UNIVERSITY OF CAPE COAST

ENVIRONMENTAL IMPLICATIONS OF OIL AND GAS ACTIVITIES ON LIVELIHOODS OF CITIZENS IN AKYINKYIN IN THE WESTERN REGION OF GHANA

BY

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DECLARATION

Candidate's Declaration

I hereby declare that this dissertation is the result of my own original work and that no part of it has been presented for another degree in this university or elsewhere.

Signature: …… Date: ……..……..

Candidate's Name: Prince Safori Amponsah

Supervisor's Declaration

I hereby declare that the preparation and presentation of the dissertation were supervised in accordance with guidelines on supervision of dissertation laid down by the University of Cape Coast.

Signature: ……. Date: ……

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ABSTRACT

The development of Ghana requires adequate revenue generation from the oil and gas sector. In the country's quest to generate revenue for its development, a number of damages are caused to both the livelihoods of people in the oil producing areas and the environment. The research examined the environmental implications of oil and gas activities on the livelihoods of citizens in Akyinkyin in the western region of Ghana. Both the probability and non-probability methods of research were used. The study also employed the simple random sampling and purposive sampling methods in selecting respondents for the study. Questionnaire and focus group discussion guide was the main data collection instrument and a sample size of 350 respondents was used along with one focus group discussion. Frequencies, tables, percentages and thematic approaches were also used to present the data. The research found that the exploration of oil and gas activities led to high teenage pregnancies, reduced fishing and farming activities and loss of farmlands. It was also found that plant species and traditional herbs used for medicines have been lost and there have been oil spills into water bodies. It is therefore recommended that there should be an intensification of oil and gas monitoring activities in order to reduce oil spills and other environmental dangers.

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DEDICATION

To my family

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE

This research is undertaken to examine the environmental implications of oil and gas activities on the livelihoods of citizens in Akyinkyin in the Western region of Ghana.

Background to the Study

Oil plays significant role in every country's development agenda. It provides jobs, fuels power and social transformation and is often accompanied by development in infrastructural investments which helps to improve standards of living of people cushioning the growth of the economy (Adam & Tweneboah, 2009). Countries such as Saudi Arabia, United Arab Emirates, Nigeria, Norway, Kuwait, Qatar, United States of America and many others have seen considerable development due to revenues generated from oil. Norway, in over twenty years has recorded significant growth after oil discovery and exploration; Mexico and Malaysia have also seen significant growth as a result of oil production (Arbo, 2006).

In June, 2007 when oil was discovered on the Jubilee fields in Ghana, it brought excitement to the populace as the nation was to generate extra source of revenue for the country's development and economic growth agenda. Ghanaians were happy because oil producing countries have shown that there exists a relationship between development and oil production (Akabzaa, 2012). This development was evident when the Ghanaian economy grew by 13.6% in 2011 (Amarfio, 2010). Ghana earned $3.208 billion from petroleum revenues for the

production of 161.7 million barrels of crude oil between 2011 and 2015; In 2016, revenue from oil and gas recorded was GH¢972.55 million [$247.18 million] (Ghanaian Times, 2017).Although, there has been a fall in revenue, it is largely attributable to the fall in oil prices on the international market. Nonetheless, Ghana has become a destination for foreign direct investments and with the democratic development and stable political environment in the African sub region, the country is expected to achieve more reasonable economic growth.

As it is with many blessings of modern civilization, there are benefits and adverse externalities from the exploration and production of oil and gas. Thus, the appellation of "black gold," black connotes "evil", while gold epitomizes what is worthwhile (Louka, 2006). In spite of the astounding wealth from oil production, one of the negative externalities from the oil industry is environmental pollution occasioned by oil spillage and discharge of effluents (Kronenberg, 2004). In the view of Kraan (2009), environmental pollution is the price for the development steered by the petroleum industry and it has been asserted that even in the best oil field practice, oil spillage cannot be completely eliminated.

For instance, from mid-June 2010 to early August 2010, the white sandy beaches along Alabama's Gulf coast were inundated with crude oil discharged from Deepwater Horizon well (Opukri & Ibaba, 2008). The longterm consequences of this environmental devastation are still unfolding. Although there have been attempt to clean up the beaches, there still exist many unanswered questions regarding the physical, chemical, and ecological state of the oil contaminated beach system. The environmental clean-up is necessary as many

citizens depend on the environment for their livelihoods. In the oil producing region in Ghana, citizen's livelihood revolves around fishing of species such as herrings, tunas, marlins, sharks, sailfish, dolphins, burrito, barracuda, cassava fish, and lobsters. Other livelihoods include petty trading and vending by small and micro businesses. Oil pollution does not only destroy the ecosystem, it also brings a halt to the activities of citizens and results in health diseases.

In Nigeria, the oil industry operates hundreds of producing wells, gas plants, networks of thousands of kilometers of pipelines crossing the entire oil-bearing zone to the flow stations and terminals. This bee-hive of oil activities runs on a very fragile ecosystem in the Niger delta region. The Niger delta is Africa largest delta and the third world largest. It is one of the largest wetlands in the world, with about 2,370 square kilometers consisting of rivers, islands, creeks, swampy terrain and estuaries (Babatunde, 2010). It contains the most extensive fresh water swamp forest in the entire East and West Africa, the stagnant swamps covers 8,600 square kilometer and the coastline spanning over 450km. Although Nigeria has recorded several cases of marine pollution, there were two outstanding cases namely, the Funiwa-5 oil well blow-out of 1980 in which, over 400,000 barrels of crude spilled into the marine environment, as well as Mobil's Qua Iboe oil spillage of 1998 which resulted in the spillage into the marine environment of about 40,000 barrels of crude oil (Boschini, Jan & Jasper, 2007). These happenings have had significant impact on the Niger delta and its ecosystems.

In Europe, chronic oil pollution which occur as a result of deliberate or illegal operational discharges of oily waste from vessels have also impacted on the marine environment. For instance, the Torrey Canyon was a tanker that is known not because of its sheer size or memorable journeys, but because of its grounding near Land's End in 1967 and the considerable environmental damage inflicted. Over 120,000 and 223,000 tonnes of crude oil were released into the sea off Cornwell, South West England and the coast of Brittany, France (Ibaba & Olumati, 2009). The spectacular nature of major shipping incidents however does not make them the most important source of oil pollution at sea. Urban run-off and discharges, atmospheric fallout, natural seeps, offshore production and operational discharges during transportation at sea are considerably larger sources of pollution (Karl, 2004). Gylfason (2001) also espouses that illegal and incidental operational discharges from shipping and chronic oil pollution are the most important sources of marine wildlife casualties because they occur all the time and overlap between large seabird concentrations and busy shipping lanes.

The environmental pollution associated with oil exploration has serious implications for the survival of species in communities near oil reserves. Oil spillage pollutes water bodies thereby threatening fisheries and reducing tourism, harming bird life and severely affecting ecological ocean life (Gordon & Pulis, 2010). Krantz (2001) also asserts that the environmental pollution caused by oil drilling also results in a destruction of livelihoods in local communities making it difficult for the present and future generations to make a living of their land.

Farming and fishing activities, which is the backbone of the local communities in Ghana, may literally come to a halt with the pollution.

As responses to environmental issues, the United Nation Convention for the Law of the Sea (UNCLOS) has recognized pollution from vessels as one of the main threats to the marine environment (Larsen, 2005). In response, UNCLOS established the framework for the multi-lateral development of rules and standards acting mainly through the International Maritime Organization (IMO). The IMO has since adopted several instruments to control the environmental impact of shipping, the most important being the International Convention for the Prevention of Pollution from Ships.

Statement of the Problem

Oil plays a significant role in the development of Ghana. Besides being an important energy source, oil products serve as feedstock for several consumer goods, thus playing a growing and relevant role in people's lives. However, the oil industry holds a major potential of hazards for the environment, and may impact it at different levels, such as air, water, soil, and consequently all living beings on the planet. Within this context, the most widespread and dangerous consequence of oil and gas industry activities is oil pollution (Mensah, 2010). In his opinion, oil pollution is associated with all activities throughout the stages of oil and gas production, from exploratory activities to refining.

Wastewaters, gas emissions, solid waste and aerosols generated during drilling, production, refining and transportation amount to over 800 different

chemicals. Other environmental impacts include intensification of the greenhouse effect, acid rain, poorer water quality, groundwater contamination, biodiversity loss as well as the destruction of ecosystems. The pollution of oil and gas activities are also as a result of a continuous stream of oil into the sea from oil spills and deliberate, illegal discharges of oily waste from vessels (Mehlum, Moene & Trorvik, 2006). Oil spills can affect almost any form of life that it comes in contact with and can be detected in the environment even after thirty years of discharge.

These oil discharges are a constant threat to seabirds, lives of people and leads to far greater numbers of casualties over time (Sachs & Warner, 2001). A small amount of illegally dumped oil can be deadly to seabirds, especially those that spend most of their time afloat. They are particularly vulnerable to oil because even the smallest amount destroys the insulating and waterproofing abilities of their feathers. Worldwide, there is an estimated 3.6 million tonnes of oil spilt into the sea annually, mainly as a result of shipping accidents involving oil tankers and deliberate flushing of tanks and engines (World Bank, 2009).

Arguably, the most important pollution in the marine environment and coastal waters therefore, is petroleum and its products. For instance, Nigeria has recorded several cases of marine pollution, such as the Funiwa-5 oil well blow-out of 1980 in which, over 400,000 barrels of crude was spilled into the marine environment, as well as Mobil's Qua Iboe oil spillage of 1998 which resulted in the spillage into the marine environment of about 40,000 barrels of crude oil (Babatunde, 2010). These two cases draw attention to the circumstances of the

oil-barring enclave and the degree of risk to which people are exposed to on account of oil exploitation in the area.

"On November 3, 2011, fishermen working near the Jubilee oil field 60 kilometers off the coast of Ghana spotted a large oil slick floating towards the land. The next day dark syrupy ooze arrived onshore, coating beaches of several fishing communities and waterfront hotels in Ghana's Ahanta West District. The fishermen told authorities they suspected that the spill came from the offshore operations, but the incident was greeted with seeming indifference. No official clean-up was launched, and the community was left to clean up the mess itself" (Amarfio, 2010). Reports by non-governmental organizations show that the companies that developed the Jubilee fields and the World Bank Group officials who lend hundreds of millions of dollars to start the oil exploitation in Ghana were aware of the risks from the beginning. Also, the Ghanaian government lack adequate monitoring systems and regulators to monitor the industry and provide equipment needed to react to spills.

There have been a number of researches in the area of oil and gas exploration and its pollution. However, there is little literature undertaken in Ghana regarding how prepared and empowered citizens are in dealing with the problem of oil pollution. In consonance with these, the research assesses the environmental implications of oil and gas activities on livelihoods of citizens and how they are prepared in dealing with the challenges of oil pollution.

Objectives of the Study

The general objective of the study was to examine the environmental implications of oil and gas activities on the livelihoods of citizens in Akyinkyin in the Western region of Ghana. Specifically, the objectives of the research were to:

1. Examine the social effect of oil and gas activities on the livelihoods of the citizens in Akyinkyin in the Western region of Ghana.
2. Examine the environmental impact of oil and gas exploration on the livelihoods of citizens in Akyinkyin in the Western region of Ghana.
3. Assess the preparation of citizens to dealing with the challenge of oil pollution in Akyinkyin in the Western region of Ghana.

Research Questions

The following research questions guided the study:

1. What is the social effect of oil and gas exploration activities on the livelihoods of citizens in Akyinkyin in the Western region of Ghana?
2. What are the environmental impacts of oil and gas exploration on the livelihoods of citizens in Akyinkyin in the Western region of Ghana?
3. How prepared are citizens to dealing with the challenge of oil pollution in Akyinkyin in the Western region of Ghana?

Significance of the Study

Oil and gas exploration may provide several benefits to a country but its major pollution cannot be underestimated. The study helps to provide an

understanding into the impact that environmental pollutions have on the livelihoods of host communities in oil producing regions. It also helps to ascertain how host communities are prepared in dealing with the menace of oil disaster or pollution in the locality. The significance of this research also adds to existing literature on the environmental challenges of exploring oil and gas. This research would be useful to researchers, oil exploration companies, community members, Non-Governmental Organisations, Civil Societies, and the Government as it helps each player in preparing for the oil disaster damage should it happen in Ghana.

Scope of the Study

The study focused on the local community of Akyinkyin, in the western region of Ghana. This was to help ascertain from the host communities the environmental impact that the oil exploration have had on their livelihoods in the locality. The study is also limited to finding out on the preparedness of local communities in dealing with the challenge of oil and gas exploration activities in the community.

Organisation of the Study

The study was organised into five chapters. Chapter one focused on the introduction which includes background to the study, statement of the problem, objectives of the study, research questions, significance and scope of the study and organisation of the study. Chapter two reviewed literature on theories used in explaining the livelihoods of people. Chapter three dealt with the research

methodology which formed the backbone of this research. Chapter four presented the results and discussion of the research work. Chapter five drew on the summaries, conclusions and recommendations of the study.

CHAPTER TWO

LITERATURE REVIEW

Introduction

Literature review is relevant as it provides a justification for the study. It also provides a background that supports the study and lays a foundation towards understanding the research. This chapter of the study focuses on both theoretical and conceptual studies. The Sustainable Livelihood Framework (SLF) is used as the underpinning theory in helping understand the means to which people live. The concepts of livelihoods, the impact of oil and gas exploration on livelihoods are reviewed. Empirical evidences from oil pollution and its impact on livelihoods and the environment is also reviewed.

Theoretical Review

The Sustainable Livelihood Framework approach is used to explain the livelihoods of people and helps in understanding the means to which people live. The livelihood framework was initiated as far back as 1987 when Brundlandt Commission Report by the World Commission on Environment and Development (WCED) was published. The report acknowledged the concept of basic needs of the poor in so doing introduced concepts that were conceptualized later as sustainable livelihood development (Scoones, 1998). According to Tyler (2006), sustainable development is explained as meeting the needs of the present generation without compromising the ability of the future generations to meet their own needs. Chambers and Conway (1992) present sustainable livelihood as a

linking of the concepts of capability, equity and sustainability. These concepts form the backbone of the Sustainable Livelihoods Approach (SLA). This framework is adopted to understand the impact of oil and gas activities on livelihoods. Vatn (2005) describe that the Sustainable Livelihood Approach is a people-centered approach, thus, people rather than the resources are the primary concern.

According to Scoones (1998), the framework seeks to identify the most pressing challenges faced by people regardless of where they occur as well as to understand how to tackle the challenges people face. For instance, in the context of this study, sustainable livelihoods mean the ability of the local people to use their assets to maintain their productivity in the event of any major disturbance such as the oil and gas exploration on the livelihoods of the people (Ellis, 2001). He describes that the framework uses the assets owned, controlled, claimed, or in other way accessed by the household. Karl (2004) opines that it is crucial to mention that the assets of the people are not limited to cash, savings or other material means but include other non-material aspects such as "health, labour, knowledge and skills, friends and family." According to Ellis (2001), the Sustainable Livelihood Framework (SLF) has some main components which begin with the assets (physical, human, financial, natural and social capital).

The Human Capital asset comprises the labor market available, level of education and the health status or environment available (Doughty, Quattrini & Cordes, 2014). The quality and quantity of human capital in a household directly affects the economic situation of the society. Lack of human capital in the form of

skills and education is seen to affect the ability to secure a livelihood more directly (Karl, 2004). As stated by Burke, Singh and Theodore (2005), the oil industry employs mainly high-skilled workers to operate activities such as the running of the off-shore oil platforms and on-shore infrastructure, such as pipelines and refineries. The local population however has nurtured exaggerated expectations of employment opportunities. These hopes are likely to be dashed which, in turn, could lead to tensions between communities and oil companies. However, there could be an exception during the construction phase of the oil infrastructure when short-term employment of the local workforce is undertaken.

Financial Capital is also dependent on wages or proceeds of work and living costs in a household's success in developing a livelihood strategy. In contrast to rural areas where losses in earnings and income are often cushioned by subsistence form of life, monetary income is essential to survival in urban economies. As such increasing costs of living which is not matched by increasing incomes becomes a burden for most households whose income generating opportunities are limited. Physical capital consists of two basic needs of a household, thus, shelter and infrastructure. The costs of housing in oil producing countries are often high in relation to the price increase of goods and services. Infrastructural provisions are also overstretched and become more expensive as the demand for it continuously goes up. This pressure is transmitted to local land and house owners who begin to demand more than they usually would charge irrespective of the consumer's origin or income (Cabrales, 2010).

The Social Capital embraces all social and community networks as well as the migration of people from one area to the other. It emphasizes the importance of social interactions and structures amongst individuals and households. The impact of oil production on the local social community is important. It is believed that the influx of foreign workers and has consequences on oil producing regions. Sometimes communities could be shaken through resentment among those who do not have jobs. Even the men who get jobs in an oil and gas industry often abandon the traditional work and ways of life and this may become a motive for tension within the local community. Apart from those security threats, the increase of housing and living costs can trigger movements out of the community which destroys existing social networks. Sam-Okyere (2010) explains that the social relations, institutions and organizations can obstruct or enable access to assets and activities.

He further opines that the external factors which is also described as the vulnerability context, comprises trends and shocks that cannot be controlled by the household affects access to assets and activities. According to Chambers and Conway (1992) vulnerability is explained as being powerless, uncertain, and being exposed to risks, shocks and stress. It includes external threats such as climatic factors, market forces or unexpected and unforeseen disasters (Ellis, 2001). The concept of vulnerability as used in analysing the Sustainable Livelihood Framework comprises three elements, thus, shocks, seasonality and critical trends. Vulnerabilities are external to the local people, yet have the

capacity of determining their livelihoods and establishing which strategies should be put in place to realize them.

In the opinion of Karl (2004), vulnerabilities include diseases, deaths, floods, storms, droughts, famine, and changes in prices of goods and services and new technology. For instance, in fishing families, they are no less prone than other rural dwellers to adverse events and trends, with natural fluctuations in fish stocks being especially critical for them. According to Macartan, Sachs, Stglitz and Sors (2007) also argue that in order to reduce the vulnerabilities of the people, there is the need to design an approach and implement strategies to militate against the occurrences. The approach deals with the construction of livelihood strategies which comprises of a group of activities, some of which may be natural resource based and others non-natural resource based (Kjeldsen, 2010). The framework concludes with outcomes of livelihood strategies which are categorized into livelihood security effects and environmental sustainability effects (Ellis, 2001).

In the opinion of Chambers and Conway (1992), shocks, trends and seasonality could have long term or short-term effects, and may have an impact on coastal areas. In the short term, investors will invest in the region and job opportunities will be created for the local people (Amarfio, 2010). Through Corporate Social Responsibility projects, the oil and gas companies and government institutions will embark on development programmes such as the building of new schools or refurbishing old ones, provision of potable drinking water and the construction of road networks. In the long term, if not managed

well, oil and gas can result in tensions between the local people, oil and gas companies and the government. This could lead to the loss of livelihoods (Krantz, 2001).

Concept of Livelihood

The livelihoods of people in every jurisdiction are paramount to governments all over the world. Krantz (2001) says ensuring that people have livelihoods is not only making food available on the table but providing facilities that support the fundamental needs such as portable water, social amenities and jobs for the people. Livelihood in the opinion of Karl (2004) implies a means to a living. Chambers and Conway (1992, p.7) defines livelihood as "comprising of the capabilities, assets (stores, resources, claims and access) and activities required for a means of living: a livelihood is sustainable if it can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the short and long term." According to this definition, a livelihood must possess the element of sustainability and must be able to recover from stress or shocks. The definition by Chambers and Conway (1992) reflects certain key components of livelihoods which includes a range of assets out of which people construct their living, and this comprises tangible assets and resources, and intangible assets such as claims and access (Krantz, 2001).

Scoones (1998, p.5) modifies the definition by Chambers and Conway (1992) and defines that "livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. He also asserts that a livelihood is sustainable if it can cope with and recover from stresses and shock, maintain or enhance its capabilities and assets, while not undermining the natural resource base." Ellis (2001) also describes livelihood as the assets (natural, physical, human, financial and social capital), the activities, and the access to these (mediated by institutions and social relations) that together determine the living gained by the individual or household. He further posits that the definition shows how agents in a management situation interact and make choices but fails to convey the element of change over time and adaptation to evolving circumstances. He further postulates that people use various survival strategies through diversification to earn a living. Though many of the people may be engaged in one occupation, the income from this source may be used to acquire other means of generating income such as building a house or buying a vehicle.

People find diverse range of activities and assets in order to survive and to improve their standard of living. This means that social relations play an important role when institutions are introduced to control the behaviour of people. The relevant consideration is to determine the degree of access individuals have to whatever resources that will be made available to be used for income generation. The access constitutes the rules and social norms that determine the different ability of people to own, control, or make use of resources such as land and

common property (Ellis, 2001). Akabzaa (2012) also demonstrates that the impact of social relations for example gender or class helps in determining the abilities of people to make a living. They further describe that it can also be extended to cover not just the right but the ability to take part in and derive maximum benefits from social and public goods and services. Burke, Singh and Theodore (2005) assert that any alternative means of livelihood that grants a high degree of access to local residents who may be negatively affected will be held in high esteem.

Although there have been several problems generated by the oil and gas industry, it is important to record that the discovery and exploration of oil have engineered development in local communities. According to Mensah (2010), oil discovery and exploration has benefited communities through the provision of jobs, schools and medical facilities. Allotey (2010) reveals that in Alaska, residents received individual allowances from oil rent trust fund. In Norway, citizens receive substantial social services and invest oil rents in a permanent fund for the future (Bakke, Klungsoyr & Sanni, 2013). In Africa, Botswana serves as a good example of the ways in which natural resources, in this case diamonds, can be used wisely to the benefit of African citizens. For instance, natural resource companies have implemented a number of appropriate policies that ensures the judicious use of the financial resources such as a future generations fund and substantial investments in health and education across the board (Blowfield, 2005). In countries such as Nigeria where the discovery of oil has had little or no effect on the population, corruption has been the practice (Babatunde, 2010). In attempts to reduce corruption, the World Bank in conjunction with a number of

other civil society groups has put together the Extractive Industries Transparency Initiative (EITI). This initiative supports improved governance in resource-rich countries through the verification and full publication of company payments and government revenues from oil, gas and mining (World Bank, 2009).

Environmental Oil Pollution

Industrial exploitation of oil and gas reserves in shallow marine areas started since 1897. By the 1960s, this exploitation had moved into deeper offshore areas as easily accessible resources declined, and technology for offshore drilling improved. Presently, drilling for oil and gas occur in all offshore environments, with major deep-water production in areas such as the Arctic, northern North Atlantic Ocean (United Kingdom and Norwegian waters), East and West Africa, Gulf of Mexico, South America, India, Southeast Asia, and Australia (Beanlands & Duinker, 1984). Bakke, Klungsoyr and Sanni (2013) explain that the activities of deep-water oil and gas exploration have environmental consequences and affects species, populations, and ecosystems by modifying a variety of ecological parameters such as biodiversity, biomass, productivity, and many others.

In the view of Bakke, Klungsoyr and Sanni (2013), oil and gas activities have damaging environmental effects during each phase of exploration, production, and decommissioning. Barro and Lee (2001) describe that in the exploration phase, environmental impacts can result from indirect (sound and traffic) and direct physical (anchor chains, drill cuttings, and drilling fluids) disturbance. They further argue that other direct physical impacts occur in the

production phase as pipelines are laid and the volume of discharged produced water increases. The Continental Shelf Associates Incorporated (2006) are also of the view that at the decommissioning stage, it can result in a series of direct impacts on the sea floor and can re-introduce contaminants to the environment. They assess that environmental impacts from deep water oil and gas development activities commence during seismic surveys that are used to reveal the subsurface geology and locate potential reservoirs. These impacts include underwater sound and light emissions and increased vessel activity. Sound levels produced during seismic surveys vary in intensity, but in some cases, sound waves from these surveys have been detected almost 4,000 km away from the survey vessel (Daan & Mulder, 1996).

The effects of theses sound levels include disruption of behavior such as feeding, breeding, resting, migration, masking of sounds used for communication and navigation, localized displacement, physiological stress, as well as physical injury including temporary or permanent hearing damage (Doughty, Quattrini & Cordes, 2014). They also lament that marine mammal exposure experiments and noise propagation modeling suggest that hearing damage may occur within a few 100 meters to kilometers from the sound source, with avoidance behaviors more variable but generally detected over greater distances. In contrast, the potential effects of sound on fish and invertebrates remain poorly understood, but may be significant (Fidler & Noble, 2012). For instance, they assert that significant developmental delays and body malformations have been recorded in scallop larvae exposed to seismic pulses.

Doughty, Quattrini and Cordes (2014) identify that exposure to underwater broadband sound fields that resemble offshore shipping and construction activity can also influence the activity and behavior of key bio-turbating species in sediments. Operations at oil fields introduce considerable amounts of artificial light that can potentially affect ecological processes in the upper ocean, such as the vertical migration of plankton (Gordon & Pulis, 2010). Further, they assert that artificial night light attracts numerous species, including squid, large predatory fishes, and birds. Daan and Mulder (1996) also address that underwater lighting, such as remotely operated vehicles, may impact species with extremely sensitive visual systems. They further demonstrate that the laying of pipelines also alters local sea bed habitat conditions by adding hard substratum which in turn may support sessile epifauna and attracts motile benthic organisms. The drilling process involves the disposal of waste, including drill cuttings and excess cement, drilling mud, produced water, and other chemicals that may cause detrimental ecological effects (Opukri & Ibaba, 2008).

Oil and gas operations have the potential to result in accidental releases of hydrocarbons, with the likelihood of an accidental spill or blowout increasing with the depth of the operations (Tyler, 2006). In United State of America there were 23 large spills of more than 1000 barrels of oil, or an average of one every 21 months between 1971 and 2010 (United Nations Development Programme, 2006). He further reveals that on a global scale there were 166 spills over 1000 barrels that occurred during offshore transport of oil in the period between 1974 and 2008, or one every 2.5 months. The greatest risk to the marine environment

comes from uncontrolled release of hydrocarbons from the reservoir, known as a blowout (Opukri & Ibaba, 2008). Several major offshore oil blowouts have occurred, including the IXTOC-1 well in the Bahia de Campeche, Mexico where 3.5 million barrels of oil were released at a water depth of 50 m over 9 months and the Ekofisk blowout where 200,000 barrels of oil were released at a water depth of 70m (Bakke, et. al., 2013). While all of these examples represent discharges, the frequency at which they occur in offshore waters suggests that they can be expected during "typical" operations. It is therefore necessary to review the effects of these oil pollutions in the sea on the natural environments in which people's livelihood are depended on.

Empirical Review on Implications of Oil and Gas Exploration on Livelihoods

In a research conducted by Robinson, Torvik and Verdier (2006) on the topic *"Environmental impacts of the oil and gas industry in Brazil,"* they demonstrate that the oil and gas industry holds a major potential of hazards for the environment, and impacts the environment at different levels; air, water, soil, and living beings on the planet. She laments that the most widespread and dangerous effects of oil and gas industry activities is pollution which is associated with all activities throughout all stages of oil and gas production, from exploratory activities to refining. Nemerow (1971) also in his research identified that wastewaters, gas emissions, solid waste and aerosols generated during drilling, production, refining are responsible for most of the pollution.

The impact of oil exploration does not only affect human beings but plants species (Louka, 2006). Environmental impacts of oil exploration affect plants some of which are used by the local communities near the oil field. Bennett (2002) reports that the construction of pipelines leads to the destruction of medicinal plants used by the local populations. This report was also supported by Boateng (2008) who corroborates that environmental destruction through oil exploration, led to the scarcity of medicinal plants used by traditional birth attendants in Nigeria. The environmental pollution associated with oil exploration has serious implications for the survival of species in communities near oil reserves. Bennett (2002) also reveals that oil spillage pollutes water bodies thereby threatening fisheries and reducing tourism, harming animal life and severely affecting ecological ocean life.

United Nations Environmental Programme [UNEP] (1997) reports that emission of greenhouse gases and other gases into the air are as a result of oil and gas activities. The operations of oil and gas emit atmospheric gases such as carbon dioxide, carbon monoxide, methane, volatile organic carbons, nitrogen oxides, sulphur dioxide and hydrogen oxide. They also report that it leads to flaring, venting and purging of gases, and the combustion process such as fugitive gases from loading operations and tankage losses from process equipment, airborne particles from soil disturbance during construction and from vehicle traffic and particulates from other burning sources are as a result of emissions.

Discharges of waste water from oil activities also pollute the environment (Vogel, 2005). The volume of waste produced depends on the stages of oil

activities and UNEP (1997) reports that seismic operations produces minimal waste volumes mainly from camp and vessel activities and exploratory drilling causes effluents, mainly drilling fluids and cuttings. Other aqueous wastes include treatment chemicals, process, wash and drainage water, sewerage, sanitary and domestic waste, spills and leakages, and cooling water. Tyler (2006) also posits that potential negative impacts include noise and light, solid waste disposal onshore which impact on local infrastructure, vegetation, and erosion. The exploration of oil according to Walker (2002) engenders ecological violence. Oil extraction involves several environmental pollutions and Vatn (2005) indicates that oil and gas exploration affect the environment in various negative ways by exposing it to oil leakages and spills, gas flaring, and deforestation as a result of the creation of access routes to new areas.

United Nations Development Programme [UNDP] (2006) reports that gas flaring without temperature or emissions control pollutes the air and releases unacceptably high levels of carbon dioxide into the atmosphere. For instance, Walker (2002) reveals that in Ogoniland, two independent studies revealed total petroleum hydrocarbons in the streams are between 360 and 680 times the European Community permissible levels. Oil spillages are also quite frequent in oil fields in the global south. The UNDP (2006) report showed that there were 5,400 officially recorded oil spillages in the Niger Delta. Sachs and Warner (2001) also reports that oil spills are far more frequent in the global south than in the north and that 37% of Shell's spills worldwide occurred in the Niger Delta.

Vogel (2005) demonstrates that environmental pollution caused by oil drilling results in the destruction of livelihoods in local communities making it difficult for the present and future generations to make a living on their land. Farming and fishing activities, which are one of the major economic backbones of the Ghanaian economy, can be brought to a standstill with the exploration of oil. This could be evident in people abandoning farming and fishing and then going into oil exploration. In certain situations, the oil exploration could destroy the farms and water bodies. Robinson, Torvik and Verdier (2006) report that the impact of oil exploration activities of Chevron has destroyed farm lands and polluted water bodies. They report that agricultural products such as cassava, okro, pepper and others have all been destroyed. Boateng (2008) also reveals that the ten-kilometer construction of the Gbaran Deep Oil Field led to the destruction of seasonal streams, lakes, swamp pools and other water bodies which have been relied on by community members from the Gbaran field for fish, shrimps and lobster.

The socio-economic impact according to Aaron (2006) demonstrates that oil pollution destroys the biodiversity, and renders the agricultural sector, which is the largest employer of labour in Ogoni community, unprofitable. Also, gas flaring has also made it impossible for the community members of Uzere in the Delta State of Nigeria to continue to fish (Babatunde, 2010). Further, the people of Ogoniland, Nigeria who earn their living as farmers attest to the ways in which the execution of oil projects compromises their livelihoods. For example, in April 1993, farmlands close to the Ogoni pipeline were demolished with no regard for

the crop growing on the land. The situation is no different in Cameroon where the construction of the Chad-Cameroon oil pipeline by ExxonMobil, Petronas and Chevron have had serious survival implications for the Bagyeli (UNDP, 2006). This is because the pipeline project left a 30-meter-wide gap through the forest, where the Bagyeli hunted, gathered and cultivated crops. The effect of this is the loss of land and access to resources upon which Bagyeli livelihoods have traditionally been based (Opukri & Ibaba, 2008).

In the Philippines, it is reported that oil exploration is affecting the fish population as some local fishes are disappearing threatening the livelihood of over 200,000 fisher folks (Mensah, 2010). The local traditional occupations of community members are not only sustainable due to the destruction of the environment through oil explorations, but the people are also vulnerable. This is because no significant efforts are made to develop alternative means of livelihood for them. According to Osterud (2007), jobs in the oil industry often go to well-paid expatriates and Nigerians from less marginalized parts of the country while the residents of the oil fields get casual jobs. This is evident in the case of the people of Bagyeli who lost their traditional livelihood as a result of the pipeline project, but only 5% of them were employed by the project (UNDP, 2006). Although the UNDP (2006) report does not give an accurate number of how many people constituted the 5% of the Bagyeli, who got jobs from the oil project, it is clear that the people who benefited were the last from any ‘left over’ trickling down effect of oil exploration in the Gbaran community (Boateng, 2008). Adam

and Tweneboah (2009) argue that oil producing countries in totality have a poor record of incorporating local residents into the formal labour force.

Oil exploration has tremendous effect on the health of citizens mainly within the exploration site. Akabzaa (2012) asserts that communities near oil explored areas have poor health status and the situation is worse especially in communities in developing countries, mainly because of non-compliance to regulations on making the environment clean and sustainable. The United Nations Environmental Programme [UNEP] (2007) report demonstrates that exploration of natural resources has the predisposition to cause health risks in communities within developing nations. This evidence is supported by the occurrences in the Niger Delta where community members have been predisposed to diseases such as skin rashes, respiratory diseases, coughing up blood, tumours, gastrointestinal problems and different kinds of cancers. It is further supported by the works of Arbo (2006) who revealed that people who reside close to oil fields have a high capacity of developing hematopoietic diseases. They further demonstrated that people who live in communities where oil is explored are more prone to developing various kinds of cancerous diseases. For instance, in Ecuador, where oil was explored in communities, different kinds of cancerous diseases were observed in the population below 10 years.

Ibaba and Olumati (2009) also reveal that most petroleum products contain carcinogenic compounds which can lead to public health issues. Okoli (2006) in his study reports that oil activities in communities are linked to fever due to heat generated by gas flare activities, various gastrointestinal disorders

contracted by drinking rain water, water from polluted rivers and streams or the consumption of fish from polluted water bodies in oil mining communities. He further reiterates that there is also the link of oil activities to various respiratory ailments such as bronchitis, asthma, cough asphyxiation as well as ocular diseases. Auty (2001) also reports that pregnant women living close to oil fields have higher mortality risk and are predisposed to high incidence of delivering defect children. Burke, Singh and Theodore (2005) also reveal that women living in communities near oil fields are at a higher risk of spontaneous abortion. An increase in the ill-health of citizens in an oil-producing community increases the work burdens of the people. In Sudan, 27 adults and three children have died since 2006 as a result of consuming contaminated water from oil fields (Continental Shelf Associates, 2006). They also report that explosions from pipelines have resulted in injuries and cases of deaths in the local communities where oil is explored.

The World Bank (2009) report reveals that because the products of the oil industry are mostly combustibles and explosives, accidents such as fires and explosion usually occur and these have repercussions on the lives of people. For instance, in October 1998, a pipeline leak led to an oil flood near the village of Jesse in the Niger Delta which resulted in an explosion in which over 700 people were reported to have died. These explosions have not only been caused by pipeline leakages but have also happened as a result of people siphoning oil from the fields. In a recent report released by a group of scientists from the Faculty of Pharmacy, University of Lagos, it was found that water samples collected from

the sea, river, bore holes, lagoons and beach from the Niger Delta region especially in Delta and River States, indicates that more than 70% of the water in the Niger Delta contains a chemical called Benzopyrene, with a high concentration of 0.54 to 4ug per liter, far above the World Health Organization (WHO) recommendation of 0.7ug/1 for drinking water (Walker, 2002).

Adam and Tweneboah (2009) also posit that one other cause of poor health in communities where oil is explored is influx of migrant population. Because of the lucrative nature of the oil business, many people even from the urban centers travel to oil explored areas in search of employment and as a result, population in these oil communities tend to increase causing congestion which further leads to health risks among lives. In some cases, new settlers and migrant workers become vectors through which new diseases are carried to the local communities. Kjeldsen (2010) reveals the case of the Ecuadorian Amazon where new settlers and migrant workers of ChevronTexaco introduced various diseases to the local population.

Conceptual Framework on Implications of Oil and Gas Activities on Livelihoods

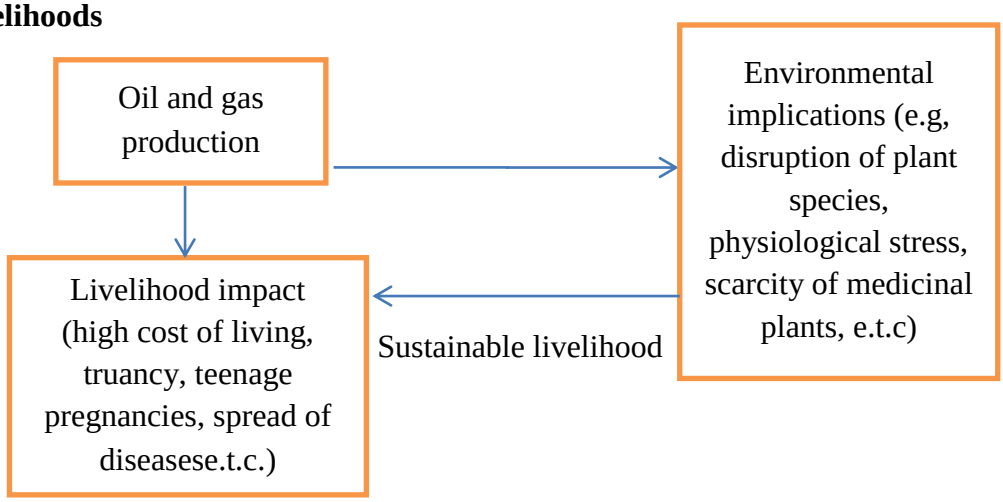

Figure 1: Environmental Effect of Oil and Gas Activities on Livelihood

Source: Amponsah (2017)

The production of oil and gas activities has presented both positive and negative impact to the people of Ghana. Positively, it has added to the income stream of the country contributing to the growth and development of Ghana. However, negatively, it has presented environmental implications to the people who live close to the oil exploring site and its environs. Environmentally, oil and gas production has caused disruption of plant species, loss of medicinal plants, and spread of diseases to animals, humans and loss of fishes and physiological stress. These environmental implications as depicted from the diagram also impacts livelihood conditions of the people. Livelihoods conditions of oil exploring communities are high due to the influx of immigrants to the community. As a result of foreigners and other many people traveling to settle in the communities, many young girls are influenced by money which then results in

teenage pregnancies and spread of other diseases. Oil and gas production activities present uncertainties which impinge on the livelihoods of people in rural areas and tend to affect livelihood change occurring in communities. The gain of a sustainable livelihood is then under threat given the levels of environmental implications which is reflected in shocks.

Brief Background of the Study Area

The study area for this research is "Akyinkyin," a small fishing community in the Ahanta West District of the western region of Ghana. It is usually known as "The Cape Three Point." The community has been at the center of oil and gas exploration since the discovery of oil in the Western region and a number of oil producing companies such as Tullow, ExxonMobil and others have moved to settle in the community. The main economic activity in Akyinkyin is fishing but during the lean seasons, farming becomes a replacement to fishing activities. Crops such as cassava, yam, plantain, tomatoes and other vegetables are grown but are on smaller scales.

CHAPTER THREE

RESEARCH METHODS

Introduction

Research methodology is a process that systematically finds solutions to research problems. According to Bryman (2004), a research methodology is important to a study because it helps to understand the assumptions underlying various techniques and procedures which are applicable to certain problems. The research methodology comprised the study area, study design, study population, sampling, data collection methods and instrument, data analysis and ethical issues.

Research Design

The study employed the quantitative and qualitative method of conducting research. Quantitative data is usually produced by coding some data, which is reduced to a number by stripping off the context and removing content from it. Qualitative studies also involve a language of cases and context, examines social processes and cases in their social context and study interpretations or meanings in specific socio-cultural settings (Neuman, 2011). In specific terms, cross sectional and descriptive designs were adopted in this study. Cross sectional studies capture aspects of social life including population characteristics, individual behaviour, social interaction and aspects of social groups, institutions and structures (Cosby, 2007). This helps to provide a deeper understanding of issues regarding the livelihoods of the people of Akyinkyin. Descriptive research

is the method used to obtain information that describes the world as it exists (Bryman, 2004). This design was used because the substance of this study entails a detailed explanation of how the livelihoods of the people of Akyinkyin are affected by oil pollution.

Population

A study population is the number of people in a particular area but for the purposes of research, a researcher is free to define population in whatever way is considered appropriate to address the research question (Neuman, 2011). For the purpose of this research, the population of the study comprised all persons in the Akyinkyin locality including local leaders, fisher folks, traders and fishermen.

Sampling

Sampling is the process of selecting from a larger population a small collection or units and examining in detail to understand a much larger set of cases. This research employed both the probability and non-probability sampling technique. The simple random and purposive sampling techniques were employed in the study. The two methods were used due to the variability of the study topic. The simple random sampling method is a probability sampling technique that was used in selecting respondents. The simple random sampling method was used because it involves a selection process that gives every possible sample of a particular size an equal chance of being selected.

The purposive sampling is a non-probability sampling method used in field research in which the researcher uses a wide range of methods to locate all possible cases of a highly specific and difficult to reach population. The purposive sampling is appropriate to select unique cases that are especially informative. This method is relevant as it helps in identifying the respondents needed purposely for the research. The purposive sampling was used in the selection of the chief fisherman, Assembly member, key informants and other opinion leaders. These people were chosen because of their in-depth knowledge about fishing activities and the livelihoods of the people. These people provided an understanding into the environmental impact of oil pollution on their livelihoods since oil exploration began in 2011. According to the sampling distribution table developed by Krejcie and Morgan (1970), a population of 95,140 requires a sample size of 398. Though, the sample size was 398, a response rate of 88 percent representing 350 respondents was retrieved for analysis. The researcher was unable to retrieve all 398 questionnaires due to the non-responsiveness of some research subjects and their unwillingness to return the questionnaire to the researcher. Some research subjects had also misplaced the questionnaires given to them, hence the response rate.

Data Collection Procedures

Questionnaire administration and focus group discussion were used asthe primary means of collecting data for the research. Data collected from these sources focused on the research questions in helping address the research

problem. Bryman (2004) describe that questionnaires are used as the generic term but can be distinguished between face-to-face, telephone, postal self-administered and internet as different methods of administration. In this study, face-to-face method of administration was employed because of many respondents could not read and write. The survey method was used because it was less costly and ensured standardisation of measurements. The focus group discussion method was also used as a method of collecting data. Respondents were put in a group of eight persons to discuss the issues under study. Data collection lasted for one week beginning 28th September, 2017 to 5th October, 2017. Efforts were made to retrieve eighty eight percent of the data from the sample size.

Data Collection Instruments

The data for the study was collected using primary sources. The primary sources of data were collected from the field by the use questionnaires, interview schedules and focus group discussion (FGD) guides. Questionnaire was grouped in three sections, thus, background information of respondents, social effect of oil and gas exploration on livelihoods and environmental impact of oil and gas exploration on livelihoods. The last objective was covered mainly by the focus group discussion guide. The study also used voice recorders to record the interviews. The focus group discussion guide was used to seek detailed information from the respondents. The voice recorder was also used in gathering information in order to capture and record up to date interviews which was not

captured using FGD guides. This helped the researcher to ascertain detailed information relating to the livelihoods of the people.

Data Processing Tool and Analysis Technique

The questionnaires gathered from the field was cleaned, edited and inputted into the Statistical Product for Social Sciences (SPSS) version 22. Frequencies, tables and percentages were the output generated from the software that was used in analysing the information. Data from the focus group discussions was also transcribed, edited and analysed using themes. After transcription, the data was arranged and categorised under various sub headings and grouped using themes. All data was analysed during a period of one month beginning 10thOctober, 2017 to 2nd November, 2017.

Study Area

"Akyinkyin" is a small fishing community in the Ahanta West District of the western region of Ghana. It is located between Dixcove and Princes town all located at 0 latitude, 0 longitude and 0 altitude. It is usually known as "The Cape Three Point." The capital of Ahanta West district is Agona Nkwanta which has a land area of 591 kilometers with a population of 95,140 (Ghana Statistical Service, 2010). At the current growth rate of 3.2% it is estimated that the population would be 102,186 by 2017 (Ghana Statistical Service [GSS], 2010). The increase in population growth in the district over the periods has been attributed to the migration of people from different parts of the country towards

the locality due to the exploration of oil and gas in the area. The community has been at the center of oil and gas exploration since the discovery of oil in the Western region. A number of oil producing companies such as Tullow, ExxonMobil and others have moved to settle in the community. With the recent oil and gas development and increasing manufacturing activities, the cost of residential accommodation has doubled, coupled with the impact of oil pollution on the environment leading to destruction of plant species and scarcity of medicinal plants.

The main economic activity in Akyinkyin is fishing but usually during the lean seasons, farming becomes a replacement to fishing activities. Fishing activities in the community has also been impacted negatively leading to loss of fishes as a result of oil and gas production. Crops such as cassava, yam, plantain, tomatoes and other vegetables are grown but are on smaller scales. The men go fishing while the women engage in fish mongering. The women usually buy the fish, smoke them and sell to other people. Other economic activities engaged in by community members include petty trading, hairdressing, dressmaking, furniture works, block making and many others. As a result of the oil exploration, fishing has been redirected to other areas along the coast and fishermen now fish far away offshore from their communities. Fishermen sometimes migrate to other coastal areas in the sub-region in response to availability of fish, the price of fish or the need to raise money to pay back accumulated debts or to invest. Such migration could be short term (seasonal), long term or sometimes permanent. Some fish traders during the lean season also adopt the strategy of purchasing

frozen fish from cold stores, which they later smoke for sale. These strategies are adopted in order to earn incomes to facilitate loan repayments and also cope with hardships associated with low fish catches.

The area of study was chosen because it is the closest to the oil discovery sites and one of the most affected communities by the oil and gas exploration. With the exploration of oil and gas in the region, most fishermen and farmers have complained about the threatening nature to their source of livelihood and the environmental implications to their lives. It was therefore necessary to investigate the environmental implications of oil and gas activities on the livelihoods of the people and how prepared they are in managing oil disasters.

Ethical Issues

The research ensured the element of confidentiality of information and truthfulness. This helped protect information gathered from respondents and the researcher ensured that responses given by participants could not be traced back to the respondents in the analysis. Respondent's names were not included in the interview to ensure confidentiality. The recorded information gathered from the interviews was transcribed for further analysis. Respondents were required to provide informed consent and their voluntariness in participation and the freedom to decline or withdraw at any time during the research process (Silverman, 2006). The focus group discussion lasted forty five (45) minutes.

Study Limitation

Despite the success of the study, there were some constraints that the researcher faced. Some respondents exhibited non-cooperative attitudes towards the researcher. Retrieval of questionnaires was very difficult and the researcher had to visit respondents several times. The researcher had to give out monies to research subject before granting interviews. Despite these challenges, efforts were made to conduct the focus group discussion and also retrieve 88 percent of questionnaires given out for analysis.

Chapter Summary

This section focused on the approaches used in carrying out the research. It also provided for the ethical issues and limitations that were encountered in conducting the study. In broader terms, the research methodology focused on understanding the practicalities involved in making the research outcomes scientific. In the next chapter, results ascertained from the field are presented and analysed using descriptive and inferential statistical tools. Literature from chapter two is also linked to the analysis of the study to confirm or disagree with the findings.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

This chapter of the study presents the results and discusses data collected from the field. The chapter is grouped into two main sections. The first section analyses the demographic characteristics of respondents and the second section addresses the objectives of the study. Statistical Product for Social Sciences version 22 was used in analysing data collected whilst tables, charts, frequencies, and percentages were also used in analyzing data. The focus group discussion also included the Assembly member for Akyinkyin, chief fisherman, fishermen, fishmongers, petty traders and farmers.

Background Characteristics of Respondents

The background characteristics of respondents are in relation to sex, age, and length of years stayed in the community.

The sex of the respondents is presented in Table 1:

Table 1: Sex of respondents

Sex	Frequency	Percentage (%)
Male	300	86.00
Female	50	14.00
Total	350	100.0

Source: Field data (2017)

The research revealed that three hundred (86%) of respondents were males while fifty (14%) of respondents were females. This indicates that responses were mostly dominated by males. Males are the dominant group in the community and this represent the reason for many males taking part in the survey.

Age of Respondents

The age of respondents is important to this research as it helps to know how knowledgeable the respondents are in terms of their knowledge on the community and the level of contribution they can make to this study. The age of respondents is presented in Table 2.

Table 2: Age of Respondents

Age	Frequency	Percentage (%)
30 - 35yrs	150	43.00
36 – 40yrs	60	17.00
41 – 45yrs	75	21.00
46 – 50yrs	30	9.00
51yrs and above	35	10.00
Total	350	100.0

Source: Field data (2017)

The age distribution of the respondents also indicated that one hundred and fifty (43%) of respondents were between the ages of 30 and 35 years; sixty (17%) of respondents were between the ages of 36 and 40 years; seventy five (21%) of respondents were between the ages of 41 and 45 years; Thirty (9%) of

respondents were also within the ages of 46 and 50 years while thirty five (10%) of respondents were above the age of 50 years. A greater proportion of the respondents are within the age bracket of 30-45years which are actively involved in fishing activities. This implies that the impact of oil and gas activities is likely to affect the livelihoods of many people as these groups of people are the bread winners of their household.

Marital status of respondents

The results on respondents' marital status is presented in Table 3

Table 3: Marital Status of Respondents

Marital status	Frequency	Percentage (%)
Single	20	6.00
Married	290	83.00
Divorced	40	11.00
Total	350	100.0

Source: Field data (2017)

The study shows that twenty (6%) of respondents are single while two hundred and ninety (83%) of respondents are married. However, forty (11%) of the respondents have divorced.

Level of education of respondents

The results on respondents' educational level is presented in Table 4

Table 4: Educational Level of Respondents

Educational level	Frequency	Percentage (%)
Primary	130	37.00
Junior High	120	34.00
Senior High	100	29.00
Tertiary--		
Total	350	100.0

Source: Field data (2017)

The finding revealed that one hundred and thirty (37%) of respondents had attended up to primary school; One hundred and twenty (34%) of respondents also have completed junior high school; One hundred (29%) of respondents had also completed senior high school; and none of the respondents had completed tertiary education. The outcome of the study is not surprising as many of the people are into fishing and farming which has been the major economic activity in the community.

Length of years in the community

Respondents were also asked how long they have lived in the community and the result is presented in Table 4.

Table 4: Length of Stay in the Community

Length of stay	Frequency	Percentage (%)
15 – 20yrs	50	14.00
20yrs and above	300	86.00
Total	350	100.0

Source: Field data (2017)

The study revealed that fifty (14%) of people have lived in the community for between 15 and 20 years. The study further revealed that three hundred (86%) respondents have lived in the town for over twenty years. All respondents who lived in the town for over twenty years are people who have lived there since birth. This goes on to show that the people who were sampled for this study have in-depth knowledge of the town which is in agreement with the assertion by Tyler (2006) who argue that people who live in a particular locality over a long period of time have requisite knowledge about the place and are able to express their views better about the locality.

Social Implications of Oil and Gas Activities on Livelihoods

One of the important effects of oil exploration on communities is its socio-economic impacts, specifically, the way in which it affects livelihoods. This section of the study therefore examines the socio-economic implication of oil and gas activities on the livelihoods of community members. First, the research found out from respondents whether the exploration of oil and gas has had impact on the livelihoods of the people. It was revealed that all (100%) respondents answered in

the affirmative that oil exploration has had significant negative impact on livelihood situation in Akyinkyin. Further, respondents were to identify the extent to which they agree that oil and gas exploration activities in the community has had effect on the livelihoods of the community. The responses from respondents are presented in Figure 2.

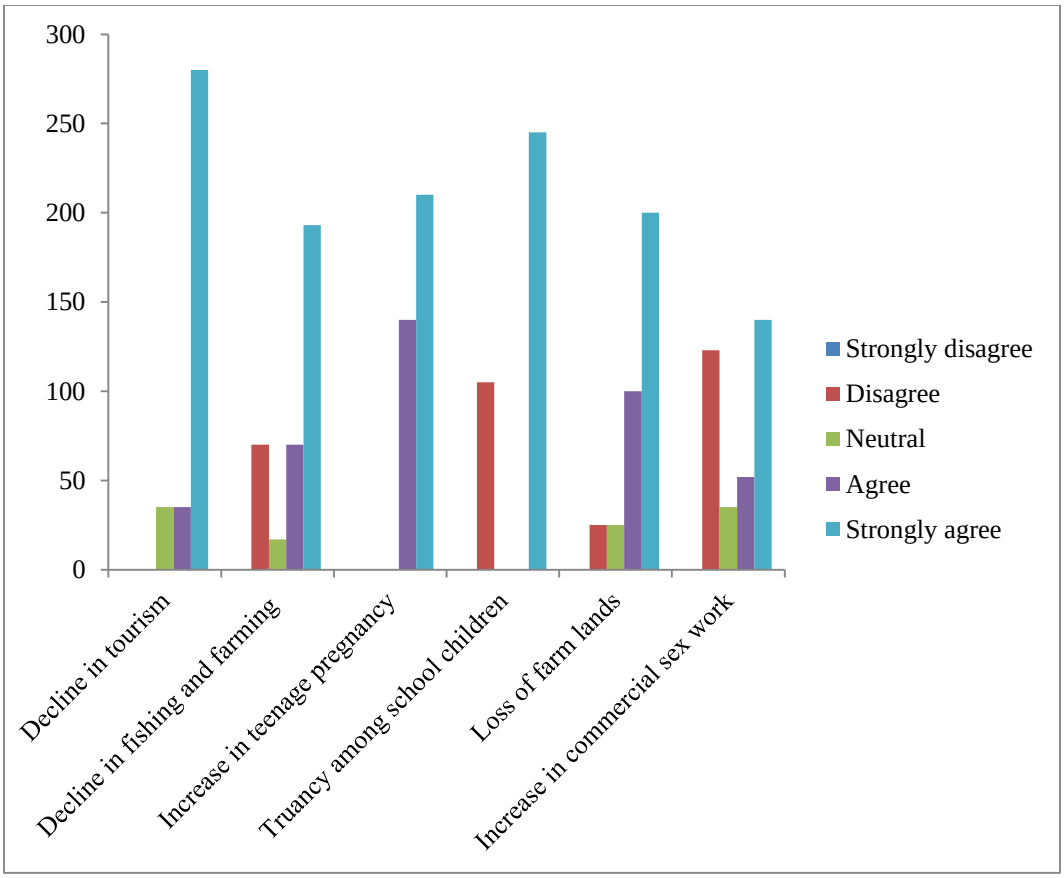

Figure 2: Social Effect of Oil and Gas Activities

Source: Field data (2017)

The finding from the study revealed that two hundred and eighty (80%) of respondents strongly agreed that oil and gas exploration has led to the decline in tourism in the community. It was also revealed that thirty-five (10%) of respondents agreed that oil exploration has affected tourism in the community

whereas thirty five (10%) of respondents remained neutral. However, it was identified that no respondents disagreed to the situational effect of the impact of oil and gas exploration on tourism in the community. This implies that majority of respondents identified that tourism has been affected as a result of the oil and gas exploration. This finding is in consonance with the study of Osterud (2007) who revealed that oil exploration led to a significant loss in revenues from tourism in Norway. Opukri and Ibaba (2008) also reiterate the argument for oil exploration leading to loss in tourism revenues in the Niger Delta that between 2002 and 2005, thousands of Dollars was lost because certain parts of the sea were banned to foreigners for tourism. It is however not surprising that a similar occurrence is happening in Ghana as citizens are losing out on their daily breads.

Further, one hundred and ninety-three (55%) of respondents strongly agreed that oil and gas exploration has led to many community members diverting from the activities of fishing and farming. It was also ascertained that seventy (20%) of respondents agreed that oil and gas exploration has led to many people diverting attention from fishing and farming into oil and gas exploration activities. However, seventy (20%) of the respondents disagreed while five seventeen (5%) of respondents also remained indifferent to the assertion. This clearly indicates that there have been many people diverting attention from farming and fishing to oil exploration. The study supports the finding of Cabrales and Esther (2010) who revealed that many individuals divert attention from cocoa their primary economic activities to oil and gas exploration which contributed to the oil curse in many parts of Europe.

The research also found that two hundred and ten (60%) of respondents strongly agreed that oil and gas exploration has led to increases in teenage pregnancies in the community. One hundred and forty (40%) of respondents also agreed that oil and gas activities has led to increases in teenage pregnancies. None of the respondents disagreed nor strongly disagreed to this assertion. This revelation is in agreement with the work of Babatunde (2010) who revealed that oil communities in the Niger delta records higher numbers of teenage pregnancies than in other parts of Nigeria because of the influence of monies from employees of oil companies who settle in the communities.

Also, the exploration of oil and gas has led to most students becoming truants as an overwhelming two hundred and forty-five (70%) of respondents strongly agreed to the statement. It was also identified from the findings that one hundred and five (30%) of respondents disagreed that oil and gas exploration have led to most students becoming truants in school. It was also revealed from the study that two hundred (57%) of respondents strongly agreed that the exploration of oil and gas activities has led to loss of farms lands. One hundred (29%) of respondents also agreed that oil and gas exploration in the community has led to loss of farm lands. It was further identified that twenty-five (7%) of respondents disagreed that oil and gas exploration has led to loss of farm lands while twenty-five (7%) of respondents also remained neutral to the assertion. The finding of the research is in consonance with the work of Okoli (2006) who demonstrated that oil and gas exploration in Nigeria led to loss of farm lands in Ogba States. It was

further supported by the work of Opukri and Ibaba (2008) who also lament that many farmers' loss lands to oil companies as a result of oil and gas exploration.

The study also found that oil and gas exploration activities has led to increases in commercial sex work in Akyinkyin as one hundred and forty (40%) of respondents strongly agreed to the assertions. Further, fifty two (15%) of respondents also agreed that the exploration of oil and gas activities has increased commercial sex work in the community. However, thirty five (10%) of respondents disagreed that oil and gas activities has led to the exacerbation of commercial sex work, while one hundred and twenty three (35%) of respondents remained disagreed. The activities of oil exploration in Akyinkyin community have led to a decline in fishing and other economic activities as viable ventures, and resulting in an increase in younger girls choosing commercial sex work for income generating purposes. The findings from the study confirm the results put out by Boateng (2008) who demonstrated in his work that communities in oil exploring areas are confronted with an increase in the number of teenage mothers with fatherless babies. This is also in consonance with the study of Boschini, Jan and Jasper (2007) who conducted a study in communities in Nigeria and concluded that small girls from Warri, Lagos, Enugu and other parts of Nigeria run after white men and staff of oil companies to engage in prostitution. With these occurrences, it is clear that commercial sex work is not a new invention in Ghana and other parts of Africa and makes the situation more disastrous in oil exploring communities.

The focus group discussions also found out how the exploration has affected social activities in the community. One of the respondents answered that:

> *"My brother, the oil exploration is destroying our community. Our children do not want to go fishing with us again neither do they want to farm. Even to go to school now is a problem. When they go to school, then they run away, because there is an oil company which they always go there to work. But it is not the children's fault because we the parents even push them to go because we have no money to pay their school fees. So we see that as an opportunity for our children to get money."*(Farmer, 32 years)

Another community member also answered that:

> *"Hmm brother, the workers in the oil field have turned many of our daughters into sex workers. Many of these have resulted in teenage pregnancies and contraction of HIV/AIDS. Teenage pregnancy and HIV/AIDS is high now in the community and it is because of the oil exploration activities. Before the exploration these problems were low but now it is on the increase."* (33yrs, Female Fishmonger)

The Assembly member of the area was quick to say:

> *"Nowadays people don't even come here to tour again. I remember before the year 2011 we used to have a lot of foreigners coming to tour in this area because of the freshness of the sea but*

ever since they started the oil exploration, they no longer come here."

An elder in the community member also said that:

"I remember we used to get money from tourists especially when the white people come here, we take them around to show them what we have. We sometimes take them through town for about three days and when they are going they buy us goods and also give us money. Now we don't get all those things again because they do not come here." (35yrs, Female)

A 50 year old woman also lamented that:

"Foreigners no longer visit our sea shore because we were told not to go to certain places along the sea because it was for oil exploration purposes. When foreigners visited our area, we used to earn some money from them but now we find it difficult getting money from tourist because they no longer come here."

The researcher also sought to find out whether community members have lost land due to the exploration of oil and gas in the area. A member of the community was quick to say:

"As for lands, we have lost a lot to the oil companies. Even now we cannot even pay for rent in our own lands. Prices of rent have gone up too much because landlords have given out houses to workers of oil companies. As I speak to you now, a single room

cost not less GH¢120.00. At first we use to rent single rooms for GH¢20.00." (Community Linguist, 54yrs)

The study also found out from respondents whether they were compensated for the loss of their lands. The responses revealed that although they were compensated, the amount given to them was very small. The finding of this research supports the study by Fidler and Noble (2014) who identified that the construction of the Chad-Cameroun oil pipeline project by ExxonMobil through the forest of Bagyeli where community members hunted and cultivated crops led to loss of lands and livelihoods of people who have traditionally lived their lives on it. Further respondents were also asked how oil explorations have affected their sources of livelihood and whether they have other means of livelihood apart from fishing. One of the fishermen said:

"The oil and gas exploration has brought a big loss in the quantity of fish we always catch." (28yrs, Fisherman)

Another respondent also said that:

"Due to the use of light by the oil companies, fishes are no more close to the shore and now they have gone deep, so if you want to catch a lot of fish you need to go deep shore and we have also been restricted as to where we can fish up to. Also, because of the low quantity of fish which we get, it has raised the prices of fish and has reduced our incomes drastically compared to previously. The cost of living has also been high nowadays in this community due to the oil and gas activities. Our own people sell things to us at

> *huge prices because they know that if we do not buy the oil worker would buy and then they will get money. In fact this has forced most of our people to engage in farming as well"* (54yrs, Chief Fisherman).

It was also revealed by a respondent that:

> *"During lean seasons, I sell some tomatoes and other food stuffs which I go and harvest from my farm."* (33yrs, Fishmonger)

A 45 year old woman also said:

> *"I have two different professions. I can braid hair so I sometimes add that to my fish mongering."*

One fisherman answered that:

> *"I sometimes also engage in farming because of my family because at times when we go fishing, we don't catch enough because we have been told not to fish in some part of the sea so I decided to add farming so that when things are not good during the fishing seasons, I can harvest other food crops to feed my family"* (38yrs, Fisherman).

Other respondents also answered that apart from the fishing, they had no other source of livelihood. This is also in consonance with the finding of Gordon and Pulis (2010) who reported that oil exploration have ceased many sources of livelihoods of people because it has affected fishing in several parts as fishes disappeared threatening the livelihoods of over one hundred thousand community members. Further respondents were also to identify whether the presence of oil

exploration has given them access to job opportunities in the oil companies. The response from a 36-year-old fisherman was that:

> *"We have not been given any job. Ever since we were told to stop fishing along certain parts of the sea, we have not been given anything to do to support our families."*

A 55-year-old fisherman also said that:

> *"My son works with one of the oil companies but he does only menial jobs."*

Another fisherman also noted that:

> *"Although I have not been employed to do anything with the oil companies, my wife has taken the opportunity to sell foods to the workers of the companies."* (32yrs, Fisherman)

The Assembly member of the area also said:

> *"We know that the oil companies cannot employ all the members of our communities, but at least they have been able to give some community members the opportunity to work with them. The only problem from our community is that most of the people have less educational qualification and so they cannot be given higher positions except for the works that require no skills. But our community members do not understand this issue. They only think that once they are the members of the community then they should be given rightful positions in the oil mine but it does not work like that."*

Environmental Implications of Oil and Gas Activities on Livelihoods

The exploration of oil and gas has destructive environmental impact which endangers the lives of the environment. The researcher therefore set out to find out how exploration of oil and gas has affected the environment and its species in the community. The results are presented in Figure 3.

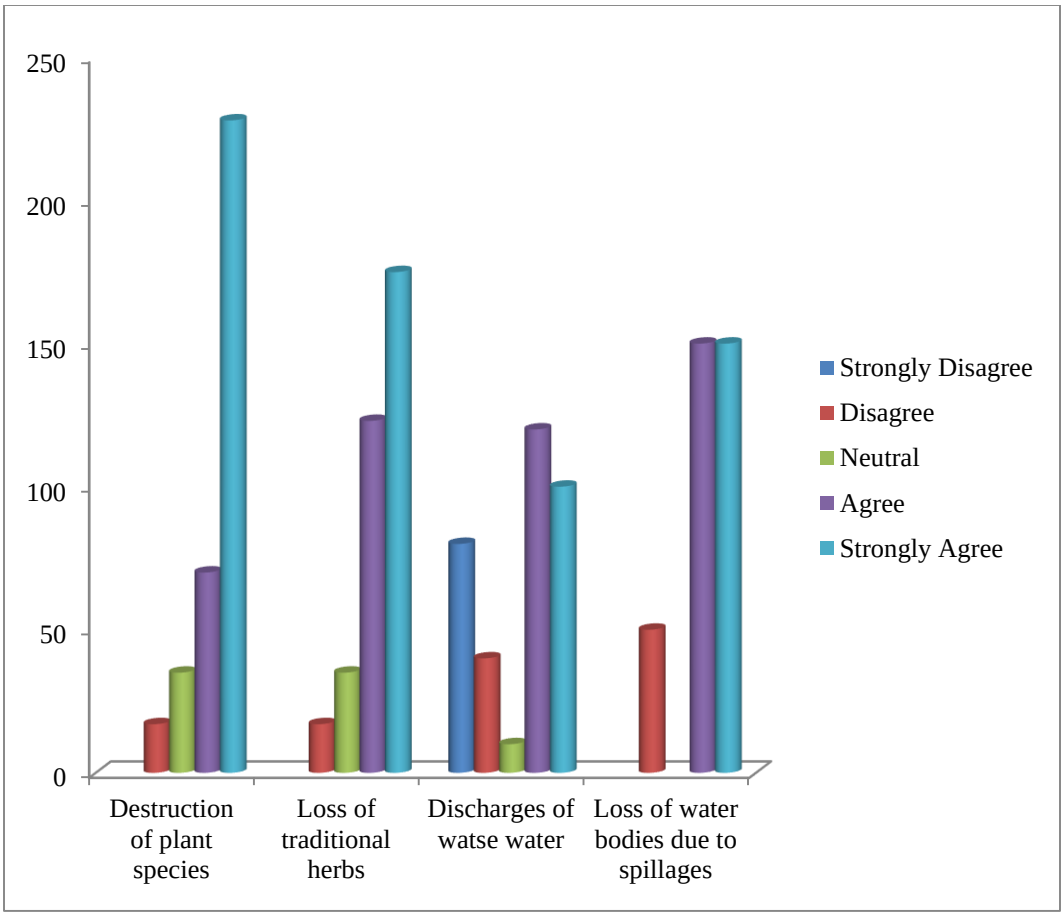

Figure 3: Environmental Effects of Oil and Gas Activities on Livelihoods

Source: Field data (2017)

The study revealed that two hundred and twenty-eight (65%) of respondents strongly agreed that the exploration of oil and gas has led to destruction of plant species in the community. It was also ascertained that seventy (20%) of respondents also agreed that oil and gas exploration has led to

destruction of plants species in the community. Further, thirty five (10%) of respondents remained indifferent to the assertions while none of the respondents strongly disagreed that oil and gas exploration has caused destruction to plant species. However, seventeen (5%) of respondents disagreed that oil and gas exploration has led to the destruction of plant species.

Further, it was revealed from the study that one hundred and seventy five (50%) of respondents strongly agreed that oil and gas exploration has led to loss of traditional herbs used for medication. Also, one hundred and twenty-three (35%) of respondents also agreed to the assertion that traditional herbs used for medications are all lost due to the exploration of oil and gas in the community. However, seventeen (5%) of respondents disagreed to the assertion that oil and gas exploration has led to destruction and loss of traditional herbs used for medical while thirty-five (10%) of respondents remained neutral that oil and gas exploration has resulted in the loss of traditional herbs for medication.

In the study, it was also relevant to assess whether there have been discharges of waste water into the sea and it was revealed that one hundred (29%) of respondents strongly agreed to the assertion. It was also identified that one hundred and twenty (34%) of respondents also agreed that oil and gas activities has led to discharges of waste water into water bodies and sea. However, eighty (23%) of respondents strongly disagreed that the oil and gas exploration has led to discharges of waste water into the sea. Forty (11%) of respondents also disagreed that oil and gas exploration has led to discharge of waste water into the sea while

ten (3%) of respondents neither agreed nor disagreed that exploration of oil and gas activities led to discharges of waste water into the sea.

It was also revealed from the study that one hundred and fifty (43%) of respondents strongly agreed that the activities of oil and gas exploration have caused oil spillages resulting in pollution of water bodies. It was also demonstrated that one hundred and fifty (43%) of respondents also agreed that oil spillages from oil and gas exploration activities have caused pollution of water bodies in the community. Further, fifty (14%) of respondents disagreed to the assertion that oil spillages have polluted water bodies as a result of oil and gas exploration activities.

Also, it was revealed from the study that one hundred and fifty (43%) of respondents strongly disagreed that oil and gas exploration activities have resulted in destruction of species with sensitive visual systems. Also, it was identified that fifty (14%) of respondents disagreed that the exploration of oil and gas has resulted in destruction of species with sensitive visual systems while sixty (17%) of respondents remained neutral to the assertion. It was further revealed that forty (11%) of respondents agreed that oil and gas activities in the community has resulted in loss of sensitive visual systems of animals and fifty (14%) of respondents strongly agreed to the assertions.

The response from a thirty-six (36) year old woman in the focus group discussion was that:

> *"Our plants have all been cut off especially the ones which were along the coast. We used to come to the sea to get some plants*

which we used for medicines but now it is very difficult to come by them."

Another fish monger also said:

"Now we only buy drugs from the chemical sellers and pharmacies because the traditional herbs which we used for medicines have all been destroyed. They have destroyed all our weeds and other plants. Since the oil companies began exploring for oil, most of our plants have been wiped out. Before the beginning of the exploration, the plants gave us fresh air anytime our husbands went fishing and also when we came to the sea side to sell. When we are in the house, we get fresh air from the sea shore but now we are experiencing heat in our homes." (29yrs, Female Fishmonger).

The researcher also asked respondents whether the presence of oil and gas exploration has affected species with sensitive visual systems. One community member said:

"Because of the lights of the exploration machines, it draws the fishes to the machines and does not make us get enough catch. Sometimes the noise also threatens fish life which affects the ecological system of the fishes" (55yrs, Community elder).

A community member also said:

"The oil activities have caused serious problems to many species. Our fishing activities have now been brought to halt as a result of the oil exploration. Most of the plants have also been affected by

> *the oil substances or chemicals which make us often fall sick as compared to previously when there were no oil exploration activities in our community"* (29yrs, Fisherman).

The researcher also enquired whether there have been discharges of waste water from oil activities. The chief fisherman responded that:

> *"Since the exploration of oil, we usually see some of the oil on the sea, which also affects our fish catch. The plants that we planted have been poisoned by substances and that has affected the growth of most of the plants."*

A 36 year old fisherman also indicates that:

> *"Pollution from oil and gas activities is destroying most of our things. Oil spillage has polluted most of our water bodies especially the ones close to the sea. The pollution from the oil and gas activities has caused chemical pollution of water bodies, noise, plant and air."*

The results from the study confirms the assertion by Ibaba and Olumati (2009) that oil and gas exploration affect the environment in many negative ways such as oil leakages, spills, gas flaring and deforestation as a result of the creation of new access routes. It is also in agreement with the study of Mehlum, Moene and Torvik (2006) who demonstrated that oil exploration have implication for plant species in communities near oil reserves. The findings from the research is not different from what Mensah (2010) identified as they revealed that oil exploration destroys plant species, fisheries and the environment in general making it difficult

for the present and future generations to make a living off their land. The environmental implication of oil and gas exploration is challenging and need to be taken seriously in communities of oil exploration in Ghana because of evidences across the world. If measures are not put in place many farmlands would be lost, water reserves polluted and plant species destroyed putting the lives of citizens at risk at the expense of the money proceeds from oil exploration.

Empowering Citizens in Dealing with Oil and Gas Disasters

This section of the objective sought to ascertain from citizens how they have been empowered to deal with oil and gas disasters. First, the researcher found out from respondents if they are prepared for an oil disaster and a 52 year old opinion leader in the community answered that:

> *"My brother, we know that a disaster can occur but we have not prepared for it. I have heard how oil disasters have destroyed lives and properties in some oil producing countries but there is nothing we can do here."*

The chief fisherman in the community also said:

> *"There is nothing to prepare for because what to eat is even a problem. The government has neglected us and even the oil exploring companies have done nothing to help us."*

A thirty-year-old fishmonger in the community also said that:

> *"Brother, we know a disaster can occur but we do not have any protection. We always pray to God to protect our children and*

properties and not for any bad thing to happen to us. Maybe when a disaster occurs, we just may have to leave this community but the problem is even if we would make it if it should happen."

The researcher also found out from respondents if they have any knowledge on prevention of oil disasters. It was known from their responses that all the respondents interviewed had no knowledge in dealing with oil disaster prevention. It is also not surprising since majority of the people in the community have lower education. However, the researcher probed further to find out from respondents why community members did not have any knowledge in oil disaster prevention. Community members were therefore asked why government or oil exploring companies have not trained them or given them any form of knowledge in disaster oil prevention. The Assembly member of the community answered that:

"I have personally gone to the district assembly to talk to the directors and some oil companies for them to organize training for us but it has never succeeded."

An opinion leader in the community also answered that:

"The government has really disappointed us. As we speak now, if anything should happen there is nothing we can do. In 2015, we saw an oil spill in the sea and we spoke to the district authorities and oil exploring companies what has happened but nothing happened. We even thought that would be an opportunity for the authorities to educate us on the effect of the spill and the kind of

things we should be looking out for as disasters if we should it happen."

The researcher probed further to know what authorities did to deal with the spill. It was said by an opinion leader that:

"I didn't see anything happen. We just saw some machines along the sea in the morning and that was it."

This assertion was confirmed by another thirty-five-year-old man in the community who also said that:

"It is true nothing happened because we didn't see anything. The only thing we saw was that after about four days, the sea was cleaned."

This implies that community members are very vulnerable to any oil spills or disasters since they have no knowledge about disasters. The study also found out from respondents if government has put in measures to deal with oil disasters in the community. The chief's linguist who was interviewed asserted that:

"Unless government has put in certain measures that we do not know, but as it stands, we know that they have not put in any measure to prevent oil spills or disasters."

The Assembly member of the community also said that:

"I do not think government has done anything to prevent any oil disaster. My brother do you know that even in the district office, there is no environmental officer. We only have health officers and officers from town council who ensure that there is good sanitation

in our community, but there is no officer in charge to ensure oil companies used good methods in their exploration. The district assemblies have always been complaining about this problem. Maybe they have but we do not know."

Finally, the researcher probed further to ascertain from respondents if they have put some measures in place as a community to educate themselves in dealing with oil disaster prevention. A forty year old community member in the area responded that:

"As a community, we have not done anything. We have not put in measures to deal with any oil disaster. The chief and leaders of the community through a Non-Governmental Organisation (NGO) have been trying to bring some environmental officers to educate us from time to time."

The assembly member of the area also responded that:

"There is an NGO called Friends of the Earth, who are about to bring a three year project into this community to educate us. We had a meeting with them together with the chief and opinion leaders."

An opinion leader in the community also answered that:

"The elders of the community are doing everything possible to help empower citizens with some education and also get government to put in measures to help the community. Last year, the minister of energy visited the community and had thorough discussions with

the elders but unfortunately they lost the election so we have put forward to the new minister to assist us and we are looking forward to that."

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Introduction

This chapter presents the summary of findings that emerged from the research and data analysis. The summary recaps the major highlights of the research and the outcomes of the study. The conclusion also draws inferences on the research analysis while recommendations to government, stakeholders, citizens and the oil sector are made.

Summary

The study addressed three specific objectives. First, the study examined the social effect of oil and gas exploration activities on livelihoods of citizens; it also investigated the environmental impact of the oil and gas exploration and lastly assessed how citizens are prepared to deal with the challenges of oil pollution in the Akyinkyin locality. The research employed both the quantitative and qualitative method and used the probability and non-probability sampling techniques such as simple random, convenience and purposive sampling techniques. The study also used a sample size of three hundred and fifty (350) respondents for the survey and also eight (8) respondents comprising fishermen, fishmongers, opinion leaders, and Assembly member for the focus group discussion. Data was analysed using tables, charts, frequencies and themes.

Based on the findings of the study, the summary of the social effect of oil and gas exploration on livelihoods are as follows:

1. The exploration of oil and gas activities has led to high teenage pregnancy and the emergence of commercial sex work among the younger girls.
2. The exploration of oil and gas has led to a reduction in fishing and farming activities forcing community members to engage in other economic viable ventures such as petty trading.
3. Tourism has been on the decline as a result of oil exploration leading to loss of income for community members.
4. Many lands have been lost to oil activities and economic cost of living has increased with rent being on the high side

Based on the findings of environmental impact of oil and gas activities on livelihoods of citizens, the following summary is provided:

1. Many plant species have been lost as a result of the oil and gas exploration.
2. Traditional herbs which are used for medicines have all been destroyed.
3. Oil spills and other pollution related activities have led to the destruction of water bodies

Based on the findings of the study, summaries on the preparation of citizens towards dealing with oil and gas disasters and pollution are provided as follows:

1. Government has not provided any form of education to community members in dealing with oil related pollution activities.
2. Government has not put in place any measure to prevent any oil disasters or pollution from occurring
3. Community members do not have any form of protection if a disaster should occur.
4. Community members have not prepared for any oil pollution or disaster in case it is to occur.

Conclusion

Based on the summary of the data, conclusions are drawn that government and oil exploration companies have not shown any commitment towards improving the livelihood conditions of community members. This is reflected or shown in the fact that corporate social responsibilities have not been fulfilled in the community. Community members have also been excluded from the development agenda manifesting in exclusion in project.

The pollution from oil and gas exploration through chemical pollution of water bodies as well as plant species poses significant danger to livelihoods situation of the people in the area. Many crops grown along the sea are likely to be affected from absorption of poisonous substances used during exploration. The impact is that food crops can be poisoned having significant health impact on the populace who consume these food

crops. This problem can be increased by the loss of lives. Further, fishermen in the community have also been instructed not to fish along certain parts along the coast of the oil rigs and incidentally, the fishes appear to have been drawn to the areas of the oil rigs due to the lighting. This has also resulted in loss of fishes putting many fishermen away from fishing and diverting into farming and other petty trading activities.

Although, there have been a number of government policy frameworks to ensure that oil disasters do not occur or are minimized, these policies seem only to be on paper. The most worrying of all is that community members have not received any education in managing oil disasters. What is more worrying is the fact that citizens have not prepared to deal with the problem of oil disaster and oil companies have also not done anything to help the community out. This has led the fate of the community in their own hands.

Recommendations

Based on the summary and conclusions, the following recommendations are made:

1. There should be the provision of alternative sources of livelihood to community members to reduce overdependence on fishing activities and other negative social acts in the community.

2. Government should develop an environmental management framework with adequate involvement of community members in response to oil spills.
3. There should be an established resource fund to cater for future compensation and damages that might occur in the oil exploration.
4. There should be an intensification of oil and gas monitoring activities in order to reduce oil spills and other environmental dangers
5. Community members, opinion leaders, chiefs and key informants should be educated on measures in managing oil disasters.

Areas for Further Studies

Further areas of research should explore many other communities to know the wider impact. Other areas of studies should concentrate on the role of other stakeholders in reducing environmental impacts on oil and gas producing areas.

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APPENDICES

APPENDIX A: QUESTIONNAIRE FOR RESPONDENTS

I am a student of the School of Business, University of Cape Coast (UCC). As part of the requirement for my Degree in the Master of Business Administration, I am conducting a study on the environmental implications of oil and gas activities in Akyinkyin community in the Western region of Ghana. It would be very much appreciated if you could provide answers to the questions below. The information is solely for academic purposes and the information provided will be treated confidential.

PLEASE TICK (√) WHERE APPROPRIATE

SECTION A: BACKGROUND INFORMATION

1. Sex: (a) Male [ ] (b) Female [ ]
2. Age: .....
3. Marital status: (a) Single [ ] (b) Married [ ] (c) Divorced [ ] (e) Widowed [ ]
4. Level of education: (a) Primary [ ] b) Junior high [ ] c) Senior high school [ ] (d) Tertiary [ ]
5. How long have you stayed in this community? (a) Less than 5yrs [ ] (b) 6-10yrs [ ] (c) 11-15yrs [ ] (d) 16-20yrs [ ] e) 20yrs and above [ ]

SECTION B: SOCIAL EFFECT OF OIL AND GAS ACTIVITIES ON LIVELIHOODS OF COMMUNITY MEMBERS

6. Has the exploration of oil and gas activities affected livelihoods of the community?

   a) Yes [ ] b) No [ ]

Check the answer that best describes your level of agreement and disagreement of your view on the social effect of oil and gas exploration activities on livelihoods of community members based on the statement below

1-Strongly Disagree (SD), 2- Disagree (D), 3- Neutral (N), 4- Agree (A),

5- Strongly Agree (SA)

Statements	**SD**	**D**	**N**	**A**	**SA**
7. It has led to decline of tourism activities					
8. There has been a decline in fishing and farming activities					
9. Teenage pregnancies have been on the increase					
10. Many young girls are engaged in commercial sex work for income					
11. Many school children have become truants					

SECTION C: ENVIRONMENTAL IMPLICATIONS OF OIL AND GAS ACTIVITIES ON LIVELIHOODS OF COMMUNITY MEMBERS

To what extent do you agree that oil and gas exploration activities have had environmental implications on livelihoods?

1-Strongly Disagree (SD), 2- Disagree (D), 3- Neutral (N), 4- Agree (A), 5- Strongly Agree (SA)

Statements	**SD**	**D**	**N**	**A**	**SA**
12. It has led to loss of plant species					
13. Traditional herbs used for medicinal purposes have been lost					
14. There have been discharges of waste water into water bodies					
15. Oil spillages have polluted water bodies					
16. Many trees have been cut down					

Appendix B: Focus Group Discussion Guide

I am a postgraduate student in the school of business, University of Cape Coast, collecting data for my dissertation on the environmental implications of oil and gas exploration and preparation of citizens in dealing with oil pollution in Akyinkyin in the Western Region of Ghana. I would be most grateful if you could take time off your busy schedule to permit me to engage you in a brief discussion which would not last more than forty (40) minutes.

1. Sex: ……
2. Age: ……
3. How long have you stayed in this community? ……..
4. How has the oil exploration of oil affected social activities in this community? Probe further
5. Has there been any effect of oil exploration on fishing activities? Probe further
6. What have been the differences in tourism activities before and after the oil exploration?
7. Was there any loss of lands as a result of the oil exploration?
8. How did you deal with the situation after the loss?
9. How do community members live during lean seasons?
10. What has been the issue of employment after the oil exploration? Probe further
11. How has oil exploration affected plant species?
12. How do the oil companies discharge their waste water?

13. Has the community been given any education on dealing with oil disasters? Probe further
14. How is the community prepared to deal with any oil disaster?
15. What measures has government put in place to deal with oil disasters in the community?
16. What measures have been put in place by the community to deal with oil pollution or disasters?

Thank you!!!