. In view of the above case studies, the multi-statutory approach may be summarized as an approach where there are many laws affecting petroleum activities, but oil and gas are excluded from the effect of some environmental laws (OPA in the U.S.A. and the land planning law in the U.K. in terms of offshore). In these petroleum jurisdictions, there is little unified legislation specifically formulated for the oil and gas industry. This multilateral-statutory approach is adopted in many other developed and developing economies with India being one among them.

5. ENVIRONMENTAL APPRAISAL OF INDIAN PRODUCTION SHARING CONTRACT

Unlike other forms of upstream investment contracts, the Production Sharing Contracts are unique in many ways. The main aim of this form of agreement is to retain the ownership of natural resources.⁸⁵

All the upstream exercises in India are principally administered by the procurements of Production Sharing Contract. It gives the administrative structure to the upstream investigation and creation exercises accordingly giving a solitary perspective for all the rights and commitments for the financial specialists. Despite the fact that the Environment Protection Act, 1986, directs nature related issues, it stays to be an umbrella enactment that is authorized to manage it by and large. Nonetheless, Article 14 of the Production Sharing Contract accommodates the particular ecological commitments that are to be satisfied by the foreman. The natural security structure in India is still in newborn child stage; particularly in the connection of oil and gas part, not even follow reference are given in the ecological insurance enactments for the interesting arrangement of issues that this specific area postures. At present, the agreement is only drafted as a lectern to draw in speculations and has perpetually neglected to instil the basic standards of feasible improvement. For instance, one such weakness can be perceived, when we investigate the procurements under Article 14 of the PSC of India. The sole commitment that must be satisfied under the agreement is to bear on the investigation and creation exercises by utilizing current oilfield and petroleum industry practices and gauges including propelled methods, practices and techniques for operation for the aversion of Environmental Damage in directing its petroleum operations, which may sound like a solid procurement however exceptionally vague. The issue emerges when such vague terms utilized as least standard for consistence, while there is no solid source to be depended upon. Moreover, it opens up a boulevard of chance for the foreman to choose without anyone else's input the obliged standard of consideration that is to be taken while

⁸⁵ The Production Sharing Model of agreements is commonly utilized in various other forms of natural resource extraction industry. One of the best examples is the mining industry. Many of the developing and least developed countries opted for this model in almost all of their natural resources extraction activities. Just as enumerated in the main text, this model provides them with various benefits in form of superior control over the contractor and extracted resources, besides the advance technologies in form of superior control over the contractor and extracted resources, besides the advance technologies and monetary resources that they attract.

carrying on the investigation and generation exercises, which should clearly prompt misuse.

Particular to the oil and gas industry, the PSC ought to contain certain conditions as the natural security commitments of the builder. It is essentially undesirable to allude to the household enactments in the agreement as opposed to giving such contractual commitments as a piece of the agreement itself, not at all like the Indian PSC. Taking after are the ecological issues that as a rule think that its place in hydrocarbon investigation contracts, in the light of which PSC is investigated.

- a) Access to protected areas;
- b) De-commissioning & site-restoration
- c) Environmental Impact Assessment;
- d) Exigencies and accidents
- e) Gas flaring;
- f) Liability, insurance & indemnity;
- g) Noise Pollution
- h) Transparency
- i) Waste management;

There are sure natural worries that are through and through slighted in this model contract. Investigating just those provisions that are introduced in the PSC will truly confine the extent of this endeavour, since all things considered, numerous difficult issues will be disregarded. Along these lines, it is appropriate that the agreement be evaluated in light of earth important conditions that by and large discover a spot in upstream investigation contracts around the world. Despite the fact that a couple of the provisos specified here are not under any condition exhibit in the present PSC, they can't be shed inside and out, thus are incorporated as weaknesses that this agreement has neglected to address.

A.GAS FLARING

“Gas flaring– a by result of petroleum generation that heaves around 400 MTs of nursery gasses in the climate consistently – has been continuing for a considerable length of time and this is a standout amongst the most disarranged aspects of unfriendly effect on environment that is brought about by upstream oil and gas investigation exercises. Indeed globally in numerous oil and gas gets this is an

oftentimes disregarded part of the agreement. Much of the time referring to monetary reasons, the organizations flare gas as opposed to recuperating them or re-infusing them into the ground, an all the more earth considerate choice. This separated from being a misuse of assets likewise essentially influences the neighbourhood air quality and accordingly is a critical benefactor to the worldwide environmental change. The World Bank's Global Gas Flaring Reduction association (GGFR) was the world's first overview of countries internationally. In 2006 alone 168 BCM of gas has been flared internationally, which is around 27% of the aggregate characteristic gas utilization of USA, demonstrates the level of effect this could have on the earth.”

“Despite the fact that India is one among the 16 countries that has demonstrated critical reported lessening of gas flaring for the time of 1995 to 2006, regardless it is not the after effect of any kind of administrative limitations in such manner; it was related with decrease in the level of generation also. Indeed, from the year 2007 to 2012, there has been a reliable increment in the volume of gas flared. In the Article 14 of the PSC, which discusses natural commitments of the builder, solicits them to incorporate the impacts from gas flaring in the Environmental Impact Assessment (EIA) report that is to be submitted, which is another debilitation condition without clear models. Further, Article 21.4 of the PSC accommodates the usage of Associated Natural Gas (ANG), and requires the foreman to present an improvement arrangement for the use of overabundance gas, in view of standards of full use and least flaring of gas, as indicated by which flaring gas will be arranged on the off chance that its business misuse is not suitable. Given that by and large, financial aspects of recuperation assumes a significant part in the choice to flare the abundance gas, organizations constantly decide to flare them instead of striving for whatever other ecologically more secure options; notwithstanding the way that it is specified in the agreement that it ought to be carried out if all else fails.”⁸⁶

B. ENVIRONMENTAL IMPACT ASSESSMENT

The EIA is produced as a device to get to the effect that a movement or an operation is going to have on a specific territory, so that the leaders take

⁸⁶ Tienhara Kyla, *Investor-State Contracts through a Sustainable Development Lens*, 2 Inv. Treaty News 13 (2011).

satisfactory measures to dispose of on at all, alleviate any antagonistic effect in the region. Because of its significance in any dependable choice making process, nowadays it discovers a spot in the greater part of the venture contracts around the world.⁸⁷

Under Article 14.5 of the Indian PSC⁸⁸,

“A contractor must present a definite Environmental Impact Study for the thought of the gatherings alongside proposals to diminish the ecological harms as pondered under Article 14.4 of the PSC.⁸⁹ It requires the consortium to attempt significant measures as indicated by the pertinent appropriate worldwide norms, in meeting with the legislature, at whatever point there is a huge change in the extension or strategy for conducting petroleum operations. Moreover, the builder ought to complete two EIAs. One preceding any exploratory operations starts which must be done further in two sections, one preceding any preparatory hands on work, for example, seismographic overview starts and the other, before the initiation of any penetrating operations. The second EIA study ought to be completed before any improvement operation starts, once a disclosure has been made in the zone under investigation.⁹⁰”

In a survey conducted by the World Bank across the world, on the manner of conducting EIAs, it was found⁹¹:

*“Much of the emphasis of the EIA process, conducted for oil and gas projects appears directed towards the approval of projects, rather than to a life cycle approach for minimizing environmental and social impact”.*⁹²

⁸⁷ *Supra n. 95.*

⁸⁸ MPSC *supra n.89* Article 14.5.

⁸⁹ MPSC *supra n.89* Article 14.4.

⁹⁰ MPSC *supra n.89* Article 14.5.1.

⁹¹ Unpublished Manuscript: Vivekanand, Environmetnal Appraisal of Indian Production Sharing Contract. (May 8, 2014) (unpublished manuscript) (on file with the author).

⁹² See Eleodoro M. Alba, *Environmental Governance in Oil Producing Developing Countries*, World Bank, Extractive Industries for Development Series (2010) available at http://siteresources.worldbank.org/EXTOGMC/Resources/3369291266963339030/eifd17_environmental_governance.pdf.

Sadly, the Indian PSC too misses the mark concerning this methodology. Also, another disregarded part of this statement is absence of straightforwardness, which makes the observing of usage an intense errand. Nonetheless, this absence of responsibility can be credited to the unlucky deficiency of any autonomous observing org to direct the methodology of EIA study as giving the circumspection to the builder on the most proficient method to lead the study, gives a significant hit to the validity of the entire procedure. Unless the entire methodology is completed to satisfy its actual point, this is just going to remain a crate ticking activity.

C. PROTECTED AREAS

Appeal for oil and gas pushes the business to endeavour flighty sources and range geological boondocks, for example, the Arctic, pushing the points of confinement of present day innovations. In any case, no administrator can promise that there won't be a spill- - even in perfect conditions, oil slicks leave their imprint. Certain land territories like backwoods and Remote Oceans specifically are very touchy, and have the most minimal level of ability to clean up an oil slick all alone. This makes it inadmissible to open such zones to oil and gas investigation and improvement with current modern innovation and administration administrations.

The Indian PSC though not completely but, still leaves a lot of lacunas. It provides:

“Where the Contract Area is partly located in areas forming part of certain national parks, sanctuaries, mangroves, wetlands of national importance, biosphere reserves and other biologically sensitive areas passage through these areas shall generally not be permitted. However, if there is no passage, other than through these areas to reach a particular point beyond these areas, permission of the appropriate authorities shall be obtained.”⁹³

⁹³ MPSC *supra* n.89 Article 14.13.

Despite the fact that a sweeping boycott on all the operations in these regions would be the best answer for these sorts of circumstances, the need to adjust improvement and ecological insurance makes this provision an inescapable one. Despite this, the condition is letting the security of environment to take rearward sitting arrangement in light of an escape clause where it offers consent to the builder to continue with the operations in the range, in the event that there is no other section other than through these territories to achieve a specific point past these regions.

This inconceivably debilitates the assurance that is conceded to such locales. Given this exemption with no strict regulation will prompt misuse of this procurement. Despite the fact that externally, it just offers authorization to utilize such ensured territories as a method for access to the zone of operation, it neglects to think seriously about, the harm that will be brought on by such operations to those touchy situations. Right from the clearing of vegetation for the entrance to streets and setting down to of pipelines, all aspects of the operation will prompt loss of untamed life living space, diminishment in plant differences, potential for expanded disintegration and potential for the presentation of intrusive or poisonous weeds. Given their delicate nature, it would soon prompt the devastation of the territory overall. Moreover, there is no comparative assurance offered to organically touchy marine situations, which are much more delicate with extensive variety of repercussions for such operations.

D. DECOMMISSIONING, ABANDONMENT AND SITE RESTORATION

More than the improvement and extraction of assets from an oil field, de-charging of the same accomplishes a critical part in the setting of ecological security. After a long stretch of asset extraction, an oil-field obliges an extremely complex methodology of decommissioning and rebuilding. Much of the time, all around monetary reasons put a critical part in deciding the nature of this complicated methodology. With administrators investigating progressively difficult topographical wildernesses for asset extraction, the related dangers on environment security too increment exponentially. A deficiently done decommissioning and site rebuilding procedure will have a long haul negative effect on the nearby environment alongside numerous financial appearances in the neighbourhood group.

The World Bank's tool compartment to aid government offices on manageable decommissioning and conclusion of oil fields and mines distinguishes the accompanying as the vital segments of a reasonable, compelling and adaptable methodology that legislatures may receive or adjust during the time spent distinguishing and overseeing decommissioning and conclusion needs:

1. *“ A robust policy, legal and regulatory framework that specifically addresses decommissioning and closure;*
2. *A series of accepted good practice guideline on environmental, social, health and safety aspect related to closure;*
3. *Sufficient and reliable financial assurance to enable implementation;*
4. *Monitoring and enforcement of established requirements;*
5. *Stakeholder consultation and engagement;”*

Although the Indian PSC has provision⁹⁴ for execution security for the site rebuilding exercises, as Site Restoration Fund Scheme, despite everything it does not have the procurements to set thorough specialized principles. It essentially expresses that the procedure ought to be done as per the cutting edge oilfield and petroleum industry practices are bland criteria, which demonstrates a characteristic uncertainty in the principles. In addition, without a legitimate autonomous checking component or any plausibility for the neighbourhood influenced people to take part in the choice making procedure, it is certain to miss the mark concerning the obliged benchmark. In spite of the fact that not simply confined to India, a vital and for the most part blocked out part of site rebuilding is that it doesn't order the organizations to restore the site to its unique condition once, the investigation in a specific spot is led and no oil is found.

⁹⁴ MPSC *supra* n.89 Article 14. 10

NOISE POLLUTION

Dissimilar to different wellsprings of commotion contamination, the petroleum operations have a broad effect on nature, considering the way of encompassing they work, much of the time the effects will be significantly additionally destabilizing. The principle wellspring of commotion contamination amid petroleum operations differs in diverse periods of the operation. Particularly in the marine environment, the issue represents a gigantic danger to different marine species. The seismic reviews did by impacting high force sound waves with the assistance of airguns, so as to evaluate the topography of an investigation region, is a real sympathy toward dolphins and whales, which utilizes echolocation to find their prey and distinguishing proof. These high power sound waves adequately veil their capacity to utilize echolocation. These seismic reviews did for quite a long time now and again, will push the whales and dolphins far from that place. Once the generation begins, the boring of wells too delivers extensive clamor yet the nonstop and delayed presentation to such commotions can result in those cetaceans like whales and dolphins to forsake their territory for all time. Ashore, where the site may be situated close to the human populace also, it postures diverse arrangement of issues. Right from the development of methodology streets to the site, clamor contamination emerges, making dangers for both the human people and also the biology relying on its area. With no enforceable rules to direct this issue, all the investigation and generation operations are proceeding with unabated. The requirement for extensive standards and regulations particular to the petroleum operations, drafted, as a piece of the agreement, has never been felt more. In spite of the fact that confinements under Environment (Protection) Rules, 1986 are now there to manage commotion contamination, they are not sufficiently complete to manage exceptional circumstances like these. They just express the maximum furthest reaches of clamour levels. In addition, just place where this issue thinks that its place is inside the Environment Impact Assessment report, which itself does not have any inborn quality to be utilized against any infringement. Recognizing the potential long haul affect on the earth, particularly in marine nature and touchy timberland natural surroundings, created by the petroleum operation and fusing medicinal measures with plainly characterized specialized norms inside the contractual procurements goes far towards tending to the issue.

F. EXIGENCIES AND FORTUITIES

History has demonstrated to us that mishappenings are unavoidable in oil and gas generation by the very way of the movement however the dangers included are far higher than normal, the asset addition is driving the adventurers looking for oil towards more mind boggling and testing geographical situations, which has turned out to be more unsafe and clumsy than any time in recent memory, in the light of late real oil and gas mishaps. This calls for wide contractual procurements that can sufficiently address natural, financial, wellbeing and security perspectives if there should arise an occurrence of a mischance in an oil well, which as a rule are missing.

The only place where the Indian PSC talks about accident and other emergencies is under Article 14.7,⁹⁵ which provides that:

“The contractor shall, prior to conducting any drilling activities, prepare and submit for review by the government contingency plans for dealing with oil spills, fires, accidents and emergencies, designed to achieve rapid and effective emergency response. The plans referred to above shall be discussed with the government and concerns expressed shall be taken into account.”

The two provisions that follow this article mandate the contractor to:

“(a) Notify the government and implement the relevant contingency plan and perform such Site Restoration as may be necessary in accordance with modern oilfield and petroleum industry practices.”⁹⁶

(b) Take such action as may be prudent and necessary in accordance with modern oilfield and petroleum industry practices in such circumstances.”⁹⁷

⁹⁵ MPSC *supra* n.89 Article 14. 7.

⁹⁶ *Id.* Article 14.7.1.

⁹⁷ *Id.* Article 14.7.2.

With these being the main procurements, that accommodate the commitments from builder regarding reaction to a mishap it misses the mark concerning tending to the issue satisfactorily. This weakness is fundamentally on account of its questionable and unclear wordings like, "making strides as per the current oilfield and petroleum industry rehearses" adequately giving the tact to the builder himself. Moreover, under Article 14.7.1, the notice of the mischance is to be made just to the administration; the nearby groups who are either straightforwardly or in a roundabout way influenced by the same are completely ignored from the methodology totally. The foreman is additionally let free from any obligation on the off chance that any ecological harm happens after the viable harm regardless of the possibility that the harm is a direct result of any activity or non execution by the builder. Most importantly, with no unmistakable specialized models and an observing instrument to guarantee predictable utilization of best practices to moderate the delayed consequences it comes up short in tending to the issue sufficiently. Liabilities to pay to the administration, in the event that the builder does not mount satisfactory reaction to any crises, compelling the legislature to address the circumstance, ought to be incorporated as a piece of the agreement itself.

G. LIABILITY AND INDEMNITY

Determination of obligation for the ecological harms is an exceptionally quarrelsome issue. With the ecological damage brought about obtaining new financial signs; this issue bears a great deal of significance in attaining to manageable advancement objectives. Globally this issue was perceived on a fundamental level 13 of the Rio Declaration of 1992, which looks for the state to create local enactment to address the issues in risk and pay for the casualties of natural harm. Given the petroleum operations regularly includes clash with the local populace and its related financial issues separated from the inescapable natural harms that it causes, it is evidently that the oil and gas part needs a reasonable obligation administration for ecological harms more than whatever else. The inquiries like who is obligated, under what circumstances are they subject, what is the remuneration that is to be paid— if left unanswered will accomplish more mischief than great.

Dissimilar to certain created countries like U.S.A., where the risk part of oil contamination is managed by particular enactments like Oil Pollution Act of 1990, just place where the Indian PSC accommodates pay is under Article 14.1(b) (ii) which commits the builder to pay sufficient remuneration, with no fitting system to focus the obligation and count of harms, this is an amazingly powerless procurement. The late Gulf oil slick exhibited the requirement for such clear obligation and remuneration administration, where, in view of the unmistakable budgetary administration built under the demonstration, which goes to the degree of fining the guilty party taking into account the volume of oil that is spilled into the marine environment by making them entirely at risk. Be that as it may, India has Public Liability Insurance Act, 1991. It is vague whether the mishaps happening in this industry will fall under the ambit of this demonstration or not and the upper top of fifty crores rupees under this Act is horribly lacking for the greatness of issue that is postured (accepting that the demonstration is material). In addition, the nature of this Act is to remunerate to people for the misfortunes supported by any mishap it doesn't address the issue of who will acknowledge the expense of rebuilding of the earth.

“The adequacy of any risk component can be disabled by the potential indebtedness of the dependable gatherings. Monetary security necessities for natural risk serve to guarantee that people in general does not pay to remediate ecological harm brought on by an organization or other individual that does not have sufficient financing to complete the medicinal activities. While their main role is not the assurance of the organization itself, budgetary security systems protection being the most generally utilized may likewise invigorate the organization to decrease the danger of natural harm. Consequently, an obligation finance that is overseen by the administration in which builder contributes certain estimation of the gross yearly creation must be secured to guarantee money related security.

Another pivotal highlight that is forgotten is the expense of cleaning up on the off chance that there has been a spill. If there should be an occurrence of significant oil slick, the expense of cleaning up ought to be forced upon the wrong practitioner. Nonetheless, there are neither powerful contractual procurements nor any specific enactment to this impact. In created nations like U.S.A., they have particular enactment to manage this, forcing common risk over the organizations in order to empower that legislature to give assets and cash important to react sufficiently to expansive scale oil slick.”

H. OIL SPILL MANAGEMENT

Oil slicks into the common habitat is an extremely incessant event here despite all the mechanical progressions that this industry has made. The inconvenience is a large portion of the minor spills more than regularly go unnoticed. It is just when the spills are over a certain edge that it draws in the general population consideration. Since, oil slicks can happen in numerous different spots like transportation and different commercial ventures, because of the nature and extent of this exposition, this segment is limited just to those issues that torment the upstream oil and gas investigation part and the cures that are to be fused into the PSC. With no coupling global guidelines or principles to control the wellbeing and security of the oil stages in the ocean, the unlucky deficiency of any kind of residential administrative system, just adds to the feeble natural insurance burdens of India. Regardless of the way that so far there has been no real oil slick brought on by the seaward or onland oil stages in India, there have been numerous examples of oil slicks created by the boats, yet on a generally little scale, when contrasted with the significant calamities brought on by the disappointment of the seaward oil stages around the world. Notwithstanding, the reaction of the Indian government to these little scale oil slicks (however one can't belittle the natural harm that these spills have created) is worse than average leaving nature in grave peril. The level of ongoing risk rises exponentially when numerous are prepared to dive to deep oceans for investigation where the earth is delicate and is getting by on a to a great degree fragile parity. Any sort of contamination will have an unfavourable effect on these situations since they are now under weight from different sorts of human exercises like over angling, refuse, dumping and numerous others. With the close outlandishness to confirm the long haul affect that

oil slicks have over maritime environment and its subsequent antagonistic impact on marine biology frequently goes unnoticed.

At the international level, India is a member of international convention on Oil Pollution Preparedness, response and co-operation (OPRC)⁹⁸ which was adopted on 30th November 1990, under the International Maritime Organization (IMO),⁹⁹ which was subsequently extended to include hazardous and noxious substances under a protocol¹⁰⁰ in the year 2000 and it came into force in the year 2007. In 1995, United Nations Environment Program (UNEP) under its South Asia Regional Seas Action Plan funded the “Development and Implementation of National and Regional Oil Spill Contingency Planning” project, specifically targeted for the countries like India,¹⁰¹ so that they can ratify and implement the OPRC, 1990.¹⁰² Unfortunately, India failed to translate any of these into an actionable plan. The sole domestic regulatory mechanism to deal with the oil spills in India is the National Oil Spill Disaster Contingency Plan (NOSDCP) of 1993.¹⁰³ Under the NOSDCP, the ministry of home affairs has been made the nodal agency to respond to the oil spills in the ocean.¹⁰⁴ The Coast Guard of India, an organization under the ministry of defence, is statutorily empowered to this effect under the Coast Guard Act of 1978.¹⁰⁵ Under the authority of this Act, in 1986 the responsibility to respond and co-ordinate in case of an oil spill was transferred from the Director General (Shipping) to the Coast Guard. Without a separate and

⁹⁸ 1891 UNTS 51 (hereinafter OPRC).

⁹⁹ This Convention is made as a part of requirement at the international level to establish measures for dealing with major incidents on threat to marine population. Under this convention, ships are required to carry a ship board oil pollution emergency plan. Operators of offshore units under the jurisdiction of PARTIES are also required to have oil pollution emergency plans or similar arrangements, which must be co-ordinated with national systems for responding promptly and effectively to oil pollution incidents.

¹⁰⁰ 2000 Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances, (2003) ATNIF 9.

¹⁰¹ Other countries that were rendered this assistance were Bangladesh, Maldives, Pakistan, India and Srilanka.

¹⁰² OPRC, *supra n. 122*.

¹⁰³ Ministry of Defence, *National Oil Spill Disaster Contingency Plan*, Edn. 2006, available at <http://www.indiancoastguard.nic.in/Indiancoastguard/NOSDCP/NOS-DCP%202006.pdf>.

¹⁰⁴ *Supra n. 127*.

¹⁰⁵ Section 14(2)(c), the Coast Guard Act, 1978.

independent authority, supported by poll of specialists to deal with this issue scientifically, India is standing at the wrong end of the stick.

Another piece of the same issue curious to this Industry is that oil slicks won't just be limited to the oceans for this situation, it will likewise happen in area where the majority of the oil wells are found. In any case, there is no suitable component that can address this issue adequately, set up. Dissimilar to the ocean based oil wells, wherein the slightest quick moves can be made in view of the NOSDCP if there should be an occurrence of an oil slick, despite the fact that, it in itself is terribly deficient to address the issue. Any spill in the area will have heartbreaking outcomes due to absence of any kind of plan to address it. Oil slicks over area remains to capacity if soil to bolster vegetation, horticulture. Here, the risk goes into the evolved way of life by the ingestion of toxic substances by the plants. Fitting systems must be made by taking such measurements of the same issue into thought.

Additionally, without a possibility trust to manage substantial scale oil slicks, any instrument is sure to come up short. Since as a rule there will be an absence of clarity on why should obligated pay the expenses for the cleanup which will hamper the prompt initiation of the operations to cut-off the harm however much as could reasonably be expected to the environment.

I. WASTE MANAGEMENT

Fuse of productive and safe waste administration hones in the mechanical operations is a fundamental step towards shielding the earth. The petroleum investigation operations too are not resistant to this. Nonetheless, transfer of squanders created amid upstream investigation exercises is a complex one that includes reuse and reusing of different sorts of squanders. Real issue confronted is the safe transfer of gigantic amount of squanders created in an ecological benevolent way. With each phase of the operation, waste is created of different natures and toxicities, the level of shields that are to be taken expands complex in their transfer. As a rule of waste transfer, economy takes points of reference over the wellbeing of environment. Particularly in India, absence of broad experimental studies directed around there essentially exacerbates the issue further, since decently grounded signs will offer financially savvy procedures that will substantially incentivise for safe transfer. There is a looming need to develop a reasonable waste administration arrangement and rules

that ought to be in light of the all around acknowledged waste administration pecking order of firstly, dodging era of squanders, took after by lessening, reusing, reusing, recouping, treating and arranging whatever waste is created. Once more, fitting organization of squanders banks upon the benchmark set up by the agreement, which takes us back to the standard of current oilfield and petroleum industry hones as talked about before. On the other hand, there are strategy rules to any semblance of waste administration of unsafe substances and plastics; there is none to manage the interesting issue confronted in this area. The need of a decently characterized waste administration strategy drafted particularly to manage the particular issues confronted by the upstream operations can't be any starker. Nonappearance of thorough rules, drafted with the assistance of specialists will just give a lee route for builders to negligence real attentiveness toward the earth.

J. TRANSPARENCY

The sheer size and money related muscle of oil organizations by and large is a scaring element for different reasons. Especially, in issues in regards to natural infringement conferred by the oil organizations this assume an enormous part in deciding the moves made up against those infringement. Absence of any deliberate exposures from organizations going into concurrence with the administration will further just wind up in further strangling any step towards the insurance of environment by the common society bunches. By and large, the natural damage done goes unnoticed by general society due to absence of any revelation by the organization. This issue achieves an expanding significance during the time spent natural effect evaluation (EIA). With no settled systems for the general population to access to subtle elements of the appraisal did on a specific venture, its absolutely impossible that the individuals influenced will know the degree to which the earth, specifically the region is influenced. Some of the time, the mischief created by the lack of data additionally strengthens to a degree of influenced individuals being ignorant of the way that their rights are being abused. The issue accept centrality since numerous choices, that have potential effect over nature are taken in view of the EIA report. With no revelation, the general population will never get the opportunity to know the reason behind a specific choice made that may have future repercussions in their living.

The Indian PSC does not perform well, as needed, in this front also. Article 26 of the Contract, which controls the builder over the administration of information and data with respect to the petroleum operations, unequivocally keeps any kind of data divulgence, undermining any endeavors towards enhancing straightforwardness.¹⁰⁶ This additionally secures the legislature from revealing the data to general society, since it is a gathering to the agreement. The reason whereupon, this provision is based upon is to avert exposure of industrially touchy data that will conflict with the hobbies of the organization. The foundation paper for the Extractive Industries Transparency Initiative (EITI) Strategy Working Group contends that by and large, these contentions against required exposure of data win despite absence of any confirmation demonstrating that it conflicts with the enthusiasm of the organization and its aggressiveness. Maybe it goes ahead to contend that, expert dynamic exposure either by the legislature or by the foreman brings about profit in two routes; by enhancing business sector productivity and their permit to work. Additionally, the statement in the PSC that keeps the contracting gatherings from revealing any information or data gives a lee approach to exposure through common assent of the gatherings. Despite probability to get to certain data through access to data law, the handy plausibility of data revelation through this instrument is less, in light of the fact that the probability of the partners to refer to the contractual confinement or that they are private in nature, which makes them to drop out of the domain of this bit of enactment. Unless the likelihood of open interest in the choice making process, whose adequacy thusly relies on the degree of access to data, is dealt with, the viability of any activity to ensure the earth will keep on weakening.

Measures like:

A) “Practical and effective disclosure mechanisms like making available all contracts and agreements that manage the relation between government and the contractor in a single website;

¹⁰⁶ MPSC *supra* n.89 Article 26.4, “All data, information and reports obtained are prepared by, for or on behalf of, the contractor pursuant to this contract shall be treated as confidential and subject to the provisions herein below, the parties shall not disclose the contents thereof to any third party without the consent in writing of other parties.”

- B) Well defined guidelines which make mandatory disclosure of information that has direct bearing upon the environment;*
- C) Making exclusions for mandatory disclosure after proper consultation with the industry;*
- D) Involvement of public in decision-making process”;*

are couple of viable approaches to coordinate straightforwardness and responsibility inside the partners. Fusing the standards won't simply guarantee that the advancement towards manageable improvement is dealt with yet will likewise guarantee that the characteristic assets of the nation are best used for the profit of the nationals of the nation.

6. ROLE OF REGULATOR

Oil Industry Safety Directorate:

The requirement for the powerful observing of security parts of the oil and gas industry and furthermore, institutionalization of security methodology has been a long felt require in India. Notwithstanding, this has been followed up on just in the year 2008 with the foundation of Oil Industry Safety Directorate (OISD), through a notification¹³⁸ by the Ministry of Petroleum and Natural Gas (MoPNG). Its purview reaches out over the accompanying activities of the industry under the supervision of MoPNG.

With an order of periodical review of refineries, gas preparing plants and investigation and creation offices are attempted to check the execution of units as for profluent treatment, air outflows and strong waste treatment and transfer framework. OISD hard controls and regulates the wellbeing related parts of Petroleum Industry. OISD comprises of a little center gathering of specialized specialists of different trains on assignment from the business. It is going by an official chief, gets its bearing and direction from the wellbeing board, the zenith body, comprising of senior authorities of the Ministry of Petroleum & Natural Gas, Chief Officials of oil/gas organizations and leaders of the concerned statutory and consultative bodies. Also, the directorate co-ordinates with specialists from the business through different boards to complete its significant exercises. The security chamber/wellbeing directorate does not supplant or at all take away the present obligations of different statutory offices like Director General of Mine and Safety (DGMS), Inspectorate of Boilers, plants assessors and so

forth. It additionally does not weaken the obligations of the CEOs of the oil business who are at last in charge of the wellbeing measures in their associations. Environment review of refineries, gas handling plants and investigation and generation offices are attempted by directorate to check the execution of units as for profluent treatment, air emanations and strong waste treatment and transfer framework. Work range observing and control arrangement of the offices moreover evaluated amid the review, which likewise incorporates wellbeing examination records of individuals working in unsafe territories.

Notwithstanding, the significant downside of this body is that disregarding all the window dressing that is ruined this body, it is still not a statutory body with a legitimate assent to have any genuine effect. Unquestionably, it has enhanced the circumstance by means of institutionalization of a different security measures in the petroleum business, both upstream and downstream. Nonetheless, it loses its steam with regards to the implementation. The actuality there is not a solitary case in the chronicles of history that demonstrates that a builder has been indicted for any sort of ecological infringement. Successfully, this has wound up as each other excess and pleonastic foundation that has recently brought about going off kilter from the genuine point.

Role of Director General of Hydrocarbons:

Created in 1993 through a determination by the govt. of India to regulate furthermore, manage the upstream exercises in the petroleum and regular gas part, the DGH has made some amazing progress in tending to the efficient issues that tormented the Indian upstream administrative structure. Until at that point the upstream petroleum division was totally hoarded by general society division oil organizations. Be that as it may, with the presentation NELP, the support of vast number of private part players turned into a certainty. The challenges in executing the PSC without a specific organization that can manage and control the exercises of the builders were acknowledged, finishing in the production of (DGH). Under the complete managerial control of Ministry of Petroleum & Natural Gas, it was created to advance sound administration of the Indian petroleum and regular gas assets having adjusted respect to nature, wellbeing, innovation and monetary parts of the petroleum exercises and to audit the investigation projects of organizations and educate the legislature on the sufficiency with respect to these projects. It is additionally ordered to prompt on

advancement plans for business disclosures, review petroleum stores, direct safeguarding, upkeep and capacity of information, offer counsel to government on agreeability issues of security standards, natural contamination and so on, in oilfield operations. Extra assignments likewise incorporate arrangement of overhauled bowl data dockets relating to distinctive squares to be offered under different New Investigation Licensing Policy Rounds.

Environment Regulation:

DGH emphasizes for a healthy HSE culture. The PSC stipulates for protection of the environment under its article 14 under which contractor shall follow some guidelines:

- *“Contractor shall conduct its Petroleum operations with protection of the environment and conservation of natural resources.*
- *Contractor shall employ modern oilfield and petroleum industry practices and standards including advanced techniques, practices and methods of operation for the prevention of environmental damage in conducting its petroleum operations.*
- *Contractor should take necessary steps to prevent environmental damage and, where some adverse impact on environment is unavoidable so that consequential effects on property and people can be prevented.*
- *Contractor should take care of adequate compensation for injury to persons or damage to property caused by the effect of petroleum operations.*
- *Contractor should comply with the requirements of applicable laws and the reasonable requirements of the government from time to time.”*

Ministry of Environment & Forest (MOEF), Central Pollution Control Board (CPCB) & other government agencies monitor and regulate the above hazards through Environment Protection Act, 1986 and other applicability. DGH also monitors environmental aspects of petroleum operations. DGH coordinates with MOEF, CPCB and other concerned authority / organizations on environmental issues and also assists MOP&NG on such matters. Environmental Impact Assessment studies are carried out prior to commencement of seismic survey, drilling operations and the development of the field for production. DGH has undertaken two studies, one through Central Mining Research Institute to assess land subsidence in a gas field in Gujarat and the

other one through Wildlife Institute of India, Dehradun to assess impact on the breeding of Olive Ridley Sea Turtles in the entire east coast of India.

7. ISSUES AND CHALLENGES

The main problem faced in the environmental protection from upstream oil and gas activities is the inadequacy of legislative framework. As far as international instruments are concerned, all of them pertain to offshore oil and gas activities, and there is not even a single convention which deals with standards to be followed while conducting on-shore activities at the international level. Onshore oil and gas operations are dealt basically under the municipal legislative frameworks since these subjects fall under domestic jurisdiction of states. Consequently, there are no uniform standards to regulate oil spills, pollution etc. arising from onshore upstream activities.

Moreover, these various international instruments have evolved on sectoral basis and there is no international instrument which deals specifically with environmental ill-effects of oil and gas activities.

Most of the legislations or contracts regulating the activities of oil companies make reference to best industry or modern oilfield and petroleum industry practices. However, no clear cut definition as to what constitutes such practices or what practices are called best industry or modern oilfield and petroleum industry practices is available.

Inadequacy of Indian Legislative Framework:

Production Sharing Contract:

The late Adani bunches' arrangement of outright natural infringement, in a multi-reason venture executed by it in Mundra, Gujrat is an impeccable illustration of how when all is said in done corporate houses in India discover a lee route inside the current structure to escape the results of ecological infringement. The Committee that was situated up to ask into these infringement essentially reasoned that, aside from collecting a fine of 200 Crore rupees, scratching off the leeway, as ordered by law, would profit neither the earth, nor the individuals. It in this way felt that it would not be judicious to end or stop the operations of the organization. What a perilous point of reference to be set upon. They totally overlooked, deliberate or not, the way that the fine is not going to restore the harm brought about and proceeding with the operations will simply further the harm effectively done. By and large, the legislature fixes the chain over the natural issues just when

it is politically practical. With numerous lawmakers guaranteeing that the natural freedom are simply making obstacles in any major taken towards pulling in venture, there is a need to hit reboot catch quickly to completely re-assess the Production Sharing Contract (PSC) through the viewpoint of supportable advancement. At present, the agreement is essentially drafted as a lectern to pull in venture and has perpetual neglected to imbue the principal standards of practical improvement. In the expressions of Lourenzo Cotula:

“Sustainable development provides a useful lens to scrutinize investment contracts. In this perspective, for host countries attracting investment is not an end in itself, but a means to an end. The ultimate goal is to improve local livelihoods whilst protecting the environment.”¹⁰⁷

The need to adjust the hobbies of both ought to be inbuilt with in the brains of the drafters. Parcel of time and vitality has been spent in characterizing and rethinking what will be what. Presently the time it now, time to follow up on them to create some substantial results. Liabilities of the builder recommended in Article 14 of the MPSC need to be more obstruction. Reformatory obligation ought to likewise be joined with any demonstration of carelessness of the foreman from which any harm to nature or the general public takes after in light of the fact that, it is simple for the builder to escape from the common risk by downplaying the harm done to the earth. A large portion of the social and ecological effects go unreported and uncompensated. There are various occasions of oil slicks from different pipelines of ONGC, the misfortune brought on by which has not yet been adjusted.

It seems that India has failed to learn anything from the BP Oil Spill. The effectiveness with which BP Oil Spill has been dealt and actions have been taken against BP lacks in Indian regulatory framework. Except for Public Liability Insurance Act, no legislation currently prescribes an amount to be paid as compensation in case of any accident. However, under this Act, compensation is to be paid only in case of injury or death of any person or damage to any property has resulted from an accident, the owner shall-be liable to give relief which cannot in any case exceed 50 Crores rupees. The Act nowhere makes mention of liability of the owner in case of damage to flora and fauna and various other components of

¹⁰⁷ Lorenzo Cotula, *Rethinking Investor-State Contracts through a Sustainable Development Lens*, 2 Inv. Treaty News 4(2011)

the environment. There is a need to have provisions similar to Oil Pollution Act (in America), which prescribe liability in form of penalty for any activity of the owner resulting in oil pollution. There is not even a single legislation which specifically deals with the protection of environment from oil and gas activities and liabilities of the Contractor in case of damage to the environment as a consequence of oil and gas activities. Such activities are generally governed by various notifications from the sectoral regulator or from Ministry of Environment and Forest etc. Moreover, Multiplicity of legislations makes the situation complex and various clarifications under diverse statutes from state and central agencies act as a discouraging factor for the investors.

The redressal mechanism meant exclusively for challenging the environmental clearance is also extremely weak and limited in scope. The National Environmental Appellate authority has heard only 15 cases in the last eight years. The process of seeking redressal from courts requires a fair amount of energy and financial allocation. It is not possible for all those with grievances to take on legal battle against large and powerful project proponents.¹⁰⁸

Also, many developed countries are switching towards some heavier unconventional fuels such as Shale Gas. Shale Gas reserves are scattered unevenly throughout the world. Extraction of Shale Gas poses environmental challenges which are unique in themselves. Without having a full-fledged and efficient legislative system to regulate the extraction and production of these primary unconventional oils, it will be an over-ambitious step to move towards extraction of Shale Gas. But, owing to the ever-increasing demand of petroleum products, India may have to consider exploration and production of shale gas and hence, it is very much important to adopt the balanced approach and upgrade various legislations in this regard.

¹⁰⁸ Aruna Murthy & Himansu Sekhar Patra, *Environment Impact Assessment Process in India and the Drawbacks*, available at <https://elibrarywcl.files.wordpress.com/2015/02/environment-impact-assessment-process-in-india-and-the-drawbacks-1.pdf>.

8. CONCLUSION/SUGGESTIONS

- A Single legislation dealing specifically in detail, with the rights and liabilities of Contractor, with respect to protection of various components of Environment, such measures and precautions to be taken, mitigating social impacts of oil and gas exploration and production activities, prescribing minimum limit of liability for the contract to restore the environment and rehabilitate the local population in case of any damage arising out of any accident from oil and gas activity. All the clarifications and certifications to be obtained by the Contractor should also be prescribed exclusively by this legislation.
- A monitoring body to review and audit the impacts of various oil and gas activities undertaken by the Contractor and to find out whether all the standards provided in the Production Sharing Contract are being duly complied with, should be set up and in case of non- compliance with the prescribed standards, there should be a provision for strict action against the contractor which may include penal liability in extreme cases.
- Article 14 of the Production Sharing Contract should be amended to include various clauses discussed under the heading “Critical Appraisal of Indian Production Sharing Contract”.
- Environment Impact Assessments should be carried out with more seriousness and a body of experts should be constituted by the government to carry out environment impact assessments for various projects with the assistance of the contractor.
- As has already been mentioned, none of the environment protection legislations make an express mention of protection from oil and gas exploration and production activities, these legislations may be amended wherever necessary to incorporate relevant provisions to enhance the efficacy of such legislations.

Therefore, it is very much important to note that we are from environment, environment is not from us. So, any attempt to damage the environment is ultimately an attempt to end the existence of mankind. Environment consists of various components on which survival of mankind is dependent for example air, water, soil, vegetation, sunlight and the like. Any unreasonable interference with any of them may lead to unpredictable consequences and irreplaceable damages.

All the components of vegetation from algae to crops, plants, big trees, flora and fauna constitute an integral part of the food chain. And a small loss to even a primary constituent of food chain disturbs the entire food chain. There is no denial to the fact that fossil fuels, basically the petroleum and petroleum products are consumed in all the walks of life and are vital for leading a comfortable life. But at the same time, it should not be forgotten that these products are also produced as a result of continuously ongoing processes below the surface of earth which is also a part of the environment. As has already been discussed petroleum operations from its inception till its abandonment have far numerous negative impacts on the environment which will bear far reaching consequences on humanity. There is a dire need to have a well regulated framework of legislative provisions with their proper execution at national as well international level for the protection of the environment as well as the global community. After years of ignorant attitude, it's now the time to shift our priorities from luxurious to conservative life style. Various policies adopted and implemented by India need to be relooked for ensuring strict implementation. Proper supervision at each stage of petroleum and natural gas operations is required from the government side. There is also a requirement of simple understanding of the fact on behalf of not only the oil companies but also by every individual being a part of the global community that the liability from legal provisions can be escaped but the reward environment is giving in the form of acid rains, ozone layer depletion, global warming will be impossible to escape from. Being members of the same community, it's a duty to act sustainably because ultimately the consequences are not going to be limited.