AN ANALYSIS OF THE ROLE OF META-REGULATIONS IN GUARANTEEING HEALTH, SAFETY AND ENVIRONMENTAL SAFETY IN THE OIL AND GAS SECTOR OF UGANDA

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DECLARATION

I, **Andrew Wabwezi** hereby declare that this dissertation is my work and it has not been submitted to any other Institution of higher learning for the fulfilment of any academic award.

Signed ……

Date…….

APPROVAL

This is to certify that this dissertation entitled **"An Analysis of the Role of Meta-Regulations in Guaranteeing Health, Safety and Environmental Safety in the Oil and Gas Sector of Uganda" has** been done under my supervision and it is now ready for submission.

Signature ……..

George WKL Kasozi- Associate Professor

(Supervisor)

Date ……..

DEDICATION

This work is dedicated to my children Alinange Andrean Wabwezi and Amber Sanyu Wabwezi. This dissertation should pose a challenge to you to always aim higher in your achievements.

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Table of Contents

LIST OF ACRONYMS

CNOOC	China National Offshore Oil Corporation
ESA	The National Environment **(**Environmental and Social Assessment**)** Regulations 2020
HSE UK	Health and Safety Executive of United Kingdom
HSA Ireland	Health and Safety Authority of Ireland
HSE Canada	Health and Safety Executive of Canada
UK	United Kingdom
Reg	Regulation
Upstream Regulations	The Petroleum (Exploration, Development and Production) (Health, Safety and Environment) Regulations 2016;
Midstream Regulations	The Petroleum (Refining, Conversion, Transmission and Midstream Storage) (Health, Safety and Environment) Regulations 2016

ABSTRACT

Much as the income derived from oil can propel Uganda's development, such development, should be sustainable, ensuring that the exploitation of oil doesn't deprive current and future generations of a clean and safe environment. The Oil and Gas Industry is fraught with a lot of risks and hazards that have caused health and safety catastrophes that have at times led to fatalities. Parliament in line with its constitutional legislative mandate, made Laws and Regulations to regulate health, safety and environmental safety of the oil and gas aspects. This study was about the analysis of the role of Meta-Regulation in guaranteeing health, safety and environmental safety in oil and gas sector of Uganda. The study used the Doctrinal Research Method together with the Comparative Legal Analysis Research Method. Using these methods, the Meta-regulations of health, safety and environmental safety were analyzed and also compared to those Norway and Kenya. Although Uganda uses both Prescriptive and Meta-regulations, this study only focused on the latter. Some of the findings in the study regarding the Health and Safety aspects include; that many vital technical terms were not defined to provide guidance and context to the operators. Attention was only given to conditions that could result into loss of work time, disability and fatalities, neglecting conditions that have a cumulative effect and may not cause any of the three listed conditions although may adversely affect a worker's health. There was also a failure to emphasize that employees should participate in the making of Safety Cases, weak financial penalties for operators who violate the regulations, no guidance was given as to how qualitative or semi qualitative or quantitative risk assessment should be done. The analysis of the environmental safety aspects of Meta–Regulations revealed that there is no guidance as to whether qualitative or quantitative method of risk analysis should be used during risk assessment, there is no provision for submission of the policy statements for approval by the regulator, mitigation hierarchy does not state that biodiversity offsets should be done in the same area of loss. Some of the recommendations include that compliant Operators should be given certificates of compliance, there should be a provision that employees participate in the making of safety cases, the regulator should be able to partly accept to partly reject a Safety Case, the regulations should require that a Safety Case includes a place for refugee in case of an emergency and the organizational emergency shouldcoordinate with public emergency preparedness.

CHAPTER ONE:

GENERAL INTRODUCTION

1.0 Introduction

This chapter provides an overview of the study. The chapter begins by providing a brief introduction of the study followed by the background of the study. It then presents the statement of the problem that highlights the research gap and what is at stake. This chapter presents the objectives of the study from which the research questions here in are derived. It gives the scope of the study that includes time scope, content scope, and the geographical scope. The chapter then gives the justification of the study, the significance of the study, the conceptual framework, the theoretical framework and the reasons why the latter will be chosen over the former.

Regulation of oil and gas operations touching on the health, safety and the environment involves the management of risk and hazards among other factors. The government/ regulator may directly be involved in the management of these risks or may delegate this function to the operators or industrial players. A situation where risk and hazard management is delegated to the operators is referred to as Meta –regulation.[1] It connotes a situation whereby the function of risk management is left to the regulatee with supervision from the regulator. [2] Uganda adopted this approach to regulation from the United Kingdom which predominantly uses it in the oil and gas sector. Oil and gas industry, if not regulated can be disastrous both to the people who work in it and to the environment because of the hazardous nature of its operations. This study concentrated on the analysis of the meta-regulation and its contribution in guaranteeing health, safety and the safe environment in Uganda while drawing from best practice from oil and gas mature provinces. Its objective was to examine the legal tools in form of meta-regulations meant for the regulation of operations in the oil and gas sector in Uganda touching on health, safety and environmental safety, in order to determine their effectiveness.

[1] Robert Baldwin, Martin Cave and Martin Lodge, *Understanding Regulation: Theory Strategy and Practice* (2nd edn, Oxford University Press 2012)
[2] Ibid

1.1. Background to the study

The discovery of oil in Uganda is traceable far back prior to independence. Oil exploration activities in Uganda were started as early as the 1920s. However, the exploration activities did not materialize to discovery of oil and were subsequently interrupted by the outbreak of the Second World War in the 1940s and the political upheavals that followed in the 1960s to the 1970s. In 1983 there was a confirmation of some presence of oil.[3] But in 2006, commercially viable quantities of proven oil reserves were discovered in the Albertine Graben Region of Uganda estimated to be approximately 6.5 billion barrels of crude oil of which about 2.5 billion is recoverable [4] According to Tumusiime and Banfield, the Albertine Region is home to most of Uganda's biodiversity.[5] It is one of the most species rich areas in the world.[6] This calls for a balancing act by the International Oil Companies or Licensees while conducting oil and gas operations in the region to exploit the oil as a natural resource but also ensure that the environment is protected. Tumusiime and Banfield assert that much as oil development comes with great benefit it can also be destructive to the environment.[7] There is therefore a need for sustainable development which will ensure that development does not come at the expense of depriving future generations of a clean and safe environment. The oil and gas industry is fraught with a lot of risks and hazards to health, safety and the environment.[8] There have been numerous accidents and disasters internationally that have destroyed the environment, injured peoples' health and even caused massive death of workers emanating from oil and gas operations.[9] On the 20th of April 2010, there was an explosion on the Deep Water Horizon drilling unit that caused uncontrolled oil and gas spill from the Macondo seafloor well into the Gulf of Mexico and this spill lasted for 87 days.[10] This oil spill caused great damage to aquatic life and livelihood of people that depended on the sea.[11]

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[3] Emmanuel B Kasimbazi, 'Environmental regulation of oil and gas exploration and production in Uganda (2012) 30/2 Journal of Energy & Natural Resources law < https://www.tandfonline.com/doi/abs/10.1080/02646811.2012.11435291> accessed 24 January 2022
[4] Ibid
[5] Frank Tumusiime and Jessica Banfield, 'Oil and gas law in Uganda : a Legislative guide' (2011) < https://www.international-alert.org/publications/oil-and-gas-laws-uganda > accessed 25 March 2022
[6] Ibid
[7] Ibid
[8] Greg Gordon and others, Oil and Gas Law: Current Practice and Emerging Trends (2nd edition, Dundee University Press 2011)
[9] Ibid
[10] Samantha B. Joy, 'Deep-water horizon, 5 years on (2015) 349/6248 < https://www.science.org/doi/full/10.1126/science.aab4133> access 25January 2022
[11] Ibid

The Piper Alpha Disaster caused the death of 167 people in 1988 on an offshore oil platform in the United Kingdom.[12] The disaster was due to an explosion caused by gas leaks and a communication problem among shift workers.[13] The oil and gas industry has been struggling and sometimes taking a reactionary approach to mitigate disasters and put up measures to minimize on the occurrence of these dangerous accidents. The principal measures taken have been regulatory, embedded in different regulatory approaches depending on the jurisdiction. In Uganda, government is supposed to hold in trust for the people and protect natural lakes, wetlands and other natural resources as per Article 237(2)(b) of the Constitution[14] . Article 39 of the same Constitution states that every Ugandan has a right a right to a clean and safe environment. The same Constitution under Article 79(1) mandates, Parliament to make laws on matters of development and good governance among others. In the same vein, Article 40 of the Constitution[15] requires that Parliament makes laws that ensure people work under safe and healthy conditions. In line with these provisions, Parliament therefore sought it wise to make laws and regulations there under that together regulate the oil and gas sector in as far as environment, health and safety are concerned. The purpose of this study therefore is to analyze the meta-regulations embedded in these laws to determine their effectiveness in regulating the oil and gas operations in Uganda that may affect health, safety (of workers) and the environment.

1.2The Statement of the Problem

Oil and gas business is saddled with numerous risks and hazards that put environmental safety and the health and lives of people who work in the industry at risk.[16] The health and safety of employees of companies and contractors in the industry and the environment will be in peril if the manner of regulation of these delicate aspects of oil and gas is not effective. More over if the environmental safety is not handled delicately during the exploitation of oil and gas, it can be one of the triggers of the oil curse.[17] Recently, in 2019, a study that was conducted in the

[12] Lord Cullen, 'The Piper Alpha Disaster '(Department of Energy UK, 1990 Vol1) <https://www.hse.gov.uk/offshore/piper-alpha-public-inquiry-volume1.pdf > accessed 20 January 2022

[13] Ibid
[14] 1995 Constitution as amended
[15] Ibid
[16] Greg Gordon and others, Oil and Gas Law: Current Practice and Emerging Trends (2nd edition, Dundee University Press 2011)
[17] Frank Tumusiime and Jessica Banfield, 'Oil and gas law in Uganda : a Legislative guide' (2011) < https://www.international-alert.org/publications/oil-and-gas-laws-uganda > accessed 25 March 2022

Albertine Region showed that the Albertine Region is already experiencing environmental impacts.[18] This study, among other findings, revealed that some rear species of animals have migrated away from their natural habitat.[19] The same study showed that some water bodies in the Albertine Region have been polluted due to poor handling of waste.[20] Meta-regulation is a fairly new approach to regulation [21] and yet no research has previously been done about it in Uganda whether generally or regarding health, safety and environment in the oil and gas sector. This creates a research gap that ought to be covered urgently especially now that Uganda has signed the final investment decision that will officially flag off the development phase of the oil and gas value chain. This study accordingly analyzes the meta-regulations of the oil and gas sector regarding health safety and the environment to determine their effectiveness to avoid taking chances or living on assumptions.

1.3. Objective of the study

1.3. 1. The general objective of the study

To analyze the role of meta-regulations in guaranteeing health, safety and the environmental safety in the oil and gas sector of Uganda.

1.3.2. Specific Objectives of the study

The Specific Objectives of the study are**: -**

(i) To identify and analyze the relevant meta-regulations in the health, and safety and environmental regulatory framework in the oil and gas sector in Uganda.

(ii) To explore best practice of meta-regulation in health, safety and environmental protection frameworks in the oil and gas sector of other jurisdictions.

(iii) To propose recommendations based on the conclusions of the study.

[18] Patrick Byakagaba, Frank Mugagga, Diana Nnakayima, 'The social –economic environment implication of oil and gas exploration: Perspectives at the micro level in the Albertine region of Uganda' (2019) Elsevier <http://elsevier.com> accessed 07 June 2022
[19] Ibid
[20] Ibid
[21] Robert Baldwin, Martin Cave and Martin Lodge, *Understanding Regulation: Theory Strategy and Practice* (2nd edn, Oxford University Press 2012)

1.4. Research Questions

(i) How effective are the meta-regulations in the health, and safety and environmental regulatory framework in the oil and gas sector in Uganda.

(ii) What is the best practice of the meta-regulatory framework in health, safety and the environment in the oil and gas sectors of other jurisdictions?

(iii) What recommendations can be made based on the findings of the study.

1.5 Scope

1.5 .1 Time scope

The study covered the period between 2013 and 2022 which is the period when most of the laws regulating oil and gas in Uganda were enacted. This notwithstanding, laws that complement or address similar issues to the meta-regulatory framework of health and safety and environmental safety in the oil and gas sector were mentioned although legal analysis was only for meta-regulations in those laws enacted between 2013 and 2022.

1.5.2. Content scope

Although Uganda uses a mixture of prescriptive regulations and meta-regulations in the regulation of health, safety and the environment in the oil and gas sector, this study was limited to the **meta-regulatory framework** of health and safety and the environmental safety in the oil and gas sector in Uganda. The laws that address Meta-Regulations of Health, Safety and Environmental safety in other oil and gas jurisdictions namely Norway, UK and Kenya, were also explored.

. 1.5.3. Geographical scope

This study covered the meta-regulation of health and safety and environmental safety of the oil and gas operations in the Albertine Region located in Uganda as a country. A comparison of the meta-regulations of health and safety and environmental safety of oil and gas in selected jurisdictions namely Norway, UK and Kenya was also done.

1.6. Justification of the Study

Meta-regulation is a fairly new approach which was adopted from the United Kingdom. In Uganda, it is being applied in the sensitive area of health, safety and environmental regulation

in the oil and gas sector which is abound with risks and hazards. No research has so far been done to analyze the effectiveness of meta-regulations in ensuring environmental safety and health of employees in the oil and gas sector in Uganda. This research gap had to be covered by this study. The study therefore evaluated the effectiveness of meta-regulations in regulating the environmental safety and the health of employees in the oil companies and made recommendations to the relevant stake holders.

1.7 Significance of the study

1.7.1. To the policy makers

The meta-regulations of environmental safety and the health of the employees in the oil and gas sector is critical for the sustainable development of the oil and gas economy of a nation.[22] Uganda is preparing herself for sustainable oil and gas production since the discovery commercially viable oil and gas in 2006. The findings of this study will be helpful in generating practical knowledge in the meta-regulatory compliance and in turn it will assist policy makers and implementers in designing more meaningful interventions strategies that will enhance better implementation of compliance standards in the environmental, health and safety standards compliance. The Study will help the government to understand the loopholes in the meta-regulatory legal framework in the regulation of environmental safety and the health of employees involved in the oil and gas sector of Uganda. .

1.7.2 To the researchers.

The study will be of great importance to students who want to learn more about the issues concerning Uganda's meta-regulatory framework of Health and environmental safety in the oil and gas sector. The knowledge that will be acquired will be used as a reference since it will be a source of information for the students in regard to any issue that can arise from compliance of international environmental, health and safety regulations.

1.8.0 Research Framework.

There are two major research frameworks. These are the theoretical framework and the Conceptual framework.

[22]Bainomugisha, A. (2006): Escaping the Oil Curse and Making Poverty History, ACODE Policy Research Series, No. 20.

1.8.1 Conceptual framework

A conceptual framework helps to postulate or hypothesize and test certain relationships which improve the understanding of the situation.[23] Conceptual frameworks seek to categorize by inductive research, "*presumed relationships*" among key factors or constructs to be studied.[24] It is aimed at the manipulation of existing theories to form a new theory [25] This research was not intended to form a new theory but rather study the existing theory without any manipulation in order to test its veracity. The researcher therefore relied on the theoretical framework for purposes of this study.

1.8.2 Theoretical framework

Theories of regulation explain in form of proposition why regulation is done, the roles of players and the sequence of interaction between different players.[26] Bronwen et al lists three theoretical perspectives of how regulation emerges. These include the public interest theory, the private interest theory, and the institutionalist theory[27]. These theories suggest reasons why a particular regulatory regime is followed. Public interest and private interest theories are the reasons government actors pass detailed rules that govern behavior of private players.

The Public interest theory suggests that legislators and other public actors make regulations for the interest of the general welfare of the public. The aims of regulatory intervention can be divided into economic efficiency and political reason. On the other hand, private interest theory is premised on the fact that regulation emanates from individual actions or groups intended to maximize their self-interest[28].

Although both the public interest and the private interest theories are important, in explaining the regulatory regime, this research was specifically hinged on the institutionalist theory of regulation. This theory emphasizes the role of organizations, institutions and systems in regulation. The institutionalist theory considers institutional dynamics to poses a life of their own in regulatory regimes which enables them to organize their regulatory affairs in ways that are unique to them. Under this theory, is the self-reference concept which depicts the regulated

[23] Sekaran Uma, Business Research Methods 2003.
[24] Sharon M Ravita, Mathew Riggam , *Reason and Rigor: How conceptual framework guide research*(2nd edn Sage 2017)
[25] Patton M.Q, *Qualitative research and evaluation methods (* Sage 2002)
[26] Bronwen Morgan and Karen Yeung, *An introduction to Law and Regulation: Text and Materials* (Cambridge University Press 2007)
[27] Ibid
[28] Ibid

area as a system with elements that interact with each other in such a way that they sustain themselves and reproduce elements with similar properties as a result of perpetual interaction? Under this theory, the law plays a facilitative role such that it lays down **the procedural guidance to regulated firms** or corporations. Bronwen et al posit that the Law's role is to play a mediatory role and shows that regulation actors operate in a semi –autonomous, social, sub-system.[29] For purposes of this research the theoretical framework was relied upon because the existing theories cater for meta-regulations in that they construe the role of law as mediatory and allow for semi autonomy of the regulatee. This well fits in the meta-regulation phenomenon because according to this regulatory framework, even if the commands come from the regulator the regulatee is given an allowance to operate semi autonomously without micro management by the regulator.

1.9 Conclusion

This introductory chapter presents the background information to the study, it presents the statement of the problem, gives the major main objective of conducting this research together with the objectives and research questions. The scope, justification and significance of the study are also given. The theoretical framework and why it was chosen over conceptual framework has also been presented. The next chapter will deal with literature review.

[29] Ibid

CHAPTER TWO:

LITERATURE REVIEW

2.0 Introduction

This chapter presents literature of previous research that is relevant to the subject of investigation. An overview of the definition of the concept of Meta-Regulations is presented first because it is relatively a new concept in Uganda. A comparison of the Meta-regulatory framework to the Prescriptive regulatory framework is then made. Salient Meta-regulatory issues regarding health and safety are then presented. These include hazard, risk, risk mitigation standards, and risk assessment. The theories of accident causation have been explored because health and safety is all about preventing calamities that manifest as accidents. The common occupational injuries and diseases in the oil and gas sector have been examined because they are important to the subject under investigation. The environmental impacts caused by oil and gas operations have also been discussed because they are what the Meta-regulations seek to avoid or mitigate. The literature review chapter has also presented the Environmental and Social Assessment and environmental degradation in the Albertine Region.

2.1 Defining Meta-Regulation

According to Coglianese and Mendelson, despite the increasing interest in meta-regulation by scholars and researchers, there is no universal definition of meta-regulation.[30] Baldwin et al define meta-regulation as a process where the regulatory authority oversees a risk management system without being involved in the direct regulation of the same system.[31] It denotes a situation where the risk control function is delegated to corporations by the regulator. The primary regulatory activities then become those conducted in the risk management system by the corporation itself. In such a situation, the responsibility of the regulator will be that of auditing and monitoring the activities of the corporation. Under meta-regulation, the corporation will write rules tailored to a specific system in the particular corporation.

[30] Cary Coglianese and Evan Mendelson, 'Meta-regulation and self-regulation' (2012) 12/11 <https://www.researchgate.net/publication/228124764_Meta-Regulation_and_Self-Regulation> accessed 26 January 2022

[31] Robert Baldwin, Martin Cave and Martin Lodge, *Understanding Regulation: Theory Strategy and Practice* (2nd edn, Oxford University Press 2012)

Hutter likens meta-regulation to the states' oversight to of the self-regulating arrangement by the corporation.[32] Christine and Braithwaite refers to meta-regulation as a process of regulating the regulators.[33]According to them, institutional meta-regulation is the regulation of an institution by another. This definition falls short of indicating that the institution being regulated has to have the autonomy to conduct its own self-regulation so as to qualify as meta-regulation. Morgan and Yeung argue that meta-regulation captures a desire to regard reflexively about regulation in such a way that the direct regulation of social and individual action is itself regulated.[34]

Meta –regulation can also be explained using the basic elements of regulation which include the regulator, the target and the command. The target is the entity or firm to which the regulation applies.[35] Usually the target may be a firm or corporation but can also be individuals (eg directors), government organizations, or non-government organizations.[36]

The Regulator is the entity that formulates and enforces the rules or regulations intended for the target. Although the **regulator** is usually government, it can also be a non –governmental organization, association or trade association.[37] The Command is the third essential ingredient of regulation.[38] This refers to what the regulator directs the target to do or refrain from, doing.[39] The command can either specify the means or the end by which the command should be executed. The means can include specifications, designs or standards, prohibition to do certain things, implementation of a particular technology or use of particular equipment.[40] With the ends command, the regulator does not specify the specification, or equipment to be used but

[32] Hutter, Bridget, 'Risk, Regulation, and Management,' in Peter Taylor-Gooby and Jens Zinn (eds.), *Risk in Social Science*, (Oxford University Press 2006)

[33] Parker, Christine, and John Braithwaite, 'Conclusion' in Christine Parker et al. (eds.), *Regulating Law*, (Oxford University Press 2004)

[34] Bronwen Morgan and Karen Yeung, *An introduction to Law and Regulation: Text and Materials* (Cambridge University Press 2007)
[35] Cary Coglianese and Evan Mendelson, 'Meta-regulation and self-regulation' (2012) 12/11 <https://www.researchgate.net/publication/228124764_Meta-Regulation_and_Self-Regulation> accessed 26 January 2022
[36] Ibid
[37] Ibid
[38] Ibid
[39] Ibid
[40] Ibid

expects a particular outcome and leaves the work of setting specifications to the target. The latter is the process that happens with meta-regulation.

There is a tendency to confuse self-regulation with meta-regulation. Although the two types of regulation have many features in common they, are actually different. Self-regulation connotes a systems where the regulating target either at individual level or sometimes through an industry association that represents the target imposes commands and consequences upon itself.[41] A firm can self-regulate itself by imposing upon its self either means or ends commands.[42] The major distinction between self-regulation and other kinds of regulation is not the command or consequences but rather the unity of the regulator and the target. An act is considered self-regulating even if it is motivated by implicit threats from an outsides regulator as long as the outside threats are not intentional efforts to encourage self-regulation.[43] By contrast, meta-regulation focuses so much on the outside regulator but also incorporates the insight from self-regulation that the target can also be a source of their own constraint or regulation. Meta regulation refers to ways in which that outside regulators deliberately rather than unintentionally seek to induce targets to develop their own internal self –regulating responses to public problems.[44]

2.2 Comparing Meta-regulatory approach to Prescriptive regulatory approach

Unlike Meta-regulation, Prescriptive regulation, allows the regulator to dictate the means of achieving safety and any deviation from the laid out procedures is considered a violation of the regulations.[45] This can be counterproductive when the regulatee's methods of achieving safety are better than the method prescribed by the regulator. This implies that the regulatee's innovative ideas will not be tried upon for fear of breaching the prescriptive regulations. Prescriptive regulation keeps the regulator busy because they have to micro-manage the operators despite the fact that the latter has better knowledge about their operations than the

[41] Ibid
[42] Ibid
[43] Parker, Christine, and John Braithwaite, 'Conclusion' in Christine Parker et al. (eds.), *Regulating Law*, (Oxford University Press 2004)
[44]Cary Coglianese and Evan Mendelson, 'Meta-regulation and self-regulation' (2012) 12/11 <https://www.researchgate.net/publication/228124764_Meta-Regulation_and_Self-Regulation> accessed 26 January 2022
[45] MarcG Lassagne , 'David X Peng and Raul Viera, Prescriptive and risk based approach to regulation: The case of FPSOs in Deep Water Govt of Mexico' (2001) <https://doi.org/10.4043/12950-MS> accessed 20 May 2021

regulator.[46] Meta-regulation only requires the regulator to state the standard /level of safety required but leaves the regulatee to devise means of achieving that standard.[47] It is open to new technology if that make achievement of the required level of safety easier [48] As shown above, the Meta regulations encourage innovation and flexibility in responding to changes and are therefore efficient.

Just like self-regulation, meta-regulation enables the operator to exercise their discretion.[49] This enables the operators to formulate internal risk management systems that matches the uniqueness of a particular operator. The discretion afforded by meta-regulation is vital because no one better understands a system of the operator than the operator themselves. Although the meta-regulated firms don't have the freedom to decide whether or not to prepare and organize these internal systems, the discretion that meta-regulation comes with enables them to manage their risk management systems. The exact opposite happens with prescriptive regulation because it takes away the discretion of the Regulatee.

2.3 Salient meta-regulatory issues regarding health and safety in the oil and gas sector

The common elements of Health and Safety regulation include accidents, near misses, Hazards, undesired circumstances, risks, risk assessment to mention but a few.[50] The word accident has been defined as an event that is neither planned nor controlled but may result into injury of person or property.[51] Oppong defines an accident as an unplanned event that is brought about

[46] Olsvik Elise Anonby, 'Challenges of aviation security regulation in Norway post 9/11 (DPhil thesis, University of Stavanger 2015)

[47] Ibid

[48] Bjornar Raaen 'A comparative study of the legislative risk regulation of Norwegian Petroleum and Coal Mining Industry and Russian Coal Mining Industry' (Master's Thesis, University of Stavanger 2018)

[49] Cary Coglianese and Evan Mendelson, 'Meta-regulation and self-regulation' (2012) 12/11 <https://www.researchgate.net/publication/228124764_Meta-Regulation_and_Self-Regulation> accessed 26 January 2022

[50] Health and Safety Executive 'Management of Risks and risk assessment at work' (Health and Safety Executive) < https://www.hse.gov.uk/simple-health-safety/risk/index.htm> accessed 20 May 2022

[51] Canadian Center for Occupational Health and Safety 'Accident Investigation' (CCOHS, 26 June 2019) < https://www.ccohs.ca/oshanswers/hsprograms/investig.html> accessed 06 June 2022

by the reactions of materials, persons, objects that has the potential to cause a near miss, personal injury or damage to property which may or not cause loss of production.[52] A near miss is also defined as an event that does not cause harm but has the capacity or potential to cause harm and includes a dangerous occurrence.[53] HSEUK defines undesired circumstance as a set of conditions or circumstances that can potentially cause injury or ill health.[54]

2.3.1 Hazard

Although Hazard and risk are used interchangeably, they are different. Canadian Health and Safety Executive defines a hazard as anything that can potentially cause danger, harm or adverse effects to something or someone.[55] Hazards can be categorized into physical, chemical, psychological, radiation and biological. Examples of physical hazards include walk ways, steps, unsafe machinery and spillage on the floor. Chemical hazards include liquids, dust, fumes, x-rays, emissions, gases and microwaves. Psychological hazards include stress, lack of empowerment and harassment; Radiation hazards include X-rays, UV microwaves, gama rays and clinical settings. Examples of biological hazards include viruses, bacteria and fungi. Covid19 makes a good example of a disaster emanating from a biological hazard.[56] According to HSE, the Operator is supposed to look around the premises and identify hazards related to their operations.[57] This they can do by listing the plants used and how they are used, the substances, the chemicals involved, the safe and unsafe work practices and work related stress. HSE UK suggests they look at previous accidents and ill health records as this will enable the

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[52] Seth Oppong, *Health & Safety: Theory and Practice in the oil and gas sector* (VD Publishing House Ltd, 2011)

[53] Health and Safety Executive 'Management of Risks and risk assessment at work' (Health and Safety Executive) < https://www.hse.gov.uk/simple-health-safety/risk/index.htm> accessed 20 May 2022

[54]Ibid

[55] Canadian Center for Occupational Health and Safety 'Accident Investigation' (CCOHS, 26 June 2019) < https://www.ccohs.ca/oshanswers/hsprograms/investig.html> accessed 06 June 2022

[56] Health and Safety Executive 'Management of Risks and risk assessment at work' (Health and Safety Executive) < https://www.hse.gov.uk/simple-health-safety/risk/index.htm> accessed 20 May 2022

[63] Ibid

identification of hazards that may not seem obvious.[58] Hazard identification is very central to meta-regulation because it enables the operator to devise means of managing the hazards that are unique to a particular facility. This would be harder to achieve if the operator was to follow prescriptive regulation which deny the operator the discretion to manage hazards according to each operator's unique settings.

2.3.2 Risk

Canadian HSE defines risk as probability or likelihood that a person will be harmed or experience a hazard.[59] This may also apply to property or adverse effects on the environment. HSA of Ireland defines a risk as the chance that a person may suffer harm or injury if exposed to a hazard.[60] The factors that influence the degree of risk include; the extent of the exposure which relates to how much a person is exposed to the hazard; the nature of the exposure which could be exposure to a substance through inhalation or skin contact; the severity of the effect which may be illustrated by one substance being capable of causing irritation while another may cause a more serious condition like skin cancer.[61] The operator is expected to provide protection to their employees by abiding by the laws and regulations regarding health and safety in the sector. The minimum they can do is to identify the hazards or what has potential of causing harm, decide the likelihood of the hazard causing injury or harm and take action to remove the hazard or control the risk of harm posed by the hazard.[62] According to HSE UK, although it is not possible to eliminate all risks, the operator should do everything reasonably practicable to protect all people from injury.[63] Risk assessment and management fits well into the meta-regulation phenomenon because different organizations/projects experience varying vulnerability to risk given their uniqueness. For example, while Kingfisher project in the Albertine region is on the shores Lake Albert the Tilenga project is on a flat landscape. This implies that the risk management that may conducted by Total in the Tilenga Project will be

[58] Ibid
[59] Canadian Center for Occupational Health and Safety 'Accident Investigation' (CCOHS, 26 June 2019) < https://www.ccohs.ca/oshanswers/hsprograms/investig.html> accessed 06 June 2022

[60] Health and Safety Authority 'Hazard and Risk' (HSA, 05 January 2018) < https://www.hsa.ie/eng/topics/hazards/> accessed 05 June 2022

[61] Health and Safety Executive 'Management of Risks and risk assessment at work' (Health and Safety Executive) < https://www.hse.gov.uk/simple-health-safety/risk/index.htm> accessed 20 May 2022
[62] Ibid
[63] Ibid

unique to the Project while that risk management conducted by CNOOC in the Kingfisher project will suited to the conditions prevailing around the project. Meta-regulation which provides for this kind of flexibility by the regulator to enable customized risk management by the operators is well suited for risk assessment in the oil and gas sector.

2.3.4 Standard for risk mitigation (ALARP and ASFAIP)

ALARP stands for as low as reasonably practicable while SFAIRP is short form for so far as is reasonably practicable.[64]The common denominator between the two terms is "reasonably practicable". This entails weighing a risk against the effort, time and money required to control it. These standards state the level to which work place risks should be controlled. This standards can be employed when the operator is given a set of goals to meet in ensuring health and safety of employees and visitors. However it is challenging to make the judgment that the standard of ALARP has been met. Most times this judgment is made by referring to the existing "good practice"[65]. The 2005 health and Safety regulations UK were amended to include a requirement for the regulatee to conduct both qualitative and quantitative risk assessment.[66] The Ugandan Upstream and Midstream regulations of 2016 require that on top of the qualitative and quantitative risk the semi qualitative assessment is also done.[67] Qualitative risk analysis is dependent on circumstances in a particular work place. It is meant to point out risk and its likelihood of causing harm or injury workers and the likely impact of that harm.[68] On the other hand, quantitative risk analysis assigns numerical values to variables such as costs, delays, impact to evaluate risks.[69] The standard of risk mitigation used by Uganda and UK is "As low

[64] Ibid
[65] Ibid
[66] Rena Steiznor 'Lessons from the North sea: Should "Safety Cases" come to America (2011) 38/2 Boston College Environmental Affairs Law Review<http://lawdigitalcommons.bc.edu/ealr/vol38/iss2/10> accessed 11 May 2022

[67] The Petroleum (Refining, Conversion, Transmission and midstream storage) (Health Safety and Environment) Regulation 2016

[68] Health and Saftey Executive 'Management of Risks and risk assessment at work' < https://www.hse.gov.uk/simple-health-safety/risk/index.htm> accessed 20 November 2021

[69] Ibid

as reasonable practicable (ALARP)" although the Ugandan Upstream and Midstream regulations call it as low as is practically feasible.[70]

2.4 Theories of accident causation in occupational setting

2.4.1 The Domino theory

Domino theory of accidents asserts that accidents are caused by casual factors or hazards where one thing leads to another in a chain format.[71] According to this theory, if no intervention is made, the accident will occur.[72] Like its name suggests, once one block of factors sets off, it sends a ripple effect to the other factors and with each block falling upon the other in a dominos style, an accident occurs. This theory asserts that an injury comes from an accident which results from a personal or mechanical hazards and the same is caused by carelessness or poorly designed equipment.[73] This theory asserts that elimination of any of the preliminary factors will lead to avoidance of the accident. Given the elements of this theory, *meta-regulation* can take care of mechanical hazards and social environment to reduce the risk of accidents hence injuries. This is possible because through *meta-regulation* the operator is able to conduct risk assessment that will cater for the both the mechanical hazards and the social environment.

2.4.2 The Epidemiology theory

Epidemiology is a medical subject that examines or investigates relationships between factors and diseases. Epidemiology has been defined as a subject of medicine that studies factors that contribute to the occurrence of diseases in a given population.[74] Although epidemiology largely depends on correlations, its findings can be used to determine causal factors in a relationship. The epidemiology theory has two elements which are predisposition characteristics and situational characteristics.[75] The predisposition characteristics include genetic properties,

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[70] The Petroleum (Refining, Conversion, Transmission and midstream storage) (Health Safety and Environment) Regulation 2016

[71] Seth Oppong, *Health & Safety: Theory and Practice in the oil and gas sector* (VD Publishing House Ltd, 2011)

[72] Ibid
[73] Ibid
[74] John C Burnham, 'The syndrome of accident proneness (unfallneigung): Why Psychiatrists did not adopt and medicalize it (2008) History of Psychiatry < https://pubmed.ncbi.nlm.nih.gov/20617632/> accessed 10 June2022
[75] Ibid

lifestyle and other tendencies that may make the worker vulnerable to certain actions while the situational characteristics are factors that include peer pressure, low motivation, risk taking, culture, group norms, worn out equipment, poorly designed machines, and many other factors that are capable of causing an unsafe working environment and unsafe behavior.[76] The Epidemiological theory asserts that a combination of the personal factors and the environmental factors work together to cause an outcome of unsafe practice. Epidemiological theory encourages safety practitioners to pay attention to both individual factors as well as environmental factors.

2.4.3 System theory

This theory states that accidents are the outcome of the interaction between machines, the environment and humans.[77] It differs from the domino theory as it states that accidents are not an outcome of a chain of events but rather of a complex type of casual connection.[78] This theory is similar to the socio-cognitive theory that considers personal environment and behaviors as acting together to cause an unsafe outcome.[79] The machine can be compared to the work environment which makes the two theories similar. The two theories imply that the degree of compliance with occupational health and safety reflect the extent to which the employee deal with machines and the environment following the law.

2.4.4 Human Factors theory and the psychological theory.

This theory asserts that the accidents are as a result of human error.[80] The three human factors which can lead to human errors are categorized as work overload, inappropriate activities and inappropriate response.[81] Overload is when the employee has to perform excessive tasks. This overload may be either be psychological or physically overwhelming work. An inappropriate

[76] Seth Oppong, *Health & Safety: Theory and Practice in the oil and gas sector* (VD Publishing House Ltd, 2011)

[77] John C Burnham, 'The syndrome of accident proneness (unfallneigung): Why Psychiatrists did not adopt and medicalize it (2008) History of Psychiatry < https://pubmed.ncbi.nlm.nih.gov/20617632/> accessed 10 June2022

[78] Seth Oppong, *Health & Safety: Theory and Practice in the oil and gas sector* (VD Publishing House Ltd, 2011)

[79] Ibid

[80] Ibid

[81] Ibid

activity occurs when a person handles a task for which they are not adequately trained to do.[82] This could be as a result of lack of supervised training and misjudgment of work place hazard. Inappropriate response occurs when a qualified person violates a procedure or fails to correct the problem when it identified.[83] This includes poor handling of hazards and ignoring safety measures.

2.5 Common occupational injuries, diseases and accidents in the oil and gas sector.

The oil and gas industry exposes workers to numerous hazards that are capable of causing catastrophic accidents. Some of the serious accidents that have occurred in the oil and gas sector include, the Piper Alpha disaster of 1988,[84] the Refinery explosion in Texas in 2005[85] and the explosion on the Deep Water Horizon in the Gulf of Mexico in 2010.[86] Some of the causes of incidents that can turn into accidents include leakages of hydro carbons, objects falling from higher grounds, explosions fires, blow outs and emissions of hydrogen sulphides.[87]

It has been reported by the Reinsurance Africa Ltd in Ghana that most dangerous accidents experienced by the workers in the oil and gas sector are explosions.[88] The other frequent injuries that are faced by the workers in the industry happen as a result of, falls, slips, burns and electrical shocks.[89] All these are enabled by the lack of health and safety infrastructure,

[82] Ibid
[83] Ibid
[84] Lord Cullen, 'The Alpha Piper Disaster '(Department of Energy UK, 1990 Vol2) <https://www.hse.gov.uk/offshore/piper-alpha-public-inquiry-volume2.pdf> accessed 15th February 2022

[85] Suxia Liu et al. 'The state of occupational health and safety Management frameworks (OSHMF) and injuries and accidents in Ghanaian Oil and Gas management: Assessing the safety knowledge. (2020) Biomedical Research International < https://www.hindawi.com/journals/bmri/2020/6354895/> accessed 20 May 2022

[86] Samantha B. Joy, 'Deep-water horizon, 5 years on (2015) 349/6248 < https://www.science.org/doi/full/10.1126/science.aab4133> access 25January 2022

[87] Suxia Liu et al. 'The state of occupational health and safety Management frameworks (OSHMF) and injuries and accidents in Ghanaian Oil and Gas management: Assessing the safety knowledge. (2020) Biomedical Research International < https://www.hindawi.com/journals/bmri/2020/6354895/> accessed 20 May 2022
[88] Ibid
[89] Ibid

inadequate funding for health and safety in the organization, lack of monitoring and lack of health and safety data for planning purposes.

According to the authors' research, most accidents occur as a result of human error[90] which is in tandem with the human factor theory of accidents described above. The authors assert that this can be cured by enhancing safety knowledge among employees which in turn improves safety performance in the oil and gas sector. Research by these researchers suggest that the most important reason why occupational accidents and work related injuries continue to grow can be attributed to lack of safety knowledge.

2.5. 1 Occupational injuries on oil rigs

Valentic et al, conducted research that shows that workers at oil rigs mostly suffered bruises, cuts, laceration, body chemical injury, bone fracture and amputation of the phalanges of the hand or fingers.[91] Their research indicated that the top three injuries that workers on the oil rigs suffered include lacerations, contusions and cuts.[92] They also categorized injuries according to the part of the body that was affected. These include the fingers, eyes and legs.[93] Their research further revealed that the least causes of injuries were electric shocks, contact with chemical hazards and vapors.[94] This is in contrast to the research conducted in Ghana shown above that indicated that electric shock was among the most frequent causes of injuries. This indicates that the injuries obtained by workers may largely depend on uniqueness of the operator/facility. This is the more reason these operators follow Meta-regulations because they allow for flexibility and customization of the risk assessment to the uniqueness of a given operator rather than following a one size prescriptive regulations or a one size fits all regulations.

The study that was conducted by *Valentic et al* also categorized occupational diseases at the oil platform and these included musculoskeletal conditions, digestive system diseases, nervous system disorders, urinary system diseases, circulatory system diseases, mental illnesses,

[90] Ibid
[91] Damir Valentic et al , 'Work related diseases and injuries ' (2005) International Maritime Health 56/4 < https://www.researchgate.net/publication/7245133_Work_related_diseases_and_injuries_on_an_oil_rig> accessed 21 May 2022

[92] Ibid
[93] Ibid
[94] Ibid

accidental poisoning, and respiratory conditions.[95] Their study found that the three most occurring diseases were respiratory conditions, digestive system diseases and musculoskeletal conditions**.**

Psychological wellbeing was also found to be a factor in the health of the workers on oil platforms.[96] This study found that more workers on offshore platforms experienced anxiety disorders that affected their psychological wellbeing than onshore workers. The study also found a correlation between the rate of occupational accidents and diseases in that organization. In order to avoid or mitigate the above mentioned these conditions, a good Health and Safety Management System should be in place.

Proper health and safety management requires proper record keeping and the use of safety manual.[97] Good record keeping provides reference to past conduct of the organization in in terms of maintaining or having lapses in health and safety in a particular organization. In this research health and safety programs were considered "excellent" if the organization had the resources to ensure health and safety and at the same time the workers were knowledgeable in using these resources.[98] It was rated just "good", if the resources were there but the workers weren't knowledgeable in safety practices. Health and safety practices were rated poor if there were no equipment for ensuring health and safety.[99] Proper health and safety programs should involve management commitment, company safety policy, training of employees including casual workers, internal auditing by the organization itself, emergency preparations, conducting drills, communication about safety, training in fire safety, hazard awareness, frequent inspections.[100] Some of the systems to be looked out for proper health and safety management include ; alarm systems, personal protective equipment, housekeeping, training

[95]Seth Oppong, 'Common health, safety and environmental concerns in Upstream oil and gas sector: implication for HSE management in Ghana' (2014) Sam Jonah School of Business < https://academicus.edu.al/nr9/Academicus-MMXIV-9-093-106.pdf> accessed 21 May 2022

[96] Ibid

[97] Osei –Wusu Achaw & Eric Danso Boateng, Safety practices in the oil and gas industries in Ghana (2012) International Journal of Development and sustainability ½ < https://isdsnet.com/ijds-v1n2-30.pdf> accessed 3 June 2022

[98]

ibid

[99] Ibid

[100] Ibid

of visitors, availability of assembly points in case of emergency, committed safety officers, fire control systems, equipment integrity and provision of clinical services.[101]

2.6 Environmental Meta-regulatory issues in the oil and gas sector.

2.6.1 Environmental impacts caused by oil and gas operations

According to Epstein and Selber, oil operations at the upstream stage lead to deforestation, and disruption of aquatic life, degradation of the environment, disruption of the habitat, destruction of livestock and causing oil spills.[102] One example of the oil spills caused by operations at the upstream stage is the Deep Water Horizon oil spill disaster in the Gulf of Mexico for which British Petroleum Company was held responsible.

In 1997, UNEP categorized environmental impacts caused by oil operations, under exploration, the impacts were found to be deforestation and disruption of aquatic ecosystem which can potentially lead to outbreak of infectious diseases.[103] Drilling and extraction was found to cause prolonged environmental degradation, livestock destruction, physical fouling and disruptive interference with the habitat.[104] These in turn lead to the ejection of hydrocarbons, mud water, increased deposits of radioactive material, deterioration of air quality, decrease in fisheries, soil contamination, noise pollution and migration of birds. [105] Transportation of oil and equipment was found to cause oil spills which in turn lead to contamination of ground water, destruction of vegetation, and destruction of aquatic life.[106] Combustion was found to

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[101] Ibid

[102] Paul R Epstein & Jesse Selber, 'A life cycle analysis of its health and environmental impacts (2002). The Center for Health & Global Environment <https://www.researchgate.net/publication/252108913_A_life_cycle_analysis_of_its_health_and_environmental_impacts> accessed 20 May 2022

[103] UNEP 'Environmental management in oil and gas exploration and production: an overview of issues and management approaches' (1997) Joint E&P forum < https://wedocs.unep.org/bitstream/handle/20.500.11822/8275/-Environmental%20Management%20in%20Oil%20%26%20Gas%20Exploration%20%26%20Production-19972123.pdf?sequence=2%26isAllowed=y> accessed 4 June 2022

[104] Ibid

[105] Seth Oppong, 'Common health, safety and environmental concerns in Upstream oil and gas sector: implication for HSE management in Ghana' (2014) Sam Jonah School of Business < https://academicus.edu.al/nr9/Academicus-MMXIV-9-093-106.pdf> accessed 21 May 2022

[106] Ibid

cause acid rain, air pollution and climate change which in turn lead to particulates, acidification of the soil global warming and extreme weather conditions.[107] UNEP also categorized environmental impacts caused by oil operations into human social and cultural impacts, atmospheric impacts, terrestrial impacts aquatic impacts and eco-system impacts.[108]

2.6.1.2 Human social and cultural impacts [109]

Operations involved in the oil exploration and production are bound to cause a change in economic activities, attraction of new dwellers from other areas and have an impact on the traditional way of life of the inhabitants of the project affected areas.[110] The oil operations will definitely change the land use pattern. The influx of people in the project affected areas is bound to cause a pattern in behavior change and lead to prostitution which will increase the prevalence of HIV/AIDS. The positives about the influx of people in these areas is the increase in economic activities and social activities.[111] For example, 2957 hectares of land were acquired by the Ugandan government in thirteen villages neighboring.[112] Another example is about the East African Crude Oil Pipeline which impacted over 4200 people along a stretch of over 295km.[113]

2.6.1.3 Atmospheric impacts [114]

The impacts of exploration and production activities are caused through activities such as venting, flaring and purging of gases, combustion from diesel engines used as sources of power, particulates from vehicle traffic and soil disturbance during construction and

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[107] UNEP 'Environmental management in oil and gas exploration and production: an overview of issues and management approaches' (1997) Joint E&P forum < https://wedocs.unep.org/bitstream/handle/20.500.11822/8275/-Environmental%20Management%20in%20Oil%20%26%20Gas%20Exploration%20%26%20Production-19972123.pdf?sequence=2%26isAllowed=y> accessed 4 June 2022

[108] Ibid

[109] Ibid

[110] Ibid

[111] Emmanuel B Kasimbazi, 'Environmental regulation of oil and gas exploration and production in Uganda (2015) Journal of Energy & Natural Resources < https://www.tandfonline.com/doi/abs/10.1080/02646811.2012.11435291> accessed 25 May 2022

[112] Tom Ogwang and others, 'Social Impact of Land Acquisition for Oil and Gas Development in Uganda' (2019) 8(7) Open Access Journal < www.openaccessjournal.com> accessed 7 May 2022

[113] ibid

[114] Seth Oppong, 'Common health, safety and environmental concerns in Upstream oil and gas sector: implication for HSE management in Ghana' (2014) Sam Jonah School of Business < https://academicus.edu.al/nr9/Academicus-MMXIV-9-093-106.pdf> accessed 21 May 2022

transportation of materials.[115] The combustion that occurs through running turbines and diesel engines adds to the mix of contributing factors to the atmospheric impacts.[116] These processes give off gases that include carbon dioxide, methane, carbon monoxide and other organic carbon gases all of which are agents of climate change.[117] More damage is done during production than during exploration because activities in the production phase are intense and produce more emissions. These impacts lead to depletion of the ozone layer held in the stratosphere. This in turn enables climate change and global warming.

2.6.1.4 Terrestrial impact [118]

The impacts on soil quality are normally as a result of physical disturbance of soil due to construction activities, oil spills and leaks into the ground, and irresponsible disposal of solid waste.[119] The deforestation that occurs due to clearing land and providing access to sites can lead to soil erosion that washes away top fertile soil. The soil may also be affected by surface hydrology and drainage patterns that form as a result of de-vegetation.

2.6.1.5 Aquatic impact[120]

Exploration and production gives off produced water, drilling fluids, cuttings, waste water including sewerage, well treatment fluids and drainage water which all find their way into the lakes and other water bodies in the affected area.[121] The volumes of these fluids depend on the stage of operation being conducted. Most of the effluents at exploration stage constitute drilling fluids and cuttings while at production stage, produced water from the biggest volume of effluent produced.[122] This contains elements like benzene, hydrocarbons and natural radioactive material.[123] Most impact is brought by the high PH and their salty nature.[124] These

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[115] UNEP 'Environmental management in oil and gas exploration and production: an overview of issues and management approaches' (1997) Joint E&P forum < https://wedocs.unep.org/bitstream/handle/20.500.11822/8275/-Environmental%20Management%20in%20Oil%20%26%20Gas%20Exploration%20%26%20Production-19972123.pdf?sequence=2%26isAllowed=y> accessed 4 June 2022

[116] Ibid

[117] Ibid

[118] UNEP 'Environmental management in oil and gas exploration and production: an overview of issues and management approaches' (1997) Joint E&P forum < https://wedocs.unep.org/bitstream/handle/20.500.11822/8275/-Environmental%20Management%20in%20Oil%20%26%20Gas%20Exploration%20%26%20Production-19972123.pdf?sequence=2%26isAllowed=y> accessed 4 June 2022

[119] Ibid

[120] Ibid

[121] Ibid

[122] Ibid

[123] Ibid

[124] Ibid

elements act as contaminating agents that penetrate even to ground water. It is important to note that the Albertine region is blessed with a number of water bodies including Lake Albert on whose shores the Kingfisher Project is located, Lake George, Lake Edward, Rivers Wambabya, Howa, Waki and part of the River Nile.[125] The oil activities therefore pose an environmental threat to the fresh water bodies in the Albertine Region. It is therefore vital that the oil and gas operators conduct thorough accurate Environmental impact assessments as is required of them by the law.

2.6.1.6 Eco-system impacts [126]

Apart from aquatic, terrestrial and the biosphere, the entire eco-system is affected by oil operations.[127] When the water is contaminated for example, water being a habitat of fish and other animal life will be affected. The plants and all other terrestrial animals will be affected by the activities such as clearing of bushes and shrubs.[128] This can lead to destruction of habitats and making various animal species vulnerable to predators. The interference with soil and ground water by the waste disposal affects soil nutrients on which different varieties of plants depend. In addition to these impacts, secondary impacts are bound to occur which secondary impacts from the influx of people leads to overfishing, fires and over hunting. All these activities affect the ecological setting leading to loss of flora and fauna and migration of birds.

2.7 Environmental and Social Assessment and Environmental degradation in the Albertine Region.

S.110 of The National Environment Act 2019, states that the purpose of conducting an Environmental and Social Assessment, is to evaluate the impact of the environmental and social impact, risks and any other anticipated occurrences that may come as a result of a particular project or activity in an area. The Act Under part X requires that the developer

[125] Emmanuel B Kasimbazi, 'Environmental regulation of oil and gas exploration and production in Uganda (2015) Journal of Energy & Natural Resources < https://www.tandfonline.com/doi/abs/10.1080/02646811.2012.11435291> accessed 25 May 2022

[126] UNEP 'Environmental management in oil and gas exploration and production: an overview of issues and management approaches' (1997) Joint E&P forum < https://wedocs.unep.org/bitstream/handle/20.500.11822/8275/-Environmental%20Management%20in%20Oil%20%26%20Gas%20Exploration%20%26%20Production-19972123.pdf?sequence=2%26isAllowed=y> accessed 4 June 2022

[127] Ibid

[128] Emmanuel B Kasimbazi, 'Environmental regulation of oil and gas exploration and production in Uganda (2015) Journal of Energy & Natural Resources < https://www.tandfonline.com/doi/abs/10.1080/02646811.2012.11435291> accessed 25 May 2022

submits the Environmental and Social Assessment to the Authority. Petroleum operations are included under schedule 5 of the Act, among activities for which it is mandatory to conduct an Environmental and Social Assessment before commencement of the same. The National Environment (Environmental and Social Assessment) Regulations 2020 lay out the procedures for conducting an Environmental and Social Assessment. According to Kasimbazi, an Environmental and Social assessment by an operator in the oil and gas sector must identify all the possible environmental and social impacts and come with management and control measures to mitigate them.[129] CNOOC under Kingfisher Project and Total under the Tilenga Project have submitted their Environmental and Social Assessment to the Authority[130] however there is environmental degradation in the Albertine Region caused by oil and gas operations according to recent research. The Albertine region has already experienced environmental impacts as per the study findings of a study that was conducted recently in 2019 region[131]. This study showed that the rid buck and other animal species have vacated their natural habitat because of the blasting of rocks[132]. Most The most affected parts were Waraga and Mpuuta sites[133]. Another study that was conducted in the Albertine region indicated that noise pollution has adverse effects on the heart, increases stress due to anger and deprives students of reading time[134].

The study findings further revealed that water bodies were polluted due to due to the mismanagement of waste from the exploration activities[135]. The same study revealed that air quality in areas near exploration sites deteriorated due to emission and dust from vehicle

[129] Ibid
[130] Petroleum Authority of Uganda. 'Environmental and Social Impact Assessment for the CNOOC Uganda Ltd, Kingfisher Oil Development, Uganda' (pau.go.ug) https://www.pau.go.ug/download/environmental-and-social-impact-assessment-for-the-cnooc-uganda-ltd-kingfisher-oil-development-uganda-5/ accessed 09 June 2022.
[131] Patrick Byakagaba, Frank Mugagga, Diana Nnakayima, 'The social –economic environment implication of oil and gas exploration: Perspectives at the micro level in the Albertine region of Uganda' (2019) Elsevier <http://elsevier.com> accessed 11 July 2021.

[132] Ibid.
[133] Ibid.
[134] W Passchier-Vermeer , W.F Passchier , 'Noise exposure and public health'(2000). Environ Health Prospect <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1637786/> accessed 05 June 2022.

[135] Patrick Byakagaba, Frank Mugagga, Diana Nnakayima, 'The social –economic environment implication of oil and gas exploration: Perspectives at the micro level in the Albertine region of Uganda' (2019) Elsevier <http://elsevier.com> accessed 07 June 2022

traffic[136]. This shows that the impact from these operations not only comes from primary sources but also secondary source such as vehicle traffic. The level of contamination of ground water and the hydro chemical evolution and contamination of ground water in the Albertine region was recently investigated[137]**.** The study findings revealed the prescence of heavy metals in the ground water that were attributed to the petroleum activities[138].The research attributed the heavy metals to drill cuttings which are products of petroleum exploration [139]. The summary of the research above shows the environmental impacts in the Albertine Region[140]. The summary of the research above shows that shows that the environmental impacts in the Albertine Region have not only affected air quality but also ground water. The impacts that are already been experienced in the Albertine region as shown above, indicate that an analysis of the role meta-regulations in the environmental regulatory framework is required.

2.8 Previous studies

Although some previous studies have been conducted regarding the regulation of environment and health and safety in the oil and gas sector in Uganda, none of them of was dealing with Meta regulations. For example the research that was conducted by Kaweesi in 2014 was about environmental compliance and its implications for oil and gas exploration. This later study used the document analysis method to investigate the compliance with environmental law in the oil and gas sector but had nothing to do with Meta-regulation. The other research was conducted by Kasimbazi in 2012 and was about Environmental regulation of oil and gas exploration and production in Uganda. The researcher never made mention of meta-regulation. The previous research created a research gap that this study sought to fill.

[136] Ibid.

[137] Brian Emmanuel Guma, Andrew Muwanga, Micheal Owor 'Hydrogeochemical evolution and contamination of ground water in the Albertine Graben, Uganda.' (2021). Environmental Earth Sciences < https://doi.org/10.1007/s12665-021-09587-6> accesed 12 June 2022.

[138] Ibid.
[139] Ibid.
[140] Ibid.

2.9 Conclusion

This literature review considered literature that is relevant to the subject of Meta-regulation of health and safety and environmental safety in the oil and gas sector. The definition of Meta-regulation was considered vital because the concept of Meta-regulation is relatively a new one in Uganda. Important aspects of Health and safety such as risk, hazard, and risk assessment, standard of risk assessment have been considered. The theories of accident causation are central to the Meta-regulation of Health and Safety and have therefore been considered. The common occupational diseases and injuries to workers in the oil and gas sector have been included to guide the research since the ultimate aim of health and safety is to avoid or mitigate such effects. The Environmental social impact assessment and the environmental impacts caused by operations in the oil and gas have also been dealt with. The state of environmental degradation in the Albertine region caused by the oil and gas operations has been explored. The next chapter will lay out the methodology that was relied upon to conduct this study. Although some research has been conducted regarding the regulation of the environmental and health and safety in the oil and gas sector the researcher found non that was focused on Meta-regulation thereby creating a research gap that this research south to fill.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter presents the methodology, the research design, data collection methods, tools, ethical considerations, and limitations of the study. The researcher used the doctrinal and, comparative research methodologies. Each of the said methodologies is designed to obtain information on particular aspects of the research questions to enable the researcher come up with comprehensive findings.

3.1 Doctrinal research design

The doctrinal legal research methodology entails critical and systematic analysis of legal propositions and making rational conclusions.[141] In other words, doctrinal legal research involves logical reasoning on legal positions for conclusions to be reached.[142] The said research method is helpful in revealing the gaps in the law.[143] Doctrinal research is established as the traditional method of research in the legal field.[144] It deals with the study of existing laws, related cases, and authoritative materials analytically on some specific matter.[145] The specific matter that was under study is meta-regulations in the health, safety and the environmental safety in the oil and gas sector. Doctrinal research normally involves two major parts which are locating the sources of the law and interpretation and analysis of the text.[146] The

[141] S.N.Jain, *Doctrinal and Non-Doctrinal legal Research,* in Legal Research and Methodology, Indian Law Institute, India, 68 (S.K. Verma & M. Afzal Wani eds., 2006)

[142] Richard Omerod, 'Rational inference: Deductive, inductive and probabilistic thinking', Journal of the Operational Research Society 61 (8)1207-1223 (August, 2020) www.jstor.org accessed on 27th January, 2022

[143] Vijay M Gawas, 'Doctrinal Legal research method a guiding principle in reforming the law and legal system towards research development', International Journal of Law, (September, 2017) www.lawjournals.org accessed on 5th February, 2022

[144] Ian Dobinson & Francis Johns, *Qualitative Legal Research*, in RESEARCH METHODS FOR LAW, EdinburghUniversity Press, Edinburgh, 18-19 (Michael McConville & Wing Hong Chui eds., 2007).

[145] Khushal Vibhute & Filipos Aynalem, legal research methods, *Teaching Material*, Justice and Legal System Research Institute, Ethiopia, 70 (2009).

[146] Kharel A, ' Doctrinal Research' SSRN Electronic Journal (January, 2018) www.researchgate.net accessed on 26th January, 2022

researcher's first duty was to identify and locate the meta-regulations regarding health, safety and environmental safety and secondly interpret and then analyse the text of these regulations. The said methodology helped the researcher in attempting to establish the loopholes in the role the meta-regulatory framework plays in guaranteeing environmental safety and the health of employees in the oil and gas sector in Uganda. In this attempt, as already mentioned above, the researcher also used the comparative legal research methodology.

3.2 Comparative legal research method

According to Eberle, comparative research methodology involves the comparison "of the law of one country with that of another."[147] The data consists of particular provisions in the law. The comparison involves the assessment of the similarities and differences in the data from the two legal systems with the ultimate aim of understanding the range of similarities or differences in the said data.[148] The aim of the comparison is to help the researcher to answer the question, "what do the divergence or similarities reveal?"[149] For the purpose of the study a comparison of the Meta-regulation provisions that provide for the safeguard of the environment and the health and safety of employees in Uganda's oil and gas sector was compared with the provisions for the said safeguards in two selected countries, that is, Norway, and Kenya to establish whether the said comparison reveals any gap in Uganda's Meta-regulatory framework. Norway was considered because it is one of the popular success stories that grew from a poor country to an oil and gas global power house.[150] Kenya's Meta-regulatory framework for environmental safety and the health of employees in its OGI was considered because the said country lies in the same region with Uganda and has been exporting oil since 2019[151] with a view to establish whether there are any lessons to learn from the said framework.

[147] Edward J Eberle, 'The Methodology of Comparative Law', Roger Williams University Law Review, Volume 16 (2011) www.semanticscholar.org accessed on 3rd February, 2022
[148] Ibid
[149] Ibid
[150] Otaha J Imo, 'Dutch Disease and Nigerian oil Economy' (2010) 6(1) African Research Review < www.afrievjo.net> accessed 6 February 2022

[151] AFP. 'Kenya ships first-ever export of crude oil', Business Standard, August 26, 2019, www.businessstandard.com accessed on 16th January, 2022

3.3 Unit of Analysis, sample and wider population

3.31 Wider Population

The wider population are the laws regulating health and safety and those regulating the environment in the oil and gas industry. The wider population for best practice was all countries that have been successful in the oil and gas business.

3.32 Sample

The Sample are regulations under the Upstream & Midstream Acts and the Regulations under the National Environment Act 2019. The sample for best practice jurisdictions is the United Kingdom, Norway and Kenya.

3.33 Unit of Analysis

The Unit of Analysis were the Meta-regulations found within the Laws regulating health and safety and the environment.

3.4 Data collection methods

The researcher used both primary and secondary sources of data collection. This entailed reviewing legislation that contains the Meta-regulations regarding environmental safety and the health and safety of employees in the oil and gas industry in Uganda's oil and gas industry, law text books, law journals and case law in other jurisdictions.

3.5 Data collection tools

To conduct a doctrinal research, the researcher systematically based on the wide range of data deposited in the library in the form acts of parliament, regulations, law text books, journal texts, which are relevant to Meta-regulatory frame of environmental safety and health and safety of the employees working in the oil and gas industry. Journal Databases including Ebscohost, Emerald, Jstor and Google scholar were used. Website of regulators in mature jurisdictions were also used.

3.6 Ethical considerations

The objective of ethics in this research was to ensure that all the literature that was reviewed was presented with proper reference to authors of the literature.

3.7 Limitations of the study

There was limited availability of relevant published work on the research problem. Access to reputable journals online was also limited. Access to the said journals was subject subscription.

In order to mitigate these changes the researcher made use of other University Libraries whose wifi allowed access to some of the commercial journals. The researcher also subscribed to some reputable online journals,

3.8 Conclusion

The doctrinal method was used in analysing the Meta-regulatory framework for environmental safety and the health and safety of people working in oil and gas operation industry in Uganda. On the other hand, the comparative legal research methodology was used to aid the researcher establish whether the comparison of the legal provisions in respect of safeguards of the environment and health and safety of worker in the oil and gas sector in Uganda.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION OF FINDINGS

4.0 Introduction

This chapter presents the data analysis and the discussion. Although the regulations for health and safety and the environment in the oil and gas sector contain both Prescriptive and Meta-regulations, this research was only focused on Meta-regulations contained in these regulations. For the health and safety part, Legal Analysis was done on the Meta-regulations found in the Petroleum (Exploration, Development and Production) (Health, Safety and Environment) Regulations[152] and the Petroleum (Refining, Conversion, Transmission and Midstream Storage) (Health, Safety and Environment) Regulations[153] which are derived from the Petroleum (Exploration. Development and Production) Act[154] and the Petroleum (Refining, Conversion, Transmission and Midstream Storage) Act[155] respectively. The Legal Analysis for the environmental safety regulation was focused on the Meta-regulations in The National Environment (Environmental and Social Assessment) Regulations[156] which also contains both Meta-regulations and prescriptive regulation although only the former comprised the subject of focus. These regulations are derived from the National Environment Act.[157] For the best practice of Meta-regulations of Health and Safety and Environmental Safety in the oil and gas sector the Norwegian Regulations relating to health safety and the Environment in the Petroleum activities and at certain onshore facilities (The Framework Regulations) 2019 as Amended were used for Norway while The Kenyan Occupational Safety and Health (oil and gas) Regulations[158] were used for Kenya.

For convenience of reference, t*he Petroleum (Exploration, Development and Production) (Health, Safety and Environment) Regulations[159] and the Petroleum (Refining, Conversion, Transmission* and *Midstream Storage) (Health, Safety and Environment) Regulations[160]* were referred to as the Upstream Regulations and Midstream Regulations respectively. These

[152] 2016 Upstream Regulations
[153] 2016 Midstream Regulations
[154] 2013 Upstream Act
[155] 2013 Midstream Act
[156] 2020 Environmental and Social Impact Assessment Regulations
[157] National Environment Act 2019
[158] 2021 Norwegian oil and gas Health and Safety and Environment Regulations
[159] 2016 Upstream Regulations
[160] 2016 Midstream Regulations

regulations were dealt with concurrently because they are similar in content and have corresponding numbering. The *National Environment (Environmental and Social Assessment) Regulations*[161] were referred to as the ESA Regulations. For convenience of reference the Norwegian and Kenyan Meta-regulations given above were referred to as the Norwegian and Kenyan regulations respectively. The term "Licensee" shall be used interchangeably with the term "Operator". The order of data analysis followed the research questions that were posed in the introductory chapter together with research objectives.

4.1 How effective are the meta-regulations in the health and safety and environmental regulatory framework in the oil and gas sector in Uganda? (*Identification and analysis of the meta-regulations in the health and safety regulatory framework in Uganda's Oil and Gas sector*.)

4.1.2 General duties of a License.

Reg.4 (a) of both the Upstream and the Midstream regulations, states the responsibilities of the licensee to include the prevention of incidents, hazards and accidents and their consequences from affecting health and the environment.[162] This is a Meta-regulation because it does not define how the Licensee is supposed to fulfil this obligation. The law therefore in this case gives the Licensee the discretion to devise methods that are customized to the specific operation taking into consideration its nature and procedures involved. The criticism with this particular regulation is the failure for the regulation to define what a "*hazard*" is in the interpretation section. The interpretation defines "hazard operability", "hazard material" and hazard identification but falls short of defining what a hazard is and yet understanding what a hazard is very vital in the health and safety sector. Given that this is a Meta-regulation, the legal requirements are general. But even when this is the case, some vital terms such as Hazard that stand at the center stage of health and safety need to be defined to provide guidance to the

[161] 2020 Environmental and Social Impact Regulations
[162] The Petroleum (Exploration, Development and Production) (Health, Safety and Environment) Regulations 2016; The Petroleum (Refining, Conversion, Transmission and Midstream Storage) (Health, Safety and Environment) Regulations 2016

Licensee. HSE UK defines hazard as anything that has the potential to cause danger or adverse effects.[163] The use of meta-regulations implies that the regulator must possess the competence and knowledge of the safety cases in order to ensure compliance by the regulatee which may not be the case.[164] Ill-informed operators may fail to form appropriate rules[165] and in this case they would fail to form an appropriate safety cases or safety documents for that matter**.** If the regulations are vague, there may be confusion as to what is required of the regulatee**.**[166]

Reg.4 (b) of both the Upstream and Midstream regulations requires the Licensee to take necessary measures to prevent the number of accidents that will lead to loss of time for work, disability or fatality.[167] This also qualifies as a Meta-regulation because it instructs the Licensee to take measures to prevent, leaving it up to them to decide how that will be achieved. This is good because different operators may find themselves in dissimilar circumstances and this affects how they deal with challenges. For example CNOOC and Total may meet different health and safety challenges given that the circumstances surrounding them are different. The Regulator therefore should not give a uniform one size fits all regulation for the Operators to implement. The criticism on this regulation is that the prevention should not be limited to those injuries or accidents that are likely to result in loss of time for work or disability or fatality. There are injuries that workers may get that may not necessarily result in any of the three results (*lead to loss of work time, disability or fatality*) but are a source of ill health or injuries to the workers such as cuts, bruises and lacerations as pointed out in the study of Valentic et al, in chapter 2**.**[168]

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[163] Health and Safety Executive 'Management of Risks and risk assessment at work' (Health and Safety Executive) < https://www.hse.gov.uk/simple-health-safety/risk/index.htm> accessed 20 November 2021

[164] Bjornar Raaen 'A comparative study of the legislative risk regulation of Norwegian Petroleum and Coal Mining Industry and Russian Coal Mining Industry' (Master's Thesis, University of Stavanger 2018)

[165] Robert Baldwin, Martin Cave and Martin Lodge, *Understanding Regulation: Theory Strategy and Practice* (2nd edn, Oxford University Press 2012)

[166] Bjornar Raaen 'A comparative study of the legislative risk regulation of Norwegian Petroleum and Coal Mining Industry and Russian Coal Mining Industry' (Master's Thesis, University of Stavanger 2018)

[167]The Petroleum (Exploration, Development and Production) (Health, Safety and Environment) Regulations 2016, The Petroleum (Refining, Conversion, Transmission and Midstream Storage) (Health, Safety and Environment) Regulations 2016

[168] Damir Valentic, 'Work related diseases and injuries ' (2005) International Maritime Health 56/4 < https://www.researchgate.net/publication/7245133_Work_related_diseases_and_injuries_on_an_oil_rig> accessed 21 May 2022

Reg. 4 (e) of both Upstream and Midstream regulations demands that the level of health and safety should at all times be in tandem with technological development.[169] This is a positive Meta-regulation and forms part of one of the most important advantages of using Meta-regulations. The Prescriptive regulations normally require that the Regulator follows particular specific procedures or products which may become obsolete with time because of failure to match the current technology. However with Meta-regulations, the Operator will formulate procedures that will match the latest technology.

4.1.3 Risk management and safety concept

Reg.8 (1-5) of both the Upstream and Midstream regulations require that operators plan and use risk assessment concerning health, process safety and the environment.[170] This is a good Meta-regulation because it requires the operator to devise their own ways of assessing health and safety risk. Risk assessment is at the center stage of health and safety because without assessing the risk whatever mitigation measures that may be put, may not match the likely incidents or accidents.

Reg 9 of both the Upstream and Midstream regulations demands that the risk assessments are done using qualitative, semi qualitative and quantitative methodologies.[171] This is positive Meta-regulation because it guides the Licensee to consider both qualitative and quantitative methodologies while conducting health and safety risk assessment. The criticism on this regulation is the failure to define what is meant by quantitative or qualitative or semi qualitative risk assessment in the interpretation part of the regulations. These two important concepts have been dealt with in chapter 2. In this Chapter, qualitative risk assessment was described as subjective and intended at identifying the risk, likelihood of their occurrence and the impact that they will have on people to facilitate decision making on whether the existing measures are satisfactory in preventing harm and whether there is need to upgrade them.[172] Quantitative risk assessment has been described in Chapter 2, as being objective and relies on verifiable data to determine the effects of risks in terms of costs and schedules delays by assigning those

[169] The Petroleum (Exploration, Development and Production) (Health, Safety and Environment) Regulations 2016; The Petroleum (Refining, Conversion, Transmission and Midstream Storage) (Health, Safety and Environment) Regulations 2016
[170] Ibid
[171] Ibid
[172] Health and Safety Executive 'Management of Risks and risk assessment at work' (Health and Safety Executive) < https://www.hse.gov.uk/simple-health-safety/risk/index.htm> accessed 20 November 2021

variables to evaluate the existing measures of mitigation of the harm.[173] Such guidance should have been given in the interpretation section to avoid the assumption that every regulatee will derive such understanding of these words. Otherwise the result by the regulatee may not be what was intended by the regulator.

4.1.4 Risk mitigation standard

Reg11 of both the Upstream and Midstream regulations states the standard of risk reduction to be "as far as is practically feasible". This is similar to the standard of risk mitigation used in the UK. The standard in the UK is "as far as is reasonably practicable". This involves weighing the risk against the costs of risk reduction, such that if the costs of risk reduction is hugely disproportionate compared to the harm the risk may cause. In making the decision about whether ALARP has been met, the duty holder must have good understanding of what is meant by reasonable practicable. In the case of *Edwards V National Coal Board, [1949] 1 ALL ER 743,* Court of Appeal in UK held that the term "reasonably practicable" is a narrower term than "physically possible". Court went ahead to state that a computation must be made in which the quantum of risk is placed on one scale on one side and the sacrifice it takes to mitigate it on the other side. Court further stated that if from the scale, it is shown that there is a gross disproportion between the risk and the sacrifice such that the risk is insignificant compared to the sacrifice, then the defendant discharges the onus on them. This means that ALARP is about weighing the risk against the sacrifice required to avert it.

Reg13 of the Upstream and Midstream regulations requires that a Licensee formulates an accident prevention policy that should take into consideration measures that ensure a high level of protection of human health, consider major accident hazards and set out the Licensees' overall aims and principles.[174] This is a positive Meta -regulation that gives the Licensee the discretion to set their own policy following parameters within which different contextual situations of Licensees can fit. The criticism of this regulation is the fact that there is no requirement for submission of this policy document to the Regulator. Although Meta-regulations are meant to avoid micro management, they work better if there is a legal requirement for submission of such health and safety documents to the Regulator.

[173] Ibid

[174]The Petroleum (Exploration, Development and Production) (Health, Safety and Environment) Regulations 2016; The Petroleum (Refining, Conversion, Transmission and Midstream Storage) (Health, Safety and Environment) Regulations 2016

4.1.5 Safety Concept/Safety Document

Reg14 of both Upstream and Midstream Regulations deal with Safety Concept and Safety Document respectively.[175] These terms mean the same although they may be referred to using different wording. In United Kingdom where the concept originated, it is referred to as Safety Cases. This concept was born out of devising a long lasting remedy that would prevent the occurrence of a tragedy similar to the Piper Alpha disaster in 1988.[176] When 167 lives were lost due to explosion that happened on the Piper Alpha disaster, a prominent Judge then known by the name Lord Cullen, was appointed to head a Public Inquiry that was supposed to determine the cause of the explosion and also make recommendations for measures including legislative remedies that should be setup to avoid the re-occurrence of the Piper Alpha disaster.[177] One of the remedies that was proposed by Lord Cullen's Commission was the use of Meta-Regulations to ensure Health and safety sector in the Petroleum sector. At the center of the Meta-regulation is the Safety Case which was popularized by the Commission of inquiry that was headed by Lord Cullen after the Alpha Piper disaster.[178] The term Safety Case or Safety Document or Safety Concept does not have a definite definition but it has been described as a document made by the Operator/Licensee, making the argument that a system or installation is safe by the way it was constructed and by its manner of operation .[179] Lord Cullen' Commission of inquiry on the Piper Alpha disaster describes a safety case as a document that is made by the operator containing compelling evidence that objectives of health and safety have been addressed.[180] Lord Cullen's Commission recommended that a safety case should contain information that demonstrates that hazards and risks have been identified, that safety management systems is in place and that the workers have a place of refuge to run to in case of an emergency .[181] The Safety Case must put forward a compelling argument that the

[175] Ibid
[176] Lord Cullen, 'The Alpha Piper Disaster '(Department of Energy UK, 1990 Vol1) <https://www.hse.gov.uk/offshore/piper-alpha-public-inquiry-volume1.pdf > accessed 15th June 2022
[177] Ibid
[178] Ibid
[179] Greg Gordon and others, Oil and Gas Law: Current Practice and Emerging Trends (2nd edition, Dundee University Press 2011)

[180] Lord Cullen, 'The Alpha Piper Disaster '(Department of Energy UK, 1990 Vol1) <https://www.hse.gov.uk/offshore/piper-alpha-public-inquiry-volume1.pdf > accessed 15th June 2022

[181] Lord Cullen, 'The Alpha Piper Disaster '(Department of Energy UK, 1990 Vol2) <https://www.hse.gov.uk/offshore/piper-alpha-public-inquiry-volume2.pdf> accessed 15th June 2022

work place is safe to operate.[182] Its content must demonstrate that the ultimate responsibility of ensuring health and safety lies with the operator and that the regulator only plays a supervisory role.[183] Although Ugandan regulations refer to the Safety Case as Safety Concept and Safety Document for the Upstream and Midstream regulations,[184] respectively, they all carry the same meaning and serve the same purpose in health and safety regulation. The Public interest theory posits that the regulator intervenes in public affairs to cure imperfection referred to as market failures.[185] This is line with the economic welfare principle, which posits that the regulator intervenes in health and safety regulation because the workers are vulnerable and their health and safety is at stake in the hands of operators some of whom careless.[186]

The market failure rationale comes into play when the operator fails to provide enough information to the public or its workers to safe guard them from harm or injury.[187] The concept of Safety Cases therefor is one way of compelling the Operator to provide information that is vital in safety of operations in the interest of workers who constitute the Public. According to the market failure rationale, the regulator should intervene whenever there is unequal bargaining power between two parties where one powerful and the other is weak.[188] This was practically observed when Meta-regulations formed part of the remedy after the Piper Alpha disaster in form of the Safety Cases in order to secure the health and safety of workers. .

The criticism of **Reg. 14** is that it does not include a place where people can run to as refuge in case of an emergency which is a deviation from the recommendations of Lord Cullen's Commission. The other criticism of **Reg.14** of both the Upstream and Midstream regulations

[182] Tim Kelly 'A systematic approach to safety case management ' (2004) 113 Journal of Passenger Cars: Electronic and Electrical Systems < https://www.jstor.org/stable/44699541> accessed 15 June 2022

[183] Ibid

[184] The Petroleum (Exploration, Development and Production) (Health, Safety and Environment) Regulations 2016; The Petroleum (Refining, Conversion, Transmission and Midstream Storage) (Health, Safety and Environment) Regulations 2016

[185] Bronwen Morgan and Karen Yeung, *An introduction to Law and Regulation: Text and Materials* (Cambridge University Press 2007)

[186] Robert Baldwin, Martin Cave and Martin Lodge, *Understanding Regulation: Theory Strategy and Practice* (2nd edn, Oxford University Press 2012)

[187] Ibid

[188] Ibid

is failure to include a safety system that will cater for both the installation and organization /company rather only catering for the installation. It should have been mentioned that the safety management system of the installation should be compiled following International quality assurance standards. This should have provided important guidance to the Licensee before designing the safety management system. While dealing with Meta-Regulation, the Licensee is given a lot of discretion which may be abused by instituting substandard self-regulations which may turn out to be detrimental for health and safety especially in the delicate sector of oil and gas.

Reg15 of the Upstream and Midstream regulations is a positive Meta-Regulation because it highlights the need for review and revision of the Safety Concept where necessary every five years.[189] It also states that need for reasons that may be relied upon for review and these include where a major accident or incident has happened, where new technology is brought on board and where there is new knowledge in the way of identifying new hazards.

Reg19 of the Upstream and Midstream regulations requires that the Licensee takes measures to protect the community where it is located.[190] The criticism with this Meta-regulation is that it fails to give guidance of the radius within which the protection should be afforded. There is a risk that the Safety Concept/Safety Document may include such measures to protect the community and they their target without mention it may only be the immediate neighborhood leaving out those that are far but can potently be affected by an incident or accident in case of a catastrophe at the facility. Accordingly, the regulation should have provided guidance on how wide the protection should to be more effective. The characteristic of Meta-regulation then would have come out in leaving it to the Licensee to determine how such protection can be achieved.

4.1.6 Enforcement

Reg165 of the Upstream regulations and **Reg. 164** of the Midstream regulations requires that the Authority makes inspection or puts up other control measures to examine the systems in place to determine whether the Licensee complies with the regulations. **Reg 172** of the Upstream regulations and **Reg.168** of the Midstream regulations provides for offences and

[189] The Petroleum (Exploration, Development and Production) (Health, Safety and Environment) Regulations 2016; The Petroleum (Refining, Conversion, Transmission and Midstream Storage) (Health, Safety and Environment) Regulations 2016
[190] Ibid

punishment to the offenders.[191] It provides that any person that fails to comply with these regulations commits an offence and is liable on conviction to a fine not exceeding 5000 currency points or imprisonment for 10 years for the Upstream regulations. While a similar offender under the Midstream regulations would be liable to the payment of fine not exceeding 2000 currency points without an alternative of imprisonment. A currency point is equal to UGX 20,000/= which implies that 5000 currency points is equivalent to UGX 100,000,000/=. The criticism with this regulation is the punishment of payment of 5000 currency point is so light and very affordable by most International Oil Companies. Such a punishment can lead the Licensees into complacency because after all the consequences of contravening the law if considered financially is negligible. The fine under the Midstream regulations is even worse without as it is not exceeding 2000 currency points which translates into a paltry UGX 40,000,000/= which is negligible given the financial muscle of Licensees. The use of Meta-Regulations does not imply that the regulator should not push violation of the regulations. According to Ayre and Braithwaite, once the chance to self-regulate through Meta-regulations is abused, the regulator should crack the whip.[192] However if the whip is too weak like is the case in terms of the financial penalties, the operator will end up violating the regulations.

[191] Ibid
[192] Ian Ayre and John Braithwaite, *Responsive Regulation: Transcending the regulation debate* (Oxford University Press 1992)

4.1.7 Analysis of the meta-regulations in the National Environmental (Environmental and Social Assessment Regulations 2020).

This section is concerned with the analysis of Meta-Regulations in the Environmental Regulatory Framework in the Oil and Gas sector in Uganda. In this section the National Environment (Environmental and Social Assessment) Regulations 2020 will be referred to as the ESA regulations.

4.1.7.1 Environmental and Social Assessment

The regulations define environmental and social impact assessment as a systematic and analytical examination of the impact that is likely to be caused by a projects interference with the environmental and social set-up of a place.[193] By this process the person I charge of the assessment is expected to come up with mitigation to match the likely impacts.

Reg15 of the ESA Regulations is a Meta-Regulation because it gives the Licensee the autonomy to conduct an Environmental and Social Impact Study which is either approved or rejected by the Authority working with the lead Agency.[194] The terms of reference for conducting the Environmental and Social Assessment are also done by the Licensee and approved under **Reg 14** of the ESA Regulations.[195] This regulation is strong because it requires that the Licensee includes direct, indirect, cumulative and induced impacts on the environment, social-economic, and climate change impacts. The regulation also requires that the Licensee proposes measures for avoidance, minimization, mitigation and possible offset measures for the anticipated impacts. The only criticism of this regulation is failure to state that this should be a periodic exercise to counter the changing environmental and social economic conditions. It is possible to identify possible impacts and matching mitigation measures and a mismatch happens later because of changing conditions some of which may happen naturally through natural disasters such as storms, floods, wild fires or earthquakes. One of the advantages of Meta-Regulations is the flexibility that comes with the Licensee being able to review the self-made regulations to match new technology or emerging issues.

[193] [193]The National Environment (Environmental and Social Assessment) Regulations 2020
[194]Ibid
[195] Ibid

Reg34 This regulation requires that the operator identifies hazards relating to pollution, climate change, threats to biodiversity conservation. Social risk relating to threats vulnerable people, land use patterns, access to land, food security, cultural heritage and human rights relating to the environment and the ecosystem. This a strong Meta-regulation, it complements risk analysis. It is impossible to conduct risk analysis without identifying hazards from because it is from the hazard that one gauges the likely hood of harm and its impact. The criticism with this regulation is that the failure to provide guidance on what a hazard is in the interpretation part.

4.1.7.2 Risk Assessment

Reg 32 of the ESA regulations demands that a developer /Licensee conducts risk assessment but cautions that lack of scientific knowledge at the time of conducting the risk assessment should not render the risk nonexistent.[196] Under **Reg.39** requires that the Risk Assessment Statement is submitted to the Authority which is the National Environmental Authority (NEMA). In Meta-regulation, the regulator is supposed to either approve or reject the risk assessment that is submitted to them by the regulatee. This is a strong Meta–Regulation because it encompasses the environmental precautionary principle. The criticism for this regulation, is its failure to guide on whether both qualitative and quantitative risk assessment should be done. The regulation also falls short of giving guidance on the standard or risk assessment that should be followed. Although the under **Reg38** of the ESA, the environmental risk assessment should be done periodically, the regulations fail to stipulate how often the risk assessment should be done. This failure to state when the risk assessment is supposed to be repeated may cause the Operators to omit to do it which lead to adverse unexpected effects to the environment.

Reg34-37 of the ESA regulations requires the developer/Licensee to carry out hazard identification and risk analysis that relate to use of natural resources, pollution, social risks, land accessibility, impacts on vulnerable groups, and impacts on human security due to conflicts, food security, culture and natural heritage.[197] This is a strong Meta-Regulation because it lets the Developer /Licensee do both the environmental and Hazard identification on their own. This enables the Licensee to formulate customized measures of dealing with the identified hazards so as to avoid or mitigate social and environmental hazards and risks. The

[196] The National Environment (Environmental and Social Assessment) Regulations 2020
[197] Ibid

criticism with these regulations is that important terms such as hazard are not defined under the interpretation regulation. The other criticism is that the regulations are repetitive in content thereby creating monotony and confusion. For example much as risk assessment is dealt with under **Reg32**, it is also repeated under **regulation 34**.

Reg35 of the ESA requires the regulator to conduct vulnerability analysis. This analysis is supposed to cover the state of the environment, persons and communities that are vulnerable to the risks and hazards identified along with the potential impact they are likely to suffer. This is a good Meta-regulation but it fails to give guidance on the factors that the operator is supposed to consider while determining vulnerability.

4.1.7.3 Mitigation hierarchy

Reg43 demands that a developer or a Licensee for this matter, should come up a mitigation hierarchy of avoidance, minimization and mitigation of social and environmental impacts.[198] This Meta-Regulation also allows the Licensee to propose to the Authority, measures of biodiversity offset as last resort measures in the mitigation hierarchy. This is a good Meta-regulation because it lets the Licensee to determine pending approval the mitigation measures. Since the Licensee understands their operations better, it is ideal for them to determine the mitigation hierarchy of their likely impacts.

4.1.7.3. (a) Description of the Mitigation Hierarchy

Mitigation hierarchy is a process by which analytical decisions are made geared towards reducing negative adverse impacts during implementation of a project that may adversely affect the environment and biodiversity. It involves the making of decisions after thorough analysis of the impacts that are likely to be caused by the Operations of the project.[199] The mitigation measures above are supposed to strike a balance between biodiversity conservation and development.[200]

4.1.7..3 (b) Avoidance: At this stage the developer is supposed to ask themselves whether the impact of the project on the environment won't be so adverse so much so that the best option

[198] The National Environment (Environmental and Social Assessment) Regulations 2020

[199] Common Wealth of Northern Maria Island , 2018 Guidance on Using the Mitigation Hierarchy to avoid impacts of Projects and Activities

[200] Combo, Training modules for applying the mitigation Hierarchy; Planning Policy and Policy for net Less or net gain Biodiversity 2017

would be to abandon the project or choose another location. Some of the example of such action would the avoidance of building a road right through a habitat but instead relocate it.[201]

4.1.7.3 (c) Minimization: This involves reducing the effect of impacts if the project cannot avoid some of the adverse impacts. Examples include.**[202]** Examples include reduction of noise, emissions or the treatment of waste.

4.1.7.3. (d) Restoration: This involves reviving the lost or affected ecosystem due to project operation that could not be avoided. Examples here include [203] An example of such restoration is re-afforestation,

4.1.7..3. (e) Offsets: This deals with measures that are meant to make compensation for the loss of caused by residual impacts after the full implementation of the project.[204] The purpose of these offsets is to ensure that there is no net loss at the end of the project.

4.1.7.3 (f) Compensatory mitigation.

This involves ensuring that there is a balance between the lost biodiversity value and the biodiversity value gained.[205] The only criticism of this regulation is the failure to state that any biodiversity offset should be in be done in the affected area and not anywhere else. For example, the Licensee should not contemplate to do re-afforestation in another place other than the Albertine region.

Reg46 demands that the Operator forms an environmental management and monitoring plan. The contents of the plan include the detailed description of the project operations, objectives of impact control, emergency plan to cater for health and safety of workers, demonstration of how impact management objectives will be achieved, plans for climate adaptation, persons in charge of the plan.

[201] Ibid
[202] ibid
[203] ibid
[204] ibid
[205] Ibid

4.1.7.4. Enforcement

Under **Reg29** of the ESA the Authority may cancel an issued certificate of approval of environmental impact assessment if they realize that the developer submitted in the environmental and social impact statement was false.

Reg56 of the sets up offences and penalties for failure to display a certificate of approval **of social** impact assessment and failure to hold consultations with the people while conducting an environmental and social impact assessment. When Meta-regulations the discretion and semi-autonomy that is granted by Meta-regulations is abused, the regulator is obliged to enforce the regulations. The criticism with this regulation is the weak financial penalty for companies that breach the regulation. The maximum penalty that the company is 50,000 currency points which translates to UGX 1bn. Moreover the regulations state that the penalty shall be not more than 50,000 currency points. Given the huge financial muscle of the International Oil Companies, the penalty that is given the by the regulations is negligible a thing that may make it easy for the Operators breach the regulations.

4.2 What is the best practice of the meta-regulatory framework in health, safety and the environment safety in the oil and gas sectors of other jurisdictions? (*Exploration best practice of Meta-regulatory framework in the health and safety and environment in the oil and gas sector of other jurisdiction)*

This section is about exploring the best practice of Meta-regulation in health safety and environmental protection framework in the oil and gas sector of other jurisdictions. In this section, the Norwegian Regulations relating to health safety and the Environment in the Petroleum activities and at certain onshore facilities (The Framework Regulations) will be referred to as the Norwegian Meta-Regulations. The Kenyan Occupational Safety and Health (oil and gas) Regulations 2021, will herein hereinafter be referred to after as the Kenyan Regulations will be referred to as the Kenyan Meta-Regulations.

4.2.1 Norwegian Meta-Regulation

Section 10 of the Norwegian Regulations requires that petroleum activities are prudent basing on both individual and overall assessment of factors that are required in the planning of matters relating to health, safety and the environment.[206] It also requires consideration to be given to local conditions and assumptions in a particular locality. This is a good Meta-Regulation, because it considers the individual level of assessment of each factor by the Operator whereas Uganda's regulations only consider the overall assessment of the risk factors.

Section 11 of the Norwegian regulations, require that the risk is not hugely disproportionate to the cost of reducing it.[207] This is similar to our standard in the extent of risk reduction. Our regulation under the Reg.11 of the Upstream and Midstream regulations require the reduction of risk to be done as far as is practically feasible. However the Norwegian Meta-regulations adds that whenever there is inadequate knowledge regarding the effects a given activity of procedure on health, safety and environment, the solution that will reduce the uncertainty should be the one used. This shows that Norwegian regulations demand that the Licensee takes no chances even on operations whose effect on health, safety and the environment is unknown.

Section 13 of the Norwegian regulations demands that employees participate in the making of the equivalent of the safety concepts of the different operators.[208] This is missing in

[206] Norwegian Regulations relating to health safety and the Environment in the Petroleum activities and at certain onshore facilities (The Framework Regulations)
[207] Ibid
[208] Ibid

Uganda's Meta- regulations. The Norwegian regulations further state that the reason for ensuring the employees participate in the making of the safety cases is to increase their interest in Health safety and environment matters.

Section 22 of the Norwegian regulations demands that the operator has in place emergency preparedness at all times.[209] The regulation also requires that the operator coordinates with the public emergency preparedness resources. The regulation further demands that operators within the same geographical location share information regarding emergency preparedness. The latter requirement is vital and yet it is missing in Uganda's health and safety regulations.

Section 25 of the Norwegian regulations states that the Petroleum Safety Authority of Norway gives compliance certificate upon application by operators who have ben compliant to the required degree. This provision is missing is in the Ugandan regulations and yet it is a motivating factor for the operators to do their best in ensuring health and safety.

4.2.2 Kenyan Meta-Regulations

4.2.2.1 The interpretation section

The interpretation Regulation of the Kenyan Meta-regulation provides many vital definitions which are missing in the Ugandan Regulations. Some of the vital regulations include "Hazard" which has been defined as something capable of causing harm; "initial risk level" which is defined as risk before the mitigation measures were put in place; "near miss" which is defined as an unplanned event which is capable of causing injury, illness or damage to property or the environment.[210] Other important terms defined under interpretation which are not defined by the Ugandan Upstream and Midstream regulations include "risk assessment " which is defined as a systematic investigation which is designed to determine and evaluate the level of risk involved in terms of severity, regularity and costs involved in case the risk occurs; " risk management "is defined as the process by risks which are identified, investigated , and evaluated in order to devise means of mitigating them.[211]The above mentioned terms are the center of the Meta-Regulatory regime in the health, safety and environment regulation especially in the oil and gas sector. Although Meta-Regulation allow a lot of discretion to the

[209] Ibid
[210]The Kenyan Occupational Safety and Health (oil and gas) Regulations 2021
[211] Ibid

operator, the regulator expects that certain universal principles should not be deviated from while formulating operator's in-house rules. Some of the those principles cannot exist or be incorporated without mentioning the defined terms above and yet their definitions are missing in the interpretation section of the Ugandan Upstream and Midstream regulations.

4.2.2.2 Safety cases

The Kenyan regulations also require that operators come up with safety cases that are supposed to contain information inventory on hazards, risks and how to mitigate them or control them. The difference with the safety case of Kenya from that of Uganda is that the Kenyan safety case is supposed to provide for the upstream, midstream and downstream operations all in one and yet the Uganda regulations require different safety cases for the different levels of the Petroleum cycle. Having a safety case that covers all the lifecycle stages is suitable when one operator is licensed for all the 3 stages. The other difference with the safety case in Kenya petroleum activities is that the Director who is the equivalent of the Authority in Uganda, may approve or reject or accept the safety case in part. The latter is of interest and it means that part of what is contained in the safety case is acceptable to the director or Authority while the rest is unacceptable and is rejected. The Ugandan regulations do not have a provision for part acceptance of the safety case. The part acceptance allows for more flexibility.

4.2.2.3 Risk assessment

The Kenyan regulations provide for a risk register where risks are recorded after conducting risk assessment.[212] The Kenyan regulations provide for both qualitative and quantitative risk assessments just like the Ugandan regulations do. The regulations require that the risk assessment that is done is able to suggest mitigation measures and barriers that are necessary to reduce or eliminate risks or prevent their escalation. This is also provided for under Reg. 16 of the Ugandan Upstream and Midstream health and safety regulations. The guidance in the Kenyan regulations mentions safety critical elements including fire, smoke detection, gas leaks and emergency shutdown systems. Both the Kenyan and Ugandan Meta-regulations provide for a risk acceptance criteria to be in place. This is an important tool in risk assessment because it formulates an internal standard upon which risk assessment should be based. Both the Kenyan and Uganda Meta-regulations provide for consideration of external threats during risk

[212] The Kenyan Occupational Safety and Health (oil and gas) Regulations 2021

assessment which is a positive provision because risk do not only come from within the facility but can also come from the neighborhood of the operators premises.

4.3 Conclusion

This chapter has presented the findings of the study. The Analysis was centered on the Meta-Regulations of Health and safety and Environmental safety in the oil and gas sector in Uganda. It has dealt with the Upstream and Midstream regulations of health and safety along with The National Environment (Environmental and Social Assessment) Regulations 2020. Although these regulations contain both Meta and Prescriptive regulations the focus was only on the Meta-regulations. The analysis revealed some strength in the Meta-regulations found there in. The findings revealed some strong meta-regulations and the loop holes that make the regulations less effective in some instances. For example the Upstream and Downstream regulations lack a provision that would require employees to be involved in the making of Safety cases.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This final chapter consists of the conclusions and recommendations based on the findings in the analysis. The conclusion is matched with the research objectives and the research questions. It also lays out the theoretical and practical implications of the research findings. The conclusions on findings under each research question and research objective were presented first followed by the recommendations.

5.1 Conclusions regarding the research questions.

The ultimate aim of this research is to provide answers to research questions that were derived from the research objectives in chapter 1.

Identification and analysis of the meta-regulations in the health and safety and environmental regulatory framework in Uganda's Oil and Gas sector.

5.1.2 Research question 1

How effective are the Meta-Regulations in the Health and Safety regulatory framework in the oil and gas sector in Uganda?

5.1.2.1 The legal analysis of the regulations revealed the following: (Upstream and Midstream Regulations)

- The Meta-regulations assign responsibilities to the International Oil Companies /Licensees with a view to let the Licensees exercise their discretion in complying with the regulations. The regulations require that the Operator allows consider the prevention and control of incidents, accidents and hazards without defining important technical terms such as "hazard". In order to eliminate the possibility of misinterpreting technical terms and provide proper guidance such terms should have been defined because they are at the center stage of health and safety. Guidance is especially important where Meta-regulations are involved such as in the Meta-regulations in the upstream and midstream regulations. The regulations would be more effective if the technical terms were defined under the interpretation section.
- The regulations instruct the Operators to avoid injuries to workers that are capable of causing loss of work time, disability and fatality. This regulations may in the end lead

to ineffectiveness because the expectation that the only injuries that should be avoided are those that would cause the listed effects. Health of workers can be affected by diseases which have a cumulative effect and may not manifest immediately with time. As seen from chapter 2 there are also injuries that may be caused by electric shocks, lacerations or bruises which may not necessarily cause affect work time, disability or be fatal but affect the health of workers. Failures to address such injuries makes them less effective.

- The Meta-regulations require the Operator to conduct qualitative, semi-qualitative and quantitative which is a positive Meta-regulation however they fail to define or describe what these methods of risk assessment entail. This failure to provide guidance on such important procedures makes the regulation less effective.

- The Meta-regulation requires the operator to design a major accident prevention policy. However the regulation do not make a requirement that the Operator submits the policy to the Authority for approval. This can create a gap for complacency where the operators either fail to come up with an accident prevention policy or form one that is substandard. This makes the regulation less affective.

- The regulations require the Operator to formulate safety cases but the requirement for them to provide for a place of refuge in case of an emergency is missing. Although guidance is provided regarding what he Authority expects to be contained in the Safety Case, requirement for the safety case to follow international standards is missing.

- The Regulations require that the Operator takes measures to protect the community in which it's located from located. However the regulation fails to state the radius that should be put into contemplation while planning this protection. Failure to provide guidance on the radius make the regulations less effective because the Operator may only consider the immediate neighborhood and disaster strikes, it may go far and beyond.

- The enforcement provisions are so weak to cause the Operators to comply. For examples the alternative financial penalties for noncompliance don not exceed UGX

100,000,000/= which negligible amount compared the huge financial muscle of the international oil companies

Identification and Analysis of the meta-regulations in the National Environment (Environmental and Social Assessment Regulations 2020).

5.1.2.2 The legal analysis of the ESA regulations revealed the following:

- The meta-regulations require that the Operator to conducts environmental and social impact assessment but fails to make it a periodic requirement to match with the changing conditions of the ecosystem and climate change. This makes the regulation less effective.

- The regulations require that the Operator conducts risk assessment which is a strong meta-regulation but fails to state whether to use qualitative or quantitative risk assessment and yet such guidance is important for meta-regulations.

- The meta-regulation require that Operator form a mitigation hierarchy which involves demonstration of how the operator will apply avoidance, minimization mitigation, and provide of biodiversity offsets as the last resort. This is a strong meta-regulation however it should have stated that the biodiversity offset should be in the same location where the environmental impacts have occurred .This would have made the regulation more effective.

Exploration of best practice of Meta-regulatory framework in the health and safety and environmental safety in the oil and gas sector of other jurisdiction

5.1.3 Research question 2

What is the best practice of the meta-regulatory framework in health and safety and environment in the oil and gas sectors of other jurisdictions?

5.1.3.1 Norwegian Regulations

- Norwegian Meta-regulations regulations require that the petroleum activities be done in a prudent manner but most importantly that assessment of these activities is based both on individual level and the organization assessment factors. Consideration should be given to local conditions and assumptions in a particular locality.

- The Norwegian risk assessment standard is as far as is practically feasible with the aim of ensuring that the cost reducing the risk is not hugely disproportionate compared to the damage the risk may cause.

- . The Norwegian regulations require that employees of the Operator to participate in the making of a safety case.

- The regulations demand that Operator has emergency preparedness in place at all times but most importantly that the Operator must collaborate with the public emergency Preparedness.

- The Norwegian regulator grants compliance certificates to Operators that apply for them if they qualify to receive them.

5.1.3.2 Kenyan Regulations

- The Kenyan health and safety meta-regulations define most of the technical terms including hazard unlike the Ugandan regulations.

- The Kenyan regulations provide partial acceptance of the safety case by the regulator. This means that part of the safety case can be rejected and part of it can be accepted which isn't the case with Uganda.

- The Kenyan regulations require that one safety case covers all stages of the Petroleum life cycle from Upstream to the downstream stage.

- Just like the Ugandan regulations, the Kenyan regulations require that both qualitative and quantitative risk assessment is done while preparing a safety case. Regulations for both countries require risk register to be in place and also require a risk acceptance criteria.

Recommendations based on the conclusion of the study

5.1.4 Research question 3

What recommendations can be made based on the finding of the study?

5.2 Recommendations

Future amendments of the regulations should include the following:

- Technical terms that are key to health and safety and environmental meta-regulations should be clearly defined in the interpretation section.

- Occupational diseases and Injuries that may not necessarily lead to loss of work time, disability and or fatality should also be considered in the regulations because of the conditions may have a cumulative effect that will affect the health of the workers.

  The Meta-regulations should require t that the major accident policy be submitted to the Regulator to avoid complacency.

- The Meta-regulations should state the estimate radius of the area of protection by the Licensee should be far and wide and should state in the regulations.

- The Meta-regulations should demand that Risk assessment during environmental and social impact assessment should be done using both qualitative and quantitative methods.

- The Meta-regulations should state that Biodiversity offsets in the Mitigation hierarchy should be done in same local of environmental or social impact.

- The Meta-regulations should require that employees of the operator participate in the making of the safety cases to enable them develop interest in the health and safety and for them to own it.

- The Meta-regulations should require that the regulator grants compliance certificates to operators who apply for them if they qualify. This will motivate Operators to be compliant

- The financial penalties for not compliance are weak especially in the health and safety Meta-regulations. The negligible penalties may have no effect on noncompliance by hugely wealth International Oil Companies. The financial penalties should therefore be raised against those that breach the regulations.

Further Research should be done after the commencement of the production phase of the Petroleum cycle, using another research method to incorporate the views of the operators in the oil and gas sector.

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