

**SOCIO-ECONOMIC EFFECTS OF OIL EXPLORATION AMONG HOIMA
MUNICIPALITY COMMUNITIES, UGANDA**

BY

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DECLARATION

I, **Samuel Mugisa**, declare that this dissertation is my original work and that it has not been presented to any University for any award of any academic qualification.

Sign:

Date:

APPROVAL

This dissertation has been submitted to the Examination Board with my approval as supervisor.

DR. DICK KAMUGANGA

Supervisor

Signed.....

Date.....

DEDICATION

I dedicate this work to my beloved wife, Faith Kandole Mugisa, and my parents for the encouragement they have given me. May the Almighty God reward them abundantly.

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ABBREVIATIONS

ACODE	:	Advocates Coalition for Development and Environment.
CNOOC	:	Chinese National Offshore Oil Corporation
DFID	:	Department for International Development
EEZ	:	Exclusive Economic Zone
E&P	:	Exploration and Production
FAO	:	Food and Agriculture Organization
GDP	:	Growth Domestic Product
HMC	:	Hoima Municipal Council
HOCADEO	:	Hoima Caritas Development Organisation
IUCN	:	International Union for Conservation of Nature
NESAQ	:	National Environmental Standards for Air Quality
PAHs	:	Poly-Aromatic Hydrocarbons
UMICs	:	Upper-Middle-Income Countries
UNDP	:	United Nations Development Programme
UNEP	:	United Nations Environment Programme
UNCTAD	:	United Nations Conference on Trade and Development
WOMAD	:	World of Music, Arts & Dance
WWF	:	World Wide Fund

ABSTRACT

This research investigated the socio-economic effects of oil exploration among Hoima municipality communities, Uganda. The study objectively sought to establish the effects of oil surveying to changes in prices of commodities; to examine road construction effects to changes in income; and to ascertain the effects of collection of seismic data on the influx of people. To achieve this, a descriptive analytical research design using quantitative and qualitative approach was used, where social economic effects resulting from oil surveying and mapping were answered using qualitative approach; and the effects of road construction, economic transformation, influx of people were answered using both qualitative and quantitative approach. The study used a sample of 146 respondents and simple random sampling and purposive sampling were used because respondents had equal chances of being selected. Data were coded and entered in the Computer and cleaned, checked and statistically analyzed using the Statistical Package for Social Scientists (SPSS) software package to generate descriptive and inferential statistics. Descriptive analysis was applied to describe the primary variable and associated indicator items related to the study objectives. The study found out that there was increased land grabbing correlated with road construction in response to the compensation of residents in areas where road construction took place; respondents strongly agreed that oil roads have led to improvement in incomes of communities (mean 4.00); respondents strongly agreed that there was creation of temporary employment (mean 4.00). It was concluded that drastic commodity price increases were reported (mean 4.14). The research findings will inform appropriate interventions among communities who are stakeholders where oil exploration takes place.

CHAPTER ONE

INTRODUCTION

1.1 Introduction to the Study

The dissertation aimed at assessing changes in prices, household income, influx of people, road construction and changes in income resulting from oil exploration activities on the well-being of communities. Oil exploration in Uganda covers more than 20 districts but the focus is presently in 3 districts of Nwoya, Hoima and Buliisa. According to the Ministry of Energy and Mineral Development (Petroleum Exploration and Production Department Update) 2016, the discovered oil and gas in the Albertine graben is 6.5 billion barrels, an amount considered viable for commercial oil production. Its estimated future output will be 200,000 barrels per day.

Hoima district, located in mid-western Uganda, was originally part of former Bunyoro district, at independence Bunyoro was a kingdom. Seven years after the abolition of Ugandan kingdoms in 1967, North Bunyoro and South Bunyoro were created; the latter becoming Hoima district in 1980, Hoima municipality is located on the edge of the Great Rift Valley, 203 kilometres from Kampala city. Over the past years, a number of developments have taken place or been planned to facilitate oil exploration these include the construction of the Kaiso-Tonya road, completed in 2014, other associated developments include a planned refinery and waste management plant.

Following oil exploration and discovery in the Albertine graben, Hoima is becoming an attractive and dynamic centre of economic activity and rapid development. This led to Hoima Town being upgraded to municipality status in 2010 through an Act of Parliament. Hoima Municipal Council (HMC) was formed from Hoima Town Council, Busiisi Sub

County, some parts of Buhanka, Kitoba, Bugambe sub counties and covers a total area of 89 square kilometres. It comprises four divisions, sixteen wards and 143 cells. Hoima's geographical position provides a huge potential to be a hub in the Great Lakes region.

1.2 Background to the Study

According to Nwankwo, (2015.P.588) human beings depend on the resources they derive from the environment for their well being and their survival, oil has had more profound impact on world civilization than any single natural resource in recorded history. Oil has become a very decisive element in defining the politics, rhetoric and diplomacy of states. All over the world, the lives of people are affected and the destinies of nations are determined by the results of oil exploration. Oil keeps the factories of the industrialized countries working and provides the revenues which enable oil exporters to execute ambitious national economic development plans. The much of progress would be retarded and life itself would be unbearable if the world was deprived of oil. That is why oil has become the concern of governments, a vital ingredient of their politics and crucial factor in social economic strategies.

The oil boom presents a moment of great opportunity for Uganda because the amount of revenues available for poverty reduction is substantial. On the other hand, dramatic development failures that have characterized most oil dependent countries indicate that the oil boom has not helped developing countries fight poverty instead it has worsened the poverty situations.

Three major oil companies are involved in oil exploration in the region. Tullow oil is a leading independent oil and gas exploration and production company, CNOOC, Total E&P operating a joint venture.

1.2.1 Global context

Global oil exploration is dynamic and subject to many factors like macroeconomics and geo-political situation, technology, the price of a barrel and conditions of the global financial markets.

Demand for liquid hydrocarbons will continue to grow, the greatest surge in oil demand will come from the transportation sector for which oil is the principal energy source for instance Russia has licenced much of its frontiers at favourable terms with drilling, Arctic exploration is to be a Russian-led exercise exploring established areas with new technology and perspective, the reserves growth revolution that hit USA traditional producing areas is unprecedented led by US independents employing hydraulic fracturing technology in horizontal wells and a learning-by-doing philosophy, the industry has reversed the decline in US oil production.

In order to facilitate the development of petroleum resources in New Zealand and its Exclusive Economic Zone (EEZ), the Government has implemented a new process for allocating oil and gas exploration permits from 2012. All permits are allocated by means of a “block offer annual competitive tender process” rather than the first-in, first-served approach known as “priority-in-time” used previously. Tenders will be evaluated on the basis of the applicants’ corporate standing; technical and financial capability; risk

management practices; operating experience; and proposed work programme (Ministry for Business, Innovation and Employment [MBIE – formerly MED], 2012a).

1.2.2 African Context

In Africa oil has mainly benefited African privileged elites, oil companies and their shareholders and western industrialized countries (ACODE, 2006).

Since 1970, Nigeria's socio-economic and political fortunes have been intricately linked with oil exploration, with petroleum oil providing about 95 per cent of export earnings and accounting for over 80 per cent of government revenue as well as generating over 40 per cent of GDP. It is revealing to note that oil that generates these numerous benefits to Nigeria comes solely from the Niger Delta. The oil has generated massive economic and social transformation of many parts of the country on the one hand, but on the other hand it has resulted into unparalleled damage to the Niger Delta environment thus inducing a multifaceted problems in the region such as abject poverty, deprivation, social conflict, occupational dislocation, ill health (Amadi and Tomuno, 2012).

1.2.3 Ugandan Context

Petroleum occurrence was first recorded in Uganda in the early 1920s one deep well was drilled in 1938 which encountered hydrocarbons but was not tested, several shallow wells were also drilled during the 1940s and 1950s for strategic purposes. There was then a period of limited or no activity between 1940s and 1980s largely due to the Second World War and political instability in the country. A modern and consistent effort to establish the country's petroleum potential has been undertaken since the 1980s. Aeromagnetic surveys undertaken during 1983 and 1992 respectively identified five sedimentary basins in the country. They are the Albertine graben, Lake Kyoga basin, Hoima basin and Moroto-

Kadam basin. Follow-up work on the ground has shown that the most prospective sedimentary basin to date is the Albertine graben. Therefore the exploitation and utilization will create durable and sustainable social and economic effects for Uganda. These resources have a potential to provide immense benefits to the country through creation of employment, generation of revenues, development of infrastructure and subsequent fast-tracking social transformation of the country.

Seismic survey, further exploratory drilling, the longer-term production stage pipelines, decommissioning plans and audits are envisaged to continue in the Albertine rift area in general and in the protected areas. The exploration of oil offers tremendous opportunities for Uganda and Hoima municipality in particular. It also poses several risks if the country succumbs to the oil curse or the diversion of revenues for development through mismanagement and corruption.

Government of Uganda has made significant progress in the petroleum sector; this has been possible through investment in the human resource capacity through specialized training and procurement of specialized equipment to collect geological, geophysical and geochemical data. These efforts led to attraction of investment for exploration and, more importantly, the discovery of commercial oil and gas reserve in 2006. Investment and licensing in the sector and cumulative foreign direct investment in petroleum exploration in the country since 1998 was over USD 2.4 billion at the end of 2013; and investment in the sector is expected to increase as the country enters the development and subsequently the production and refining phases of the petroleum value chain. Three oil companies have been licensed to carry out exploration, development and production in far exploration

areas. These are Tullow Uganda Operations Ltd, Total E & P Uganda and China National Offshore Oil Corporation (CNOOC).

1.3 Statement of the Problem

There was inadequate empirical evidence or qualitative research that has been done regarding socio-economic effects of oil exploration among Hoima municipality communities. Many socio-economic effects resulting from oil exploration activities such as, culture mix, changes in prices, changes in income, displacement, occupational dislocation, economic transformation, influx of people, construction activities have not been given serious attention and documented yet these are associated effects of oil exploration activities and they affect the well-being of the communities in terms of planning, management and development, hence necessitating the dissertation.

The available research conducted does not focus on socio economic effects that this dissertation intends to address resulting from oil exploration. For instance, according to the Jobs and oil living earth Uganda project (2013) baseline study report, improving access to youth employment in western Uganda the main focus of the study in Hoima municipality was on access to employment.

Furthermore HOCADDO, (2012) report on the baseline study on the current trends of oil exploration and social-economic implications of the emerging oil and gas industry on the livelihood security of the local communities in the Albertine region focused mainly on land ownership, employment, business opportunities, markets and access to health services. The report indicates that business opportunities from oil and gas exploration activities in the Albertine graben, local communities have not yet benefited. According to

HOCADEO report (2012), 70% of the study respondents believed that oil and gas exploration has not yet benefited local communities, hence necessitating this research.

1.4 General Objective

To assess the socio-economic effects of oil exploration among Hoima Municipality communities.

1.4.1 Specific Objectives

- i. To examine the effects of oil surveying activities to changes in prices of commodities in Hoima Municipality;
- ii. To examine road construction effects to changes in income in Hoima Municipality;
- iii. To find out the effects of collection of seismic data to influx of people in Hoima Municipality.

1.5 Research questions

- i. What are the effects of oil exploration on changes in prices of commodities in Hoima Municipality?
- ii. What are the effects of oil exploration to changes in income resulting from road construction in Hoima Municipality?
- iii. What are the effects that result from collection of seismic data to influx of people in Hoima Municipality?

1.6 Hypotheses of the study

- i. Oil surveying and mapping leads to changes in prices of commodities.
- ii. Road construction results into changes in income.

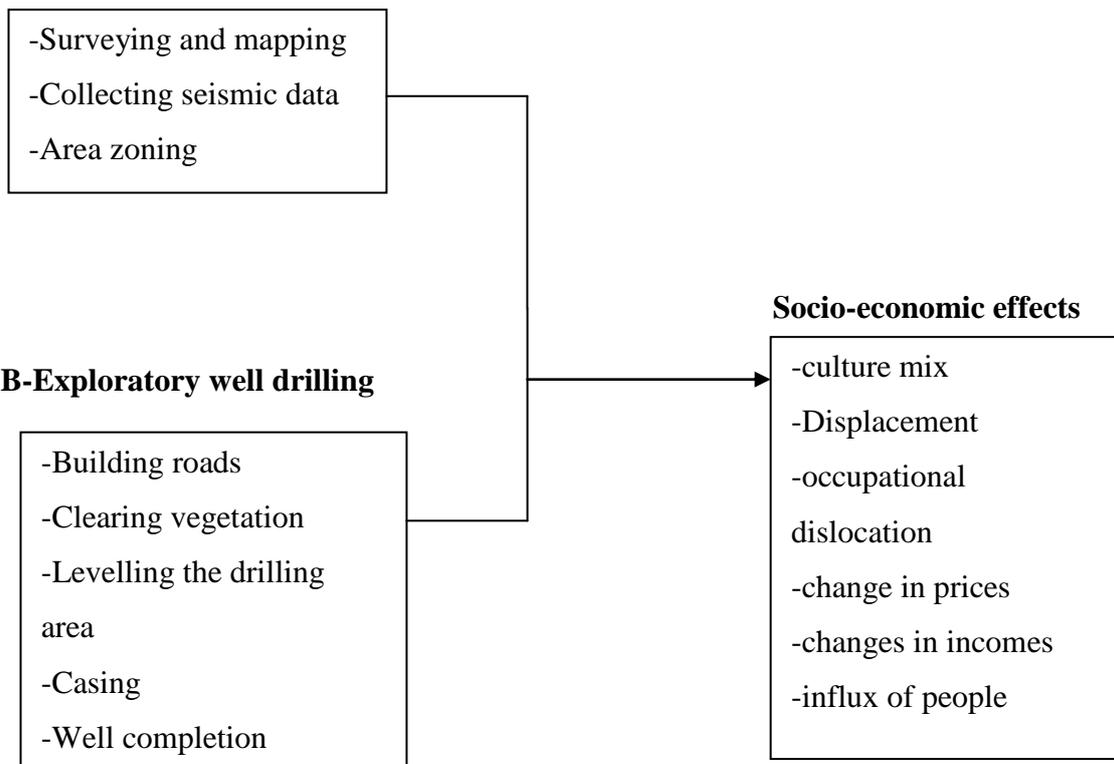
iii. There are positive and negative effects between collection of seismic data and influx of people.

1.7 Conceptual Framework

Figure 1: This study was conceptualized on the conceptual framework below;

Oil exploration activities

A- Seismic studies (independent variable)



Source: Adopted from Kisémbó (2009, p.23) and modified by the researcher.

The independent variable was oil exploration activities with the following activities: seismic studies and exploratory well drilling, surveying and mapping, collecting seismic data, area zoning, building roads, and clearing vegetation, drilling, casing and well completion. All the listed affect the dependent variable the social economic effects on the well-being of communities leading to culture mix, economic transformation, displacement, prices, occupational dislocation, influx of people.

The purpose of the conceptual framework was to establish the relationship between the variables (oil exploration activities and social economic effects) where the whole process of obtaining oil; from exploration, extraction, processing and transportation as well as storage and consumption generate one form of pollution or the other. The activities of the oil industry have often resulted in a different multitude of social, environmental, and economic problems such as environmental pollution, occupational dislocation, rural-urban drift, unemployment and poor human health (UNEP, 2011). Among the most conspicuous aspects of life in contemporary areas like Hoima Municipality are poverty, malnutrition and disease. Further oil exploration is associated with loss of basic necessities, no clean water, little electricity, abysmal health care and no jobs for displaced residents, farmers. To make matters worse, they face the effects of unrestrained environmental molestation by the multinational companies every day.

1.8 Significance of the Study

- The findings of the study will be of help to the Government of Uganda, Hoima municipality, the Ministry of Energy and Mineral Development in making clear policies on how oil companies and individuals are to handle demands of the local community, concerning issues such as jobs, culture mix, health, displacement and peaceful co-existence.
- The study findings will also enable other stakeholders, for instance the civil society charged with accountability and strengthening participatory mechanisms intervene in the ‘paradox of plenty’ and the ‘windfall revenue phenomenon’ which is likely to lead to the ‘oil curse’ (negative effects of oil; resource utilization leading to economic stagnation, environmental degradation and increased poverty).

- As a student of Executive Master's in Business Administration in Oil Governance and Management, I am hopeful that the research findings will to a large extent enhance my career in research and enable me to have a practical approach in analysing issues resulting from oil exploration, as the course requires.
- The study will also be useful to other researchers in the field of mineral exploration and to those who would wish to expound on the area of mining to obtain a foundation in the form of literature review.

1.9 Justification of the study

Petroleum geologists have determined that the Mputa and Waraga oil fields in Buseruka, Hoima have volumes of between 100 and 300 million barrels of oil. In the Waraga field, a maximum of 12,050 barrels of oil can be produced per day. According to Hardman's Chief Executive Officer, the great news is the fact that flow tests from all the zones have exceeded the expectations of productivity. Additional recent exploration findings by Tullow Oil Partners in Area 3A have revealed the existence of up to 500 million barrels of oil at the Kingfisher well in Hoima. According Reuben Kashambuzi, the Commissioner for Petroleum Exploration and Production, production is now possible as the issue of commercial capacity has been settled.

1.10 Scope of the Study

The dissertation focused on assessing changes in prices, household income, influx of people, road construction and changes in income resulting from oil exploration activities.

1.10.1 Geographical Scope

The study was carried out in Hoima municipality focusing in two divisions of Kahoora and Mparo respectively focussing on social, economic effects of oil and gas exploration activities on the wellbeing of communities.

1.10.2 Time Scope

The study looked into consideration the time when serious oil exploration activities started in 2006 under Hardman Resources up to 2015 when exploration license for Total E&P, Tullow oil and CNOOC expired.

1.10.3 Content Scope

The study focused on assessing how the people have been affected by oil exploration activities. The focus was in the local communities within Hoima municipality in the two divisions of Kahoora and Mparo respectively focussing on the indicators and dimensions.

1.11 Operational definitions

Oil Exploration

This was the most important in the oil industry involved with finding oil fields and bringing oil up from the ground. This detective work requires looking for clues; search for underground or under water oil and gas reservoirs, careful observation of ground conditions, taking notes of different information and the evaluation of survey data. This is the job of geoscientists who are experts on rocks. They look for places where there might be oil, and they look for signs that may indicate the presence of hydrocarbons underground and responsible for determining the best places to drill.

They start examining the shapes of different underground layers, advanced technologies and special tools like aerial photography, satellite pictures, nanorobots, 3 and 4 dimensions are used to measure variations in the earth's gravity and magnetic fields to help in identifying crude oil fields. This is an expensive activity; the information generated is supplied to economists and financial planners to make decisions whether or not to drill an exploratory well. Initial drilling is followed by the production phase which is the actual extraction of oil from the ground. The cost of drilling an exploratory well costs between 1-5 million dollars.

The majority of the world's oil and gas reserves are located in emerging economies that now have the opportunity to invest further in the development of technologies and infrastructure that would enable them to exploit their mineral wealth efficiently while providing a platform for economic diversification.

Oil

Accumulation of hydrocarbons, three conditions of oil formation, source rock, and rock cap, and porous rock, crude oil is an organic liquid substance often found below the earth's surface. It is made up of thousands of molecules composed of different hydrogen and carbon atoms. Such compounds are called hydrocarbons. Hydrocarbons contain different proportions of impurities like oxygen, sulphur, nitrogen and heavy metal atoms. Crude oil is a central part of modern life and the world's most important energy resource. We rely on it in many ways for the food we eat, the clothes we wear and the electronics we use at home and work place.

Seismic Studies

Seismic technology uses sound waves to reveal what lies deep in the ground. Sound waves can travel through some materials more easily than others. Once the waves have all been recorded for an area, the information is taken back to a laboratory where geoscientists read the waves and make interpretations.

Drilling

Since the first oil well was drilled in 1859 by Edwin Drake in Pennsylvania United States of America, oil exploration and production has become an increasingly complex and precise process, wells have gotten deeper and more complex.

To drill a well, a large drilling rig is brought to the site; once it's situated above the desired location drilling can begin. Drill bits have sharp teeth that rotate to tear apart rock. While the well is drilled it gets deeper to length of 30 feet. Pipes are attached to the top of the drill.

For this reason drillers use mud to lift debris out of the well, mud is a complex material specifically made for its purpose. Because it is so complex, mud is one of the biggest expenses in drilling. Controlled by mud engineers, drilling mud keeps the formation or walls of the well from collapsing inward.

Wellbeing

Human wellbeing has many dimensions, income to pay for food, clothing and shelter, access to clean water and sanitation, good health, security, access to social services and amenities, freedom of choice.

The conceptual framework used in the compendium of OECD (Organisation of Economic Cooperation and Development) wellbeing indicators distinguishes between material living conditions and quality of life and conditions required to ensure their sustainability over time.

Material living conditions or economic well-being determines people's consumption possibilities and their command over resources.

Quality of life, defined as the set of non-monetary attributes of individuals, shapes their opportunities and life chances and has intrinsic value under different cultures and contexts. The sustainability of the social-economic and natural systems where people live and work is critical for wellbeing to last over time. Sustainability depends on how current human activities impact on the stock of different types of capital (natural, economic, human and social) (OECD; 2011:50).

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Under this chapter, a critical review was made of the issues that have been explored and studied both theoretically and empirically in the existing literature on the social economic effects of oil exploration activities on the well-being of communities in developing countries and elsewhere in the World. It was important to note the existing literature in the works of other scholars who have written about the topic of study or those who have addressed similar issues as those of the variable that was available in the study. The literature was comparative in that it was in line with the specific objectives of the study; so as to make the researcher appreciate the contributions of the different researchers and identify the gaps.

In this study, stakeholder theory was applied. Stakeholder is a person, group or organization that has interest or concern in an organization, whereby stakeholders can affect or be affected by the organization's actions, objectives and policies. Some examples of key stakeholders are creditors, directors, employees, government (and its agencies), owners (shareholders), suppliers, unions, and the community.

Regarding background of stakeholder theory, it was embedded in the management discipline in 1970s and gradually developed by Freeman (1984) incorporating corporate accountability to a broad range of stakeholders. Wheel et al (2002) argued that stakeholder theory is a less formal unified theory and more of a broad research tradition incorporating philosophy, ethics, political theory, economics, law and organisational science.

Freeman (1984) hold that stakeholders of a firm can be defined as individuals and constituencies that contribute, either voluntarily and involuntarily to its wealth-creating capacity and activities and who are therefore its potential beneficiaries and or risk bearers. Sundaram and Inkpen, 2004 contends that stakeholder theory attempts to address the group of stakeholder deserving and requiring management's attention whilst Donaldson and Preston (1995) suggest that the firm is a system where there are stakeholders and the purpose of the organisation is to create wealth for its stakeholders.

Stakeholder theorists have tended to devote relatively little attention on defending stakeholder rights, while issues of governance and corporate law have received insufficient attention among advocates of radical departure from the shareholder focused conception and failure of stakeholder theory being viable over time, failing to demonstrate its ability both to achieve the multiple objectives of the different parties and to distribute the value created in ways that maintain their commitment.

It is important to note that stakeholders can make or break a project/corporation or programme. It can be tough to pin them down or describe the depth of the project with them, creating a stakeholder management plan can help them informed.

2.1.1 The Institutional Theory

According to Scott, (2001) institutions are 'social structures which have attained a high degree of resilience'. The institutional theory can be decomposed into three core thematic areas: the cultural cognitive, normative and the regulative. These three core thematic areas work in tandem and when combined with appropriate activities and resources, bring about stability and meaning to social life (Ibid, 48). Institutions operate at various degrees of

power, ranging from *the 'world system to localized interpersonal relationships'* and are affected by both periodic and constant change they entail stability (Scott, 2001). This implies that institutions have the inherent capacity to control and restrain behaviour thus being able to shape actions.

2.1.2 The Basic Concept of Institution

Political ecology as a driver for institutions: The concept of Political ecology is defined differently by various scholars (Robbins,2012; Watt, 2000; Le Billion, 2001) with the term sustaining fundamental changes in the management of nature and rights of people working directly or indirectly with institutions like states or organizations to challenge current conditions. Le Billion (2001:564) argues that the people face unusual ecological circumstances when they have too much or too little resources, exposing them to high risks of violent conflicts. *Resource scarcity (generally renewable resources) and resource abundance (with respect to non-renewable resources)* all generate strife hence the best mode is to enlist the two angles. The linkage between these two elements puts forward the basic theoretical root for this study. This concern is explored more in the sustainable livelihood approach and Institutional theory.

Political ecology is seen as a measure that seeks to appreciate complex relations between nature and society through observant examination on means of access and control over resources and their implications for environmental welfare and sustainable livelihoods. (Watts, 2000: 257) This means that social institutional structures grant valuable controls over resources to avert conflicts that could emerge. Most recent research by Forsyth (2013:11) shows that previous approaches to political ecology embodied insufficient steps that aimed at separating environmental issues and politics in the environmental plan. This

not only causes grave problems that lead to environmental strategies to inflict undue restrictions on livelihoods of marginalized people; it also heightens conflicts. In comparing political ecology to other rational meaning, *Forsyth (2013:20)* identifies political ecology as an *approach to environmental politics that allows the booming integration of political analysis with the formation and dissemination of understanding of ecology reality.*

2.1.3 The resource curse theory

The resource curse refers to the paradox that countries with an abundance of natural resources, specifically non-renewable resources like minerals and fuels, tend to have less economic growth, less democracy and worse development outcomes than countries with fewer natural resources (Kisembo,2009, p. 25). Literature available on resource curse (Sachs & Warner,1995, p.50; Auty,2001,p360) and the paradox of plenty (Karl,1997,p.23) relate both resource abundance and resource dependence to low levels of human development, corruption, repression, poor economic performance, However, even with the vast and varied nature of literature on socio economic effects an identifiable oversight in their research findings are that Karl (1997) based his premises only on formal sectors. He gave little consideration to the non-formal sector, non-state institutions and non-formal authorities like farming traditional institutions and community leadership which in one way or another are affected by extractive activities. This theory is critiqued because it neglected the study of peace and war. The results of macro qualitative comparison for a reduced sample of highly dependent oil exporters are even clearer cut, compared to oil poor countries and in contradiction to the rentier state theory, the institutions of oil wealthy countries do not seem to be particularly characterised by patronage and clientelism

2.2 How does oil surveying lead to social effects on the surrounding communities?

In a review of the Regional Coastal Plan for Taranaki in New Zealand, Taranaki Regional Council (TRC, 2009b) the number of unauthorized coastal incidents has been recorded as 219 over the five-year period to 2009 (fewer than five per cent of all unauthorized incidents recorded). Unauthorized incidents include pollution incidents, spills and incidents of non-compliance with resource consent conditions. In total, nine unauthorized incidents (4.1 per cent) were attributed to hydrocarbon exploration and servicing facilities, and ten (4.6 per cent) to petrochemical processing. Forty-six incidents were attributable to oil or petrol spills but the source of these is not identified in the report. Although the total number of incidents is low, the report states that the consequences of a single event can be devastating. It cites, among a number of examples, an accidental discharge of 23,000 litres of crude oil from the Tui oil field in 2007. The significant amounts of oil that washed up along the Okato coastline required a major clean-up of sandy beaches in the area that took eight months. Fortunately, the timing of this spill (during the spring high tide) meant that oil was deposited high on beaches well away from the zone where marine wildlife is active (TRC, 2012b).

The TRC undertook/commissioned a series of reviews in 2011/2012 on the potential impacts of hydraulic fracturing (fracking) and deep well re-injection on the regional environment. Fracking is a technique used to release gas and oil that is not accessible by other means, by pumping pressurized fluid into well-bores to open fractures in the hydrocarbon reservoir, while deep well re-injection is a process for returning wastes back into depleted oil or gas wells. The reviews examined the potential impacts on freshwater supplies, the risks of earthquakes and other seismic activity, as well as the impacts on air quality of the flaring of fracture fluids.

The Institute of Geological and Nuclear Sciences Ltd reviewed the likelihood that seismic activity would be triggered by fracking in Taranaki and the potential impacts on the region's population and infrastructure if earthquakes were to be triggered (Sherburn and Quinn, 2012). Data from the Geo-Net project, which has monitored geological hazards in New Zealand since 1994, were analysed to determine whether there was evidence of increased seismic or volcanic activity near petroleum operations in Taranaki. The authors concluded that the data did not support “any suggestion that hydraulic fracturing or deep well re-injection activities could trigger in Taranaki a large earthquake, a sequence of moderate-sized earthquakes, or a widespread zone of earthquakes” Hydrocarbon flaring is used as a means of disposing unwanted hydrocarbon gases extracted from drilling or from Hydraulic Fracturing (HF) fluids, before well-testing is undertaken.

In three studies undertaken at well-sites during 1997/1998 (Institute of Environmental Science and Research, 2008; Fletcher Challenge, 1998) it was shown that the levels of carbon monoxide, carbon dioxide and methane measured downwind of the well sites were safe at all measurement sites including those within 50 metres of the wells. Levels of PM10 (suspended particulate matter in the size range that has the most serious impacts on respiratory health) in close proximity to the sites were compliant with the National Environmental Standards for Air Quality (NESAQ). Levels of Poly-Aromatic Hydrocarbons (PAHs), which epidemiological evidence have linked to the incidence of cancer (Armstrong et al., 2003), were similar to background atmospheric levels 120 metres from the flare sites. Background levels of dioxins, which have been widely linked to a range of adverse impacts on human health including cancer, and endocrine, central nervous system, and reproductive function abnormalities (WHO, 1999), were achieved beyond 250 metres.

Walter, (2014) observed that in the experience of his Council (South Taranaki District Council), the main issues of community concern with respect to petroleum exploration were “noise, road damage and road safety, visual impact and more noise” with the addition of excessive light at night, vibration, dust, and stock disturbance. A number of approaches were developed and used to minimize these impacts. Local authorities worked to develop uniform approaches to district planning and companies recognized that communication, consultation and consistency of compensation are vital to community acceptance. The voluntary land access code agreed by Federated Farmers which clarified company and community responsibilities was considered a significant advance (Walter, 2015).

Similar concerns in Walter, (1994) have been identified more recently. In a public meeting held by residents in Tikorangi (a rural community in North Taranaki), heavy traffic, falling land values, noise and feelings of helplessness were mentioned by residents (Radio New Zealand, 2013). In addition, there have been some isolated noise issues (Maetzig, 2010), one of which resulted in a number of local hapū members leaving their homes during the construction phase of the Motunui production station (Treaty of Waitangi, 2011).

Community relationships have been enhanced by providing support to community groups and organisations through sponsorships, scholarships and investment (Venture Taranaki, 2010a). These can have positive impacts for the Taranaki community. For example, the aquatic centre and the raceway in New Plymouth have been sponsored by Todd Energy while Puke Ariki, the regional museum, was sponsored by Shell. Both companies are also major event partners of the annual World of Music, Arts & Dance (WOMAD) International Festival in New Plymouth which encourages and promotes cultural diversity.

Similar contributions can be identified for companies from the oil and gas supply chain. In addition to their community investments, the oil and gas industry makes contributions to education programmes in the region.

Hannesson, (2001) discusses the question of making resource wealth permanent, arguing that the best strategy is to invest resource revenues in the highest-returning assets, such as education, health, roads and other infrastructure in developing countries like Ghana. This is however true in the sense that “effective infrastructure supply supports economic growth, enhances quality of life and it is vital for national security” (Baldwin & Dixon, 2008:32). For it is with the provision of infrastructure that the current and future generations will be happier than with some unknown value of money deposited in a bank overseas from which political elites will be using to enrich themselves. In this season of global financial hardship, one cannot be sure that this amount of money will be available in some years to come when the reserves have dried up

Macroeconomic policy implementation research has been instituted to counter the negative effects of oil of oil exploration that overshadows other industries, promotes massive borrowing and public spending, and suppresses growth in the long run. Davis et al. (2001) consider the function and misuse of savings and stabilization funds in managing non-renewable resource wealth. They argue that the existence of funds have rarely been able to address the issue of volatility in oil prices and especially that of savings for future use to the expected standard and hence there seems to be a strong case for government to be cautious about policies pertaining to oil revenue. The principle underlying the stabilization fund is applauding able. However, government should be cautious about the use of the resources saved in the fund as suggested above by Davis et al. (2001). It should

not be used as a source of fund to cover up the shortfalls in the general budget whether they occur as a result of oil price volatility or not. The use of the fund to supplement the shortfall in non-oil revenue should be prohibited otherwise it will encourage government to relax in the mobilization of traditional revenue which could promote indiscipline in the fiscal policy process that can feed into dependence on oil fund.

Sachs & Warner (1995) identified that resource sectors have weak linkages with the rest of the economy because imported inputs and capital-intensive production generate little employment; therefore, the real impact on the overall economy depends on how the wealth is used. The capital intensiveness in exploiting oil in most developing countries has transferred employment power to the foreign investors who have the necessary capital to invest. This however creates fewer jobs for the local people than is expected. This situation leaves the government share of the revenue as the major tool for greater economic transformation. In this sense only, good management policies will ensure that the nation benefits significantly from the oil discovery. Sachs and Warner (1995) again argue that oil abundance is a key negative determinant of economic growth. These empirical results are themselves controversial but the point here is to argue that the criterion itself is not sufficient. Lower growth in the long run does not necessarily mean that the oil is a curse. A country can experience a windfall, which raises income and consumption in all periods but does not produce faster growth, and indeed it may even slow growth. Even if growth slows after the windfall, consumption, the usual aggregative measure of welfare, may still remain higher in all periods because disposable income is higher than if the economy had not had a windfall but had grown faster. Thus, the empirical observation referred to above, that resource abundant economies tend to have lower aggregative growth, is not in itself sufficient to demonstrate that oil is a curse.

Saraf & Jiwanji, (2001) outline many reasonable issues of the resource curse. Firstly, the of problems, known as Dutch Disease (whereby the local currency of a nation appreciates increased sudden availability of foreign exchange, if not managed well, causes a significant appreciation of real exchange rate, further damaging the competitiveness of manufacturing and other tradable industries. Meltdown of the manufacturing industry may also lead to less educational investment and labour productivity. Unsuccessful protectionist policies are another frequent end result. This number which encourages lower prices of non-traded export produce as a result of which exports are discouraged) is less important for resources that are exploited at a sub-national level. However, at the national level, Dutch disease has been a major problem in managing oil wealth. In this instance, there is an uncontrollable appreciation of a country currency over the medium to long-term period.

The volatility nature of prices and production quantity of primary goods, lead to highly fluctuating exports and government revenues. Higher production and price times can create fiscal indiscipline, leading to market discipline relaxation. Saraf & Jiwanji (2001) assert that boom-based borrowing to expand public infrastructure can lead to unsustainable expenditures and burdensome debt after the boom. Moreover, once there is an expansion of government's expenditures, their contraction may be difficult. Boom times associated with capital inflow can lead to increased careless spending which can result in a higher inflation rate and lower levels of domestic savings. During bad times, there will not be enough funds to cater for the budget deficit which can force government to abandon most developmental projects.

2.3 How does road construction result into changes in income

A strong, growing, sustainable economy is the goal of every nation in the world. A sustainable economy enhances a nation's standard of living by creating wealth and jobs, encouraging the development of new knowledge and technology and helping to ensure a stable political climate.

The Texas oil exploration boom sometimes called the gusher age was a period of dramatic change and economic growth in the United States state of Texas during early 20th century that began with discovery of a large petroleum reserve near Beaumont, Texas. The fund was unprecedented in its size and ushered in an age of rapid regional development and industrialization that has few parallels in United States history, Texas quickly became one of the leading oil producing states in the US along with Oklahoma and California. The major petroleum strikes that began the rapid growth in petroleum exploration and speculation occurred in south east Texas but soon reserves were found across Texas and wells were constructed in North Texas, East Texas and the Permian Basin in West Texas.

The period of oil exploration had a transformative effect on Texas. At the turn of the century, the state was predominantly rural with no large cities, but by the end of second world war the state was heavily industrialized and the population of Texas cities had broken into top 20 nationally. The city of Houston was among the greatest beneficiaries of the boom and Houston area became home to the largest concentration of refineries and petrol chemical plants in the world, the city grew from a small commercial centre in 1900 to one of the largest cities in the United States during the decades following the era.

Furthermore, regarding economic transformation the urban landscape of the cities changed dramatically the Praetorians building in Dallas (1907) and the amicable life insurance company building in Waco (1911) was among the first skyscrapers in Texas. Texans who became wealthy from oil exploration activities established upscale communities, including river Oaks which became a model for community planning in the United States.

In Brazil oil exploration activities, construction industry and services contributed similarly to growth, but this was also driven by inter-sectoral shifts to services, a decline in agricultural employment and growth in agricultural productivity. The decline in services-sector productivity suggests movement of some workers into more precarious forms of employment, indicative of a decline in employment quality for those workers. This is the price of oil exploration activity.

While the services sector has clearly played an important role in growth in these countries, the implications for policy depend very much on the quality of jobs that people are moving to within the services sector (Walter, et al. 2015). Even if rising average productivity in the services sector suggests that, on average, newer jobs are growth-enhancing and potentially therefore able to provide decent work conditions, the services sector shows a variety of transformation experiences. In all except Thailand, services were the largest contributor to value added growth. South Africa, Mauritius and Chile exhibit large contributions to growth from increases in productivity in that sector, so potentially rising employment quality for those already employed.

Rather than services, industry contributed the most to value-added growth in Thailand. Moreover, structural change accounted for half of the country's growth between 1990 and

2012. In fact, Thailand had the greatest absolute change contribution of the structural-transformation component.

In Mauritius and South Africa, the contribution of industrial productivity was also large, but declining employment offset this and reduced the overall contribution of industry. Governments have also relied on fiscal and financial incentives, SME-support programmes, and in some countries on state-owned enterprises and public procurement to encourage investment and employment creation. For example, in Ethiopia, fiscal and financial incentives encourage investments in strategic industries, and policies in support of micro and small enterprises facilitate their (very limited) access to credit (Gebreyesus, 2013).

Ethiopia's record in reducing poverty through increased employment and diversified incomes suggests that this strategy is having some success. Productivity growth in the agricultural sector has been the main driver of poverty reduction in Ethiopia, as seen in Section 2, made possible by public investments in transport, storage and communication; business services (finance, insurance, real estate); government services; and personal services (community, social and personal services). Studies reveal changes in shares in value added and employment and changes in labour productivity disaggregated by industry, as described above.

In Ethiopia, the highest growth rates in value added are registered in government, construction, trade and transport, and business services (Fox and Pimhidzai, 2013). While government services are less interesting in terms of structural-change dynamics (and may

be subject to doubts about their calculation) and construction's growth can be explained by public works programmes, the growth of the business services is an important phenomenon. Due to their application of ICT and their need for skilled labour, business services are considered 'modern services'. This oil sector tends to offer higher-quality employment, but due to their skills' requirements, they are not easily accessible by the poor. Business services are also the sector with the highest average labour productivity (134,396 birr, 2005 constant prices), roughly 80 times higher than labour productivity in agriculture, and the sector with lowest average productivity.

Both value added and employment of trade services (also referred to as 'traditional services', due to their low technology and knowledge intensity) increased in the past decades. These services offer low-quality jobs still. This may explain the prevalence of low-quality employment in Ethiopia oil industry. Ethiopian manufacturing value added and employment have also increased in the past two decades, despite negative labour productivity growth. In terms of labour productivity, data show a clear problem of the economy in raising labour productivity in most industries (notable exceptions are agriculture and transport services). This might be related to the improvements in infrastructure and roads, and consequently market access for rural producers.

Similarly, oil exploration in India, together with construction, business services also witnessed the highest rates of employment growth. While the role of business services in the Indian economy is so widely recognized that modern services have been considered the new engine of Indian economic growth (e.g. Dasgupta and Singh, 2005), the highest rates of productivity growth are found in utilities and manufacturing. As McMillan et al. (2013) show, India

According to the Jobs and oil living earth Uganda project (2013) baseline study report improving access to youth employment in western Uganda, Hoima municipality is one of the 14 municipalities in the six-year Uganda support to municipal infrastructure development (USMID) project, the objective of the project is to enhance the institutional performance of local governments to improve urban service delivery, expand urban infrastructure, enhance capacity of the municipalities to generate revenue, improve urban planning and strengthen financial management and social systems, As it is improved, infrastructure is expected to meet the demands of the incoming businesses and population growth, land prices, rental rates and other real estate costs have escalated as demand for real estate in the municipality and surrounding area has increased.

Following oil exploration and discovery in the Albertine graben, the 90 km Kaiso-Tonya road, Kyangwali- Buhuka was successfully tarmacked. It is important to note Hoima municipality is becoming an attractive and dynamic centre of economic activity indeed increased economic activity in the area and rapid development of Hoima Town led it being upgraded to municipality status.

HOCADEO (2012) report on the baseline study on the current trends of oil exploration and socio-economic implications of the emerging oil and gas industry on the livelihood security of the local communities in the Albertine region indicates that local communities have not yet benefited from business opportunities related oil and gas exploration activities in the Albertine graben. According to HOCADEO report (2012), 70% of the study respondents believed that oil and gas exploration has not yet benefited local communities. The majority of beneficiaries are not residents in Bunyoro sub-region. Despite the huge business potentials of the industry nothing substantive had been made to

tap these unique opportunities. These infrastructure developments, especially road construction, are important because they enhance labour and capital productivity which are key measures of sustainable economic development. However, the trickledown effect on communities well being is still questionable in Hoima municipality.

Jiwanji, (2001) argue that since resource wealth tends to be possessed by a few companies and the public elites, rent-seeking behaviour is often a problem. Most of the resource wealth is possessed by powerful foreign investors, bureaucrats and some influential private investors. They engage in all forms of rent-seeking activities to maximize wealth for themselves alone. This therefore deprives ordinary citizen's opportunities of benefiting from the resource wealth. Institutions built on strong accountability and transparency can be used to avert this unpleasant situation to ensure greater economic benefit for all.

Ghana is placed among the group of countries with a lower middle income following a threefold increase of its real gross domestic product (GDP) (African Economic Outlook, 2010). The significant increase in Ghana's real GDP rate from 4.7% in 2009 to 5.9% in 2010 signifies how strong Ghana's economic growth has been over these years. Growth strengths are even higher as real GDP of 12% growth rate and about 11.0% GDP are anticipated for the years 2011 and 2012 respectively, relying on the start of earnings from the oil production which began in December 2010 (African Economic Outlook 2010). Furthermore, the country's democratic and stable social environments have boosted foreign investors' confidence, triggering a rise in investment.

However, setbacks remain, such as a very weak fiscal position and fragile external balances. Growing fiscal challenges include large domestic payment arrears (African

Economic Outlook, 2010). Furthermore, the governments newly adopted public sector payment policy known as the single-spine salary policy: A structural adjustment programme to address the issues of pay disparities, fairness, transparency and equity in the public sector, needs a high budgetary cost which could undermine macroeconomic stability unless government intensifies its efforts in mobilizing domestic revenues. Strong and sustainable investment over many years will need perpetual high levels of investments especially in the manufacturing sector, and in public infrastructure; this will be conditional on proper policies regarding the oil wealth management. Furthermore, the government should create training opportunities to equip the unskilled labour force with relevant job skills to overcome the unemployment and underemployment challenges.

Political scientists often talk of “oil curse” emphasizing that resource-rich countries often are slow in growth, corrupt, less equitable, violence-prone, and with more authoritarian government compared with those with fewer resources. There is a strong association between resource wealth and the likelihood of weak democratic development (Ross, 2001), corruption (Salai-Martin and Subramanian, 2003) and civil war (Humphreys, 2005).

Natural resource extraction can also take place quite independently of other political processes; a government can often access natural resource wealth regardless of whether it commands the cooperation of its citizens or effectively controls institutions of state (Ross, 2001). The second major issue is about the non-renewable characteristics of many natural resources such as gas and oil. From an economic view point, they are thus less like a source of income and more like an asset (Ross, 2001).

Environmental problems are inevitable when oil has to be extracted from the ground. Oil spills, damaged lands, accidents and fires, and incidents of air and water pollution have all been recorded at various times and places (E&P Forum/UNEP, 1997). It is certain this will also be the case in Ghana during the exploration of the oil find. However, proper management practices, technologies and procedures can be used to minimize these effects. The continued coordination among stakeholders such as oil firms, contractors and suppliers is essential to implement the best environmental management practices to accentuate the negative effect that could occur during the exploitation and production of oil. There is also the possibility that human life could be affected as a result of the environmental damage caused by oil production. Humans suffer from environmental consequences through the damage to livestock, farms, and the human body itself. Oil spillage can also interfere with the normal working of power stations and desalination plants that require continuous flow of clean seawater (E&P Forum/UNEP, 1997).

2.4 The relationship between collection of seismic data and influx of people

Biers (2010) assert that seismic exploration surveys in the field of oil and gas are an application of reflection seismology. It is a method to estimate the properties of the earth's surface from reflected seismic waves. When a seismic wave travels through the rock surface it creates impedance. A wave travels through materials under the influence of pressure. Because molecules of the rock material are bound elastically to one another, the excess pressure results in a wave propagating through the solid. A seismic survey can reveal pockets of lower density material and their location. Although this cannot be guaranteed that oil can be found in these pockets, since the presence of water is also possible. Thus the acoustic impedance of each rock formation in the subsurface will be different due to different densities. This density contrast is helpful in tracking the waves in

the subsurface and an acoustic impedance chart is obtained which is known as a seismic chart. However, the impedances recorded by the instruments on the surface are not correct due to noise and other factors that change the impedance factor of the wave causing population displacement and migration to new exploration sites.

Natural neighbour interpolation finds the closest subset of input samples to a query point and applies weights to them based on proportionate areas in order to interpolate a value (Sibson, 2011). The population potential as a basis for determining the vulnerability has an edge over other methods of showing population concentration as it negates uninhabited areas by considering cities or urban centres as focal point of concentration. A historical review of past events helps in the preparation of a seismic activity profile of an area. This is a vital element in understanding seismic behaviour. Ample work exists in relation to historical perspective of seismic activity (Allen et al., 2013) and seismic vulnerability (Bilham, 2009; Jackson, 2006) at the global scale. Significant contribution in this respect at country or regional level includes reconstruction of historical seismicity on the Pacific coast of USA (TownleyandAllen2011).

Exposure to very high intensity noise can cause direct physiological damage, such as tissue or cell ruptures. Temporary threshold shift can occur at longer ranges (i.e., lower received levels of sound); this is basically a temporary loss of hearing, so that a sound must be louder than normal in order to be heard or understood (Mark, 2005). Permanent threshold shift, which is in effect permanent partial hearing loss, is also possible after incidental exposure to extremely loud sound or chronic exposure to moderately loud sounds, though this has not been well studied, especially in the wild.

Mackish, (2011) says that seismic data acquisition refers to collection of seismic data. The acquired data is further sent to a computer network where processing of data takes place. With better technologies, the prospect of better acquisition surveys has come into place. A generation and recording of seismic data requires: receiver configurations - includes geophones or hydrophones in the case of marine acquisition, transmitter configurations - includes laying of transmitter as according to the survey configuration pre-decided, orientation of streamers in case of marine surveys and proper computer network to carry the information from receivers to the programming network. When a survey is conducted, seismic waves generated by dynamite or vibrators travel through the subsurface strata, which are in turn reflected or refracted. These reflected waves and their time to complete one interval are noted by the receivers. The receiver configuration has to be well determined so that maximum data can be collected over an area.

On demographics, the major commercial centres in the state grew tremendously during this period the city of Houston grew by 555% between 1900 and 1930.

However, it is important to note the growth of many towns was only temporary. Growth in some communities was often driven by exploitation of limited oil resources, so once wells ran dry or demand slowed down, their populations rapidly declined when the oil boom ended the population crashed from its 1927 peak of 30,000 to 2000 people in 1929, the population of Breckenridge dropped from similar high to 7569 in 1930. One of the most significant demographic changes in the state was the percentage of urban dwellers between 1910 and 1930 the percentage of urban dwellers increased by 32% resulting in 41% of Texans living in urban areas in 1930.

According to the Jobs and oil living earth project report (2013) in western Uganda, Hoima municipality because exploration activities there has been influx of people posing challenges to municipality the capacity of the council to provide to provide infrastructure and other services is stretching the councils resources to the limit. It is also leading to unplanned development including encroachment on road reserves and wetlands and the expansion of slums, and increase in immoral behaviour.

There is increasing concern about how oil activities impact livelihood patterns touching the social, economic, and cultural elements such as fishing, agriculture, livestock and eco-tourism strategies. Far-reaching effects on people' source of livelihood vary from founding of short-term employments, loss of land in terms of displacements to changes in the standard of living halting ways people meet the needs for their families (Esuruku, 2013, p. 6). According to UNDP (2006:75) oil activities create unrelenting effects like conflicts which are influential factors to poor human development. These stem from land use,/land ownership or destabilization among communities. Going through Niger delta, UNDP remarks that it is “a *place of frustrated expectations and deep-rooted mistrust* outcomes derived from overlooked actions related to Oil operations (canalization, oil spills and lack appropriate waste among others) that continue to alter the surroundings on which people rely for subsistence activities. Countless points of view revolve around who is liable for all these harms; but this cannot take away the pain it has caused the people. This provides a complete view of what effects could erupt if mining companies fail to pay attention to the value the environment derives to its society.

Such constructs do not only entail deprivation of one's opportunity to earn a descent living but rather could lead to increased crime rates within the study region represented by

anxiety and circumstances of the Uganda's oil extractive region at this time; The case in point is not merely an African problem, comparable examples in South America are justified by Washington AFP (2013). The ruin of oil and gas extraction in Amazon basin reveals immense ecological degradation and social troubles that continue to affect local people's lives in Ecuador. Presently, Chevron Oil Company faces a law suit for failure to pay to the Ecuadoran villagers and the local government for the massive environmental damage caused in the Amazon rain forest affecting local people's lives. It is evident that Mineral extraction processes involve unsustainable dealings but there are procedures oil industry can undertake to work towards attaining the values of environmental sustainability.

Uganda's' National Oil and Gas Policy, (2008) observes that numerous oil and gas activities can be subdivided into upstream, midstream and downstream respectively. Upstream covers promotion, licensing, exploration, development and production of petroleum. Midstream includes transportation, refining of oil and conversion of gas. It is recognized that upstream petroleum also take account of transportation, especially transportation of oil and gas on petroleum fields and in between these fields and processing centres which calls for road construction. Downstream petroleum deals with the distribution, marketing plus sale of petroleum products. Oil and gas production activities, however, present diverse environmental impacts ranging from land grabbing in oil regions, alteration of land surface areas, ecosystems, atmospheric pollution to water impacts (Oil watch, n.d).

As Finer et al (2008:1) exemplifies Oil access roads bring on deforestation and related shocks which generate both indirect and direct impacts whose damage cannot be

effectively managed. Concern of altering land surface area with activities like drilling and construction (as exposed in Figure.1) in the Albertine fragile area can possibly destroy inhabitant's livelihoods influencing their ability to harvest much from their land. Eman et al (2012: 7479) argue that nearly all oil find its way into the ecosystem through leakages of lakeshore oil refineries. Though spills occur inadvertently, this is a basis for severe and extensive damage to marine ecosystems, terrestrial life and human health which are also natural resources.

Kityo (2011:1) indicates that, Oil exploration activities ought to follow sets of ecological studies, such as strategic environmental assessment, environmental and social Impact assessment studies. However sites where these studies are conducted often lack baseline data needed to back up the assessed impacts from these studies. This hampers the evaluation process of both the direct and indirect ecological effects linked to environment.

WWF (2009) considers Albertine rift of Uganda as Africa's most ecologically diverse area for animal species and has the highest level of endemism (nativeness). This slim stretch of land just 45 km wide runs from the southern tip of Lake Tanganyika to about 30 km above Lake Albert in Uganda. About 14 per cent of all African reptiles with 175 species, 19 percent of all African amphibians with 119 species, 35 per cent of all African butterflies with 1300 species, and 39 per cent of all African mammals with 402 species (Plumptre and Cox, 2006:183). This high biodiversity area is protected through a network of over fifteen National parks and Wildlife reserves comprises about 70 per cent of all Uganda's conservation areas. IUCN (2003) refers to biodiversity as complex genes, species, ecosystems and ecological processes that sustain life on earth, providing human society with food, medicine, natural resources, ecological services, and aesthetic benefits. It is a web where ranges of variability among living organisms and the ecological complexes

occur and the ways in which they interact with each other and their environment (Ramesh, 2003). Evaluation done using the IUCN Red List criteria shows that 40% of 40,177 species are now listed as threatened with extinction (irreversible) (Sharma, 2003, Gunawardene. et al. 2007: 1567). In light of this, the EBI (2003) concludes that the most feasible way to safeguard the ecology is to prevent degradation of habitats.

The first asset type *Human Capital* comprises the Labour market available, the level of education and the health status or environment available (Serrat, 2008). The quality and quantity of human capital in a household directly affects the economic situation of the human group. “Lack of human capital in the form of skills and education, for instance, is seen to affect the ability to secure a livelihood more directly in urban labor markets than in rural areas” (Rakodi, 2002a:10).

As stated by Basedau (2005) the oil industry employs mainly high-skilled workers to operate activities such as the running of the off-shore oil platforms and on-shore infrastructure, such as pipelines and refineries. The local population, however, has nurtured exaggerated expectations of employment opportunities. These hopes are likely to be dashed which, in turn, could lead to tensions between communities and oil companies. There could be an exception during the construction phase of the oil infrastructure when short-term employment of the local workforce is undertaken (cf. Waskow and Welch, 2005:122). The reality to be faced then is in comparison to other industries; the oil industry is predominantly capital-intensive and employs very little labour.

Environmental and health issues related to the extraction of natural resources have been also affecting human capital. A UNEP report published in 2009 points out that both

environmental pollution and conflicts caused by the production of raw materials raise the health risks of local population (UNEP, 2009). It is not only the raw material, in this case oil, which can be considered as a source of danger, but in the influx of foreign workforce that Livelihood Assets “introduced various diseases among the indigenous communities” (UNCTAD, 2007:151), including HIV/AIDS spread by prostitution, alcohol and drug abuse (cf. Waskow and Welch, 2005:122).

The ability to generate *Financial Capital* also dependent on wages or proceeds of work and living costs in a household’s success in developing a livelihood strategy. In contrast to rural areas where losses in earnings and income are often cushioned by subsistence form of life, monetary income is essential to survival in urban economies. As such, increasing costs of living which is not matched by increasing incomes becomes a burden for most households whose income generating opportunities are limited. Oil production is often accompanied by the influx of high-skilled foreign workers who easily cause increases the demand for certain goods and services. Unmet demand eventually also causes prices to rise. Irrespective of the these increases, income sources often remain unchanged, limiting the ability of local populations with no links to the oil sector to pay for goods that were previously affordable (ibid:122). This implies lower savings and less financial capital accumulation.

The term *Social Capital* embraces all social and community networks as well as the migration of people from one area to the other. It underscores the importance of social interactions and structures amongst individuals and households. The impact of oil production on the local social fabric can be incisive. It is believed that the influx of foreign workers has consequences on oil producing regions. Sometimes the social fabric within

communities could be shaken through “resentment among those who do not have jobs and the few that do” (ibid: 122). Further, it is argued that “the men who get jobs on a drilling site often abandon the traditional work and ways of life” (ibid:102) and this may become a motive for tension within the local community. Apart from those security threats, the increase of housing and living costs can trigger movements out of the community which destroys existing social networks.

Access to assets in every organized society is determined by the shape of structures and systems that have been put in place. These structures are captured under one umbrella as Policies, Institutions and Processes (PIP). They “influence how, where, when and by whom assets are accessed, used, controlled and decided upon” (FAO 2008:13). Interactions of organizations, institutions and individuals are decisively influenced by political processes and this determines the context within which individuals and households construct and adapt livelihood strategies” (DFID, 1999:1). PIP to a large extent borders on participation, power, authority, governance, laws, policies, public service delivery and social relations which are in turn also controlled by other characteristics such as gender, caste, ethnicity, age and so on” (ibid:1). Many people employ ways and strategies to develop their assets into livelihood outcomes depending on the existing PIP. DFID has outlined some aspects these strategies: “(1) poor people’s access to various assets (such as land or labour); (2) the benefits poor people are able to derive from different types of capital (through markets); (3) the environment for private sector investment; (4) the extent to which poor people are able to engage in decision-making processes; and individual and civil society rights” (ibid: 1).

Local communities agreed that just as oil sands extraction could bring a number of positive benefits; adverse negative impacts on their social and economic setting might also be felt. Numerous problems that would affect the individual, family and community are therefore envisaged if the oil sands project comes into being. Indeed, the general consensus among communities is that every development activity, oil sands not an exception, could result in some undesirable conditions, apart from deformity of the surrounding. This submission tallies with Bridge's (2004:246) argument that: "aesthetic and physical safety concerns have been progressively supplemented by struggles over the impacts of mining on human health, agricultural productivity, and ecosystem function".

It appears a common theme those oil sands mining can result in some anti- social activities that are intolerable to the communities. The influx of foreign and non-local migrants to the communities bring banditry, alter local lifestyle, and increase competition for existing natural resources. The Omi community leader have observed that the community is relatively safe from robbery at present, but worried that mining comes with the threat of petty theft, and assault on mine workers and the local people. Despite the fact that traditional rulers have very limited control over migrants, they are nonetheless unwilling to condone any act of abomination or sacrilege within the community. To buttress this view elsewhere, Gibson and Klinck's (2005) study of indigenous communities in Canada indicates that income earned from oil sands employment has also led to detrimental negative social impacts such as alcoholism and drug abuse. Ijuba-Ijuoshun and Legbogbo communities, however, hold the conviction that any violent crime is likely to be committed by an outsider, and not by a member of the communities. The fear of women regarding promiscuity in the mining industry was given empathy.

Synthesis and gap analysis

This review of the contributions and limitations of existing literature provided a basis for developing the main proposition of the thesis; however some work had already been done. If oil exploration effects are not well checked result in further damages once development stage kick starts, there is need to devise approaches and minimize impacts, communication, consultations and consistency of compensation are vital to community acceptance. Oil exploration induces infrastructural development focus on roads which lead to economic transformation this enhances standard of living, creating wealth and jobs. Oil exploration can create a shift in the sectors; this is a price of oil exploration activity. Over time localities where oil exploration is actually located compared to the rest of the country tend to suffer from lower economic growth. Therefore the study focused on socio economic effects of oil exploration among Hoima municipal.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter presents the methodology that was used during the study. It involved the research design, study population, sample size and selection, sampling techniques, data collection methods, data collection instruments, procedure of data collection, reliability and validity of instruments, data analysis plus measurement of variables.

3.2 Research Design

The study used a descriptive analytical research design using quantitative and qualitative approach. The study employed purposive and simple random sampling to select the sample and the sample elements. This resulted into a sample size of 146 respondents. Both quantitative (questionnaire) and qualitative (interviewing) data collection approaches were used in order to achieve a high degree of reliability and validity of results. The two methods complemented each other to address the inadequacies of each particular method. A questionnaire, interview guide ‘Social economic effects resulting from oil surveying and mapping’ were answered using qualitative approach; effects of road construction, economic transformation, influx of people were answered using both qualitative and quantitative approach. Brewerton (2001) asserts that a case study provides an in-depth study of the problem with limited time scale. He further asserts that the notion of combining qualitative and quantitative data in a case study research offers the promise of getting closer to the whole of a case in a way that a single method study could not achieve.

3.3 Study Population

According to Amin (2005:235) a target population is the population to which the researcher ultimately wants to generalise the results. The target population of the study was 240 respondents drawn from the two out of four divisions of Hoima Municipality and included those involved in or with knowledge about the social economic effects of oil exploration activities on the well being of communities and included: 8 from international oil companies, 150 area residents, 20 politicians, 16 municipal administrators, 46 local council members.

3.4 Determination of Sample Size

This refers to the number of items being selected from the universe to constitute a sample (Kothari, 2004).The respondents comprised both sexes but of different marital statuses, different levels of education and age groups.

The sample size used was 146 respondents and included 113 community members, 10 municipal administrators, 13 local council members, 8 politicians, 2 oil companies and were selected basing on a formula for determining sample size by Yamane (1967,p.886).

Below is the Yamane formula of determining sample size

$$n = \frac{N}{1 + N(e)^2} = \frac{240}{1 + 0.65} = 146$$

Where

n - Sample size

N - Population size

e - Level of precision

3.5 Sampling techniques and procedure

The study used simple random sampling and purposive sampling, Simple random sampling was used because respondents had equal chances of being selected or picked. The entire process of sampling was done in a single step with each subject selected independently of other members of population and purposive sampling procedures. Purposive sampling was used to select different activities in the area of investigation in order to get firsthand information from the key informants; in this case respondents who are knowledgeable or experts in the area of oil and gas.

Table 1: Category, target population, sample size and sampling technique that were used in the study

Category	Target Population	Sample size	Sampling Techniques
Municipal Administrators	16	10	Purposive sampling
Oil companies	8	2	Purposive sampling
Area residents	150	113	Simple random sampling
Local councils	46	13	Purposive sampling ling
politicians	20	8	Purposive sampling
Total	240	146	

3.6 Data Collection methods

Data was collected from primary and secondary sources. Secondary data was got from the existing reports and magazines whereas primary data was obtained by distribution of questionnaires to the respondents.

Mugenda and Mugenda, (2005) state that questionnaires are used to obtain vital information about the population and ensure a wide coverage of the population in a short time. In addition, Sekaran (2003) states that questionnaires are an efficient data collection mechanisms where the researcher knows exactly what is required and how to measure the variables of interest. He further asserts that administering questionnaires to a number of interests simultaneously was less expensive and time-consuming and does not require much skill to administer as compared to conducting interviews.

3.6.1 Data collection instruments

A self-administered questionnaire was used with closed ended questionnaire in which responses were provided by the researcher for example strongly agree, agree, strongly disagree and key informants were interviewed to help the researcher obtain additional in-depth information useful in the phenomena under investigation. It focused at collecting respondent's opinions and attitudes that may not be easily obtained from questionnaires. An interview guide was also used where the researcher conducted face-to-face interactions and conversations with the sole aim of soliciting data. The researcher used both formal and informal interviews with the respondents. This enabled the researcher to get more information in greater depth, reduce resistance and also obtain personal information from the respondents.

3.7 Pretesting (Validity and Reliability)

3.7.1. Validity

Validity refers to the degree to which results obtained from analysis of the data actually represents the phenomenon under study. The validity of the research instrument was

determined by pretesting. Mugenda and Mugenda, (2005) assert that pretesting ensures clarity and accuracy of results so that data collected gives meaningful, reliable results representing variable in the study. Pre-testing helped to estimate the time needed to fill the questionnaires, pre-testing was done by administering to ten respondents within the study population but outside the sample. Questionnaires were scrutinized by five colleagues at the University for their Peer Opinion on content and accuracy. Results from the field and opinion of colleagues helped identify gaps and make modifications to the instruments where necessary. The supervisor was also notified accordingly.

3.7.2 Reliability

According to Mugenda and Mugenda (1999) reliability referred to the measure of the degree to which a research instrument yields consistent results or data after repeated trials. Cornbach’s Alpha coefficient was used to measure reliability of the instruments. According to Amin (2005), an alpha of 0.5 or higher is sufficient to show reliability; the closer it is to 1 the higher the internal consistency in reliability (Sekaran, 2003). The questionnaire were pre tested using ten (10) respondents within the division and the reliability results were computed using the Statistical Package for Social Scientists (SPSS) and the scores were evaluated as below:

Strongly agree	Agree	Not sure	Disagree	Strongly disagree
1	2	3	4	5

3.8 Data analysis

The quantitative data involved information from the questionnaires and interview guide. Data from the field was too raw for proper interpretation. It was therefore vital to put it into order and structure it, so as to derive meaning and information from it. The raw data obtained from questionnaires and interview guide was cleaned, sorted and coded. The

coded data was entered into computer, checked and statistically analysed using the Statistical Package for Social Scientists (SPSS) software package to generate descriptive and inferential statistics. Descriptive analysis was applied to describe the primary variable and associated indicator items related to the study objectives.

3.9 Measurement of variables

The variables of the study were measured using the five-point Likert scale. Different variables were measured at different levels.

The variables were measured at nominal and ordinal scale. The nominal scale measurement were used in the first part of the questionnaire (demographics) which comprised items with some common set such as sex, age, marital status, designation and level of education of respondents. According to Mugenda and Mugenda (1999), nominal scales are assigned only for purposes of identification but do not allow comparisons of the variable being measured.

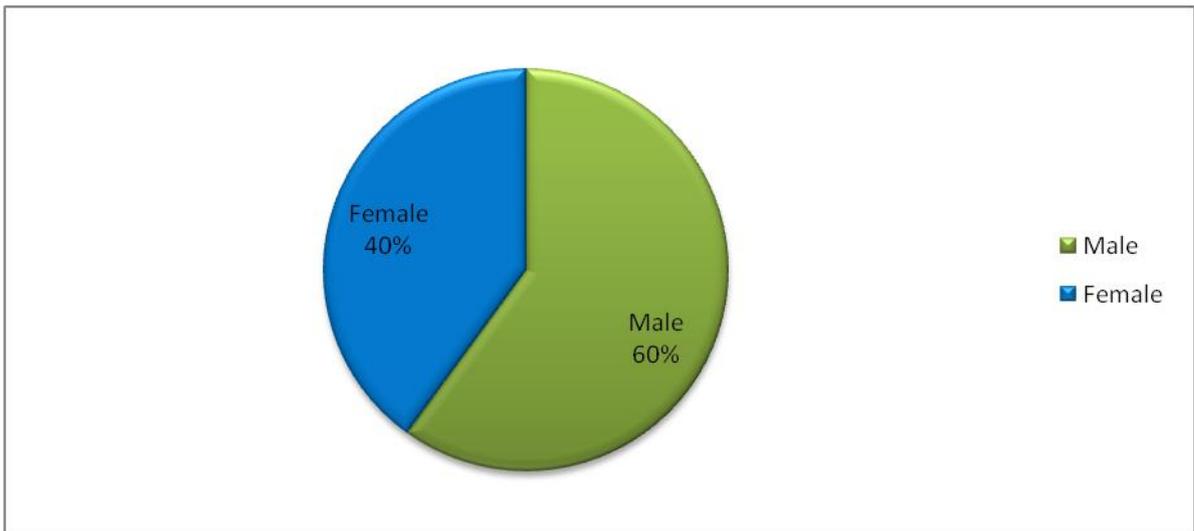
3.10 Ethical considerations

It was important during the process of research for the researcher to make respondents to understand that participation was voluntary and that participants were free to refuse to answer any question and to withdraw from participation any time they feel like.

Another important consideration, involved getting the informed consent of those going to be met during the research process, which involved interviews and observation on issues that may be delicate to some respondents. The researcher undertook to bear this seriously in mind.

Personal confidentiality and privacy are very important since the research was public. If individuals had used to provide information, it was important for their privacy to be respected. If private information had been accessed then confidentiality had to be maintained (Stephen, 2002). All respondents were therefore, re-assured of this before being involved.

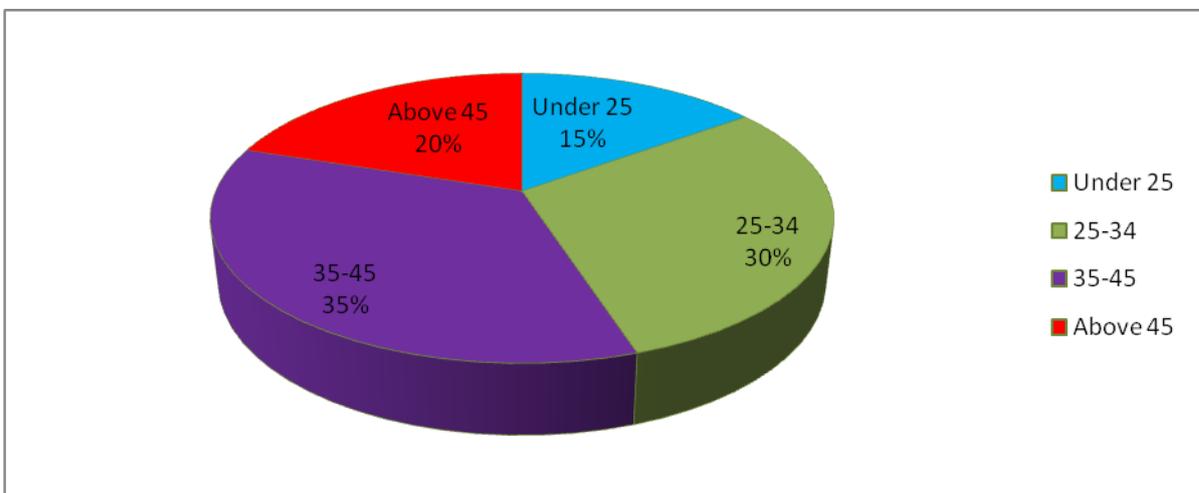
Figure 2: Respondents gender



Source; primary data (2016)

According to figure 2 above, the biggest percentage of the respondent's represented by 60% were found to be males whereas 40% of the respondents were found to be females this implies that male respondents actively participated in the study and they are heavily experience the socio-economic effects of oil exploration because they have families to look after.

Figure 3: Respondent age



Source; primary data (2016)

An assessment of the respondent's age was as follows; majority of the respondents represented by 35% were found to be of age between 35-45 these were followed by 30% of the respondents who were between 25-34, also 20% of the respondents revealed that they were 45 years and above lastly to not was 15% of the respondents who were found to under 25 years which implies that majority being 35-45 years the y were mature people and new the socio-economic effects of oil exploration among Hoima Municipality Communities as showed in the previous figure above.

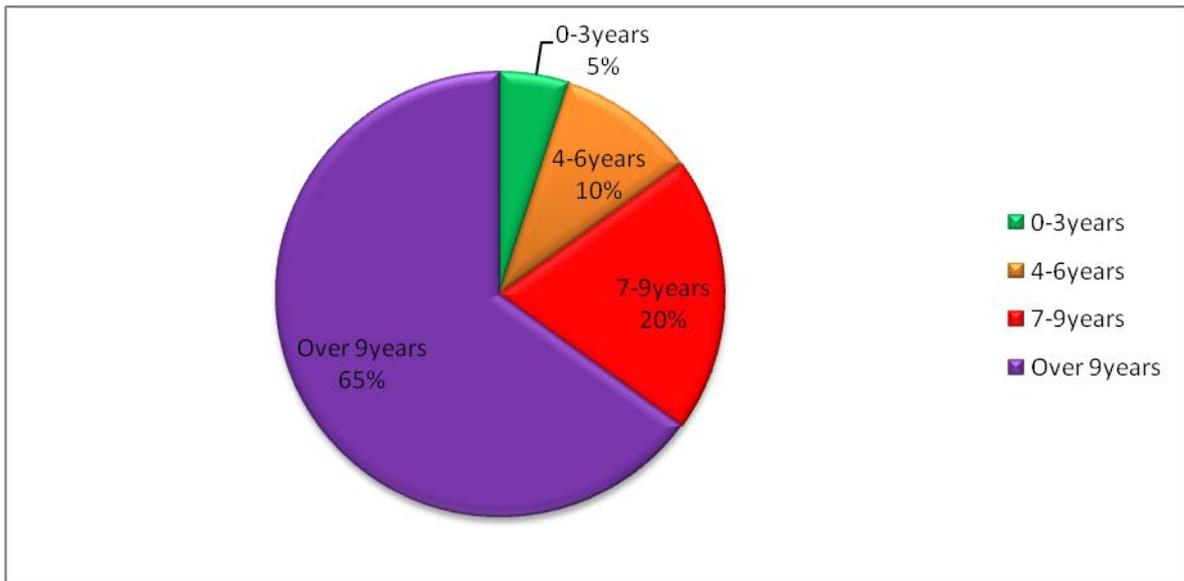
Table 2: Respondents marital status

Marital status	Frequency	Percentages
Married	70	48.0
Single	50	33.2
Separated	16	10.9
Widowed	10	7.8
Total	146	100

Source; primary data (2016)

Numerous responses were put forward when respondents were asked of their marital status and they were as follows; majority of the interviewees represented by 48.0% revealed that they were married people these were followed by 33.2% of the respondents who said they were single whereas 10.9% of the respondents said they has separated with their partners and lastly was 7.8% of the respondents who revealed that they were widows which implies that the biggest percentage of the respondents being married, had families and they were responsible people for this matter they felt the socio-economic effects of oil exploration in Hoima.

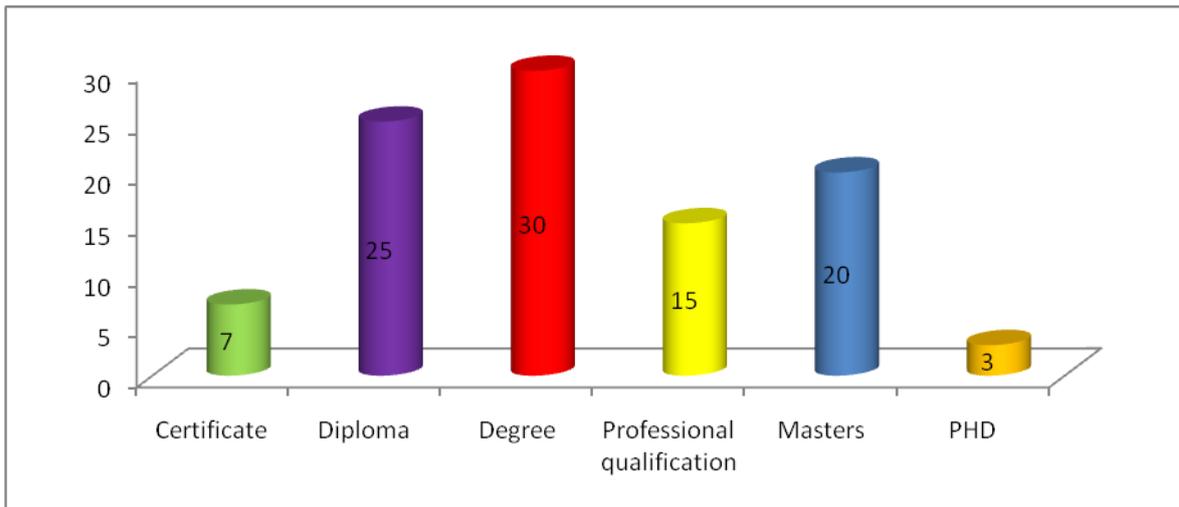
Figure 4: Period of stay in Hoima Municipality



Source; primary data (2016)

According to the filled questionnaires, it was found out that the biggest percentage of the respondents represented by 65% were found to have stayed in Hoima municipality for over 9 years whereas these were followed by 20% of the respondents who had stayed in Hoima municipality for years between 7-9 lastly but not the least 10% of the respondents revealed that they had stayed in Hoima municipality for years between 4-6 and lastly 5% of the respondents said they had stayed in Hoima municipality for between 0-3 years implying that the biggest percentage had leaved in the municipality and had settled with their families and for that matter they cannot escape the socio-economic effects of oil exploration where prices of the commodities have already changes

Figure 5: Respondents level of education attained



Source; primary data (2016)

Various views with their respective percentages were put forward when respondents were asked of the level of education they had attained, they were as follows; majority of them represented by 30% said they were degree holders, followed by 25% of the respondents who said were diploma holders and 20% of the respondents revealed that they were Master degree holders whereas 15% of the respondents also revealed that they had professional qualifications in different fields lastly but not the least 7% of the respondents said they were certificate holders and lastly 3% of the respondents said they were qualified with PHDs implying that majority having degree qualifications meant they understand the socio-economic effects of oil exploration among Hoima municipality communities which involves changes in the prices of commodities, influx of migrants, land conflicts.

4.3 Objective One: The effects of oil surveying to changes in prices of commodities in Hoima Municipality

Using item means of oil surveying, an assessment of the effects of oil surveying to changes in prices of commodities in Hoima Municipality was carried out. The items were

rated on the 5 point Likert scales ranging between strongly disagree, disagree, not sure, agree and strongly agree. The findings are shown in Table 6 below.

Table 3: Frequencies of effects of oil surveying to changes in prices of commodities in Hoima Municipality

	Item	Min	Max	Mean	Std. Dev
1.	Most food commodities around the municipality come from the oil area	1	5	2.45	1.23
2.	There is scarcity of commodities since oil exploration began in 2006	1	5	2.74	1.01
3.	There is price increase of commodities in Hoima municipality since oil exploration began	1	5	2.65	1.10
4.	People's farms were destroyed in areas where oil was discovered leading to increase in the food price of commodities in Hoima municipality	1	5	3.45	1.32
5.	Surveys and mapping engineers influenced the prices of commodities in Hoima municipality due to their consumption capacity	1	5	3.72	1.65
6.	Surveying and mapping Oil companies stocked a lot of commodities leaving scarcity in the municipality hence high prices	1	5	1.22	0.71
7.	More expensive commodities started to flock the municipality due to the middles and first class surveyors and mapping engineers hence scarcity of cheap ones	1	5	1.33	.719

Source: Primary data, (2016)

The results shown in Table 3; above reveal that respondents disagreed that most food commodities around the municipality come from the oil area (mean=2.45, disagreed). Respondents strongly agreed that; there is scarcity of commodities since oil exploration began in 2006 as revealed by (mean= 2.74, strongly disagreed) and responses on whether there is price increase of commodities in Hoima municipality since oil exploration began was represented as follows (mean= 2.65, disagreed) as some respondents emphasized that *people's farms were destroyed in areas where oil was discovered leading to increase in the food price of commodities in Hoima municipality* as represented with (mean= 3.45, strongly agreed). One of the respondents from the interview guided was quoted as follows: *"not some people may end up not consuming commodities due to increased prices"*. An analysis on surveys and mapping engineers influenced the prices of commodities in Hoima municipality due to their consumption capacity were as follows; (mean=3.72, agreed). A response from the interview guide noted: *"not really much because most food for these people were from outside the municipality. Also on surveying and mapping Oil companies stocked a lot of commodities leaving scarcity in the municipality hence high prices was as follows (1.22 disagreed). Also more expensive commodities started to flock the municipality due to the middles and first class surveyors and mapping engineers, hence scarcity of cheap ones as represented (mean 1.33 agreed) as responses from the interview were quoted: "most changes were in the sales of land due to the compensation received by displaced people other commodities changed but not so much"*.

Table 4: Correlations of the effects of oil surveying and changes in prices of commodities in Hoima Municipality

		Effects of oil surveying
Effects of oil surveying	Pearson Correlation	1
	Sig. (2-tailed)	.
	N	91
Changes in prices of commodities	Pearson Correlation	.869
	Sig. (2-tailed)	.022
	N	61

**** Correlation is significant at the 0.05 level (2-tailed).**

Table 4 shows that there is no significant relationship between the effects of oil surveying and changes in prices of commodities in Hoima Municipality ($r = 0.022$, $p = 0.869$). This is because $r = 0.022$ is less than in magnitude than 0.05. ($p = 0.05 < 0.869$). Therefore a null hypothesis (H_0) is rejected and it is concluded that there is no significant relationship between effects of oil surveying and changes in prices of commodities in Hoima Municipality.

4.4 Objective Two; Road construction effects to economic transformation in Hoima Municipality

Using item means of road construction, an examination of road construction effects to economic transformation in Hoima Municipality was carried out. The items were rated on the 5 point likert scale ranging between strongly disagree, disagree, not sure, agree and strongly agree. The findings are shown in Table 8 below:

Table 5: Frequency of road construction effects to economic transformation in Hoima Municipality

	Item	Min	Max	Mean	Std Dev
1	There was displacement of people in areas where roads to Oil exploration sites were constructed	1	5	3.78	1.01
2	People's property including houses and gardens were destroyed	1	5	3.92	0.91
3	There was increased number of migrants along road construction areas	1	5	2.23	1.11
4	People more especially the youth abandoned their activities and went for employment in road construction companies in the exploration areas	1	5	4.3	0.75
5	There was increased land grabbing due to road construction where some people were displaced to other areas	1	5	1.95	1.05
6	Compensated residents in areas where road construction took place caused inflation in Hoima municipality	1	5	4.14	0.67
7	Oil roads have led to improvement in incomes of communities	1	5	4.00	0.76
8	There was creation of temporary employment	1	5	4.00	0.76
9	There was increased rural urban migration due to excitements resulting from oil exploration	1	5	3.2	.312

Frequencies in Table 5; indicate that respondents agreed (mean=3.78) on the displacement of people in areas where roads to Oil exploration sites were constructed and respondents agreed (mean=3.92) people's property including houses and gardens were destroyed, respondents agreed (mean=2.23). A respondent from the interview guide was quoted: *“road construction affected agriculture in that there was destruction of gardens, trees and land”* in addition, *“social sector was improved where landlords are building better housing facilities anticipating for increased number of migrants in the municipality”*. There was increased number of migrants along road construction areas whereas responses on whether people, more especially the youth, abandoned their activities and went for employment in road construction companies in the exploration areas respondents agreed (mean=4.3), as responses from the interview guide were quoted thus: *“looked for employment opportunities, improved the standard of living due to earnings from the oil companies”*, and (mean=1.95) respondents revealed that there was increased land grabbing due to road construction. Where compensated residents in areas where road construction took place caused inflation in Hoima municipality respondents agreed (mean 4.14) and respondents also strongly agreed that oil roads had led to improvement in incomes of communities (mean 4.00) as it was quoted from the interview: *“easy transport, jobs creation to the locals, standard of living for the people attraction of tourists because of good roads”*. Similarly, respondents strongly agreed that there was creation of temporary employment with (mean 4.00) and, lastly, respondents agreed that there was increased rural urban migration due to excitement resulting from oil exploration represented with mean (mean 3.2). It was quoted from the interview guide that, *“farmers from the direction where oil was discovered had to get the chance to transport their commodities to the municipality as easy as possible because of the constructed roads and hence increased incomes and better livelihoods”*.

Table 6: Correlations of the road construction and economic transformation among communities in Hoima Municipality

		Road construction
Road construction	Pearson Correlation	1
	Sig. (2-tailed)	.
	N	91
Economic transformation	Pearson Correlation	.022
	Sig. (2-tailed)	.869
	N	61

**** Correlation is significant at the 0.05 level (2-tailed).**

Table 6 above shows that there is significant relationship between the road construction and economic transformation among communities in Hoima Municipality ($r = 0.022$, $p = 0.869$). This is because p (0.869) is greater in magnitude than 0.05 . ($p = 0.869 > 0.05$).

Therefore an alternative hypothesis (H_i) is retained and it is concluded that there was a significant relationship between road construction and economic transformation among communities in Hoima Municipality.

4.5 Objective Three: The effects of collection of seismic data to influx of people in Hoima Municipality

Using item means of collection of seismic data, an examination of the effects of collection of seismic data to influx of people in Hoima Municipality was carried out. The items were rated on the 5 point Likert scale ranged between strongly disagree, disagree, not sure, agree and strongly agree. The findings are shown in Table 7 below.

Table 7: Frequencies of the effects of collection of seismic data to influx of people in Hoima Municipality

	Statement	Minimum	Maximum	Mean	Std Dev
1.	Communities were informed about oil surveying before the exercise started	1	5	2.74	1.01
2.	Good cooperation existed between oil exploration company officials and the communities	1	5	2.65	1.10
3.	I participated during oil surveying and mapping	1	5	1.74	1.32
4.	There was population increase in Hoima municipality	1	5	1.22	0.71
5.	Oil companies listened to our views as a community during seismic data collection	1	5	1.33	.719
6.	Municipality officials set up programs aimed at sensitizing the public about oil exploration data collection and other related seismic information	1	5	3.3	.652
7.	The was increased crime in the municipality due to increased influx of people	1	5	2.1	.342
8.	Promised community support programs were aired out to the people	1	5	3.3	.652
9.	Oil companies listened to the community views	1	5	4.12	1.54
10.	Am pleased with the way the seismic data collectors communicate with my community	1	5	3.13	0.132
11.	Municipality officials assured the communities of their support in case of any misunderstanding with oil exploration companies	1	5	4.02	1.43

Source: Primary data (2016)

According to Table 7; above, respondents disagreed that communities were informed about oil surveying before the exercise started (mean=2.74, disagreed). One of the respondents was quoted from the interview guide to have said “*we just saw people coming with machines and gadgets*”. Respondents strongly disagreed about good cooperation existing between oil exploration company officials and the communities were as follows: (mean= 2.65, strongly disagreed) and responses on participation during oil surveying and mapping were as follows (mean= 1.74, disagreed). Responses on whether there was population increase in Hoima municipality mean= 3.45, agreed). A quote from the interview said: “*there was increased prostitution due to population increase, high rate of HIV/AIDS, intermarriage, unemployment due to high numbers of vying for opportunities*”. An analysis on whether Oil companies listened to peoples’ views as a community during seismic data collection were as follows: (mean=1.33, disagreed). Responses on whether municipality officials set up programmes aimed at sensitizing the public about oil exploration data collection and other related seismic information showed that: (mean= 3.3, disagreed), as responses from the interview guide were quoted saying: “*we were not well informed, the programs they brought on radio were about how oil will benefit the region but not anything related to seismic data collection*”. Responses on whether there was increased crime in the municipality due to increased influx of people were as follows: (mean=2.1 agreed,). Promised community support programmes were aired out to the people (mean= 3.3, disagreed). Also respondents disagreed Oil companies listened to the community views (mean 4.12 disagreed). And respondents disagreed that they were pleased with the way the seismic data collectors communicate with community (mean 3.13 disagreed). Also, respondents agreed that Municipality officials assured the communities of their support in case of any misunderstanding with oil exploration companies with (mean 4.02).

Table 8: Correlations of collection of seismic data and influx of people

		Collection of seismic data
Collection of seismic data	Pearson Correlation	1
	Sig. (2-tailed)	.
	N	91
Influx of people	Pearson Correlation	.022
	Sig. (2-tailed)	.869
	N	61

**** Correlation is significant at the 0.05 level (2-tailed).**

Table 8; shows that there is no significant relationship between the factors that influence employees of a company in post-acquisition stage in the banking sector and service delivery ($r = 0.022$, $p = 0.869$). This is because p (0.869) is greater in magnitude than 0.05 . ($p = 0.869 > 0.05$). Therefore a null hypothesis (H_0) is rejected and it is concluded that there is no significant relationship between the factors that influence employees of a company in post-acquisition stage in the banking sector and service delivery

4.6 Regression analysis

Regression analysis was used to examine the oil surveying, road construction effects and effects of collection of seismic data.

Regression Model

$$Y_i = \beta_0 + \beta_1 X_i + \epsilon_i: \text{Linear relationship between } Y_i \text{ and } X_i$$

i = each observation

Y = Dependent Variable: Social economic effects

X = Independent Variable: Oil exploration activities

β_0 = intercept, also called the constant of regression. It tells us the predicted value of Y when X = 0.

β_1 = The coefficient that tells us how Y changes for unit change in X.

ε_i = Error term.

Table 9: below shows the regression model for oil surveying, road construction effects and effects of collection of seismic data

Model	Unstandardized coefficients		Standardised coefficients		
	B	Std. Error	Beta	T	Sig
Constant	-5.735	108.362		-.053	.966
Oil surveying	.691	.955	.506	.723	.601
Road construction effects	.598	.996	.397	.601	.656
Effects of collection of Seismic data	-.174	.672	-.186	-.259	.838
R- Square =0.584, Adjusted R- square = 0.665, F= 0.468, Sig = 0.760					

Source: primary Data (2016)

Table 9; shows a linear relationship between oil surveying, road construction effects and effects of collection of seismic data (F= 0.468, Sig = 0.760) Oil surveying, Road construction effects and effects of collection of seismic data.

Oil surveying (Beta = 0.506) explained more to effects of collection of seismic data, followed by road construction effects (Beta = 0.397). This implied that for road construction effects to overcome there must be a proper seismic methods used that can help better road construction procedures and proper oil surveying needs to be carried out in the areas covered by oil.

OBSERVATION, INTERVIEW GUIDE SUMMARIES

The effects of oil surveying to changes in prices of commodities in Hoima Municipality

The results showed that the consumption quantities of major food commodities in Hoima Municipality decrease due to high prices resulting from oil surveying and exploration. At the same time, expenditure increases, this leads to erosion of some of the consumers' savings. High food and other commodities expenditure has made lower income group in the municipality more fragile and sensitive for any future increase in both food and other commodity prices. The perception of consumers for price increase in the future is also registered which reflects the lower consumer confidence in the commodity markets. The respondents iterate the absence of the role of the government to control the commodity markets that may reduce the impact of higher commodity prices. Therefore, the study recommends that government should intervene through food policy to mitigate the effects of food price volatility.

Road construction effects to changes in income in Hoima Municipality

Rural roads are the basis for transformation and communication. They constitute the most critical infrastructure in the rural, and by extension national development drive. Contributions of roads construction to rural development include: changes in income, accelerated delivery of farm inputs and evacuation of product and reduction in the cost of transportation. On the other hand, lack of rural access roads has killed the dreams and resilience of those who may have chosen to live in the villages with their villages cut away from the municipality and potentials in the villages wasting away. These sets of people have chosen to join the rest for urban life. Since majority of economic activities in our society depend in one way or the other on road infrastructure, Hoima municipality was

making an effort to provide roads to bridge the rural people to the municipality. This work therefore assessed the impact of government effort in the provision of rural road and bridges on the socio-economic transformation of Hoima municipality focusing mainly on incomes. The study further revealed that provision of roads has equally helped to reduce the cost of transportation into the municipality. Above all, it has reduced rural urban drift in the municipality. Based on this, the study recommended that the government should sustain the present tempo by increasing fund allocation in the annual budget for road construction in both rural areas and the municipality.

The effects of collection of seismic data to influx of people in Hoima Municipality

On demographics of the major commercial centres in Hoima Municipality the population tremendously increased during this period as reported. Hoima Municipality which had a population of many villages in the district was now having greater population increases when oil discoveries brought in prospectors, investors, field labourers and businessmen. However it is important to note the growth in some communities might be driven by exploration of oil resources, so once demand slows down, populations may rapidly decline.

One of the most significant demographic changes in Hoima municipality was the percentage of urban dwellers which increased. According to the Jobs and oil living earth project report (2013) in western Uganda, Hoima municipality because exploration activities there has been influx of people posing challenges to municipality the capacity of the council to provide infrastructure and other services is stretching the council's resources to the limit. It is also leading to unplanned development including encroachment on road reserves and wetlands and the expansion of slums increase in immoral behaviours.

CHAPTER FIVE
SUMMARY, DISCUSSION OF FINDINGS, CONCLUSION AND
RECOMMENDATIONS

5.1. Introduction

This chapter dealt with the summary, discussion, conclusions and recommendations related to the socio-economic effects of oil exploration among Hoima municipality communities, Uganda. The issues were to establish the effects of oil surveying to changes in prices of commodities in Hoima Municipality; to examine road construction effects to economic transformation in Hoima Municipality; and, to ascertain the effects of collection of seismic data to influx of people in Hoima Municipality.

5.2 Summary of the Findings

5.2.1 Objective One: the effects of oil surveying to changes in prices of commodities in Hoima Municipality

From the field findings, it was found out that respondents strongly disagreed that there was scarcity of commodities since oil exploration began in 2006 as revealed by; (mean= 2.74, strongly disagreed) and responses on whether there is price increase of commodities in Hoima municipality since oil exploration began was represented as follows (mean= 2.65, disagreed) as some respondents emphasized that peoples' farms were destroyed in areas where oil was discovered, leading to increase in the food price of commodities in Hoima municipality as represented with (mean= 3.45, strongly agreed). In response to the above findings, it can be concluded that commodities prices rose only in some few parts of the municipality, for example in places which were hosting the oil surveying staff, oil exploration staff and other workers whom they believed had a lot of money. In the same way, i agree with the respondents that the issue of scarcity of commodities was not right

because the number of staff who were working in oil exploration, surveying or even roads construction was not that much to an extent of making commodities scarce in Hoima municipality.

5.2.2 Objective two: road construction effects to changes in income in Hoima Municipality

Respondents revealed that there was increased land grabbing due to road construction where compensated residents in areas where road construction took place caused inflation in Hoima municipality. Respondents agreed (mean 4.14) and respondents also strongly agreed that oil roads have led to improvement in incomes of communities (mean 4.00). Similarly, respondents strongly agreed that there was creation of temporary employment with (mean 4.00) and lastly respondents agreed that there was increased rural urban migration due to excitement resulting from oil exploration represented with mean (mean 3.2). In response to the findings on road construction effects to changes in income in Hoima Municipality this was true because very many people who were compensated shifted to Hoima municipality and sought temporary settlement. And since they had the capacity to afford accommodation from the money they were compensated, they could also spend a lot on alcohol, hence inflation in the municipality.

5.2.3 Objective three: the effects of collection of seismic data to influx of people in Hoima Municipality

Additionally, respondents agreed that because of seismic data there was increase of people in the municipality who flocked in search of employment (mean 2.12 agreed). Respondents agreed that the number of people in the municipality increased to an extent that there was lack of accommodation, food, and there was increased crime among the

communities (mean 2.13 agreed). In response to this finding, it was noted that oil company officials only could collaborate with municipality officials like the resident district commissioner, police and other security organs to try handling the increasing numbers and its associated effects. Also community members felt the people should not just come into the municipality because at this stage the jobs available cannot absorb the number of the people entering the municipality.

5.3 Discussion of the Findings

5.3.1 Objective One: the effects of oil surveying to changes in prices of commodities in Hoima Municipality

The findings were that there was no scarcity of commodities since oil exploration began in 2006, there was price increase of commodities in Hoima municipality since oil exploration began was and that people's farms were destroyed in areas where oil was discovered leading to increase in the price of food and other commodities in Hoima municipality. These findings contradict Walters, (2015) who observes that in the experience of his Council (South Taranaki District Council), the main issues of community concern with respect to petroleum exploration were "noise, road damage and road safety, visual impact and more noise" with the addition of excessive light at night, vibration, dust, and stock disturbance. A number of approaches were developed and used to minimize these impacts. Local authorities worked to develop uniform approaches to district planning and companies recognized that communication, consultation and consistency of compensation are vital to community acceptance. The voluntary land access code agreed by Federated Farmers which clarified company and community responsibilities was considered a significant advance. In conclusion, the hypothesis (Ho) was rejected and it was concluded

that there was no significant relationship between effects of oil surveying and changes in prices of commodities in Hoima Municipality.

5.3.2 Objective two: road construction effects to changes in income in Hoima Municipality.

Field findings were increased land grabbing due to road construction where compensated residents in areas where road construction took place caused inflation in Hoima municipality. Oil roads led to improvement in incomes of communities and there was increased rural urban migration due to excitement resulting from oil exploration. In a related way, Fox and Pimhidzai (2013) revealed that a strong, growing, sustainable economy is the goal of every nation in the world. A sustainable economy enhances a nation's standard of living by creating wealth and jobs, encouraging the development of new knowledge and technology and helping to ensure a stable political climate. In addition, the Texas oil exploration boom sometimes called the gusher age was a period of dramatic change and economic growth in the United States state of Texas during early 20th century that began with discovery of a large petroleum reserve near Beaumont Texas. The fund was unprecedented in its size and ushered in an age of rapid regional development and industrialization that has few parallels in United States history, Texas quickly became one of the leading oil producing states in the US along with Oklahoma and California. In conclusion, the hypothesis (H_i) was retained and it was concluded that there was a significant relationship between road construction and economic transformation among communities in Hoima Municipality.

5.3.3 Objective three: the effects of collection of seismic data to influx of people in Hoima Municipality

Findings were that Oil companies did not listen to the community views while collecting seismic data; community was not pleased with the way the seismic data collectors communicated with them. In the same way, Sibson (2011) pointed out that the distribution of population and its concentration is a major point of concern when addressing possible effects of seismic activities. A simpler yet effective way to understand possible threat from oil exploration, population residing in an area is the ‘population potential’ which defines the number of persons within a given distance from a point. Population potential is an indicator of population pressure on a centre or a node assumed to be the point of maximum population concentration which diminishes outward from the node. The high values of population potential denote a higher concentration of population and vice versa. Natural neighbor interpolation finds the closest subset of input samples to a query point and applies weights to them based on proportionate areas in order to interpolate a value. Therefore it can be concluded that if the indigenous people are not approached over issues pertaining their well-being, they can in the end fail to cooperate and talk negatively about the company and this drives us to a no hypothesis. (H_0) was rejected that there was no significant effect between collection of seismic data and influx of people.

5.4 Conclusion

5.4.1 Objective One: The effects of oil surveying to changes in prices of commodities in Hoima Municipality

Drastic commodity price increments were obvious since commodity owners took advantage of the incoming oil company workers and a group of compensated

communities. The frustration can be felt everywhere no matter where the people are coming from. Especially young people, women and other marginalized groups (such as workers in the informal sector or unemployed people) are the most affected. This frustration could lead eventually to social unrest and conflicts, for example, for those who lost their properties during surveying and were not satisfied with the compensation which may threaten the stability of Hoima municipality and the region at large. Coincidences such as demonstrations and unrest in Hoima, the neighboring district and western region should be already an eye-opener for the elite in the country that the current problems may be the causes for future violent conflicts.

The tendency of increasing commodity prices may have different reasons. Firstly, the businessmen and owners of properties would like to have their share of being now an oil producing region. As soon as the oil discovery was announced, prices for food commodities, rent and services went up in Hoima district. Nevertheless, it has to be mentioned that the costs of running businesses in the municipality have been increased immensely as well (rent, taxes, duties, etc.).

5.4.2 Objective two: Road construction effects to changes in income in Hoima Municipality

Because of factors mentioned above like increased land grabbing, improvement in incomes of communities and increased rural urban migration brought about by road construction connecting oil wells can lead to improved standards of living for the compensated residents in areas where road construction took place. However, this will not uplift all the community in Hoima town because not all the people in the municipality were compensated. Also not note, the increase in rural-urban migration could result into

social problems in Hoima municipality, in that crime rate were high, and there was increased spread of diseases (HIV/AIDS). Further to that, there might be emergence of small suburbs which might result into slums.

5.4.3 Objective three: The effects of collection of seismic data to influx of people in Hoima Municipality

The distribution of population and its concentration is a major point of concern when addressing possible effects of seismic activities. A simpler yet effective way to understand possible threat from collection of seismic data to influx of people in Hoima Municipality was the ‘population potential’ which defines the number of people within the municipality and where oil was being explored. Population potential was an indicator of population pressure on a centre or a node assumed to be the point of maximum population concentration which diminishes outward from the node.

5.5 Recommendation

5.5.1 Objective One: The effects of oil surveying to changes in prices of commodities in Hoima Municipality.

Engaging producers, consumers and traders to regulate the prices of commodities in markets around Hoima municipality would be of benefit. Also supplies of commodities should be made easier for example the cost of transporting food from rural areas to the town should be made cheap in order constant supply can be maintained. In addition, support should be provided to the oil bearing communities, and suffering people of the area where oil is produced.

In devising an adaptive strategy for better living of the people in Hoima municipality, most of the people should be encouraged to create economic activities and supported with

low interest rate loans that can provide them with earnings. These are possible alternative means of livelihood that should be invested in to give economic empowerment to the local people who feel they are affected by the increased commodity prices as a source of hope of life. The population should be encouraged to embrace micro credit schemes for the people to apply for loans to expand their small scale businesses hence boosting their incomes like youth livelihoods scheme, operation wealth creation.

5.5.2 Objective two: Road construction effects to changes in income in Hoima Municipality

The oil exploration companies should seriously put into consideration the impact mitigation and enhancement framework, as well as a social management plan in order to make those people whose environment has been directly impacted to have means of livelihood and a sense of belonging with improvements in the quality of their environment with respect to farmlands, houses and rivers.

The local residents should be encouraged to form cooperatives to go into farming of non-traditional export crops on large scale. The assurance that the area would be experiencing an influx of migrants offers a good prospect for a market. For those who would be doing farming and trading alongside any other business, there should be collaboration between the fishermen and the oil companies since oil exploration has been done among the fishing communities on Lake Albert.

Hoima is among 14 municipalities that are already benefiting from the municipal infrastructure development projects (USMID) which will expand urban infrastructure and enhance the capacity of the municipalities to generate own source of revenues, improve

urban planning and strengthen financial management, procurement, environmental and social systems.

5.5.3 Objective three: The effects of collection of seismic data to influx of people in Hoima Municipality

For positive and satisfactory influence of oil activities among communities in Hoima municipality and all major stakeholders (Government and oil multi-national companies) should embark on meaningful empowerment in form of sustainable employment, practical skill acquisition for youths and women including free health care and social services for the elderly.

Ensure that the Department of Petroleum Exploration, Production and Development (PEPD) effectively performs its regulatory function of monitoring and controlling the activities of the petroleum exploration and production including the processes of oil licensing, enforcement of the implementation of the Corporate Social Responsibility and the Global Memorandum of Understanding (GMoU) signed by both the petroleum exploration and production Multinationals and their host communities.

5.6 Contribution of the study

As countries find new grounds and discover new natural resources, it is expected that their economies would receive a boost which will translate into better living conditions for their citizens. This study takes a look at how a new natural resource discovery (oil) would impact on the lives of people living close to the catchment area in economic and environmental terms. Just like other publications have done, it is adding to the existing stock of literature on natural resource management. Specifically, the study takes an in-

depth look at how local residents would be catered for differently from how communities in other parts of Hoima municipality or Uganda at large have been treated. It also explores the strengths and weaknesses of institutions of oil exploration companies and to stimulate future debate and research on Uganda's oil.

5.6.1 Body of knowledge

Activities associated with oil exploration, development and production operations have local detrimental and significant impacts on the atmosphere, soils and sediments, surface and groundwater, marine environment and terrestrial ecosystems in the Hoima municipality. Many approaches need to be developed for the management of environmental impacts of oil production-related activities and several environmental laws have been institutionalized to regulate the oil exploration industry in Hoima municipality. However, effective understanding of oil exploration and associated socio-economic effects need more multidisciplinary approaches for sustainable risk mitigation and effective environmental protection of the oil-producing host communities in the Hoima municipality.

5.6.2 Management practice

Awareness of the importance of social- economic issues has become more and more central to the thinking of the oil industry and regulators in the last few decades. This study provides an overview of the social- economic issues and the technical and management approaches to achieving high environmental performance in the activities necessary for oil and gas exploration and production in the in Hoima municipality. Management systems and practices, technologies and procedures are described that prevent and minimize impact. The continued sharing of best practices and the application of comprehensive

management systems by oil companies and their contractors and suppliers are essential. The role of government in setting and enforcing regulations was also key to minimizing the potential social- economic impact. The trend towards performance-based regulations, rather than the traditional command and control approach, has the potential to stimulate more innovative and effective social- economic management in all areas of the world. Consultation with local communities and other legitimate stakeholders is also an essential element of good social- economic management.

5.6.3 Theory

Regarding background of stakeholder theory it was embedded in the management discipline in 1970s and gradually developed by Freeman, (1984) incorporating corporate accountability to a broad range of stakeholders. Sundaram and Inkpen, (2004) contends that stakeholder theory attempts to address the group of stakeholder deserving and requiring management's attention whilst Donaldson and Preston (1995) suggested that the firm is a system where there are stakeholders and the purpose of the organisation is to create wealth for its stakeholders.

The Dependency theory derives its tradition from Marxism. The Marxists argue that the wealth and poverty of nations results from the global process of exploitation. The theory argues that the underdevelopment of the Third World countries is neither as a result of cultural backwardness nor poor technological development; rather it is as a result of unequal economic relation between the rich North and poor South. This is the situation that Andre Gunder Frank refers to as "the development of underdevelopment". The problem of the country is not the lack of technological know-how, cultural traits conducive to development, or modern institutions, but they have been to the exploitation

of the international capitalist system and its special imperialist agents, both domestic and foreign. By dependence in this work, we mean a situation in which the economy of certain countries is conditioned by the development and expansion of another economy to which the former is subjected. Dependency theory explains the underdeveloped status of the Third World countries. The theory also focuses on the explanation of the economic dependence of Third World states on developed countries of the world.

5.6.4 Conceptual contribution

There are many uncertainties and possibilities that will affect the scale and nature of the economic and social impacts from the development of oil and gas in the Hoima municipality. A key element of this study is the development and use of a range of scenarios for the future development of oil. The purpose of developing scenarios is not to set out every possibility, but rather to inform the communities, Government and businesses in the Hoima municipality about a plausible range of futures and the associated opportunities and challenges.

5.7 Limitation of the study

In the process of carrying out this research, a number of limitations were met. These limitations obstructed the speed at which the study was carried out and these included; Some targeted respondents were not willing to set aside time to respond to the investigator's questions. This ended up frustrating the researcher's efforts to collect substantial data. However, this was handled in a way that the researcher assured that respondents that the study was strictly for academic purposes.

The researcher also faced a problem of some rude and hostile respondents. This was overcome by assuring the respondents that the study was going to benefit them in terms of improving their socio-economic status and was going to solve the effects of oil exploration in the municipality. The study required a lot of time to be dedicated to collecting substantial data from one respondent to another making observations, continuous review of literature, data analysis and report writing to delay. However, this was handled by abandoning other programmes and concentrating on carrying out research in order to meet the time dedicated.

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APPENDICES

APPENDIX I: QUESTIONNAIRE

SELF-ADMINISTERED QUESTIONNAIRE FOR THE RESPONDENTS IN HOIMA MUNICIPALITY

Dear respondent!

My name is Samuel Mugisa a student at Uganda Technology and Management University (UTAMU) pursuing Executive Master's Degree in Business Administration in Oil Governance and Management. This questionnaire is designed to collect information aimed at assessing the oil exploration activities and its social-economic effects on the well-being of communities in Hoima Municipality, Uganda. The information obtained will be strictly for academic purposes and it will be treated with utmost confidentiality. I kindly request you to fill this questionnaire. Thank you very much for your time and co-operation

SECTION A: Demographic data

(Tick in the appropriate box provided)

1. Your age

Under 25	25-34	35-45	Above 45

2. Gender

Male	Female

3. Marital status

Single	Married	Divorced	Widowed

4. For how long have you been in Hoima Municipality?

0-3years	4-6years	7-9years	Over 9years

5. What is the highest level of education you have attained?

Certificate	Diploma	Degree	Professional qualification	Masters	PHD

SECTION B: Effects of oil surveying to changes in prices of commodities in the municipality

Evaluate the following statements by ticking the appropriate alternative of your choice.

Strongly agree	Agree	Not sure	Disagree	Strongly disagree
1	2	3	4	5

	Statement	1	2	3	4	5
1	Most food commodities around the municipality come from the oil area					
2	There is scarcity of commodities since oil exploration began in 2006					
3	There is price increase of commodities in Hoima municipality since oil exploration began					
4	People's farms were destroyed in areas where oil was discovered leading to increase in the food price of commodities in Hoima municipality					
5	Surveys and mapping engineers influenced the prices of commodities in Hoima municipality due to their consumption capacity					
6	Surveying and mapping Oil companies stocked a lot of commodities leaving scarcity in the municipality hence high prices					
7	More expensive commodities started to flock the municipality due to the middles and first class surveyors and mapping engineers hence scarcity of cheap ones					

SECTION C: Road construction effects to changes in income

Evaluate the following statements by ticking the appropriate alternative of your choice.

Strongly agree	Agree	Not sure	Disagree	Strongly disagree
1	2	3	4	5

	Statement	1	2	3	4	5
1	There was displacement of people in areas where roads to Oil exploration sites were constructed					
2	People's property including houses and gardens were destroyed					
3	There was increased number of migrants along road construction areas					
4	People more especially the youth abandoned their activities and went for employment in road construction companies in the exploration areas					
5	There was increased land grabbing due to road construction where some people were displaced to other areas					
6	Compensated residents in areas where road construction took place caused inflation in Hoima municipality					
7	Oil roads have led to improvement in incomes of communities					
8	There was creation of temporary employment					
9	There was increased rural urban migration due to excitements resulting from oil exploration					

SECTION D: Effects of collection seismic data to influx of people in the municipality

Evaluate the following statements by circling/ticking the appropriate alternative of your choice.

Strongly agree	Agree	Not sure	Disagree	Strongly disagree
1	2	3	4	5

	Statement	1	2	3	4	5
1	Communities were informed about oil surveying before the exercise started					
2	Good cooperation existed between oil exploration company officials and the communities					
3	I participated during oil surveying and mapping					
4	There was population increase in Hoima municipality					
5	Oil companies listened to our views as a community during seismic data collection					
6	Municipality officials set up programs aimed at sensitizing the public about oil exploration data collection and other related seismic information					
7	The was increased crime in the municipality due to increased influx of people					
8	Promised community support programs were aired out the people					
9	Oil companies listened to the community views					
10	Am pleased with the way the seismic data collectors communicate with my community					
11	Municipality officials assured the communities of their support in case of any misunderstanding with oil exploration companies					

**APPENDIX II: INTERVIEW GUIDE FOR THE KEY INFORMANTS IN HOIMA
MUNICIPALITY**

Dear respondent!

My name is Samuel Mugisa a student at Uganda Technology and Management University (UTAMU) pursuing Executive Master’s Degree in Business Administration in Oil Governance and Management. This questionnaire is designed to collect information aimed at assessing the oil exploration and its social-economic effects on the well-being of communities in Hoima Municipality, Uganda. The information obtained will be strictly for academic purposes and it will be treated with utmost confidentiality. I kindly request you to answer this interview. Thank you very much for your time and co-operation.

1. Your age
2. Gender
3. Marital status
4. For how long have you been in Hoima Municipality?.....
5. What is the highest level of education you have attained?.....
6. What do you think are the effects of oil surveying and mapping to changes in prices of commodities in the municipality?.....
.....
.....
.....

7. What are some of the measures the oil companies put in place to counter the effects of oil surveying and mapping to changes in prices of commodities in the municipality?.....

.....

.....

.....

8. Do you think road construction had effects on changes in income?

.....

.....

.....

.....

9. Besides the economic sector, what other sector has road construction affected and how?

.....

.....

10. Do you think road construction during oil exploration had significant effects to changes in prices and incomes among Hoima municipality members? (If yes/no why)

.....

.....

.....

11. What do you think are the effects of collection seismic data and influx of people in the municipality?.....

.....

Thank you for participating.