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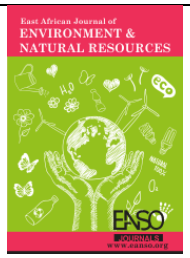

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Original Article

Effect of Upstream Stage of Oil Exploration on Property Rights in the Albertine Graven Region

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Oil Exploration, Property Rights, Albertine Graben, Upstream Stage, Household Survey, Qualitative Interviews, Policy Implications.

ABSTRACT

This study investigates the effect of the upstream stage of oil exploration on property rights in the Albertine Graben region, focusing on the impact of oil exploration activities on local households in the Bullisa and Hoima districts. Employing a cross-sectional survey design, data were collected from a representative sample of 335 households, alongside 18 key informant interviews with local leaders, security officers, and government workers selected for their in-depth knowledge of the issue. Analysis revealed a coefficient of determination (R^2) of 0.336, indicating that 31.2% of the variability in property rights violations can be attributed to the upstream stage of oil exploration. The ANOVA results demonstrated a significant positive effect of the upstream stage on property rights, with an F-value of 12.177 and a p-value of 0.003, indicating that upstream activities substantially contribute to the infringement of property rights. These findings underscore the need for effective policy measures to address the challenges posed by oil exploration and safeguard the rights of affected communities, while also highlighting the necessity for further investigation into additional contributing factors.

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INTRODUCTION

According to Nwankwo (2015), human beings depend on the resources they derive from the environment for their well-being and their survival. Warfare is a prominent human activity used to gain access to these resources. Oil, gas, and minerals are vital natural resources that meet crucial human needs. Whether for transport, for heating or for everyday goods and services, these resources constitute essential raw material inputs. Modern civilization would struggle to survive without readily available access to these resources at reasonable and affordable prices. It is for these reasons that these resources are considered to be strategic resources; critical for national and global well-being and prosperity.

Oil forms the largest percentage of energy consumption in the world, ranging from as low as 30% to as high as 60%, depending on the country's energy consumption level. Forming the world's largest industry in terms of dollar value, the industry which includes exploration, production, distribution, refining as well as retailing is the largest in the world (O'Callaghan-Gordo et al., 2023).

The world's nations interact with each other in their pursuit of external natural resources through governmental and non-governmental avenues in an astonishing variety of bilateral and multilateral ways. These international interactions change with time, ranging from cordial and synergistic to antagonistic and destructive (Lebedev, Peng, Xie, & Stevens, 2015). For instance, one of the several explicitly enunciated national-security objectives of the USA is to protect U.S. economic interests worldwide by maintaining steady access to energy supplies, other critical resources, and foreign markets. The relations among subdivisions or portions of a nation similarly range in changing patterns from the harmonious to the discordant. At the negative extreme of these spectra of international and domestic interaction are found overt threats of aggression and the actual pursuit of war (Lebedev, Peng, Xie, & Stevens, 2015).

Oil and gas exploration encompasses the processes and methods involved in locating potential sites for oil and gas drilling and extraction. Early oil and gas explorers relied upon surface signs like natural oil seeps, but developments in science and technology have made oil and gas exploration more efficient. Geological surveys are conducted using various means from testing subsoil for onshore exploration to using seismic imaging for offshore exploration. Energy companies compete for access to mineral rights granted by governments by either entering a concession agreement, meaning any discovered oil and gas are the property of the producers, or a production-sharing agreement, where the government retains ownership and participation rights (Kibumba, A. 2023). He added that exploration is high-risk and expensive, involving primarily corporate funds. The cost of an unsuccessful exploration, such as one that consisted of seismic studies and drilling a dry well, can cost $5 million to $20 million per exploration site, and in some cases, much more. However, when an exploration site is successful and oil and gas extraction is productive, exploration costs are recovered and are significantly less in comparison to other production costs.

Oil exploration activities in Uganda are concentrated in the Albertine Graben, in the western region of the country. The oil exploration area stretches from West Nile to the south-western tip of Uganda covering an area of 23,000 km2.land issue; compensation under the constitution, land act and land acquisition act is required for land to be acquired for public purposes which include oil exploration. The challenge is the poor are selling land to the rich at a cheaper price and who expect to

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benefit from the land; this is causing land conflicts and landless people, especially in Buseruka Sub-County.

Oil exploration is taking place along the entire western rift of the country, an area which is politically sensitive because it lies between two countries with a history of violent conflicts and border disputes. This area is also characterised by a number of conflicts, including violent rebellions, ethnic conflicts, land conflicts and insecurity according to the Independent, 4th June 2012. The Albertine region is also an area that embraces a multiplicity of local government authorities, traditional institutions and people of various ethnic groups. Given this fragmented identity, the discovery of oil has the potential to stir up tensions along different lines. Therefore, in Uganda, where rural livelihoods largely derive from natural resources, careful management of the impact of oil exploration is crucial for ameliorating the livelihood vulnerabilities of rural households as well as resolving the raging conflicts. It is important to consider mainstreaming conflict-sensitive analysis in programming for the oil and gas sector (Knutzen, A., & Smith, A. 2012).

Statement of the Problem

The upstream stage of oil exploration in the Albertine Graben region presents significant challenges related to property rights, which are deeply intertwined with theories of land ownership and resource extraction. As oil exploration intensifies, conflicts often arise over the interpretation and enforcement of property rights, particularly in the context of the absolute ownership theory, which asserts that landowners possess rights to the natural resources beneath their land (Nwankwo, 2015). However, the dynamics of oil migration and extraction can lead to disputes regarding ownership, as neighbouring landowners may capture resources that have migrated from their properties, resulting in a potential loss of rights for original landowners (Woodward, 1965). Additionally, the involvement of multinational oil companies can further complicate the legal landscape, as local communities may feel marginalized and inadequately compensated for the exploitation of resources on their ancestral lands (O'Callaghan-Gordo et al., 2023). This situation raises critical questions about the adequacy of existing legal frameworks to protect property rights and ensure equitable benefit-sharing among stakeholders. Consequently, there is a pressing need to investigate and address how the upstream stage of oil exploration impacts property rights within the Albertine Graben, to mitigate conflicts and promote sustainable resource management.

LITERATURE REVIEW

Theoretical Review

The study is guided by the absolute ownership theory and the Non- Ownership Theory. This theory propounded by Woodward (1965) states that whoever owns a piece of land owns the natural resources lying underneath it. Absolute ownership has been defined as "the actual right a person is having on a property. According to the absolute ownership theory, oil and gas are owned by the owner of the land where they are found and extracted. When they are extracted, they become the possessory personal property of the party that captures it. However, the theory also states that the ownership of crude oil can be denied to the landowner when the crude oil migrates and is captured by others. Hence, ownership of oil and gas could be lost by reasonable drainage and by the rule of capture. In the United States, this theory is also known as the "ownership in place theory".

The theory of absolute ownership of crude is built on the doctrine of ad coelom. Which states that the owner of a piece of land is regarded also as the owner of the petroleum lying underneath the land. Land in this regard includes everything down to the lowest and deepest part of the earth beneath the land and up to the sky. This means ownership of "land to an indefinite extent", upwards as well as downwards. The Latin maxim "cujus est solum, ejus

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est usque ad coelum ad inferos," which literally translates as: "to whomever the soil belongs he owns also the sky and to the depth."

This theory no longer works in favour of the claimants in many countries such as Nigeria and the UK. This is well illustrated in the following two cases (Heller, M. A. 1998). In both cases, the courts rejected the argument and claims that invoked the ad coelom doctrine. However, where the claimant is a sovereign authority or a national authority (e.g. the Government of Kenya) the ad coelom doctrine can be sustained. In jurisdictions like Kenya and Nigeria, natural resources are vested in the federal government. The federal government absolutely owns the minerals. The theory of absolute ownership is still valid in some parts of the United States and Canada. For example, in the province of Alberta, Canada, and in the US State of Texas, private landowners are permitted to own the oil and gas found on their lands.

The non-ownership theory by Woodward, M. K. (1965), emphasizes that no person owns the crude oil until produced, extracted or captured and controlled. However, the right to produce or extract crude oil is limited to those persons who own or have the right to drill on the land where the straddle of the crude is embedded.

This theory states that petroleum is not capable of being owned since it is fugacious (has the capacity to migrate). In essence, since crude oil is in fluid form and can move from one place to another, it cannot be owned in the strict sense of the word. There is not much support for this theory as modern practice shows that petroleum though may move from one place to the other is still subject to ownership by the person or authority that captures it at any particular point in time. "The substances are fugacious and are not stable within the container although they cannot escape from it. If any of the three substances (petroleum, gas or water) is withdrawn from a portion of the property which does not belong to the appellant but lies within the same container and any oil or gas situated in his property thereby filters from it to the surrounding lands, admittedly he has no remedy. So, also, if any substance is withdrawn from his property, thereby causing any fugacious matter to enter his land, the surrounding owners have no remedy against him. The only safeguard is to be the first to get to work, in which case, those who make the recovery become owners of the material which they withdraw from any well which is situated on their property or from which they have authority to draw (Low, C. A. 2008).

The two theories discussed above were selected due to their substance related to oil exploration and property rights for example; According to the absolute ownership theory, oil and gas are owned by the owner of the land where they are found and extracted. When they are extracted, they become possessory personal property of the party that captures it and the non-ownership theory by Jones (1965) emphasizes that no person owns the crude oil until produced, extracted or captured and controlled.

Related Literature

Upstream Stage and Property Rights

According to Ron (2015), the upstream segment of the oil and gas industry contains exploration activities, which include creating geological surveys and obtaining land rights, and production activities, which include onshore and offshore drilling. Oil and gas exploration encompasses the processes and methods involved in locating potential sites for oil and gas drilling and extraction. Early oil and gas explorers relied upon surface signs like natural oil seeps, but developments in science and technology have made oil and gas exploration more efficient. Geological surveys are conducted using various means from testing subsoil for onshore exploration to using seismic imaging for offshore exploration. Energy companies compete for access to mineral rights granted by governments by either entering a concession agreement, meaning any discovered oil and gas are the property of the producers, or a production-sharing agreement,

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where the government retains ownership and participation rights. Exploration is high-risk and expensive, involving primarily corporate funds. The cost of an unsuccessful exploration, such as one that consisted of seismic studies and drilling a dry well, can cost $5 million to $20 million per exploration site, and in some cases, much more. However, when an exploration site is successful and oil and gas extraction is productive, exploration costs are recovered and are significantly less in comparison to other production costs.

During the upstream phase of oil exploration, there is Contamination of water has been identified as another possible mechanism for observations of health risks. Women relying on surface water for household needs and men working in oil spill remediation recorded the highest levels of urinary mercury in oil extraction regions of Ecuador and Peru (O'Callaghan-Gordo et al., 2023). Overall, however, the urinary mercury levels in this population were consistent with global background levels, while 7% of participants exceeded World Health Organization background levels.

Only one study was found examining birth outcomes in relation to oil extraction. After adjusting for socioeconomic factors, women of child-bearing ages from exposed communities reported higher numbers of spontaneous abortions (OR: 2.47, 95% CI 1.61-3.79); however, no significant differences in stillbirth were observed (San Sebastian et al. 2002). This review did not identify any studies assessing birth outcomes, such as birth weight, pre-term birth, or birth defects.

Contamination of the earth occurs when drilling fluids are spilt during transport by truck or wastewater pipelines, failure of well casings, or leaks from tank pipes (Orłowski et al., 2016). Polluted lands can then impact human health through direct ingestion, crops, dermal contact, indoor and outdoor inhalation of soil particulates, and/or migration to groundwater, with field workers and nearby communities at highest risk for exposure.

Hydrocarbons, primarily measured as total petroleum hydrocarbons (TPH), comprise the major component of crude oil profiles, with hundreds of individual chemicals in a single TPH mixture. These profiles may vary between oil fields. A comparison of TPH soil concentrations between oil fields and farmlands in China found significantly higher concentrations in the oil fields, particularly in the top 15 cm of soil, likely as a result of direct oil spills or leaks (Teng et al. 2013). Similar results were observed around oil production sites in Nigeria, where the TPH concentrations are expected to have adverse effects on soil quality and microorganism health (Olobaniyi and Omo-lrabor 2016). Naphthenic acids, for example, are a naturally occurring component of nearly all crude oils and can persist in water and accumulate in sediments. These compounds have been found to be toxic to microorganisms, aquatic organisms, birds, and mammals (Pinzón-Espinosa & Kanda, 2020). An investigation across four oil fields measured naphthenic acids in all samples, and many samples were found to be at concentrations that exceeded reported ecotoxicity thresholds (Rodrigues et al., 2015). These compounds have been found to be toxic to microorganisms, aquatic organisms, birds, and mammals.

Exploratory well drilling activities last from 1 to 2 years, commonly 2 or 3 wells will be drilled during this exploratory stage (oil and gas journal, June 7, 1982). Environmental impacts associated with exploratory well drilling are obviously dependent upon precisely where the exploratory well is to be located; a well site on flat desert terrain will pose different problems than one located in a high mountain meadow. A preliminary environmental review occurs before an operator's plan is finalised and submitted. This review identifies potential conflicts with other land uses or resources and impact mitigation steps that might avoid these conflicts. The purpose of this review is to assist the lessee and operator in developing project plans and directing initial surveying and staking activities before they occur (Oil Industry International

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Exploration, & Production Forum. (1997), the author was not clear on the type of conflicts, therefore this needs further study.

Land is a very important resource. Several reports (e.g., Uganda Land Alliance, 2011, Asasira, A., COLONEL, L., & FORCE, U. P. S. D. (2020). indicate that oil exploration activities, such as the digging of seismic wells and drilling, have already led to changes in ownership of land, conflict, and displacement as well as an influx of migrants vying for opportunities in the Albertine Graben.

Not only is this growing migration likely to trigger population growth, increase land pressure, and escalate competition among the indigenous people and newcomers, it is also likely to place more demand on the already limited social services of education, health and water in the region. This large movement of people has implications for fiscal expenditure and allocation as well, making it critical to capture land issues, demographics and changes in social infrastructure, including schools and hospitals and other physical infrastructure aspects such as roads and telecommunications. In addition, there is a precedent of increased health and other social problems connected with oil exploration: For example, studies from Nigeria and Ecuador document increased health risks to communities as a result of pollution from oil exploration. There are also risks associated with the transfer of disease by migrant populations to their new communities (Inomiesa, O. 2015). Despite, the strength of the literature done by Uganda Land Alliance, more evidence is needed which necessitates further study.

Irrespective of their purpose, large-scale development and infrastructure projects require land, and sometimes very large tracts of land (Vanclay, 2017). Expected international practice suggests that any project should adhere to the following principles: involuntary resettlement should be avoided or at least minimised; where resettlement is unavoidable, all people affected should be compensated fully and fairly; involuntary resettlement should be conceived as an opportunity for improving the livelihoods of affected people and undertaken accordingly; and all affected people should be involved in the resettlement planning process to ensure adequate mitigation of adverse effects and to ensure the benefits of resettlement are appropriate and sustainable (IFC, 2012; Vanclay, 2017).

Many families were affected by the government's plan to build an oil refinery. In 2010, the government commissioned a Swiss firm, Foster Wheeler, to consider the feasibility of a refinery and to identify a suitable place to site it. It was established that 29 square kilometres would be needed for the refinery and associated works. The firm recommended Kabaale Parish in Buseruka Sub-county, Hoima District, an area which comprises 13 villages, as the most appropriate location. In 2013, the government started the process of resettling and compensating the over 7000 affected residents by paying them cash or relocating them to an alternative land (Kyomugasho, M. 2016).

METHODOLOGY

Research Design

The study adopted a cross-sectional survey design. Thus, data elicited from a representative subset of the study population at a specific point in time and the data gathered from the subset will be used to generalize for the entire population. Additionally, the study adopted a mixed method approach in data collection, whereby both quantitative and qualitative approaches were used in data collection. The quantitative approach involved the use of questionnaires, while the qualitative approach involved collecting data through face-to-face interviews and observations.

Population of the Study

The study considered a target population of 2500 households in Bullisa and Hoima districts affected by the oil exploration (Asinansi, N. 2023).

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Sample Size

The sample size is the number of observations taken from a population through which statistical inferences for the whole population are made. The study sample size was categorized into two: quantitative sample and qualitative sample.

Quantitative sample: The quantitative sample size was determined using the table of sample size determination by Krejicie and Morgan (1970). Based on the study population of 2500 house Households the sample size was determined to be 335 respondents.

Qualitative Sample

This consists of a section of the study population that was selected for key informant interviews. The study selected 18 key informants including local leaders, security officers and local government workers. The key informants were purposively selected based on the researcher's perception of their deep knowledge of the issue under investigation.

Table 1: Categorization of Qualitative Sample

S/N	Portfolio of Participants	Target population	Sample	Sampling Technique
1	Government officials	11	9	Purposive Sampling
2	Religious leaders	2	2	Purposive Sampling
3	Local government leaders	4	4	Purposive Sampling
4	Ministry of Land officials	3	3	Purposive Sampling
	TOTAL	**20**	**18**	

Source: *Respondents' data, 2023*

Sampling Technique

Sampling is the act, method, process or technique involved in the selection of a suitable sample size or a representative subset of a study population (Annual Report, 2022), for the purpose of determining parameters or characteristics of the whole population. The study employed two sampling techniques: Simple Random Sampling for quantitative data (questionnaires) and Purposive Sampling for qualitative data (interviews).

Sources of Data

In order to adequately address the purpose of the study and the research objectives, the study adopted two major sources of data: primary and secondary sources of data.

Primary Source

In this study, the primary source of data reflects the data elicited from the study participants through the administration of survey questionnaires and face-to-face interviews with key informants.

Secondary source

Secondary data refers to data that has already been collected and processed by another person other than the researcher. The source of secondary data for the study includes: books, peer-reviewed journals and publications of the government of Uganda.

Data Collection Instrument

The study utilized two main data collection instruments: survey questionnaires and interview guides, to elicit data from the study participants.

Survey Questionnaire

The researcher designed a survey questionnaire, which was used to collect data from the respondents. The questionnaire was structured on a five-point Likert scale ranging from: 1= strongly disagree; 2= disagree; 3= not sure; 4= agree; 5= strongly agree. Furthermore, the questions were designed into four segments that capture information about the demography of the respondents, as well as the three objectives of the

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study. A total of 335 questionnaires were distributed.

Interview Guide

In order to generate qualitative data, the researcher interviewed 18 key informants including 9 government officials, 2 religious leaders, 4 local government leaders and 3 ministry officials. An interview guide was designed as a template that guided the researcher during the interviews. The interview guide contained open-ended questions that were consciously designed to elicit valuable data from the respondents on the study objectives.

Data Quality Control (Validity and Reliability)

This deals with the validity and reliability of the data collection instrument. Data Quality Control ensures that the instruments used in data collection are capable of generating information that is reasonable enough to realize the purpose of the study, achieve the study objectives and answer the research questions.

Ethical Consideration

To ensure that the study followed appropriate ethical standards, the researcher obtained an introductory letter from the Directorate of High Degree and Research of Kampala International University. The letter was presented to the study participants to assure them of the essence of the study, thus it helped to eliminate suspicion about the actual reason for the research. Furthermore, the researcher informed the study participants of the confidentiality of the information provided. The participants were assured that the information collected from them was to be used solely for academic purposes. Furthermore, they were encouraged to use pseudonyms instead of their real names. Also, the respondents were informed of their right not to participate in the study or to discontinue should they at some point during the study feel uncomfortable to continue.

FINDINGS

Table 2: Descriptive Statistics on Upstream Phase and Property Rights

Statement	N	Mean	Std. Deviation	Interpretation
Oil Exploration and Land Rights				
At the upstream stage of exploration, people's settlements are affected in the Albertine Graben region.	335	3.62	1.319	High
At this stage, Oil exploration and production have a negative impact on food crop production.	335	3.85	1.349	High
The upstream phase of Oil exploration in the Albertine Graben region has hindered the economic activity of stone quarrying carried out by the local people in the region.	335	3.86	1.210	High
It has limited access to rivers through the distortions that have been created.	335	3.85	1.049	High
Oil exploration has resulted in the loss of land rights	335	4.14	.882	High
There has been limited access to swamps by the local people as caused by the interference of the oil exploration activities	335	4.15	.939	High

According to Table 2, findings showed that property rights in the Albertine Graben region of Uganda were affected at the upstream stage of oil exploration. This was ranked high as specified by the average mean (Mean = 3.65). This implies that the Upstream stage of oil exploration affects people's settlement in the Albertine Graben Region, for example, the building of roads and site

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preparation, comments are centred on vegetation clearance, possible erosion and changes in surface hydrology; vibration and noise from earth moving equipment; disturbance of population and wildlife; impacts related to influx and settlement through new access routes; drainage and soil contamination; land use conflicts; loss of habitat and construction noise. This was rated high with an average mean (Mean = 3.62).

Oil exploration and production have a negative impact on food crop production (Mean 3.85) this is because crude oil exploration destroys the necessary nutrients that will make crops grown on land and grasses livestock eat. These have led to poor agricultural outputs and income making a livelihood in agriculture unattractive.

Oil exploration in the Albertine Graben region has hindered the economic activity of stone quarrying carried out by the local people in the region (Mean, 3.86). Implying that an oil spill can harm birds and mammals in several ways: direct physical contact, toxic contamination, destruction of food sources and habitats, and reproductive problems. It has limited access to rivers through the distortions that have been created (Mean, 3.85), implying that Oil in sediments may be very harmful because sediment traps the oil and affects the organisms that live in or feed off the sediments.

Oil exploration has affected the lakes in the region and the access of people to the water body (Mean, 4.14) this implies that Produced water in offshore drilling is often discharged into the close aquatic environment. The discharge of this wastewater into the freshwater environment affects agricultural resources and destroys aquatic life. Oil spills can suffocate fish, get caught in the feathers of birds and mammals and block light from photosynthetic plants in the water. There has been limited access to swamps by the local people caused by the interference of the oil exploration activities (Mean, 4.15). This implies that because of the delay in oxygen availability caused by oil can increase stress on wetland plants, unable to supply enough oxygen to their root system. One of the religious leaders from the Albertine Graben region in Hoima District opined that.

> *"Production activities in the Albertine Graben region has hindered economic activity of stone quarrying carried out by the local people in the region-Hoima District".*

According to a local leader in the region, it was said that

> *"obtaining land rights during the Upstream stage distorted the ownership of property rights for local residents-Hoima district".*

Another informant from the Ministry of Land in the region said that

> *"creating of geological surveys during the upstream stage affects the growth of cash crops in the Albertine Graben region-Ministry of land"*

Therefore, this implies that there is a significant impact of the Upstream stage of exploration on property rights.

Linear Regression Results (Upstream Stage of Exploration and Property Right)

The coefficient of determination (denoted by adjusted R2) a key output of regression analysis was used to determine whether the Upstream stage of Oil exploration was on property rights

Table 3: Linear Regression Results for Corona Virus Pandemic and University Education

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.580a	.336	.312	.68360

a. Predictors: (Constant), Upstream stage of exploration of oil

***Source**: Primary Data, (2023)*

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Table 3: comprises the model summary with scores including R as (0.580), R squared as (0.336), Adjusted R square as (0.312) and standard error of the estimate as (0.68360) using the predictor; Upstream Stage. The coefficient of determination measures the proportion of variation in the dependent variable that is predictable from the independent variable. The coefficient of determination is equal to adjusted R2; in this case, (0.312) or (31.2%). Therefore, (31.2%) of the variability in the extent to which the upstream stage of oil exploration has violated property rights in the Albertine Graben region with the remaining percentage of 68.8% suggesting proof of other factors contributing to the loss of property rights.

Analysis Of Variance (ANOVA[a])

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	78.105	1	78.105	12.177	.003[b]
	Residual	519.552	369	7.318		
	Total	608.658	370			

Source: Primary data, (2023)

a. Dependent Variable: Property rights

b. Predictors: (Constant), Upstream stage of Oil Exploration.

The ANOVA table indicated that the Upstream stage of Oil Exploration positively affects property rights and this was indicated by the (F-value=12.177) and (P-value=.003) since the P-value (0.003) was less than 0.05 which is the maximum level of significance required to declare a significant effect. This implies that the Upstream stage of Oil Exploration highly positively contributes to Property Rights.

DISCUSSION

The Upstream stage of oil exploration affects people's settlement in the Albertine Graben Region, for example, the building of roads and site preparation, comments are centred on vegetation clearance, possible erosion and changes in surface hydrology; vibration and noise from earth-moving equipment; disturbance of population and wildlife; impacts related to influx and settlement through new access routes; drainage and soil contamination; land use conflicts; loss of habitat and construction noise. This was rated high with an average mean (Mean = 3.62). The findings concurred with those of Pichtel, (2016) who opined that Contamination of the earth occurs when drilling fluids are spilled during transport by truck or wastewater pipelines, failure of well casings, or leaks from tank pipes.

Oil exploration and production have a negative impact on food crop production (Mean 3.85) this is because crude oil exploration destroys the necessary nutrients that will make crops grown on land and grasses livestock eat. These have led to poor agricultural outputs and income making a livelihood in agriculture unattractive. The findings were found to be in line with Sebastian et al. (2002) who found that Polluted lands can then impact human health through direct ingestion, crops, dermal contact, indoor and outdoor inhalation of soil particulates, and/or migration to groundwater, with field workers and nearby communities at highest risk for exposure.

Oil exploration in the Albertine Graben region has hindered the economic activity of stone quarrying carried out by the local people in the region (Mean, 3.86). Implying that an oil spill can harm birds and mammals in several ways: direct physical contact, toxic contamination, destruction of food sources and habitats, and reproductive problems. The findings herein rhyme with Ron (2015), that the upstream segment of the oil and gas industry

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contains exploration activities, which include creating geological surveys and obtaining land rights, and production activities, which include onshore and offshore drilling which hinders stone quarrying and any other economic activities that could be carried out by the residents.

It has limited access to rivers through the distortions that have been created (Mean, 3.85), implying that Oil in sediments may be very harmful because sediment traps the oil and affects the organisms that live in or feed off the sediments. Johnson, A. (2024), found that the oil exploration impacts on livestock are primarily due to an increase in temperature and atmospheric carbon dioxide (CO2) concentration, precipitation variation, and a combination of these factors.

CONCLUSION

The study concludes that the upstream stage of oil exploration significantly impacts property rights in the Albertine Graben region. Analysis of the data revealed a substantial correlation between exploration activities and violations of property rights, indicating that local communities are often marginally involved in decision-making processes that affect their land and resources. The findings highlight the urgent need for a more equitable framework that recognizes the rights of landowners and ensures that local communities benefit from the exploitation of their natural resources.

Furthermore, the study emphasizes the importance of establishing clear legal frameworks and policies that protect property rights while allowing for responsible resource extraction. As oil exploration continues to expand in the region, it is crucial that both governmental and non-governmental entities work collaboratively to mitigate conflicts and promote sustainable practices that prioritize the welfare of affected communities.

Recommendations

- **The study recommends that local governments** implement and enforce stricter regulations that protect property rights during oil exploration. This includes ensuring that land acquisition processes are transparent and that affected communities are adequately consulted and compensated.
- **The study recommends that oil companies** engage in corporate social responsibility initiatives that prioritize the rights and needs of local communities. This could involve providing fair compensation for land use and investing in community development projects that enhance the well-being of affected populations.
- **The study recommends that policymakers** develop comprehensive frameworks for benefit-sharing that ensure local communities receive a fair share of the profits derived from oil extraction. This should include mechanisms for ongoing dialogue between stakeholders to address grievances and negotiate terms of engagement.
- **The study recommends that civil society organizations** advocate for the rights of affected communities by raising awareness of property rights issues and supporting legal actions against violations. Empowering local voices can help hold both government and industry accountable for their actions.

Contribution to Knowledge

This study contributes to the existing body of literature on the intersection of natural resource exploitation and property rights by providing empirical evidence from the Albertine Graben region. It highlights the complexities surrounding oil exploration and the often-overlooked consequences for local communities. By employing a mixed-methods approach, the research enriches our understanding of how upstream activities affect property rights and sheds light on the specific challenges faced by households in oil-rich regions.

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Moreover, the findings underscore the need for a nuanced understanding of property rights within the context of resource extraction. The study illustrates that traditional theories of absolute ownership may not fully capture the realities of oil migration and the socioeconomic dynamics at play. This contribution not only informs academic debates but also serves as a practical guide for policymakers and practitioners working in the field of natural resource management.

Lastly, this research serves as a catalyst for further investigations into the broader implications of oil exploration on community rights and environmental sustainability. By identifying key areas for future studies, such as the long-term socio-economic impacts of oil extraction on local communities and the efficacy of existing legal frameworks, the study paves the way for ongoing dialogue and research that can lead to more equitable and sustainable practices in the oil industry.

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