Effect of Oil Exploration and Production on Economic Activities of Host Niger Delta Communities in Nigeria

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Certification

This is to certify that **Oluwalogbonju Monday OJULARI** with matriculation number **LCU/PG/00370** carried out this research work titled "Occupational Effect of Oil and Gas Activities on Host Communities in Nigeria" in the Department of Economics and Development Studies, Faculty of Management and Social Sciences, Lead City University Ibadan, Oyo State for the award of Doctor of Philosophy (Ph.D.) Degree in Economics and that this has into been previously submitted.

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Dedication

This research work is dedicated to God Almighty.

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Abstract

The effects of oil and gas production on the economy, society, and environment continue to be a contentious topic among oil-producing states, oil firms, and governments in developing nations like Nigeria. Thus, this study examines the effects of oil exploration and production on economic activities of Host Niger-Delta communities in Nigeria. The study employed a survey research design and a multi-stage sampling technique to select a sample of 400 from the entire population. Percentile ranking and multilevel mixed-effects ordinal logistic regression were employed to achieve the objectives. The study discovered that there is high level of oil and gas activities in the Niger Delta region of Nigeria. Further, these oil and gas activities come more from oil exploration than oil production. Another finding is that there is high level of occupational changes caused by oil and gas activities in the region. It implies that people in the region changed their jobs on the basis of oil and gas activities which have created environmental challenges to the residents. This is more in the urban areas than rural areas, and among secondary and tertiary school certificate holders that other certificate holders. The logistic regression result showed that growth opportunity, environmental changes, environmental changes and socio-cultural changes have positive and significant on occupational mobility. Finally, the study showed that economic, socio-cultural and environmental factors of oil and gas activities have adverse impact on the development of the host communities. Thus, this apparently indicated that oil and gas exploration has a great impact on the host community which indirectly influences the occupational selection of the host community. The study recommends that the government and oil-producing companies should expedite the cleanup of regions that have been contaminated as a result of oil spills and gas flare-ups to reduce the occupational effect of oil and gas exploration and production on the host communities in Nigeria.

Keywords: Occupational mobility, oil and gas exploration, production, host communities, environmental conditions

Word counts: 298

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Chapter One

Introduction

1.1 Background to the Study

All activities associated with subsea petroleum deposits, including exploration, exploration drilling, production, transportation, utilization, decommissioning, and planning of such activities. Including, transport of petroleum in bulk by ship affects the host communities, in Niger Delta region of Nigeria that is richly endowed with natural resources at the South-South zone that is principally the oil manufacturing region of Nigeria, is entails six states (Akwa Ibom, Bayelsa, Cross River State, Delta, Edo and Rivers), South-West (Imo and Abia), and South-West (Ondo). Paradoxically, the region remains the poorest, due largely to the unfriendly ecologically exploitation of oil and gas, Government policies that expropriate the indigenous peoples of the Niger Delta of their rights to these natural resources. It is believed that since the advent of oil exploration some decades ago, the region has become the breadwinner of the nation, accounting for over 90% of the nation's export earnings since 1975[2].

The ecological devastation occasioned by oil exploration and production has rendered farming and fishing, which are the main occupations of the rural people of this region near useless. Pollution and continuous flaring of gas from oil prospecting and production have created health hazards and rendered fishing, farming and other traditional activities almost impossible. Also, occasional large oil spills kill fish; destroy agricultural crops; pollute the waters which seriously affect families and communities as a result of effects on occoupation of the people.

According to the Department of Petroleum Resources, between 1976 and 1996, a total of 4,835 incidents resulted in the spillage of at least 2,446,322 barrels[3], and Nigeria recorded 4,919 oil

spils in 6 years which is 4.5 trin per barrel stolen in 4 years[4]. Several years of oil exploration and exploitation by Multinational Corporations, and the hazards of spillage and gas flaring which accompany it, have degraded the environment of the region and left the communities desolate. Not only have farming and fishing, the major occupations of these mostly riverine minorities been decimated, their territories have continuously lacked basic infrastructure and amenities - electricity, roads, schools, hospitals, portable water, among others. The Niger Delta region in Nigeria is believed to be the world's third largest mangrove and fresh water swamp, a third of which is wetland[5].

Nigeria, which ranks as the top producer in Africa and the sixth-largest producer in the world, is without a doubt a major oil-producing nation. Starting at a daily output of 5,100 barrels in 1956, oil production progressively increased to 415,000 barrels in 1966 and 2.3 million barrels in 1979. Oil output increased to 923.5 million barrels in 2005 and reached 880 million barrels in 2007[6]. Community disturbances and militant disruptions of oil exploration in Nigeria's Niger Delta between 2005 and 2007 are to blame for this shortfall. Currently there is production of 2.5million barrels per day. Since 1958 till 2007, Nigeria has received around $254 billion in oil-related earnings, or about ₦30 trillion[6]. As the demand for oil and natural gas grows around the world, proactive and corrective environmental control measures and strategies towards a sustainable society is necessary[6]. However, different oil manufacturing states different than the South-South states embody Ondo (in the South-West), Abia and IMO (in the South-East). All the oil manufacturing states are loosely stated because the Niger Delta most likely because of their geophysical location[7]. The Niger Delta may be a soil of regarding 70,000 km2 cover variety of ecological zones on the Gulf of Guinea and therefore the third largest soil within the world. In the recent past, the issue of environmental control in oil and gas exploration and production in

the Niger Delta has assumed a polemical dimension by scholars and researchers. Before now, there has been a number of unaccounted environmental degradation especially in the tropics (Africa), other emerging economies as well as in some advanced economies of the world[8]. The nature of human existence is being threatened by negative effects of the activities of Oil & Gas production in the region. It is pertinent to note that natural principles and cycles are violated by the activities of oil and gas exploration and production around the world. It is quite obvious that little or nothing is being done to the effect of this environmental degradation. Based on oil production from year 1956 to 2021, Nigeria, which is the 6th largest oil producing nations in Organization of Petroleum Exporting Countries (OPEC), Oil & Gas Production in the Niger Delta has led to unprecedented environmental degradation and deterioration. And it has negative effects on the occupation of host communities. In the Niger Delta no place is safe, the offshore is not, the aquatic body has suffered and is still suffering from uncontrolled oil spillages, marine accidents and lose of bio diversities. In the same likeness the onshore and inlands have suffered and is still suffering from air pollutions, gas flaring, pipeline explosions, cancer and other health-related diseases, spillages, erosion and leaching of poisonous substances, communal crises, acidic rain, and lose of bio-diversity[9] which create little or no work for the effected communities.

On a global scale perspective, oil and gas exploratory activities and production is a major threat to the very existence of our universe[10]. It is a major contributor of Green House Gas emissions, CO_2 emission and Global Warming, Ozone layer depletion, pollution of arctic and anthertic regions due to relief drift and geological diffusion[11]. Many countries are recognized by the quantity and variety of natural resources they have, and Nigeria is recognized for its hydrocarbon deposits in the Niger Delta. The extractive industry, which makes use of all the natural resources (solid minerals, hydrocarbons, and valuable crops like coffee and cocoa), is the main engine of

most economies. The extractive sector drives the economy in 81 countries around the world and contributes to one-fourth of global GDP. Crude oil has been a significant contributor to the economies of many countries, including Nigeria, and a major source of energy[10].

The Niger Delta is an area in Nigeria comprising of wetlands and dry lands which covers about 70,000 square kilometers. The region which consists of a number of distinct ecological zones, coastal ridge barriers, mangrove swamps, fresh water swamps, forests, and lowland rain forest is dominated by rural communities that depend solely on the natural environment for subsistence living more than seventy percent of the people depend on natural environment for their livelihood[11].

The Niger Delta has seen a lot of petroleum sector activity during the past 60 years. The Nigerian government's legislation and concessions to numerous oil prospecting corporations after the first successful drilling at Oloibiri-1 in 1956 paved the way for extensive exploration and production activity from 1970 to the present. Nearly 200 oil fields and over 400 oil production and storage facilities are dispersed throughout the Niger Delta's wetlands and creeks. These are run through joint ventures with the Nigerian National Petroleum Company by global corporations like Shell, Mobil, Chevron, Elf, Agip, and Texaco. The hunt for oil and gas was intensified in both deep and shallow waterways, as well as inland, as the Niger Delta became the base of exploration and production of crude petroleum oil, and the operation of the people is severely impacted. After only a brief time of commercial oil exploration, the "Dutch sickness" struck the Nigerian economy. This is an instance where a thriving export sector, in this case Nigeria's oil business, raises the relative cost of non-tradable goods and services, affecting the rest of the trading sector. 70% of her entire income and 90% of her international profits come from the oil industry[12]. The

residents of the area were completely ignored as government effort (especially during the military administration) was focused on increasing its money flow from the sector[13].

The Niger Delta's terrain is covered in manifolds, flow and pump stations, pipeline terminals, refineries, and other oil and gas production and processing infrastructure. The people of the Niger Delta have been deprived of their land, fertility, delta forest (mangroves), water supplies, and means of subsistence due to many years of oil and gas development along with periodic crude oil and petroleum product spills. As a result of the area being taken over by multinational corporations, these losses have caused significant levels of poverty and unemployment (especially among young), infrastructure collapse, moral decadence, and criminality in the area. The area has been plagued by violent conflict, which has wilfully destroyed its inhabitants and priceless assets and prevented millions of dollars from being realized owing to postponed production as a result of work stoppages and violent clashes. The violent crises of Ogoni (1994/95), Ijaw/Ilaje (1998-2000), Warri (Urhobo/Itsekiri, 1952, 1981, 1987, 1997-2002), and Ogbe-ijaw/Itsekiri (between 1995 and 2004) are just a few examples. These crises resulted in the deaths of many people, including oil company employees and members of the Nigerian police and armed forces, the destruction of property[14].

Due to the Niger Delta's high level of activity, the region is now at risk from oil spills, water, land, and air pollution, which endangers aquatic life as well as the entire ecosystem, terrain, and surface vegetation. The issue of deforestation has resulted in the loss of bio-diversity in mangrove swamps, as well as the obliteration of many species of fish and crustaceans that are crucial for the global economy. Oil contamination of water bodies has also resulted in the death of fish, crabs, oysters, and periwinkles, as well as the contamination of fisheries, freshwater and brackish water wetlands. Therefore, artisan fishing, which is crucial to the economy of the Niger

Delta, has been eliminated. Mangroves have been stripped of their leaves due to the 66 years of oil production in the region, which has also accelerated erosion and floods in the coastal areas. There is also the issue of river and inland water contamination, which renders such water and food unsafe for human consumption and significant supplies of drinking water. Another negative effect of oil production is ground water pollution. The health of the human components of the Niger Delta environment was not spared by the oil industry's activities, as was to be expected[15]. For instance, oil acne (a special skin eruption due to exposure to oil) among respondents. There is also report of the incidence of cancer, decreased fertility, fever, cough, abdominal pain and diarrhea, while as much as 85 percent of respondents suffered a combination of these symptoms in a survey conducted by the federal ministry of health[15].

Construction and upkeep of roads are challenging tasks due to the challenging terrain. As a result, the Niger Delta's residents have poor road conditions and expensive transit costs. The region hasn't been able to construct the social and economic infrastructure, such roads, power, and piped water, that is much required. Both rural and urban unemployment are relatively high in the Niger Delta states. An army of enraged youth appeared to have been produced as a result of the region's long-term neglect and the presence of so many unresolved problems[16].

The region which consists of diverse ecosystems of mangrove swamps, fresh water swamps, rain forest is now characterized by complete contamination of streams and river and forest - destruction of biodiversity as a result of oil and gas exploration and production activities in the area. This has affected the livelihood of the indigenous people who depend on the ecosystem services for survival. It has also created an occupational shift, as the predominant occupation before the discovery of oil was fishing, farming, craft works, weaving, moulding, hunting, tapping/gin making, carpentry and petty trading, but this has considerably changed, as nobody is

interested in agriculture and other blue-collar jobs[12]. The interest of everybody, including the uneducated has shifted to the search for white-collar jobs in the oil industry. The exposure of the natives and the people living in the region to oil companies' activities has drastically eroded the traditional social- cultural values in the communities[17]. Oil activities have also caused intra and inter communal conflicts resulting in the loss of lives due to disputes over ownership of oil or gas wells. In other words, the central focus of this study is to examine the different socio-cultural, economic and environmental impacts of oil activities in the host communities in Nigeria and analyse their effects on the occupational changes among the indigenous people.

1.2 Statement of the Problem

The effects of oil and gas production on the economy, society, and environment continue to be a contentious topic among oil-producing states, oil firms, and governments in developing nations, but less so in industrialized nations with oil resources and thriving civil societies. The effects of crude oil pollution are felt locally, nationally, regionally, and globally, but the locals (oil-producing communities) bear the brunt of the load, as shown in the Niger Delta in Nigeria. The paradox is that despite its significant economic contribution, the region suffers from the highest level of poverty as a result of the extensive oil resource exploration and exploitation that has taken away their ability to engage in traditional economic (occupational) activities like farming and fishing[18]. Majority of the Niger Delta people's primary source of income was denied, which led to an increase in poverty[18]. As a result of their inability to pay for their children's education, many are involved in petty trade and seeing an increase in unemployment. This has proven a problem for the extraction of oil and gas, and the Niger Delta is no exception. The socioeconomic conditions of these locals have been significantly impacted by these activities. Of particular relevance, oil exploitation in the Niger Delta has quickly altered the visible

environmental and climatic changes, which in turn has dictated the type and rate of social changes in the area.

Global demand for oil and gas has led to an over-reliance on its production, which has resulted in environmental degradation and economic exploitation. As a result, there is an inverse correlation between the wealth the community generates for the country and the socioeconomic development of the indigenous people. The environmental problems caused by oil in the Niger Delta and the population's worries are not too dissimilar from what the European Parliament accurately called a "environmental nightmare". The lack of action by oil companies "who are viewed as big offenders and have the financial means to intervene" increases dissatisfaction among the affected communities[19]. All of these have led to the Niger Delta communities blaming the government via the Nigerian National Petroleum Corporation (NNPC) of failing to help the people, as well as the oil firms' lackluster approach to environmentally friendly business practices.

This study, therefore, evaluates the occupational effect of oil and gas activities in host communities in Niger Delta area of Nigeria there by raising a potential questionif oil been a blessing or curse to the people of Nigeria most especially Niger Delta.

1.3 Research Questions

The following research questions answered in the research study are:

I. What is the level of oil and Gas activities in the host communities?

II. What is the extent of occupational mobility caused by oil and gas activities in the host communities?

III. What are the determinants of the occupational mobility of indigenous people in the oil and gas producing communities in Nigeria?

IV. What are economic, socio-cultural and environmental effects of oil and gas activities on the host communities?

1.4 Objectives of the Study

The aim of this study is to examine the occupational effects of oil and gas activities on the host communities in Nigeria. The following specific objectives pursued are to:

I. assess the level of oil and gas activities in the host communities;

II. determine the extents of occupational mobility caused by oil and gas activities in the host communities of Niger Delta area of Nigeria;

III. analyses the determinants of the occupational mobility of the indigenous people in oil and gas producing communities; and

IV. investigate the economic, socio-cultural and environmental effects of oil and gas activities on the host communities.

1.5 Hypotheses

The following null hypotheses are tested in the process of providing empirical evidence for this research study.

$H_0$1: The factors determing occupational mobility of indigenous people in the oil and gas producing communities in Nigeria are not statistically significant.

$H_0$2: There is no significant relationship between the economic, socio-cultural and environmental effects of oil and gas activities and host communities.

1.6 Scope of the Study

The scope of the present study is very far-reaching and profound. This study examines the occupational effects of oil and gas activities in host communities of Nigeria. The study covers all the nine coastal southern Nigerian states, which include: all six states from the South South geopolitical zone (Bayelsa, Delta, Rivers, Akwa-Ibom, Edo and Cross River State), one state (Ondo) from South West geopolitical zone and two states (Abia and Imo) from South East geopolitical zone. This study limits its examinations and investigation to three states, one in each geopolitical zone, which was under the Niger Delta region. The study selected Delta State from South-South zone, Imo State from South-East zone and Ondo State from South-West Geopolitical Zone, to represent each political zones of the oil producing area and the study will also cover the entire International Oil Companies (IOCs) and some Nigeria companies operating in the region.

1.7 Significance of the Study

This study is important because several scholars have highlighted the continuing conflict between oil companies and host communities in the Niger Delta region of Nigeria. Part of this conflict has been painstakingly traced to vast environmental degradation and consequent social and economic disequilibrium that have trumped up several paradox including large-scale unemployment and leaving traditional occupation. Some of the paradoxes and unequivocally stated that "the anxiety and expectations surrounding the discovering of oil have waned because the general livelihood of the people has not been positively affected by the discovering of the oil, has further expand that, the multiplier dividend that should accrue from the sales of oil are neither here or there.

So many Studies in Nigeria mainly focused on the impact of oil and gas resource exploration on the environment of selected communities in Delta state, oil exploration and poverty in the Niger Delta region, the oil industry and the Nigerian environment. Other studies are mainly on environmental impacts of oil and gas exploration and production on livelihood of the people in the region. Scanty researches have been conducted on socio-cultural, economic and environmental impacts of oil exploration and production on the occupational changes (i.e., between the petroleum industry occupation and traditional occupation of the host communities) among the indigenous people in the region. Therefore, this serves as the main significance of the study by filling the existing gaps in the area of oil and gas activities and methodology in Nigeria.

This research becomes indispensible because it helps the host communities in aspect of sustainable development and growth of the traditional occuptation/operation. The management of oil industry and Nigerian National Petroleum Corporation (NNPC) are informed on how to effectively collect, process, store and disseminate data at their disposal. Therefore, this leads to

growth in the NNPC and the oil industry in Nigeria. Also, potential and existing investors benefit from the growth and development in the industry as this means growth in their investments. As the industry advances due to proper management of information, it becomes easy to discharge its corporate social responsibilities which benefit the society. The research is also beneficial to future researches in this particular area of environmental economics.

1.8 Limitation of Study

The research work was to cover the entire, oil and gas host community especially the Niger Delta area where exploration and production (activities) of oil and gas is taken place by multinational companies. These characteristics include time factors, finance, unrest among the youth of Niger Delta, political crisis, geographic allocation of the area, several and different agitations in the areas. The work shall be limited to only three States.

1.9 Operational Definition of Terms

Community: A community is a social unit (a group of living things) with commonality such as norms, religion, values, customs, or identity. Communities may share a sense of place situated in a given geographical area.

Effect: Effect is a change which is a result or consequence of an action or other cause.

Exploration: Exploration is the act of searching or traveling around a terrain for the purpose of discovery of resources or information.

Gas: Gas is one of the four fundamental states of matter (the others being solid, liquid and plasma).

Host Community: It refers to a group of people who share a common identity, such as geographical location, class, and ethnic background beliefs.

Host: Host is a person who receives or entertains other people as guests.

Occupational Effect: A change resulting to a job or training/skills choice, in addition, it could also be defined as a change as a result of the negative influence or outcome of imported or new operation of oil and gas which move away the indigenous people on their traditional operation/occoupation.

Occupational Mobility: This refers to the ease with which a worker can leave one job for another in a different field.

Oil: An oil is any nonpolar chemical substance that is a viscous liquid at ambient temperatures and is both hydrophobic (does not mix with water, literally "water fearing") and lipophilic (mixes with other **oils**, literally "fat loving").

Production: Production is the action of making or manufacturing from components or raw materials, or the process of being so manufactured.

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Chapter Two

Literature Review

This chapter reviewed related literatures to the topic under discussion with a view to creating a formidable link in research and bridge academic gap. The chapter is subdivided to five sections which are:

2.1 Conceptual Review

2.1.1 The History of Petroleum (Oil and Gas) Activities in the Nigeria's Niger Delta

Historical Perspective of Oil and Gas Activities in Nigeria dates back to 1908, when German surveyors for the Nigerian Bitumen Corporation, began prospecting for Tar Sand deposit in the South–Western Nigeria. These pioneering efforts ended abruptly with the outbreak of the World War I in 1914. Exploration of petroleum resources did not begin until 1938, when Shell D'Arcy (a consortium of Iranian Oil Company (later British Petroleum) and Royal Dutch Shell) was granted a sole concessionary right over the whole country[1]. However, World War II (1939-1945) terminated the initial oil exploration activities by Shell D'Arcy. Oil exploration in the Nigeria's Niger Delta resumed in 1946 after World War II and Shell D'Arcy drilled a number of oil exploratory wells in 1951. At the initial stage, Shell D'Arcy (later Shell–British Petroleum) enjoyed a complete monopoly of oil exploration for a considerable long time (1938-1955). Thereafter, Mobil Producing (Nigeria) Ltd, a subsidiary of American Socony–Mobil Oil Company, obtained license to explore for oil and began operations in Nigeria in 1955 under the name Mobil Exploration Nigeria Incorporated (which was later incorporated as Mobil Producing Nigeria on June 16, 1969).

The first commercial oil discovery in the Niger delta was confirmed at Oloibiri field in January 1956 by Shell D'Arcy (later Shell–British Petroleum) and a second oil field was later discovered. In February 1958, Shell British Petroleum (now Royal Dutch Shell) started exporting crude oil produced from Oloibiri and Afam oil field sat Port Harcourt. The giant Bomu oil field, which has estimated ultimate recovery (EUR) of 0.311 billion of barrels (BB) of oil and a total of 0.608 billion of barrels of oil equivalent (BBOE) including gas, was discovered southeast of Port Harcourt-Rivers State in 1958. The petroleum sector began to play a vital role in shaping the Nigerian economy and political destiny of the country in the early 1960s. When Nigeria became an independent nation on 1 October 1960, Shell–BP began to relinquish its acreage and its exploration licenses were converted into prospecting licenses that allowed development and production. Following the increase dominance of the Nigerian economy by petroleum sector, the sole concession policy was abandoned and exclusive exploration right was introduced to encourage other multinational oil companies aimed at accelerating petroleum exploration and production. Other multinational oil companies joined oil and gas exploration in Nigeria and these include Texaco Overseas Nigeria Petroleum Company Unlimited in 1961, Amoseas in 1961, Gulf Oil Company in 1961 (now Chevron), SociétéAfricaine des Pétroles (SAFRAP) in 1962 (which later became Elf Nigeria Limited in 1974), Tennessee Nigeria Limited (Tenneco) in 1962, Azienda GeneraleItalianaPetroli (AGIP) in 1962, ENIin 1964, Philips Oil Company in 1964 and Pan Ocean Oil Corporation in 1972. Most of these multinational oil companies recorded considerable successes in oil and gas exploration and production in both onshore and offshore fields in the Niger Delta[2].

The Federal Government of Nigeria started its Department of Petroleum Resources (DPR) Inspectorate in 1970 and Nigeria joined the Organization of the Petroleum Exporting Countries

(OPEC) in 1971. The first national oil company, the Nigerian National Oil Corporation (NNOC), was created in 1971 and it later became the Nigerian National Petroleum Corporation (NNPC) in 1977. In order to take control of the country's petroleum industry, Nigeria nationalized BP's holding completely in 1979, and Shell–BP became Shell Petroleum Development Company of Nigeria (SPDC). Although several other oil companies have joined in exploration and production American Journal of Environmental Protection 81 over the past decades, SPDC has the largest acreage in the country from which it produces some 39 per cent of the nation's oil and remains the major producer in the Nigeria's petroleum industry[3].

Initially government interest in the oil industry was limited to the collection of royalties, lease rentals and taxes, but that changed with the United Nations Resolution on Permanent Sovereignty over Natural Resources which spurred the Nigerian Government into taking positive steps to control the oil and gas industry by enacting the Petroleum Act in 1969, which vested the ownership and control of all petroleum resources in the Federal Government. Subsequently Nigeria joined the Organization of Petroleum Exporting Countries (OPEC) in 1971 and in furtherance of OPEC's resolution urging member states to acquire controlling interest in concessions held by foreign companies, Nigeria's military government established the Nigerian National Oil Corporation (NNOC) by a decree in 1971.

2.1.2 Operations of the Nigerian Oil Industry

The operations of Nigeria's oil industry are in three major areas, namely, crude oil exploration and exploitation, refining and products transportation and marketing. Since 1956 when the first oil well was drilled, over 1,481 oil wells have sprung up, producing from about 159 oil fields. There are more than 7,000 kilometers of pipelines and flow lines and 275 flow stations operated by more than 13 oil companies. Nigeria's crude oil production stood at about 2.68 million bpd as

at February, 2012. Nigeria has four refineries (Port Harcourt I and II, Warri, and Kaduna) with a combined capacity of about 450,000 bpd. The refineries came under the management and ownership by Nigerian National Petroleum Corporation (NNPC) in January, 1986. All the refineries produce the normal range of products which include Liquefied Petroleum Gas, Premium Motor Spirit, Dual Purpose Kerosene, Aviation Turbine Kerosene and Automatic Gas Oil[4].

The Petroleum Products and Marketing Company (PPMC), a subsidiary of the NNPC, ensures that refined petroleum products are distributed nationwide from the refineries. They are transported through a national network of pipelines linking all the 21 petroleum products storage depots strategically located all over the country. The PPMC distribution network is made up of three separate systems for the supply of gasoline, kerosene and diesel and complemented by coastal barges and road haulage from the refineries and depots to marketers' outlets nationwide.

2.1.3 Joint Venture Company

Pursuant to the powers granted it by the decree, in 1971 the NNOC (which later became NNPC in 1977) acquired controlling interests in the oil companies operating in the country. Presently, the NNPC have JVCs with six IOCs and one indigenous oil company.

1. Shell (SPDC), which accounts for about 40 percent of Nigeria's total oil production. The joint venture is composed of NNPC (55%), Shell (30%), Elf (10%), and Agip (5%).
2. Chevron (CNL) composed of NNPC (60%) and Chevron (40%).
3. Mobil (MPNU) composed of NNPC (60%) and Mobil (40%).
4. Agip (NAOC) composed of NNPC (60%), Agip (20%) and Phillips Petroleum (20%).
5. Elf (EPNL) composed of NNPC (60%) and Elf (40%); about 100,000bpd and

6. Texaco Overseas (TOPCON) composed of NNPC (60%), Texaco (20%) and Chevron (20%).

NNPC has 17 Production Sharing Contracts (PSC) with Addex, Snepco, StatOil, Esso, Oranto, Ocean Energy, Philips, Conoco, ChevronTexaco, Elf, NAE, PetroBrass; and one service contract with Agip[4b]. In the downstream, NNPC has four refineries in Kaduna, Port Harcourt and Warri that were built between 1978 and 1985 with a total installed capacity of 445,000 bpd and these refineries are linked with a network of pipelines and Depots.

In 1977, when NNPC was created, its primary function was to oversee the regulation of the Nigerian oil and gas industry with a secondary mandate for upstream and downstream developments, but today it has been transformed into a regulatory and business corporation. The Nigerian government in 1988 restructured the NNPC into six Directorates namely; Exploration and Production, Refineries and Petrochemicals, Finance and Accounts, Commercial and Investment, Corporate Services, and Gas and Power under a Group Managing Director. Twelve subsidiaries were also formed namely; Duke Oil, Hyson (Carlson Bermuda), Integrated Data Services Ltd (IDSL), National Engineering & Technical Co. (NETCO), Nigerian Gas Co. (NGC), Nigerian Petroleum Development Co. (NPDC), National Petroleum Investment Management Service (NAPIMS), Warri Refinery &Petrochemical Co. (WRPCO), Kaduna Refinery & Petrochemical Co. (KRPC), and Port Harcourt Refinery Co. (PHRC)[5].

2.1.4 Regulatory Regimes

The Constitution of the Federal Republic of Nigeria 1999, section 44(3), vest the ownership and control of all minerals, mineral oils and natural gas in, under or upon any land in Nigeria, its territorial waters, and exclusive economic zone on the Federal Government, and the Federal Government is to manage such minerals in such manner as may be prescribed by the National

Assembly. Thus, the Constitution confers exclusive jurisdiction on the National Assembly on matters relating to oil, gas and other minerals.

This provision is an adoption of a series of statutory laws and regulations promulgated by the Federal Military Government between 1969 and 1990. The most important of these legislations include the Petroleum Act of 1969 as amended (§1), Offshore Oil Revenue Act of 1971, Petroleum Profit Tax Act of 1959 as amended, Land Use Act of 1976 as amended, Oil Pipelines Act of 1978 as amended, Oil In Navigable Waters Act of 1979, Exclusive Economic Zone Actof 1978 (§2(1)), Hydrocarbons Oil Refineries Act, the Petroleum Equalisation Fund Act of 1989, Associated Gas Re-Injection Actof 1979, Nigeria Liquefied Natural Gas Act of 1990, Oil Pipeline Regulations (Under the Oil Pipelines Act) of 1969, Petroleum (Drilling and Production) Regulations of 1969, and Petroleum Refining Regulations of 1969[6].

The Petroleum Act and its regulations remain the primary law regulating oil and gas exploratory activities in Nigeria. The Act vested the entire ownership and control of oil and gas resources in, under or upon all land or territorial waters in the Nigerian government, and authorizes the Federal Ministry of Petroleum Resources to issue licenses to Nigerian citizens or companies incorporated in Nigeria for oil prospecting, drilling, production, storage, refining, and transportation activities.

The Land Use Act vested land comprised in the territory of each state in the Governors of the State and such land are to be held in trust and administered for the use and common benefit of all Nigerians. The Act reduced the individual interest in land that was hitherto an absolute ownership right to a mere right of occupancy. Land can be compulsorily acquired for oil and gas activities on the payment of mere surface rights restricted to the value of unexhausted improvements at the date of the revocation, which are in most cases inadequate[15]. The Exclusive

Economic Zone Act, vest on the Federal Government of Nigeria sovereign and exclusive rights with respect to the exploration and exploitation of the natural resources of the seabed, sub soil and superjacent waters of the EEZ.

These laws have been one of the major sources of conflict between the host communities, the international oil companies (IOCs) and the Federal government, which have considerably impeded oil and gas production in the Country. The Federal Government with a view to mitigate the effect of these conflicts enacted several legislations such as the Oil Minerals Producing Areas Development Act 1992 which was repealed by the Niger Delta Development Commission Act 2000, the Allocation of Revenue (Abolition of Dichotomy in the Application of the Principle of Derivation) Act of 2004, Nigerian Oil and Gas Industry Content Development Act 2010 and others.

2.1.5 Relevant Oil and Gas Regulatory Agencies in Nigeria

The principal agencies responsible for regulating the oil and gas industry are

1. Ministry of Petroleum Resources (MPR)
2. Directorate of Petroleum Resources
3. Nigerian National Petroleum Corporation (NNPC)
4. Federal Ministry of Environment (FME)
5. Federal Inland Revenue Service (FIRS)

2.1.6: Type of Occupation in Oil and Gas Industry and Host Communities

Primary occupation	***Oil Exploration and Production***	[22] Welding and fabrication
	[1] Surveyor	[23] Zodiac drivers
	[2] Geologist	[24] Fire watchman
	[3] Safety officer	[25] Security
	[4] Rigger	[26] Laundry
	[5] Engineering	[27] Filters I
	[6] Tool pusher	[28] CT man
	[7] Night pusher	[29] Liaison officer
	[8] Drillers	[30] Office girl
	[9] Crane operators	[31] Company secretary
	[10] Doctor/nurses	[32] Radio operators
	[11] Plumber	[33] Others
	[12] Carpenter	
	[13] Deckman	
	[14] Shakers	***Traditional Occupation***
	[15] Floorman	[1]Farming
	[16] Roughnecks	[2] Fishing
	[17] Welder	[3] Craft works
	[18] Storekeeper	[4] Weaving
	[19] Roustabout	[5] Moulding hunting
	[20] Rig electrician	[6] Tapping/gin making
	[21] Captain on vessel	[7] Carpentry and petty trading

2.1.7 Concept of Oil and Gas Activities (Exploration and Production)

Oil and Gas activities refer to exploration and productions of mineral resources from the land and sea using technological know-how. It is also refer to miming or exploration of mineral resources. There are three (3) categories of mineral resources namely fuel mineral, (upstream, middle stream and downstream) metallic mineral and industrial minerals and their exploration processes differ[1]. Fuel mineral exploration activities involve exploration, extraction, processing

and transportation as well as storage and consumption of petroleum, natural gas, coal, lignite and uranium. Similar activities which involve iron, gold, columbite, cassiterite and tantalite is referred to as metallic exploration while those that involve limestone, marble, feldspars, gypsum, gravel and sand among others come under industrial exploration. Fuel exploration is done basically for harnessing energy that is latent in theminerals, metallic exploration is carried out for the purpose of industrial and economic undertakings while industrial exploration is for the use of the minerals in construction[7].

Shell BP, a sole concessionaire, discovered oil in Nigeria in 1956 and began the practice of gas flaring during its production of crude oil. Before independence in 1960, agriculture was the mainstay of Nigeria's economy and a major source of foreign exchange. However, with the discovery of oil, emphasis shifted from agriculture to oil production. Agriculture is still declining in significance. In 1986 it accounted for 38.7 percent of the country's GDP, a decade later it accounted for only 30.7 percent. The overall contribution of the oil sector to the national economy grew from 0.1 percent in 1959 to 87 percent in 1976. By 1981, oil revenue had increased to approximately 90 percent of Nigeria's export earnings and approximately 80 percent of government revenues. Approximately 42 percent of Nigeria's oil exports go to the United States, 13 percent to India, 6 percent to Brazil, 6 percent to France, 5 percent to Spain, 4 percent to Italy, and 3 percent to Canada. The remaining exports go to an assortment of African, Asian, and European countries[8]. At the time the oil industry was developing, environmental protection and impacts on host communities were not given full consideration. Because Nigeria was a former colony of Britain, concessions such as monopoly of exploration rights was given to Shell BP in 1938 without competitive bidding or full evaluation of the long-term consequences of oil extraction on the environment[9]. Since there were inadequate government policies to regulate the

exploration and exploitation of oil resources, environmental degradation and the impoverishment of host communities became a major problem. Nigeria is not alone. The way the oil industry operates in many developing countries indicates that the interest of host communities and multinational oil companies are often at odds. In short, the host communities bear the brunt of the environmental degradation and other costs, whereas they derive few benefits from the revenues generated[10].

Multinational companies do not typically keep the interests of oil-producing communities at the forefront of business decisions; because they are generally driven by profit motives and the desire to maximize returns on their investments[11]. Though it is their obligation under international law to respect and protect human rights, the Nigerian government has often failed to do so. Instead, the government seems willing to collaborate with multinational oil companies to exploit the resources without providing adequate safeguards for host communities. The Nigerian oil industry is operated under a Joint Operating Agreement (JOA) and within the legal and fiscal framework of aMemorandum of Understanding (MoU). The MoU governs how the oil income is allocated among the partners. This includes payment of taxes, royalties and industry margin under Split of the Barrel as a Joint Venture Agreement (JVA) between the government-owned Nigerian National Petroleum Corporation (NNPC) and oil companies such as Shell, Exxon Mobil, Chevron-Texaco, and Total Final Elf. The NNPC holds majority shares while the oil companies hold minority interests in the oil development. The partners fund the joint ventures according to their equity share. Shell, the largest operator, produces more than one million barrels of oil per day (bpd); Exxon Mobil produces approximately 750,000 and Chevron accounts for 520,000 bpd[12]. The country has a total production capacity of 2.5 million bpd, a million of which is produced offshore. In spite of the volume of oil production, local refining

capacity is currently insufficient to meet domestic demand so the country has to import petroleum products. Nigeria's state-owned refineries, Port Harcourt I and II, Warri, and Kaduna have a total capacity of 438,750 bpd. But problems including sabotage, fire, poor management, and a lack of regular maintenance contribute to the current operating capacity of approximately 214,000 bpd. To meet local demand, the Nigerian government recently granted licenses to 18 private investors to build independently owned refineries. The private refineries when completed could save Nigeria as much as $2 billion in operational costs for refined petroleum imports[13].

Generally, two main parts are distinguished in the oil and gas industry: (1) upstream, which concerns with the exploration and production part of the industry and (2) downstream, which caters for the refining and processing of crude oil and gas products, distribution and marketing. Usually, a company in this industry may be fully integrated meaning it undertakes both the upstream and downstream operations or may just concentrate in just one aspect such as exploration and production alone or distribution or marketing. Within each part of the industry, there may be mini companies (commonly termed as the contractor companies) providing various degrees of services. For instance, the upstream may consist of sub-companies providing technical services like geophysical surveying, drilling and cementing or non technical services such as catering, hotels and cleaning services[14].

The oil and gas exploration and production basically involve five main processes: prospecting surveying, Exploration drilling, Appraisal, Development and production, Decommissioning and rehabilitation. The prospecting surveying starts with a review of geological maps to identify major sedimentary rock basins. This may be followed by an aerial photography to identify promising geological formations such as faults or anticlines. A field assessment is then done to gather more detailed information. Finally, surveying is undertaken using one of these three

methods: magnetic, gravimetric and seismic[15]. The exploration drilling involves creation of exploration wells ("wildcats") to confirm the presence of hydrocarbons and the thickness and internal pressure of reservoirs. In Ghana, self-contained mobile offshore drilling units (MODUs) are being used. The appraisal stage comprises determining the size of the oil field and hence the economic viability for development and production. Usually, more wells ("outstep" or "appraisal" wells) are drilled to evaluate the size of the field, determine the nature of the reservoir, the number of confirming wells and also whether a further seismic work is required. If it is established that the oil field is economically viable, a reservoir is made out of many appraisal wells or from development wells. Here many developments take place such as the replacement of heavy drill pipe with lighter weight tubing in the well and also a control valve assembly replaces blowout preventer. Also at this stage of development, the underground pressures are maintained either by injecting gas, water or stream into the reservoir. Hydraulic fracturing of the hydrocarbon bearing formation and acid treatment may be done to increase the flow channels. Once the hydrocarbon reaches the surface, it is pumped into the production facility, which separates oil, gas and water. So, the development and production stage seek to produce oil and gas from the reservoir through the geological formation pressure, artificial lift, and other advanced techniques until the oil reserve is fully depleted[16]. The decommissioning and rehabilitation stage involves dismantling production structures and restoring the site to environmentally acceptable standards. This is usually done at the end of the field's production life. However, in the course of production, wells that are found to be unproductive are decommissioned as well[17].

2.1.8 Environmental Issues and Oil and Gas Activities

There are numerous environmental issues caused by oil and gas activities, these include oil spills, gas flare and globe warning, destruction of eco-system pollution (water, air and land or soil pollution), bush burning, deforestation erosion, dragging of canal, lost of biodiversity and diseases and health associated impart.

a) Oil Spillage in the Host Communities

Oil spillage in the Niger delta is no longer breaking news as it is now a routine. It is also a social issue as it is an environmental issue. According to available statistics and report by UNDP, in the last three decades more than 400,000 tons of oil has spilled into the creeks, waterways, and soils of the Niger Delta and over 6800 spills were on record between 1976 and 2001. About 70 percent of the 400,000 tons of the spilled oil has not been recovered. The vast majority of the spills are a consequence of aging facilities and human errors[18].

The major environmental challenges facing the Niger Delta are as a result of oil spillage, gas flaring and deforestation. The frequent occurrence of spillage and environmental degradation has strong agitations and significant tension between the transnational E&P corporations and their host Niger Delta communities. Since the late 1980's up until the late 1990's much was not done as per environmental control of E&P as recent studies are not different. Some of the identified oil spillage sources include: pipeline leakage and rupturing, accidental discharges (tank accident), discharges from refineries, well blowout, and pipe corrosion, wash off from tanks, improper cementing, vessel discharge in sea and coastal regions, sabotage, valve leakages from oil installations, vandalization of pipeline and oil facilities, improper reservoir management, ageing facilities and negligence. Between 1976 and 1997, there have been 5334 reported cases of crude oil spillages releasing about 2.8 million barrels of oil into the land, mangroves, waterways,

estuaries and coastal region of Nigeria[19]. It is pertinent that most of these oil spill incidents reported in Nigeria occur in the mangrove swamp forest of the Niger Delta and majority of the oil spillage are considered minor and were never reported. Some of the recorded oil spillages in the Niger Delta include: Bomu-II blow out, 1970; Forcados terminal spillage, 1980; Funiwa-5 oil well blowout, 1980; Oyakana pipeline spillage, 1980; Okoma pipeline spillage, 1985; Oshika pipeline, 1993, the Goi Trans Niger pipeline oil spill, 2004, With the invasion of oil spillage in the inland and onshore agriculture becomes difficult for the host communities who are renowned in their peasant and subsistence farming. The people are now overwhelmed by hunger and starvation, and gather their strength in violence and militancy[20]. Similarly, the people of Niger delta are also renowned in fishing but that has reduced drastically as a result of oil spillage in their waters and fishing zones killing and endangering most aquatic lives. Oil spills on the water surface forms a layer which prevents oxygen from dissolving in water and thereby suffocating the living organisms (plant and animals) therein[21].

In addition, on the 24th of June 2001, there was a massive oil spill from a Shell's pipeline in Ogbodo community and it took 18 days before shell was able to fix the pipe. This rupture resulted in letting several thousand tones of oil to make their way into the surrounding waterways distorting the natural ecosystem and other economic activities[22].

It is pertinent and not a surprise that Shell admits it still has a lot of ageing oil facilities in Nigeria; a review from Shell's 2006 sustainability report. The managing director of Shell Petroleum Development Company (SPDC) Basil Omiyi stated "…Shell has a substantial backlog of asset integrity work to reduce spills and flaring". One thing is the admittance of ageing facilities by SPDC and another thing is getting rid of them as at when due. The government and

these actors should wake up to their responsibilities and save the common people from the menace of E&P activities[23].

Oil spills pose a major threat to the environment in Nigeria. If not checked or effectively managed, they could lead to total annihilation of the ecosystem, especially in the Niger Delta where oil spills have become prevalent. Life in this region is increasingly becoming unbearable due to the ugly effects of oil spills, and many communities continue to groan under the degrading impact of spills[24].

The photos below depict a few examples of oil spillage in the Niger Delta by the E&P companies.

b) The Concept of Gas Flaring and Global Warming in the Host Communities

Gas flaring is the controlled disposal of surplus (unwanted) combustible natural gas in the course of petroleum production by igniting it in the atmosphere. Natural gas is a byproduct of petroleum drilling and production and flaring is a widely used method to get rid of it where there are no infrastructures to capture and utilize the gas for further and/or other applications. It is the easiest but unhealthy way to get rid of unwanted gas in petroleum production. Flaring natural gas from oil fields as a by-product of crude oil production is a common sight that dominates the skyline in the Niger Delta. Gas flaring is the most visible environmental impact of oil and gas exploration and production in Niger Delta alongside oil spillage. Flaring constitutes noise, toxic gases, soot, excessive heat and radiant energy, CO2 that causes global warming, and methane another green house gas that causes ozone depletion[25].

Gas flaring is a major contributor to the stock of green house gases in the atmosphere thus adding to the climate change chaos and disaster. Power generation by coal in South Africa and gas flaring in the Nigeria's Niger Delta are by far the main sources of CO2 emissions in Sub-

Saharan Africa (Environmental Rights Action/Friends of the Earth Nigeria, 2008). Gas flaring associated with oil and gas production in the Niger Delta is very unfriendly to natural environment, humans and biodiversity and contains over 250 toxins. Some of the visible effects of gas flaring in the Niger Delta include: extreme harsh weather conditions; loss of biodiversity, less yield in agriculture leading to hunger and starvation in the region; acidic rain as a result of the dissolution of Sulphur and Nitrogen Oxide; skin cancer and other health related diseases. For host and neighboring communities flaring may have serious health impacts in the form of respiratory illnesses, asthma, blood disorders, cancer, painful breathing and chronic bronchitis, among others (Environmental Rights Action/Friends of the Earth Nigeria, 2008). People no longer sleep in their homes as there are no differences between day and night. The indoor climate is unhealthy for humans to flourish as the air quality is nearly suffocating with a deteriorating state[26].

Despite the efforts made by the Federal Government of Nigeria to end this madness of gas flaring in the recent decades, yet not much has been done. It has been deadline upon deadline, yet the actors (Federal Government and the E&P companies) keep apportioning blames to each other. Shell stated that they had effectively ended continuous flaring everywhere outside Nigeria. The big question is: why is Nigeria not inclusive? Begging for their right a local community in Delta state of Nigeria took Shell to court and this was the ruling as documented by the Environmental Rights Action and Friends of the Earth, 2008[27].

> *"Delivering a judgment brought against Shell by the Iwhrekan Community of Delta State, on the company's continued flaring in the community, a Federal High court sitting in Benin and presided over by Justice V. C Nwokorie, had on November 14th 2005 ordered the oil multinational to stop gas flaring in Iwhrekan, saying it violates the people's fundamental right to life and dignity of human person. The judge ruled that gas flaring*

is a "gross violation" of the constitutionally-guaranteed rights to life and dignity, which include the right to a "clean poison-free, pollution-free healthy environment".

In response to national and international pressures the federal government of Nigeria gave another deadline to stop gas flaring as January 1, 2008; but interestingly nothing was done as usual. Nigeria has the highest amount of gas flares across the globe alongside Russia. It is documented that about 2.5 billion cubic feet of gas associated with crude oil is wasted in flare every day. These wasted resources could as well be used to generate electricity for the host communities and their environs engendering industrial symbiosis or better still re-injected into the subsurface reservoirs for future use. It is interesting to note that gas flaring became illegal since 1984 in Nigeria following the section 3 of the Associated Gas Reinjection Act, 1979. According to satellite research, worldwide 168 billion cubic meters of natural gas is flared yearly[28]. Nigeria accounted for 23 billion cubic meters, biggest after Russia. About 13 per cent of global flaring originates from Nigeria[37].

It is also interesting to note these multinational E&P companies operating in Nigeria for example Shell has its origin in The Netherlands and the UK do not have record of malicious gas flare in those countries. Appendix 4 shows the related amount of gas flares by countries. It shows that The Netherlands has about 0.0003192 Billion Cubic Meters (BCM) and UK has 1.2 BCM as at 2008; whereas Nigeria recorded about 15 BCM second to Russia with 40 BCM in the list. If these transnational E&P corporations can maintain gas flaring as low as documented in their originating countries, why is the case different with their operations in Nigeria? Besides the environmental and social impacts of gas flaring in Nigeria, huge amount of revenue has been wasted over the past decades. Nigeria has lost about 150 billion dollars to gas flaring from 1970 to 2006. This gas flaring must stop in order to minimize green house

gas emissions, CO2 emission, health related diseases and maximize revenue. Flared natural gas can be re-injected for pressure control, or an alternate use can be found and flaring should be restricted to emergency use only. The alternate use of flared natural gas includes: electricity production and dry ice for export. The gas re-injection scheme should be revisited and lunched according to the gas reinjection act of 1979. This will not only save the non-renewable natural gas but will reduce both social and environmental impacts associated with gas flaring while generating income from both domestic and foreign exchange earnings[29].

The picture below shows a satellite imagery of gas flares in the Niger Delta Composite satellite images showing the reduction in gas flaring in Nigeria over 14 years, the year 2006 is in red, 2000 is in green and 1992 is in blue[30]

c) Destruction of the Ecosystem and Host Communities

In the Nigerian Coastal environment, a large area of the mangrove ecosystem has been destroyed. The mangrove was once a source of both fuels for the indigenous people and a habitat for the area's rich ecosystem, but is now unable to survive the oil toxicity of its habitat. The oil spills have also had adverse effects on marine life, which has become heavily contaminated; in turn having negative consequences for human health from consuming contaminated seafood Oil spill has also destroyed farmlands, polluted ground and drinkable water and caused drawbacks in fishing off the coastal waters.

d) Water Pollution and Host Communities

Water is considered polluted when it is altered in composition or condition directly or indirectly as a result of activities of man so that it becomes less suitable for some or all of the uses for which it would be suitable in its natural state. Any undesirable change in the natural

characteristics of any state of matter is, therefore, pollution or damage. When water is polluted it does not only affect humans but also plants and animal; it in fact distorts the natural ecosystem causing huge impact on the environment. As a result of oil spillage and other related impacts the E&P companies are the major water polluters in the Niger Delta. The upstream and downstream activities of these companies which include: offshore drilling and completion, development and production, tank wash, effluent discharge, refining and transportation[31]. Each of the aforementioned activities generates enormous amount of waste and in most cases ends up in waterways. Oil spillage and drilling fluid are the most visible water pollutants in the Niger Delta region as oil and water are immiscible. Old oil facilities and installations such as pipes rupture and leak oil into the surrounding environment. These leakages and spills from pipes and valves end up polluting the waters and waterways, making them unfit for consumption, agriculture and other applications[32].

The after-effect of oil and gas on water could be classified as externality. When something or someone is affected negatively directly or indirectly by the activities of another without proper agreement, knowledge and consent is termed externality. It has, however, been shown in the economic literature that government failure could also promote social and environmental externalities[33]. When there are no proper legislations and checks the externalities of oil and gas production increase. This is because government failure could be manifested in the implementation of inappropriate policies, poor policy construct, ignorance of the effects of policies, and incomplete information to mention but a few. Water pollution does not only cause health diseases and lose of biodiversity but also has social impact on the local host communities. Since the government and the E&P companies have not been able to maximize their positions to remedy the situation, the youth will not sit and watch as they said.

The result of this nonchalant attitude of the oil producers and their highest joint venture, the government, have led to frequent agitations by irate youths, unending chaos, rift or anarchy, which is being witnessed over the years in the Niger Delta area. This restiveness will be history if the government and the polluting actors will stand up to their responsibilities and incorporate sound Corporate Social Responsibilities (CSR) while treating the environment in a sound way[34]. This time the CSR will not be 'business as usual' but getting involved with people at the grassroots and doing what needs to be done. The result of the actions taken by organizations (E&P companies) in order to improve their impact on society is what is understood by Corporate Social Performance (CSP). Figure 2.1 shows the effect of oil spillage on water.

Figure 2.1: Water pollution
Source: http://www.pollutionissues.com/Ec-Fi/Fish-Kills.html

d) Air Pollution

Pollution is the introduction by man in the environment of substances or energy liable to cause hazards to human health, harm to living resources and ecological systems, damage to structure or amenity, or interference with legitimate use of the environment, pollution[35]

> *"...shall mean the direct or indirect introductions a result of human activity, of substances, vibration, heat or noise into the air, water or land which may be harmful to human health or the quality of the environment, result in damage to the material property, or impair or interfere with amenities and other legitimate uses of the environment".*

Summarizing these two definitions in relation to air pollution means the direct or indirect introduction of harmful substances into the atmosphere and the surrounding air which make it unhealthy for living organisms to consume. The activities of the E&P companies in the Niger Delta introduce various pollutants into the environment causing air pollution. Theses pollutants include: chemicals, gases, smoke from flaring, Nitrogen Oxides, sulphur (IV) oxide, particles, rock cuttings, dust drilling wastes and associated wastes. The impact of air pollutants on humans and animals includes suffocation, irritation and damage to respiratory systems. Sulphur (IV) Oxide concentrations on the order of 1ppm can cause constriction of airways in the respiratory tracts of humans. Air pollution in The Niger Delta will reduce if flaring reduces. Meanwhile flaring will reduce with the application of gas re-injection technology and/or channel the waste natural gas into other useful application as the gas flaring section of this dissertation proposes[36].

Besides, there are escaped pollutants that are hardly seen or invisible yet people go about inhaling and living on them. These invisible substances include: gases, fine particles and

volatile compound from leaking valve and fittings. Figure 2.2 shows some air pollution scenes in the Niger Delta.

Figure 2.2: Air pollution
Source: http://www.ageofstupid.net/image/tid/297

e) Soil Pollution

According to Federal Environmental Protection Agency Act, pollution

> *"...means man-made or man-aided alteration of chemical, physical or biological quality of the environment to the extent that is detrimental to that environment or beyond acceptable limits and "pollutant" shall be construed accordingly"*

Soil pollution is the direct or indirect introduction of any substances (pollutants) unto the soil to cause imbalance to nature and to make it unfit for its intended use. Several activities in the E&P sector generate different kinds of waste and contaminants that are detrimental to land use according to Nigerian Land Use Act, 1978. These pollutants include: oil spills, drilling fluids, cementing wastes, domestic waste and associated wastes. It is clear that there is always going to be wastes associated with E&P operations, minimizing these wastes is the problem, modalities should be put in place by the actors to reduce waste to a minimal level while operating in environmentally-sound manner. Applying the waste management hierarchy can be a staring point. The E&P companies should also strengthen up the remediation processes and respond to clean-up calls. Remediation or restoration is the process of bringing back a polluted site or impacted area to its original state or even better as documented in the *'Decommissioning & Site Restoration'* segment of this dissertation. Shell in its 2004 sustainability report stated that out of the 915-site requiring restoration, 542 sites were restored and 373 are yet to receive remediation in the Niger Delta. This is an indication that a lot still has to be done to restore accessed sites in the area. These contaminated lands are not good for anything; not for agriculture, grazing or otherwise. It is recommended for the E&P companies to have modalities in motion from the design phase of the projects for decommissioning and site restoration[37]. That is plan for site restoration from the beginning and by so doing it becomes a part of the on going project which must be executed and not left for a future date. Below is a photo of an area polluted by oil.

Figure 2.3: Soil pollution
Source: http://www.ageofstupid.net/image/polution_2

f) Bush Burning and Deforestation

Deforestation is the conversion of forest to another land use or the long-term falling of trees in an area for divers intended usage. Deforestation implies the long-term or permanent loss of forest cover and its transformation into another land use. Deforestation is the direct or indirect clearance of naturally occurring forests or trees within a forested area by the activities of man without afforestation or reforestation[38]. Over the years deforestation happens as result of population growth, industrialization, lumbering, and the need for fuel amongst others in several nations across the world[39].

In the Niger Delta the issue is skewed to the activities of E&P operations involving pipelines, drilling, development and production. In addition, some of the oil spillages end in fire disasters bringing down a wide range of forest. Ruptured or corroded pipes explode in occasions setting the environment on fire which always results in deforestation. The after effect of bush burning and deforestation includes global warming. These forest help sequester CO2 and reduce its effect in the atmosphere. The exposure of land as a result of deforestation

and bush burning make the area prone to hazards which include: flooding, excessive erosion, and loss of biodiversity. Studies reveal that the rate of deforestation of the natural freshwater swamp forest in Nigeria has led to situation whereby the rich ecosystem is threatened by devastating erosion, floodwaters and rising air temperatures. This has resulted to low agricultural yield due to the washing away of the top nutrients of the soil; home and people displaced; and of course, excessive heat and global warming[40].

Hence it is recommended and imperative that the E&P companies should incorporate reforestation in their plan for decommissioning and restoration. This will not only regenerate trees and forests but will also restore balance in the natural ecosystem while sequestering CO2. The photos below show the shot of where oil was first drilled in Nigeria by Shell in 1956 at Oloibiri, Niger Delta and some examples of deforestation[41].

Figure 2.4: Oloibiri Well
Source: http://www.ageofstupid.net/image/oloibiri_well

Figure 2.5: Deforestation & Bush burning
Source: http://www.ageofstupid.net/image/oloibiri_well

g) Erosion and the Host Communities

As a result of perpetual dragging of the area during exploration and production of oil and gas, there is 90% certain of wearing and tearing away of the earth surface of the area which leads to gross erosion.

h) Lose of Biodiversity and the Host Communities

Biodiversity is the variety of plant and animal life in a habitat or in the world to be universal. It is the variation among living organisms, which encompasses species diversity (the number of

different species), genetic diversity (genetic variety within species) and ecosystem diversity (the variety of interactions among living things in natural communities)[42]. As a result of pollution and other effects of the E&P activities biodiversity in the Niger Delta is endangered and threatened. Oil spills and waste dumping damage soil fertility and agricultural productivity. It also kills fish, their food sources, destroys fish larvae, and damages the ability of fish and other marine life to reproduce. Studies and estimates show that in Nigeria there are more than 4600 plants species of which about 205 are endemic (not found elsewhere). Of these, about 484 plants in 112 families are threatened with extinction alongside many animals and birds. The importance of biodiversity cannot be overemphasized which includes: tourism, food, food supplements, pest control, medical applications, drugs and to maintain ecological succession and balance in the natural ecosystem[43].

However, the Niger Delta could be protected from lose of biodiversity if the activities of oil and gas E&P are well-control, contained, and carried out in environmentally friendly manner. Advanced seismology, advanced drilling and completion technologies, advanced oil and gas exploration and exploration technologies, and proper decommissioning and remediation operations amongst others will go along way to enhancing the achievement of this objective[44].

i) Diseases and Health Associated Impacts on the Host Communities

Oil and gas E&P environmental and social impacts will not be completed without mentioning its impact on health. Mangrove losses, gas flaring, industrial wastes, oil pollution, and heavy metals contamination bring about the physical deterioration in the Niger Delta. Researches have also shown that the after-effect of E&P operations results in some health related problems which include: respiratory track diseases, cancer, gene mutation, short life expectancy and death. Oil well workers and people living around risk injuries and chronic diseases from exposure to

chemicals such as cadmium, arsenic, cyanide, PAHs (Polycyclic Aromatic Hydrocarbons) and lead; and over exposure to PAHs leads to birth defects or mutations[45]. No doubt, the accumulated oil spillages, leaks, flaring and explosions have gross and long lasting effect on public health. However, these effects will reduce with zero-flare, less spillage and of course oil workers diligence in carrying out their duties effectively and efficiently while empowering the angry youths to avoid onward sabotage of oil and gas installations[46].

2.1.9 Socio-Cultural Effect of Oil and Gas Activities in Host Communities

Oil and Gas industrial is tainted with communal and ethnic conflict, militancy operation, human right violation, socio-cultural impart and security impart.

a) Communal and Ethnic Conflicts amongs the Host Communities

As the names imply, communal and ethnic conflicts are the lack of agreement amongst people of the same community and ethnicity respectively. Whereas inter communal and inter ethnic conflicts refer to the lack of agreement amongst people of the different communities and different ethnicities respectively. It is pertinent to note that social crises and restiveness in the Niger Delta are as a result land ownership, resource ownership and mineral right ownership structures in the oil and gas producing zones. Communities and ethnic groups seek for resource control over oil and gas production and to claim ownership of the lands where oil is produced or has potentials of discovery. In this struggle for land lordship people step on toes causing conflicts and restiveness in the Niger Delta. The land ownership tussle is well pronounced in Nigeria because of lack of infrastructural development and resource control policies[47]. The Niger Delta is amongst the 10 most important wetland and coastal marine ecosystems on earth and home to some 31 million people. There are over 250 spoken dialects and 40 ethnic groups in the Niger Delta with about 31 million people of different believes and cultural diversities. This is enough

reason to go into crisis in the event of any kind of dispute. For instance, the conflict between the Kalabari People (Soku) and the Oluasiri people (Nembe) was as a result of the decision to name the Shell's gas project, "Soku Gas Plant"; the Nembe community raised dusts in agitation and it spread over a wide range of other neighboring communities and ethnicities in diversity causing chaos and restiveness[48]. Similarly, in October 1999, there was a massacre in the Niger Delta amongst the Eleme, Ogu and Okrika Communities over the benefits accruing from being the base of the Port Harcourt Refinery (a subsidiary of NNPC) at Alesa-Eleme; the deadly incidence is still fresh with heavy scars in memories of the survivors. The Federal Government should bring infrastructural development and proper resource control measures that will benefit the ordinary people of the Niger Delta and stop investing without vision in ransoms and amnesty deal with the Militants. Settlements and ransoms will be short-lived but infrastructures, infrastructural development and education will be remembered for a long time[49].

b) Militancy in the Host Communities

Militancy is the aggressive action taken by persons or group of persons to support a political or social cause. Militancy in the Niger Delta was partly conceived in the middle of the Nigerian political nightmare and rivalry and partly as means of bringing the government and oil companies to the negotiation table. In the quest for power and winning elections, the nation's political juggernauts organize and equip these youths with assault riffles and ammunitions as instruments to crush any form of opposition, to highjack and rig elections[50]. This nightmare and conception was pronounced during the 1999 election. But then, at dawn when the elections were over the nation was not aware of the monster she had created. The arms were never taken from these political thugs. Socialized and politicized into violence, the armed youths can hardly withdraw from acts of lawlessness long after the elections are over. As a result, with the slightest

power tussle between and amongst the local politicians and conflict entrepreneurs, the youths are mobilized by the local powerful elites for action, causing mayhem[51]. Today, the same political thugs are creating chaos and hunting the nation in the disguise of militancy. The most powerful, influential and pronounced is the Movement for the Emancipation of the Niger Delta people (MEND). It is not a surprise to figure out that some elite Nigerians are still the patrons of these militants or groups for one self interest or the other. This was affirmed in an exclusive interview with the former Minister of Information, Chief Edwin Clark who happens to hail from the region; he says these youths are not supposed to be addressed as militants rather they should be seen as freedom fighters. A generation of restive-youth, deep political frustrations among oil producing communities and pre-electoral thuggery all combine to prosper in the rich soil of political marginalization. Some of the riffles and rocket launchers retrieved from the militants as a result of the on-going amnesty deal between the Federal Government and the militants show that these weapons are made in the US, Russia and other parts of Europe and smuggled into the Niger Delta from warring African countries[52].

The Niger Delta region is very rich and contributes about 90% of Nigeria's foreign exchange earnings and 50% of her GDP yet impoverished as a result of political marginalization and improper resource control measures. Since these youths are not empowered and have sophisticated weapons so they resort to restiveness and violence. This leads to the destruction of oil and gas installations (sabotage) and the adoption of foreign oil workers in the region. According to the United Nations Development Program (UNDP),

> *"the Niger Delta region is suffering from administrative neglect, crumbling social infrastructures and services, high unemployment, social deprivation, abject poverty, filth and squalor, and endemic conflicts".*

The communities where oil and gas are produced are characterized by squalor, neglect, abject poverty and absence of basic amenities such as clean water, hospitals, good roads, schools, etc. The people of the Niger Delta are aggrieved that proceeds of the petroleum resources are not being used to develop the people on whose land the mineral are produced, and who suffer degradation caused by oil and gas E&P activities. Militancy in the oil-rich Niger Delta claims to redress the issue of environmental degradations and resource control since the Federal Government fails to live up to its responsibilities. However, in the recent past some Niger Delta intellectual protests have been largely peaceful and nonviolent, such as those of the Ogoni-speaking people, led by the late Nigerian writer and activist Ken Saro-Wiwa. Royal Dutch Shell Oil Company recently agreed to a $15.5 million out-of-court settlement with the families of Mr. Saro-Wiwa and others who were executed by the Nigerian government in 1995 for supposed treasonous activity[53].

The Niger Delta militant groups are on the warpath with the Federal Government and the E&P companies in the region which has resulted to numerous amounts of bloodsheds which include killing of national security personnel, innocent civilians, the militants and animals. In the months of January and February 2005, over twenty-four Nigerian military men were killed by the militants illegally operating in the waterways and creeks of Niger Delta while property worth several millions of dollars were destroyed. There have been series of kidnapping and adoption of foreign Oil workers by this armed militia. Life and property are not safe, leading to the violation of human right act in the region and a threat to national security. The big question is how are these arms bought? Where do these unemployed youths have so much power and money to smuggle sophisticated weapons? No doubt some elite Nigerians are in one way or the other giving some kind of support to these frustrated able-bodied youths. These patrons should be

uncovered and brought to book while empowering the youths through education, vocational training, and employment. The photos below show some militants in action aboard the Niger Delta creeks and waterways;

c) Human Rights Violations in the Host Communities

Human rights violation is the abuse of fundamental and social rights of the people. Environmental pollution and degradation caused by the oil sector have resulted in violations of the rights to live, health and a healthy environment, and the right to the basic necessities of life (including the right to food and water). The oil-rich Niger Delta which accounts for about 90% of Nigeria's foreign exchange earnings and about 50% of its GDP is still impoverished with over 70% of its indigenes living in hunger and starvation[54]. Any protest from the communities of Niger Delta is seen as treason and a threat to national security. People are slaughtered like animals by the actions of the security forces trying to protect the so-called oil installations while indulging in some other social injustices. The leader and pioneer of the peaceful and intellectual resistance of environmental degradation and a human right activist, Ken Saro-Wiwa was executed alongside eight other campaigners by the Federal Government who charged them with treason[55].

> *"The people of the Niger Delta have seen their human rights undermined by oil companies that their government cannot – or will not – hold to account - they have been systematically denied access to information about how oil exploration and production will affect them, and they are repeatedly denied access to justice".*

The Federal Government uses a joint task force team to raid communities in search for hoodlums against them, the E&P companies and oil installations. These soldiers commit all sorts of atrocities: indulge in rape, killings, battery, destroying properties, causing fear and infringing human right to the core. To cap these atrocious demeanors, after such invasions neither the

Federal Government nor the companies involved assist in bringing medical support to the injured. The allegations and claims by the communities were never investigated as to decipher the truth[56]. Amnesty International called on the Federal Government to carryout independent and detailed inquiries into allegations that the security forces injured, killed, raped civilians and destroyed their property, and insisted that the findings be made public and those responsible be brought to book[57].

d) Social Impact on the Host Communities

The social impact of exploration and production of oil and gas has negatively impacted on the socio-cultural life of the Niger Delta people. Petroleum exploration activities have caused rural urban migration, as everybody is moving to the city in search of oil company employment or contract. It has also created an occupational shift. The exposure of the people in the region to oil companies' activities has drastically eroded the traditional social- cultural values in the communities. Bribery and corruption is also another social malady that was introduced into the Niger Delta region as a result of activities in the oil industry that has become endemic in their government and in the petroleum industry. Oil companies also caused instability in the traditional institutions as it became highly politicised leading to the frequent removal of community chiefs, which are mostly instigated by oil politics[58].

The Niger Delta is one of the world's most important wetland and coastal marine ecosystem, with a population of about 30 million people. The region has four distinct ecological zones; coastal island, mangrove swamp, fresh water and rain forest zones. And its inhabitants solely rely on its environmental resources for both economic and social sustenance. However, oil and gas exploration by IOCs, and some Nigerian companies since 1956 has seriously caused environmental degradation and biodiversity depletion (environmental impact) in the Niger Delta.

Environmental pollution caused by oil spills and gas flaring has caused aggravated poverty, loss of livelihood, contamination of source of drinking water, damage to agricultural land, destruction of shelter and preventable deaths. The United Nations Development Program (UNDP) report states that, "there is a strong feeling in the region that the degree and rate of degradation are pushing the delta towards ecological disaster[59]". Also, a report by the U.N. Environmental Program (UNEP) on the Environmental Assessment of Ogoni land states that restoration of Ogoni land, which is an ethnic group in the Niger Delta could take up to 30 years and an initial investment of about $30 billion for the first 5 year. Although industry operators are required by law to observe the highest international environmental safety standards in their operations, corruption and compromise on the part of industry regulators, the lack of technical knowledge and cumbersome judicial enforcement mechanism have greatly impeded compliance. These unfavorable environmental conditions propelled the emergence of several environmental right movements that confronted the federal government and IOCs for social, economic and environmental justice.

The petroleum industry has negatively impacted on the socio-cultural life of the Nigerian society. Petroleum exploration activities have caused rural urban migration, as everybody is moving to the city in search of oil company employment or contract. It has also created an occupational shift, as the predominant occupation before the discovery of oil was fishing and farming, but this has considerably changed, as nobody is interested in agriculture. Everybody, including the uneducated is in search of white-collar jobs in the oil industry.

The exposure of the rural communities to oil companies' activities has drastically eroded the traditional social- cultural values in the communities. Oil activities have also caused intra and inter communal conflicts resulting in the loss of lives due to disputes over ownership of oil or

gas wells. Bribery and Corruption is also another social malady that was introduced into the Nigerian society as a result of activities in the oil industry that has become endemic in the government and in the petroleum industry.

Oil companies also caused instability in the traditional institutions as it became highly politicized leading to the frequent removal of community chiefs, which are mostly instigated by oil politics. The greatest social threat is the high rate of poverty in the country, which despite the increase in oil revenue, has geometrically increased over the last forty years. According to the World Bank Country Report on Nigeria (2010), most of Nigeria's oil revenue is appropriated by 1 percent of the population.

e) Political Effects on the Host Communities

Between 1960 when Nigeria gained independence and 2007, Nigeria was ruled by the majority tribes who unfortunately do not produce any petroleum resource, but was in charge of the management of the huge oil revenues. This made the minority tribes in the Niger Delta to clamor for self-determination and resource control. At the height of the crisis in 2006, the region brought the political leadership of the country unto its knees, as it practically stopped oil and gas exploration in the region[60].

This prompted the ruling People's Democratic Party (PDP) zoned the Vice Presidency to the region, and picked the then Governor of Bayelsa State, Dr. Goodluck Jonathan. Upon the untimely death of President Umaru Musa Yar'Adua in May 2010, Dr. Goodluck Jonathan, a son of the Niger Delta was sworn in as President of Nigeria for the first time and he contested and won the 2011 general election. This has brought respite to the Oil producing tribes who have for years clamored for political and economic control[61].

f) Security Impact on the Host Communities

Oil activities which is at the center of the long running conflict between the Niger Delta Communities and the federal government, coupled with the state execution of Ken Saro-Wiwa, and the military invasion of Odi, resulted into the emergence of several armed militant groups, such as the Movement for the Emancipation of the Niger Delta (MEND), The Niger Delta Volunteer Force and many others. These militant groups supposedly formed to fight for the control of natural resources engaged in the destruction of oil installations, harvesting of oil pipelines, kidnaping of expatriate oil workers, and killing of security forces[62]. These activities reached its peak in 2006, which forced oil companies to withdraw their staff and shut-in production and declared force majeure on oil shipments. The result was a drastic decline in production, which plummeted from its peak of 2.65 million bbl/d in 2005 to a decrease of 25 percent in the successive 4 years.

This state of insecurity in region threatened the very existence of Nigeria as the economy, which is highly dependent on the petroleum industry was stagnated, in addition government activities were almost grounded as there was no money for the government to spend. This prompted the Federal Government to consult with the Governors of the Niger Delta States on how best to curb the situation, assuage the agitations and restore normalcy in the region.

2.1.10 Economic and Oil and Gas Activities in the Host Communities

a) Economic Impact and Host Communities

The economic impact of exploration and production of oil and gas in commercial quantities and the attendant increased revenue made Nigeria to be a mono economy, solely dependent on oil and gas from the region for its survival. The abundant agricultural and solid mineral resources

were glaringly neglected in favor of oil and gas. Before 1960, Nigeria was heavily dependent on agricultural export. Cocoa produce, palm produce, groundnut, cassava, rubber (natural), cotton, yam, fish and shrimps accounts for over 70 percent of total export between 1960 and 1970. The value of non-oil exports has been on the decline ever since. For instance, the share of agricultural products in total export declined from 84 percent in 1960 to 1.8 percent in 1995. Nigeria's economic stability is dependent on the stability of the world energy market; therefore, any change in the price of oil and gas will directly affect the economy of Nigeria and thereby directly affects the economy of the Niger Delta region. Another thorny economic issue is the modalities for the distribution of the oil and gas revenue between the federal government, the state governments and the oil producing host communities[63]. This has been a perennial source of conflict as the host communities demand for a greater control of their natural resources, while the federal government through obnoxious legislations retained a lion share of the revenue. Presently 13 percent of oil revenue from onshore production goes to the nine oil producing states in the Niger Delta, while the remaining revenue is shared in the following ratio; federal government 47.2 percent, states 31.1 percent, local governments 15.2 percent and national priority service fund 6.5 percent[147].

The production and export of oil and gas in commercial quantities and the attendant increased revenue made Nigeria to be a mono economy, solely dependent on oil and gas for its survival. The abundant agricultural and solid mineral resources were glaringly neglected in favor of oil and gas. Before 1960, Nigeria was heavily dependent on agricultural export. Cocoa produce, palm produce, groundnut, cassava, rubber (natural), cotton, yam, fish and shrimps accounts for over 70 percent of total export between 1960 and 1970. The value of nonoil exports has been on

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Nigeria's economic stability is dependent on the stability of the world energy market; therefore, any change in the price of oil and gas will directly affect the economy of Nigeria. Nigeria has been advised by the IMF and other experts to diversify its economy by evolving policies to encourage investments in agriculture, solid minerals, manufacturing and production.

Another thorny economic issue is the modalities for the distribution of the oil and gas revenue between the federal government, the state governments and the oil producing host communities. This has been a perennial source of conflict as the host communities demand for a greater control of their natural resources, while the federal government through obnoxious legislations retained a lion share of the revenue. Presently 13 percent of oil revenue from onshore production goes to the nine oil producing states in the Niger Delta, while the remaining revenue is shared in the following ratio; federal government 47.2 percent, states 31.1 percent, local governments 15.2 percent and national priority service fund 6.5 percent[65]. Increased oil revenue without a corresponding investment in infrastructure, agriculture and manufacturing, had caused Nigeria to be an importer of everything and exporter of only oil and gas. This has resulted into increase in inflation and drastic devaluation of the currency. Increased oil revenues have also caused a high degree of fiscal indiscipline and resource mismanagement.

b) Occupational Change and Movement within the Income Distribution

Social scientists have studied occupational mobility from many perspectives. Sociologists view an occupation as a basic link between an individual and the rest of society. Through that link comes an image of an individual's prestige, power, intelligence, status and income. This logic has

led to the use of occupational mobility as a proxy for the broad concept of social mobility, and excellent studies exist of inter- and intra-generational social mobility[66]. Economists have studied occupational mobility with reference to whether labor markets operate within segments. These studies mention, but do not focus on, the relationship between occupational mobility and change in income.

When training possibilities in one occupation are exhausted, a worker may seek an additional occupation to continue the human capital accumulation process. Workers proceed through a pathway of jobs during their careers, each adding progressively smaller amounts to human capital. In this way, occupational mobility contributes to future increments in wages. A recursive system of equations to incorporate occupation change into his model predicting the wage rate for middle-aged men. Among his results is that the empirical effect of occupation change, as measured by the difference in median earnings between the two categories, appears to be consistent with Rosen's upgrading hypothesis. Along the same lines, occupational investment as "the accumulation of skills an individual acquires to perform work within an occupation," and finds evidence among younger men that occupational investment is an important determinant of income[67]. Economists have done a substantial amount of work on the related topic of job/employer change. Recent studies of employer change look at both turnover and wage. Many involve the test of a job search model or a job-matching theory of turnover, and a resulting wage increase due to the higher productivity of a better job match.

The job searches and matching models indicate not only that turnover affects the wage, but also that the wage and other current job conditions influence turnover. The basic idea of the job-matching model is that in a labor market with incomplete information and with costs to changing employment, workers may not be allocated to a worker-employment pairing that maximizes

productivity. As workers and firms learn about each other on the job, the quality of the match can be evaluated relative to perceived alternatives. Beneficial pairings provide incentives for investments in job-specific human capital; unsatisfactory matches will end in turnover if separation costs are not too high. Anticipated gains from potential matchings, therefore, influence the probability of job change, and any turnover may alter earnings.

c) Concept of Occupational Mobility by the Host Community

The western (or Northern) Niger Delta is a heterogeneous society with several ethnic groups including the UrhoboDelta Ibo, Isoko, Itekiri, Ijaw (or Ezon) and Ukwuani groups in Delta State. Their livelihoods are primarily based on fishing and farming. History has it that the Western Niger was controlled by chiefs of the five primary ethnic groups the Itsekiri, Isoko, Ukwuani, Ijaw and Urhobo with whom the British government had to sign separate "Treaties of Protection" in their formation of "Protectorates" that later became southern Nigeria.Occupational mobility refers to changes in individual occupational status. Occupational mobility is usually measured by changes in International Standard Classification of Occupations (ISCO) categories. This criterion cannot, however, be applied to researchers because most job changes would not result in a change in International Standard Classification of Occupations (ISCO) category. Thus, we need to consider other substantial changes in job profiles and job content in order to analyze researchers' occupational mobility. Career progression is a driver of occupational mobility. Changes within the academic career, for example, promotion from assistant professor to associate and then full professor, are usually associated with positive changes in job profile and job content and provide access to additional resources. Therefore, job changes that result in a promotion could be considered a proxy for occupational mobility. A considerable number of studies have focused on the determinants of academic promotion, showing the importance of a

higher rank to enable full access to resources and institutional advantages. In addition, gender discrimination in academia has been shown to operate through promotion Occupational mobility can also be used to assess other types of mobility.

Various materials released into the environment in the course of oil production operations include Drill cuttings, drilling mud, and fluids used for stimulating production; Produced fluids, oil and water, and chemicals injected into them to control corrosion or assist the separation of oil from water; and general industrial waste. Despite careful precautions, accidents do occur periodically in the drilling and exploitation of crude oil. These accidental discharges resulted from equipment failure and human error. It is known that the majority of oil spills during 1976-1980 occurred through accidental discharges attributed to equipment failure to malfunctioning, age, overloading, and corrosion or abrasion of machine parts. Nigeria recorded 1,360 oil spill incidents during 1976 – 1983 and the total quantity of oil released into the environment was 1,426 million barrels[16]. Significant pollutants or pollution indicators for selected sources in the oil industry include drilling mud and cuttings, oil and grease, chlorine, sulphides, turbidity, suspended solids, heat, pH (acidity/alkalinity PH), heavy metals, Biochemical Oxygen Demand (BOD), and Chemical Oxygen Demand (COD)[68].

People with farming as their sole occupational activities do compliment with other economic activities for instance, the Urhobos of Delta and Bayelsa states sometimes take to fishing during rainy season when the land for farming is either flooded or inaccessible. It is the same with those who live in other ecozones. The implication of this occupational arrangement is that everybody in traditional communities in the Niger Delta is occupationally engaged throughout the year. The economic activities of the people thus reveal that, in spite of their difficult terrain, the Niger Delta environment still offer something in form of occupation. With these occupational

arrangements in place, both young and old had variety of occupations to choose from. In other words, virtually everybody was gainfully employed. People of all ages could meet their needs with the available resource and the technology of their time[69].

Energy dense crude oil-derived fuels have displaced coal which has long since dominated as a transport fuel. Bentley stated that the world oil reserves are in 70,000 fields unevenly distributed in the world. Worldwide, these proved oil reserves contain about 1.5 trillion barrels and production averages roughly 89 million barrels a day (Oil peak, 2014). The top 10 countries with the biggest oil reserves. Out of the 70, 000 oil fields, 507 fields are classified as 'giant' oil fields and account for 60% of conventional oil production. Ghawar field in Saudi Arabia is the world's largest and most productive field ever discovered, producing on the average of about 5 million barrels of oil per day[70].

World oil production increased to about 74 million barrels per day by January 2005, and was fairly constant until 2011 when it started to increase to 77.8 mb/d in 2014. This sharp increment is not unconnected with shale oil production by the U.S. The production of the shale oil and gas in North America and China definitely has impact on OPEC oil market. This amounts to a potential fall in demand for imported oil in the two largest economies and largest oil consumers in addition with increased production and possibly exportation of the shale oil thereby reducing OPEC's ability to control prices by pushing up supply relative to demand. The surge will not last longer because the Light Tight Oil from the shale formation is expensive to produce. Despite this occurrence, OPEC has continued to dominate the global oil supply with various strategies like production quota for OPEC members which tend to curb excess supply[71].

The trend of OPEC oil supply from 1980-2013 in despite having been under OPEC production quota maintains the highest capacity of crude oil production. For instance, they produced on

average 11.6 million bbl/d of total petroleum liquid in 2013, of which 9.6 million bbl/d was crude oil production and 2 million bbl/d was non-crude liquids production which declined to accommodate non-OPEC production growth[72].

Nigeria as the largest oil producing nation in Africa and the eleventh largest producer of crude oil in the world, prospecting and extracting petroleum hydrocarbons in over 50% of the Niger Delta region. The Niger Delta region which is located in the south and comprises nine states. Nigeria with total proven crude oil reserve of 37.1 billion barrels (bb) is among the top 10 countries with the biggest crude oil reserve and has a greater potential for gas. The oil reserves are predominantly in the on-shore Niger Delta, coastal offshore areas and lately in the deep waters. As a developing country, Nigeria operates a concession system of exploration and production with the operating multi-national companies. The Nigeria National Petroleum Corporation (NNPC), which manages the exploration bidding activities, is the concessionaire while the operating companies are the operators[73].

Oil production in Nigeria started at Oloibiri in present Bayelsa state in 1956 at a modest rate of 5,100 barrels per day, rising steadily to 415,000 barrels per day in 1966 and to 2.3 million barrels per day in 1979. A maximum crude oil production capacity of 2.5 million barrels per day which makes the country the highest crude oil producer in Africa, a capacity higher than Libya which has more oil reserves. The crude oil production in Nigeria during the period of 1980-2012 is illustrated in Figure 5, showing a peak production in 2005[74].

Nigeria joined OPEC in 1971. As an OPEC member, Nigeria has a sustainable production capacity of 2.25 million barrel per day but supplied a total of 1.92 million barrels per day in 2014. Crude oil production in Nigeria went down from 1.949 million barrels per day produced in January 2016 to 1.881 million barrels per day in February 2016, Nigeria produces only high

value, low sulfur content, light crude oils; mainly Antan Blend, Bonny Light, Bonny Medium, Brass Blend, Escravos Light, Forcados Blend, IMA, Odudu Blend, Pennington Light, Qua-Iboe Light and Ukpokiti[75].

c) Occupational Impact and the Host Communities

Social scientists have studied occupational mobility from many perspectives. Sociologists view an occupation as a basic link between an individual and the rest of society. Through that link comes an image of an individual's prestige, power, intelligence, status and income. This logic has led to the use of occupational mobility as a proxy for the broad concept of social mobility, and excellent studies exist of inter- and intra-generational social mobility. Economists have studied occupational mobility with reference to whether labor markets operate within segments[76].

The new occupation of petroleum industry has now become the main stay of Niger Delta people earning and is what most skilled and unskilled, local and urban, Old and young, female and male, are seeking to do. It will interest us to know the reasons for the desire for the works at petroleum industry by those in traditional occupation in the host community by deserting traditional occupation for the works in petroleum industries which is very common in Niger Delta region of Nigeria[77].

d) Concept of oil and Gas Activities on the Host Communities

Oil and gas activities are associated with many environmental and socio-economic impacts[78]. Despite this, many nations throughout the world would still cherish to discover oil and gas within their territories. This is due to the fact that the availability of such natural resources is seen as a point of economic transformation and in fact can determine the development fortunes of such nations. With the world's population estimated to increase from the current 6 billion to about 9

billion in 2050, it is logical that the world's energy level increases to meet the demands or at least be reliable in supply. A report by the Energy Information Administration (EIA) estimates from their reference scenario that with the world's current laws and policies remaining unchanged for the projection period, the world marketed energy consumption is projected to grow by 44 percent over the 2006 to 2030 period. Total world energy use rises from 472 quadrillion British thermal units (Btu) in 2006 to 552 quadrillion Btu in 2015 and then to 678 quadrillion Btu in 2030"[79]. The EIA report indicates that the most rapid growth in energy demand is expected to come from nations outside the Organization for Economic Cooperation and Development (non-OECD nations). Furthermore, liquid fuel and other petroleum are expected to remain the world's dominant energy.

Already, nations have relied on uninterrupted supply of oil and gas over the years to meet their energy needs and the commodities still remain critical especially for industrial growth. Unfortunately, in spite of their importance not all nations are abounding in these products hence the dependence on external sources. Meanwhile, the sources of supply have considerably become volatile with time partly because of the very characteristic of the products; non-renewability and also political instability at most points of production. Such a situation threatens to put the guarantee of constant supplies in limbo. Consequently, the trend has led to many states seeking alternative means to ensure energy security. Likewise, businesses in oil and gas industry have responded to the challenge by revising their operational directions. In most cases, attention has been shifted to explore the unexplored and emerging countries where there is relatively a congenial political atmosphere to enhance operations. For most developing countries where oil and gas exploration and production activities are currently taking place, desperation for

economic success is usually the driving force behind such operations[80]. Table 2.1 shows economists and other intellectuals comparison of these occupations.

Table 2.1: Economist and other intellectuals' comparison of these occupations

S/N	Ground of comparison	Petroleum industry occupation	Traditional and host communities' occupations
1.	Commencement (entry & exit)	Have requirements such as registration with government DPR, NSITF, BANK Account	Free entry
2.	Income gotten from the job	High income	Low Income
3.	Capital Requirement	Huge capital	Low capital
4.	Skill needed	Highly skilled workers	Little or no skill is needed
5.	Hazard of the work	Heavy taxes	Little hazard or no hazard
6.	Taxes	High contribution	Little or no tax
7.	Contribution to GDP	Huge amount	Little
8.	Type of trade	International and local trade	Local in most cases
9.	13th month salary and leave allowance	Leave and allowances	No leave, no allowance
10.	Training	Western training is available at all levy of the petroleum industry organization	Traditional training

2.2 Theoretical Review

The theoretical basis of this study is founded on three theories, which are; economic theory of socio change (Marxian theory of change), holland occupational theory and institutional theory backing it up with environmental Kuznets curve. The theories were synergized to examine how different socio-cultural, economic and environmental impacts of oil activities in the host communities influence occupational change among the indigenous people.

The Marxian theory rests on this fundamental assumption that changes in the economic 'infra-structure' of society are the prime movers of social change. For Marx, society consists of two structures 'infra-structure' and 'super-structure'. The 'infra-structure' consists of the 'forces of production' and 'relations of production[81]. The 'super-structure' consists of those features of the social system, such as legal, ideological, political and religious institutions, which serve to maintain the 'infra-structure', and which are moulded by it. The socio-economic structure of society is basically determined by the state of productive forces.

Holland occupational theory states that career choice is an expression of individuality. The theory details on work-related conduct, for example, the occupational selections that may lead to success and fulfillment. It also explores other personal experiences such as success and fulfillment in academic, training or social programs as a motivation for choosing a specific occupation. An implication of the theory is that individuals with identical personalities working together can create an atmosphere that matches their type. For instance, artistic individuals working together on a task can create a work atmosphere that recognizes creative thinking and conduct- an artistic atmosphere[82]. Holland states that the attributes aid individuals in finding work environments that are more satisfying. In short, the model helps us in understanding work environments, the theory can be applied over a long period as it is stable.

Institutional theory holds that the institutional environment can strongly influence the change of formal structures in a community. Communities spring up in different physical environments; they develop unique shared values, shared experience, and mental simulations to describe the world around them. However, at a point the unique shared values, experience, and simulations are likely to change due to variation internally and to volatility externally[83]. These changes can be linked to shifts in the institutional order. Institutions in this context are arrays of established

practices, norms and rules that engineer how communities or organisations operate in order to achieve their desired goal. Alternatively, institutions are the frameworks that govern an organization or a community.

As mentioned earlier, all these theories would be utilized examine how different socio-cultural, economic and environmental impacts of oil activities in the host communities influence occupational change among the indigenous people.

2.2.1 Economic Theory of Social Change

Owing largely to the influence of Marx and Marxism, the economic theory of change is also known as the Marxian theory of change. Of course, economic interpretations of social change need not be always Marxist, but none of the other versions (such as Veblen who also stressed on material and economic factor) of the doctrine are quite as important as Marxism. The Marxian theory rests on this fundamental assumption that changes in the economic 'infra-structure' of society are the prime movers of social change. For Marx, society consists of two structures 'infra-structure' and 'super-structure'. The 'infra-structure' consists of the 'forces of production' and 'relations of production'[84].

The 'super-structure' consists of those features of the social system, such as legal, ideological, political and religious institutions, which serve to maintain the 'infra-structure', and which are moulded by it. To be moreclear, according to Marx, productive forces constitute 'means of production' (natural resources, land, labour, raw material, machines, tools and other instruments of production) and 'mode of production' (techniques of production, mental and moral habits of human beings) both and their level of development determines the social relation of production, i.e., production relations. These production relations (class relations) constitute the economic structure of society, the totality of production relations. Thus, the socio-economic structure of

society is basically determined by the state of productive forces. For Marx, the contradiction between the constantly changing and developing 'productive forces' and the stable 'production relations' is the demiurage of all social development or social change.

- **Basic Postulates**

Change is the order of nature and society. It is inherent in the matter through the contradiction of forces. Marx wrote: "Matter is objective reality, existing outside and independent of the mind. The activity of the mind does not arise independent of the material. Everything mental or spiritual is the product of the material process."[85] The world, by its very nature is material. Everything which exists comes into being on the basis of material course, arises and develops in accordance with the laws of motion of matter. Things come into being, exist and cease to exist, not each independent of all other things but each in its relationship with others.

Things cannot be understood each separately and by itself but only in their relation and interconnections. The world does not consist of permanent stable things with definite properties but of unending processes of nature in which things go through a change of coming into being and passing away. Production system is the lever of all social changes, and this system is dynamic. Need system determines production and the technological order, i.e., mode of production. It is man's material necessities that are at the root of his productive effort, which in its turn is the basics of all other forms of his life. Marx believed that change occurs through contradiction of forces and this is present throughout the history in some or the other form.

In the 'Preface' of his monumental work Capital: A Critique of Political Economy Marx's whole philosophy of social change is summarised: "At a certain stage of their development, the material forces of production in society come into conflict with the existing relations of production or with the property relations within which they had been at work before[86]. From forms of

development of the forces of production these relations turn into their fetters. Then comes the period of social revolution with the change of the economic foundation, the entire immense superstructure is more or less rapidly transformed." Thus, the main thrust of the Preface is the emphasis on changes in the economic base (mode of production), and these in turn produce ideologies which induce people to fight out social struggles. As it stands, this materialist conception of history certainly encourages us to regard 'evolution' of the economic base as the key to social change, what Engels called 'the law of development of human history'. Marx viewed the course of history (social change) in terms of the philosophy of 'dialectics. (An idea borrowed from Hegel but Marx called it materialistic. According to Hegel, evolution proceeds according to a system of three stages, thesis, antithesis and synthesis). Accordingly, the change, development, and progress take place by way of contradiction and conflict and that the resulting change leads to a higher unity.

In particular, Marx viewed the class struggle and the transition from one social system to another as a dialectical process in which the ruling class viewed as 'theses evoked its 'negation' ('antithesis') in the challenger class and thus to a 'synthesis' through revolutionary transformation resulting in a higher organisation of elements from the old order. In the dialectical point of view of change, sharp stages and forces are abstracted out of the continuity and gradations in the social process and then explanations are made of the process on the basis of these stages and forces in dialectical conflict. Marx believed that the class struggle was the driving force of social change. For him it was the 'motor of history'. He states that "the history of all hitherto existing society is the history of class struggles". Society evolves from one stage to another by means of struggle between two classes, one representing the obsolescent system of production and the other nascent (new) order. The emerging class is ultimately victorious in this

struggle and establishes a new order of production; within this order, in turn, are contained the seeds of its own destruction, the dialectical process once more. Change will only occur as a victory of the exploited class.

Marx believed that the basic contradictions contained in a capitalist economic system would lead to class consciousness. Class consciousness involves a full awareness by members of the working class of the reality of exploitation, a recognition of common interests, the common identification of an opposing group with whom their interests are in conflict. This realisation will unite them for proletarian revolution[87]. The proletariat would overthrow the bourgeoisie and seize the forces of production, the source of power. Property would be communally owned. Now, all members of society would share the same relationship to the forces of production. Since the history is the history of the class struggle, history would now end.

2.2.2 Holland's Occupational Theory (1959)

The theory was developed by John Holland and states that career choice is an expression of individuality. The theory details on work-related conduct, for example, the occupational selections that may lead to success and fulfillment. It also explores other personal experiences such as success and fulfillment in academic, training or social programs as a motivation for choosing a specific occupation. An implication of the theory is that individuals with identical personalities working together can create an atmosphere that matches their type. For instance, artistic individuals working together on a task can create a work atmosphere that recognizes creative thinking and conduct- an artistic atmosphere[88].

Work atmospheres are divided into six: Realistic, Artistic, Social, Conventional, Investigative and Enterprising. Persons look for atmospheres in which they can convey their values and thoughts, and once a person lands such an atmosphere, the probability of success and satisfaction

is high. Holland states that the attributes aid individuals in finding work environments that are more satisfying. In short, the model helps us in understanding work environments, the theory can be applied over a long period as it is stable. The "resource curse" theory, presupposes those nations with rich natural resources may fail to develop in other sectors ultimately bringing about financial problems. The theory also assumes that such a country will also fail to develop infrastructure and other industries; instead, they focus on a handful of industries which cripples the economy by encouraging very isolated investments and development; while ignoring the need to develop a more diversified economy[89]. The result is that the country is also forced to a large extent to rely on other nations for a wide variety of goods and services; and may in fact end up with a net loss at the end of the year. The term resource curse was first used to describe how Countries rich in natural resources were unable to use that wealth to boost their economies and how counter initiatively; these countries had lower economic growth than countries without an abundance of natural resources. This was exemplified with the "Dutch Disease" syndrome, a situation which makes it difficult to diversify the economy, generally undermining non-oil activities.

2.2.3 Institutional Theory

Institutional theory holds that the institutional environment can strongly influence the change of formal structures in a community. Communities spring up in different physical environments. They develop unique shared values, shared experience, and mental simulations to describe the world around them. However, at a point the unique shared values, experience, and simulations are likely to change due to variation internally and to volatility externally[90]. These changes can be linked to shifts in the institutional order. Institutions in this context are arrays of established practices, norms and rules that engineer how communities or organisations operate in order to

achieve their desired goal. Alternatively, institutions are the frameworks that govern an organization or a community.

Needless to say, oil exploration and production companies from developing or developed countries are influenced by their homemade institutional structures; this means that the companies would take with them some core values, corporate cultures and business practices from their sources. Consequently, what plays out between the oil exploration and production companies and the host communities is usually conflict of interest. For instance, fishing activities stops where physical disturbance and contamination as a result of construction and spillage, leakage or chemical waste disposal exist. Failure of the oil exploration and production companies to reconcile different institutional structures of both the headquarter and host community may create an environment where shifts in the institutional order (such as change in tribe-based occupation) occurs.

2.2.4 Environmental Kuznets Curve

The environmental Kuznets curve suggests that economic development initially leads to deterioration in the environment, but after a certain level of economic growth, a society begins to improve its relationship with the environment and levels of environmental degradation reduces. From a very simplistic viewpoint, it can suggest that economic growth is good for the environment. However, critics argue there is no guarantee that economic growth will lead to an improved environment, in fact, the opposite is often the case. At the least, it requires a targeted policy and attitudes to make sure that economic growth is compatible with an improving environment.

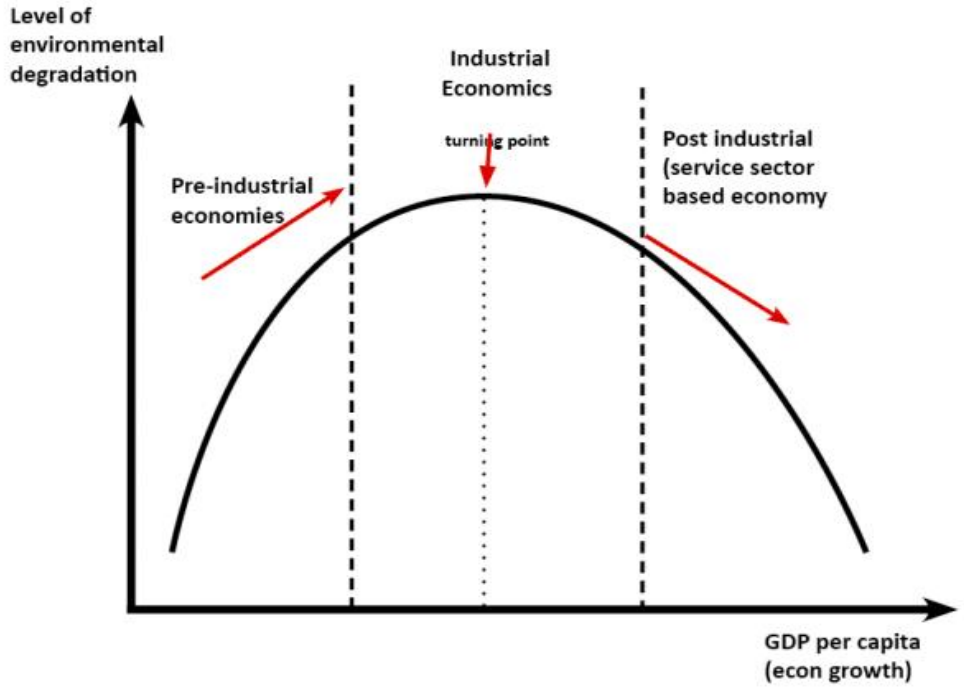

Figure 2.6: Diagram of Environmental Kuznets Curve

Causes of Environmental Kuznets Curve

Some of the causes of Environmental Kuznets curve are:

1. **Empirical evidence of declining pollution levels with economic growth:** Studies found that higher economic growth in the US led to increased use of cars, but at the same time due to regulation, levels of air pollution (in particular sulphur dioxide levels declined).
2. **Spare income with growth:** With higher rates of economic growth, people have more discretionary income after paying for basic necessities; therefore, they are more amenable to paying higher prices in return for better environmental standards.
3. **Focus on living standards as opposed to real GDP:** Traditional economic theory concentrates on increasing real GDP and rates of economic growth. But there is a growing awareness the link between economic growth and living standards can be weak. Focusing on living standards can become politically popular.

4. **Improved technology:** The primary driving force behind long-term economic growth is improved technology and higher productivity. With higher productivity, we can see higher output, with less raw materials used. For example, since the 1950s, the technology of car use has significantly improved fuel efficiency. In the 1950s, many cars had very low miles per gallon. In recent years, car manufacturers have made strides in reducing fuel consumption and have started to develop hybrid technology.

5. **Solar and renewable energy:** A good example of how improved technology has reduced potential for environmental damage is the progress in solar technology. In recent years, the cost of solar energy has significantly fallen – raising the prospect of clean technology.

6. **De-industrialisation:** Initially, economic development leads to shifting from farming to manufacturing. This leads to greater environmental degradation. However, increased productivity and rising real incomes see a third shift from industrial to the service sector. An economy like the UK has seen industrialisation shrink as a share of the economy. The service sector usually has a lower environmental impact than manufacturing.

7. **Role of government regulation:** Economic growth and development usually see a growth in the size of government as a share of GDP. The government is able to implement taxes and regulations in an attempt to solve environmental externalities which harm health and living standards.

8. **Diminishing marginal utility of income:** Rising income has a diminishing marginal utility. The benefit from your first £10,000 annual income is very high. But if income rises from £90,000- £100,000 the gain is very limited in comparison. Having a very high salary is of little consolation if you live with environmental degradation (e.g., congestion,

pollution and ill health). Therefore, a rational person who is seeing rising incomes will begin to place greater stress on improving other aspects of living standards.

Criticisms of Kuznets Environmental Curve

Some of the criticisms of Kuznets Environmental curve are:

1. **Empirical evidence is mixed:** There is no guarantee that economic growth will see a decline in pollutants.
2. **Pollution is not simply a function of income:** Pollution is not simple determine by income but also other factors, for example, the effectiveness of government regulation, the development of the economy, population levels.
3. **Global pollution:** Many developed economies have seen a reduction in industry and growth in the service sector, but they are still importing goods from developing countries. In that sense, they are exporting environmental degradation. Pollution may reduce in the UK, US, but countries who export to these countries are seeing higher levels of environmental degradation. One example is with regard to deforestation. Higher-income countries tend to stop the process of deforestation, but at the same time, they still import meat and furniture from countries who are creating farmland out of forests.
4. **Growth leads to greater resource use:** Some economists argue that there is a degree of reduced environmental degradation post-industrialisation. But, if the economy continues to expand, then inevitably some resources will continue to be used in greater measure. There is no guarantee that long-term levels of environmental degradation will continue to fall.

5. **Countries with the highest GDP have highest levels of CO_2 emission:** For example, US has CO2 emissions of 17.564 tonnes per capita. Ethiopia has by comparison 0.075 tonnes per capita. China's CO_2 emissions have increased from 1,500 million tonnes in 1981 to 8,000 million tonnes in 2009.

The link between levels of income and environmental degradation is quite weak. It is possible economic growth will be compatible with an improved environment, but it requires a very deliberate set of policies and willingness to produce energy and goods in most environmentally friendly way.

2.2.5 Human Capital Theory

In the 1960s, economists Gary Becker and Theodore Schultz pointed out that education and training were investments that could add to productivity. As the world accumulated more and more physical capital, the opportunity cost of going to school declined. Education became an increasingly important component of the workforce. The term was also adopted by corporate finance and became part of intellectual capital, and more broadly as human capital. Intellectual and human capital are treated as renewable sources of productivity. Organizations try to cultivate these sources, hoping for added innovation or creativity. Sometimes, a business problem requires more than just new machines or more money. The possible downside of relying too heavily on human capital is that it is portable. Human capital is always owned by the employee, never the employer. Unlike structural capital equipment, a human employee can leave an organization. Most organizations take steps to support their most useful employees to prevent them from leaving for other firms.

The human capital theory posits that human beings can increase their productive capacity through greater education and skills training. Human capital is the intangible economic value of

a worker's experience and skills. This includes factors like education, training, intelligence, skills, health, and other things employers value such as loyalty and punctuality. Critics of the theory argue that it is flawed, overly simplistic, and confounds labor with capital.

Human capital in a broad sense is a collection of activities – all the knowledge, skills, abilities, experience, intelligence, training and competences possessed individually and collectively by individuals in a population. These resources are the total capacity of the people that represents a form of wealth that can be directed to accomplish the goals of the nation or state or a portion thereof. The human capital is further distributed into three kinds: (a) knowledge capital (b) social capital (c) emotional capital. Many theories explicitly connect investment in human capital development to education, and the role of human capital in economic development, productivity growth, and innovation has frequently been cited as a justification for government subsidies for education and job skills training.

It was assumed in early economic theories, reflecting the context – i.e., the secondary sector of the economy was producing much more than the tertiary sector was able to produce at the time in most countries – to be a fungible resource, homogeneous, and easily interchangeable, and it was referred to simply as workforce or labor, one of three factors of production (the others being land, and assumed-interchangeable assets of money and physical equipment). Just as land became recognized as natural capital and an asset in itself, human factors of production were raised from this simple mechanistic analysis to human capital. In modern technical financial analysis, the term "balanced growth" refers to the goal of equal growth of both aggregate human capabilities and physical assets that produce goods and services.

The assumption that labor or workforces could be easily modelled in aggregate began to be challenged in 1950s when the tertiary sector, which demanded creativity, begun to produce more

than the secondary sector was producing at the time in the most developed countries in the world. Accordingly, much more attention was paid to factors that led to success versus failure where human management was concerned. The role of leadership, talent, even celebrity was explored.

Today, most theories attempt to break down human capital into one or more components for analysis Most commonly, Emotional capital is the set of resources (the personal and social emotional competencies) that is inherent to the person, useful for personal, professional and organizational development, and participates to social cohesion and has personal, economic and social returns Social capital, the sum of social bonds and relationships, has come to be recognized, along with many synonyms such as goodwill or brand value or social cohesion or social resilience and related concepts like celebrity or fame, as distinct from the talent that an individual (such as an athlete has uniquely) has developed that cannot be passed on to others regardless of effort, and those aspects that can be transferred or taught: instructional capital. Less commonly, some analyses conflate good instructions for health with health itself, or good knowledge management habits or systems with the instructions they compile and manage, or the "intellectual capital" of teams – a reflection of their social and instructional capacities, with some assumptions about their individual uniqueness in the context in which they work. In general, these analyses acknowledge that individual trained bodies, teachable ideas or skills, and social influence or persuasion power, are different.

The concept of human capital has relatively more importance in labour-surplus countries. These countries are naturally endowed with more of labour due to high birth rate under the given climatic conditions. The surplus labour in these countries is the human resource available in more abundance than the tangible capital resource. This human resource can be transformed into human capital with effective inputs of education, health and moral values. The transformation of

raw human resource into highly productive human resource with these inputs is the process of human capital formation. The problem of scarcity of tangible capital in the labour surplus countries can be resolved by accelerating the rate of human capital formation with both private and public investment in education and health sectors of their national economies. The tangible financial capital is an effective instrument of promoting economic growth of the nation. The intangible human capital, on the other hand, is an instrument of promoting comprehensive development of the nation because human capital is directly related to human development, and when there is human development, the qualitative and quantitative progress of the nation is inevitable. This importance of human capital is explicit in the changed approach of United Nations towards comparative evaluation of economic development of different nations in the world economy. The United Nations publishes the Human Development Report on human development in different nations with the objective of evaluating the rate of human capital formation in these nations.

The statistical indicator of estimating human development in each nation is Human Development Index (HDI). It is the combination of "Life Expectancy Index", Education Index" and "Income Index". A country's population health status is indicated by the life expectancy index, its educational level and literacy rate are shown by the education index, and its standard of living is shown by the income index. A growing trend in HDI can be seen if all of these indices have been trending upward for a while. Health, education, and the caliber of the standard of living are used to measure human capital. Therefore, the three HDI components are life expectancy index, education index, and income index and they are directly tied to the development of human capital across the country. The HDI is a measure of the relationship between the creation of human capital and economic growth. In response to better levels of health and education, there is

a higher rate of human capital production as HDI rises. Similar to how HDI improves, so does the country's per capita income. Inferentially, HDI shows that a country's per capita income increases as human capital increases as a result of high levels of health and education. This process of human development serves as a solid basis for the country's long-term, ongoing economic development. It is impossible to understate the importance of the notion of human capital in fostering long-term economic development of the country. It is anticipated that all countries' macroeconomic policies will be geared toward encouraging human development, which will lead to economic progress.

In any country, human capital serves as the foundation for both economic and human development. The macro-level, human capital management is about three key capacities: the capacity to develop talent, the capacity to deploy talent, and the capacity to draw talent from elsewhere. Collectively, these three capacities form the backbone of any country's human capital competitiveness. One of the fundamental pillars of what has been called anthropological economics is human capital. An evaluation standard for examining economic systems, whether they be public or private, is anthropological economics. It employs the language of economics to study and change economic processes in favor of an anthropological viewpoint. According to this viewpoint, the economic process as a whole and its scope are determined by human capital.

2.3 Empirical Review

It is imperative to appraise existing empirical literature regarding the impact of oil exploration and production on developing countries as there are few works done by scholars in this rsearch area. Five researchers focused on individual and place-based determinants of occupational mobility in Scotland over the period 2001–11[91]. Its novelty relates to the importance of workplace location, rather than residential locations, on occupational mobility, and in questioning the idea that spatial mobility accelerates occupational mobility. The findings indicate that skill level and employment in 'knowledge-intensive' sectors are key determinants of career progression. Urban career escalator effects are found to be particularly evident for higher-skilled workers. The findings point to the importance of spatial sophistication and sectoral sensitivity in understandings of occupational mobility.

A study separately compares chronic illnesses in retired miners and Oil and Gas extraction workers with all other retirees[92]. National Health Interview Survey (NHIS) public data were analyzed for the years 2007–2017 to estimate weighted unadjusted and adjusted prevalence of selected health conditions (cancer, cardiovascular disease, high cholesterol, diabetes, hypertension, respiratory conditions, health status, and hearing loss) in retirees. Three retired worker groups (miners, oil and gas extractors, and other retirees) were defined using the respondents' longest-held industry and occupation. Higher prevalence of a number of adverse health conditions was noted in miners and Oil and Gas extraction workers when compared with all other retirees. A significantly higher adjusted prevalence of hypertension, hearing loss, functionally limiting lung problems, and fair or poor health was seen in miners over other retirees. Retired Oil and Gas extraction workers demonstrated a significantly higher adjusted prevalence of both hearing loss and poor health status.

Some scholars assessed spill data from 2005 to 2014 at 31 481 UOG wells in Colorado, New Mexico, North Dakota, and Pennsylvania[93]. They found 2–16% of wells reported a spill each year. Median spill volumes ranged from 0.5 m3 in Pennsylvania to 4.9 m3 in New Mexico; the largest spills exceeded 100 m3. Seventy-five to 94% of spills occurred within the first three years of well life when wells were drilled, completed, and had their largest production volumes. Across all four states, 50% of spills were related to storage and moving fluids via flowlines. Reporting rates varied by state, affecting spill rates and requiring extensive time and effort getting data into a usable format. Enhanced and standardized regulatory requirements for reporting spills could improve the accuracy and speed of analyses to identify and prevent spill risks and mitigate potential environmental damage.

A study developd a new data-driven model to analyze how workers move through an empirically derived occupational mobility network in response to automation scenarios which increase labor demand for some occupations and decrease it for others. At the macro level, the study's model reproduces a key stylized fact in the labor market known as the Beveridge curve and provides new insights for explaining the curve's counter-clockwise cyclicality. At the micro level, our model provides occupation-specific estimates of changes in short and long-term unemployment corresponding to a given automation shock. We find that the network structure plays an important role in determining unemployment levels, with occupations in particular areas of the network having very few job transition opportunities. Such insights could be fruitfully applied to help design more efficient and effective policies aimed at helping workers adapt to the changing nature of the labor market.

A research study investigates the relationship between residential proximity to oil and gas development and birth outcomes in California[95]. It conducted a retrospective cohort study of

2,918,089 births to mothers living within 10 km of at least one production well between January 1, 2006 and December 31, 2015. The researchers estimated exposure during pregnancy to inactive wells count (no inactive wells, 1 well, 2–5 wells, 6+ wells) and production volume from active wells in barrels of oil equivalent (BOE) (no BOE, 1–100 BOE/day, >100 BOE/day). The study used generalized estimating equations to examine associations between overall and trimester-specific oil and gas development exposures and term birth weight (tBW), low birth weight (LBW), preterm birth (PTB), and small for gestational age birth (SGA). Adjusted models showed exposure to active oil and gas development was associated with adverse birth outcomes in rural areas; effect estimates in urban areas were close to null. In rural areas, increasing production volume was associated with stronger adverse effect estimates. High (>100 BOE/day) vs. no production throughout pregnancy was associated with increased odds of low birth weight [odds ratio (OR)=1.40, 95% confidence interval (CI): 1.14, 1.71] and small for gestational age birth (OR=1.22, 95% CI: 1.02, 1.45), and decreased term birth weight (mean difference = −36 grams, 95% CI: −54, −17), but not with preterm birth (OR=1.03, 95% CI: 0.91, 1.18). Proximity to higher production oil and gas development in California was associated with adverse birth outcomes among mothers residing in rural areas.

A study explored whether residential proximity to oil and gas development was associated with risk for hematologic cancers using a registry-based case-control study design[96]. Participants were 0–24 years old, living in rural Colorado, and diagnosed with cancer between 2001–2013. For each child in our study, we calculated inverse distance weighted (IDW) oil and gas well counts within a 16.1-kilometer radius of residence at cancer diagnosis for each year in a 10 year latency period to estimate density of oil and gas development. Logistic regression, adjusted for age, race, gender, income, and elevation was used to estimate associations across IDW well count tertiles

for 87 acute lymphocytic leukemia (ALL) cases and 50 non-Hodgkin lymphoma (NHL) cases, compared to 528 controls with non-hematologic cancers. The result showed that ALL cases 0–24 years old were more likely to live in the highest IDW well count tertiles compared to controls, but findings differed substantially by age. For ages 5–24, ALL cases were 4.3 times as likely to live in the highest tertile, compared to controls (95% CI: 1.1 to 16), with a monotonic increase in risk across tertiles (trend p-value = 0.035). Further adjustment for year of diagnosis increased the association. No association was found between ALL for children aged 0–4 years or NHL and IDW well counts. While our study benefited from the ability to select cases and controls from the same population, use of cancer-controls, the limited number of ALL and NHL cases, and aggregation of ages into five year ranges, may have biased our associations toward the null. In addition, absence of information on O&G well activities, meteorology, and topography likely reduced temporal and spatial specificity in IDW well counts.

Some researchers evaluate potential associations between residential proximity to unconventional oil and gas development (UOGD) and risk of acute lymphoblastic leukemia (ALL), the most common form of childhood leukemia, in a large regional sample using UOGD-specific metrics, including a novel metric to represent the water pathway. They conducted a registry-based case–control study of 405 children ages 2–7 y diagnosed with ALL in Pennsylvania between 2009–2017, and 2,080 controls matched on birth year. We used logistic regression to estimate odds ratios (ORs) and 95% confidence intervals (CIs) for the association between residential proximity to UOGD (including a new water pathway-specific proximity metric) and ALL in two exposure windows: a primary window (3 months preconception to 1 y prior to diagnosis/reference date) and a perinatal window (preconception to birth). The results showed that children with at least one UOG well within 2km of their birth residence during the

primary window had 1.98 times the odds of developing ALL in comparison with those with no UOG wells [95% confidence interval (CI): 1.06, 3.69]. Children with at least one vs. no UOG wells within 2km during the perinatal window had 2.80 times the odds of developing ALL (95% CI: 1.11, 7.05). These relationships were slightly attenuated after adjusting for maternal race and socio-economic status [odds ratio (OR) =1.74 (95% CI: 0.93, 3.27) and OR=2.35 (95% CI: 0.93, 5.95)], respectively). The ORs produced by models using the water pathway-specific metric were similar in magnitude to the aggregate metric.

The authors examine the problem of the influence of the profession and industry of work of Russian applicants on their labor mobility[98]. The general growth of labor mobility of the population is currently caused by several factors: change in the labor values of applicants, technological progress, desynchronization of the education sector and the labor market, growth of the economic crisis, etc. The main reasons prompting applicants to think about changing their current job in the article are the aspects of their relation to those professional areas and industries in which they are currently working or would like to work in the future. The authors analyzed the results of surveys of applicants of various ages and from various professional fields regarding their desire to change their profession (without taking into account the influence of the material factor), as well as their opinions regarding the most attractive professional fields for them. In addition, there are the opinions of applicants regarding the reasons prompting them to think about changing their profession.

The study examines how female expatriates mobilise couples' dual-career coordination strategic choices to achieve their own and their partners' desired career goals[99]. This qualitative research is based upon in-depth interviews with 20 dual-career female expatriates working in two case study oil and gas organizations. The findings revealed that female expatriates use a series of

tactics ranging from cooperation in maintaining a dual-career hierarchy, through to coordinating aspects of their own and their partners' assignments, undertaking compatible industry roles and co-working (working together in the same organization) to attempt to achieve a greater egalitarian international dual-career strategic outcome.

The study investigates young people's experiences of living in a community dependent on resource extraction and processing industries during boom-bust economic cycles[100]. They used a qualitative multi-method approach to engage 50 youth ages 13–24 in a study of resilience and well-being. As part of our analysis of resilience processes, the researchers examined how young people's perceptions of their community's identity affect the strategies young people use to cope with stress and access supports. The data collection took place in a small town in western Canada dependent on oil and gas extraction. Applied thematic analysis indicated that young people participate in the co-construction of their community's social, economic, and place-based identities and that these co-constructions shape the decisions young people make with regard to education, work, and relationships.

Local participation is crucial for linking the oil and gas industry to broader economies. Direct employment in the oil and gas industry, albeit often on a limited scale remains critical for the transfer of expertise and know-how in many developing economies. Focusing on the social construction of carcerality – a set of spaces, practices and relationships, a study examines the carceralities of non-prison places such as offshore oil and gas infrastructures[101]. With emphasis on oil rigs and Floating, Production, Storage and Offloading (FPSOs) vessels, the study highlights the complex labour relations, negotiations and conflicts in offshore working environment and its impacts on local content and participation in Ghana's oil and gas industry. The study shows that carceral techniques operate to limit the potentiality of career progress.

Offshore labour practices and relations show the new kinds of carceral spaces being created through offshore extraction, and sheds light on how these carceral spaces depotentialize the labour force and reinforce global political economic inequalities.

The study assesses the evidence of carcinogenicity of water contaminants and air pollutants related to unconventional oil and gas (UOG) development[102]. The researchers obtained a list of 1177 chemicals in hydraulic fracturing fluids and wastewater from the U.S. Environmental Protection Agency and constructed a list of 143 UOG-related air pollutants through a review of scientific papers published through 2015 using PubMed and ProQuest databases. They assessed carcinogenicity and evidence of increased risk for leukemia/lymphoma of these chemicals using International Agency for Research on Cancer (IARC) monographs. The majority of compounds (> 80%) were not evaluated by IARC and therefore could not be reviewed. Of the 111 potential water contaminants and 29 potential air pollutants evaluated by IARC (119 unique compounds), 49 water and 20 air pollutants were known, probable, or possible human carcinogens (55 unique compounds). A total of 17 water and 11 air pollutants (20 unique compounds) had evidence of increased risk for leukemia/lymphoma, including benzene, 1,3-butadiene, cadmium, diesel exhaust, and several polycyclic aromatic hydrocarbons. Though information on the carcinogenicity of compounds associated with UOG development was limited, our assessment identified 20 known or suspected carcinogens that could be measured in future studies to advance exposure and risk assessments of cancer-causing agents. Our findings support the need for investigation into the relationship between UOG development and risk of cancer in general and childhood leukemia in particular.

Numerous studies have evaluated air and water quality degradation and human exposure pathways, but few have evaluated potential health risks and impacts from environmental noise

exposure. A study reviewed the scientific literature on environmental noise exposure to determine the potential concerns, if any, that noise from oil and gas development activities present to public health[103]. Data on noise levels associated with oil and gas development are limited, but measurements can be evaluated amidst the large body of epidemiology assessing the non-auditory effects of environmental noise exposure and established public health guidelines for community noise. There are a large number of noise dependent and subjective factors that make the determination of a dose response relationship between noise and health outcomes difficult. However, the literature indicates that oil and gas activities produce noise at levels that may increase the risk of adverse health outcomes, including annoyance, sleep disturbance, and cardiovascular disease. More studies that investigate the relationships between noise exposure and human health risks from unconventional oil and gas development are warranted.

A research conducted by three scholars examine the factors that influences the employees attrition rate to create sustainable workplace job satisfaction within the Oil and Gas service providers in Federal Territory of Labuan, Malaysia, using the Berry (1981) Model and Dyala, Kamal, Petra, Sherrihan, and Suleiman (2013) Model as the guiding principle[104]. While global oil price is falling, it might be an issue for employees to be warned for job retrenchment. This research discusses about implications of internal marketing tools such as employee extrinsic reward, employee intrinsic reward, leadership, training and development, and employee satisfaction to employee retention. Respondents are selected on the basis of simple random sampling to response the 48 items in the survey questionnaire.

A study reviews the sustainability challenges in oil and gas development, which established a literature-based framework for clean fuel predominantly with reference to MENA region, and identifies the trend for oil and natural gas usage and their effect on the technologies and its

human development index[105]. The findings indicate that fossil fuel will remain the major source of energy and transportation fuels, which can be effectively refined using catalytic refining processes along with the CO_2 capturing and storage techniques in order to reduce global warming. Sustainable development refers to basic information about the social, economic, and environment aspects of human activity. Among the main driving elements of sustainability are the progress made in technology and the utilization of energy resources. Worldwide, the use of renewable energy sources may increase but has moderate progress. Thus, the fossil fuels are playing a vital role in the energy world but require efficient refining processes to produce high-quality clean fuels for transportation as well as energy production.

The study presents a methodological framework for oil and gas development proximity studies grounded in an understanding of hydrocarbon geology and development techniques[106]. The study geospatially overlay locations of active oil and gas wells in the conterminous United States and Census data to estimate the population living in proximity to hydrocarbon development at the national and state levels. We compare our methods and findings with existing proximity studies. The study estimated nationally, that 17.6 million people live within 1,600m (~1 mi) of at least one active oil and/or gas well. Three of the eight studies overestimate populations at risk from actively producing oil and gas wells by including wells without evidence of production or drilling completion and/or using inappropriate population allocation methods. The remaining five studies, by omitting conventional wells in regions dominated by historical conventional development, significantly underestimate populations at risk.

Nigeria is a critical player in the energy industry. However, the industry has concerns over the underperformance of Nigerian oil and gas projects. The study involved comprehensive and quantitative analysis of Nigerian oil and gas project performance from technical and non-

technical perspectives with data from 65 projects[107]. Nigerian projects have a high average cost overrun of 38% with an SD of 39%, time overrun of 37% with an SD of 41%, fatality rate of 0.027, and oil spillage ratio of 18.51. The overall performance of Nigerian projects is much worse than that for their global peers. The results demonstrate that Nigerian oil and gas projects are of low subsurface complexity and present low technology challenges, which are advantages for field development; therefore, subsurface complexity and technology challenges are not the major causes of the poor performance. However, non-technical factors (local content, community, security, and partnership) play a significant role. In the study, the degree of the factor's effect is quantified and categorized into groups for guidance.

A study investigates the critical types of knowledge lost when employees depart companies in the oil and gas field[108]. The study adopts a grounded theory methodology. Twelve semi-structured interviews were conducted with elite informants in the oil and gas sector to gain an in-depth insight into the research problem. ATLAS.ti was used for data analysis and coding. In the oil and gas industry, employees generally have job rotation and work at various geographical locations during their career. The departing employees possess valuable types of knowledge depending on the role and duties they have performed over the years. These include specialized technical knowledge, contextual knowledge of working at different geographical locations, knowledge of train wrecks and history of company, knowledge of relationships and networks, knowledge of business processes and knowledge of management.

Local content laws are essential for promoting positive synergies between extractive industries and broader economies. A scholar critical evaluates the employment effects of Ghana's local content law[109]. It draws on the relational geography concept of scale – a constructed arena of activities that are highly interrelated – to examine the dynamic roles and relations between actors

and how that shapes employment opportunities and outcomes for Ghanaians in the oil and gas industry. The study shows that Ghanaians dominate onshore administrative positions and low echelon (ratings)/low skill positions offshore. There is a significant salary disparity between Ghanaians and expatriates due to poor regulation by the petroleum commission, corruption and undercutting by local recruitment agencies.

A study examined the impact of external business environment on SMEs willingness to invest in the Ghanaian oil and Gas Sector[110]. Using binomial logistic regression analysis, the study analyzed primary data from 245 SMEs from Ghana during the periods between 2015-2016. The study found that SMEs that had ready access to finance, reliable electrical supply, required technical qualification, no competition from foreign companies, well informed on Oil and Gas investment opportunity were more likely to invest in Ghanaian oil and gas sector. We also find that corruption perception, political stability and training support in the capacity building had no significant influence on SMEs willingness to invest. We suggest that future studies should cover internal firm factors, perceived barriers as well as macro-level factors.

2.3.1 Socio Cultural Effect

Due to regulatory officer and officers in charge of fund mismanagement corruption, there is currently poverty and dispossession in countries that produce oil. Corruption thwarted a number of government initiatives for development, including those of the Niger Delta Board, Niger Delta Basin and Rural Development Authority, OMPADEC, NDDC, and Ministry of Niger Delta. The government and oil firms must work together to develop the Niger Delta's population. The Nigerian oil business hardly ever thought about long-term partnerships with the host communities and totally relied on the military and police services of the Nigerian state for the

daily oil production activities. This corporate strategy was often described as heartbreaking and reckless.

The artisanal local oil refineries were seen all over the Nigerian Niger Delta Creeks and acknowledged that revenues to the federal government and profit to oil companies was affected by the illegal act of some community youths. This report also stated that soil and ground water was heavily contaminated, vegetation was devastated, aquatic life destroyed, and public health under serious threat as benzene and other carcinogenic chemicals are in concentrations higher than WHO and USEPA reports as corresponding to a 1 in 10,000 cancer risk.

Hydrocarbon concentration in drinking water samples are at least 10,000 times higher than the Nigerian drinking water standards of 3ug/l, benzene concentration at levels over 900 times above WHO guidelines. The people of the Niger Delta communities know about the pollution of their portable water and its dangers but had no options than to use the water for drinking, bathing and cooking as they have no alternative. The level of contamination found in the Niger Delta warrants emergency action ahead of all other remedial efforts, but, nothing has been done by the oil companies or Nigerian government, not the least efforts of consulting with the people up till now.

Michael employed the social exchange theory to explain the reason why women engage in protests in order to redress injustice in the Niger Delta. AP, J used the social exchange theory to characterize the reasons why tourism host communities develop different perception toward tourism, the author explain that communities assess business in terms of social exchange, they assess it in terms of advantages or disadvantages and decide to show good will or not. Ogege and Ewhrudjakpor adopted George Homan's social exchange theory in explaining how the Niger Delta youths resorted to violence when their expected rewards were not fort coming from

persistent hydrocarbon extraction in their region ; the violent behavior of the youths was described by these authors as a rational response to the monumental deprivation and marginalization by the IOCs and their accomplice in the Nigerian State, the authors used the social exchange theory in providing understanding for the sustained environmental resource crisis.

The effects of oil pollution on crop production in Rivers State, Nigeria on a sample of 296 respondents drawn from 17 out of 23 Local Government Areas, applied a stochastic trans-log production function in a multi-stage sampling technique. The results indicate that the effect of crude oil pollution on crop farms reduced the size of farmland, significantly at 1%, reducing marginal physical product (MPP), while in non-polluted farms output increased. Physical inputs, crude oil pollution variables and their interactions show strong negative (diminishing) returns to scale in oil polluted farms, but in non-polluted farmlands result indicate strong positive returns to scale. The technical efficiency results show that less than 22% of crop farmers were over 80% efficient in their use of resources in oil polluted farmlands, while technical efficiency in non-polluted farmlands indicates a high efficiency of 33%. This result indicates that environmental degradation poses a serious threat to farmers by diminishing both physical ability and psychological desires to farm. The goal of farming may be defeated before the proper exercise, especially when the individual has no hope of any compensation when the crops are destroyed, or the waters are polluted, as always, the case in the Niger delta region.

Critically assessed the effect of oil exploration on poverty in the Niger Delta region of Nigeria. The author's extensive review of the literature and drawing conclusion from the empirical findings restate the neglect of the region and the consequences of pollution as a drawback to economic progress. The study further concludes that the greatest negative tendency associated

with the exploration and exploitation of oil in this region is environmental degradation. However, a recent study by Adeyi suggests soil screening and massive clean-up funding to enhance contaminated land legislation. The efforts of government in the recently commissioned clean-up exercise of affected areas in the Niger Delta could not be ascertained but given the importance of oil exploration and exploitation to the Nigerian economy one would expect that this initiative will yield positive results.

A study examined oil pollution and agricultural productivity in the Niger Delta of Nigeria, the study employed an empirical analysis derived from a unique estimable production function based on Ramon Lopez's Cobb Douglas production function model. Findings established that increasing levels of oil spill and forest loss negatively affect agricultural productivity, while land, labour and capital positively improved agricultural productivity in the Niger Delta. In the same vein, another study explore the environmental effects of petroleum activities and policies in Nigeria employing descriptive techniques to attain logical interpretations. Findings from this study revealed that the actions of oil companies operating in the Niger Delta have tremendous influence on the survival of ecosystems and biodiversity of the region. In a similar study, an investigation on the consequences of oil spill on sea-food safety in coastal areas of Ibeno, Akwa Ibom State, observed the mean concentration of toxic petroleum hydrocarbons in the tissues of various fish species sample to be increasing as a result of oil spills. Investigating the impact of petroleum activities on various episodes of economic crisis in Nigeria, another study evaluates the historical pattern of oil spills using a descriptive technique to analyse data obtained from secondary sources and affirming that the transmogrification of the economy from agricultural-based to petroleum-based laid the foundation for the current economic crisis in Nigeria. Also, a study was conducted while exploring the extent of environmental degradation in Niger Delta

region and examining the efforts of oil companies in remediating the degraded farmlands in Niger Delta finds that oil pollution causes damage to human health, agricultural land and fish ponds as well as long-standing ecological malfunctioning.

A study examining the effects of environmental degradation on human health in nine selected oil communities in Delta State, Nigeria using cluster and principal component analysis, observed that gas flaring has a statistically significant, but dangerous impact on human health in the affected areas giving the high temperature and emission to the atmosphere. Nonetheless, the problem of illegal bunkering and vandalizing petroleum pipelines contribute immensely to oil spillage and degradation of the environment. Some of the researchers observes that oftentimes illegal bunkering and petroleum pipeline vandalization results from destructive tendencies of restive youths, who were aggrieved by government neglect of oil producing communities and corruption of the ruling class in amassing wealth through collaborations with oil companies. Unfortunately, these social vices perpetrated by the youths have a counter-effect in increasing the level of oil spills on the environment and the negative effect on water and land agricultural produce. Also, many bodies had analysed the influence of petroleum on Nigerian economy using secondary annual data from 2000 to 2009. The technique employed for the analysis include linear regression model and found that petroleum has substantial direct influence on the economy. Unfortunately, the mismanagement of the proceeds from petroleum exploration imbues Nigeria into the resource curse dilemma. Given the present circumstances in the Niger Delta and the need for improved economic activities for the population, it becomes very imperative for studies to explore the impact of environmental degradation on specific issues such as fish production to enable policy makers pin-point areas of concentration in the implementation of various policies for the economic development of the region.

Recent quantitative assessments of oil spills on fish production for other regions, especially in the Arctic, categorized fish in two distinct ways, A researcher described the pelagic and demersal fish as varying with respect to their natural habitat and the impact of oil spills. The study contends that while the pelagic and fish eggs may come into direct contact with oil spill, the demersal fish does not easily come into contact with spilled oil, except it spills deep into the sea bed. However, prolonged spills may inhibit the survivability of the demersal fish to avoid spilled oil by swimming away from danger zone. The implication is that if a spill is allowed to spread, it permeates deep down to the sea bed over a long period, causing more harm to the environment, which in turn affects fish production. In the same vein, a study assessing the impact of simulated oil spills on the Northeast Arctic Cod fishery, finds a spatial regeneration of fish population. In all simulations, the adult fish population remained at full reproductive potential with a reasonable number of juveniles swimming to replace the old fish population. Nevertheless, the variation in age of the fish determines the rate of survival following the impact of an oil spill. The study concludes that the reproductive health of the adult fish population is not affected in all simulations. However, the results provide the necessary insights to assist in the management of oil spills on fisheries.

Another very compelling study, using data from the Northeast Arctic cod to estimate spatial variations in natural mortality segregates studies on the impact of oil spills on fish into retrospective and prospective studies. While the former investigates the impact of a spill, the later estimates the probable outcome of potential future oil spills. In this case, the prospective study finds that spatial variation in natural mortality can alter the impact of an oil-spill on fish. However, in this study we have employed the retrospective dimension to analyse the effects of oil spill on fish production in the Niger Delta. Here we strongly aver to the contrary on the

assertion in that scientific studies on the impact of oil spills on fish stocks tend to ignore the fact that spatial patterns of natural mortality may influence the magnitude of the impact over time. To this end, we apply parametric Cobb-Douglas production function on fish production and oil spill data, assuming that oil spills kill fish at the egg or larval stage and at maturity. The oil spill risk assessment is based on a probability of constant mortality rate for all fish categories; hence the spatial variability is difficult to estimate given the paucity of data.

In Nigeria, about 62.8 percent of the oil spill incident occurred on farmlands. A major impact being the reduction in the availability of fish products and this has also made them very expensive. Statistics also indicate that a total of 9,107 oil spill incidences occurred in Nigeria between 1976 and 2005 resulting in about 3,121,909.8 barrels of oil spilled into the environment[93]. Some of these major spills include; the Escravos spill (Funiwa-5 blowout) of over 400,000 barrels of oil spreading through the Delta region polluting about 1,200 km2. In the disaster about 180 people died while 300 people contacted various illnesses through drinking polluted water and eating contaminated food in the affected areas.

The influence of occupation and occupational change on changes in real labor earnings: does choice of occupation or a specific change in occupation influence earnings changes. The findings revealed that large fluctuations in earnings exist even within this sample of workers, and the income changes vary markedly by occupation. By examining movements from year to year within the overall distribution of real labor income, we calculate that the percent of occupation-changers who increased their relative labor earnings by two or more 5% categories in the income distribution exceeded the percent of occupation-stayers similarly increasing their position in all 11 years measured[94].

In an agricultural economy with large fluctuations of income, current income is a poor indicator of a household's permanent income or economic status. They have considered occupational mobility as an alternative indicator. Their evidence suggests that occupational mobility is rather limited among the group of agricultural labourers who are generally from the poorest households in a village society. The picture of economic mobility is rather different when occupational changes are used instead of income mobility. However, very little has been done so far to examine the implications of occupational mobility for rural poverty, at least within the economic literature.

A number of empirical papers have attempted to examine the issue of training and its influence on various dimensions of labour market behaviour. The majority of the literature utilizes US data, particularly the National Longitudinal Survey of Youth (NLSY). Training in an international context, focusing upon the US, UK and Australia. The data used for the UK are from the National Child Development Study (NCDS4). This survey contains useful information on sources of training but unfortunately does not document the level of training from each source. The focus of the literature is the use of data on actual training rather than the proxies provided by tenure and the Mincer measure of work experience. Tenure is clearly a poor proxy for specific skills since the level of skill acquisition is largely determined by the type of job held. Some jobs provide very limited prospects of capital acquisition[95]. The role of on-the-job training (ON-JT) and off-the-job training (OFF-JT) in job mobility. Her conclusion is that both types of training have a significant effect on the exit rate within a hazard model of job mobility. Interestingly, her results suggest formal ON-JT leads to a decrease in the likelihood of mobility, whereas OFF-JT increases the likelihood. Thus, the suggestion is that ON-JT is more firm-specific and OFF-JT is more general human capital.

There are several studies conducted in Nigeria as well on the impact of oil exploration and production and its aftermath effects on the immediately environments. Eteng[96] explained that oil exploration and exploitation have over the last four decades impacted disastrously on the social, and the physical environment of the Niger Delta oil bearing communities massively threatening subsistent peasant agricultural economy and environment as well as the entire livelihood and basic survival of the people. The deplorable way Oil and Gas resource are exploited overtime in Delta State is the bane of the region. Saro Wiwa maintained over time that the environment in Ogoni land and other oil producing communities has been completely devastated by decades of reckless oil exploration and ecological welfare by shell and other Multinationals[96]. This makes the situation in the Niger Delta region, a "paradox of plenty". World Bank Report in 1995 in its observation highlights the point that despite its vast oil reserves, the Niger Delta region remains poor with education level below the national average. According to the report, while seventy percent (70%) of Nigerian children attend primary schools, the level in some parts of the Niger Delta has dropped with GNP below average of US$280. The existence of multinational oil firms in this area does not equate the developmental level in the area rather; it appears that these firms only exist to take advantage of oil turnover, at the expense of the host communities. This assumption corroborates in their insistence that the primary interest of the global corporations is of worldwide profit maximization.

2.3.2 Disasters and Disaster Impacts

The term 'Disaster' has undergone a number of efforts at redefining and researches, with some more effective than others, depending on the purpose and interest, what individuals consider as a disaster, the situation, disciplines and context. Quarantelli and Dynes, described disaster as an entrance into a state of uncertainty, duplication of war, catastrophe and, an expression of social

vulnerabilities. Mohamed Shaluf, described disasters as an emergency occurring due to human-induced or natural hazards that result in noteworthy changes in circumstances over a period. However, this definition doesn't reflect the harshness of the incidents. Parker and Handmer define disaster as "unusual natural or man-made event, including an event caused by failure of technological systems, which temporarily crushes the response capacity of human communities, groups of individuals or natural environment and which causes massive damage, economic loss, disruption, injury and/ or loss of life". However, United Nations International Strategy for Disaster Reduction describe disaster "as a serious disruption of the functioning of a community or society, involving widespread human, material, economic or environmental losses and impacts, which exceeding the ability of the affected community or society to cope using its own resource" (p.9). This definition embodies the same as Parker and Handmer emphasis on the economic and human ability to withstand the harshness of the effects. From the definition above, disaster can be defined as an un-prevented incident that forcefully placed vulnerable people in the quest for external assistance and this study adopts the definition of the United Nations.

2.3.3 Oil Spillage and Land Resources Pollution

Niger Delta is known to be a major farming region in Nigeria, contributing remarkably in the agricultural sector of the country. It's said to be the third producer of oil palm in the world after Indonesia. Because of their rich vegetation, most of the indigenous people are engaged in farming as their means of livelihood. Some studies have been focused on how the various environmental challenges have affected the farming activities in the region (Niger Delta). That is. the productivity, fertility of the crops, access to farmlands for transportation of goods to their farms and to the market to sell their products; and others have also been focused on crop diseases.

Before the production of oil, the lands in Niger Delta were used for farming and other activities but the land is now shared with oil companies for crude exploitation. Activities of the oil companies are still affecting the remaining lands left for the people to use. Their farmlands for growing crops are being reduced every day because of oil spillage and other forms of pollution. Investigations on the various environmental problems associated with oil exploration and production in specifically the Niger Delta in Nigeria have revealed that oil spillages have caused immense damage to farmlands, sources of water, mangrove forest, fishing activities, and other marine resources. This has caused people to completely relocate from their communities, no source of proper drinking water, loss of ancestral homes, pollution of fresh water, loss of agricultural land, destruction of fishing grounds and reduction of fish population.

A study has argued that, after all the enormous contribution of the oil companies located in the Niger Delta region of the country and their host communities, the exploration and production of crude oil has also led to the contamination of streams and rivers, forest destruction and loss of biodiversity in the area. Studies have shown that over 50 years' period of exploration and production activities in the Niger Delta at least 9-13 MMbbl of oil have been spilled.

Considering the effect of oil spillage on farming activities, the study by Ojimba and Iyagba focused on how oil pollution has affected horticultural crops in Rivers State, Nigeria. Multistage sampling procedure was used to obtain data from 17 local government areas. The results from analyzing 296 questionnaires showed that average hectare of horticultural farm cultivated was smaller in crude oil polluted farms (1.04 ha) than in unpolluted farms (1.17 ha). It revealed that output of fruits, banana, pepper, okra, leafy vegetables and melon in crude oil polluted farms (15.98 tons) were lower than in non-polluted farms (18.75 tons). The income per farm in crude oil polluted farms was also lower (US$ 324.70) than that of non-polluted farms (US$ 365.84).

They noted that the reduction in income of farmers was because of low harvest resulting from retarded crop growth. And the retardation in growth was due to air-borne pollutants released into the environment during gas flaring. It was, therefore, shown that crude oil pollution had detrimental and negative effects on the area of farmland cultivated, horticultural crops output produced and hence farmers' income.

In 2009, Abii & Nwosu conducted a study to know why the polluted farm recorded retarded plant growth which has affected the income of the farmers. Analysis was conducted on soil samples from three communities, two oil spill affected communities (Ogali and Agbonchia) and a non-oil spill affected community (Aleto) to serve as a control. After analyzing the samples with standard methods of some petrophysical properties that determine the content of nutrient in the soil and the soil's fertility status, affected oil spill soils recorded a decrease in Ca, K, P, Cation Exchange Capacity (CEC) contents and the content of sand fraction and Na increased. From the results, nutrient level and fertility status of Eleme soil had been adversely affected by oil and hence, it was included in the soil cleaning areas in Rivers State. They concluded that the oil companies should adhere to environmental laws during their operations and regular monitoring of petroleum production activities. The people of the communities should also be given compensations when their lands get affected by these activities. A higher concentration of heavy metal in polluted soil in maize farms and stress induced by the spill on cowpea seedlings account for the retardation in the growth of both plants. The question now is what has happened to these people whose lands are affected? Are there any changes in their socioeconomic life because of the impact on their communities?

To know the influence of oil spillage on cassava productivity, Ahmadu and Egbodion conducted research on 17 cassava farmers each from three oil spillage communities (Otor-Udu, Olomoro

and Uzere) and three non-oil spillage communities (Egini, Aradhe and Ellu) in Delta State. Ahmadu and Egbodion examined the effect of oil spillage on cassava farmland, yield and land productivity. The outcome indicated that oil spillage on cassava farms has led to major crop failure, poor yield, rotting tubers and stunted crop growth, increased soil temperature and toxicity, reduction of soil fertility, degradation of farmlands and low land productivity. Further analysis indicated that at the oil spillage affected land, there were smaller cassava farm size, low yield and less land productivity as compared to those of the non-oil spillage communities. They concluded that there should be a maintenance culture on the part of oil companies. And suggested further study to be conducted to know what adaptation measures the farmers need to engage in. This paper also analyzed basically, the effect of oil E&P on the cassava crop and to know what has become of the people in the communities whose means of livelihood has been affected by the oil spillage. The question then is where are the cassava farmers, their children and how are they coping with life?

Akpokodje and Salau employed an empirical analysis derived from a unique estimable production function based on Ramon Lopez's Cobb Douglas production function model to investigate the relationship between agricultural productivity and oil pollution in the Niger Delta of Nigeria. The results from their study showed that agricultural productivity is increasingly being affected by levels of oil spill and forest loss, whereas land, labor and capital positively improved agricultural productivity in the Niger Delta. The long term effect of platform sites, access roads, test sample pits, pipeline routes and seismic activities is typically a reduction in crop yield.

2.3.4 Economic Effect

Globally, Nigeria is ranked the sixth country to flare gas. Before recently, the natural gas has been exploited as hydrocarbon reserves, all the gas after the discovery of oil in the 1900s was flared. This, in the long run, has affected the local settlers and the region in general. Gas flaring has been the highest source of air pollution in the Niger Delta. The uncontrolled gas flaring is gradually destroying the ecosystem of the Niger Delta. Gas flaring goes on for twenty-four hours and some have gone on for as long as thirty years and in the process hydrogen sulphide is released into the atmosphere. The oil companies are not only destroying Niger Delta environmentally but also immensely contributing to global warming. The chemicals released aid in acid rain formation which corrodes the roofing sheets, causing skin diseases, etc. Olobaniyi and Efe also showed elevated levels of lead at concentrations of 0.56 mg/l in the atmosphere and argued that large concentration of oxides of nitrogen and sulphur from gas flares in the Niger Delta released into the environment contributes to acid rain experiences in the region. The quantity of carbon released per day is about 2,525,000 tons these flares have affected vegetation, farming, fishing and the entire community in general.

There has been massive destruction of aquatic life in communities due to acid rain. Also, no vegetation can have proper growth in an area close to flare sites. The leaves of cassava, waterleaf, and pepper near flare sites have decreased in dimension and the nutrients such as starch and ascorbic acid in the cassava in flare sites are less as compared to those located farther away from flare sites.

A study done at the Izombe flaring site indicates that there is a 100% loss in crop yield within 200 meters of the station. Cotton and oil palm among other economic plants wither away at any instance where they are located close to flares. This has brought about high socioeconomic cost

on the people in terms of repairing their corroded zinc roofing sheet, treating of sicknesses (breathing difficulties and pain, asthma, headaches, nausea, chronic bronchitis), buying of fertilizers, resettlement, and farming. And eventually increase in unemployment and poverty in the region. Unfortunately, these impacts will continue for a long time if not forever because the existing law only charges companies' monies for continuous flaring but do not ban gas flaring. Orubu stated that pollutant concentrations are highest in the Niger Delta after undertaking a comparison of concentrations of ambient air pollutants in the Niger Delta region and Lagos State. Orubu argued that the emitted greenhouse gases (such as methane and carbon dioxide) at flare sites contribute to global warming. Sadly, the highest number of the flare sites are located in the Niger Delta where the heat temperature from the flare sites could be as high as 1600^0C contributing to thermal pollution. Also, Adewale and Mustapha, after their research on gas flaring at Akwa Ibom, Rivers and Bayelsa states confirmed that gas flaring has caused sicknesses, a damaged and unsustainable environment, toxic waterways, loss in productivity of fishing and farming activities. What changes have these implications brought to the life of the people of the Niger Delta.

2.3.5 Oil and gas Activities

The extraction of natural mineral resources in the various parts of the world has called for the enactment of laws to enhance the smooth operation of activities, from the permit for the exploration stage to the refinery stage. Every country has a series of legislation regarding its natural resources. In view of this, Nigeria has had a series of laws and regulations concerning oil exploration and production which ranges from the onset of a permit for exploration to the sale of the hydrocarbon products to the world market.

In view of assessing legislation and systems that are to monitor and safeguard the environment, Kadafa et al., analyzed some existing laws applicable to oil pollution in Nigeria. They stated that environmentalists and others apportion all blames of environmental damage of Niger Delta on the oil companies but fail to remember that the federal government is the lawmaker and provides licenses to the oil companies. Therefore, the government should ensure all regulations are adhered to. They suggested that there must be the provision of individual agencies and communities based on environmental regulatory bodies which are not dependent on the state. This is due to the fact that NNPC cannot operate without being bias since some of its own plants and installations are causes of the pollution recorded; and also reforms are needed in the present judicial attitude towards litigation in relation to the environment, among others. These independent sectors will ensure government directives and legislation pertaining to oil development activities are monitored. Kadafa also suggested a review of legislation and made known that the monitoring agents are not available and the government cannot systematically or frequently monitor these sites. The question still stands, after all the losses faced by the people, what has become of them? Why are the monitoring teams not available? Will anyone who does not stay in the affected community allows such acts in their back yards? Among the various ways used by the federal government to handle the issues of Niger Delta was the establishment of the Niger Delta Development Commission (NDDC) in 2000. This was to enable the rapid, even and sustainable development of the Niger Delta into a region that is economically prosperous, socially stable, ecologically regenerative and politically peaceful (www.nddc.gov.ng, 2018). According to Isidiho and Sabran study, the formation of this corporation has positively affected some communities in the Niger Delta region although some communities in the region have not been covered.

Even in the existence of several laws and regulations, the ecosystem of the Niger Delta with its thick mangrove, streams, crop farms and rivers are being destroyed, worked on how to use the Environmental Planning and Management (EPM) process as a means of solving environmental problems in Bonny Island, Rivers State, Nigeria. They investigated the view of the general public on the state of the environment in the area, level of participation of people in compliance to existing environmental strategies, causes of ineffective environmental management in the area and assessing community satisfaction with existing environmental management approach. The responds or results of questionnaires given to the people confirmed that the level of damage from oil exploration, gas flares, oil spillage, water pollution, and pipeline vandalization is continuously increasing. This has given rise to the dilapidation of the environment, irregular routine of facilities and compliance with environmental management, and inspections are not properly carried out because of grossly inadequate facilities and equipment. About 85% of the people expressed displeasure with the existing environmental management approaches that were not fully implemented in their community.

The Mineral Act of 1946 which conferred crude oil in Nigeria with the government prohibits pollution of the environment through exploration activities and made provision for the restoration of the extraction areas. These laws were all set to ensure safe and environmentally friendly operation of the oil sector or companies in order to prevent degradation of the environment. Many researchers have called for the review of these laws to make new laws in order to preserve the environment and also get more qualified personnel to ensure that these laws are adhered to by the companies.

Every individual deserves some form of basic needs and every state also deserves development both physical and social. The people of the Niger Delta have human, political, social, economic

and cultural rights as the oil companies and their workers. Therefore, they all must be subjected to the same set of rules, rights and obligations. These basic elements, describes the equality of all persons before the law, effectively eliminate any risk of arbitrariness manifesting itself in discrimination, abuse or oppression. The political elites of Nigeria since 1970 established an authoritarian power system that allows central control of strategic resources including the country's substantial oil deposits. These have led to the powerful elites pursuing social and economic strategies that are short-sighted, selfish, and not at motivated by the needs of the people whose environment has been degraded. These have consequently led to scarcity of material, deep frustration, and youth restlessness in the Niger Delta region.

2.4 Theoretical Framework

The study hinges on the human capital theory by assuming a direct cross-sectional association between environmental performance and per capita output. The study modeled environmental performance as a function of per capita capital stock and human capital development, both of which are the fundamental inputs determining per capita income. To extend the analogy to the aggregate production function, we consider the democratic capital and social capital as additional inputs generating national environmental performance, in line with recent studies on economic growth that proposes democratic and social capital as critical factors explaining cross-country variations in economic growth. Based on the analogy to the production function, it can be formally state the production of national environmental performance as follows:

$$E = AK^{\alpha} H^{\beta} N^{\theta} L^{1-\alpha-\beta-\theta} \qquad (2.1)$$

Where: E denotes the environmental performance, A is the environmental technology available to all countries, K denotes the physical capital which may embody the cross-individual

technology, L is the population, H is the human capital stock, and N is the natural endowments. For $\alpha + \beta + \theta < 1$, where $\alpha, \beta, \theta \in (0,1)$, the model can be rewrite in per capita terms as:

$$\frac{E}{L} = A\left(\frac{K}{L}\right)^{\alpha}\left(\frac{H}{L}\right)^{\beta}\left(\frac{N}{L}\right)^{\theta} \tag{2.2}$$

Taking the natural log of equation (2.2), it becomes:

$$\ln ev = \phi + \alpha \ln k + \beta \ln h + \theta \ln n \tag{2.3}$$

Where: ϕ represents ln$A$, and k, n, and h denote the inputs divided by L. In this way, the study synthesizes various factors that have been shown to affect environmental performance in a single framework, which can be summarized as follows:

$$EF_i = \phi + \alpha HCD_i + \varphi Z_i + e_i \tag{2.4}$$

Where: *EF* denotes measures of environmental factors of oil and gas activities; *HCD* denotes human capital development; *Z* denotes the other determinants of environmental factors of oil and gas activities, including economic, socio-cultural, environment, social capital, natural endowment; *i* is cross sections and *e* denotes the error term. The study also controlled for the demographic factors such as gender, age, marital status, employment status, formal education, occupation location, and household income.

2.5 Summary of Gaps in the Literature

The review of related literature revealed that extensive research has been conducted on the oil and gas exploration and production by Multinational Corporations in the Niger Delta region of Nigeria. Valuation analyst of oil companies basically focuses on fundamental characteristics like production efficiencies and growth rather than on measures of marketing, sales or product

pricing characteristics. The people of the Niger Delta have been deprived of their land, fertility, delta forest (mangroves), water supplies, and means of subsistence due to years of oil and gas development along with regular crude oil and petroleum product spills. High levels of poverty and unemployment (especially among young people), deteriorating infrastructure, moral degeneration, and crime have all been brought on by these losses. It has also created an occupational shift, as the predominant occupation before the discovery of oil was fishing, farming, craft works, weaving, moulding, hunting, tapping/gin making, carpentry and petty trading, but this has considerably changed, as nobody is interested in agriculture and other blue-collar jobs. The interest of everybody, including the uneducated has shifted to the search for white-collar jobs in the oil industry. Social scientists have studied occupational mobility from many perspectives. Sociologists view an occupation as a basic link between an individual and the rest of society. Through that link comes an image of an individual's prestige, power, intelligence, status and income. This logic has led to the use of occupational mobility as a proxy for the broad concept of social mobility, and excellent studies exist of inter- and intra-generational social mobility. Several more recent studies indirectly measure specificity based on the wage differentials of occupational changers or based on the relative distribution of workers across occupations. Few studies explicitly analyze the specificity of human capital investments based on subject choices within study programs, but no study so far has analyzed the effect of various activities of the oil and gas companies in the Niger Delta region on the occupational changes of the host communities.

Before oil and gas E&P activities began, farming, fishing, and other petty trades like blacksmithing, hunting, weaving, and other small trades were the main jobs in the area. Oil and gas's interference in the local economy has reduced economic activity, especially in agriculture,

which has led to a poor production of crops including cassava, cocoa, maize, rice, and oil palm as well as fish capture. The growing of cash or food crops is practiced in all but one of the nine states. After the oil boom in the early 1970s, the labor market's distortion led to a drop in agricultural production. This ultimately had a negative impact on the region's and even the country's ability to produce food, cash crops, and fish. Due to low production from Ogoniland, the nation's annual fish production, which formerly varied from 600,000 to 700,000 tons, fell to 120,000 tons in 1990. Oil exploration and production activities have contaminated land and water bodies, which have decreased fishing and farming production. The protracted oil spill in practically all of the fishing towns in the area is to blame for the low fishing catch rates. When the government implemented a policy of giving farmers low rates for essential food products over time to suit urban demands, natives of the Niger Delta started to find agriculture unappealing.

Eventually, some people turned to dealing in other items, while others lost their jobs and tried to find work in the oil industry. Some regional business owners closed their companies in order to make investments in the oil and gas industries. Among these companies is the cocoa cottage industry. A significant number of locals were made unemployed by this diversion. Some individuals lost their land and crops without receiving any compensation as a result of laws like the Petroleum Act of 1969 and the Land Use Decree of 1978. This was due to the fact that compensations were only granted to owners of cash crops rather than owners of land used for food crops whose farms were impacted by oil and gas activities. The decline in productivity in the typical occupation has reduced family income and raised the unemployment rate. As a result, individuals are unable to pay for necessities of life like food, shelter, clothing, access to education, and basic medical care due to a lack of cash.

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Chapter Three

Methodology

This chapter presents the procedure for data gathering and analysis for the research. The various methods and techniques to be used to achieve the set objectives are described below. The work is arranged to capture the occupational effect of oil and gas exploration and production in host communities in Nigeria.

3.1 Study Area

The study area entails the generality of Nigeria and to be concentrated on Niger Delta area of the country where Exploration and Production of Oil and Gas are dominant at commercial rate with focus on the Social-Cultural, Environmental and Economic impacts on the host communities, as they affect occupational mobility of people in the host communities.

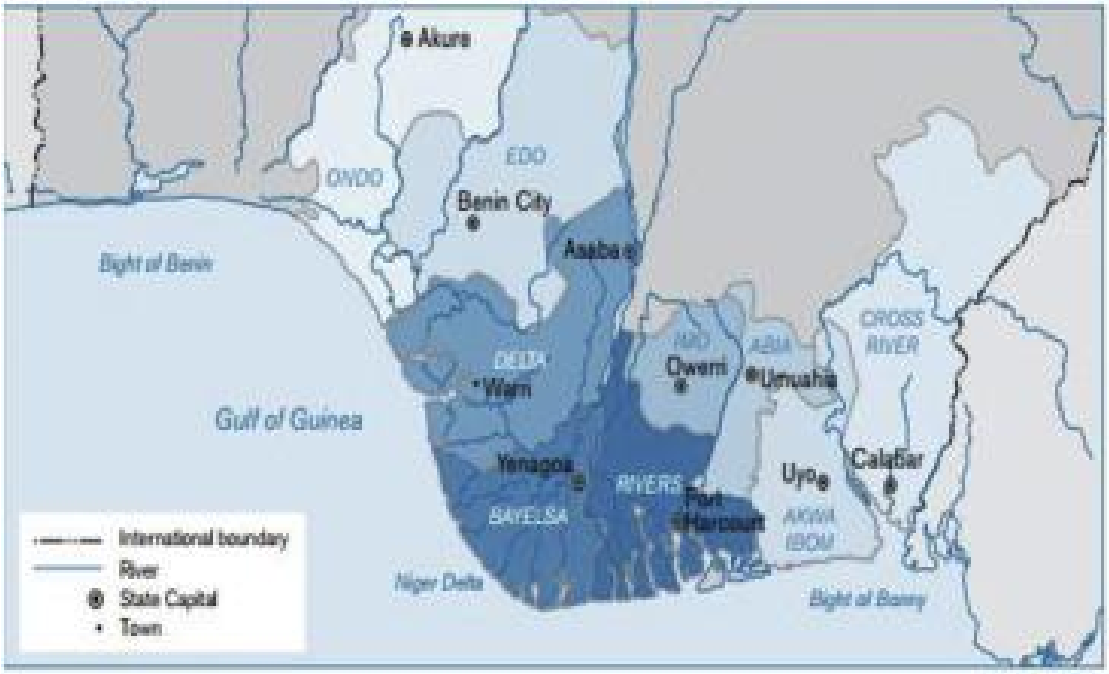

Figure 3.1: Map of Niger-Delta Region

3.2 Research Design

This study proposes a cross sectional survey research design. The reason for the adoption of cross-sectional survey research design is that it provides opportunity to examine the occupational effect of oil and gas exploration and production in host communities based on direct subject's experiential information on the subject matter. In addition, since the data that will be used in this study will be collected through a structured questionnaire to be administered to some selected respondents in the study area, best hand information will be made available.

3.2.1 Primary Sources of Data

Primary data will be obtained from the targeted population through the use of well-structured questionnaires.

3.2.2 Secondary Data

Secondary data shall be those that are obtained from Government Institutions, Department, Bureaus and Agencies in Nigeria e.g., Bureau of Statistic, Central Bank of Nigeria, Nigeria National Petroleum Corporation, Annual Statistic Reports, Niger Delta Development Commission (NDDC). World Bank Reports, Amnesty International, UNEP Report, UNDP report/WHO, Friend of the Earth Nigeria etc.

3.3 Population of the Study (Sample Frame)

The 2016 projected population according to the National Bureau of Statistics (NBS: Demographic Statistics Bulletin, 2017) reported the population of all the states in the Niger Delta region as; Bayelsa – 2,277,961, Delta – 5,663,362; Rivers – 7,000,924, Akwa-Ibom – 5,482,177, Edo – 4,235,595 and Cross River state – 3,866,269, all of which were located in the south-south region of Nigeria. Abia – 3,727,347 and Imo state – 5,408,756, located in the south-east region

of Nigeria. Ondo state – 4,671,695, located in the south-west of the nation. However, the population of this study would comprise of total number of working age (between 15-64 years) across the three selected states. Working ages drawn from the oil rich region(s) in Nigeria as at December, 2021. Specifically, these include all the men and women of working age in all the three states from the South-South (Delta), South East (Imo) and South West (Ondo state).Working ages (between 20 - 64 years) in Delta state was report to be 3,937,962, Imo state was 3,739,211 and in Ondo state, it was 3,391,766 according to the Nigerian Bureau of Statistics (2021). The total population is 15,743,813 across the three selected states. The sample population is 11,068,939 (working age between 15 - 64 years) across the three selected states.

3.4 Sample Size of the Study

The "sample size" has to do with the magnitude of such a portion of the population selected for the study. In determining the sample size, the researcher has used "Taro Yamen's formula".

The formula is normally stated as:

$$n = \frac{N}{1+N(e)^2} \qquad (3.1)$$

Where: n = sample size required

N = population sizeof the three purposively selected states (working age 20-65 years)

e = level of significance (0.05), and 1 = is a constant.

For the purpose of this research, there was a population size of 11,068,939 people, and 0.05 level of significance was used. Therefore, substituting in the formula stated above, the sample size was calculated below:

$$n = \frac{N}{1+N(e)^2} \qquad (3.2)$$

$n = 15,743,813 /1+15,743,813 (0.05)^2$

$n = 15,743,813 /1+15,743,813 (0.0025)$

$n = 15,743,813 /1+39,359.53$

$n = 15,743,813 /39,360.53$

$n = 399.9 \approx 400.$

Total number of 400 responses would be garnered in the three selected zones of South-East, South-South and South-West.The sample size selection was represented in Table 3.1.

Determination of Individual (Zone) Sample Size in Table 3.1

The individual sample size was determined using Bourley's (1964) population allocation formula, which is normally stated as:

$$nh = \frac{nNh}{N} \qquad (3.3)$$

Where: nh = sample size per each state, n = the total sample size, Nh = Number of working ages (between 15 - 64 years) in each state, and N = total study population.

- Delta State (South South):

  nh= nNh/N; nh= 400(3,937,962)/11,068,939 = 142

- Imo state (South East):

  nh= nNh/N; nh= 400(3,739,211)/11,068,939= 135

- Ondo state (South West):

  nh= nNh/N; nh= 400(3,391,766)/11,068,939= 123

Table 3.1: Sample Size Selection of the Respondents

S/N	Ranks of Selected Respondents	Population size	Proportionate sample
1.	Delta State (South South)	3,937,962	142
2.	Imo State (South East)	3,739,211	135
3.	Ondo State (South West)	3,391,766	123
Total		**11,068,939**	**400**

Source: Author's computation (2022).

3.5 Sampling Technique

The study adopted two (2) stage sampling technique. The sampling procedure involves taking of samples in stages using smaller and smaller sampling units at each stage. Additionally, it involves selecting the clusters first and then randomly choosing a specified number of units from each selected cluster. This technique is chosen because it allows the selection of respondents that have experience on mater relating to the subject of interest. In selecting the respondents, the two (2) stage sampling technique would be utilized as follow;

First stage: the oil rich regions will be purposively selected. The regions are the South-South (Bayelsa, Delta, Rivers, Akwa-Ibom, Edo and Cross River), South East (Abia and Imo) South West (Ondo State). Second stage: one state will be selected from each region. The states are Delta State in South-South, Imo State in South East and Ondo in South West from which 400 respondents would be selected randomly in all the states. The justification for the selection is as follows:

i. Ondo State was choosing for the fact that Oil Activities (Exploration) commenced in Ondo state, it is the only state in the western geo-political zone that produce oil. It has many oil wells and the negative environmental, socio-cultural and economic impact of oil

and gas activities was very pronounced in the state; moreover, it has the longest coast in Nigeria.

ii. Imo State was selected on the basis that, it was in existence before the creation of Abia State. Imo was created in 1976 and Abia State was created in the year 1991. In terms of population, Imo State has a population of about 5.409 million, which is higher than Abia State population that stood at 3,727,347. It is the largest onshore production and it is easy to access.

iii. Delta state was chosen based on the peaceful atmosphere that is present in the state. It is accessible with a host of many multi-national oil companies situated there. The state has varieties of tribes and culture, it also bounded with Bayelsa, Ondo, Anambra, Imo, Rivers and Edo amongst others.

3.6 Research Instrument

Again, the data would be gathered using well-structured questionnaire because this inspires direct response and feedback mechanism from the respondents who are knowledgeable and ready to respond to the questions from the questionnaire. The questionnaire would be divided into four sections. Section A comprises the respondents' locational information which includes; state and local government area. Section B consists of the respondents' socio-economic information which includes; age, gender, tribe, marital status, employment status, religion, year of formal education, level of education, household size, household head gender, primary occupation, secondary occupation and job status. In addition, the section covers questions that relate length of time in the job, average monthly income and location. With respect to occupation, the questionnaire also covers information on the respondents' past and present occupations, and if they have had reasons to change their occupation in the past few years. If they had tried to change occupation,

they were asked why. Section C covers questions that centre on oil exploration and current socio-cultural, economic and environmental issues in the study area. Section D focuses on how the respondents expect the socio-cultural, economic and environmental challenges to change in the next few years. All these would be covered in order to adequately address the objectives of this study, highlight the current issues as they relate to oil and gas activities in the study area and provide advice to government and other authorities.

3.7 Validity and Reliability of the Research Instrument

The validity of the instruments was established through face validity. The questionnaire was given to the researcher's supervisors for critical review, certify and correct where necessary. In addition, to determine the degree of consistency of the research instrument, a pretest study was carried out using the administered copies of questionnaire which are forty (40) observations. The collected data was coded into the IBM Statistical Package for Service Solution (IBM SPSS) and Cronbach's Alpha coefficient was obtained for all the variables to determine whether the instrument is reliable or not.

Reliability of the research instrument was ensured through Cronbach Alpha statistical test which measures internal consistency on the data from pretest survey. A pre-test result showed correlation coefficient greater than 0.78, which is said to be reliable. The pretest assessed the reliability of the instrument and the ability of respondents to understand the questions in the research instrument. It was also conducted to evaluate the adequacy of the instrument in measuring the aims and objectives of the study.

Pilot Study

Pilot study was carried out to enable the researcher have a foreknowledge of the reactions of the respondents and to ascertain the reliability of the questionnaire when finally used. About 10% of the sample size was covered in the pre-testing exercise.

3.8 Method of Data Collection

For the purpose of this study, primary data would be utilised. The data would be gathered by administering well-structured questionnaires to the target respondents. In addition, the questionnaire copies would be handed out to only respondents that are within the categories of selected working age group and are available, and willing to respond to the researcher's questions. The completed questionnaires would be returned for sorting, coding and analysis.

3.9 Methods of Data Analyses & Model Specification

(a) The work is not focused on a peculiar sample size in one community because analyzing the socioeconomic implication of oil and gas on one community and generalizing it for the entire region will be biased. The statistical information to be used will be extracted from:

1. Official statistics from Nigeria: this comprises of information obtained from government institutions, departments, bureaus and agencies in Nigeria. Such government institution consulted for data during this thesis were Nation Bureau of Statistics, Central Bank of Nigeria, Nigeria National Petroleum Corporation, Annual Statistical reports, Niger Delta Development Commission.
2. Data from other Organization: World Bank Report, Amnesty International, UNEP Reports, UNDP Report, WHO, Friends of the Earth Nigeria.
3. Other sources of information, etc.

All the data for the research would be combined to form database of information that is regionally representative. Both qualitative and quantitative data collected from the different source would be analyzed and added in order to come up with the output concerning each relevant parameter. The mixed method approach would be considered suitable to meet the objective of the research.

The data obtained would be sequentially presented to identify and describe the facts needed to give a clear picture of the problem. The data would then be analyzed using descriptive and conceptual approaches and from the analysis, logical deductions and presentation would be made. A comparative study method would also be adopted to review, interpret and cross-analyze the pieces of information to allow a better understanding of the specific causes of environmental pollution and its impacts on socioeconomic life.

(b) Model Specifications

The study examines the occupational effects of oil and gas activities on the host communities in Nigeria. Specifically, the objectives are to assess the level of oil and gas activities in the host communities, determine the extents of occupational mobility caused by oil and gas activities in the host communities of Niger Delta area of Nigeria, analyses the determinants of the occupational mobility of the indigenous people in oil and gas producing communities, and investigate the economic, socio-cultural and environmental effects of oil and gas activities on the host communities. The first two objectives are achieved using descriptive analysis and percentile ranks approach which require no model specification. Following the theoretical framework developed in the previous section, the logistic regression models of objectives three and four are specified as follows:

Model specification of objective three: Determinants of occupational mobility of the indigenous people.

$$\Pr(omob_i) = \alpha_0 + \alpha_1 gender_i + \alpha_2 age_i + \alpha_3 ms_i + \alpha_4 emps_i + \alpha_5 fedu_i + \alpha_6 inc_i + \alpha_7 oloc_i + \alpha_8 gopp_i + \alpha_9 loch_i + \alpha_{10} envc_i + \alpha_{11} ecis_i + \alpha_{12} sci_i + \mu_i \quad (3.4)$$

The dependent variable is occupational mobility (omob) which indicates 1 if the respondent changed occupations in the last decade and zero otherwise. The variables of interest among the explanatory variables are growth opportunity (gopp), location change (loch), environmental challenges (envc), economic issues (ecis) and socio-cultural issues (sci) respectively. Other counding variables are gender (Male -1, Female - 0), age (in years), marital status (married - 1, never married - 0), employment status (employed -1, unemployed - 0), formal education (in Years), household income (in Naira), and occupation location (urban -1, rural - 0). In this model, *i* stands for respondents, the parameters are α_0, α_{1-12} while the error term is μ_i.

Model specification of objective four: Economic, envionmental and socio-cultural effects of oil and gas activities on the development of the host communities.

$$\Pr(hcd_i) = \theta_0 + \theta_1 gender_i + \theta_2 age_i + \theta_3 ms_i + \theta_4 emps_i + \theta_5 fedu_i + \theta_6 inc_i + \theta_7 oloc_i + \theta_8 scc_i + \theta_9 ecc_i + \theta_{10} evc_i + \varepsilon_i \quad (3.5)$$

The dependent variable is host community development (hcd) which indicates 1 if high rate of the oil and gas activities aiding the general development of the region and zero otherwise. The variables of interest among the explanatory variables are socio-cultural challenges (scc), economic challenges (ecc), and environmental challenge (evc) respectively. Other counding variables are gender (Male -1, Female - 0), age (in years), marital status (married - 1, never married - 0), employment status (employed -1, unemployed - 0), formal education (in Years),

household income (in Naira), and occupation location (urban -1, rural - 0). In this model, *i* stands for respondents, the parameters are θ_0, θ_{1-10} while the error term is ε_i.

(c) Measurement and Sources of Variables

Again, for the purpose of this study, the source of data that would be used is primary. The data would be collected through well-structured questionnaire administered to the target respondents. The completed questionnaires would be returned for sorting, coding and analysis. Summarily, the variables that would be used in this study would be measured as presented in Table 3.2.

(d) Techniques of Estimation / Methods of Data Analysis

In this study descriptive and inferential methods of analysis are employed. The descriptive statistical tools such as frequency and percentages are used (where necessary) to represent the responses in all sections of the research instrument. Also, the descriptive analysis considers representations of mean and standard deviation scores for a clear description of the characteristics of the data to be collected.

Table 3.2: Description of Variables

Variable	Acronyms	Measurement
Job Status	*omob*	Dummy; 1 if the respondent changed occupations in the last decade and 0 otherwise
Host community development	*hcd*	Dummy; 1 if there is high rate of the oil and gas activities aiding the general development of the region and 0 otherwise
Age	*age*	Natural logarithm of age of the respondent in years
Gender	*gender*	Dummy; 1 for male and 0 for Female
Household income	*inc*	Natural logarithm of income of the respondent
Location	*loc*	Dummy; 1 if the respondent location is Urban and 0 otherwise
Formal education	*fedu*	Natural og of the number of years spent on education
Employment status	*emps*	Dummy; 1 if the respondent formally employed and 0 otherwise
Occupation location	*oloc*	Dummy; 1 if urban area and 0 otherwise
Socio-cultural factors	*scc*	Principal composite score of the reasons for change of occupation if the respondent changed occupations in the last decade. The reason (s) and current issues indicated under socio-cultural challenge will be juxtaposed to form items that can be used for composite score.
Economic factors	*ecc*	Principal composite score of the reasons for change of occupation if the respondent changed occupations in the last decade. The reason (s) and current issues indicated under economic challenge will be juxtaposed to form items that can be used for composite score.
Environmental factors	*evc*	Principal composite score of the reasons for change of occupation if the respondent changed occupations in the last decade. The reason (s) and current issues indicated under environmental challenge will be

		juxtaposed to form items that can be used for composite score.
Growth opportunity	*gopp*	Dummy; 1 if occupation changes due to growth opportunity and 0 otherwise
Location shange	*loch*	Dummy; 1 if occupation changes due to location change and 0 otherwise
Environmental changes	*envc*	Dummy; 1 if occupation changes due to environmental changes and 0 otherwise
Economic issues	*ecis*	Dummy; 1 if occupation changes due to economic issues and 0 otherwise
Socio-cultural changes	*sci*	Dummy; 1 if occupation changes due to socio-cultural factor and 0 otherwise

Source: Researcher's Compilation (2022)

Test of Objectives One and Two

The study employed Percentile Ranks approach to determine the level of oil and gas activities in the Niger Delta region. Likewise, the method was used to investigate the level at which oil and gas activities affect the Niger Delta region. The *percentile ranks* measure the proportion of an observation (score) in its frequency distribution which is equal to or lower than it. This is commonly employed to make clear the interpretation of scores on standardized test. The value obtained from the percentile rank is interpreted as the proportion of the group that scored at least the score of interest. The mathematical formula is:

$$\frac{c_\ell + 0.5 f_i}{N} \times 100\% \qquad (3.5)$$

Where: c_ℓ represents the count of all scores equal and less than the score of interest/question, f_i denotes the frequency of the score of interest, and N is the number of observations in the sample.

Test of Objectives Three and Four

In addition, inferential statistical tools namely; multilevel mixed-effects ordinal logistic regression analysis was used to examine the occupational effect of oil and gas activities in host communities. The choice of probit regression analysis for analyzing the data collected for testing the two hypotheses, is based on its ability to model dichotomous or binary outcome variables. One of the main virtues of this approach is that the underlying standard normal distribution allows for a more uniform probability of obtaining a 0 or a 1 as outcome variable whilw taking into consideration the differences in states. The standard probit model is built around a latent regression of the following form;

$$\hat{y} = X'\beta + \varepsilon \qquad (4)$$

Where:

X and β are the regression variables and parameter matrices. The vector matrix of normally distributed error term is ε.

Furthermore, the collected data would be subjected to various tests to minimize possible errors. Prior to the inferential analysis, each set of items expected to measure socio-cultural, economic and environmental issues would be subjected to composite score estimation technique for extraction of reliable and valid indicators. Also, for more precision, marginal effects of each variable on occupational change using the probit model estimates would be calculated.

In addition, multilevel mixed-effects ordinal logistic regression analysis approach is employed to investigate the economic, socio-cultural and environmental impact of oil and gas activities on the host community. The conditional distribution of the response given the random effects is assumed to be multinomial, with success probability determined by the logistic cumulative distribution function.

Endnotes

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2. M. Watts & A. Zalik. *Consistently unreliable: Oil spill data and transparency discourse*. **Extr Ind Soc.**, 7(3), 2020, 790–795.

Chapter Four

Results and Discussion of Findings

This section of the research study presents the analysis of data collected on the the effects of oil exploration and production on economic activities of Host Niger-Delta communities in Nigeria. Out of the total questionnaires of 400 administered to the targeted respondents, 388 were returned, giving a high response rate at 97%. The results presentation and discussion were in three parts. The first section dealt with the descriptive analysis of respondents' characteristics and their perception regarding the key questions. The second part presented the data analysis on the basis of the four specfic obectives, and the last section provided the discussion of findings.

4.1 Descriptive Analysis

4.1.1 Descriptive Analysis of Demographic Report

This sub-section presents information on the socio-economic features of the respondents. From the administered questionnaires, Figures 4.1-4.4 show the statistics of the three sampled states as well as the local governments. In Figure 4.1, it shows that 35.1% of the total sampled respondents are from Imo state, while 34.8% and 30.1% are from Delta and Ondo states respectively. Concerning the demographic distribution of the 136 sampled local government areas (LGAs) in Imo state, Figure 4.2 reveals that 29.4% of the respondents are indigenes of Oguta LGAs, followed by Ohaji (19.9%), Ohaji/Egbema (16.9%), Owerri North (8.8%), Ohuta (5.9%), Ikeduni (4.4%), Njaba (2.9%), Mbaitohi (2.2%), Owerri Municipal (2.2%), Ideato North (2.2%), Ehinme Mbani (2.2%), Nkor-Okpala (0.7%), Ohahi Egembi Assa(0.7%), and Onulmo (0.7%) respectively. As regards the distribution of 135 sampled LGAs in Delta state, Figure 4.3 indicates that Ukwani LGA has the highest number of indigenes with 17.8% of the respondents,

followed by Isoko South (15.6%), Warri North (14.1%), Isoko North (11.9%), Burutu (11.9%), Ughelli North (10.4%), Ughelli South (6.7%), Warri South (2.2%), Udu (2.2%), Ukwani (1.5%), Ethiope East (1.5%), Ohafia (1.5%), Okpe (0.7%), Ubeji (0.7%), and Warri South (0.7%) correspondingly. With reference to the respondents' distribution of 117 sampled LGAs in Ondo State, Figure 4.4 shows that Ilaje indigenes has the highest respondents with 94.9% of the total respondents, then Akoko NE (1.7%), Igbokoda (1.7%), Ikwere (0.9%) and Ese Odo (1.7%) respectively.

The information regarding the bio-data of the respondents are provided in Tables 4.1a-c. The total numbers of respondents that provided information concerning age are 359. Out of the 359 respondents, people within the age bracket of 46–55 years consist 32.31%, followed by those within the age group of 36–45 years (28.69%), 26 – 35 years (14.21%), 56 -65 years (12.81%), 65 years and above (6.96%), and 26 year below (5.01%) respectively. This shows that majority of the respondents are within the working age bracket. Concerning the age distribution based on the states, the table indicates that 1(0.74%), 24(17.78%), 28(20.74%), 32(23.7%), 26(19.26) and 24(17.78%) are within the age brackets of 26 years below, 26–35 years, 36–45 years, 46–55 years, 56–65 years and 65 years & above among the respondents from Imo state respectively. The table further shows that among the 126 respondents from Delta, 56(44.44%) are within age group 46–55 years, whereas, 44(33.33%), 12(9.52%), 12(9.52%), 3(2.38%) and 12(0.79%) are within age group 36–45 years, 26–35 years, 56–65 years, 26 years below, and 65 years & above correspondingly. Among the respondents from Ondo state, 33(34.02%) are within the age group 36–45 years, while 28(28.87%), 15(15.46%), 13(13.4%), and 8(8.25%) are within the age group 46–55 years, 26–35 years, 26 years below, and 56–65 years respectively. As earlier stated, the findings show that majority of the respondents fall within the economic active age group.

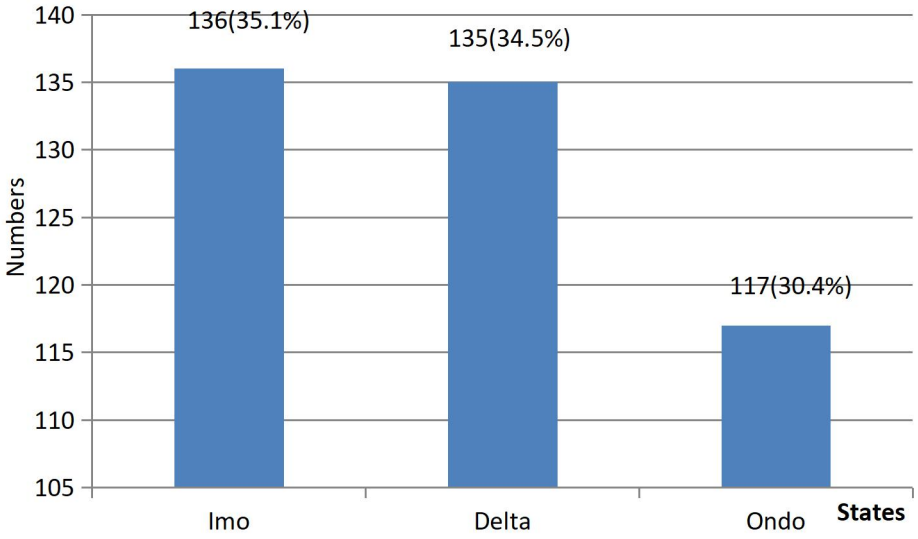


Figure 4.1: Respondents' classification by states

Source: Field Survey (2022)

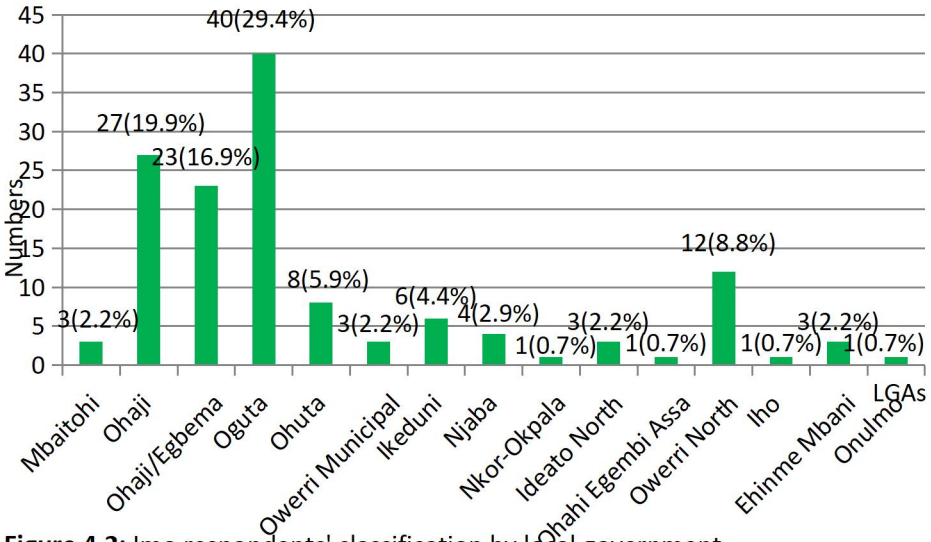


Figure 4.2: Imo respondents' classification by local government

Source: Field Survey (2022)

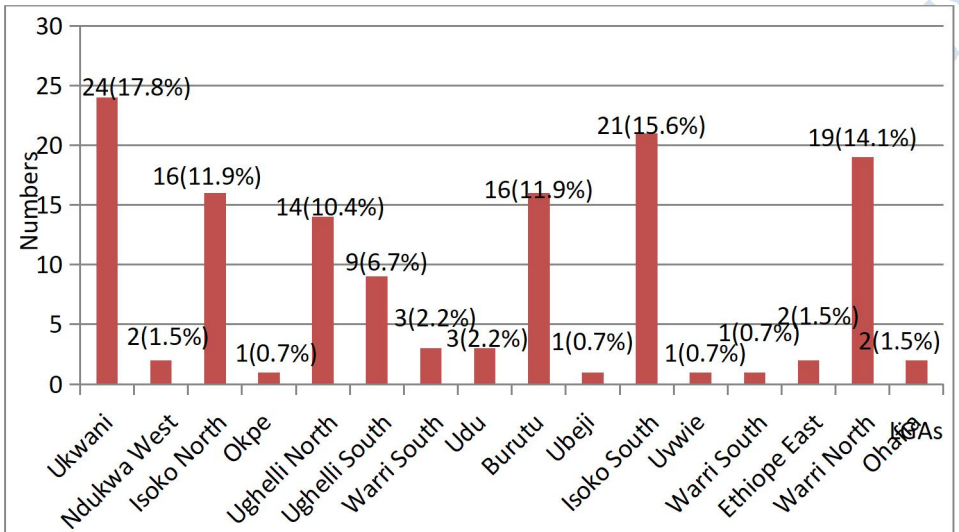


Figure 4.3: Delta respondents' classification by local government

Source: Field Survey (2022)

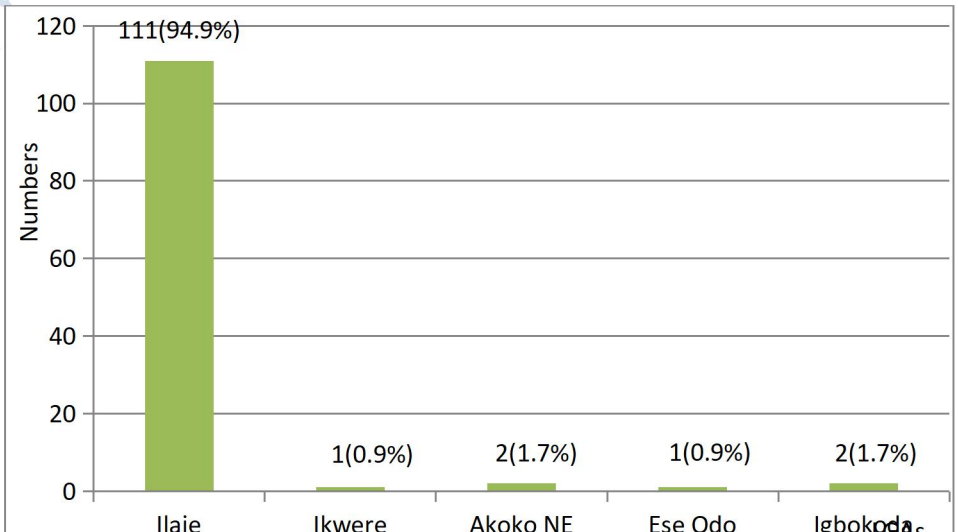


Figure 4.4: Ondo respondents' classification by local government

Source: Field Survey (2022)

Furthermore, Table 4.1a shows the age distribution of the respondents following the sampled states. The table showed that about 68.42% of the total respondents are males while the remaining 31.58% consist of female gender. Among the gender category in Imo state, 76(56.72%) are males and 58(43.28%) are females. For the sexual characteristics in Delta state, 88(66.67%) are males and 44(33.33%) are females. Concerning the femininity in Ondo state, 96(84.21%) are males whereas 18(15.79%) are females. The findings from the sexual distributions of the respondents indicate that greater part of the sampled respondents consist of the male folks.

More so, the respondents' tribe distribution for the sampled states is also presented in Table 4.1a. It shows that about 38.28% of the respondents are Igbo descendants, 28.13% are from the Yoruba clan, and 0.52% of the total respondents are Hausas. Among the 135 respondents from Imo state, all of them are from the Igbo race. For the tribe distribution of respondents from Delta state, about 89.55% are from other tribes from the South-South region of Nigeria which consist of Ukwani, Ndokwa, Delta Igbo, Isoko, Urhobo, Itsekiri, and Izon, whereas 4.48%, 5.22% and 0.75% are from Yoruba, Igbo and Hausa tribes. However, amongst the respondent from Ondo state, about 88.7% are from Yoruba tribe, 4.35% are Igbo, 0.87% are Hausa and 6.09% are from other tribes like Ijaw.

As for the marital status of the respondents, 80.05% are married while 17.62% are single and 2.33% select others such as divorced, separated, and widow/widowers. The table further shows that among the respondents from Imo state, 25.74% are single, and 74.26% are married. Among the respondents from Delta state, 10.53% are single, 84.21% are married, and 7(5.26%) picked others. However, among those from Ondo state, 16.24%, 82.05% and 1.71% selected others. The results showed that majority of the respondents are married, who have family they cater for.

Table 4.1a: Demographic Distribution of Respondents

Variables	Levels	States in Numbers				States in Percentage (%)			
		Imo	**Delta**	**Ondo**	**Total**	**Imo**	**Delta**	**Ondo**	**Total**
Age	Less than 26 years	1	3	13	18	0.74	2.38	13.40	5.01
	26 – 35 years	24	12	15	51	17.78	9.52	15.46	14.21
	36 – 45 years	28	42	33	103	20.74	33.33	34.02	28.69
	46 – 55 years	32	56	28	116	23.70	44.44	28.87	32.31
	56 – 65 years	26	12	8	46	19.26	9.52	8.25	12.81
	Above 65 years	24	1	0	25	17.78	0.79	0.00	6.96
	Sub-Total	**135**	**126**	**97**	**359**	**100.00**	**100.00**	**100.00**	**100.00**
Gender	Male	76	88	96	260	56.72	66.67	84.21	68.42
	Female	58	44	18	120	43.28	33.33	15.79	31.58
	Sub-Total	**134**	**132**	**114**	**380**	**100.00**	**100.00**	**100.00**	**100.00**
Tribe	Yoruba	0	6	102	108	0.00	4.48	88.70	28.13
	Igbo	135	7	5	147	100.00	5.22	4.35	38.28
	Hausa	0	1	1	2	0.00	0.75	0.87	0.52
	Others	0	120	7	127	0.00	89.55	6.09	33.07
	Sub-Total	**135**	**134**	**115**	**384**	**100.00**	**100.00**	**100.00**	**100.00**
Marital Status	Never Married	35	14	19	68	25.74	10.53	16.24	17.62
	Married	101	112	96	309	74.26	84.21	82.05	80.05
	Others	0	7	2	9	0.00	5.26	1.71	2.33
	Sub-Total	**136**	**133**	**117**	**386**	**100.00**	**100.00**	**100.00**	**100.00**
Employment Status	Employed	59	76	81	216	45.04	59.84	74.31	58.86
	Unemployed	72	51	28	151	54.96	40.16	25.69	41.14
	Sub-Total	**131**	**127**	**109**	**367**	**100.00**	**100.00**	**100.00**	**100.00**
Religion	Christianity	120	126	113	359	88.24	93.33	96.58	92.53
	Islam	6	7	4	17	4.41	5.19	3.42	4.38
	Traditional	10	2	0	12	7.35	1.48	0.00	3.09
	Sub-Total	**136**	**135**	**117**	**388**	**100.00**	**100.00**	**100.00**	**100.00**
Years of Formal Education	1 – 6 years	28	9	5	42	20.90	6.77	4.31	10.97
	7 – 12 years	52	32	27	111	38.81	24.06	23.28	28.98
	Above 12 years	54	92	84	230	40.30	69.17	72.41	60.05
	Sub-Total	**134**	**133**	**116**	**383**	**100.00**	**100.00**	**100.00**	**100.00**
Level of Education	Primary	27	6	1	34	20.30	4.48	0.86	8.88
	Secondary	51	33	28	112	38.35	24.63	24.14	29.24
	Tertiary	54	87	84	225	40.60	64.93	72.41	58.75
	Others	1	8	3	12	0.75	5.97	2.59	3.13
	Sub-Total	**133**	**134**	**116**	**383**	**100.00**	**100.00**	**100.00**	**100.00**

Source: Field survey (2022).

Also, the demographic analyses of the respondents on the basis of their employment status were also reported in Table 4.1a. From the table, the result shows that a larger percentage of the respondents amounting to 216(58.86%) are employed while the remaining 151(41.14%) are not employed. The survey revealed that among the respondents from Imo state, 59(45.04%) are gainfully employed whereas 72(54.96% are unemployed. Among the respondents from Delta state, the table showed that about 76(59.84%) of the people willing and capable to work have a job they are doing while 51(25.69%) do not have a job. Further, the table indicates that among the respondents from Ondo state, 81(74.31%) are employed while the remaining 28(25.69%) are not employed. The study revealed that Imo state has the majority of the unemployed respondents among the sampled states. Overall, majority of the sample individuals from the three states have jobs they engage themselves in day to day activities for their livelihood.

With regard to the religion distribution of respondents, the table indicates that 359(92.53%) practice Christianity, 17(4.38%) are Muslims, and 12(3.09%) are traditionalists. The survey revealed that among the respondents from Imo state, 120(88.24%) practice the religion of Christ, 6(4.41%) do Islam and 10(7.35%) are traditionalists. Among the respondents sampled in Delta state, 126(93.33%) are Christians, 7(5.19%) practice Islam, and 2(1.48%) do the traditional religion. As for the respondents from Ondo state, 113(96.58%) practice Christianity while the remaining 4(3.42%) are Muslims. Thus, it revealed that there is more Christians in the total respondents from the three sampled states than other forms of religion composition considered in this research study.

In addition, Table 4.1a shows the classification of respondents based on the years of formal education the acquired in educational institutions which consists primary, secondary and tertiary. The table revealed that a large percentage of the respondents with 230(60.05%) have a formal

education that is above 12 years. Afterwards, 111(28.98%) have a formal education that ranges within 7–12 years, and 42(10.97%) have a formal education between 1–6 years. Among the respondents sampled in Imo state, the study showed that 28(20.9%), 52(38.8%), and 54(40.3%) have formal education that range within 1–6 years, 7–12 years and 12 years and above. The survey further revealed that among the respondents from Delta state, 92(69.17%) have a formal education that is above 12 years, 32(24.06%) have a formal education that is within 7–12 years, and 9(6.77%) have a formal education between 1–6 years. Among the respondents sampled in Delta state, the study showed that 84(72.41%), 27(23.28), and 5(4.31%) have formal education that is above 12 years, within the years of 7–12 years, 1–6 years. Therefore, the study revealed that majority of the respondents had formal education that is above the basic level of education.

The study equally classified the respondents in terms of their level of formal education. Finding from the table indicate that 58.75% of the respondents have acquired tertiary education, whereas 29.24% and 8.88% of total respondents have secondary and primary education respectively and 3.13% picked others which involved vocational training and education. Among the respondents sample in Imo state, 40.6% had tertiary level of education, 38.35% had secondary education, 20.3% hold primary school certificate, and 0.75% select others. The survey revealed that among the respondents from Delta state, 4.48% had primary education, 24.63% had secondary school leaving certificate, 64.93% had tertiary education, and the remaining 5.97% picked other levels of education. The table further reveals that among respondents from Ondo, 0.86% had primary level of education, 24.14% had secondary education, 72.41% had tertiary certification, and 2.59% had other form of education. This shows a large number of the respondents have tertiary form of education. It implies that majority of the respondents have the basic education.

Table 4.1b: Demographic Distribution of Respondents (cont'd)

Variables	Levels	States in Numbers				States in Percentage (%)			
		Imo	Delta	Ondo	Total	Imo	Delta	Ondo	Total
Household Size	1 – 5 members	21	64	27	112	42.86	65.31	50.94	56.00
	6 – 10 members	27	31	22	80	55.10	31.63	41.51	40.00
	11 – 15 members	1	2	4	7	2.04	2.04	7.55	3.50
	Above 15 members	0	1	0	1	0.00	1.02	0.00	0.50
	Sub-Total	49	98	53	200	**100.00**	**100.00**	**100.00**	**100.00**
Household Head Gender	Female Head	45	17	8	70	34.09	13.82	7.48	19.34
	Male Head	87	106	99	292	65.91	86.18	92.52	80.66
	Sub-Total	**132**	**123**	**107**	**362**	**100.00**	**100.00**	**100.00**	**100.00**
Primary Occupation	Oil Exploration	68	73	45	186	51.91	54.07	40.91	49.47
	Traditional	63	62	65	190	48.09	45.93	59.09	50.53
	Sub-Total	**131**	**135**	**110**	**376**	**100.00**	**100.00**	**100.00**	**100.00**
Secondary Occupation	Oil Exploration	5	51	45	101	25.00	52.58	44.55	46.33
	Traditional	15	46	56	117	75.00	47.42	55.45	53.67
	Sub-Total	**20**	**97**	**101**	**218**	**100.00**	**100.00**	**100.00**	**100.00**
Primary Occupation - Length of time (in years) in the job	0 – 10 years	83	38	43	164	68.60	40.86	53.09	55.59
	11 – 20 years	12	24	24	60	9.92	25.81	29.63	20.34
	21 – 30 years	8	17	8	33	6.61	18.28	9.88	11.19
	31 – 40 years	12	10	5	27	9.92	10.75	6.17	9.15
	41 – 50 years	6	2	1	9	4.96	2.15	1.23	3.05
	Above 50 years	0	2	0	2	0.00	2.15	0.00	0.68
	Sub-Total	**121**	**93**	**81**	**295**	**100.00**	**100.00**	**100.00**	**100.00**
Primary Occupation - Average monthly income	Amount ≤ ₦50,000	40	35	44	119	88.89	40.70	61.97	58.91
	₦50,001 – ₦100,000	5	24	14	43	11.11	27.91	19.72	21.29
	₦100,000 - ₦500,000	0	26	12	38	0.00	30.23	16.90	18.81
	Above ₦500,000	0	1	2	3	0.00	1.16	2.82	1.49
	Sub-Total	**45**	**86**	**71**	**202**	**100.00**	**100.00**	**100.00**	**100.00**
Primary Occupation-Location	Rural	71	69	82	222	56.35	60.53	79.61	64.72
	Urban	55	45	21	121	43.65	39.47	20.39	35.28
	Sub-Total	**126**	**114**	**103**	**343**	**100.00**	**100.00**	**100.00**	**100.00**

Source: Field survey (2022).

Regarding the household size distribution of respondents, it shows that 56% of the respondents have 1–5 family members, 40% have 6–10 family members, 3.5% have 11–15 family members, and 0.5% have 15 members and above. The table indicates that among the respondents in Imo state, 21(42.86%), 27(55.1%), and 1(2.04%) have 1–5 family members, 6–10 family members, and 11–15 family members respectively. Further, Table 4.1b shows that among the respondents sampled in Delta state, 64(65.31%), 31(31.63%), and 2(2.04%) have 1–5 family members, 6–10 family members, and 11–15 family members correspondingly, whereas 1(1.02%) selected 15 family members and above. Among the respondents from Ondo state, the table reveals that 27(50.94%), 22(41.51%), and 4(7.55%) have 1–5 family members, 6–10 family members, and 11–15 family members correspondingly. Therefore, the result means that majority of the respondents have family member that panned between 1 and 10.

Meanwhile, the study shows that male gender constitutes the household head with about 80.66% while the female head consist of 19.34% of the total respondents. The table further shows that among the 132 respondents sampled in Imo state, 45(34.09%) have their house head as female while the remaining 87(65.91%) are male household head. Concerning the respondents from Delta state, the female household heads accounted for about 13.82% whereas 86.18% are male household heads. The table also presents the household head gender distribution of respondents in Ondo state. Among the 107 respondents that responded to the question, 7.48% are female household head and 92.52% are male household heads. It therefore means that the male gender constitutes the major household head gender.

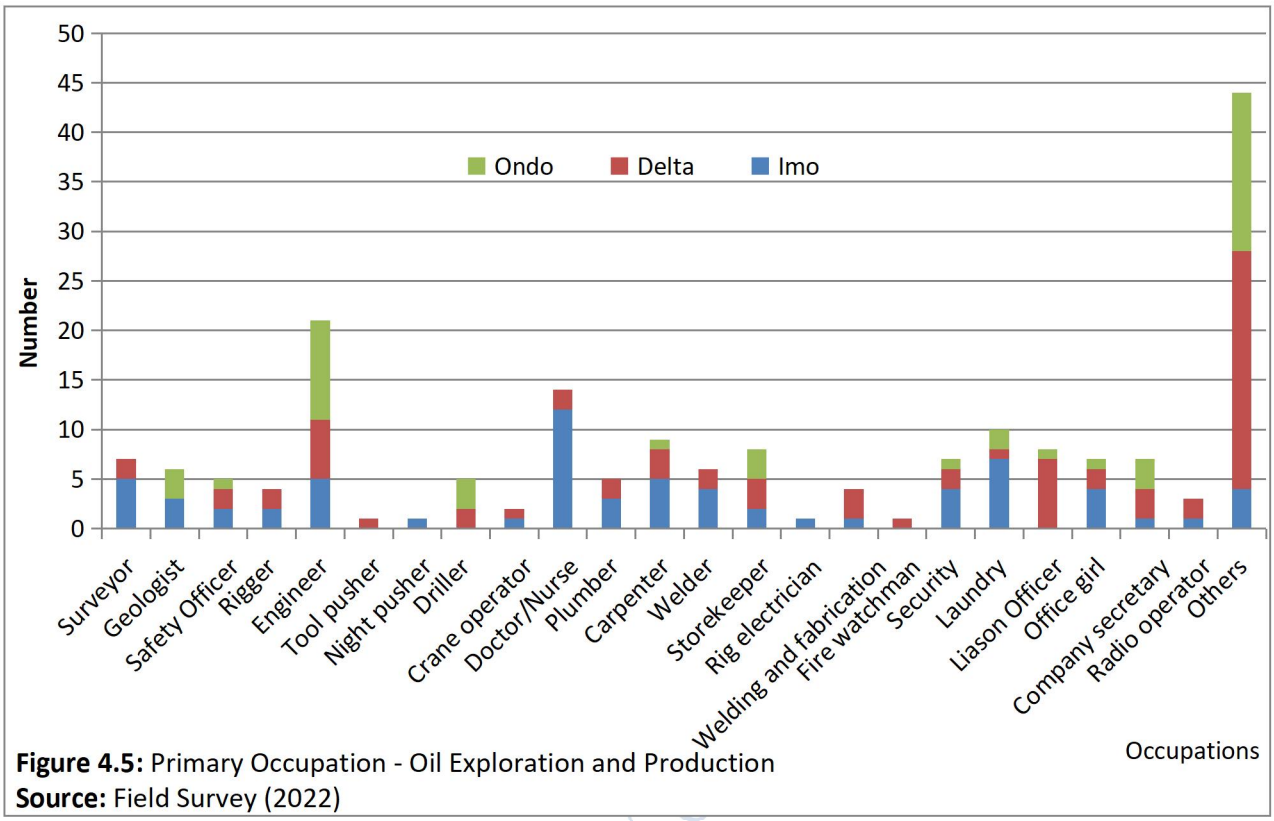


Figure 4.5: Primary Occupation - Oil Exploration and Production
Source: Field Survey (2022)

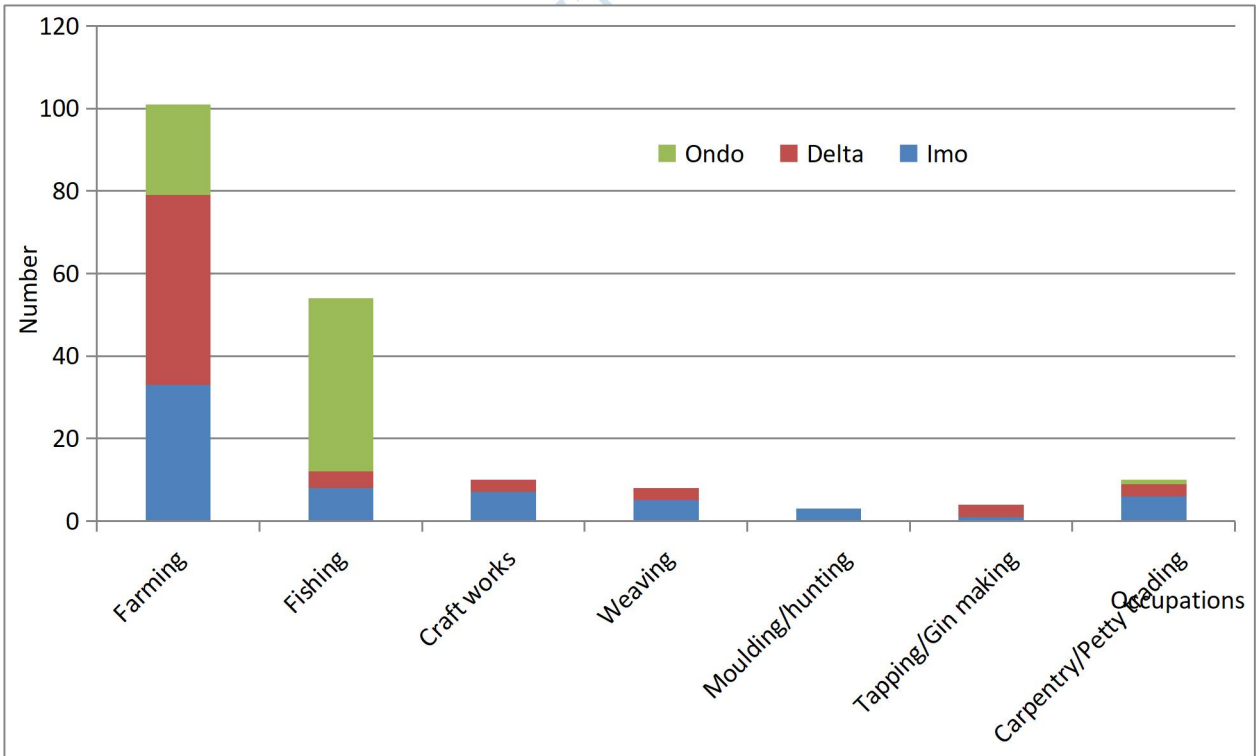


Figure 4.6: Primary Occupation - Traditional Occupation
Source: Field Survey (2022)

As to the primary occupation of the respondents, Table 4.1b shows that 49.47% engages in oil exploration and production, while the remaining 50.53% engage in traditional occupation. The statistics show that 51.91% and 48.09% of the total respondents sampled in Imo state engage in oil exploration & production and traditional occupation respectively. The table further shows that among the 135 respondents from Delta state, 54.07% are into oil exploration and production, while 45.93% engage in traditional occupations. Among the respondents from Ondo state, 45(40.91%) are into oil exploration and production and 65(59.09%) engage in traditional occupation. It indicates that a large number of the respondents from Imo and Delta states engage in oil exploration and production but majority of the respondents sampled in Ondo state are into traditional occupation. Figures 4.5 and 4.6 show the different compositions of primary oil exploration & production and traditional occupation of the sampled respondents respectively.

As regards the secondary occupation of the respondents, Table 4.1b shows that 46.33% engages in oil exploration and production, whereas 53.67% engage in traditional occupation. The table shows that among the respondents sampled in Imo state, 25.0% are into oil exploration and production, while 75.0% engage in traditional occupations. The statistics further show that 52.58% and 47.42% of the total respondents sampled in Delta state engage in oil exploration & production and traditional occupation respectively. Among the respondents from Ondo state, 44.55% are into oil exploration and production and 55.45% engage in traditional occupation. Just like the primary occupation, the findings indicate that majority of our respondents are into the traditional occupation. However, a greater percentage of the respondents from Delta state engage in oil exploration and production. Figures 4.7 and 4.8 show the different compositions of secondary oil exploration & production and traditional occupation of the sampled respondents correspondingly.

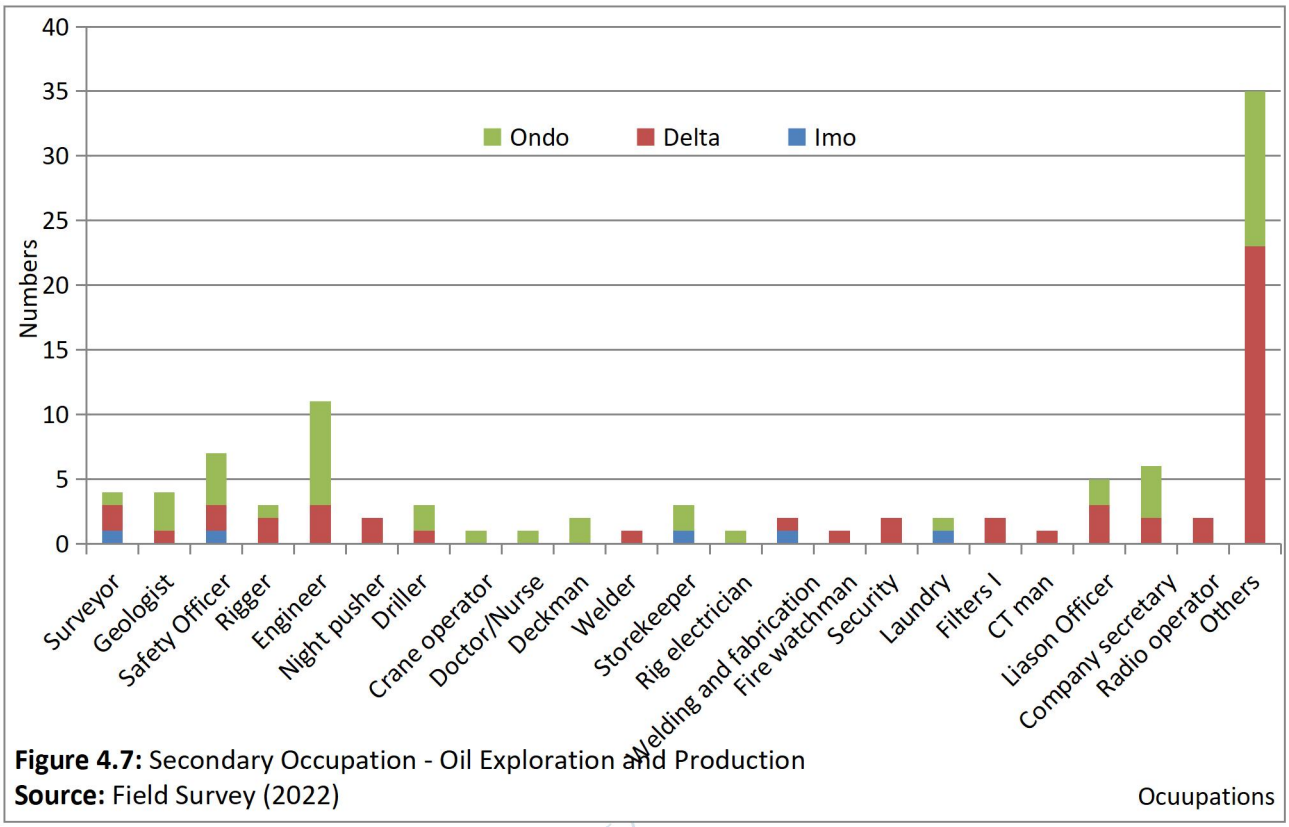


Figure 4.7: Secondary Occupation - Oil Exploration and Production
Source: Field Survey (2022)

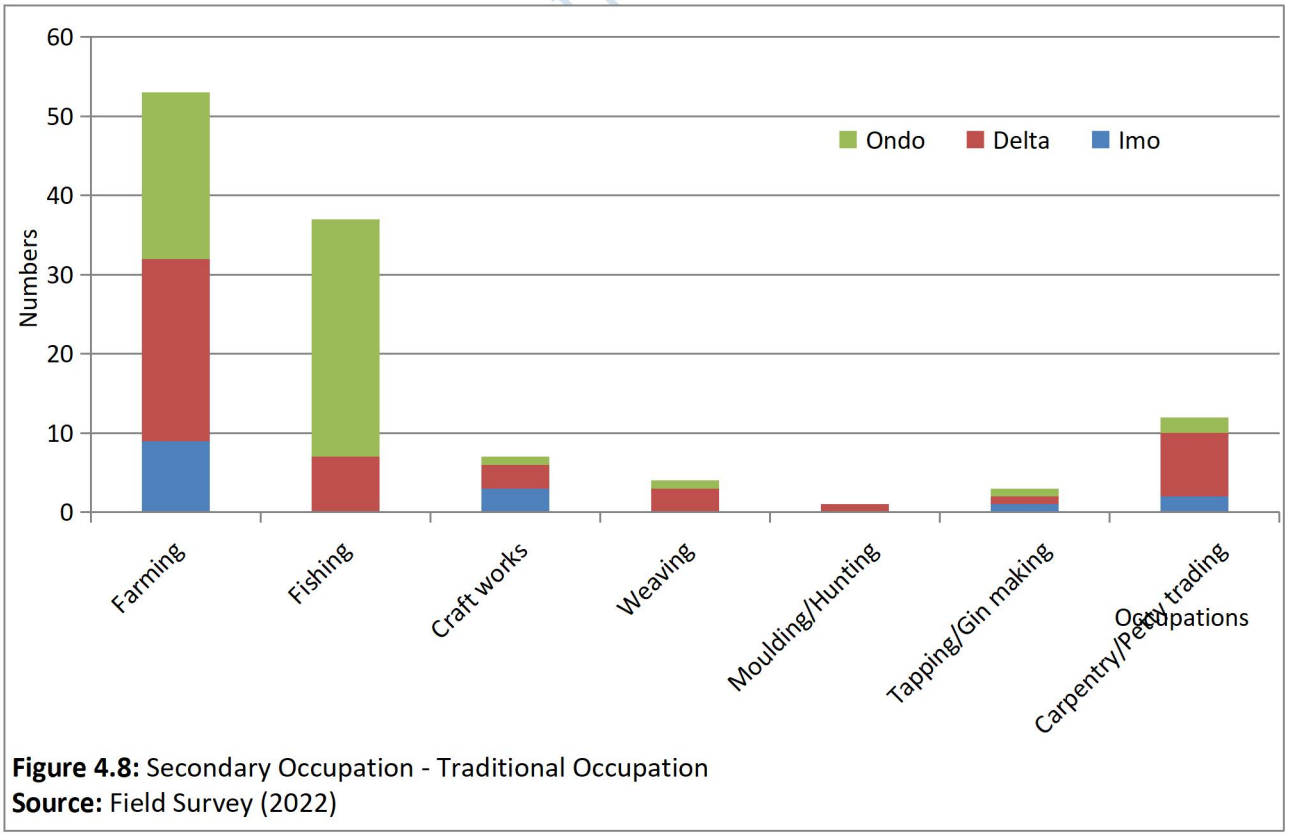


Figure 4.8: Secondary Occupation - Traditional Occupation
Source: Field Survey (2022)

What's more, the length of time (years) spent in primary occupation is reported in Table 4.1b. The result indicates that about 55.59% of the respondents have 0–10 years of experience, followed by 11–20 years amounting to 20.34%, 21–30 years accounting for 11.19%, 31–40 years with 9.154%, 41– 50 years amounting to 3.05%, and 0.68% has over 50 years of experience. The table further shows that among the respondents from Imo state, 68.6%, 9.92%, 6.61%, 9.92% and 4.96% have 0–10, 11–20, 21–30, 31–40, and 41– 50 years of experience. Among the respondents sampled in Delta state, about 40.86% of the respondents have 0–10 years of experience, after that 25.81% have 11–20 years, 18.28% have 21–30 years, 10.75% have 31–40 years, and 2.15% have 41–50 and over 50 years of experience respectively. It shows that majority of the respondents have experience that is within the first ten years.

The study also presents the average monthly income of respondents' primary occupation in Table 4.1b. It was discovered from the table that about 58.91% of the total respondents earned below ₦50,000, 21.29% earned within ₦50,001–₦100,000, 18.81% earned within ₦100,001–₦500,000, and 1.49% earned above ₦500,000. The table further shows that among the respondents selected from Imo state, 88.89% earned below ₦50,000, whereas 11.11% earned within ₦50,001–₦100,000 respectively. Among the respondents sampled in Delta state, 40.7% of the total respondents earned below ₦50,000, 27.91% earned within ₦50,001–₦100,000, 16.9% earned within ₦100,001–₦500,000, and 1.16% earned above ₦500,000. The table also revealed among the respondents selected in Ondo state, 61.97% earned below ₦50,000, 19.72%, 16.9%, and 2.82% earned within ₦50,001–₦100,000, ₦100,001–₦500,000 and above ₦500,000 correspondingly. It therefore shows that majority of the respondents earned below ₦50,000.

Table 4.1c: Demographic Distribution of Respondents (cont'd)

Variables	Levels	States in Numbers				States in Percentage (%)			
		Imo	Delta	Ondo	Total	Imo	Delta	Ondo	Total
Secondary Occupation - Length of time (in years) in the job	0 – 10 years	6	29	38	73	85.71	53.70	74.51	65.18
	11 – 20 years	1	12	11	24	14.29	22.22	21.57	21.43
	21 – 30 years	0	8	0	8	0.00	14.81	0.00	7.14
	31 – 40 years	0	3	2	5	0.00	5.56	3.92	4.46
	41 – 50 years	0	1	0	1	0.00	1.85	0.00	0.89
	Above 50 years	0	1	0	1	0.00	1.85	0.00	0.89
	Sub-Total	**7**	**54**	**51**	**112**	**100.00**	**100.00**	**100.00**	**100.00**
Secondary Occupation - Average monthly income	Amount ≤ ₦50,000	7	22	31	60	100.00	46.81	65.96	59.41
	₦50,001 – ₦100,000	0	13	9	22	0.00	27.66	19.15	21.78
	₦100,000 - ₦500,000	0	12	6	18	0.00	25.53	12.77	17.82
	Above ₦500,000	0	0	1	1	0.00	0.00	2.13	0.99
	Sub-Total	**7**	**47**	**47**	**101**	**100.00**	**100.00**	**100.00**	**100.00**
Secondary Occupation - Location	Rural	9	53	54	116	69.23	64.63	67.50	66.29
	Urban	4	29	26	59	30.77	35.37	32.50	33.71
	Sub-Total	**13**	**82**	**80**	**175**	**100.00**	**100.00**	**100.00**	**100.00**
Job Status change in the decades	Yes	27	40	42	109	19.85	29.63	35.90	28.09
	No	109	95	75	279	80.15	70.37	64.10	71.91
	Sub-Total	**136**	**135**	**117**	**388**	**100.00**	**100.00**	**100.00**	**100.00**
Job Status - If Yes, state	Gas vendor	1	1	0	2	4.76	3.57	0.00	3.23
	POS operator	2	0	0	2	9.52	0.00	0.00	3.23
	Clerk	1	0	0	1	4.76	0.00	0.00	1.61
	Petty trading	4	5	1	10	19.05	17.86	7.69	16.13
	Teaching	0	1	1	2	0.00	3.57	7.69	3.23
	Farming	0	1	1	2	0.00	3.57	7.69	3.23
	Retirement(civil servant)	7	1	9	17	33.33	3.57	69.23	27.42
	Deferral schedule	0	1	0	1	0.00	3.57	0.00	1.61
	Director	0	1	0	1	0.00	3.57	0.00	1.61
	Civil Servant	0	2	0	2	0.00	7.14	0.00	3.23
	Wielding and fabrication	2	2	0	4	9.52	7.14	0.00	6.45
	Riggers	0	1	0	1	0.00	3.57	0.00	1.61
	Information technologist	0	1	0	1	0.00	3.57	0.00	1.61
	General contractor	0	1	0	1	0.00	3.57	0.00	1.61
	Land and property agent	0	1	0	1	0.00	3.57	0.00	1.61
	Transportation	2	1	0	3	9.52	3.57	0.00	4.84
	Rank/Position	0	3	0	3	0.00	10.71	0.00	4.84
	Laundry attendant	0	1	0	1	0.00	3.57	0.00	1.61
	Weaving	0	2	0	2	0.00	7.14	0.00	3.23
	Fishing	1	1	0	2	4.76	3.57	0.00	3.23
	Drilling	0	1	0	1	0.00	3.57	0.00	1.61
	Plumbing	1	0	1	2	4.76	0.00	7.69	3.23
	Sub-Total	**21**	**28**	**13**	**62**	**100.00**	**100.00**	**100.00**	**100.00**

Source: Field survey (2022).

With reference to the location of the respondents' primary occupation presented in Table 4.1b, the table indicates that about 64.72% are located in rural area whereas 35.28% are situated in the urban areas. Among the respondents sampled in Imo state, 56.35% and 43.65% are located in the rural and urban areas respectively. The table further shows that among the respondents selected from Delta state, 60.53% are situated in the rural area while 39.47% are located in the urban area. Among the respondents from Ondo state, the table indicates that about 79.61% and 20.39% are situated in rural and urban areas respectively. It shows that majority of the respondents' primary occupation are situated in the rural area.

Moreover, the length of time (years) spent in secondary occupation is reported in Table 4.1c. The result indicates that about 65.18% of the respondents have 0–10 years of experience, after that 21.43% have 11–20 years of experience, 7.14% had 21–30 years of experience, 4.46% have 31–40 years of experience, and 0.89% have 41–50 years and over 50 years of experience respectively. The table further shows that among the respondents from Imo state, 85.71% and 14.29% have 0–10, and 11–20 years of experience correspondingly. Among the respondents sampled in Delta state, about 53.7% of the respondents have 0–10 years of experience, followed by 22.22% have 11–20 years, 14.81% have 21–30 years, 5.65% have 31–40 years, and 1.85% have 41–50 and over 50 years of experience respectively. In the case of Ondo state, 74.51%, 21.57% and 3.92% have 0–10, 11–20 and 31–40 years of experience. This shows that majority of the respondents' secondary yeas in job have experience that is within the first ten years.

Table 4.1c also shows the average monthly income of respondents' secondary occupation. It was discovered from the table that about 59.41% of the total respondents earned below ₦50,000, 21.78% earned within ₦50,001–₦100,000, 17.82% earned within ₦100,001–₦500,000, and 0.99% earned above ₦500,000. The table further shows that among the respondents selected from Imo state, all earned below ₦50,000. Among the respondents

sampled in Delta state, 46.81% of the total respondents earned below ₦50,000, 27.66% earned within ₦50,001–₦100,000, and 25.53% earned within ₦100,001–₦500,000. The table also revealed among the respondents selected in Ondo state, 65.96% earned below ₦50,000, 19.15%, 12.77%, and 2.13% earned within ₦50,001–₦100,000, ₦100,001–₦500,000 and above ₦500,000 correspondingly. This therefore shows that majority of the respondents' secondary average monthly income earned below ₦50,000.

Relating to the location of the respondents' secondary occupation presented in Table 4.1bc, it indicates that about 66.29% are located in rural area whereas 33.71% are situated in the urban areas. Among the respondents sampled in Imo state, 69.23% and 30.77% are located in the rural and urban areas respectively. The table further shows that among the respondents selected from Delta state, 64.63% are situated in the rural area while 35.37% are located in the urban area. Among the respondents from Ondo state, the table indicates that about 67.5% and 32.5% are situated in rural and urban areas respectively. It shows that majority of the respondents' secondary occupation are situated in the rural area.

Table 4.1c shows the job status change in decades of the respondents. It reveals that only 28.09% of the respondents change their job in the last decades while 71.91% has not change their job status for the last ten years. As to the job status of respondents sampled in Imo state, only 19.85% changed their job whereas 80.15% do not. Among the respondents selected from Delta state, 29.63% have change job over the last decade and 70.37% has not change their job. The table also show that among the respondents from Ondo state, only 35.9% changed their jobs in the last decade while 64.1% has not changed jobs for the last ten years. It shows that majority of the respondents have not change their jobs in the last decade.

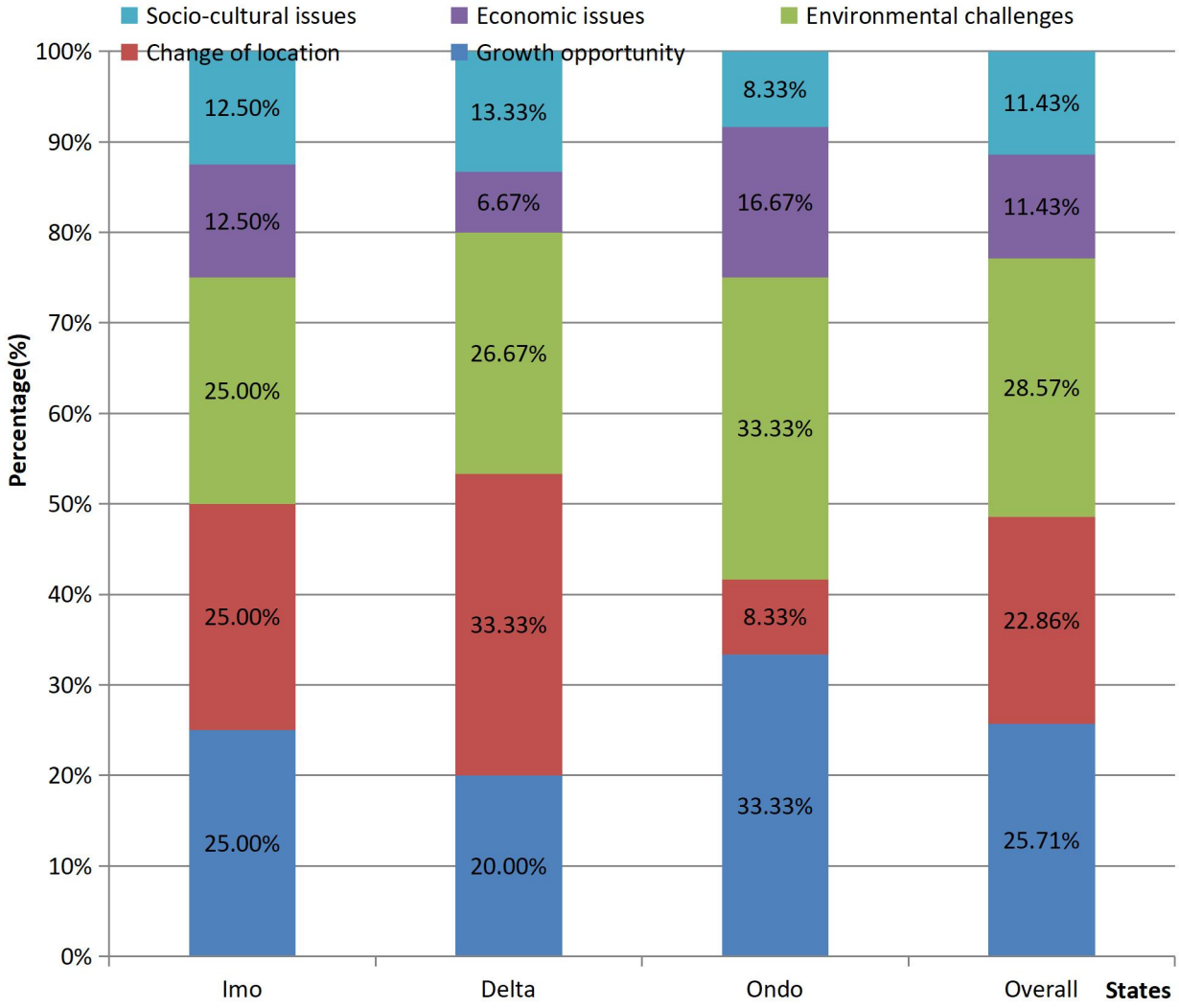


Figure 4.9: Reasons for the change in the job status
Source: Field Survey (2022)

Our analysis further shows the job types of the respondents after change from their previous jobs. Table 4.1c indicates that about 27.41% are retired civil servants, 16.13% are petty traders, 4.48% are into transportation and rank position, 3.23% are gas vendor, POS operator, teachers, farmers, hair stylists, plumbing, and fishermen, and 1.61% are clerk, deferral schedule, director, riggers, information technologist, general contractor, land and property agent, laundry attendant, and drilling operators.

Among the respondents selected from Imo state, 33.33% are retired civil servant, 19.05% are petty trader, 9.52%are into POS operation, wielding and fabrication, and transportation, and 4.76% are clerk, gas vendor, fishermen, and plumber respectively. As to the respondents sampled in Delta state, 17.86% are petty trader, 10.71% are rank position, 7.14% are civil servant, wielding and fabrication operator, and stylist, and 3.57% are gas vendor, teacher, farmer, retired civil servant, deferral schedule, riggers, information technologist, land and property agent, transporter, laundry operator, fishermen, and drilling operator. Concerning respondents from Ondo state, 69.23% are retired civil servant, while 7.69% are petty trader, teacher, farmer, and plumber respectively. This indicates that the larger percentage of retired civil servants is mainly from Ondo and Imo states.

The study equally classified the reason for changes in the job status into growth opportunity, change of location, environmental challenges, economic issues, and socio-cultural issues. The result is present in Figure 4.9. The chart shows that 28.57%, 25.71%, 22.86%, 11.43% and 11.43% change their job for environmental challenges, growth opportunity, change of location, economic issues and socio-cultural issues correspondingly. As to the respondents from Imo state, 25% changes for environmental issues, change of location, and growth opportunity respectively, and 12.5% due to economic issues and socio-cultural issues correspondingly. Concerning the respondents sampled in Delta state, 33.33%, 26.67%, 20%, 13.33% and 6.67% changes their jobs due to change of location, environmental challenges,

growth opportunity, socio-cultural issues and economic issues respectively. Regarding the respondents from Ondo state, 33.33% of the respondents change for growth opportunity and environmental challenges, 16.67% for economic issues and 8.33% for change of location and socio-cultural issues. This indicates that majority of the respondents changed their jobs over the last decade due to environmental challenges and growth opportunity.

4.1.2 Respondents' Perception on Oil and Gas Activities & Host Community Occupation

This sub-section provides explanations on the respondents' perceptions to the administered questionnaire with respect to oil & gas activities in Niger Delta region and the host community occupation. It is further sub-divided into five parts, which are: oil exploration and current issues, oil exploration and socio-cultural challenges, oil exploration and economic challenges, oil exploration and environmental challenges, and future expectations.

4.1.2.1 Oil Exploration and Current Issues

The information obtained from the response of our selected respondents as regards the questions drawn on the level of oil and gas activities in Niger Delta region; the extent to which oil and gas activities create environmental, socio-cultural and economic challenges; and the rate at which the activities of oil &gas companies aid general development of Niger Delta region were presented in Figures 4.10, 4.11 and 4.12 respectively.

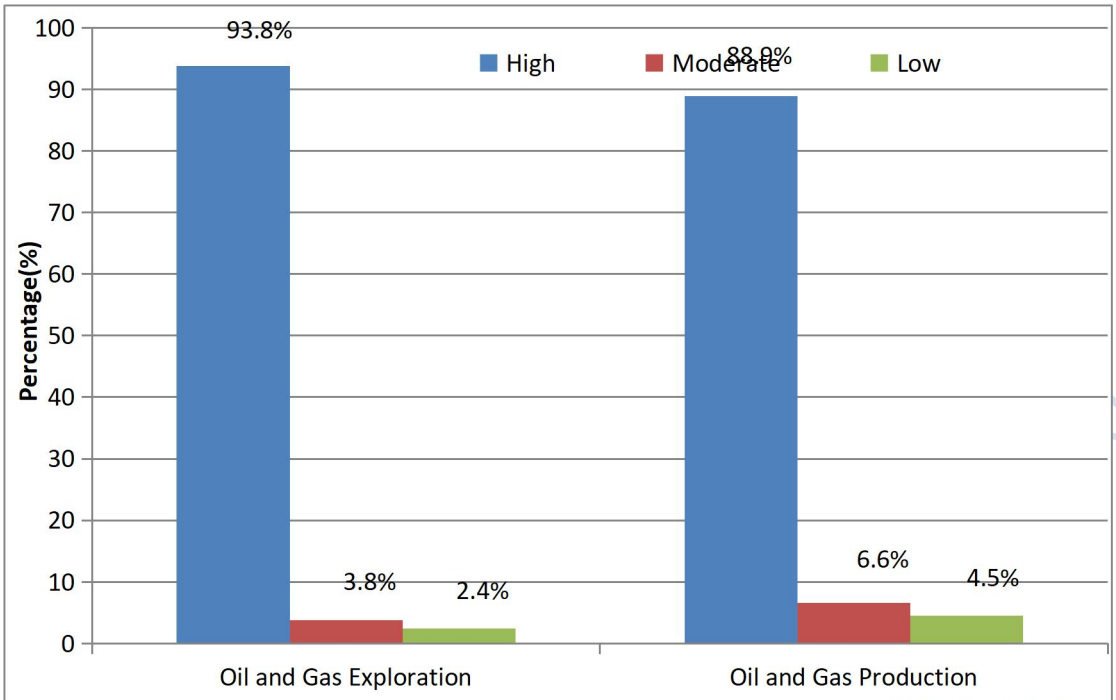


Figure 4.10: The level of oil & gas activities in Niger Delta region of Nigeria
Source: Field Survey (2022).

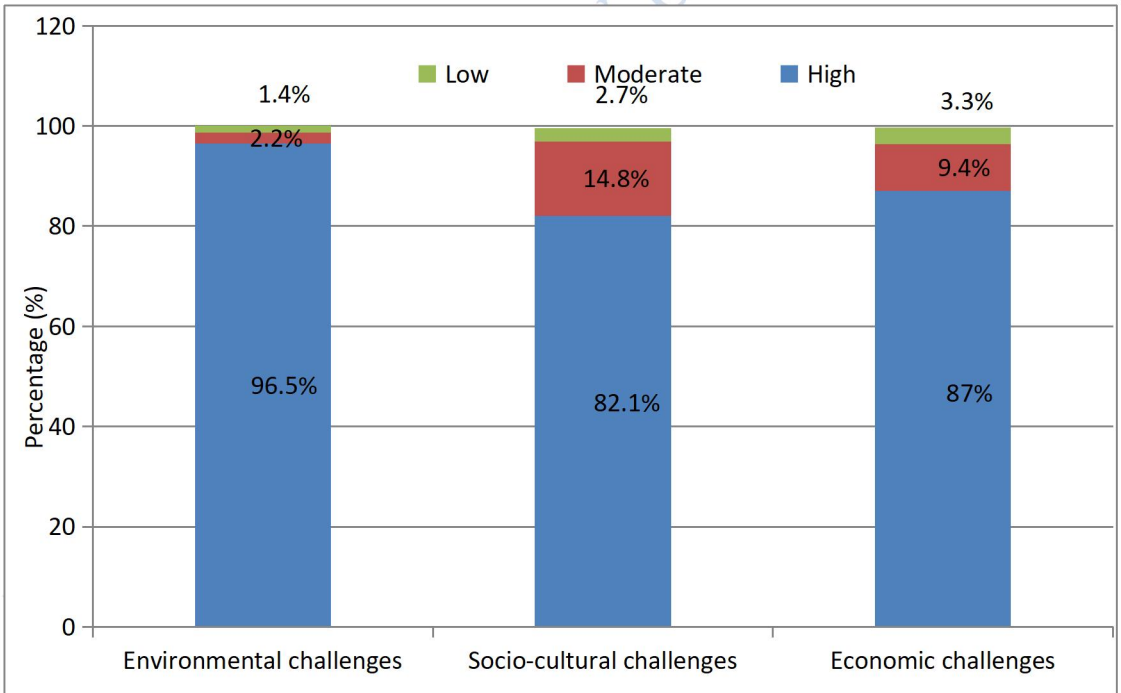


Figure 4.11: The Extent to which oil and gas activities create environmental, socio-cultural and economic challenges
Source: Field Survey (2022).

The findings in Figure 4.10 revealed that 93.8% of the respondents opined that the level of oil and gas exploration is high, 3.8% believed the exploration of oil and gas is moderate and 2.4% argued that it is low. Concerning the production of oil and gas in the Niger Delta region, 88.9%, 6.6% and 4.5% indicated that the production activities are high, moderate and low respectively. This implies that majority of the respondents believed that the oil and gas activities regarding exploration and production are high in the region. Afterward, the subsequent question asked was the extent to which oil and gas activities create environmental, socio-cultural and economic challenges in the Niger Delta region of Nigeria.

The results presented in Figure 4.11 show that 96.5% of the respondents noted that the extent at which oil and gas activities create environmental challenges in the region is high, whereas 2.2% and 1.4% indicate moderate and low extent. As to the extent to which oil and gas activities create socio-cultural challenges, 82.1%, 14.8% and 2.7% show high, moderate and low extent. Further, the results indicate that 87% of the respondents agreed that oil and gas activities create economic challenges, while 9.4% and 3.3% opined moderate and low extent of oil and gas activities on economic challenges. Overall, the results revealed that oil and gas activities is responsible for high environmental challenges, after that, economic and socio-cultural challenges. In Figure 4.12, it shows the rate at which oil and gas activities aid general development of Niger Delta region of Nigeria. It revealed that about 78.7% of the total respondent opined low rate, 13.8% showed moderate rate and 7.5% indicated high rate.

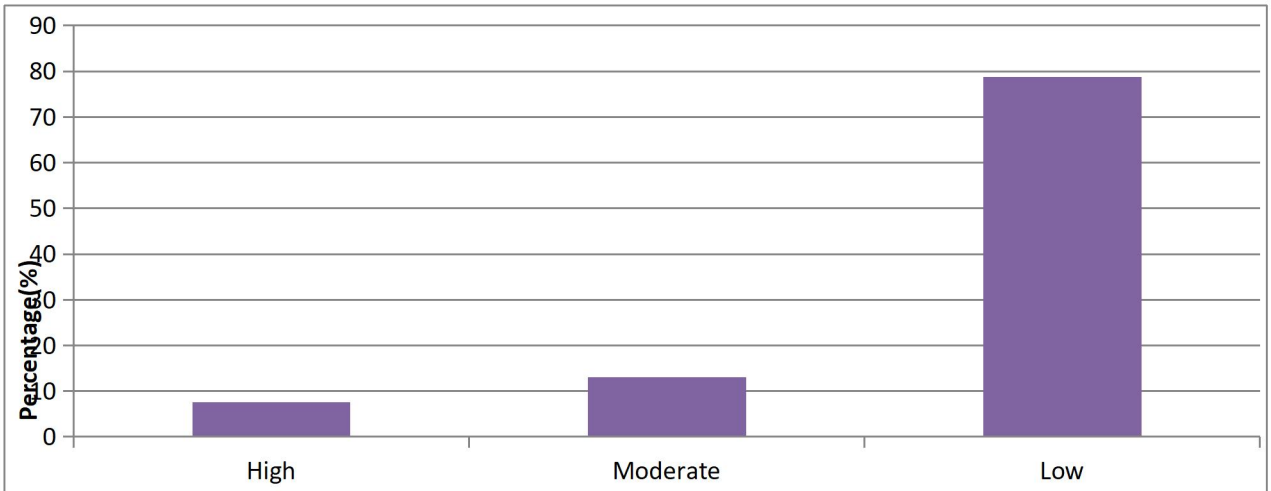
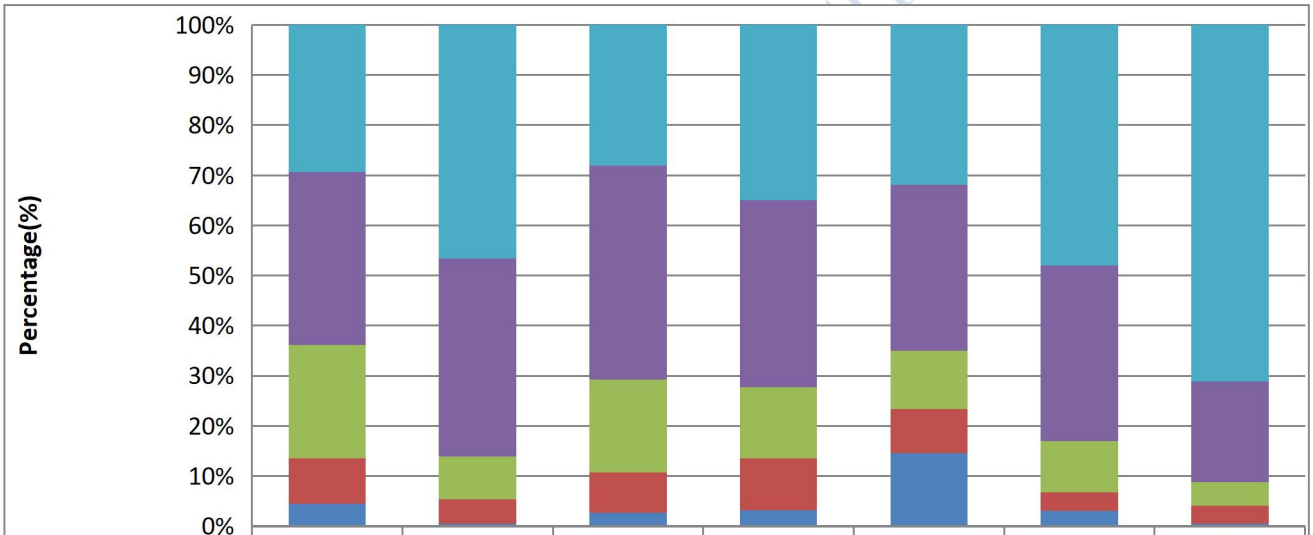


Figure 4.12: At what rate has the activities of oil &gas companies aid general development of Niger Delta region of Nigeria?
Source: Field Survey (2022).

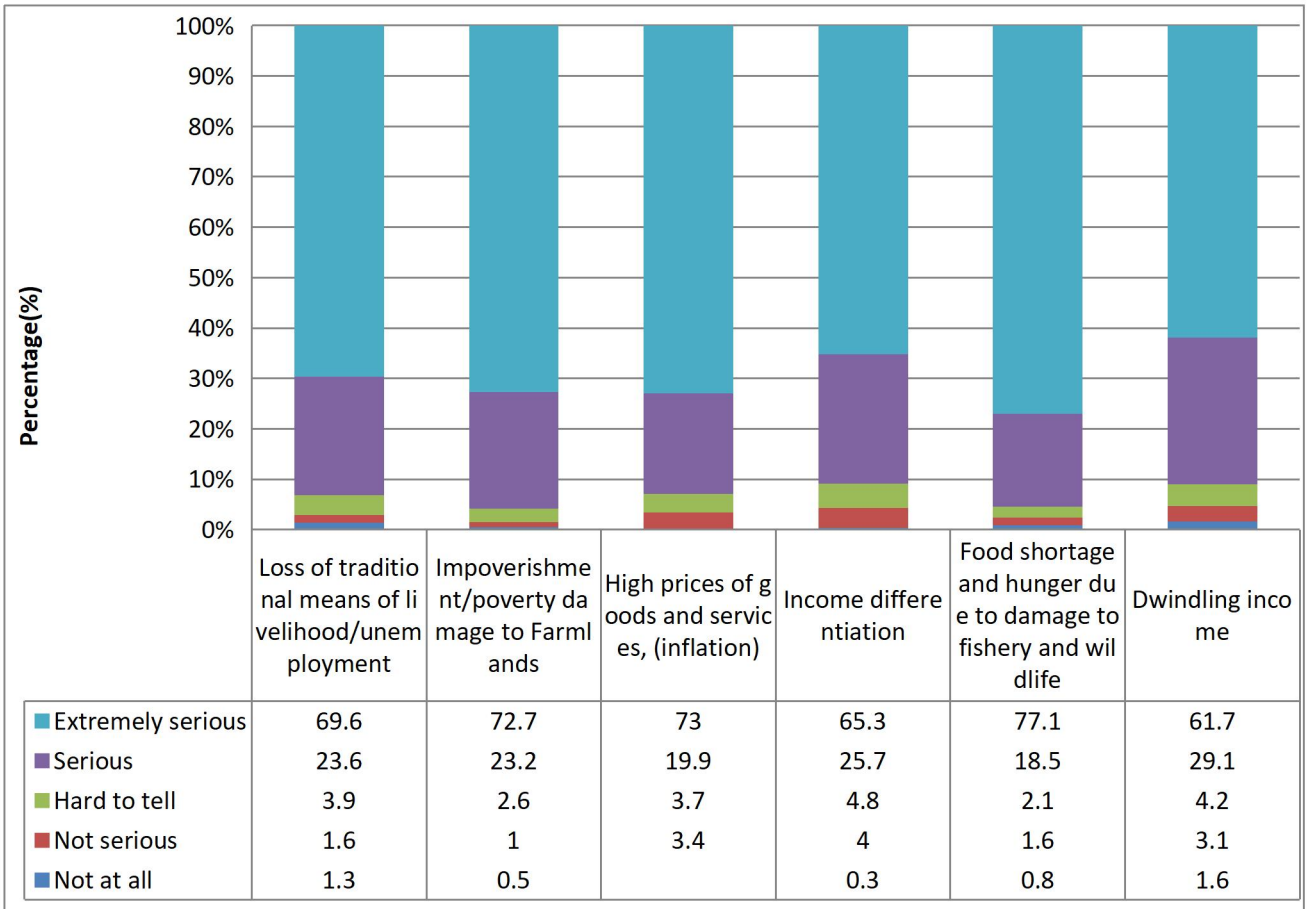


	Invasion of traditional customs and rites	Community clashes and intercine violence	Loss of community norms and values	Destruction of historical sites of importance	Sexual pervasiveness	Degradation in aesthetic due to increase in slums	Abandonment of farming for the oil and gas industry
Extremely serious	29.4	46.6	28	35	31.9	48	71.1
Serious	34.5	39.4	42.7	37.4	33	34.9	20.1
Hard to tell	22.6	8.5	18.6	14.2	11.7	10.2	4.7
Not serious	9.1	4.9	8.1	10.3	8.8	3.7	3.6
Not at all	4.4	0.5	2.6	3.2	14.5	3.1	0.5

Figure 4.13: Oil exploration and socio-cultural challenges
Source: Field Survey (2022).

4.1.2.2 Oil Exploration and Socio-Cultural Challenges

In this sub-section, the study presents the response of our selected respondents regarding the questions drawn on how oil exploration activities are responsible for seven identified socio-cultural challenges in the Niger Delta region. The perceptions of the respondents to the questions were presented in Figure 4.13. The chart revealed that about 29.4% and 34.5% of the total respondents noted that oil and gas exploration brings extremely serious and serious invasion of traditional customs and rites, while 22.6%, 9.1% and 4.4% picked hard to tell, not serious and not at all respectively. Also, 86.0% argued that oil exploration causes serious community clashes and internecine violence, 8.5%, 4.9% and 0.5% noted hard to tell, not serious and not at all correspondingly. It is also noted in the chart that about 70.7% agreed that oil exploration seriously caused loss of community norms and values, 18.6% selected hard to tell, 8.1% opined not serious and 2.6% said not at all. Concerning the cause of destruction of historical sites of importance due to oil exploration activities, 35%, 37.4%, 14.2%, 10.3% and 3.2% said extremely serious, serious, hard to tell, not serious and not at all respectively. As to how oil exploration activities cause sexual pervasiveness, Figure 4.13 indicates that 31.9% and 33% of the total respondents said it is extremely serious and serious, whereas 11.7%, 8.8% and 14.5% opined that it is hard to tell, not serious, and not at all correspondingly. The figure reveals that 48% and 34.9% of the total respondents opined extremely serious and serious degradation in aesthetic due to increase in slums by oil exploration, whereas 10.2%, 3.7% and 3.1% selected hard to tell, not serious and not at all in that order. Also, Figure 4.13 shows that about 91.2% of the respondents said oil exploration is responsible for serious farming abandonment, while 4.7%, 3.6% and 0.5% select hard to tell, not serious and not at all respectively.



	Loss of traditional means of livelihood/unemployment	Impoverishment/poverty damage to Farmlands	High prices of goods and services, (inflation)	Income differentiation	Food shortage and hunger due to damage to fishery and wildlife	Dwindling income
Extremely serious	69.6	72.7	73	65.3	77.1	61.7
Serious	23.6	23.2	19.9	25.7	18.5	29.1
Hard to tell	3.9	2.6	3.7	4.8	2.1	4.2
Not serious	1.6	1	3.4	4	1.6	3.1
Not at all	1.3	0.5		0.3	0.8	1.6

Figure 4.14: Oil exploration and economic challenges
Source: Field Survey (2022).

4.1.2.3 Oil Exploration and Economic Challenges

This sub-section presents the response of our selected respondents regarding the questions drawn on how oil exploration activities are responsible for some highlighted economic challenges in the Niger Delta region of Nigeria. Figure 4.14 provides the perceptions of the respondents to the questions. The chart showed that respondents with perspectives that oil exploration activities are responsible for serious loss of traditional means of livelihood or unemployment are 93.2%, serious impoverishment or poverty damage to farmlands are 95.9%, severe effect on prices of goods and services (i.e. high inflation) are 92.9%, serious income differentiation are 91.0%, serious food shortage and hunger du to damage to fishery and wildfire are 95.6%, and extremely dwindling of income are 90.8%. It therefore implies that oil exploration activities in the region are responsible for severe loss of traditional means of livelihoods, impoverishment or poverty, unstable prices of goods and services, income differentials, food shortages and hunger, and decreasing income levels.

4.1.2.4 Oil Exploration and Environmental Challenges

In this sub-section, Table 4.2 presents the perspectives of our selected respondents concerning the questions drawn on how oil exploration activities are responsible for some highlighted environmental challenges in the Niger Delta region of Nigeria. The table shows that 91.5% opined that water are contamination due to effluent, wash water and cooling water discharges, and seepage from storage and waste tanks, whereas 5.7% said it is hard to tell, 1.3% agreed that the statement is not serious and 1.6% picked not at all. It further shows that about 92.7% opined that the region witnessed thermal pollution due to discharge of effluents with temperatures higher than recipient water bodies while the remaining 7.3% said otherwise.

Table 4.2: Oil and Gas Exploration and Environmental Challenges

S/N		Not at All (%)	Not Serious (%)	Hard to Tell (%)	Serious (%)	Extremely Serious (%)
1.	Water contamination due to effluent, wash water and cooling water discharges, and seepage from storage and waste tanks	1.6	1.3	5.7	24.2	67.3
2.	Thermal pollution due to discharge of effluents with temperatures higher than recipient water bodies	1.6	2.8	2.8	28.5	64.2
3.	Thermal pollution due to discharge of effluents with temperatures higher than recipient water bodies	1.3	2.1	7.9	29.4	59.3
4.	Particulate emissions into the atmosphere generated during operations at production and refining plants	0.5	3.9	11.3	29.1	55.2
5.	Water contamination due to discharges of water effluents rich in inorganic salts without appropriate treatment (saline pollution)	1	1.6	6.7	29.3	61.4
6.	Sulfur and nitrogen oxides, ammonia, acid mist and fluorine compounds gas emissions from production and refining plants operations	2.3	7.3	15.1	25.8	49.5
7.	Occasional release of potentially hazardous materials, such as solvents and acid or alkaline materials	1.6	1.8	7	29.7	59.9
8.	Soil, surface water and/or groundwater contamination by inappropriate disposal of solid wastes resulting from chemical industry process, including effluent treatment sludge and particulate matter from dust collectors	1.8	2.1	6.2	24.6	65.3
9.	Changes in local traffic due to truck circulation (including dangerous cargos)	1.6	4.7	5.2	20.3	68.3
10.	Noise pollution caused by equipment and operations that generate loud noise	2.6	2.9	4.2	23.4	66.8
11.	Accidents that impact the environment, such as large oil spills, leaks, fires and explosions on plants. Eventual deaths	1.8	4.5	10.3	28.4	55
12.	Thermal pollution due to discharge of effluents with temperatures higher than recipient water bodies	1.6	3.2	6.6	24.8	63.9

Source: Field Survey (2022).

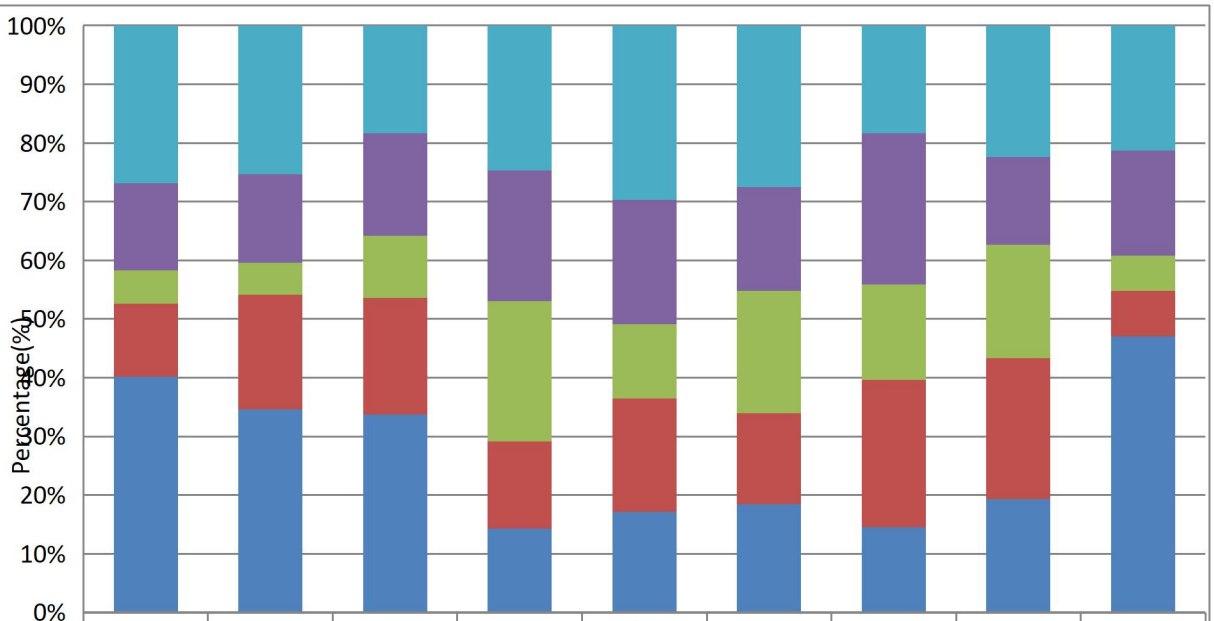
Above and beyond, a large percentage amounting to 88.7% of the respondents opined that thermal pollution is extremely serious because of discharge of effluents with temperatures higher than recipient water bodies, whereas 7.9% said it is hard to tell, 2.1% argued that the thermal pollution is not serious and 1.3% opined not at all. It was further revealed that 84.3% said the generation of particulate emissions into the atmosphere is extremely serious during operations at production and refining plants, whereas 11.3% said hard to tell, 3.9% opined not serious and 0.5% picked not at all respectively. Also, about 90.7% of the respondents noted that water contamination is extremely serious in the region owing to discharges of water effluents rich in inorganic salts without appropriate treatment (saline pollution), while 6.7%, 1.6%, and 1% opined hard to tell, nt serious and not at all correspondingly. As well, 75.3% argued that sulfur and nitrogen oxides, ammonia, acid mist and fluorine compounds gas emissions from production and refining plants operations are serious in the region, while 15.1%, 7.3% and 2.3%noted that it is hard to tell, not serious and not at all respectively.

Furthermore, Table 4.2 showed that about 89.6% of the total respondents occasional release of potentially hazardous materials, such as solvents and acid or alkaline materials are serious in the Niger Delta region, 7% said it is hard to tell, 1.8% argued that it is not serious and 1.6% said not at all. Also, a large proportion of the respondents amounting to 89.9% said soil, surface water and/or groundwater contamination are serious in the region owing to inappropriate disposal of solid wastes resulting from chemical industry process, including effluent treatment sludge and particulate matter from dust collectors, whereas 6.2%, 2.1% and 1.8% said that the statement is hard to tell, not serious and not at al; correspondingly. The table also showed that about 88.6% opined that changes in local traffic are serious in the Niger Delta region because of truck circulation which include dangerous cargos, while 5.2%, 4.7% and 1.6% opined that it is hard to tell, not serious and not at all respectively. More so, it was obtained in the table that 90.2% of the respondents said serious noise pollution is caused

by equipment and operations that generate loud noise, whereas 4.2% opined that it is hard to tell, 2.9% noted that the noise pollution is not serious and 2.6% opined not at all. Also, about 83.4% of the total respondents opined that accidents that impact the environment, such as large oil spills, leaks, fires and explosions on plants cause eventual deaths of residents, whereas 10.3%, 4.5% and 1.8% said hard to tell, not serious and not at all respondents. In addition, 88.7% of the respondents argued that thermal pollution are serious in the region due to discharge of effluents with temperatures higher than recipient water bodies, whereas 6.6% said it is hard to tell, 3.2% noted that it is not serious and 1.6% opined not at all.

4.1.2.5 Future Expectations

This sub-section discusses the perspectives of our selected respondents concerning questions on future expectations of oil and gas exploration activities of economic, socio-cultural and environmental challenges in the Niger Delta region of Nigeria. The results presented in Figure 4.15 revealed that about 26.9% and 14.8% of the respondents are optimistic that changes in general economic condition are very likely and likely in the future, whereas more than half (52.6%) said it is unlikely for changes in general economic condition whereas 5.7% are indifference. Similarly, a large percentage of the respondents amounting to 54.1% are not hopeful of future changes in general environmental condition in the region, but about 40.4% said it is likely for potential changes in general environmental condition and 5.5% are indifference. Likewise, 53.6% are negative of future changes in general socio-cultural activities, while 35.8% are positive about the changes in general socio-cultural activities, and 10.6% are unresponsive.



	Changes in general economic condition	Changes in general environmental condition	Changes in general socio-cultural activities	Loss of traditional means of livelihood/unemployment	Food shortage and hunger due to damage to fishery and wildlife	Community clashes and internecine violence	Loss of community norms and values	Destruction of historical sites of importance	Decrease in longevity and infant mortality
Very likely	26.9	25.3	18.3	24.7	29.7	27.5	18.3	22.4	21.3
Likely	14.8	15.1	17.5	22.3	21.2	17.7	25.8	14.9	17.9
Indifference	5.7	5.5	10.6	23.9	12.7	20.8	16.3	19.3	6
Unlikely	12.4	19.5	19.9	14.8	19.4	15.6	25.1	24	7.8
Very unlikely	40.2	34.6	33.7	14.3	17.1	18.4	14.5	19.3	47

Figure 4.15: Future Expectations
Source: Author's computation (2022)

Furthermore, Figure 4.15 showed that 47.0% of the total respondents opined that loss of traditional means of livelihood/unemployment is likely to continue in the future, whereas 39.1% said it is unlikely and 23.9% are unconcerned. The chart also revealed that majority of the respondents said future food shortage and hunger is likely in the region due to damage to fishery and wildlife with 50.9%, whereas about 36.5% opined that the statement id unlikely and 12.7% said indifference. More so, 45.2% of the respondents said community clashes and internecine violence are very likely in the future, whereas 34.0% noted that it is unlikely and 20.8% picked indifference. Similarly, about 44.1% opined that loss of community norms and values are likely in the region, whereas 38.6% said it is unlikely and 16.3% picked unresponsiveness. However, majority of the respondents (43.3%) supported the assertion that destruction of historical sites of importance are unlikely to continuous oil and gas exploration in the region, but 37.3% said loss of historical sites are likely and 19.3% selected indifference. Likewise, the information in Figure 4.15 revealed further that majority of our respondents (54.8%) are of opinion that decrease in longevity and infant mortality are unlikely in the future, 39.2% showed that decline in infant mortality and human longevity is likely whereas only 6% said indifference,

4.2 Empirical Analyses of the Research Objectives

4.2.1 Analysis of the First Objective

This sub-section provides answer to the research objective concerning the level of oil and gas activities in the host communities of Niger Delta region. With the purpose of ascertaining the level of oil and gas exploration and production in Niger Delta region of Nigeria using the percentile rank approach, the response of the respondents were added together to give a score for every individuals that participated in the process of questionnaire administration. Afterward, the minimum and maximum values were identified which is 1 and 6 respectively. The range and mean values of the respondents' scores were 5 and 5.82 correspondingly. Intervals were created on the basis of low/moderate/high level of oil and gas exploration and production activities in the region. Thus, scores between 1 and 2 were said to be low extent, scores between 3 and 4 were said to have moderate extent, while scores between 5 and 6 were taken as high extent.

Meanwhile, after adding the categorized responses, the total scores within 1–2, 3–4 and 5–6 are 351, 23 and 14 respectively. Afterward, the percentages of these scores according to the intervals are 90.46%, 5.93% and 3.61%. The scores were plotted on a graph, as presented in Figure 4.16. Therefore, the chart showed the level of oil and gas activities in Niger Delta region of Nigeria. This shows that about 90.46% of the total respondents reported high level of oil and gas activities, 5.9% showed moderate level of oil and gas activities in the region, and the remaining 3.61% showed low level of oil and gas activities in the region.

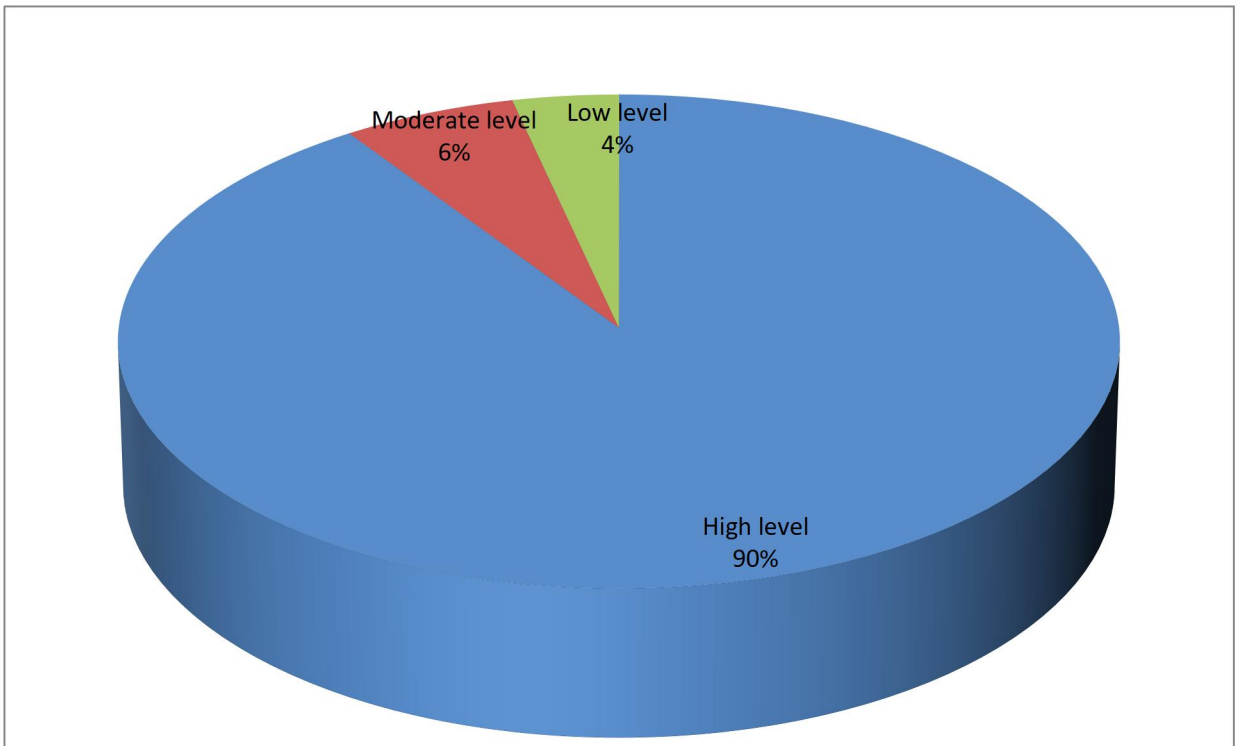


Figure 4.16: The Level of Oil and Gas Activities in Niger Delta region
Source: Author's computation from field survey (2022)

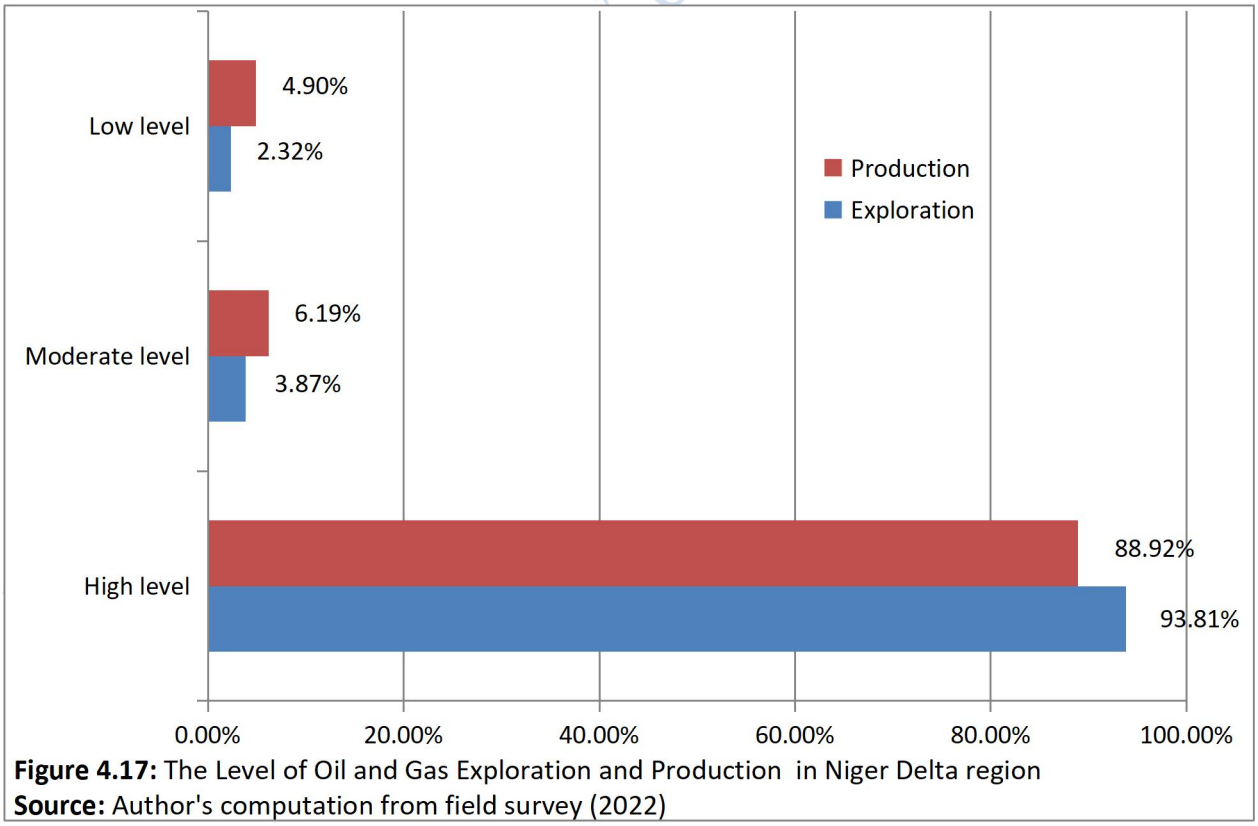


Figure 4.17: The Level of Oil and Gas Exploration and Production in Niger Delta region
Source: Author's computation from field survey (2022)

Furthermore, the study estimates the respective level of oil and gas exploration and production in the region. Following the categorization of respondents' perspectives, the total scores of oil and gas exploration and (production) within 1–2, 3–4 and 5–6 are 364(345), 15(24) and 9(19) respectively. Figure 4.17 presents the plotted scores as the percentage score of oil and gas exploration are 93.81%, 3.87% and 2.32% whereas the score percentage of oil and production are 88.92%, 6.19% and 4.9%. It therefore shows that about 93.81%, 3.87% and 2.32% reported high, moderate and low level of oil and gas exploration, while 88.92%, 6.19% and 4.9% indicated high, moderate and low level of oil and gas production in the Niger Delta region.

Figure 4.18 further showed the level of oil and gas activities in the three selected Niger Delta states. The result shows that 91.11%, 5.19% and 3.7% of oil and gas activities in Imo state is high, moderate and low levels correspondingly. As to Delta state, about 94.12% reported high level of oil and gas activities, 5.04% showed moderate level, and the remaining 0.84% showed low level. Concerning Ondo state, 85.96%, 7.02% and 7.02% of oil and gas activities is high, moderate and low levels respectively. It therefore shows that the level of oil and gas activities is more in Delta state, followed by Imo state and Ondo state. Also, Figure 4.19 revealed the level of oil and gas activities in rural and urban areas in the region. The findings indicate that 91.89%, 5.41% and 2.70% oil and gas activities in rural is high, moderate and low levels respectively. As to urban areas, the results showed that about 90.08% reported high level of oil and gas activities, 5.79% showed moderate level, and the remaining 4.13% showed low level. This implies that the level of oil and gas activities is higher in the rural areas than the urban areas of Niger Delta region of Nigeria.

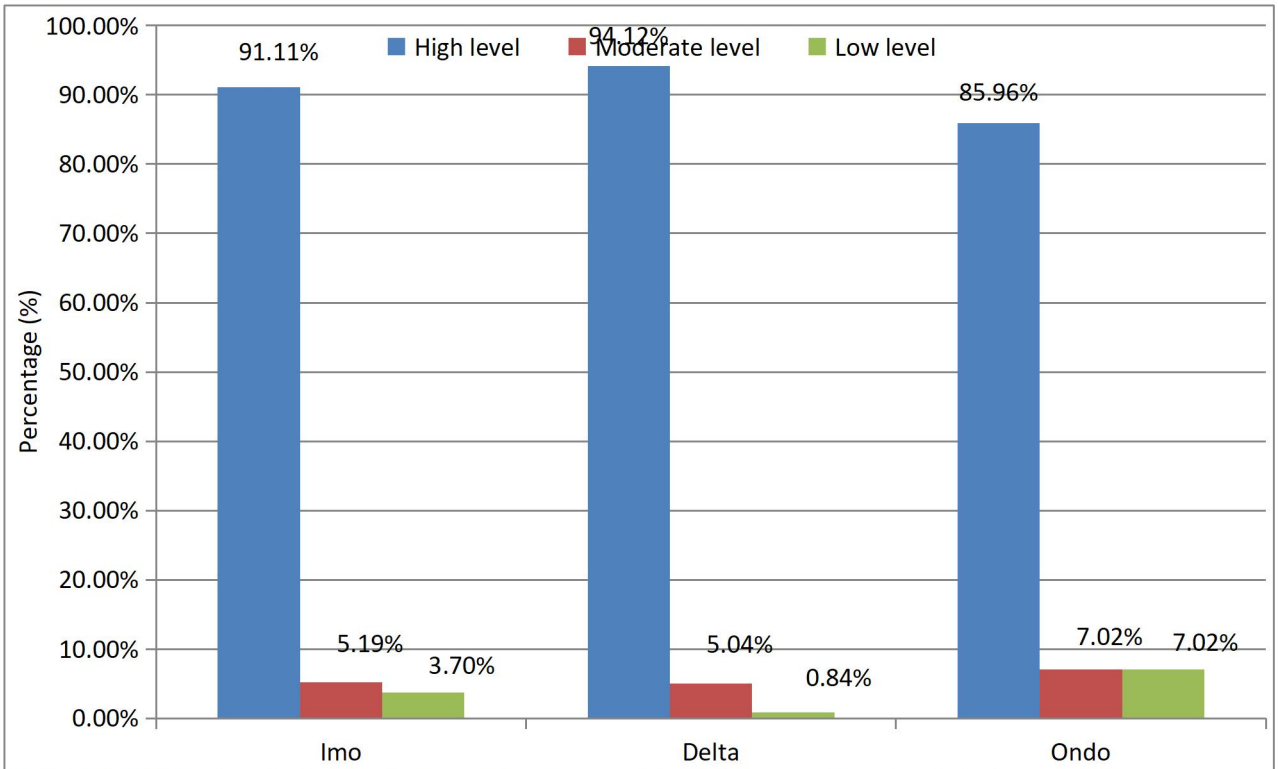


Figure 4.18: The Level of Oil and Gas Exploration and Production in Niger Delta Selected States
Source: Author's computation from field survey (2022)

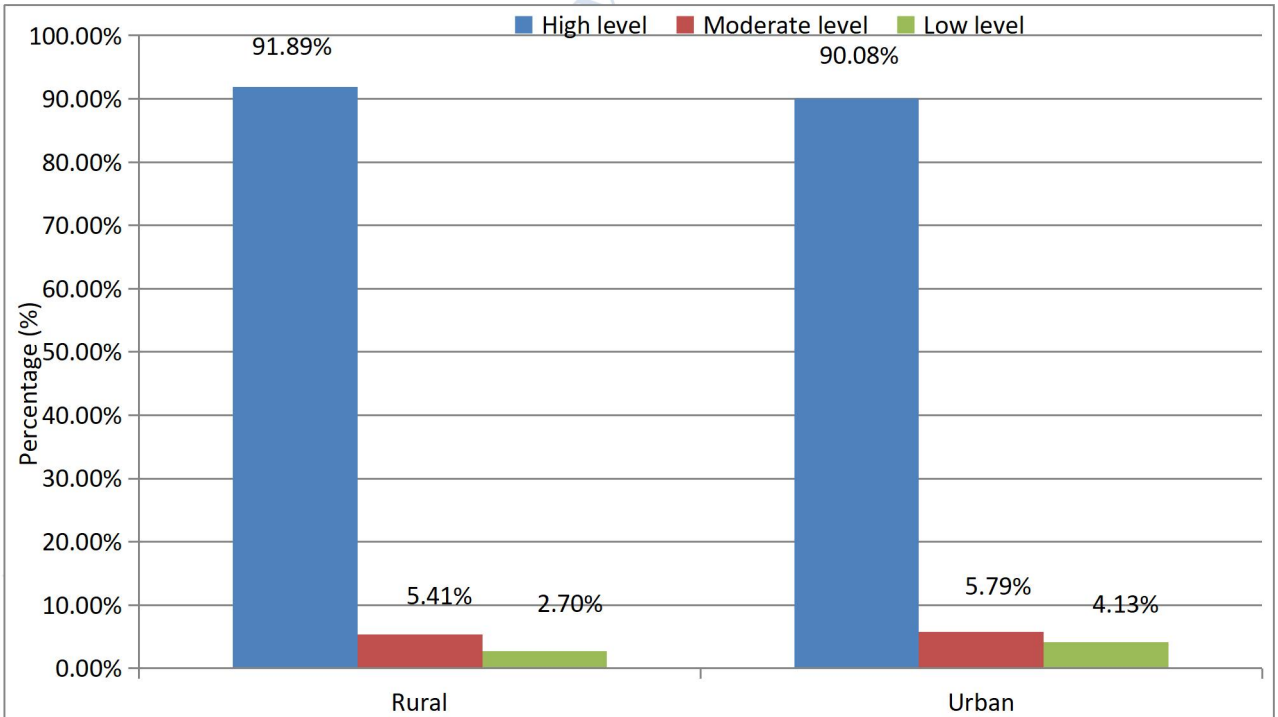


Figure 4.19: The Level of Oil and Gas Exploration and Production in Rural and Urban of Niger Delta
Source: Author's computation from field survey (2022)

4.2.2 Analysis of the Second Objective

The study answers the second objective concerning the extents of occupational mobility caused by oil and gas activities in the host communities of Niger Delta area of Nigeria in this sub-section. To establish the extent of occupational change resulting rom oil and gas activities in the Niger Delta region, the study used the cross tabulation rank approach to group the response of the respondents on questions relating to job changes and the level of oil and gas activities. The respondents' perception of the two questions were added together to give a score for every individuals that changes job in the past decades. Afterward, the values were categorized based on high, moderate and low extent respectively. After adding the categorized responses, the total scores for high, moderate and low response are 91, 7 and 5 respectively. Subsequently, the percentages of these scores according to the categorization are 88.35%, 6.80% and 4.85%. The scores were plotted on a graph, as presented in Figure 4.20. Thus, the chart showed the extent of occupational mobility caused by oil and gas activities in Niger Delta region of Nigeria. It shows that about 88.35% high extent of occupational mobility, 6.8% showed moderate rate of job mobility, and the remaining 4.85% showed low extent of job changes resulting from oil and gas activities in the region.

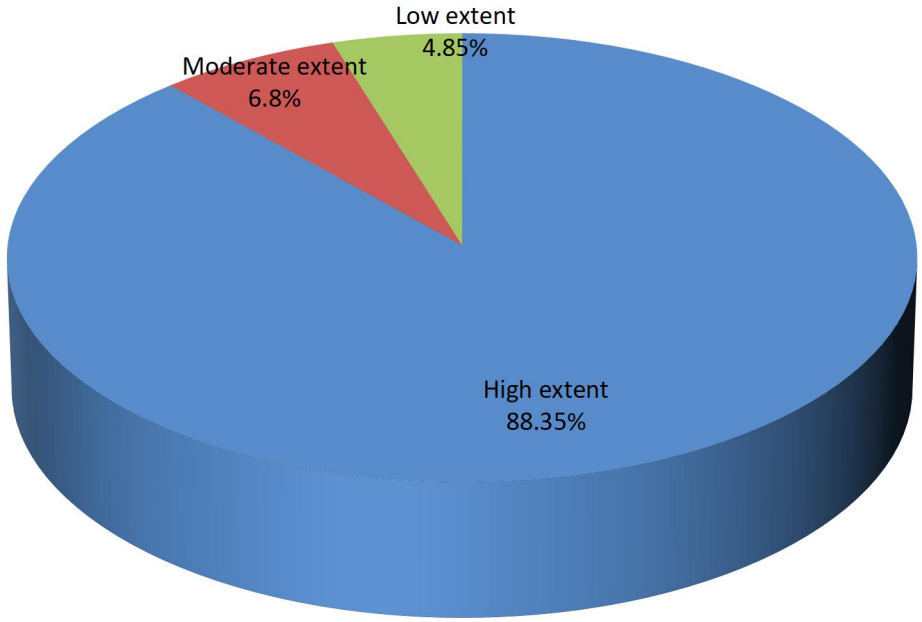


Figure 4.20: Job change caused by oil and gas activities in Niger Delta region
Source: Author's computation from field survey (2022)

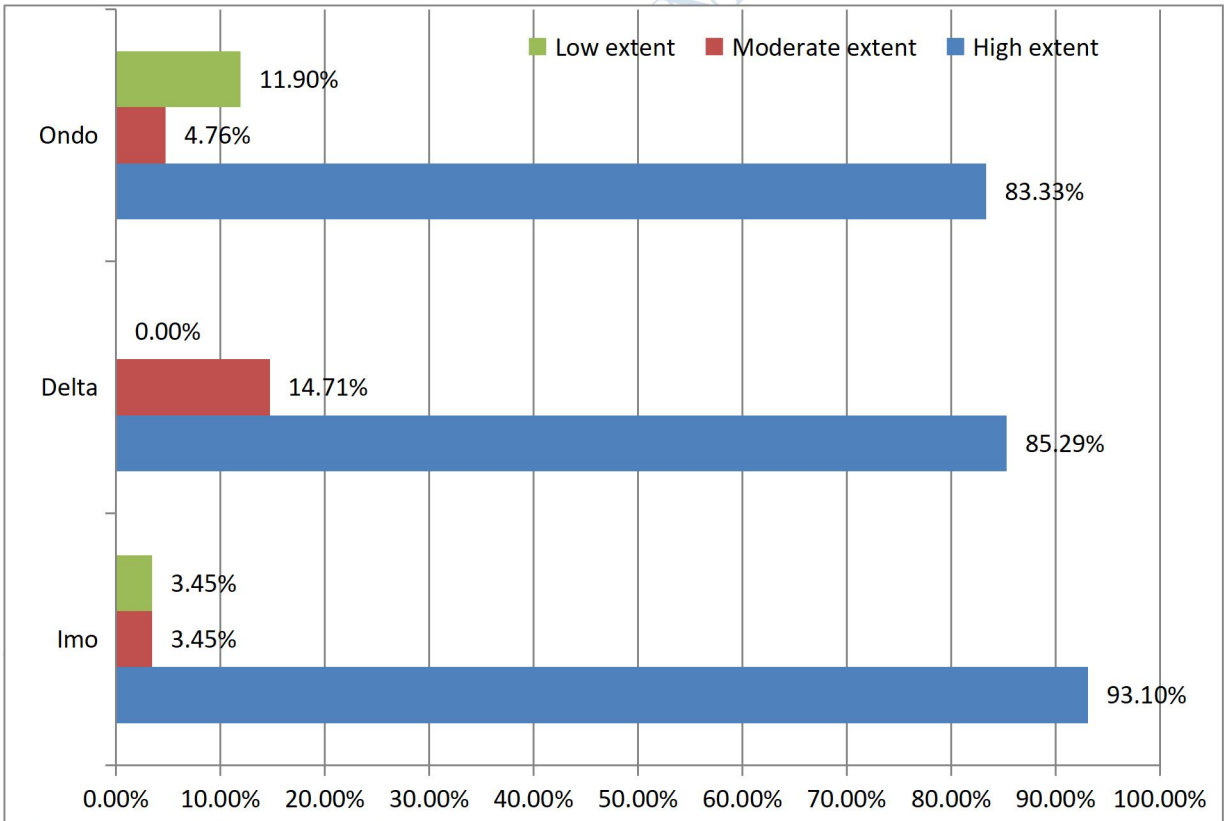


Figure 4.21: Job change caused by oil and gas activities in Niger Delta States
Source: Author's computation from field survey (2022)

In addition, the study estimates the respective extent of occupational mobility caused by oil and gas exploration and production activities in the three selected states of Niger Delta. Figure 4.22 showed the extent of job mobility resulted from oil and gas activities in the three selected Niger Delta states. The results show that 93.1%, 3.45% and 3.45% of occupational changes due to oil and gas activities in Imo state is high, moderate and low extents correspondingly. With regard to Delta state, about 85.29% reported high extent of job mobility, and 14.71% showed moderate extent caused by oil and gas activities. Relating to Ondo state, 83.33%, 4.76% and 11.9% of occupational mobility resulted by oil and gas activities in Ondo state is high, moderate and low extents respectively. It therefore shows that the extent of occupational mobility resulting from oil and gas activities is more in Imo state, then Delta state and Ondo state.

Also, the extent of occupational changes caused by oil and gas activities in rural and urban areas in the Niger Delta region is presented in Figure 4.22. From the categorization of respondents' perspectives, the total scores of occupational mobility resulting from oil and gas activities in the rural area are 89.04%, 8.22% and 2.74% for high, moderate and low rates respectively. As to urban areas, the results showed that about 90.0% reported high extent of job mobility from oil and gas activities, 6.67% showed moderate extent, and the remaining 3.33% showed low extent. It therefore indicates that the extent of occupational mobility due to oil and gas activities is higher in the urban areas than the rural areas of the Niger Delta region of Nigeria.

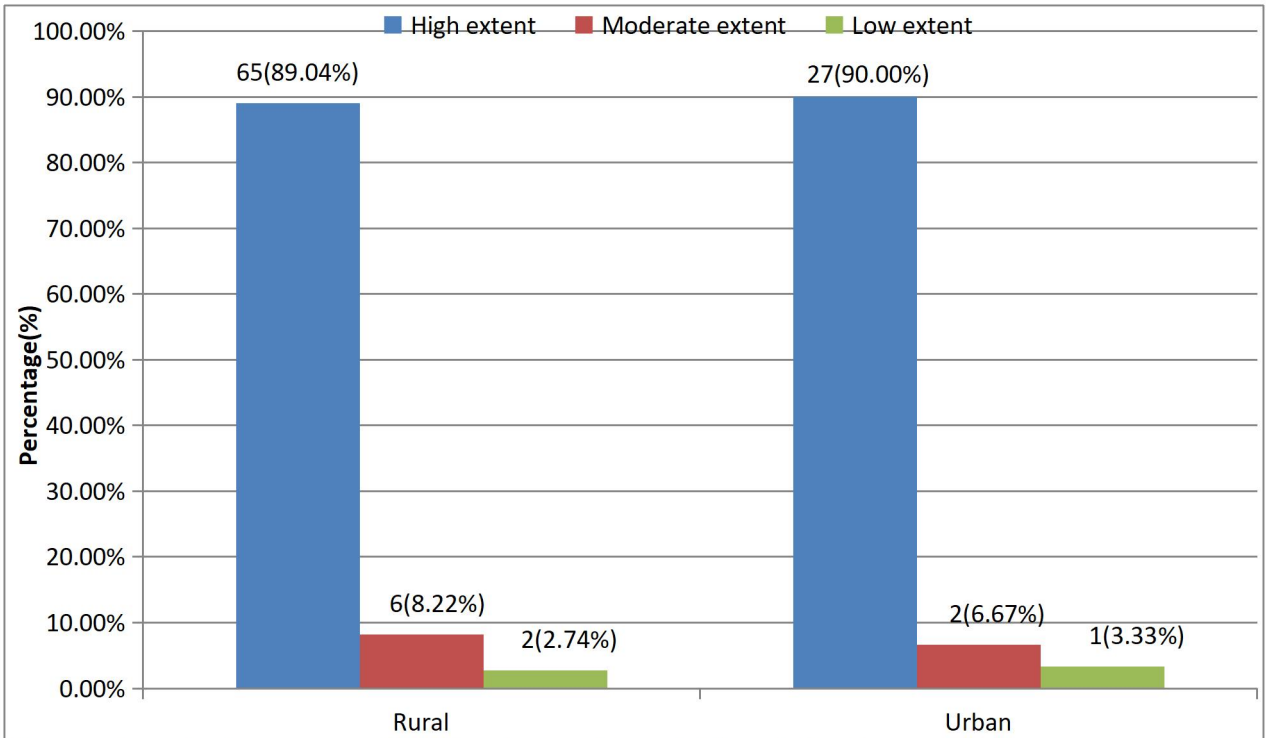


Figure 4.22: Job change caused by oil and gas activities in Niger Delta States
Source: Author's computation from field survey (2022)

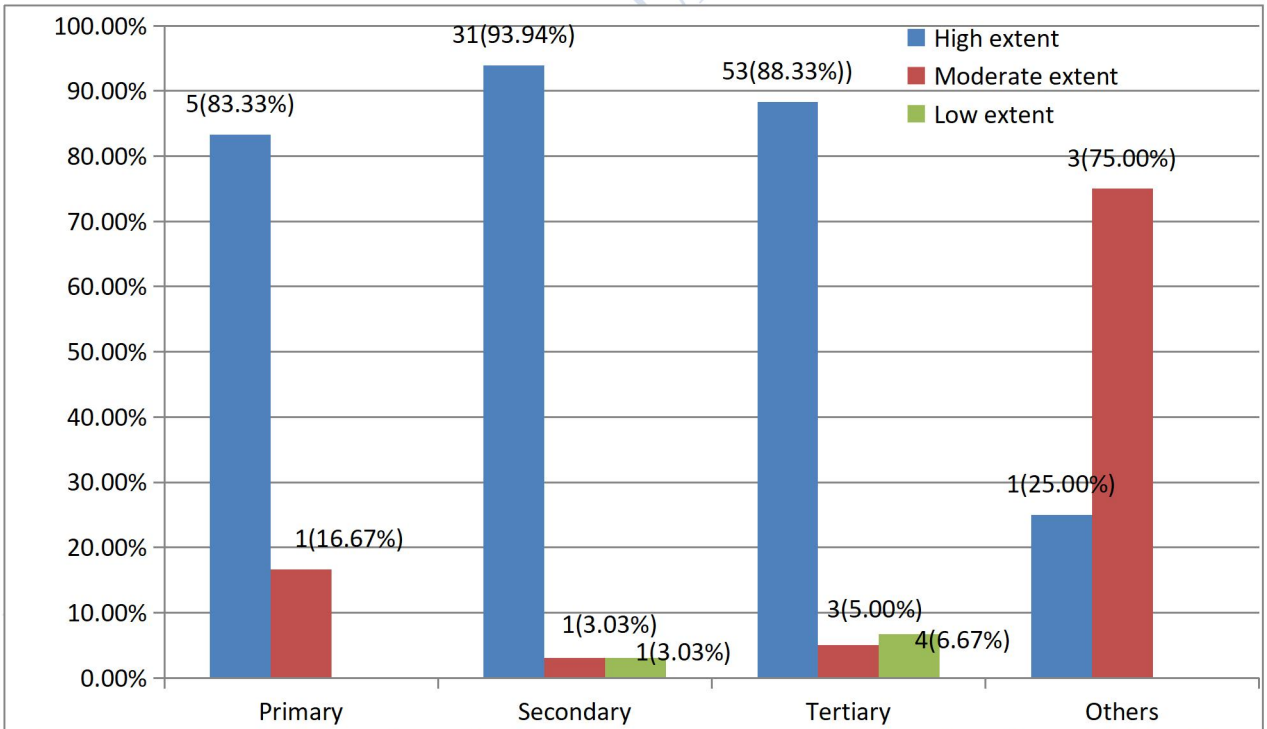


Figure 4.23: Job mobility caused by oil and gas activities in Niger Delta States based on educational background
Source: Author's computation from field survey (2022)

Figure 4.23 presents the plotted scores of occupational mobility caused by oil and gas activities based on educational background. Following the categorization of respondents' perspectives, the total scores of occupational mobility resulting from oil and gas activities among primary school leavers are 83.33% and 16.67% for high and moderate rates respectively. As regards the secondary school certificate holders, the results showed that about 93.94% reported high occupational mobility extents, whereas 3.03% showed moderate and low extent of job changes. Concerning the tertiary institution certificate holders, 88.33%, 5.0% and 6.67% indicate high, moderate and low job mobility extents. The results show that 25% and 75% high and moderate job mobility extents for respondents with other educational background. This means that there is high occupational mobility among secondary and tertiary school certificate holders in the Niger Delta region.

As well, the score plots of job mobility caused by oil and gas activities in Niger Delta States based on employment status is presented in Figure 4.24. The graph revealed that there are higher numbers of employed individuals that changed jobs compared to those that are unemployed. Concerning the percentage, the study revealed high occupational mobility extents among unemployed people than the employed individuals. Figure 4.25 shows the score plots of household heads' occupational mobility resulting from oil and gas activities in Niger Delta region. The emanating research outcomes show that there are more male household heads who changed jobs in the last decades than the female household heads. Pertaining to the percentage ranking, the study revealed high occupational mobility extents among female household heads than the male counterparts.

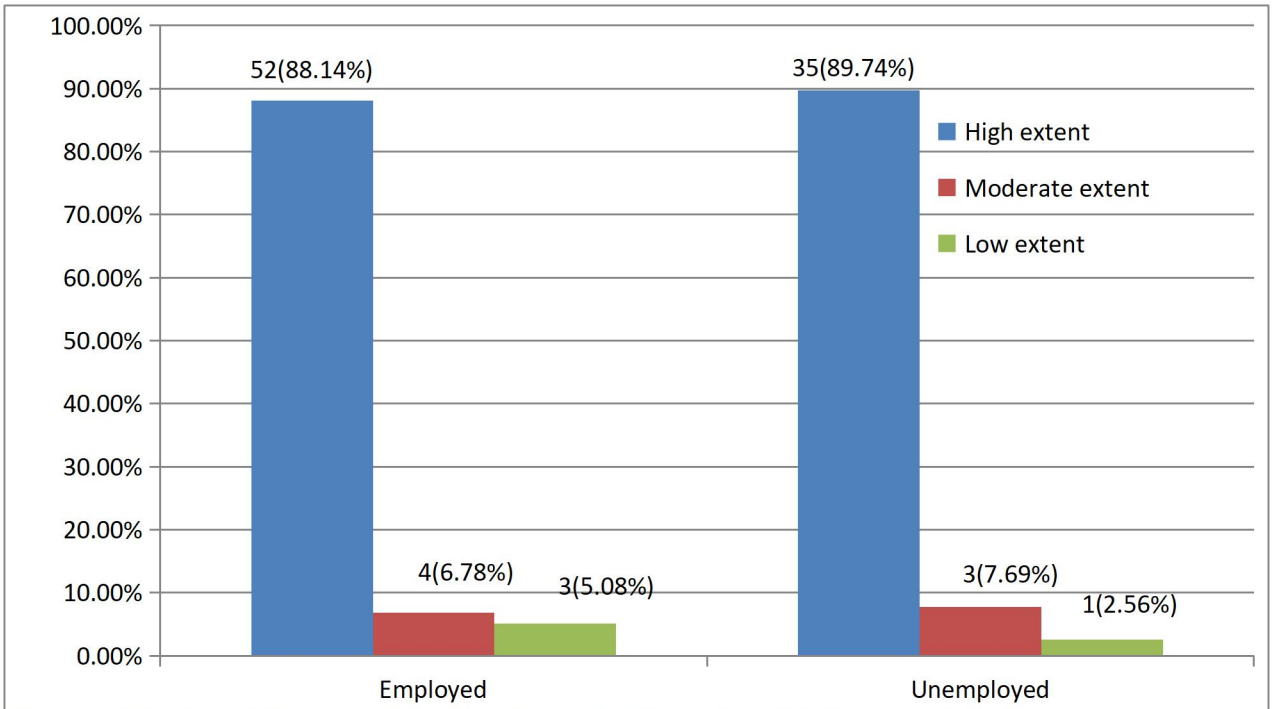


Figure 4.24: Job mobility caused by oil and gas activities in Niger Delta States based on employment status

Source: Author's computation from field survey (2022)

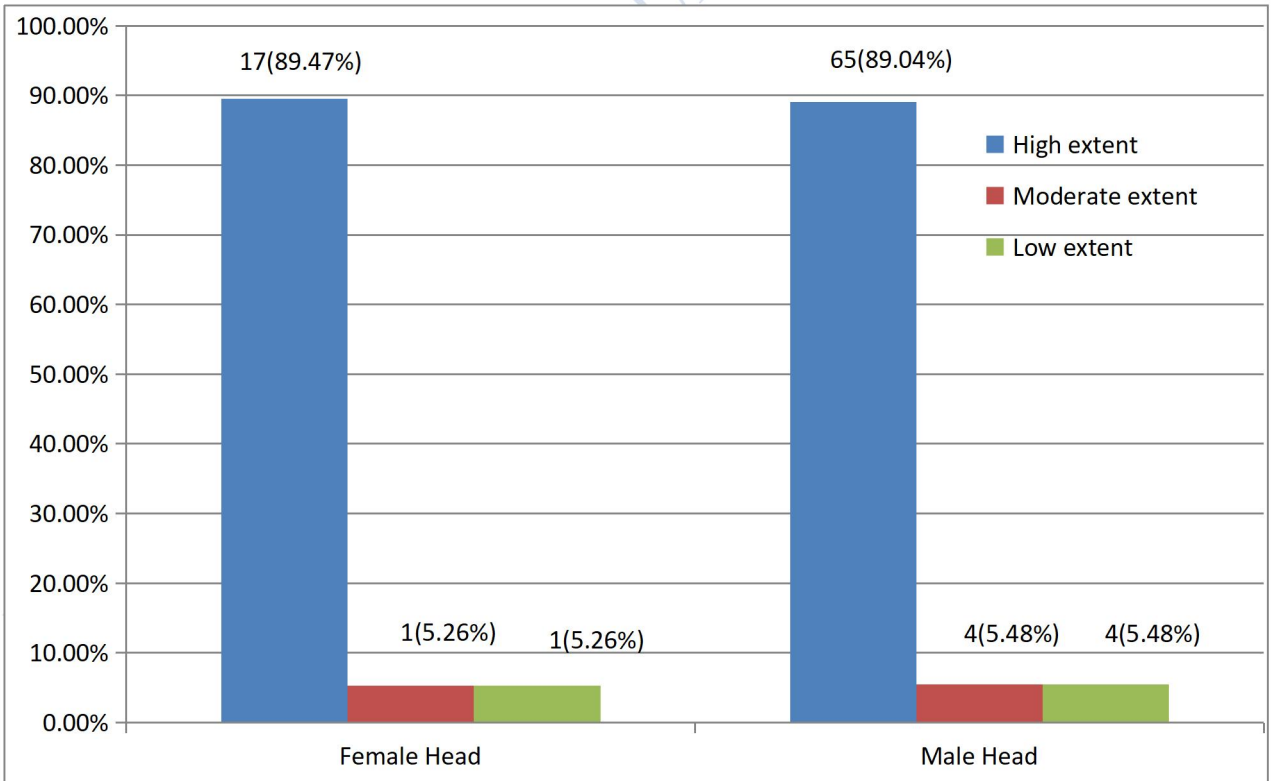


Figure 4.25: Household heads' occupational mobility caused by oil and gas activities in Niger Delta

Source: Author's computation from field survey (2022)

4.2.3 Analysis of the Third Objective

4.2.3.1 Descriptive Analysis

The descriptive statistics of the indicators of factor determinants of occupational mobility for the indigenous people in oil and gas producing communities is presented in Table 4.3. The table shows the series' mean, maximum, minimum, and standard deviation values obtained from our survey. Occupational mobility has a mean value of 0.2809, which implies that about 28.09% of the sampled respondents that change occupation over the years are 28.09%. The result also showed that the series has a higher variation among the data points. The descriptive statistics of the reasons for the occupational changes measured by growth opportunity, location change, environmental challenges, economic issues and socio-cultural issues have their respective averages at 0.2577, 0.2294, 0.2861, 0.1134, and 0.1134. This indicates that about 25.77%, 22.94%, 28.61%, 11.34%, and 11.34% of the total respondents change their occupations on the basis of growth opportunity, location change, environmental challenges, economic issues and socio-cultural issues respectively.

Also, the table describes the average values of other indicators of occupational mobility. The average values of respondents' age, formal education, and household income, are 46.8 years, 13.274 years, and ₦80,269.06 respectively. The mean of those who are employed are 58.86%, and respondents' occupation location in urban areas 35.28% respectively. In addition, the percentage mean of male respondents are 68.42% while those that are married are 86.49% respectively.

Table 4.3: Descriptive Statistics

Signs	Measurements	Mean	Std. Dev.	Max.	Min.	Kurtosis	Skewness	Obs.
omob	Occupational mobility(Yes - 1, No - 0)	0.2809	0.4500	1	0	-1.0477	0.9786	388
gender	Gender (Male -1, Female - 0)	0.6842	0.4654	1	0	-1.3741	-0.7957	380
age	Age (in years)	46.804	13.116	90	17	0.6407	0.5339	358
ms	Marital Status (Married-1, Never Married-0)	0.8649	0.4921	3	0	6.1990	0.7607	385
emps	Employment Status (Employed-1, Unemployed -0)	0.5886	0.4928	1	0	-1.8797	-0.3614	367
fedu	Formal Education (in Years)	13.274	3.3668	22	1	2.0787	-1.3790	383
inc	Household Income (In Naira)	80269.06	132487.3	1500000	5000	69.840	7.2922	202
oloc	Occupation Location (Urban -1, Rural - 0)	0.3528	0.4785	1	0	-1.6264	0.6190	343
gopp	Growth opportunity	0.2577	0.4380	1	0	-0.7672	1.1121	388
loch	Location change	0.2294	0.4210	1	0	-0.3316	1.2923	388
envc	Environmental challenges	0.2861	0.4525	1	0	-1.1025	0.9504	388
ecis	Economic issues	0.1134	0.3175	1	0	4.0130	2.4479	388
sci	Socio-cultural issues	0.1134	0.3175	1	0	4.0130	2.4479	388

Note: Min. is minimum; Max. denotes maximum; Std. Dev. means standard deviation; Obs. is observation.
Source: Author computation from Field Survey (2022).

Furthermore, their standard deviation values are presented. This depicts the pace at which these variables depart from their respective mean values. The standard deviation numbers are larger than the mean values, indicating a significant departure from the average positions. Table 4.3 also covers the remaining variables (control variables) that were used in the research investigation. It is clear that the variables with the highest averages have a high variety in their data.

4.2.3.2 Correlation Analysis

Table 4.4 reports the correlation matrix among the indicators of the factors determinants of occupational mobility. The coefficients denoting positive relationship existing between gender and occupational changes suggest that there is low chance of male respondents changing occupation in the region. Also, occupational mobility positively correlates with growth opportunity, location changes and socio-cultural issues but negatively associated with environmental challenges and economic issues. It is critical to highlight that the correlation analysis is only a preliminary analysis that will be confirmed in the following section after controlling for other factors influencing occupational changes, such as demographic and occupation-related characteristics. As a result, empirical analysis is required.

Table 4.4: Correlation Matrix

	gender	**age**	**ms**	**emps**	**fedu**	**inc**	**oloc**	**gopp**	**loch**	**envc**	**ecis**	**sci**
omob	0.002	-0.156	-0.111	0.017	0.026	-0.096	-0.125	0.012	0.014	-0.015	-0.061	0.048
gender	1	0.051	0.089	0.089	0.099	0.113	-0.037	0.029	-0.016	0.014	-0.002	-0.037
age		1	0.280	0.000	-0.219	0.050	-0.035	-0.083	0.019	0.064	0.076	-0.083
ms			1	0.080	0.124	0.163	0.008	0.018	0.009	0.010	-0.051	-0.001
emps				1	0.352	0.135	0.248	-0.060	0.129	-0.071	0.012	0.002
fedu					1	0.133	0.153	0.032	0.022	-0.052	-0.044	0.045
inc						1	0.046	-0.047	0.076	0.036	-0.068	-0.015
oloc							1	-0.061	0.112	-0.021	0.026	-0.059
gopp								1	-0.321	-0.373	-0.211	-0.211
loch									1	-0.345	-0.195	-0.195
envc										1	-0.226	-0.226
ecis											1	-0.128

Note: omob - Occupational mobility(Yes - 1, No - 0); gender - Gender (Male -1, Female - 0); age - Age (in years); ms - Marital Status (Married - 1, Never Married - 0); emps - Employment Status (Employed -1, Unemployed - 0); fedu - Formal Education (in Years); inc - Household Income (In Naira); oloc - Occupation Location (Urban -1, Rural - 0); gopp - Growth opportunity; loch - Location change; envc - Environmental challenges; ecis - Economic issues; and sci - Socio-cultural issues.
Source: Author computation from Field Survey (2022).

With respect to the control variables, age, marital status, formal education, employment status, household income and occupational location, their correlation coefficient relation to occupational mobility were reported in the table. Specifically, gender is positively related to occupation mobility. More so, age and marital status are negatively related to occupational mobility whereas employment status and formal education are positively related to occupational mobility. Also, household income and occupational location are negatively related to occupational mobility. The correlation coefficients of the variables listed above are less than 0.5. As a result, the low correlation values derived from the table indicate that there is no multicollinearity problem in the data.

4.2.3.3 Parameter Estimates of the Determinants of the Occupational Mobility of the Indigenous People in Oil and Gas Producing Communities

Table 4.5 reports the logistic regression results of the factors determinants of occupational mobility of the indigenous people in oil and gas producing communities. In the table, the coefficients, standard errors in parenthesis and their probability values at 1%, 5% and 1/0% are reported. The results showed that the parameters of growth opportunity and environmental changes are positive and statistically significant in the estimated model of occupational mobility. This means that one of the reasons for occupational mobility of the indigenous people in oil and gas producing communities in Niger Delta region of Nigeria is growth opportunity. Thus, it implies that occupational changes of the people are aided by the growth opportunities they can achieve from other places. It also indicates that environmental changes contributes to the reasons the people of Niger Delta region changes their occupations. Thus, oil spillages and environmental damages caused by the oil industries are reasons the people consider other occupations as a means of livelihood. Similarly, location change and socio-cultural issues contribute to the occupational changes of the indigenous people in oil and gas producing communities. This shows that location changes of these people to another

contribute to the reason they changes jobs over the decades. Also, socio-cultural changes which resulted from the indigenous peoples' interaction with people of other clans affect their beliefs and social values to consider other occupations that are different from their indigenous ways of livelihoods. Likewise, the result showed that economic issues contribute positively to occupational changes in the region, albeit not significant statistically at 5% level. In magnitude terms, the findings suggest that for every change in growth opportunity, location change, environmental changes, economic issues and socio-cultural issues, the study expects 0.7, 0.476, 0.228, 0.125 and 0.81 changes in the log odds of occupational mobility. The positive consequence of socio-cultural issues is more prominent in occupational changes, followed by growth opportunity, location change, and environmental changes.

As far as the control variables (demographic and occupation-related factors) are concerned, their parameter estimates are reported in the above table. In regards to gender as a factor affecting occupational changes, the benchmark used is female respondents. Compared with the average benchmark, the coefficients showed positive and significant values for most of the models. This implies that there is difference in the occupational mobility of both male and female workers in the Niger Delta region. It indicates that male folks are likely to change jobs compared than to female gender.

Table 4.5: Logistic Regression Estimates of Factors Determining Occupational Mobility

Variables	**Dependent Variable:** Occupational Mobility				
	1	**2**	**3**	**4**	**5**
Gender	0.490*	0.436	0.407*	0.402*	0.446**
	(0.275)	(0.269)	(0.217)	(0.212)	(0.197)
Age	-0.062*	-0.057	-0.057*	-0.059*	-0.060*
	(0.035)	(0.035)	(0.033)	(0.035)	(0.033)
Marital stats	-0.398***	-0.395***	-0.397***	-0.400***	-0.395***
	(0.049)	(0.058)	(0.048)	(0.057)	(0.049)
Employment status	-0.030	-0.109	-0.054	-0.019	-0.030
	(1.059)	(1.047)	(1.100)	(1.075)	(1.101)
Formal education	0.011	0.013	0.009	0.010	0.011
	(0.050)	(0.052)	(0.049)	(0.051)	(0.048)
Household income	-0.204	-0.202	-0.182	-0.187	-0.163
	(0.412)	(0.386)	(0.374)	(0.380)	(0.401)
Occupation location	-0.301	-0.296	-0.248	-0.265	-0.224
	(0.663)	(0.662)	(0.679)	(0.680)	(0.666)
Growth opportunity	0.700**				
	(0.341)				
Location change		0.476***			
		(0.171)			
Environmental changes			-0.228		
			(0.176)		
Economic issues				0.125	
				(0.385)	
Socio-cultural issues					0.810***
					(0.134)
Constant	-3.727	-3.267	-3.230	-3.245	-2.860
	(2.626)	(2.544)	(2.584)	(2.602)	(2.769)
Wald Chi-Square	54.64***	40.16***	115.2***	49.33***	51.27***
Log likelihood	-92.37	-620.61	-588.42	-587.12	-570.56
Observations	296	296	296	296	296

Note: Standard errors and z-score are reported in parentheses() and square bracket [] respectively; *, **, ***: significance levels of 10%, 5%, and 1% respectively.
Source: Author computation from Field Survey (2022).

The result is different to the findings of the marital status. As for marital status, the benchmark was respondents that are single. The parameter estimates for occupational mobility was negative and significant all through the models. It means that there are differences in the occupational mobility of people that are married couples and single. This shows that single individuals in the region have higher chances of changing occupation than people who are married. As to ages of the respondents, the parameters are negative but significant at 10% level. This means that people within the lower age brackets have higher tender of changing their occupation than people of older ages.

The table also reported the occupational mobility of indigenous people of Niger Delta region when the equations were augmented with employment status, formal education, households' income, and occupational location. Their benchmark categories were respondents with no employment for employment status, and rural location for occupational location. The parameters of employment status and occupational location were negative and insignificant at 5%. This means that there is no difference in occupational mobility for employed and unemployed persons as well as those in rural and urban areas of the region. More so, the study showed that formal education has a positive impact on occupational mobility, albeit not significant statistically at the conventional level. It implies that there is no difference in occupational changes of people with higher and lower education qualification. This study further found that there is no difference in occupational changes of households with high and low income. In addition, the overall significance of the estimated coefficients for the models was verified using Chi-square test. This shows that occupational change factors jointly impacted occupational mobility significantly at 5% level.

Table 4.6: Principal Component Analysis

Components		Eigenvalues	Proportion (%)	Cumulative (%)
Socio-cultural challenges	1	2.8475	0.4054	0.4054
	2	1.2420	0.1774	0.5828
	3	0.8149	0.1164	0.6992
	4	0.7106	0.1015	0.8007
	5	0.4998	0.0714	0.8721
	6	0.4683	0.0669	0.9390
	7	0.4269	0.0610	1.0000
Economic challenges	1	3.3682	0.5614	0.5614
	2	0.9576	0.1596	0.7210
	3	0.6080	0.1013	0.8223
	4	0.4386	0.0731	0.8954
	5	0.3566	0.0594	0.9548
	6	0.2710	0.0452	1.0000
Environmental challenges	1	5.0051	0.4171	0.4171
	2	1.3504	0.1125	0.5296
	3	1.1931	0.0994	0.6290
	4	0.9171	0.0764	0.7055
	5	0.6495	0.0541	0.7596
	6	0.6242	0.0520	0.8116
	7	0.5129	0.0427	0.8544
	8	0.4452	0.0371	0.8915
	9	0.4133	0.0344	0.9259
	10	0.3382	0.0282	0.9541
	11	0.2958	0.0246	0.9787
	12	0.2553	0.0213	1.0000

Source: Author computation from Field Survey (2022).

4.2.4 Analysis of the Fourth Objective

4.2.4.1 Principal Component Analysis

In this section, indexes are produced for socio-cultural challenge, economic challenge, and environmental challenge based on the contents of the questionnaires administered to our respondents' seven, six, and twelve questions, respectively. The responses of our respondents to the questions (Figures 4.13 and 4.14, and Table 4.2) are explained in the previous section for more clarification on these issues.

Table 4.6 shows the results of the primary component for socio-cultural challenge, economic challenge, and environmental challenge. According to the table, the indexes derived from the first seven, six, and twelve principal components of the indicators of socio-cultural challenge, economic challenge, and environmental challenge explain a significant percentage of the total variance in the original data. The principal component analysis revealed that only their first component had eigenvalues of 2.8475, 3.3682, and 5.0051 for socio-cultural challenge, economic challenge, and environmental challenge, respectively. In the original data of socio-cultural challenge, economic challenge, and environmental challenge, these components account for 40.54%, 56.14%, and 41.71% of the total variance, respectively. Figures 4.26a, 4.26b, and 4.26c show the scree plots of the eigenvalues following principal component analysis for the socio-cultural challenge, economic challenge, and environmental challenge, respectively.

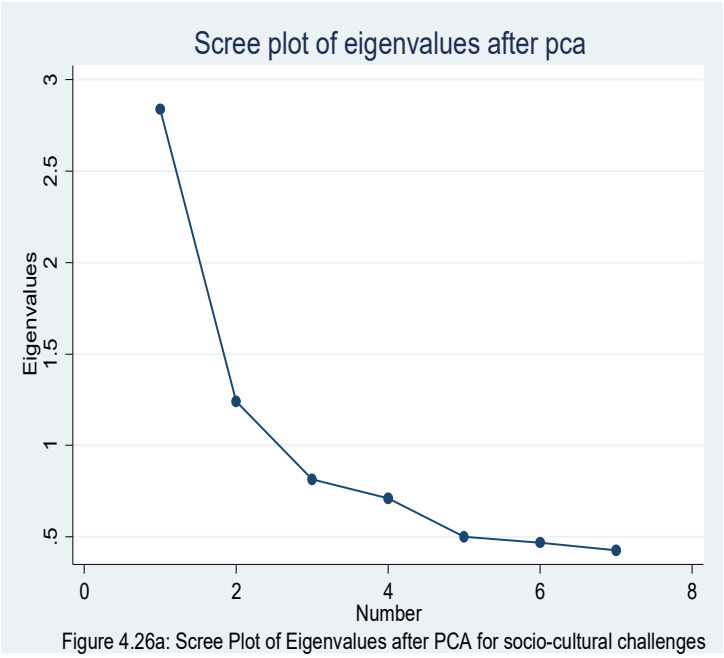
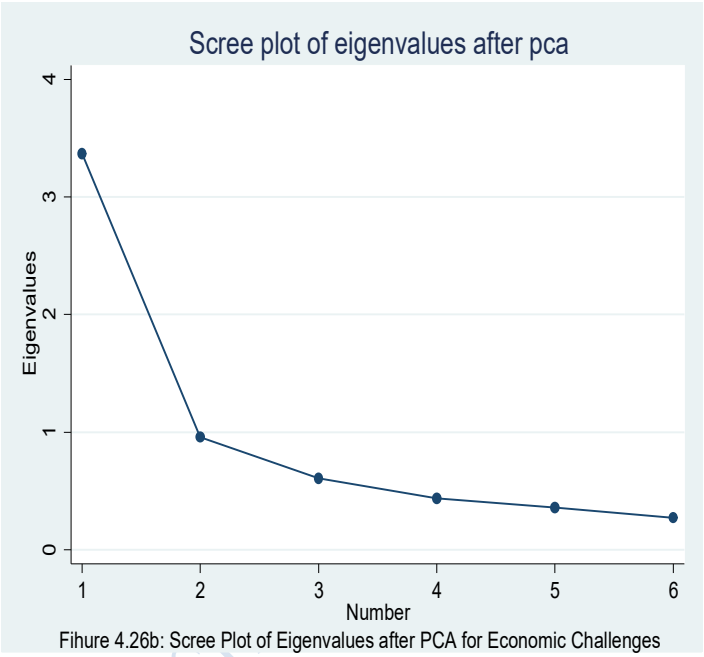


Figure 4.26a: Scree Plot of Eigenvalues after PCA for socio-cultural challenges



Fihure 4.26b: Scree Plot of Eigenvalues after PCA for Economic Challenges

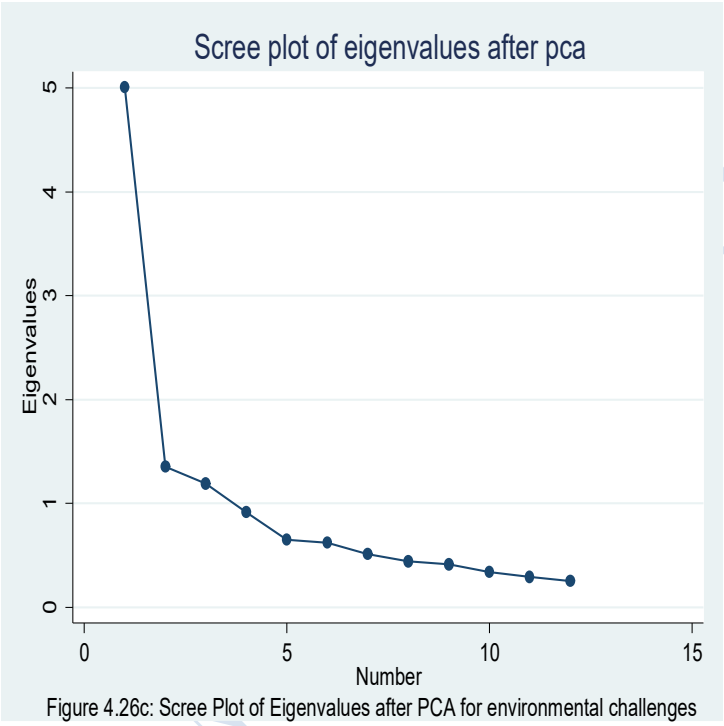


Figure 4.26c: Scree Plot of Eigenvalues after PCA for environmental challenges

4.2.4.2 Descriptive Analysis

The descriptive statistics of the indicators of economic, socio-cultural and environmental challenges, control variables and host community development presented in Table 4.7 show their respective average, maximum, minimum, and standard deviation values obtained from our survey. Host community development has its mean value slightly lesser than 2.5, which indicate low level of development of the region. Also, the descriptive statistics of socio-cultural, economic and environmental challenge show mean values of -0.0012, -0.0017, and -0.0053 respectively. Thus, it implies that there is some of level of socio-cultural, economic and environmental challenges in the region.

As well, the table describes the average values of other cofounding factors of the host community development. The average values of gender, age, marital status, employment status, formal education, household income and occupation location are 0.684, 46.8 years, 0.865, 0.589, 13.27 years, ₦80,269.1 and 0.353 respectively. More so, their standard deviation values are also reported. This shows the rate at which these variables deviate from their individual mean values. The standard deviation values are greater than their mean values implying high deviation from the average points. It can be seen that the variables with the highest averages has corresponding high variation in their data.

Table 4.7: Descriptive Statistics

Signs	Measurements	Mean	Std Dev.	Max.	Min.	Kurtosis	Skewness	Obs.
hcd	Host community development	0.2410	0.5529	5	0	25.3273	4.0068	361
scc	Socio-cultural challenges	-0.0012	1.6845	7.4818	-2.4812	1.7115	1.0206	366
ecc	Economic challenges	-0.0017	1.8353	9.8646	-1.2924	6.9074	2.2767	365
evc	Environmental challenges	-0.0053	2.2372	13.5343	-2.1815	8.4512	2.3662	367
gender	Gender (Male -1, Female - 0)	0.6842	0.4654	1	0	-1.3741	-0.7957	380
age	Age (in years)	46.8045	13.1164	90	17	0.6407	0.5339	358
ms	Marital Status (Married - 1, Never Married - 0)	0.8649	0.4921	3	0	6.1990	0.7607	385
emps	Employment Status (Employed -1, Unemployed - 0)	0.5886	0.4928	1	0	-1.8797	-0.3614	367
fedu	Formal Education (in Years)	13.2742	3.3668	22	1	2.0787	-1.3790	383
inc	Household Income (In Naira)	80269.1	132487.3	1500000	5000	69.8395	7.2922	202
oloc	Occupation Location (Urban -1, Rural - 0)	0.3528	0.4785	1	0	-1.6264	0.6190	343

Note: Min. is minimum; Max. denotes maximum; Std. Dev. means standard deviation; Obs. is observation.
Source: Author computation from Field Survey (2022).

4.2.4.3 Correlation Analysis

Table 4.8 reports the correlation analysis among the indicators of the region's community development with socio-cultural, economic and environmental challenges. The coefficients denoting positive relationship existing among the region's community development with socio-cultural, economic and environmental challenges suggest that there is high chance of having improved development as societal challenges relating to socio-cultural, economic and environmental issues reduces. This is just a preliminary analysis subject to confirmation in the next section after controlling for other factors affecting the region's community development like the demographic and occupation-related factors. Thus, it necessitates the need for empirical analysis.

Nonetheless, with respect to other confounding variables such as gender, age, marital status, employment status, formal education, household income and occupation location, their correlation coefficient with respect to host community development were reported in the table. Specifically, gender was negatively related to host community development. Similarly, host community development is indirectly associated with formal education, household income and occupation location. However, the correlation result revealed that the region's community development is positively correlated with respondents' age, marital status, and employment status. The correlation coefficients of the above variables are less than 0.5, which indicates that the low correlation values obtained from the table suggest the absence of no multicollinearity problem in the data.

Table 4.8: Correlation Matrix

	scc	ecc	evc	gender	age	ms	emps	fedu	inc	oloc
hcd	0.047	0.145	0.133	-0.078	0.007	0.007	0.060	-0.030	-0.008	-0.006
scc	1	0.356	0.510	-0.011	-0.097	-0.058	0.030	0.053	-0.090	0.093
ecc		1	0.751	0.029	-0.219	0.006	0.040	0.050	-0.045	0.006
evc			1	-0.043	-0.206	-0.057	0.009	0.044	-0.084	0.027
gender				1	0.051	0.089	0.089	0.099	0.113	-0.037
age					1	0.280	0.000	-0.219	0.050	-0.035
ms						1	0.080	0.124	0.163	0.008
emps							1	0.352	0.135	0.248
fedu								1	0.133	0.153
inc									1	0.046

Note: hcd - Host community development; scc - Socio-cultural challenges. ecc - Economic challenges; evc - Environmental challenges; gender - Gender (Male -1, Female - 0); age - Age (in years); ms - Marital Status (Married - 1, Never Married - 0); emps - Employment Status (Employed -1, Unemployed - 0); fedu - Formal Education (in Years); inc - Household Income (In Naira); oloc - Occupation Location (Urban -1, Rural - 0).
Source: Author computation from Field Survey (2022).

4.2.4.4 Parameter Estimates of the Economic, Socio-Cultural and Environmental Effect of Oil and Gas Activities on the Host Communities

Table 4.9 reports the logistic regression results of the economic, socio-cultural and environmental effects of oil and gas activities on the development of the host communities. In the table, the coefficients, standard errors in parenthesis and their probability values at 1%, 5% and 1/0% are reported. The results showed that the parameters of economic, socio-cultural and environmental effects of oil and gas activities are negative and statistically significant in the estimated models of the development of the host communities. In particular the findings obtained from the economic effect of oil and gas activities indicate that the variable has negative impact on the host community development. This means that the reasons for the depleting development of many indigenous communities of the oil producing states in Nigeria resulted from the economic activities of oil and gas activities in the community. Likewise, the study found environment challenges negatively influencing the development of the oil producing communities in the Niger Delta region. It shows that environmental pollution from oil and gas activities contribute to the worsening situation of the oil producing region. Just like the economic and environmental effects of oil and gas activities, socio-cultural challenges of these activities affect the developmental pace of the region negatively. This suggests that socio-cultural challenges of the region further deplete the host communities' development over the years. In magnitude terms, the findings suggest that for every one unit increase in economic, environmental and socio-cultural factors of oil and gas activities in the region, there is 0.214, 0.206 and 0.234 decreases in the log odds of the host communities' development respectively.

Table 4.9: Logistic Regression Estimates of Economic, Socio-Cultural and Environmental Effects of Oil and Gas Activities on the Host Communities

Variables	**Dependent Variable:** Host Community Development		
	1	2	3
Gender	-0.693*	-0.560*	-0.569
	(0.383)	(0.324)	(0.444)
Age	0.028	0.032*	0.025
	(0.022)	(0.018)	(0.017)
Marital status	0.263	0.324	0.305
	(0.393)	(0.313)	(0.365)
Employment status	0.524	0.247	0.789**
	(0.587)	(0.392)	(0.398)
Formal education	0.027	0.073	-0.031
	(0.057)	(0.106)	(0.082)
Household income	-0.207	-0.215***	-0.247*
	(0.139)	(0.076)	(0.142)
Occupation location	0.605***	0.818***	0.668***
	(0.171)	(0.007)	(0.086)
Socio-cultural challenges	-0.234***		
	(0.023)		
Economic challenges		-0.214*	
		(0.127)	
Environmental challenges			-0.206***
			(0.031)
Constant	5.153*	5.812***	4.124
	(2.648)	(1.962)	(2.935)
Wald Chi-Square	48.48***	48.38***	124.04***
Log likelihood	-68.39	-70.07	-71.14
Observations	253	249	255

Note: Standard errors and z-score are reported in parentheses() and square bracket [] respectively; *, **, ***: significance levels of 10%, 5%, and 1% respectively.
Source: Author computation from Field Survey (2022).

As far as the control variables (demographic and occupational-related factors) are concerned, their parameter estimates are reported in the above table. In regards to gender as a factor affecting host community development, the benchmark used is female respondents. Comparing with the average of benchmark, the coefficients showed negative and significant values at 10% for two out of three models. It means that there are no differences in the host community development as regards male and female folks in the region. While using rural area as the benchmark of occupational location, the study found that occupational location positively and significantly impacted the host community development. This shows that there are differences in the development of host community development relating to the urban and rural setting of the community. It therefore means that urban areas are more likely to be experience much development compared to the rural areas. Similarly, employment status shows positive coefficients but one out of the three estimated models are significant at 5% level when unemployed person are used as benchmark of employment status. Thus, communities with more of employed people experienced development in their areas than communities with more of unemployed persons. Likewise, age has direct influence on the host communities' development, albeit at 10% significance level.

However, household income negatively impact on the development of the host communities. One of the reasons for the negative influence of income on host community development can be attributed to insufficient income level earned by the household head for the family coupled with incessant increase in the price of goods and services. As regards marital status and formal education, their respective influences on host communities' development are not statistically confirmed at 5% level. As well, the overall significance of the estimated coefficients for the models was verified using Chi-square test. This shows that economic, socio-cultural and environmental effects of oil and gas activities significantly influenced the host community development at 5% level.

4.5 Discussion of Findings

For the first objective, the investigation discovered a significant degree of oil and gas activity in Nigeria's Niger Delta region. Furthermore, it was determined that oil exploration accounts for a greater proportion of these oil and gas activities than oil production. Delta state had the highest level of oil and gas activity, followed by Imo and Ondo states. When oil and gas activities in the region's rural and urban centers were compared, it was determined that these activities are concentrated in the region's rural centers. According to the respondents, clearing of bush, burning of bush, dredging of carnal, use of chemical, use of drilling instrument, spills during drilling, spills during transportation, spills during bunkering, discharge farm oil pipe, discharge during vandalism were all part of the oil and gas industries' activities in the study area. Somme of the followings were the reasons that advance for increase in activities of oil and gas in Niger Delta area of Nigeria: increasing population; increase in demand for energy because petroleum is one of the best source of energy; the country's crude oil being one of the best in the whole world e.g. bunny light, Escravos Blend, Brass River, Qua Ibo, Forcados & penninglon and Anfa; search and discovering of more well; illegal refineries; illegal bunker.

The above activities account for burning of bush, dredging of carnal, use of chemical, drilling instrument, spilling during bunkery discharge from oil pipe and discharge during vandalization has led to high level activities in Niger Delta the economic implication is that there will be geometrical increase in activities (exploitation, exploration & production) to meet up with the demand, OPEC quota etc. This has led to a high level of activities and if not well monitored will have great adverse effect on the host community in respect of economic, socio-cultural and environmental issues and led to migration or shift in traditional occupation (farming, fishing, craft works, hunting, moulding, tapping, gin making, weaving etc.) of the people in the area.

Concerning the second objective, the study's findings indicate that there is a significant level of occupational shift in the region as a result of oil and gas activity. This means that citizens in the region have changed jobs as a result of oil and gas activities, which have produced environmental concerns. Furthermore, we determined that these activities had the greatest impact on the people of Imo states, followed by the people of Delat and Ondo states. Furthermore, the extent of occupational mobility owing to oil and gas activities is greater in metropolitan regions than in rural sections of Nigeria's Niger Delta region. It was also shown that secondary and postsecondary school graduates have high career mobility. Furthermore, male household heads changed jobs more frequently than female household heads over the last few decades. Unemployed people are more likely to shift jobs than employed people.

The level of oil & gas activities in the area has paved way for great extent of occupational mobility. These are caused by negative impact of environmental issue, Economics situation and socio-cultural decayed in the area and are very pronounced in the rural area where oil well, tank farms, flow station are very pronounced, moreover, post primary and secondary graduate are left idle in terms of employments and therefore migrate to the city. The implication is that there will be no fertile land for farming and fishing, tapping, weaving, moulding etc. Also, male head of family and single men has to desert their home in search for work. Further, unemployment is high, therefore unemployed people is to move to search for job in other places. This has higher chances of hunger in that area since the people now depend on farm product from another state etc. for example, Oyo state, Osun state, Benue state depends on ice fish imported to the country and the area become poor.

As to the third objective, the study discovered that opportunities for growth and environmental changes had a favorable and significant impact on occupational mobility. This suggests that one of the reasons for indigenous people's occupational mobility in oil and gas producing towns in Nigeria's Niger Delta region is the chance for advancement. As a result, it

means that people's vocational transitions are supported by the growth chances available in other regions. It also suggests that environmental changes contribute to the reasons why people in the Niger Delta region change jobs. Thus, oil spills and environmental harm caused by the oil industry are causes why individuals consider other employment as a source of income. Similarly, shifts in location and socio-cultural factors influence indigenous people's occupational choices in oil and gas producing communities. This demonstrates that these people's movement from one location to another contribute to the reasons they change occupations over the years. Furthermore, socio-cultural changes brought about by indigenous peoples' interactions with people from other clans influence their ideas and social values, leading them to consider other jobs that differ from their indigenous ways of life. Similarly, the findings revealed that economic factors influence occupational shifts in the region, albeit not statistically significant at the 5% level. The positive impact of socio-cultural concerns is most visible in vocational changes, followed by opportunities for growth, geographical changes, and environmental changes.

As a result of high level of activities in the area, the area has becomed mono-product area, only produce crude oil. Traditional occupation of farming, fishing, weaving, moulding, tapping, hunting, etc. become worthless as the indigenous people becomes jobless and idle and have to move, because there is need to solve the problems of opportunity growth, environmental issue, change in occupation, and socio-cultural changes. Apart from the traditional occupation the indigenous people in the host community has seen and known that there are other growth opportunities, for those that visit and study in the city and will want white colar job and oil industry job where the income is high and give room for growth as in the society. This implies mobility and change of occupation. The negative effect of environmental problem affected the host communities. The implication is that there will be little or no income and involvement in traditional occupation because the environmental issue

equally affected their health and has to move to a place where better source of income can be found mainly in oil companies and in other sector if the economy where there can earn their living.

Concerning the last objective, the study found that economic, socio-cultural, and environmental issues associated with oil and gas activities have a negative impact on the development of host communities. The data from the economic effect of oil and gas activities, in particular, reveal that the variable has a negative impact on the development of the host community. This suggests that the economic operations of oil and gas activities in the community are to be blamed for the dwindling development of many indigenous communities in Nigeria's oil-producing states. Similarly, the study discovered that environmental difficulties are having a negative impact on the growth of oil-producing towns in the Niger Delta region. It demonstrates that pollution from oil and gas activities contributes to the deterioration of the oil-producing region's predicament. The socio-cultural issues of oil and gas activities, like the economic and environmental repercussions of these activities, have a negative impact on the region's development speed. This shows that the region's socio-cultural problems have hampered the growth of the host populations throughout time.

From the investigation carried through questionnaire and oral interview, respondents have the following to say that economic activities of the area which was farming, fishing, weaving, moulding, tapping, hunting is very low, and cannot be relied upon by the people on what they produced from their states, it leads to poverty, low earning, poor standard of living, illiteracy etc and these account for change of occupation and migration from the area to another one. As a result, this has made the economy of that area to stand still. Socio-cultural heritage of the people in the area is decayed, the IOC has engaged in divided and rule, traditional ruler were killed, a case of Olomoro In Isoko South local Government in Delta, Evwreni in Ughelli North Local Government in Delta state and others. The norm and value of the people are

tampered with, marriages are not conducted the way it was, as a result of oil money, many ladies go to husband or man friend houses or home without formal marriages. Also, there is no respect for elder in the society again. Further, intra and inter-communal fight is the order of the day, ways of dressing is tampered with, sacred forest are explored and exploited. As a result, this affects the development of that area and occupation of the people. The greatest implication is that the indigenous people moved from their traditional job to another and later desert the communities.

This finding corroborates Central Bank of Nigeria report on the petroleum exploration activities in the Niger Delta region, which concludes that, the petroleum industry has negatively impacted the socio-cultural life of the Nigerian society, Niger Delta region specifically[1]. Petroleum exploration activities have caused rural urban migration, as every body is moving to the city in search of oil company employment or contract. It has also created an occupational shift, as the predominant occupation before the discovery of oil was fishing and farming, but this has considerably changed, as nobody is interested in agriculture. Everybody, including the uneducated is in search of white-collar jobs in the oil industry[2]. The exposure of the rural communities to oil companies' activities has drastically eroded the traditional social- cultural values in the communities[3]. Oil activities have also caused intra and inter communal conflicts resulting in the loss of lives due to disputes over ownership of oil or gas wells. Bribery and Corruption is also another social malady that was introduced into the Nigerian society as a result of activities in the oil industry that has became endemic in the government and in the petroleum industry.

Also, oil companies also caused instability in the traditional institutions as it became highly politicized leading to the frequent removal of community chiefs, which are mostly instigated by oil politics[4]. The greatest social threat is the high rate of poverty in the country, which despite the increase in oil revenue, has geometrically increased over the last forty years[5].

According to the World Bank Country Report on Nigeria, most of Nigeria's oil revenue is appropriated by 1 percent of the population[6]. However, this finding further established the assertion of an existing study that cocoa produce, palm produce, groundnut, cassava, rubber (natural), cotton, yam, fish and shrimps accounts for over 70 percent of total export between 1960 and 1970[7]. The value of nonoil exports has been on the decline ever since. For instance, the share of agricultural products in total export declined from 84 percent in 2010 to 1.8 percent in 2015. Nigeria's economic stability is dependent on the stability of the world energy market; therefore, any change in the price of oil and gas will directly affect the economy of Nigeria. Nigeria has been advised by the IMF and other experts to diversify its economy by evolving policies to encourage investments in agriculture, solid minerals, manufacturing and production[8].

Another thorny economic issue is the modalities for the distribution of the oil and gas revenue between the federal government, the state governments and the oil producing host communities[9]. This has been a perennial source of conflict as the host communities demand for a greater control of their natural resources, while the federal government through obnoxious legislations retained a lion share of the revenue[10]. Presently 13 percent of oil revenue from onshore production goes to the nine oil producing states in the Niger Delta, while the remaining revenue is shared in the following ratio; federal government 47.2 percent, states 31.1 percent, local governments 15.2 percent and national priority service fund 6.5 percent[11]. Increased oil revenue without a corresponding investment in infrastructure, agriculture and manufacturing, had caused Nigeria to be an importer of everything and exporter of only oil and gas. This has resulted into increase in inflation and drastic devaluation of the currency. Increased oil revenues have also caused a high degree of fiscal indiscipline and resource mismanagement[12].

However, this result is in consistent with the findings of ANEEJ, who asserted that, oil and gas exploration by IOCs, and some Nigerian companies since 1956 has seriously caused environmental degradation and biodiversity depletion in the Niger Delta[13]. Environmental pollution caused by oil spills and gas flaring has caused aggravated poverty, loss of livelihood, contamination of source of drinking water, damage to agricultural land, destruction of shelter and preventable deaths[14]. The United Nations Development Program (UNDP) report stated that, "there is a strong feeling in the region that the degree and rate of degradation are pushing the delta towards ecological disaster"[15]. Also, a report by the U.N. Environmental Program (UNEP) on the Environmental Assessment of Ogoniland stated that restoration of Ogoniland, which is an ethnic group in the Niger Delta could take up to 30 years and an initial investment of about $30 billion for the first 5 years[16].

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Chapter Five

Conclusion

This chapter contains the summary of key findings made by the study, the conclusion arrived at based on the findings, policy recommendations towards micro and macroeconomic policy management on the occupational effect of oil and gas activities in host communities in Nigeria, and also raises points of consideration for future research.

5.1 Summary

The study was conducted to examine the effects of oil exploration and production on economic activities of Host Niger-Delta communities in Nigeria. It specifically sought to uncover the key determinants of the occupational mobility of the indigenous people in the oil producing communities. In addition, the study sought to examine the socio-cultural, economic and environmental impacts of these activities of the oil producing companies on the host communities. The study utilized percentile rank approach for objectives one and two while the multilevel mixed-effects ordinal logistic regression was employed for objectives three and four. The choice of logistic regression analysis for analyzing the data collected for testing objectives 3 and 4 was based on its ability to model dichotomous or binary outcome variables. The empirical results of the study can be summarized as follows.

Concerning the first objective, the study found that there is high level of level of oil and gas activities in the Niger Delta region of Nigeria. Further, it was discovered that more of these oil and gas activities comes from oil exploration compared to oil production. Also, there was high level of oil and gas activities in Delta state, followed by Imo state and Ondo state. Comparing oil and gas activities in the rural and iurban centers of the region, it was discovered that these activities are more in the rural centres of the region. The respondents are of the view that clearing of bush, burning of bush, dredge of carnal, use of chemical, use

of drilling instrument, spills during drilling, spills during transportation, spills during bunkering, discharge farm oil pipe, discharge during vandalizing formed part of the activates of the oil and gas industries in the study area

Regarding the second objective, the findings from the study show that there is high level of occupational changes caused by oil and gas activities in the region. This means that people in the region changed their jobs on the basis of oil and gas activities which have created environmental challenges to the residents. Also, we discovered that the occupations of the people of Imo states are mostly affected by these activities, afterwards, the people of Delta and Ondo states. More so, the extent of occupational mobility due to oil and gas activities is high in the urban areas than the rural areas of the Niger Delta region of Nigeria. Also, it was shown that there is high occupational mobility among secondary and tertiary school certificate holders. Furthermore, more male household heads changed their jobs in the last decades than the female household heads. Uenemployed people are likely to change occupations than those that are employed.

As to the third objective, the study revealed that growth opportunity and environmental changes have positive and significant on occupational mobility. This means that one of the reasons for occupational mobility of the indigenous people in oil and gas producing communities in Niger Delta region of Nigeria is growth opportunity. Thus, it implies that occupational changes of the people are aided by the growth opportunities they can achieve from other places. It also indicates that environmental changes contributes to the reasons the people of Niger Delta region changes their occupations. Thus, oil spillages and environmental damages caused by the oil industries are reasons the people consider other occupations as a means of livelihood. Similarly, location change and socio-cultural issues contribute to the occupational changes of the indigenous people in oil and gas producing communities. This shows that location changes of these people to another contribute to the reason they changes

jobs over the decades. Also, socio-cultural changes which resulted from the indigenous peoples' interaction with people of other clans affect their beliefs and social values to consider other occupations that are different from their indigenous ways of livelihoods. Likewise, the result showed that economic issues contribute positively to occupational changes in the region, albeit not significant statistically at 5% level.

With reference to the fourth objective, the study showed that economic, socio-cultural and environmental factors of oil and gas activities have adverse impact on the development of the host communities. In particular, the findings obtained from the economic effect of oil and gas activities indicate that the variable has negative impact on the host community development. This means that the reasons for the depleting development of many indigenous communities of the oil producing states in Nigeria resulted from the economic activities of oil and gas activities in the community. Likewise, the study found environment challenges negatively influencing the development of the oil producing communities in the Niger Delta region. It shows that environmental pollution from oil and gas activities contribute to the worsening situation of the oil producing region. Just like the economic and environmental effects of oil and gas activities, socio-cultural challenges of these activities affect the developmental pace of the region negatively. This suggests that socio-cultural challenges of the region further deplete the host communities' development over the years.

5.2 Conclusion

The environmental, socio-cultural and economic impacts of oil and gas production remains a contentious issue between oil-producing states, oil companies and governments in developing countries, but less so in developed countries with oil resources and vibrant civil societies. The impacts of the crude oil pollution occur at the local, national, regional and global levels but it's the locals (oil bearing communities) who experience the heaviest burden. The paradox is that the region that contributes so much to the national economy is ravaged with the highest

level of poverty resulting from extensive oil resource exploration and exploitation which have deprived them of their traditional economic activities such as farming and fishing. While the region is the treasure base of the country, it is paradoxically Nigeria's socio-economic poverty enclave with growing youth unemployment, displacement and perceived discriminatory practices against the indigenes by oil companies. This has been the issue with regards to oil and gas activities, and Niger Delta region is no exception. These activities have gone a long way to impact the socio-economic life of these locals.

Based on the empirical evidence of the study, the study concluded that socio-cultural factors, growth opportunity, location change, and environmental changes are imperative to the occupational changes among the indigenous people of Niger-Delta region. It can be concluded that there is significant environmental, socio-cultural and economic effects of oil and gas activities in host communities on occupational change. The conclusion from this study is mostly agreement that, oil and gas activities by IOCs, and some Nigerian companies since 1956 has seriously caused environmental degradation and biodiversity depletion in the Niger Delta. Furthermore, oil and gas activities have caused rural urban migration, as every body is moving to the city in search of oil company employment or contract. It has also created an occupational shift, as the predominant occupation before the discovery of oil was fishing and farming, but this has considerably changed, as nobody is interested in agriculture. Everybody, including the uneducated is in search of white-collar jobs in the oil industry. Also, the study concludes that there is significant impact of oil and gas activities on socio-cultural, environmental and economic conditions of the host communities.

5.3 Recommendations

The over-reliance on oil and gas production has led to the environmental degradation and economic exploitation and hence an inverse relationship between the wealth the community produces for the nation and the socio-economic growth of the indigenes. In view of the realities of significant impacts of oil and gas activities on socio-cultural, environmental and economic conditions of the host communities in Nigeria, the following policy measures are recommended:

a) The government and oil-producing companies should expedite the cleanup of regions that have been contaminated as a result of oil spills and gas flare-ups. Avoiding situations like the one at Oruma in Balyesa state in 2005, where it takes companies up to 12 days to control a leak and four months to start cleanup efforts that are then set ablaze and cause further damage.

b) It is important to appropriately manage NDDC and other palliative measures for environmental issues. This will to some extent contain occupational shift, social unrest and protests, alienation, and marginalization difficulties.

c) Despite the dominance of the private and multinational companies in the region, the federal government should possess the political and financial will to enable increased participation from the residents of the oil-producing regions. In addition to providing social amenities and infrastructure, sustained job creation for young people would minimize occupational shift, youth restlessness, unemployment, and activities with dubious morals while also promoting peace and stability in the region.

d) It is important to treat environmental degradation issues seriously. The government has a duty to safeguard the society's most vulnerable citizens. The greatest sense of responsibility should be used while implementing environmental protection laws and

regulations. Enacting strict and idealistic regulations on paper is insufficient. The government must make sure that the oil firms strictly abide by its rules.

5.4 Contribution to Knowledge

Much emphasis has been laid in the literature on the impact of oil and gas activities on socio-cultural, environmental and economic conditions of the host communities in developing countries, Nigeria inclusive. Several studies looked rather into the socio-cultural and environmental impacts and variables that could influence frequent and extensive oil spill that have occurred in the region overtime. The high level of oil and gas activities in the Niger Delta as seen this study, has exposed the area to the dangers of pollution of water, land and air as well as oil spills (environmental effects) which have endangered aquatic life (economic effects) as well as the entire ecosystem (socio-cultural effects), topography and surface vegetation. The problem of deforestation has led to loss of bio-diversity in the mangrove swamps, and to the destruction of nurseries and feeding grounds for many commercially important species of fish and crustaceans. The contamination of water bodies by oil has also led to the contamination of fisheries, freshwater and brackish water swamps, and to the killing of fishes, crabs, oysters and periwinkles. This has therefore destroyed artisan fishing which is of great importance to Niger Delta economy, with the outcome greatly influencing occupational mobility in the region. The neglect of the region for so long against the backdrop of so many unresolved environmental, socio-cultural and economic issues seem to have resulted in the occupational mobility amongst the dwellers and the indigen is one of the justifications for the study. This study has contributed to existing knowledge by investigating the different socio-cultural, economic and environmental impacts of oil activities in the host communities in Nigeria and analyse their effects on the occupational mobility among the indigenous people. The findings showed_that there is significant environmental, socio-

cultural and economic effect of oil and gas activities in host communities on occupational change.

5.5 Suggestion for Further Research

The oil and gas industry has for long been plagued by operational conflicts which centre around environmental and economic concerns. Research into operational conflicts as a result of environmental and economic effects of the activities of oil and gas companies such as; as widespread environmental degradation, human displacement, inadequate compensation for loses imposed in the oil producing communities and inadequate community level involvement which often leads to alienation between state and the indigenous population should be embarked upon.

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Appendix

Appendix I

QUESTIONAIRE

DEPARTMENT OF ECONOMICS

FACULTY OF ENVIRONMENTAL, MANAGEMENT AND SOCIAL SCIENCE

LEAD CITY UNIVERSITY IBADAN

Dear Respondent,

I am Ojulari Oluwalogbonyu Monday, student of the above institution researching the topic "**Occupational Effect of Oil and Gas Exploration and Production in Host Communities in Nigeria "** I kindly solicit your help in carrying out the project by providing answers to the following research questions.

Kindly answer the questions as accurately as possible to ensure reliable data for this research. It is for academic purposes, and responses will be treated with utmost confidence. Thank you for your co-operation.

Yours faithfully,

_____

Oluwalogbonyu Monday Ojulari

SECTION A: LOCATIONAL INFORMATION

State	LGA	Date: dd/mm/yyyy	Questionnaire ID

SECTION B: SOCIO-DEMOGRAPHIC DATA (Please tick (√) where applicable.)

SN	*Question*	**Responses**
1	*Age (in years)*	……
2	*Gender*	[1] Male [2] Female
3	*Tribe*	[1] Yoruba [2] Igbo [3] Hausa [4] Others (specify)……
4	*Marital status*	[1] Never married [2] Married [3] Others
5	*Employment status*	[1] Employed [2] Unemployed
6	*Religion*	[1] Christianity [2] Islamic [3] Traditional [4] Others (specify)……
7	*Year of formal education*	……
8	*Level of Education*	[1] Primary [2] Secondary [3] Tertiary [4] Others
9	*Household size*	……
10	*Household head gender*	[1] Female Head [2] Male Headed
11	*Primary occupation*	***Oil Exploration and Production*** [1] Surveyor [2] Geologist [3] Safety officer [4] Rigger [5] Engineering [6] Tool pusher [7] Night pusher [8] Drillers [9] Crane operators [10] Doctor/nurses [11] Plumber [12] Carpenter [13] Deckman [14] Shakers [22] Welding and fabrication [23] Zodiac drivers [24] Fire watchman [25] Security [26] Laundry [27] Filters I [28] CT man [29] Liaison officer [30] Office girl [31] Company secretary [32] Radio operators [33] Others ***Traditional Occupation***

		[15] Floorman	[1]Farming
		[16] Roughnecks	[2] Fishing
		[17] Welder	[3] Craft works
		[18] Storekeeper	[4] Weaving
		[19] Roustabout	[5] Moulding hunting
		[20] Rig electrician	[6] Tapping/gin making
		[21] Captain on vessel	[7] Carpentry and petty trading
12	***Secondary occupation***	***Oil Exploration and Production***	[22] Welding and fabrication
		[1] Surveyor	[23] Zodiac drivers
		[2] Geologist	[24] Fire watchman
		[3] Safety officer	[25] Security
		[4] Rigger	[26] Laundry
		[5] Engineering	[27] Filters I
		[6] Tool pusher	[28] CT man
		[7] Night pusher	[29] Liaison officer
		[8] Drillers	[30] Office girl
		[9] Crane operators	[31] Company secretary
		[10] Doctor/nurses	[32] Radio operators
		[11] Plumber	[33] Others
		[12] Carpenter	
		[13] Deckman	
		[14] Shakers	***Traditional Occupation***
		[15] Floorman	[1]Farming
		[16] Roughnecks	[2] Fishing
		[17] Welder	[3] Craft works
		[18] Storekeeper	[4] Weaving
		[19] Roustabout	[5] Moulding hunting
		[20] Rig electrician	[6] Tapping/gin making
		[21] Captain on vessel	[7] Carpentry and petty trading
13	***Primary Occupation***	a. Length of time (in year) in the job ... ……..	
		b. Average monthly income (in Naira) ……..	
		c. Location; [1] Rural [2] Urban	
14	***Secondary Occupation*** *(if any)*	d. Length of time (in year) in the job ... ……..	
		e. Average monthly income (in Naira) ……..	
		f. Location; [1] Rural [2] Urban	
15	***Job status***	a. Job status change in the past decade [1] Yes [2] No	
		b. If Yes, changed to (***new job***)…….	
		c. Reasons for the change ***(multiple selection is allowed;*** [1] Growth Opportunity [2] Change of Location	

		[3] Environmental challenges Kindly state the specific challenge (s) …… …… …… …… …… …… …… …… …… …… …… …… …… …… …… …… [4] Economic issues Kindly state the specific issue (s) …… …… …… …… …… …… …… …… …… …… …… …… …… …… …… ……

		…… …… …… [5] Socio-cultural issues Kindly state the specific issue (s) …… …… …… …… …… …… …… …… …… …… …… …… …… …… [6] Others (please specify) …… …… …… …… …… …… …… …… …… …… …… ……

		…… …… …… ……

SECTION C: OIL EXPLORATION AND CURRENT ISSUES

*Kindly provide answer to the following. Please consider the statements/phrases and tick the options that best describe your opinion using the following 5-likert point:**ES** = Extremely Serious; **S** = Serious; **HT** = Hard to Tell; **NS** = Not Serious; NA* = Not at All

SN	Parameters	ES [5]	S [4]	HT [3]	NS [2]	NA [1]
	OIL EXPLORATION ANDSOCIO-CULTURAL CHALLENGES					
1	Invasion of traditional customs and rites					
2	Community clashes and internecine violence					
3	Loss of community norms and values					
4	Destruction of historical sites of importance					
5	Sexual pervasiveness					
6	Degradation in aesthetic due to increase in slums					
7	Abandonment of farming for the oil and gas industry					
	OIL EXPLORATION AND ECONOMICCHALLENGES					
1	Loss of traditional means of livelihood/unemployment					
2	Impoverishment/poverty damage to Farmlands					
3	High prices of goods and services, (inflation)					
4	Income differentiation					
5	Food shortage and hunger due to damage to fishery and wildlife					
6	Dwindling income					
	OIL EXPLORATION AND ENVIRONMENTALCHALLENGES					
1	Water contamination due to effluent, wash water and cooling water discharges, and seepage from storage and waste tanks					
2	Thermal pollution due to discharge of effluents with temperatures higher than recipient water bodies					
3	Thermal pollution due to discharge of effluents with temperatures higher than recipient water bodies					
4	Particulate emissions into the atmosphere generated during operations at production and refining plants					
5	Water contamination due to discharges of water effluents rich in inorganic salts without appropriate treatment (saline pollution)					
6	Sulfur and nitrogen oxides, ammonia, acid mist and fluorine compounds gas emissions from production and refining plants operations					
7	Occasional release of potentially hazardous materials, such as solvents and acid or alkaline materials					
8	Soil, surface water and/or groundwater contamination by inappropriate disposal of solid wastes resulting from chemical					

	industry process, including effluent treatment sludge and particulate matter from dust collectors					
9	Changes in local traffic due to truck circulation (including dangerous cargos)					
10	Noise pollution caused by equipment and operations that generate loud noise					
11	Accidents that impact the environment, such as large oil spills, leaks, fires and explosions on plants. Eventual deaths					
12	Thermal pollution due to discharge of effluents with temperatures higher than recipient water bodies					

SECTION D: FUTURE EXPECTATIONS

*Kindly indicate how you expect the socio-cultural, economic and environmental challenges to change in the next five years. Consider the statements/phrases and tick the option that best describe your opinion using the following 5-likert point:**VL** = Very likely, **LI** = likely, **IN** = indifferent, **UN** = unlikely, **VU** = Very unlikely*

SN	Parameters	VL [5]	LI [4]	IN [3]	UN [2]	VU [1]
1	Changes in general economic condition					
2	Changes in general environmental condition					
3	Changes in general socio-cultural activities					
3	Loss of traditional means of livelihood/unemployment					
4	Food shortage and hunger due to damage to fishery and wildlife					
5	Community clashes and internecine violence					
6	Loss of community norms and values					
7	Destruction of historical sites of importance					
8	Decrease in longevity and infant mortality					
	***Reasons for the expectations*;** ……. ……. ……. ……. ……. …….					

SECTION C: OIL EXPLORATION AND CURRENT ISSUES

Kindly provide answer to the following. Please consider the statement / phrases and tick the options that best describe your opinion using the following 5-likert point very high (VH) High (H) moderate (M). Low (L) Very Low (VL)

SN	Parameters	VH [5]	H [4]	M [3]	L [2]	VL [1]
	ASSESSMENT OF LEVEL OF ACTIVITIES					
a	Clearing of bush					
b	Burning of bush					
c	Dredge of carnal					
d	Use of chemical					
e	Use of drilling instrument					
f	Spills during drilling					
g	Spills during transportation					
h	Spills during bunkering					
i	Discharge farm oil pipe					
j	Discharge during vardalising					
	EXTENT OF CHALLENGES CAUSED BY OIL AND GAS ACTIVITIES					
		VH	**H**	**M**	**L**	**VL**
a	Environmental challenges					
b	Socio-cultural challenges					
c	Economic challenge					
d	Extent of development of host community of Oil & Gas activities					

Appendix II

Objective III

. meologit omob gopp gender age ms emps fedu inc oloc, vce(cluster state)

```
Iteration 0:   log pseudolikelihood = -101.57236
Iteration 1:   log pseudolikelihood = -92.643495
Iteration 2:   log pseudolikelihood = -92.370232
Iteration 3:   log pseudolikelihood =  -92.36975
Iteration 4:   log pseudolikelihood =  -92.36975

Ordered logistic regression                 Number of obs     =        296

                                            Wald chi2(2)      =      48.48
Log pseudolikelihood =  -92.36975           Prob > chi2       =       0.00
                              (Std. Err. adjusted for 3 clusters in state)
------------------------------------------------------------------------------
             |               Robust
        omob |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        gopp |   .7003592   .3407821     2.06   0.040     .0324385     1.36828
      gender |   .4902407   .2747503     1.78   0.074      -.04826    1.028742
         age |  -.0623705   .0353493    -1.76   0.078    -.1316539    .0069129
          ms |   .0545501   .1963644     0.28   0.781    -.3303171    .4394173
        emps |  -.0304862   1.058938    -0.03   0.977    -2.105966    2.044993
        fedu |   .0108534   .0501784     0.22   0.829    -.0874944    .1092012
         inc |  -.2044623   .4120484    -0.50   0.620    -1.012062    .6031377
        oloc |  -.3008418   .6633288    -0.45   0.650    -1.600942    .9992587
-------------+----------------------------------------------------------------
       /cut1 |  -3.726991   2.626456    -1.42   0.156    -8.874749    1.420767
------------------------------------------------------------------------------
```

. margins, at(gopp=(-2/1)) predict(outcome(1)) atmeans

```
Adjusted predictions                        Number of obs     =        166
Model VCE    : Robust

Expression   : Predicted mean (1.omob), predict(outcome(1))

1._at        : gopp            =          -2
               gender          =     .753012 (mean)
               age             =    43.69277 (mean)
               ms              =    .9096386 (mean)
               emps            =    .6626506 (mean)
```

```
          fedu          =    13.71687 (mean)
          inc           =    10.78481 (mean)
          oloc          =     .373494 (mean)

2._at     : gopp        =          -1
          gender        =     .753012 (mean)
          age           =    43.69277 (mean)
          ms            =    .9096386 (mean)
          emps          =    .6626506 (mean)
          fedu          =    13.71687 (mean)
          inc           =    10.78481 (mean)
          oloc          =     .373494 (mean)

3._at     : gopp        =          0
          gender        =     .753012 (mean)
          age           =    43.69277 (mean)
          ms            =    .9096386 (mean)
          emps          =    .6626506 (mean)
          fedu          =    13.71687 (mean)
          inc           =    10.78481 (mean)
          oloc          =     .373494 (mean)

4._at     : gopp        =          1
          gender        =     .753012 (mean)
          age           =    43.69277 (mean)
          ms            =    .9096386 (mean)
          emps          =    .6626506 (mean)
          fedu          =    13.71687 (mean)
          inc           =    10.78481 (mean)
          oloc          =     .373494 (mean)

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _at |
          1  |   .6530723   .1421622     4.59   0.000     .3744395    .9317052
          2  |   .4830596   .0884654     5.46   0.000     .3096706    .6564486
          3  |   .3168801   .0647864     4.89   0.000      .189901    .4438592
          4  |   .1871698   .0813483     2.30   0.021      .02773    .3466096
------------------------------------------------------------------------------
```

```
. meologit omob loch gender age ms emps fedu inc oloc, vce(cluster state)

Iteration 0:   log pseudolikelihood = -101.57236
Iteration 1:   log pseudolikelihood = -93.409197
Iteration 2:   log pseudolikelihood = -93.200758
Iteration 3:   log pseudolikelihood = -93.200009
Iteration 4:   log pseudolikelihood = -93.200009

Ordered logistic regression                     Number of obs     =        166

                                                Wald chi2(2)      =          .
Log pseudolikelihood = -93.200009               Prob > chi2       =          .
                                 (Std. Err. adjusted for 3 clusters in state)
------------------------------------------------------------------------------
             |               Robust
        omob |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        loch |   .4755427   .1711334     2.78   0.005     .1401274     .810958
      gender |   .4355338   .2694765     1.62   0.106    -.0926304     .963698
         age |  -.0570842   .0350985    -1.63   0.104    -.125876     .0117076
          ms |   .0508517   .2088071     0.24   0.808    -.3584027     .460106
        emps |  -.1090566   1.047392    -0.10   0.917    -2.161908     1.943794
        fedu |   .0130753    .051992     0.25   0.801    -.0888272     .1149778
         inc |  -.2022868   .3864379    -0.52   0.601    -.9596912     .5551176
        oloc |  -.2959631   .6615926    -0.45   0.655    -1.592661     1.000735
-------------+----------------------------------------------------------------
       /cut1 |  -3.267208   2.543848    -1.28   0.199    -8.253059     1.718643
------------------------------------------------------------------------------

. margins, at(loch=(-2/1)) predict(outcome(1)) atmeans

Adjusted predictions                            Number of obs     =        166
Model VCE    : Robust

Expression   : Predicted mean (1.omob), predict(outcome(1))

1._at        : loch          =          -2
               gender        =    .753012 (mean)
               age           =   43.69277 (mean)
               ms            =   .9096386 (mean)
               emps          =   .6626506 (mean)
               fedu          =   13.71687 (mean)
               inc           =   10.78481 (mean)
```

```
            oloc          =     .373494 (mean)

2._at       : loch          =          -1
            gender          =     .753012 (mean)
            age             =    43.69277 (mean)
            ms              =    .9096386 (mean)
            emps            =    .6626506 (mean)
            fedu            =    13.71687 (mean)
            inc             =    10.78481 (mean)
            oloc            =     .373494 (mean)

3._at       : loch          =          0
            gender          =     .753012 (mean)
            age             =    43.69277 (mean)
            ms              =    .9096386 (mean)
            emps            =    .6626506 (mean)
            fedu            =    13.71687 (mean)
            inc             =    10.78481 (mean)
            oloc            =     .373494 (mean)

4._at       : loch          =          1
            gender          =     .753012 (mean)
            age             =    43.69277 (mean)
            ms              =    .9096386 (mean)
            emps            =    .6626506 (mean)
            fedu            =    13.71687 (mean)
            inc             =    10.78481 (mean)
            oloc            =     .373494 (mean)
------------------------------------------------------------------------------
             |            Delta-method
             |    Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _at |
          1  |   .1203729   .0230341     5.23   0.000      .075227    .1655188
          2  |   .1804412   .0301654     5.98   0.000     .1213182    .2395643
          3  |   .2615712    .059366     4.41   0.000      .145216    .3779264
          4  |   .3630211   .1049259     3.46   0.001     .1573702     .568672
------------------------------------------------------------------------------
```

```
. meologit omob envc gender age ms emps fedu inc oloc, vce(cluster state)

Iteration 0:   log pseudolikelihood = -101.57236
Iteration 1:   log pseudolikelihood = -93.807101
Iteration 2:   log pseudolikelihood = -93.602053
Iteration 3:   log pseudolikelihood = -93.601388
Iteration 4:   log pseudolikelihood = -93.601388

Ordered logistic regression                     Number of obs     =        166

                                                Wald chi2(2)      =          .
Log pseudolikelihood = -93.601388               Prob > chi2       =          .
                                (Std. Err. adjusted for 3 clusters in state)
------------------------------------------------------------------------------
             |               Robust
        omob |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        envc |  -.2282928   .1757502    -1.30   0.194    -.5727568    .1161713
      gender |   .4069636   .2170785     1.87   0.061    -.0185025    .8324298
         age |  -.0574791   .0332909    -1.73   0.084    -.1227282    .0077699
          ms |   .0874968   .1942563     0.45   0.652    -.2932385    .4682321
        emps |  -.0539877   1.100394    -0.05   0.961    -2.210721    2.102746
        fedu |    .008518   .0490366     0.17   0.862     -.087592     .104628
         inc |  -.1819588    .374201    -0.49   0.627    -.9153793    .5514616
        oloc |  -.2482234   .6786328    -0.37   0.715    -1.578319    1.081872
-------------+----------------------------------------------------------------
       /cut1 |  -3.229801   2.584431    -1.25   0.211    -8.295192    1.835589
------------------------------------------------------------------------------


. margins, at(envc=(-2/1)) predict(outcome(1)) atmeans

Adjusted predictions                            Number of obs     =        166
Model VCE    : Robust

Expression   : Predicted mean (1.omob), predict(outcome(1))

1._at        : envc            =          -2
               gender          =    .753012 (mean)
               age             =    43.69277 (mean)
               ms              =    .9096386 (mean)
               emps            =    .6626506 (mean)
               fedu            =    13.71687 (mean)
```

```
            inc           =    10.78481 (mean)
            oloc          =     .373494 (mean)

2._at       : envc        =          -1
            gender        =     .753012 (mean)
            age           =    43.69277 (mean)
            ms            =    .9096386 (mean)
            emps          =    .6626506 (mean)
            fedu          =    13.71687 (mean)
            inc           =    10.78481 (mean)
            oloc          =     .373494 (mean)

3._at       : envc        =          0
            gender        =     .753012 (mean)
            age           =    43.69277 (mean)
            ms            =    .9096386 (mean)
            emps          =    .6626506 (mean)
            fedu          =    13.71687 (mean)
            inc           =    10.78481 (mean)
            oloc          =     .373494 (mean)

4._at       : envc        =          1
            gender        =     .753012 (mean)
            age           =    43.69277 (mean)
            ms            =    .9096386 (mean)
            emps          =    .6626506 (mean)
            fedu          =    13.71687 (mean)
            inc           =    10.78481 (mean)
            oloc          =     .373494 (mean)

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _at |
          1  |   .3981851   .1589246     2.51   0.012     .0866986    .7096716
          2  |   .3449469   .1146604     3.01   0.003     .1202166    .5696772
          3  |   .2953337   .0770113     3.83   0.000     .1443943    .4462731
          4  |   .2501315   .0524352     4.77   0.000     .1473603    .3529026
------------------------------------------------------------------------------
```

```
. meologit omob ecis gender age ms emps fedu inc oloc, vce(cluster state)

Iteration 0:   log pseudolikelihood = -101.57236
Iteration 1:   log pseudolikelihood = -93.940786
Iteration 2:   log pseudolikelihood = -93.731242
Iteration 3:   log pseudolikelihood = -93.730626
Iteration 4:   log pseudolikelihood = -93.730626

Ordered logistic regression                     Number of obs     =        166

                                                Wald chi2(2)      =          .
Log pseudolikelihood = -93.730626               Prob > chi2       =          .
                                 (Std. Err. adjusted for 3 clusters in state)
------------------------------------------------------------------------------
             |               Robust
        omob |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        ecis |   .1247576   .3852722     0.32   0.746    -.630362    .8798772
      gender |   .4021946   .2120328     1.90   0.058    -.013382    .8177712
         age |  -.0591586    .034635    -1.71   0.088    -.1270419    .0087247
          ms |   .0875884   .2087581     0.42   0.675     -.32157    .4967468
        emps |  -.0191162   1.074582    -0.02   0.986    -2.125258    2.087025
        fedu |   .0099673   .0507154     0.20   0.844    -.089433    .1093676
         inc |   -.187375   .3799402    -0.49   0.622    -.9320441    .5572942
        oloc |   -.264596   .6800521    -0.39   0.697    -1.597474    1.068282
-------------+----------------------------------------------------------------
       /cut1 |  -3.245049   2.602104    -1.25   0.212    -8.345078    1.854981
------------------------------------------------------------------------------

. margins, at(ecis=(-2/1)) predict(outcome(1)) atmeans

Adjusted predictions                            Number of obs     =        166
Model VCE    : Robust

Expression   : Predicted mean (1.omob), predict(outcome(1))

1._at        : ecis            =          -2
               gender          =    .753012 (mean)
               age             =   43.69277 (mean)
               ms              =   .9096386 (mean)
               emps            =   .6626506 (mean)
               fedu            =   13.71687 (mean)
               inc             =   10.78481 (mean)
               oloc            =    .373494 (mean)
```

```
2._at       : ecis          =         -1
              gender        =    .753012 (mean)
              age           =   43.69277 (mean)
              ms            =   .9096386 (mean)
              emps          =   .6626506 (mean)
              fedu          =   13.71687 (mean)
              inc           =   10.78481 (mean)
              oloc          =    .373494 (mean)

3._at       : ecis          =          0
              gender        =    .753012 (mean)
              age           =   43.69277 (mean)
              ms            =   .9096386 (mean)
              emps          =   .6626506 (mean)
              fedu          =   13.71687 (mean)
              inc           =   10.78481 (mean)
              oloc          =    .373494 (mean)

4._at       : ecis          =          1
              gender        =    .753012 (mean)
              age           =   43.69277 (mean)
              ms            =   .9096386 (mean)
              emps          =   .6626506 (mean)
              fedu          =   13.71687 (mean)
              inc           =   10.78481 (mean)
              oloc          =    .373494 (mean)

------------------------------------------------------------------------------
             |            Delta-method
             |    Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _at |
         1 |   .231064   .2052325     1.13   0.260    -.1711844    .6333123
         2 |   .2539689   .1458674     1.74   0.082    -.0319259    .5398637
         3 |   .2783225   .0772735     3.60   0.000     .1268691    .4297758
         4 |   .3040596   .0027744   109.59   0.000     .2986218    .3094973
------------------------------------------------------------------------------
```

```
. meologit omob sci gender age ms emps fedu inc oloc, vce(cluster state)

Iteration 0:   log pseudolikelihood = -101.57236
Iteration 1:   log pseudolikelihood = -92.887156
Iteration 2:   log pseudolikelihood = -92.639581
Iteration 3:   log pseudolikelihood = -92.639073
Iteration 4:   log pseudolikelihood = -92.639073

Ordered logistic regression                     Number of obs     =        166

                                                Wald chi2(2)      =          .
Log pseudolikelihood = -92.639073               Prob > chi2       =          .
                                 (Std. Err. adjusted for 3 clusters in state)
------------------------------------------------------------------------------
             |               Robust
        omob |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         sci |   .8102487   .1335607     6.07   0.000     .5484745    1.072023
      gender |   .4464198   .1973791     2.26   0.024     .0595638    .8332757
         age |  -.0596039   .0332175    -1.79   0.073    -.1247091    .0055013
          ms |   .0915391   .2048343     0.45   0.655    -.3099287    .4930069
        emps |  -.0298967    1.10076    -0.03   0.978    -2.187348    2.127554
        fedu |    .010963   .0477367     0.23   0.818    -.0825991    .1045251
         inc |  -.1631462   .4009685    -0.41   0.684     -.94903    .6227377
        oloc |  -.2239954   .6658133    -0.34   0.737    -1.528965    1.080975
-------------+----------------------------------------------------------------
      /cut1 |  -2.860002   2.769025    -1.03   0.302    -8.287191    2.567186
------------------------------------------------------------------------------

. margins, at(sci=(-2/1)) predict(outcome(1)) atmeans

Adjusted predictions                            Number of obs     =        166
Model VCE    : Robust

Expression   : Predicted mean (1.omob), predict(outcome(1))

1._at        : sci             =          -2
               gender          =    .753012 (mean)
               age             =   43.69277 (mean)
               ms              =   .9096386 (mean)
               emps            =   .6626506 (mean)
               fedu            =   13.71687 (mean)
               inc             =   10.78481 (mean)
```

```
            oloc          =     .373494 (mean)

2._at       : sci         =          -1
            gender        =     .753012 (mean)
            age           =    43.69277 (mean)
            ms            =    .9096386 (mean)
            emps          =    .6626506 (mean)
            fedu          =    13.71687 (mean)
            inc           =    10.78481 (mean)
            oloc          =     .373494 (mean)

3._at       : sci         =          0
            gender        =     .753012 (mean)
            age           =    43.69277 (mean)
            ms            =    .9096386 (mean)
            emps          =    .6626506 (mean)
            fedu          =    13.71687 (mean)
            inc           =    10.78481 (mean)
            oloc          =     .373494 (mean)

4._at       : sci         =          1
            gender        =     .753012 (mean)
            age           =    43.69277 (mean)
            ms            =    .9096386 (mean)
            emps          =    .6626506 (mean)
            fedu          =    13.71687 (mean)
            inc           =    10.78481 (mean)
            oloc          =     .373494 (mean)

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _at |
          1  |   .0655024   .0324783     2.02   0.044     .0018461    .1291587
          2  |   .1361463   .0498497     2.73   0.006     .0384426    .2338499
          3  |   .2616472   .0650724     4.02   0.000     .1341076    .3891868
          4  |    .443449   .0710772     6.24   0.000     .3041402    .5827577
------------------------------------------------------------------------------
```

Objective IV

. meologit hcd scc gender age ms emps fedu inc oloc, vce(cluster state)

Iteration 0: log pseudolikelihood = -75.574972
Iteration 1: log pseudolikelihood = -68.975605
Iteration 2: log pseudolikelihood = -68.392705
Iteration 3: log pseudolikelihood = -68.389976
Iteration 4: log pseudolikelihood = -68.389976

Ordered logistic regression Number of obs = 253

Wald chi2(2) = 48.48
Log pseudolikelihood = -68.389976 Prob > chi2 = 0.0000
(Std. Err. adjusted for 3 clusters in state)

| Robust
hcd | Coef. Std. Err. z P>|z| [95% Conf. Interval]
---|---|---|---|---|---|---
scc | -.2337183 .0226103 -10.34 0.000 -.2780337 -.1894029
gender | -.6930028 .3826167 -1.81 0.070 -1.442918 .0569121
age | .0284996 .0223419 1.28 0.202 -.0152896 .0722889
ms | .2629688 .3931255 0.67 0.504 -.5075429 1.033481
emps | .5242504 .5867252 0.89 0.372 -.6257098 1.674211
fedu | .0274984 .0574098 0.48 0.632 -.0850227 .1400195
inc | -.2066464 .1393891 -1.48 0.138 -.4798441 .0665513
oloc | .6046169 .1709259 3.54 0.000 .2696084 .9396255
---|---|---|---|---|---|---
/cut1 | 1.486629 2.793123 0.53 0.595 -3.987791 6.961049
/cut2 | 5.15279 2.647526 1.95 0.052 -.0362655 10.34185

. meologit hcd ecc gender age ms emps fedu inc oloc, vce(cluster state)

Iteration 0: log pseudolikelihood = -76.309748
Iteration 1: log pseudolikelihood = -70.436388
Iteration 2: log pseudolikelihood = -70.068158
Iteration 3: log pseudolikelihood = -70.067029
Iteration 4: log pseudolikelihood = -70.067029

Ordered logistic regression Number of obs = 249

Wald chi2(2) = 48.38
Log pseudolikelihood = -70.067029 Prob > chi2 = 0.0000
(Std. Err. adjusted for 3 clusters in state)

| Robust
hcd	Coef. Std. Err. z P>|z| [95% Conf. Interval]
ecc	-.21423 .127476 -1.68 0.093 -.4640784 -.0356184
gender	-.559974 .3235743 -1.73 0.084 -1.194168 .07422
age	.0321115 .0180799 1.78 0.076 -.0033246 .0675475
ms	.3236316 .3127033 1.03 0.301 -.2892557 .9365188
emps	.2467088 .3922505 0.63 0.529 -.522088 1.015506
fedu	.0729214 .1058506 0.69 0.491 -.134542 .2803847
inc	-.2146895 .0757693 -2.83 0.005 -.3631946 -.0661843
oloc	.8180572 .0069265 118.10 0.000 .8044815 .831633
/cut1	2.150058 2.352683 0.91 0.361 -2.461115 6.761232
/cut2	5.81234 1.962369 2.96 0.003 1.966167 9.658513

```
.
. meologit hcd evc gender age ms emps fedu inc oloc, vce(cluster state)

Iteration 0:   log pseudolikelihood = -79.057647
Iteration 1:   log pseudolikelihood = -71.790398
Iteration 2:   log pseudolikelihood = -71.152713
Iteration 3:   log pseudolikelihood =  -71.14783
Iteration 4:   log pseudolikelihood =  -71.14783

Ordered logistic regression                     Number of obs     =        255

                                                Wald chi2(2)      =     124.04
Log pseudolikelihood =  -71.14783               Prob > chi2       =     0.0000
                                (Std. Err. adjusted for 3 clusters in state)
------------------------------------------------------------------------------
             |               Robust
         hcd |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         evc |  -.2059683   .0310731    -6.63   0.000    -.2668705   -.1450662
      gender |  -.5692164   .4439971    -1.28   0.200    -1.439435    .301002
         age |   .0246703   .0167429     1.47   0.141    -.0081451    .0574857
          ms |   .3049825   .3653865     0.83   0.404    -.4111618    1.021127
        emps |   .7891864   .3977194     1.98   0.047     .0096707    1.568702
        fedu |  -.0309554   .0823593    -0.38   0.707    -.1923766    .1304658
         inc |  -.2468232   .1419946    -1.74   0.082    -.5251276    .0314812
        oloc |     .66787   .0856244     7.80   0.000     .5000492    .8356907
-------------+----------------------------------------------------------------
       /cut1 |   .3327972   3.230368     0.10   0.918    -5.998607    6.664201
       /cut2 |   4.124248   2.934977     1.41   0.160     -1.6282    9.876696
------------------------------------------------------------------------------
```