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Assessing The Effectiveness of Risk Management and Mitigation Strategies Employed by Oil Companies in Bonny and Ogba/Egbema/Ndoni Local Government Area of Rivers State, Nigeria

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ABSTRACT: *This study assessed the emergency and risk drivers in oil exploration activities in Bonny Local Government Area, Rivers State, Nigeria. The descriptive research survey design was adopted for the study. Five research questions were raised to guide the study. The data for the study were collected using a five-point likert scale questionnaire containing a total of 25-items and utilized as a major instrument for the study. In all, three hundred and sixty (360) respondents made up the sample for the study. Arithmetic mean and standard deviation were the major statistical tools used for the data analysis. The results of the study reveal that the risk management and mitigation strategies employed by the oil companies in the study areas are grossly ineffective. Findings of the study also revealed that putting in place a comprehensive scientific rehabilitating programme for the people, diversification of sources of income, adequate compensation for people affected by oil spill, government and other stakeholders in the oil industry provision of grants and soft loan to affected persons and the adoption of long distance farming and fishing are potentials for alternative livelihood for the people. Finally, findings of the study showed that strict adherence to regulations and safety procedures, routine inspections and maintenance of oil equipment and infrastructures, comprehensive training and education, emergency preparedness by oil companies and the use of advanced technology are possible recommendations that could improve the safety and risks reduction strategies in oil explorations. Based on the above findings, the study recommended among other things, that oil exploration should be operated within stringent regulations designed to safeguard the welfare of employees, the environment, and nearby communities, oil companies operating in the areas should ensure regular monitoring and maintenance of their equipment and facilities so as to reduce the occurrence of pollution due to faulty oil and gas facilities, that oil companies should formulate and practice clearly defined emergency response strategies to manage potential incidents like oil spills or fires effectively. Lastly, conduct routine drills to ensure all staff are adept at promptly and efficiently executing these plans.*

KEYWORDS: assessing, effectiveness, risk management, mitigation, strategies and oil companies

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INTRODUCTION

The environment is dynamic. It undergoes modification by several natural processes such as climatic and tectonic processes, and thus imposed physical constraints on human activities. However, artificial modifications of the environment do occur and it has become noticeable in recent times, and man has proved to be the main actor in this regard (Adepelumi et al., 2006). Aigbedion and Iyayi (2007) assert that exploitation of mineral resources has assumed prime importance in several developing countries including Nigeria. Nigeria is endowed with abundant mineral resources, which have contributed immensely to the nation's wealth with associated socio-economic benefits. Adekoya (2003) opine that mineral resources are an important source of wealth for a nation, but before they are harnessed, they have to pass through the stages of exploration, mining, and processing. He noted that different types of environmental damage and hazards inevitably accompany the three stages of mineral development. The oil and gas mining industry in Bonny and Ogba, Egbema Ndoni LGA is of great potential which has the capacity to contribute to local and foreign exchange earnings as well as the attraction of foreign direct investment thereby boosting the country's economy. These economic raw materials that are exploited from these areas have some environmental impact associated to it.

This impact is observable at the oil drilling sites, pipelines, quarry sites, processing factories and the surrounding environments. The degradation of the environment have in turn affected agriculture, vegetation, wildlife and even pose a threat to the health conditions of the oil, mine or quarry workers and every other persons living within the surrounding environment. The environmental impacts of these activities have been of concern to government regulatory agencies, oil and gas companies' operators as well as the host communities. Violent protests by communities are the most eloquent testimonies of the resistance to the general pollution of the environment by the activities of oil and gas companies.

Consequently, various control programmes and policies have been articulated by government for the mitigation or amelioration of environmental problems associated with the oil and gas industry. It is however doubtful, whether the mitigation measures are being implemented efficiently and effectively. Nigeria as an oil and gas producing nation has over the years anchored it economy on oil. According to the Global Financial Asset (2012), "the business represents more than 95% of commodity profit and more than 90% of government income". They however assert that "the sector has been blamed for poor safety performance as well as for polluting the air, land, and water, resulting in poor ecological quality". UNEP (2011; 2012) blames "poor technical infrastructures, accidents, and vandalism have the cause of the industry's poor safety and environmental management".

According to Koto (2006), "the Nigerian petroleum industry operates in two distinct streams, upstream and downstream, which are analogous to the global classification of petroleum industry operations". He noted that "exploration is one of the upstream operations; appraisals and evaluations; development; crude oil and untreated gas production and transportation while crude oil refining, transportation, distribution, and product retailing, on the other hand, are downstream operations and any of these activities serve as risk drivers to the environment and human safety". No wonder in Nigeria, "the upstream petroleum industry accidents in Nigeria typically receive more research attention and focuses more on crude spills—accidental or deliberate—and environmental pollution that occurs during oil exploration and production". Researchers such as Koto and others noted that "the perceived importance of the upstream subsector, the involvement of large multinational corporations, and the relatively late cohesion of the downstream operations in Nigeria may have contributed to the focus on upstream risk research (Koto, 2006; 2008, Adefulu; 2012, and others, 2014)". Adefulu (2012:16) notes that "research on safety and risk management in the downstream context and gas exploration and processing has often been neglected,

and until now, no satisfactory generally accepted risk management framework has been developed for measuring, assessing, interpreting, and mitigating environmental and safety risks from accidents in the Nigerian petroleum industry's downstream and the gas exploration sector, hence accidents in these sectors not only cause significant financial losses but also have significant effects on human safety and the environment".

Bonny and Ogba/Egbema/Ndoni play host to a number of oil exploration and production companies with trunk lines and oil and gas carrying pipelines transversing the entire Bonny kingdom and Ogba/Egbema/Ndoni have caused adverse effect on the people and ecosystem within the surrounding communities thereby posing as a threat to human and the environment. Oil spillage resulting from oil exploration in the study areas had caused untold hardship on the livelihood of the people and the environment. This situation has increased the vulnerability of households thereby affecting their wellbeing adversely, with a threat on the areas' future means of sustenance; while governments response and remediation efforts aimed at restoring the areas ecosystem have not being very effective, hence the motivation for the present study. Oil exploration and production operations in the areas have caused devastating effect on human and the environment.

In Bonny Kingdom as well as Ogba/Egbema/Ndoni, fishing as a source of occupation of the people has being greatly affected leading to increase in the rate of poverty among the local inhabitants. Also, the exploration and production of oil and gas in this areas has resulted in air and land pollution, defacement of the landscape, increased rate of soil erosion and deforestation The emergencies and risk drivers associated with oil and gas operations in the areas has being attributed to a lot of factors. Also, the effects of the oil and gas operation in the area have caused untold hardship on the people. It is however unfortunate that the oil exploration and production companies in the areas are not concerned and have refused to put in place measures that will reduce the negative impact of their operations on the people.

Moreso, there are literatures on the general effects of oil exploration on health and the environment (Adekoya 2003; Nnabo and Taiwo, 2001). There are literatures that had touched on the effects of crude oil pollution in Nigerian agriculture (Agbogidi, et al., 2005; Daniel-Kalio and Tih, 2006; Chikere and Chijioke-Osuji, 2006; Chikere, et al., 2009; Anugwom and Anugwom, 2009; Tanee and Akonye, 2009). None of these studies mentioned above had researched on the current topic "assessment of the emergencies and risk drivers in oil exploration with special interest on Bonny and Ogba, Egbema Ndoni, Rivers State Nigeria It is therefore pertinent that a study be conducted to assess the emergencies and risk drivers associated with oil exploration in the area.

Statement of the Problem

Bonny and Ogba, Egbema Ndoni play host to a number of oil exploration and production companies with trunk lines and oil and gas carrying pipelines transversing the entire Bonny kingdom and Ogba, Egbema Ndoni have caused adverse effect on the people and ecosystem within the surrounding communities thereby posing as a threat to human and the environment. Oil spillage resulting from oil exploration in the study areas had caused untold hardship on the livelihood of the people and the environment. This situation has increased the vulnerability of households thereby affecting their wellbeing adversely, with a threat on the areas' future means of sustenance; while governments response and remediation efforts aimed at restoring the areas ecosystem have not being very effective, hence the motivation for the present study.

Aim and Objectives of the Study

The aim of this study is to assess the emergencies and risk drivers in oil and gas exploration in Bonny and Ogba/Egbema/Ndoni, Rivers State Nigeria. The specific objectives of the study are to:

i. Assess the effectiveness of risk management and mitigation strategies employed by the oil companies.
ii. Investigate the potentials for alternative livelihood for local communities affected by oil exploration.

Research Questions

i. How effective are the risk management and mitigation strategies employed by the oil companies?
ii. What are the potentials for alternative livelihood for local communities affected by oil exploration?

REVIEW OF RELATED LITERATURE

Oil and gas exploration encompasses the processes and methods involved in locating potential sites for oil and gas drilling and extraction. Early oil and gas explorers relied upon surface signs like natural oil seeps, but developments in science and technology have made oil and gas exploration more efficient. Geological surveys are conducted using various means from testing subsoil for onshore exploration to using seismic imaging for offshore exploration. Energy companies compete for access to mineral rights granted by governments by either entering a concession agreement, meaning any discovered oil and gas are the property of the producers, or a production-sharing agreement, where the government retains ownership and participation rights.4 Exploration is high risk and expensive, involving primarily corporate funds. The cost of an unsuccessful exploration, such as one that consisted of seismic studies and drilling a dry well, can cost $5 million to $20 million per exploration site, and in some cases, much more. However, when an exploration site is successful and oil and gas extraction is productive, exploration costs are recovered and are significantly less in comparison to other production costs.

Concept of Risk and Risk Management in Oil Exploration and Production

Aven and Renn (2010) defined risk management as the methodical amalgamation of risk assessment and judgment made during risk characterization from the input material upon which risk management options are evaluated, assessed, and chosen. In risk management, the processes for making decisions are driven by these outcomes". Hence, "risk management is referred to as a process of decision-making and such independent direction requires evaluation and prioritization in light of a strategic methodology that coordinates a gamble theory". It should be noted that "the various definitions of risk are guided by a variety of philosophical perspectives. Ontological realism has been used to describe risk as an objective state of the world". Eugene and Rosa (2003) noted that "this philosophical approach to research methodology holds that risk must exist independently of perception, knowledge, and subjective judgment about what is at risk and how likely a risk will manifest". They noted further that "by allowing risk an ontological status, risk standards banter is put into a field of conflict over inquiries of information, discernments, and understandings of hazard, versus the comprehension of how gatherings and social orders decide to be worried about certain dangers while disregarding others".

Concept of Environmental Pollution

Amiriheobu (2019) defines environmental pollution as the unfavorable alteration of our surroundings that occurs entirely or largely as a result of human activity which happen directly or indirectly as a result of changes in energy patterns, radiation levels, the chemical and physical constitution of organisms, and their abundance". Environmental pollution "could also refer to the introduction of contaminants into the natural environment, which has negative effects on humans, nature, and its resources. He "went on to say that environmental pollution is any unnatural and harmful change in the chemical, physical, and biological properties of any ecosystem component, such as air, water, or soil, that can harm a variety of living things and property". According to him, "the malicious tension in the Niger Delta has decreased as a result of the administration

of President Umaru Musa Yar'adua's amnesty and other social rehabilitation programs". According to Roya, (2015), "environmental pollutants have a variety of negative health effects starting in early life and some of these negative effects include prenatal disorders, infant mortality, respiratory disorders, allergies, cancers, cardiovascular disorders, an increase in stress oxidative, endothelial dysfunction, mental disorders, and other negative effects. Roya went further to note "that though, short-term effects of environmental pollutants are usually highlighted, wide range of hazards of air pollution from early life and their possible implication on chronic non-communicable diseases of adulthood should be underscored". Roya also assert that "numerous studies have exposed that environmental particulate exposure has been linked to increased risk of morbidity and mortality from many diseases, organ disturbances, cancers, and other chronic diseases". Hence, "it is time to act and reduce pollution. Otherwise, the environment will be damaged by the waste products of consumption, heating, agriculture, mining, manufacturing, transportation, and other human activities".

Oil Operation and Environmental Regulation in Nigeria

According to Iwayemi, (2008), "the generation of energy in Nigeria is largely dependent on petroleum products despite the fact that hydropower, biomass, and coal make a small contribution". A report by AGUSTO (2008) shows that "since the beginning of the 1980s Nigeria's petroleum consumption has been rising". This is in line with the "Energy Information Administration (EIA) data which shows that from 2006, 2007, and 2011, petroleum products accounted for 53, 67.3, and 68.5 percent of the nation's total energy consumption, respectively".

Iwayemi, (2008) noted that "the upstream and downstream operations of the country's petroleum industry are clearly impacted by this rise in petroleum product consumption, which raises concerns about threats to human health and the natural environment". There may be risks to human health, safety, and the environment from any of the upstream or downstream activities; and balancing these concerns with goals for national economic development and energy security presents a challenge for any government. "This is accomplished by establishing a sufficient regulatory framework, which includes regulatory institutions tasked with monitoring compliance and laws and regulations outlining rights, responsibilities, procedures, and standards (Principle 11, 1992)". "It is against this background that this part examinations the wellbeing and ecological administrative structures pertinent to the downstream area of the Nigerian petrol industry". "The goal is to see how well they handle the particular risks or concerns that come from this industry, specifically trucking and pipeline activities".

Nigeria's Oil and Gas Industries and the Framework for Risk Management

Notably, the developed world's risk management frameworks combine human and technical components to create proactive and reactive strategies for accident prevention and response at all regulatory and commercial levels. In the context of accident risk reduction and response, the application of risk management concepts to downstream operations in other developed nations is on the rise. These nations are adapting risk management concepts to their particular circumstances and using them to manage environmental and safety risks from downstream petroleum operations. In addition, the concepts are utilized as a means of achieving specific regulatory objectives while also achieving a balance between stakeholders involved in petroleum operations' perception of risk and business profitability. The United States (ICF, 2000), the United Kingdom (Energy Institute, 2007), and Italy (Bubbico et al., 2006). Chapter 1: An illustration of a risk-based framework that is incorporated into a guideline for petroleum distribution operations in the United Kingdom is the Environmental Guidelines for Petroleum Distribution Installations (EGPDI) developed by the Energy Institute in 2007 with the goal of maximizing environmental and safety performance.

Environmental Impact of Pollutants from Oil Exploration and Production

Efforts to improve the standard of living of man through the control of nature and the development of new products have also resulted in the pollution or contamination of the environment. Most of the world's air, water and land are now partially poisoned by chemical wastes from industrial processes, including those of crude oil and gas. The pollution exposes people to new risks from diseases. Many species of plants and animals have become endangered or are on the verge of extinction. As a result of these developments, governments have passed laws to limit or reverse the threat of environmental pollution. The effects of environmental pollution are diverse and varied, and the physical, biological, chemical, and socio-economic effects or impacts have been very well documented. While some of these may be observed, the major impacts as they affect microorganisms and ecosystems may never be fully estimated or completely understood.

Environmental Threats from Oil and Gas Operations

According to Corner (2015), "oil and gas industry operations occur in every corner of the globe, in a diverse range of habitats and ecosystems". He explained that "these operations often place large pressures on the local environment and inhabitants, and as global population growth continues to rise, so too does the demand for useable energy and resources". According to Statistical Review of World Energy (2021), "in 2021, consumption and production increased for all fuel types, surpassing previously record high levels for all fuels except nuclear. For fossil fuels, global consumption rose more rapidly than overall production, resulting in further production pressure for oil and gas companies". Corner assert that "meeting the rising global energy demand comes with high risks and costs to both society and the environment, hence, oil and gas companies are thus faced with the challenge of meeting the world's expanding energy demands while minimizing the negative externalities associated with these operations".

Goals of Environmental Risk Management

The primary goal of internalizing environmental risks is to reduce corporate environmental impacts by limiting the number and severity of incidents that occur from the exploration, production and refining of oil and gas. Minimizing the number of incidents and mitigating their environmental impacts if and when they do occur may help address environmental concerns such as pollution, industrial accidents and global climate change. There is a large capacity for oil and gas companies to internally improve their practices to prevent future stringent legislation as well as increase profitability by restricting the number of fines paid annually for environmental degradation. Integrating risk management practices into all aspects of business should be an industry-wide objective as improving environmental performance has proven to create a competitive advantage for oil and gas corporations (Sache.org, 2013). Energy companies should seek to align internal business values and environmental goals with external perceptions of the company, which can be accomplished by explicitly embedding environmental risks into daily processes.

Addressing Environmental Business Risks

Traditional approaches of addressing environmental business risks is comparable to the manner in which corporation must tackle financial risks. Before undertaking a project, the company should determine all possible risks associated with operations at the specific site and the probability of each adverse event occurring. Using a cost-benefit analysis, the company can then estimate the total social burden of an event occurring.

Methods Adopted in Cushioning the effects of Oil exploration and Production Activities

The protocol was supported by numerous international players, but several large nations, including the United States and Canada, were unwilling to accept and implement it. Gaps in numerous international regulations have resulted from a lack of unanimous voluntary participation, reducing their effectiveness. There appears to be international consensus regarding

the significance of addressing these environmental issues, as evidenced by discussions and revisions of programs like the United Nations Environment Programme (UNEP). However, the fact that none of the nation's adhere to the rules and enforce them suggests that international conferences and protocols alone will not be sufficient to address these environmental issues. Additionally, traditional approaches to enforcing national policies are unable to prevent incidents brought on by energy exploration and production. Although the Bureau of Safety and Environmental Enforcement (BSEE) is in place to regulate and enforce safety rules for offshore oil and gas activities, the legislation is insufficient to prevent catastrophes like the Deep water Horizon Spill in 2010. Environmental impact statements must be submitted in accordance with the National Environmental Policy Act (NEPA) before drilling can begin at a location; however, in contrast to the rising national subsidies for oil and gas, these safeguards do not gain traction. In the United States, subsidies for the fossil fuel industry cost an estimated $37.5 billion as of July 2014. Subsidies for the exploration and production of fossil fuels have increased in value by nearly 45% since 2009, going from $12.7 billion to $18.5 billion. Domestic production has increased to meet the ever-increasing global energy needs, causing the expansion. As long as government subsidies for oil and gas operations persist, national legislation may not be sufficient to address environmental concerns. This suggests that addressing the issues associated with corporate environmental performance necessitates taking a different approach.

Integration of Environmental Risk Management

Firms must incorporate environmental concerns into daily operations because external sources have not proven to be effective in changing corporate environmental risk valuation procedures. Over the years, international frameworks, declarations, and treaties have been developed to combat the challenges associated with protecting the environment. Unfortunately, these international agreements have not proven to be an effective method to compel large oil and gas companies to manage their environmental impact. This is primarily due to the fact that the frameworks and treaties are not accepted and subsequently adopted by all countries. The Earth Summit UNCSD Conference held in Rio in 2012 brought together a large international audience to discuss green economies and the implementation of sustainable development (UN, 2012). Without a 100 percent participation rate, agreements made at these international meetings are not strong enough to combat these global environmental issues. Similar challenges arose with the Kyoto Protocol, which was intended to cap emissions through binding reduction targets (Kyoto, 2012).

The Resource Curse Theory

The Resource Curse theory was originally coined by Richard Auty (1993). Auty studied economics and geography, and he investigated the reasons why some resource-rich countries underperform and remain undeveloped in spite of the abundance of natural resources in the country as in the case of Nigeria. In other words, Auty defined the term natural resource curse as the perverse effects of a country's natural resource wealth on the country's economic, social, or political well- being (see Rose, 2014 Cited in Mehrdad, 2017: 2). Azarhoushang and Rukavina (2014), and Mellissa (2017), in their respective studies of the resource curse theory, lumped the term with the Dutch Disease, an idiom used in association with a 1960 crisis in Netherlands after the discovery of natural gas in the North Sea region of the country. They saw the phrase as the appropriate word to describe what happens when an event, like a commodity-boom, makes a country's currency more expensive and its other goods less competitive. Akpotor (2016) stated that the Dutch Disease or Resource Curse theory is used to examine the negative effects that rich natural resources bring upon the economic growth of a resource rich country. To him, it is paradoxical for countries with the abundance of non-renewable natural resources to experience stagnant economic growth and contraction often associated with conflicts or crises of marginalization of the host community. For Duruji and Dibia (2017), Resource curse also known as the Paradox of Plenty describes the failure of many natural resource-rich nations to

benefit fully from the wealth of their rich natural endowment following the inability of their governments to respond favourably and effectively to public welfares and needs.

The Man Environment Relationship Theory

In the year 1997, Holland put up this notion. The notion was born out of the fundamental need to provide a focal point for the interaction between man and his surroundings so that every action he took might contribute to the sustainability of both his surroundings and the components that inhabit them. This was done in order to resolve the complex relationship between the environment and human nature, as proposed by the environmental philosophy theory college of thought. This concept originated from research conducted in the year 1909 by a researcher named Parsons, who found that human behavior was influenced by his immediate environment both psychologically and through the interactions that men had with it. According to Holland (1997), people naturally gravitate toward places where they can see a glimmer of hope and find the basic necessities of life, which can ensure their hope for survival. As a result, living in such an environment ceases to be a drag because it is clear that relationships can be formed there. More specifically, the surroundings' possibilities and propensity to increase their capacity for productivity.

METHODOLOGY

The descriptive and qualitative research survey design was adopted for the study. Five research questions were raised to guide the study. To ensure the face and content validity of the instrument (questionnaire), the questionnaire together with the objectives of the study was submitted to my supervisor who read through, vet, scrutinized, and made comment(s) before approval for distribution. This was done to establish that the instrument is appropriate for measuring the variables contained in the study. The data for the study were collected using a five-point likert scale questionnaire containing a total of 25-items and utilized as a major instrument for the study. In all, three hundred and sixty (360) respondents made up the sample for the study. Arithmetic mean and standard deviation were the major statistical tools used for the data analysis.

RESULT AND DISCUSSION

Research Question 1: How effective are the risk management and mitigation strategies employed by the oil companies?

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Table 4.1: Mean and standard deviation on the effectiveness of the risk management and mitigation strategies employed by the oil companies.

S/No	Questions	SA	A	D	SD	X	SD	Remark
1	Risk management and mitigation strategies employed by the oil companies has been marked by corruption making it ineffective	130	200	20	10	3.36	.48	A
2	Their risk management and mitigation strategies are marked by lack of effective communication	125	198	25	12	3.59	.49	SA
3	Oil companies are slow to responding to issues of oil spills in the study areas	150	200	6	4	3.58	.50	SA
4	Their risk management and mitigation strategies are marked with power struggles making it ineffective	145	205	5	5	3.56	.53	SA
5	There is almost total failure on the part of the oil companies to adequately remedy oil spills by cleaning and restoring the environment and compensating those harmed	135	210	10	5	3.55	.50	SA
	Grand Mean					**3.53**	**0.50**	**SA**

Criterion mean = 2.50. Guide: 0 - 1.49 = Strongly disagree (SD); 1.50 - 2.49 = Disagree (D); 2.50 – 3.49 = Agree (A); 3.50 – 4.00 = Strongly agree (SA)

Source: Researcher's computation from survey data, 2023.

The result in table 4.1 revealed risk management and mitigation strategies employed by the oil companies has been marked by corruption making it ineffective, their risk management and mitigation strategies are marked by lack of effective communication, oil companies operating in the areas are slow to responding to issues of oil spills in the study areas, their risk management and mitigation strategies are marked with power struggles making it ineffective and that there is almost total failure on the part of the oil companies to adequately remedy oil spills by cleaning and restoring the environment and compensating those harmed thereby making their risk management and mitigation strategies ineffective ($\bar{X} = 3.53 \pm 0.50$). Also, respondents strongly agree that the risk management and mitigation strategies are marked by lack of effective communication ($\bar{X} = 3.59 \pm 0.49$), oil companies are slow to responding to issues of oil spills in the study areas ($\bar{X} = 3.58 \pm 0.50$), the risk management and mitigation strategies are marked with power struggles making it ineffective ($\bar{X} = 3.56 \pm 0.53$) and that there is almost total failure on the part of the oil companies to adequately remedy oil spills by cleaning and restoring the environment and compensating those harmed ($\bar{X} = 3.55 \pm 0.50$). Furthermore, respondents agree that risk management and mitigation strategies employed by the oil companies have been marked by corruption making it ineffective ($\bar{X} = 3.3 \pm 0.50$). Thus, it is concluded that the risk management and mitigation strategies employed by the oil companies in the study areas are grossly ineffective.

Research Question 2: What are the potentials for alternative livelihood for local communities affected by oil exploration?

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Table 4.2: Mean responses on the potentials for alternative livelihood for local communities affected by oil exploration

S/No	Questions	SA	A	D	SD	$\bar{X}$	SD	Remark
6	Putting in place A comprehensive scientific rehabilitating programme for the people is a potential for alternative livelihood for the people	155	201	4	0	3.65	.48	SA
7	Diversification of sources of income is a potential for alternative livelihood for the People	150	195	10	5	3.53	.49	SA
8	Adequate compensation to people affected by oil spill is a potential for alternative livelihood for the people	160	200	0	0	3.70	.50	SA
9	Government and other stakeholders in the oil industry provision of grants and soft loan to affected persons is a potential for alternative livelihood for the People	153	198	7	2	3.50	.53	SA
10	Long distance farming and fishing are potentials for alternative livelihood for the People	100	200	40	20	3.45	.50	A
	Grand Mean					**3.57**	**0.50**	**SA**

Criterion mean = 2.50. Guide: 0 - 1.49 = Strongly disagree (SD); 1.50 - 2.49 = Disagree (D); 2.50 – 3.49 = Agree (A); 3.50 – 4.00 = Strongly agree (SA)

Source: Researcher's computation from survey data, 2023.

The result in table 4.2 revealed that putting in place a comprehensive scientific rehabilitating programme for the people, diversification of sources of income, adequate compensation for people affected by oil spill, government, and other stakeholders in the oil industry provision of grants and soft loan to affected persons and the adoption of long distance farming and fishing are potentials for alternative livelihood for the people ($\bar{X}$ = 3.57 ± 0.53). Respondents strongly agree that adequate compensation for people affected by oil spill is a potential for alternative livelihood for the people ($\bar{X}$ = 3.70 ± 0.50), putting in place a comprehensive scientific rehabilitating programme for the people is a potential for alternative livelihood for the people ($\bar{X}$ = 3.65 ± 0.48), diversification of sources of income is a potential for alternative livelihood for the people ($\bar{X}$ = 3.53 ± 0.49) and that government and other stakeholders in the oil industry provision of grants and soft loan to affected persons is a potential for alternative livelihood for the people. Also, respondents agree that

long distance farming and fishing are potentials for alternative livelihood for the people ($\bar{X} = 3.45 \pm 0.53$). Thus, it can be concluded that putting in place a comprehensive scientific rehabilitating programme for the people, diversification of sources of income, adequate compensation for people affected by oil spill, government, and other stakeholders in the oil industry provision of grants and soft loan to affected persons and the adoption of long distance farming and fishing are potentials for alternative livelihood for the people.

DISCUSSION OF FINDINGS

Finding of the study further reveal that the risk management and mitigation strategies employed by the oil companies in the study areas are grossly ineffective. This finding is in tandem with the work of Vivan et al (2012) when they opined that the environment around the study area are polluted by solid and liquid waste as well as gaseous pollutants that are released during oil refining. The findings of the study also collaborate the findings of Kadafa (2012) when he opine that oil pollution caused by spillages from the oil industry located primarily in the Niger Delta region has caused the massive destruction to farmlands, sources of drinking water, mangrove forest, fishing grounds and declination of fish, crabs, molluscs, periwinkles and birds. Large areas of mangrove forest have been destroyed over a wide area affecting terrestrial and marine resources. Some past spills have necessitated the complete relocation of some communities, loss of ancestral homes, pollution of fresh water, loss of forest and agricultural land, destruction of fishing grounds and reduction of fish population, which is the major source of income for the Niger Delta people. It was concluded that activities that come with the oil exploration and exploitation causes alterations to the environment.

Findings of the study also revealed that putting in place a comprehensive scientific rehabilitating programme for the people, diversification of sources of income, adequate compensation for people affected by oil spill, government and other stakeholders in the oil industry provision of grants and soft loan to affected persons and the adoption of long- distance farming and fishing are potentials for alternative livelihood for the people. This finding is in line with the finding of Ojimba (2011) when he recommended that comprehensive scientific rehabilitating programme and diversification of sources of income for farmers is embarked upon through effective extension and rural education programmes.

Summary of Findings

The findings of the study are highlighted below.

i. The risk management and mitigation strategies employed by the oil companies in the study areas are grossly ineffective.
ii. Putting in place a comprehensive scientific rehabilitating programme for the people, diversification of sources of income, adequate compensation for people affected by oil spill, government and other stakeholders in the oil industry provision of grants and soft loan to affected persons and the adoption of long distance farming and fishing are potentials for alternative livelihood for the people.

CONCLUSION

The environmental impacts of these activities have been of concern to government regulatory agencies, oil and gas companies' operators as well as the host communities. Violent protests by communities are the most eloquent testimonies of the resistance to the general pollution of the environment by the activities of oil and gas companies. Consequently, various control programmes and policies have been articulated by government for the mitigation or amelioration of

environmental problems associated with the oil and gas industry. It is however doubtful, whether the mitigation measures are being implemented efficiently and effectively.

Findings from the study showed that fire outbreak, destruction of crops and farmland, pollution of water bodies and marine lives, destruction of mangroves and increase in the cases of health threatening are the risks and environmental hazards associated with oil exploration in the study areas. The effect of oil exploration has affected human health and the environment greatly by depriving the people their sources of economic, social and cultural livelihood. However, the negative effect of oil exploration in the areas could be ameliorated through putting in place a comprehensive scientific rehabilitating programme for the people, diversification of sources of income, adequate compensation for people affected by oil spill, government and other stakeholders in the oil industry provision of grants and soft loan to affected persons and the adoption of long distance farming and fishing which are viable potentials for alternative livelihood for the people.

Contributions to Knowledge

By balancing technical processes with human involvement for comprehensive risk management, this study has demonstrated the necessity of defining novel means of mitigating these operations' risk. It has also demonstrated that the operational context, characteristics of stakeholders, and legislation in the downstream sector in Nigeria make it especially crucial for risk managers and professionals to strike a balance between technical and human involvement in risk management. Additionally, it has projected the safety and environmental impact of pipeline and road-truck operations.

REFERENCES

Bubbico, R., Di Cave, S., Mazzarotta, B. and Silvetti, B. (2009) 'Preliminary study on the transport of hazardous materials through tunnels', Accident Analysis & Prevention, 41(6), 1199-1205.

Chaturvedi, A.D., Pal, D., Penta, S., Kumar, A (2015). Ecotoxic heavy metals transformation bybacteria and fungi in aquatic ecosystem. World Journal of Microbiology and Biotechnology 31, 1595-1603.

Chikere, C. B., Mordi, I. J., Chikere, B. O., Selvarajan, R., Ashafa, T. O., & Obieze, C. C. (2019). Comparative metagenomics and functional profiling of crude oil-polluted soils in Bodo West Community, Ogoni, with other sites of varying pollution history. Annals of Microbiology, 69, 495–513.

EIA (2011). Country analysis briefs. Energy Information Administration, Nigeria. https://doi.org/10.1080/09709274.2011.11906345

Iwayemi, A. and A. Adenikinju, 2001. Energy-environment-economy linkage in Nigeria. The Nigerian Economic Society, A General Equilibrium Assessment, Ibadan, Nigeria

Nnabo, P. N. and Taiwo, A. O. (2001). A historical survey of gasexploitation and associated problems with examples from parts of Nigeria. Journal of Environmental Sciences, 4: 42-54.

UNEP (2011). Environmental assessment of Ogoniland, United Nations Environment Programme, Nairobi, 257. http://www.unep.org/nigeria

Zabbey N, Tanee FBG (2016) Assessment of asymmetric mangrove restoration trials in Ogoniland, Niger Delta, Nigeria: lessons for future intervention. Ecological Restoration 34(3):245–257.

Aven, T., & Renn, O. (2010). Risk management and governance: Concepts, guidelines, and applications. Heidelberg, Germany: Springer.

Aigbedion, I and Iyayi S. E. (2007). Environmental effect of mineral exploitation in Nigeria. International Journal of Physical Sciences, 2: 33-38.

Adepelumi AA, Solanke AA, Sanusi OB, Shallangwa AM (2006). Model tank electrical resistivity characterization of LNAPL migration in a clayey-sand formation. Environ. Geol. 50: 1221-1233.
Adekoya JA (2003). Environmental Effect of Solid Minerals Mining. Journal of. Physical. Science. 625-640.