



**Constraints and Opportunities for SMEs Investment in Uganda's
Oil and Gas Sector**

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Abstract

Uganda's Oil Industry has attracted huge foreign investment, but participation by SMEs has remained poor despite their importance in income generation, employment and poverty eradication. Although the Oil industry is highly specialised, it provides indirect investment opportunities for SMEs who make up 80 percent of Uganda's private sector. The opportunities available however have not been sufficiently usurped by SMEs due to the information gap on how to create business partnerships, requirements of the industry and actors in the industry. The study therefore investigated key actors in the Oil and Gas value chain, potential business linkages between the existing large oil prospecting companies and SMEs and; factors that influenced SME decisions and willingness to invest in the Oil and Gas value chain. A total of 220 registered SMEs were purposively selected from a cross section of sectors. Using the Logit model, ten variables were regressed against the dependent variable "willingness to invest." The dependent variable was treated as a dichotomous variable taking on values 1= willingness to invest and 0 = none willingness. The results of the study revealed that the main actors in the Oil and Gas value chain were Trans-National Oil Companies, large foreign and domestic direct and indirect service providers with minimal involvement of SMEs. Business linkages for SMEs and TNCs existed at the vertical and horizontal levels but they were rather poor. Only 10 percent of SMEs had permanent contractual terms to supply Oil companies. Mainstream activities at the current infantry stage of the oil value chain such as exploration, surveying and drilling required huge capital investments and were highly specialized which affected SME investment. SME investment in the sector remains a challenge since most enterprises are fragmented, sole proprietors, lacked capital and are unable to supply in bulk. SMEs lack the desired international standards and certifications implying that they were not prequalified in the main stream procurement criteria required by the oil companies. In addition is lack of information on procedures for entering into contract agreements with the Oil companies, insufficient information on oil developments, prospects and existing business opportunities. According to the Logit model the strongest predictors of SME willingness to Invest (WTI) were having investment capital, access to credit, information and owning fixed assets.

Key Words: SMEs, Oil and Gas, Value Chain

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List of Acronyms

BDS	Business Development Services
BoU	Bank of Uganda
ESCAP	Economic and Social Commission for Asia and the Pacific
EU	European Union
FGD	Focus Group Discussion
GDP	Gross Domestic Product
MDI	Microfinance Deposit-Taking Institution
MEMD	Ministry of Energy and Mineral Development
MPED	Ministry of Finance, Planning and Economic Development
NAADS	National Agricultural Advisory Services
NDA	National Drug Authority
NEMA	National Environment Management Authority
OECD	Organisation for Economic Co-Operation and Development
PPDA	Public Procurement and Disposal of Public Assets Authority
PSFU	Private Sector Foundation Uganda
SACCOS	Savings and Credit Cooperative Organizations
SMEs	Small and Medium Sized Enterprises
TNCs	Transnational Corporations
UBOS	Uganda Bureau of Statistics
UIA	Uganda Investment Authority
UMA	Uganda Manufacturers Association
UNBS	Uganda National Bureau of Standards
UNCMP	Uganda National Chamber of Mines and Petroleum
UNCTAD	United Nations Conference on Trade and Development
UNIDO	United Nations Industrial Development Organization
URA	Uganda Revenue Authority
USAID	United States Agency for International Development
USSIA	Uganda Small Scale Industry Association
UWA	Uganda Wildlife Authority
UWEAL	Uganda Women Entrepreneurs 'association Limited

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1. Introduction

1.1 Background

Until the recent discovery of the oil and gas, Uganda's economy was largely dominated by agriculture. During this time, the country was endowed with myriad natural resources such as forests; fertile soils and sufficient rain fall favouring two growing seasons that have seen the economy flourish on agricultural produce over the past 5 decade. At present, in quest for a more diversified economy several land reforms have occurred and land for agriculture has greatly reduced causing a decline in agricultural production (Abuka et al., 2006). Likewise exponential growth in the population estimated at 3% per year over economic growth (UBoS, 2011) has increased in-house demand for food such that little is available for export. In order to balance the economy, increasing the level of industrialisation is widely being undertaken as a strategy to reduce imbalance between imports and exports (MFPED, 2008). The main stream (formal) industry level is however just beginning to grow with majority (up to 80%) actors being Small to Medium Enterprises distributed as those producing households utilities (30%), food and beverages (30%), fabricators of metal, steel and concrete (10%) and others such as telecommunication, ICT and construction occupying 10% (UBoS, 2010).

The Small and Medium sized Enterprises (SMEs) sector transcends all the sectoral boundaries in the production, distribution and marketing channel. Recent economic studies in Uganda, have dubbed SMEs as the backbone, key drivers and primary catalysts of economic development (Ariyo, 1999; Ihua, 2005). Estimated at 800,000 in urban and rural areas, the SME² sector plays a vital role in the economy especially on job creation, innovation, promotion and subsistence incomes. A study in 2007 revealed that MSMEs account for 90 percent of the private sector³ and employ over 1.5 million people (Common Wealth Secretariat, 2007). A UBOS report on the Census of Business Establishments 2010/2011 illustrated that 30% of 458,106 enterprises were small and medium enterprises and the sector employed over 1 million people.

² A Small Enterprise is an enterprise employing maximum 50 people with an annual turnover of approximately \$ 215,000; while the Medium Enterprise is an enterprise employing more than 50 people with an annual turnover of more than approximately \$ 215,000 (Business in Development (BiD) Network, 2008). SMEs are enterprises which employ fewer than 250 persons and have an annual turnover not exceeding 50 million Euros (European Commission, 2005). Although there are varied definitions of SMEs, all of them define SMEs as registered enterprises of a certain level of capital investment and headcount at a certain threshold. In this research study, SMEs will be defined as enterprises registered with the Registrar of Companies, have Capital Investment of between \$ 25,000 – \$ 50,000 and create at least 5 permanent jobs.

³ Development of a National Micro, Small and Medium Enterprises (MSMEs) Policy and Strategy, Draft report 2007

SMEs have for a long time provided out grower services to the large commercial agriculturalists and other primary sectors. In the oil sector however, focus has been on creating an enabling regulatory environment for oil exploration, refinery establishment and production. Other efforts in the Oil sector are geared towards promoting efficient management of the oil resource, environmental protection, revenue management and land ownership with limited interventions on enhancing SME investment in the industry.

The above initiatives though vital, may not directly support SME investment and yet the sector could be developed into the main supplier for secondary services in the sector. Some of the opportunities that the SMEs could explore include but not limited to; provision of office supplies, catering services, provision of unskilled labourers, information and communication technology services, building and construction, clearing and forwarding, hotel/accommodation, environment services, fabrication and welding services. It should however be noted that majority of Uganda's SMEs are unable to meet quality standards, are inconsistent with volumes of goods supplied, pricing and breach business contracts. Additionally SMEs have internal weaknesses in record keeping, credit utilisation and repayment. Such challenges impact on the possibilities of acquiring business contracts and sub contracts with Trans-national Oil Corporations and large domestic companies respectively.

Government therefore needs to establish a long term SME investment plan by providing strategic interventions that will enhance productive capacities and integrate SMEs into the mainstream supply chain of the Oil Industry. With adequate support SMEs have the potential of transforming and becoming the future source of products and services for the large oil companies.

1.2 History of Uganda's oil and prospects for investment growth in Uganda

In Uganda, Petroleum exploration activities date back to geological mappings developed in 1925. Thirteen years later a deep well revealed some hydrocarbons although it was not tested. Between 1940 and 1980 minimal petroleum drilling activities were carried out mainly due to the political turmoil in the country but efforts were rejuvenated between 1983 and 1992. In that period, five potential sedimentary basins were identified but the Albertine Graben has since been the most prospective (Ministry of Energy and Mineral Development, 2010).

In 2009, Uganda's oil reserves in the Albertine Graben region were estimated at 2 billion barrels of Oil Equivalent but the reserves are anticipated to increase in view of the fact that exploration is on-going (National Planning Authority, 2010). Although Uganda meets all its petroleum needs, the demand for petroleum continues to grow rapidly with the import bill in 2010 standing at \$ 917 million⁴ from \$ 527 million in 2006. Petroleum export earnings have also recorded growth in the last five years reaching \$ 72 million in 2009 from \$ 36 million in 2006 (Uganda Bureau of Statistics, 2011). Oil discovery gives hope to Uganda, a country ranked the 21st poorest country in the World (Aneki, 2010) and ranked 91 among 135 countries in respect to human poverty (United Nations Development Programme, 2009). The proportion of people living below the poverty line in 2005/06 stood at 31 percent with projections to reduce to 24.5 percent in 2014/15 (United Nations, 2007).

Uganda's oil resources have been deemed significantly sufficient to elevate to her amongst the top 50 producers⁵ of oil in the world, and among the foremost African oil producers (Tullow Oil, 2010). Although it is not clear at this point how much the likely revenues and royalties are, there is wide anticipation of national income growth through exports. Such a boost to national income will offer Uganda a unique and exciting chance to alleviate poverty and create broad-based development and improved standards of living (International Alert, 2009).

In Uganda, the oil and gas serve the secondary source of energy after wood fuel acts both as an input and a facilitator of industrial production and distribution (Sebit et al., 2004). Although own well exploration is 'new' the Oil and Gas sector has been vibrant with cross-cutting linkages with all sectors in the economy. For the last 20 years the oil and gas business has been in private hands with government only making direct importations to serve its reserves for public duties. The monetary value added down the value chain through trans boundary acquisition (importation, transportation and distribution) all the way to the fuel pump price is high and this has been the motivation for the actors involved. Discovery of own reserves is therefore hypothetically expected to attract many actors who anticipate huge harvest of benefits at the different levels within the value chain.

⁴ Petroleum constitutes the highest import value of Uganda's imports. In 2009 and 2010 the percentage stood at 17 and 19 per cent respectively of the national imports

⁵ Brian Glover, Tullow oil country manager for Uganda, quoted in 'Tullow oil: new drilling could put Uganda in top 50 producers', 20th February 2009

The concept of value chain and value chain analysis in marketing literature was first coined by (Porter, 1985). Porter postulates that a value chain is an interconnection of activities that create value for a firm operating in a specific industry. He further elaborates that value is added through every activity at each stage a product passes through right from idea conception to distribution to the final consumer. The value chain analysis then becomes a framework to track value through the different activities, identifying opportunities for more value creation and constraints involved (Porter, 1980, 1985). According to World Bank (2007; 2009), the oil industry has three levels: upstream, midstream, and downstream and these also encompass the main segments in the supply chain. The upstream level includes the exploration, drilling, and production of crude oil and this is usually occupied by strategic managers of the value chain. The midstream level includes the refining, transportation and trading of crude oil to refineries. The downstream level includes the storage of crude oil, refining of crude oil into finished product, distribution and marketing of oil to wholesalers and retailers (World Bank, 2007).

The value chain approach is a must start point to offer a meaningful alternative to value private or public companies when there is a lack of publically known data from direct competition or where the subject company is compared with, for example, a known downstream industry to have a good feel of its value by building useful correlations with its downstream companies which is a typical case for new producers (Humphrey and Schmitz, 2002). For Uganda's case, ongoing petroleum operations is opening up various business opportunities in the upstream and mid-stream these are expected to expand as the oil and gas sector grows. The huge business potential in the sector has consequently begun attracting substantial Foreign Direct Investments from about \$ 46 million in 2006 to \$ 436 million in 2009. In 2011 for instance investments in seismic and drilling subsectors alone were over \$ 900 million (Byaruhanga et al., 2011).

At a local scale, the sector presents numerous investment prospects especially as more and more wells are discovered implying that the value chain is expected to grow to all three functioning levels. From literature cases in older oil producing economies such as Niger, Angola, Nigeria, Libya and Sudan some of the outstanding opportunities are expected to stem from; "primary activities" which include: inbound logistics such as, exploration activities, initial civil and well constructions, test production, research and development. Outbound logistics such as transportation of oil, gas and petrochemicals, marketing and sales (demand creation), and

demanded services such as engineering works, maintenance and repairs. Support activities are yet another avenue for investment which includes: administration, infrastructure management, human resource management, technology (R&D), and procurement (Byaruhanga et al., 2011).

Given that oil and gas industry is still at the infancy level in Uganda, two big questions arise (i) *who takes what amid heavy competition to supply and (ii) what does it require to competitively join the value chain?* Several literature sources affirm the fact that oil and gas is a capital intensive venture therefore “supreme value achievable” in value chain tends to accrue to firms with the ability to invest in the upstream and mid-stream (Warner, 2007; Gereffi, 2003; Humphrey and Schmitz, 2002). World over, the oil and gas sector is dominated by large integrated companies. In most cases where the large enterprises are local they are either publicly or nationally owned for this is the only way they can square up to the fierce competition that defines the industry. For example the largest oil company in the world, Saudi Aramco, is nationally owned and is Saudi Arabia’s primary source of income (UNCTAD, 2001). There are six major publicly owned integrated public companies: ExxonMobil, Royal Dutch Shell, BP, Chevron, Total S.A., and ConocoPhillips that are referred to as the “super majors” which monopolize the market (UNCTAD, 2001).

The recent trend in the industry is for companies to merge to expand their upstream levels instead of their downstream levels. Increasingly for well-developed value chains, there is less emphasis on increasing refinery capacity, and Multi-National Companies (MNCs) are now focused more on the exploration and production segments of the value chain (UNIDO, 2004). Due to over dominance of MNCs in the value chain, there is growing advocacy that a big portion of oil income should accrue to the producer country (World Bank, 2007). In many African oil producing states a few local firms have fully competitive capacity to dominate the value chain. A recent study in Nigeria by Ugwushi (2010) reveals that although the Oil and Gas industry has served as the main stay for over 50 years, a very little proportion of the accruable profit is available to indigenous oil firms especially SMEs. The imbalance according to Aneke (2002) and Ariweriokuma (2009) is explained by internal constraints such as lack of requisite skills, technical expertise and high value investment capacity. In a similar study, Heum et al. (2003) summarized the constraints of local SMEs to competitively participate in the oil and gas value chain as having low technological capacity, lack of funding from financial institutions,

inadequate and incoherent policies/legislation; inadequate infrastructure; unfavorable business climate; and lack of partnerships between indigenous contractors and technically competent foreign companies. The same can be feared for Ugandan local players especially the SMEs. This is because the oil and gas sector is new to majority of them and their potential needs to be ascertained for strategic positioning as potential beneficiaries to the available opportunities.

1.3 Problem Statement

Ever since oil exploration was commissioned to start in Uganda, Government has undertaken several initiatives to create an enabling investment environment in the sector. Some of the commendable efforts include improvement of transport infrastructure connecting to exploration sites, developing the National Oil and Gas Policy, development of local content document, Refinery Bill and the Petroleum Bill. What is lacking however, is how exactly to encourage local SME firms that form the main business arm of the economy to competitively strategise and participate in the oil and gas value chain. In particular a gap exists on practically available opportunities for SMEs to participate in the value chain with an advantage over foreign competition, the constraints and challenges that may deter or lessen their competitive advantage and better still how these constraints and challenges can be identified and converted into opportunities to realise both the local content and Oil and Gas policy objectives. In light of the above, this study sought to find out the current activities and main actors in within the oil and gas sector, emerging potential opportunities for SMEs, SME decisions and willingness to invest in the opportunities areas and likely constraints and challenges that may deter them from venturing into the value chain.

1.4 General Objective

The general purpose of the study was to identify opportunities in the oil and gas value chain to enhance increased SME investment in the sector.

1.4.1 Specific Objectives

- To find out present actors in the Oil and Gas sector value chain;
- To determine factors likely to influence SME decisions and willingness to invest in the Oil and Gas value chain;

- To find out business partnerships that would be created between SMEs, Trans National Corporations and other actors in the Oil and Gas sector;
- To propose actions to address the constraints hindering SMEs from exploiting the identified opportunities in the Oil and Gas Sector.

1.4.2 Research Questions

The research questions that guided this study were to determine:

- The potential actors in the upstream, mid-stream and downstream stages of the oil and gas value chain.
- The factors that would influence SME decisions and willingness to invest in the oil and gas sector.
- The likely business partnerships with Trans National Corporations and Government in the Oil and Gas sector.
- The policy and non-policy actions to address the challenges in the sector.

1.5 Study Justification

In as much as a lot has been written about SMEs economic significance in Uganda, there have been few attempts to actually quantify their investment potential, competitive advantage, opportunities and prevailing constraints and barriers to invest in high capital value chains such as the oil and gas. Our opinion of this is that in pursuit of a winning strategy of realizing specifications of the local content for Uganda, it is worth starting with an understanding of the role that SMEs play in the local economy. The fact that government policies and actions have been consistent with the overall objective of establishing the private sector as the provider of employment, it is important to fully understand the determinants of private sector investment. It is further important to analyze the institutional and regulatory frameworks as well as the firm-level factors that have an impact on investment in greater detail and to relate them to firm decisions on investment, growth and expansion. This study is intended to fill a gap about the SMEs potential and willingness to invest in the oil and gas sector, highlighting opportunities where competitive advantage can be built including the outstanding constraints to participation and investment in the oil and gas value chain.

2. Literature review

2.1 Introduction

This section presents a review of literature focusing on the concept of value chain, definition and characteristics of SMEs, conceptualization of Willingness To Invest (WTI), factors that affect firms' willingness to invest in heavy capital and high risk development projects. Further analysis was done to understand the oil and gas value chain, SME participation in the oil and gas value chain, reported constraints for SME investment. Finally the review extends to revealing potential partnerships between TNCs and SMEs that can catalyze SMEs participation in the Oil and Gas value chain.

2.2 SMEs Definitions

On a global scale small and medium-sized enterprises (SMEs) are a very heterogeneous group. SMEs cut across several sectors and activities, ranging from the single artisan producing agricultural implements for the village market, the coffee shop at the corner, the internet café in a small town to a small sophisticated engineering or software firm selling in overseas markets and a medium-sized automotive parts manufacturer selling to multinational automakers in the domestic and foreign markets. The owners may or may not be poor; the firms operate in very different markets (urban, rural, local, national, regional and international); embody different levels of skills, capital, sophistication and growth orientation, and may be in the formal or the informal economy (UNIDO, 2004).

Statistical definitions of what constitutes an SME vary quite widely from country to country and even within single countries, depending on the business sector concerned (OECD, 1997). Thus, there is no universal determinant or criteria of defining an SME. Much depends on the character of the relevant host country, and the profile of its own particular corporate sector, from which a relative measure of an SME is then typically made, sometimes on a rather arbitrary basis. Some countries just use the number of employees as the sole criteria for determining whether a business is an SME or not. Other countries use this same criterion, plus an additional criterion based on either the value of the firm's assets or the size of revenues, typically denominated in the local currency. For instance considering the European Union (EU) and the Organisation for Economic Co-operation and Development (OECD), transition and developing countries set the

upper limit of number of employees in the SMEs between 200-250, with a few exceptions such as Japan (300 employees) and the USA (500 employees) (OECD, 2004). Another classifying variable has been level of investments measurable in monetary terms. Using both head staff count and level of capital investment, the EU classifies SMEs as enterprises which employ fewer than 250 persons and which have an annual turnover not exceeding 50 million euro, and/or an annual balance sheet total not exceeding 43 million euro (EU commission, 2003).

The diverse definitions criteria can sometimes be conflicting and confusing due to the overlap in what they should differently define. For instance on the basis of employment many enterprises especially in Asia and Africa due to cheap labour may employ over 200 persons whereas operating below 10million euro. In such a case a regional definition can be more helpful than a universal one because what qualifies in one region or country such as Nepal and India may be different from what an SME is in the United Kingdom, United States of America or Germany because of differences in market economies.

Divisions in SMEs definitions are still evident even with smaller groups of neighboring economies like the recently formed East African community countries. Table 1 shows SME definitions across members of the EAC based on number of employees and level of investment. Since this is about SMEs in Uganda, we restricted ourselves to the recent definition by Ministry of Finance, Planning and Economic Development, Ministry of Trade, Industry and Cooperatives and Uganda Investment Authority. The three bodies responsible for investment and trade in Uganda unanimously define a “Small Enterprise” as an enterprise employing maximum 50 people; with annual turnover of a maximum Ugandan Shillings 360 million and total assets of maximum Ugandan Shillings 360 million. A Medium Enterprise is defined as an enterprise employing more than 50 people; annual sales/revenue turnover of more than Ugandan Shillings 360 million and total assets of more than Ugandan Shillings 360 million.

Table 1: Definitions of SMEs in the East African Community (EAC)

Criteria	Category	Kenya	Tanzania	Uganda	Rwanda
No. of employees	Small	11 - 50	5 - 49	Max. of 50	3 - 30
	Medium	51 - 100	50 - 99	Over 50	30 - 100
Capital Investment	Small	-	5million - 200 million shillings	Maximum of 360 million shillings.	500,000 - 15 million Francs
	Medium	-	200 -800 million shillings	Over 360 million	Over 15 million to 75 million Francs

Source: Uganda Investment Authority, 2011

Economic significance, Characteristics and challenges of SMEs in Uganda

According to the National Micro, Small and Medium Enterprises (MSME) Policy and Strategy of Uganda (MFPED, 2007), the MSME sector contributes 20 percent of the national GDP, provides employment to approximately 1.5 million people at an employment growth of 20 percent per annum in the sector. In comparison with developed economies such as Germany, SMES generate 70 percent of employment and 57 percent of corporate value added, in China, SMEs generate 73 percent of employment and contribute 60 percent of industrial Gross Product United Nations Conference on Trade and Development, (2003). In Uganda, majority SMEs are informal, small and highly concentrated in urban and peri-urban centers (Kasekende and Opondo, 2003).

Given their size and informality, these entities face multi-dimensional challenges. In the past 10-15 years, SMEs have remained informal due to several barriers to trade such as formal registration, high technical standards qualifications, high taxes; poor transport bottlenecks especially the rural based, poor communication infrastructure and limited energy supply. This has bred a number of constraints, which include the difficulty in employing competent people with techniques in financial management because of the salaries such people would demand, financial problems arising from late payments by debtors, and inability to raise own finance and access financial services from formal sources. This category of enterprises usually looks to the banking sector and other financial intermediaries for instruments to finance working capital and to provide credit for short-term liquidity management. They, however, often fail to access the financial resources in the required amounts because banks evaluate them on the basis of a strict

checklist which includes high value of collateral, audited books of accounts, articles of business registration and insurance bonds.

The challenges continue to mount as trade barriers for foreign medium and large-scale firms melt away and both transport and communication costs fall. To remain viable, SMEs are required to add more value to their products to stay ahead and compete with lower cost rivals. Consumer demand is also changing rapidly as incomes rise and choices increase when imported products become easily available in domestic markets. Likewise as Foreign Direct Investment (FDI) increases, technological advances are creating new products and transforming almost every stage of business from production to marketing, sourcing and logistics. New rules of business are being introduced through the multilateral trade system and increasingly foreign buyers require SMEs to comply with higher technical (such as International Organization for Standardization), environmental and labor standards in domestic and export markets. With a now more liberalized economy, many SMEs especially those that have failed to re-orient themselves to match the high quality standards required by fast growing will be eroded. Perhaps this explains the short life span of many SMEs (Reinikka and Svensson, 2001; Hatega, 2006).

The other major challenge that cuts across a broad spectrum of SMEs in Uganda is the inadequate innovation and product differentiation to match or better still avoid foreign competition. According to Darku (2001), 60% of the SMEs do not invest in human resource development, but rather employ semi-skilled labour with a wish to cut the wage bill. Because of this, businesses remain fragmented and stunted due to lack of innovativeness which according to Manu (1998) is the main driver of enterprise growth and a genesis of new products and specialized market niches. Lack of substantial innovativeness coupled in individualist approach to business and operating informally has broken down lines of communication and cooperation undermining their capability to attract financing (Kasekende and Opondo, 2003).

From this background most SMEs are characterized by; use of family and unpaid labor, flexibility, allowing people to enter and exit economic activities in response to market demand; Simple and sometimes precarious facilities; ability to improvise products from scrap materials; a willingness to operate businesses at times and locations convenient to customers and a tendency

to locate smaller markets, out of the reach of the larger enterprises (Uganda Investment Authority, 2011).

2.3 The Value Chain concept

Value chain as defined by Porter (1980, 1985), is the sequential set of primary and support activities that an enterprise performs to turn inputs into value-added outputs for its external customers. According to Porter, value chains connect organizations, resources, and knowledge streams to create and deliver value to end customers. It can also be conceptualized as an aggregation of value systems (Kula et al., 2006; Simchi et al 2003). Value systems integrate supply chain activities, from determination of customer needs through product/service development, production/operations and distribution, including first, second and third-tier suppliers.

Over the last two decades value chain studies have been popular both in economics and strategic management fields. The proponents argue that value chain management provides competitive advance over competitors because its power to ensure value (Kula et al., 2006). The secret of value chain management lies in separation, harnessing and optimization of the primary and support services. The primary activities include; inbound logistics, operations, out bound logistics, marketing and sales. Inbound logistics refers to goods being obtained from the organization's suppliers ready to be used for producing the end product. Operations depict securing the raw materials and goods and converting them into final products. Value is added to the product at this stage as it moves through the production line. Outbound logistics refers to the mobility of products from source distributed to distribution centers, wholesalers, retailers or customers. Marketing and Sales provides a means that the product is delivered to correct customer group. The marketing mix is used to establish an effective strategy; any competitive advantage is clearly communicated to the target group by the use of the promotional mix (Porter, 1985, 1990).

The support activities on other hand assist the primary activities in helping the organization achieve its competitive advantage. They include; procurement, technology development and human resource management. According to Badrinath et al., (1997), efficient procurement ensures the department or firm gets the best source raw materials for the organization and obtains

the best price for doing so. The nature of technology acquired is key to obtaining a competitive advantage within the organization. This is very important in today's technological driven environment. Technology can be used in production to reduce cost thus add value, or in research and development to develop new products, or via the use of the internet so customers have access to online facilities (USAID, 2006; 2009). On the other hand, the organization will have to recruit, train and develop the correct people for the organization if they are to succeed in their objectives.

In large value chains such as the oil, gas and petrochemical chain, Porter (1985) further postulates that active participation can only be quantifiable in terms of firm ability within the giant industry to supply its buyers with a product or service that meets all the buyer's requirements. Gereffi, (2003) then suggests that this largely depends on the ability of the value chain to deliver information, skills, resources and benefits to all participants in the chain. From his argument, an implication is derived that where the value chain entails a big product portfolio as it is the case for oil and gas a single firm may not be to supply everything. In support (Kula et al.,2006) suggests smaller firms such as SMEs to be integrated in large global value chains they need to link up vertically or horizontally, and they all must cooperate to get a product from inception to the final consumer.

According to Kula et al., (2006) buying and selling relationships link firms vertically, and through these links firms engage in market and non-market interactions while performing different functions (i.e., operating at different levels) in the value chain. In addition to buying and selling, vertical linkages allow firms to exchange knowledge, information and technical, financial and business services. These non-financial transactions are important elements of buyer-seller relationships and are central to sustained value chain competitiveness (Simchi et al., 2003). In Uganda, Micro, Small and Medium Enterprises (MSMEs) are vertically linked to a varied range of market actors including wholesalers, retailers, exporters, traders, middlemen, input dealers, suppliers, service providers and others.

The nature of vertical linkages including the volume and quality of information and services disseminated often defines and determines the benefit distribution along the chain and creates incentives, or constraints, for firm-level upgrading, defined as innovation to increase value added

Moreover, the efficiency of the transactions between vertically linked firms in a value chain affects the competitiveness of the entire industry (Hatega, 2006). For the case of Ugandan SMEs, their integration into the oil gas and gas value chain raises several questions such as; what are the opportunities (accruing value) for them in the chain?, what are the potential constraints for their participation? And what needs to be done to convert constraints to favour environment that permits maximization of opportunities?

Value Chain Analysis (VCA) is a working model that kind of audits value chains. It facilitates a process for understanding the systemic factors and conditions under which a value chain and its firms can achieve higher levels of performance (Gereffi, 2003; Humphrey and Schmitz, 2002). Using the USAID model “*using value chains as a means for fostering sector growth and reducing poverty*” which we assume is the case for Uganda, the analysis should focus on identifying ways to contribute to; i) improving the competitiveness of value chains with large numbers of small firms, and ii) expanding the depth and breadth of benefits generated, iii) understanding all the major constraints to improved performance or competitiveness. USAID further recommends a strategic approach that focuses on understanding end-market opportunities and the constraints to these opportunities such an approach obviates the need to understand all constraints and narrows the scope of the analysis to “constraints to opportunities” which also forms a basis for our study. The results of the analysis offer industry stakeholders a vision for value chain competitiveness and form the basis for a competitiveness strategy—a plan for eliminating constraints to end market opportunities and advancing sustainable competitiveness (USAID, 2010).

There is currently a big argument as whether the small firms have a significant place in the global value chains (OECD, 2004; UNIDO, 2006; World Bank 2004). This is because in many value chains, powerful actors have the resources and influence, to define and impose the parameters of commercial transactions in their supply chain these actors are known as *lead* firms. They set product and process standards across the value chain and act as coordinators and/or integrators of the value chain. The control that lead firms wield may be based on ownership of well-established brand names, proprietary technology, monopolistic or oligopolistic power, or exclusive information about different product markets (Humphrey and Schmitz, 2002). Furthermore, lead firms can exert substantial influence and, more often than not, drive the

upgrading decisions and create incentives and punitive systems for firms lower in the value chain. They also take lead in catalyzing changes in a value chain by ensuring that knowledge and information move down the chain (Gereffi, 2003).

2.3.1 Applicability of value chain analysis to sector growth and industrial development

The value chain provides an important construct that facilitates the understanding of the distribution of returns from the different activities of the chain (Kaplinsky and Morris, 2001). By breaking a chain into its constituent parts of design, supply, production, and distribution, one can better understand its structure and functioning and perhaps more importantly, assess its scope for systemic competitiveness (Porter, 1985). Value chain analysis, therefore, is an effective means of conceptualizing the forms that functional integration takes in the production process, because it shifts the focus from production alone to the varied set of activities that make up the chain.

Value chain analysis is an important tool for strategic management and when competition is intense, companies must manage activities and costs strategically, or they will lose their competitive advantage. Value chain analysis can be used for determining at what point costs can be reduced or value added in the organization's value chain. Value chain analysis also highlights the issues of chain coordination or governance. The pattern of direct and indirect control in a value chain is called its governance (McCormick and Schmitz, 2001). Chains vary in the degree of overall control that is exerted, in the location of control within the chain, and in how much of it is concentrated on a single firm (Gereffi et al, 2001).

According to Kula et al., (2006) overall control can be almost non-existent, with interactions being mainly driven by market forces, or a chain can be strongly or weakly directed by one or more of its actors. The concept of governance is most meaningful in the latter case. In these cases some firms directly or indirectly influence the organization of the chain's production, logistics, and marketing systems. Through the governance structures that they create, these firms can take decisions that have consequences for others' access to markets and the range of activities that they are able to undertake. The influence can extend from defining the products to specifying the processes and standards to be used in production.

Governance is sometimes exercised directly through the control of key resources and decisions about entry and exit and monitoring of suppliers (Kula et al., 2006). Governance may also be exercised in more subtle ways, such as providing technical support to enable producers to achieve the required performance. The parameters defining what is to be done at any time are product definition, how it is to be produced (production process), when it is to be produced and how much is to be produced (Humphrey and Schmitz, 2001). The way a chain is governed may determine such competitive factors as market access, fast track to acquisition of production capabilities, distribution of gains and to funnel technology assistance.

Gereffi (1994, 2001) is credited with identifying two main types of value chains: buyer-driven and producer-driven. In the buyer-driven value chains, the buyer at the apex of the chain plays the critical governing role. Labour-intensive industries common in least industrialized countries are often buyer-driven. Examples include garments, processed fruits, and horticultural products (Gereffi et al., 2001, Dolan and Tewari, 2001). In the producer-driven chains, producers with critical technology play the main role of coordinating the various links and take the responsibility of checking the efficiency of their suppliers and customers. Producer driven chains often have significant foreign direct investment, and are more often capital and technology intensive industries (Gereffi, 2001).

Value chain analysis incorporates both vertical and horizontal relations between different sectors, underlining the necessity to approach the concept of competitiveness not solely on the basis of a single economic sector, but more broadly focusing on whole set of relations this sector has with other economic domains (Fries et al., 2004). These interrelations determine the position and competitiveness of an entire cluster. The idea of a value chain becomes useful for analytical and policy purposes, once we include three further features:

- First, the activities are often carried out in different parts of the world, hence the global value chain;
- Second, some activities add more value and more lucrative than others (the policymakers' concern is to help local enterprises to move into the lucrative activities);
- Third, some actors in the chain have power over the others.

On the other hand, Systems are characterized by networks of production of strongly interdependent firms linked to each other in a value adding production chain. The interactions between different units depart more and more from the vertical structure, with horizontal relations gaining ever-increasing importance. Thus, the approach can complement the value chain analysis by:

- Analyzing economic competitiveness as its scope is not limited to isolated intra oil and gas industry relations alone, but also pays attention to relations with other sectors.
- Analyzing innovation possibilities, as innovation is typically generated in a system of comprehensive networks. Frequently, these networks have far-reaching access to a number of actors across different sectors. Systems approach, by identifying the support connections helps to establish sources for action without identifying priorities.

2.3.2 The Oil and Gas Value chain, Actors and Opportunities

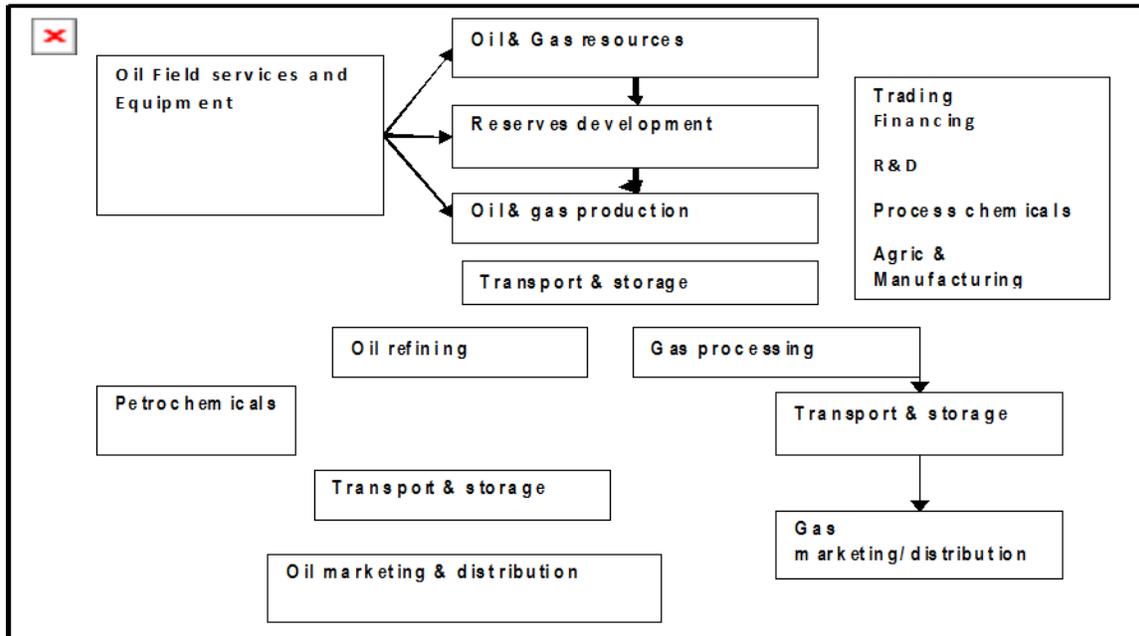
In this subsection, we re-examine the status of different components of the oil and gas value chain activities, the players/actors and nature of opportunities that SMEs can usurp through active partnership with TNCs.

The analysis of the oil and gas industries illustrates that there are several players who work collectively to transform the resource into useable form. According to the Petro Strategies Incorporation, the oil and gas industry chain is composed of fully-integrated oil and gas companies, independent oil and gas producers, refiners and marketers, pipeline operators, service companies, trade associations and government agencies. (Petro Strategies. Inc., 2011).

Similar to the definition above, the World Bank (see Figure 1) suggests that the petroleum industry is made up of several processes which collectively lead to the transformation of the resource into the useable end-products. These processes according to the World Bank (2007; 2009) are linked with each other conceptually, contractually and/or physically, and these linkages sometimes occur within or across individual firms, and within or across national boundaries. The upstream level includes Research and Development (R&D), Strategic Planning and Procurements for oil reserve exploration and development. The middle stream activities largely include; Oil and Gas production, processing and refining into Petrochemicals, Natural gas, including packaging and storage. The downstream activities are mainly dominated with

products (Oil, Gas and Petrochemicals) transportation, temporary storage, marketing and distribution to the middle and final consumers.

Figure 1: Petroleum Value Chain



Source: World Bank, 2009

The Oil Value Chain in Uganda, opportunities and potential actors using the Work Bank Model, have been summarized as below;

1. **Upstream:** There are quite a number of auxiliary services demanded at this level which include; seismic surveys, well drilling, equipment supply and engineering works (World Bank, 2009; Tullow Oil Ltd- Local Content Report, 2009)
2. **Opportunity:** Supply of services such as contracting engineering projects, consultancy services and provision of key equipment.
3. **Potential players:** National engineering/construction and consultancy firms, individuals who are petroleum experts and skilled professionals.
4. **Nature of the opportunity:** High quality is demanded, high professional skills and high capital (finance) requirements.

5. **Middle stream:** Auxiliary activities include; transportation infrastructure e.g. bulk haulage and storage of crude oil, oil pipe line networks, including the links between production and processing facilities, oil refining, gas and petrochemical processing.
6. **Potential opportunities:** oil refining⁶, gas and petrochemical processing, transportation and storage services.
7. **Nature of the opportunity:** In many Oil and Gas producing nations, refining has been highly developed into a clinical business in which profitability is sensitive to marginal changes in product quality and quantity supplied. To this end, oil refining has become globally competitive implying high initial upfront investments in machinery and technology. The high cost in R&D, plant and machinery, legal requirements and quality certification present a huge barrier to entry for the small actors.
8. **Potential players:** Given its complexity, many local players may not have the potential, however with strategic partnership with TNCs and Government support especially on infrastructural development some companies may participate. But by far we expect this stage to be dominated by bilateral trade TNCs.
9. **Down Stream:** It is at this value chain level that we envisage more local involvement by the domestic firms and capable business individuals particularly SMEs. The wide range of activities include; transportation, marketing and distribution to wholesalers, retailers and directly to industrial, institutional and individual final consumers.
10. **Potential opportunities are enormous** – Transportation of fuel oil, kerosene and petrochemicals, direct trade in form of wholesale and retail of fuel oil, gas and petrochemicals, direction and marketing as distributors, bulk suppliers and brokering of fuel oil, kerosene, LPG, fuel gas, gasoline and many other petrochemicals.
11. **Potential players:** Majority SMEs such as local companies involved in marketing, fuel retailers (local fuel and stations), automobile companies, general traders and suppliers.

We note that as one goes down the value chain, massive participation is encouraged due to lessening of the initial capital investment and other entry barriers.

⁶ Oil refining is defined as the process of separating the hydrocarbons molecules present in the crude oil and their conversion into more valuable finished petroleum products major; product categories being fuel oil, gas oil, jet/kerosene, gasoline, and naphtha and Liquefied Petroleum Gas (LPG).

2.3.3 Current status of various segments of the Oil and Gas Value Chain in Uganda

Notwithstanding the potential (prospective) opportunities presented in (2.2.2), above, apparently, the oil value chain in Uganda is still at the infancy stage, that is, Oil Reserve Development and Exploration Phase. At this stage, major business taking place is between the large oil companies such as Tullow Oil, Neptune and Dominion as well as Government through its functional arms such as Uganda Revenue Authority, Ministry of Finance, Planning and Economic Development, Ministry of Energy and Mineral Development, Uganda Investment Authority, Uganda National Bureau of Standards, National Environment Management Authority, Ministry of Trade, Industry and Cooperatives and Ministry of Tourism and Wildlife. There is limited involvement of the private sector that is largely dominated by large foreign and domestic service providers/suppliers and logistics corporations. Also informally, some local SMEs located in the studied districts excluding Kampala are indirectly (*not under permanent contracts*) involved in supplying a wide range of boundary services from casual labour to food stuffs and utility merchandise. Most services were mainly provided by the medium sized enterprises located in Kampala.

Conclusion: Whether the value chain will develop to the level depicted by the World Bank will depend on factors such as;

1. The quantity and quality of the resource;
2. Commitment of government (custodian), mainly in terms of putting in place favorable investment climate, and other stakeholders to invest and develop the oil and gas industry.

2.4 SME Willingness to Invest in the Oil and Gas value chain

2.4.1 The concept Willingness to Invest (WTI)

With the market economies largely becoming integrated globally, research is hatching several advances in technology, redefining business environment and business decisions. Willingness to Invest (WTI) has been a central concept in macroeconomics literature over the last two decades (Abuka et al., 2006; Nzomoi, 2007; Babu *et al.*, 2009; IFPRI, 2009; Jaakko, 2012). Willingness to Invest (WTI) has been largely defined as an individual or firm /industry's willingness to accept high business risk in the hopes the investments will increase in value (Sureth et al., 2005; Abuka et al., 2006; Mburu et al., 2007). Several studies have been carried out on similar

concepts of “willing to pay” (WTP), “willingness to adopt” (WTA) in service and information technology sectors (Banga et al., 2011; Verbic et al., 2005; Fujita et al., 2005). The willingness to pay (WTP) is the maximum amount a person would be willing to pay, sacrifice or exchange in order to receive a good, service or to avoid something undesired such as pollution (Verbic et al., 2007). This term stands in contrast to willingness to accept payment (WTA), which is the minimum amount an individual is willing to receive to give up a good or to accept something undesirable. Several methods have been developed to measure consumer willingness to pay or accept. These methods can be differentiated by whether they measure consumers' hypothetical or actual willingness to pay or accept and whether they measure consumer willingness to pay or accept directly or indirectly.

Contingent valuation models have been most popular in surveys where a firm, individual or group is asked directly to state how they would be willing to pay or accept on a specific actual or hypothetical scenario (Verbic et al., 2007). The WTI model distinguishes itself with an extra ability to incorporate both WTP and measurement risk and probing further into factors that may affect willingness (Jaakko, 2012; Graham and Tu, 2003). The model establishes the relationship between internal and external factors that influence SME willingness to invest. It further explains how SMEs with a certain level of willingness to invest (WTI) decide whether to invest or not to do so (IFPRI, 2009). The model has been successfully used by Castlepines Corporation, an International investment Company dealing in a broad range of infrastructure assets and in India to study the carbon credits for energy self-sufficiency in rural India (Babu *et al.*, 2009).

2.4.2 Factors likely to affect SME willingness to invest in development projects

Several barriers have been advanced as limiting for SME growth, expansion and willingness to adopt and take investment decisions in different business environments. In more general terms, the factors have been broadly categorized as; internal and external constraints (Antonio and Rodolfo, 2005). The internal constraint are firm based factors such as size, age, investment capital, formal registration, tax payments ability, sales volumes, access to markets, access to credit finance (Abuka et al., 2006; Reinikka and Svensson, 2001). External factors can either compound or modulate the effect of firm specific factors. These include; macroeconomic stability (inflation and other monetary controls, cost of production and borrowing), macroeconomic policies and regulations such as tax policies, business registration procedures,

pricing on inputs mechanisms, trade agreements, presence of enabling infrastructure such as reliable energy sources, water sources, roads, communication networks and services (Reinikka and Svensson (2001).

External factors usually affect predictability of the business environment. Business environment predictability is a crucial factor determining business decisions (Aldaba, 2008). Non predictability increases perceived risk and given the phenomena of long time capital accumulation in Africa, not only SMEs, but also large firms, including foreign invested ones, depend on the ability of government to implement sound and consistent macroeconomic policies (Bigsten et al (1999). According to World Bank-World Invest Report(2004), issues like low budget deficits, low inflation, and a stable and transparent currency regime, yielding competitive exchange rates in an economy, help secure the minimum stability that businesses needs to make sound business decisions. Shiffer and Weder (2001) confirmed through a worldwide survey¹⁰ that inflation affected SME growth more than larger enterprises and that exchange rates also affected SMEs more, due to lower hedging opportunities available to smaller firms.

Several other studies have highlighted internal constraints that may affect SMEs decisions to invest in any sector. For instance Antonio and Rodolfo (2005) highlights (i) high cost of labor and power; (ii) lack of ICT applications; (iii) lack of locally sourced quality raw materials and dependency on imported raw materials which leads to longer lead times; and (iv) lack of design capabilities and minimal linkages between local designers and manufacturers. A study by Fukumoto, (2004) revealed; lack of skilled labor, limited market access, lack of information on market opportunities and insufficient technical training as major internal factors affect SMEs growth and willingness to investment in higher value chains in Philippines. In Vietnam, Singapore, Indonesia, India, and Eastern Europe SME studies have continued to highlight the same major constraints that affect SME development such as access to finance, technology, and skills along with information gaps and difficulties with product quality and marketing (FINEX and ACERD, 2006; Tecson, 2004; Fukumoto, 2005). What comes out more clearly all these studies is that the lack of access to financing is the most difficult constraint to SME growth and a top determinant of their willingness to investment.

2.4.2.1 Factors anticipated to affect WTI for Ugandan SMEs

Bigsten et al (1999) argue that size may constrain investment with a smaller impact on large firms. Reinikka and Svensson (2001) and Abuka et., (2006) confirm the effect of size on investment in Uganda in addition to determining the effects of other factors such as age, location and sector. In another recent study by Hatega, (2006) it is revealed that, SMEs in Uganda are confronted by lack of adequate investment capital which compounds problems of supply chain management from the sourcing of their raw materials to problems in processing, packaging, and distribution. Kasekende and Opondo, (2003) in their study about SME financing in Uganda highlight inadequate financing as the major aspect constraining SMEs growth and willingness to invest. Their study findings point to issues such as inadequate working capital, insufficient equity, difficulties of credit finding and expensive credit cost.

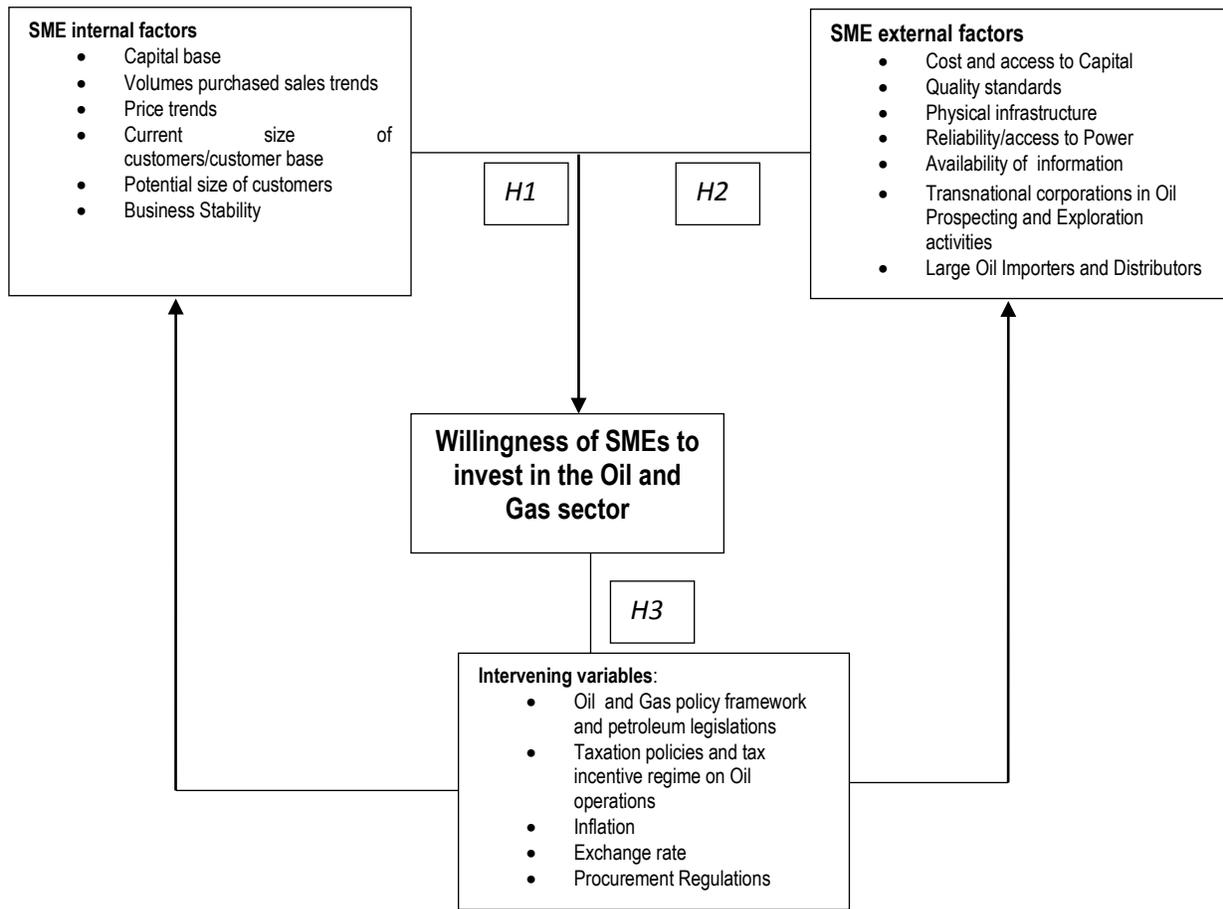
Preliminary reconnaissance during our study especially FGDs and personal interviews held with district officials revealed high perceived risks to lack of information, erratic power supply, poor work ethics, poor roads, land wrangles and political transparency. From entrepreneurialism point of view to be vibrant in an economy, a willingness by individuals to take (calculated) business risks must also be present. If the social stigma associated with business failure is perceived to be too great, or the practical repercussions of business closure are too onerous (for example, if the difficulty or cost of registering a company specifically to trade in oil and gas is too great), then entrepreneurialism will not flourish easily. In addition, the right kinds of economic incentives need to be in place to prompt potential entrepreneurs to take a leap into the unknown. If the prospect of relatively substantial financial gain is a dim one, then the motivation to venture will no doubt be constrained. We assume that perceived risk is sometime an information gap problem. To this end we assessed the level of awareness of policy, regulation and rights of SMEs in the Oil and Gas sector. In addition, we assessed awareness of possible business cooperation and prospects for SMEs in the Oil and Gas sector.

The other over pronounced aspects from the preliminary FGDs and key informant interviewees were perceived technical requirements such as formal registration and special fixed assets ownership were perceived as potential barriers to SME willingness to invest in oil and gas sector given the high quality of inter-linkages desired. We also incorporated the aspect investment capital in our conceptual frame because it cannot be over emphasized than it is in literature

reviewed (e.g., Kasenkende and Opondo, 2003; Abuka et al., 2006). The country's underdeveloped financial markets represent a formidable barrier not just to the entry of new enterprises but also to the growth prospects of small and medium sized firms. The absence of a liquid and deep peso financial market contributes to the high cost of investment and makes it more difficult for enterprises to expand. In the oil and gas business investment capital exerts significant influence on the investment decision of intending to invest enterprises.

In this study we highly anticipated that predictability will much depend on micro and macroeconomic stability and flow of macroeconomic information downstream to the potential SMEs. We therefore set out to investigate flow of information about oil and gas investment prospects from the TNCs to the potential SMEs and whether having (not) this information affects willing to invest. We integrate possession, access and handling as important variables that affect investment capital and in proxy SME willingness to invest. The details of the factors are presented in Figure 2 below.

Figure 2: Conceptualisation of SMEs’ willingness to invest in oil and gas sector in Uganda



Source: Researchers

Key

H1, 2 & 3 = Hypothesis directions

From the figure above, we make three propositions;

H₁.... that SME willingness to invest will depend on the firms characteristics such as size, capital, years of operation (age of capital accumulation, sales volume, annual turnover and access to credit)

H₂that SME willingness to invest is affected by the external factors such as cost and access to Capital, Quality standards, Physical infrastructure, Reliability/access to Power, Availability of information , competition from Transnational corporations in Oil Prospecting and Exploration activities and Large Oil Importers and Distributors.

H₃that that SME willingness to invest is affected by other factors that define the investment environment such as macroeconomic policies (inflation, exchange rates, petroleum legislation etc) infrastructure.

2.5 Business Partnerships that would be created between SMEs, Transnational Corporations and other actors in the Oil and Gas sector

Several studies have proven that it is particularly important to forge horizontal and vertical linkages between SMEs and their larger counterparts as these hold the key for SMEs to benefit Economic and Social Commission of Asian and the Pacific, (2009). For large firms, globalization has generated both new markets and new competitive forces. Constant pressure to reduce costs, shorten lead times, and focus on core competencies has driven firms to change their supply chain management strategies. Most large manufacturing companies now buy significant percentages of their inputs of both goods and services from other firms, with some spending as much as half of their revenues this way (UNCTAD, 2001). Managing the supply chain for an optimal mix of cost, quality, flexibility, and strategic advantage (such as access to innovation) is becoming an increasingly important source of competitive advantage (Jenkins et al., 2007).

Experience from literature by World Bank, USAID, UNIDO and OECD publications on MNC-SME linkages shows that countries that have facilitated the development of sustainable linkages have upgraded their local productive capacities and enhanced their industrial performance. In this way they are also integrating their enterprises into global supply chains of large foreign firms and thus fostering sustainable development of local firms (UNCTAD 2010). African Development Bank (2010) adds that it is the small, agile, growth-oriented indigenous and independent firms that are pioneering new discoveries because they are willing to take on more risk than TNCs.

In developing countries, business linkages with small and medium enterprises (SMEs) can occur in various forms such as backward linkages by sale of parts, components, materials and services as well as forward linkages with customers (UNCTAD 2010(2)). Other spillover effects include; demonstration effects and human capital spillovers. These relationships can allow large firms to reduce input costs while increasing specialization and flexibility. They can also increase local integration and “rooting,” providing access to local knowledge and, by spurring growth and

development in the local SME sector, bringing about positive social and economic impacts in the wider community (UIA 2008). There are thus both competitiveness and corporate social responsibility arguments in favor of business linkages. Currently, most of Uganda's SMEs are generally unable to meet business standards required to deal with TNCs on such crucial production issues as price, quality, as well as consistency in volumes. In addition, the majority of the SMEs have weaknesses in record-keeping, credit utilization and repayment and; respect for business contracts. On the other hand, TNCs were ready to establish formal vertical (buyer to seller) business relationships with SMEs, provided SMEs committed themselves to remedy the existing shortcomings in their business systems, attitude and skills (UIA 2008). There is therefore need to revise the necessary legislations to handle such a mismatch.

3. Methodology

3.1 Introduction

The study's ultimate objective was to identify the different key actors in the upstream, mid-stream and downstream stages of the oil and gas value chain, underpinning the role and current positioning of SMEs investing in the oil value chain. The study investigated the factors that influenced SME decisions and willingness to invest whilst identifying policy and non policy actions to address the challenges. The study was also intended to strengthen the existing oil policy/legislations to enhance SME investment. This section therefore summarises the study design, studied areas, sampling procedure, data collection and analysis as well as limitations to the study.

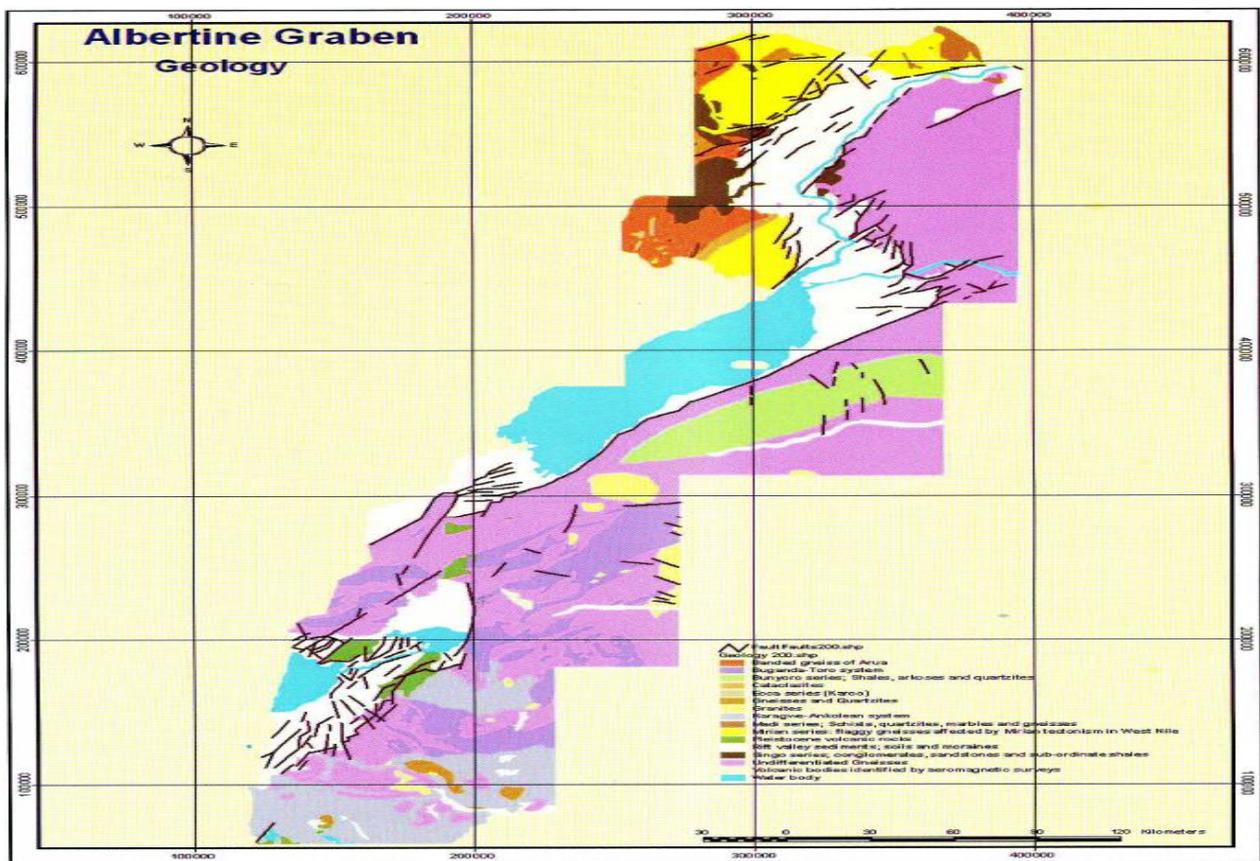
3.2 Study Design and Scope

To achieve the study objectives a Cross-Sectional Survey Design was used. In a survey, data is collected at one point in time from a sample selected to represent a larger population. The cases used were SMEs such as those in Agriculture, Hotel and Catering Services, Real Estate and Construction, General merchandise trade, Petroleum products trade, Fabrication and Service Provision within the 5 districts of the study. The chosen study design was appropriate to accommodate diversity and provide enriched and refined data. Participatory Appraisal methods were used to collect data for the study. Participatory approaches conferred an added advantage of

rapid but enriched data collection saving on time and monetary resources that would have been enormous otherwise.

The research study was carried out in selected districts within Bunyoro and Acholi sub-regions of the Albertine Graben (Figure 3). The districts covered were Gulu, Hoima, Masindi, Buliisa and Kampala District. Gulu is located in the Acholi region while Buliisa, Hoima and Masindi districts are located in Bunyoro region. Amuru⁷ and Buliisa are new Districts and did not have substantial number of SMEs that fit into the SME definition of the study.

Figure 3: Map of the Albertine Graben



Map 1: Geology of the Albertine graben
Source: Geology Department

The selection of the Albertine as a study site was based on the fact that out of Uganda's six sedimentary basins, the Albertine Graben is the most prospective site where exploration

⁷ Although Amuru District was initially targeted in this study, on visiting the district most enterprises were micro and very few were found to fit into the definition of the study. SMES of the district therefore were excluded in the sample.

activities by the large oil companies namely Tullow Oil, Dominion Petroleum and Neptune Petroleum are ongoing (Ministry of Energy and Mineral Resources, 2009).

Kampala District was added because it is the commercial hub of the country where most (over 70 percent) of the business enterprises including SMEs do their business (Uganda Investment Authority, 2010). The study analyzed potential opportunities arising out of the emerging oil discovery, including potential areas of partnership with the TNCs and the factors likely to impact on the willingness of the SME to invest. Emphasis was put on understanding the internal and external factors that may hinder and/or favour SME investment with the view to propose actions that may overcome the hindering factors. The research was conducted in phases including a diagnostic phase, data collection, data analysis, results reporting and dissemination.

3.3 Data collection, Processing and Analysis

3.3.1 Sample Selection

The sampling frame included all existing SMEs in various sectors in the study areas, private sector associations, ministries and public agencies. The major assumption considered was that all the SMEs in the area have equal chances to be attracted to invest into the oil and gas sector in the region should opportunities emerge. For Objective 1; concerning identification of key actors in value chain, the entire population was considered while for the other objectives stratified random sampling was used. Stratified random sampling was considered over the non-probabilistic methods because of its sampling error reducing power. Using this method, the entire diverse SMEs population was reduced to clusters (strata) making sampling more representative and simpler. The different sectors with direct and indirect relationship to the petroleum value chain formed the basis for stratification. These sectors included Agriculture, Hotel and Catering Services, Real Estate and construction, Manufacturing and Fabrication were the strata. The research team first identified the relevant strata and their actual representation in the population after which random sampling was used to select a representative number of subjects from each stratum. From the selected government agencies and ministries, private sector associations and existing TNCs investing in the Oil and Gas sector, data on general opportunities that have emerged with the oil discovery and potential areas for business partnership with Government and TNCs were collected to address objectives 3 and 4 of the study.

3.3.2 Sample size

A total of 270 enterprises were identified for participation in the study using SMEs data from UIA triangulated with registration lists at municipal registration centres. Out of the 270 SMEs identified, only 220 were actually interviewed representing 81% response rate. The rest of the sample units were excluded due to non-qualification. The criteria used for screening was based on total capital investment (assets and working capital) which ranged from 100 million to 1 billion Uganda shillings, existence of a permanent address for the enterprise and formal registration with municipal authorities in the region or district. The sample was deemed representative based on available data about enterprise registration in the sampled regions giving $\frac{n}{N} = 0.23$, where n = sample population and N = total enterprise population in the region studied.

Table 2 shows the distribution of the sub-samples by sector and location (district) and the total sample size.

Table 2: Distribution of the selected SME respondents by sector and district

Sector	No. of Respondents – SMEs per District				
	Kampala	Masindi	Hoima	Buliisa	Gulu
Freight Forwarding	5	0	0	0	0
Transport (passenger)	3	2	3	1	3
Catering/ restaurants	8	9	7	1	8
Consultancy services	4	1	2	0	2
Real Estate and Accommodation	6	8	10	2	9
Micro financing and Foreign Exchange Bureaus	7	3	5	2	3
Agricultural produce	0	5	6	4	6
• Processed					
• Fresh (Food supply, beef, milk, poultry and fish)					
Health services	8	5	7	1	8
Vocational training	6	3	4		2
Metal Fabrication/Artisans	7	4	4	1	3
Trading (supply of hardware merchandise and equipment)	3	2	3	0	2
Maintenance (plumbers, electricians and mechanics)	10	2	3	0	3
Road construction	16	4	8	3	9
Total number of respondents	96	45	61	11	57

3.3.3 Methods of Data collection

In collecting primary data, the study employed two data collection methods namely; personal interviews and Focus Group Discussions (FGDs). Interview guides and questionnaires were used as the major data collection tools for the interviews, whereas thematic checklists were used for the FGDs. Primary data collection mainly targeted information about key and active actors in the Oil and Gas sector, factors that influence SMEs` decisions and willingness to invest, business opportunities/business partnerships that have emerged in the oil sector and policy/non policy actions that can address constraints that will hinder SMEs from investing in the Oil sector. Table 3.3 presents a summary of the key variables collected from the different respondents/SMEs. Secondary data was collected mainly for triangulation with the primary data and these mainly targeted potential actors in the oil and Gas value chain, anticipated benefits of oil and gas discovery, related policies and legislation.

3.3.4 Data Processing and Analysis

The collected data was cleaned to ensure that only complete interviews are considered for analysis. After cleaning, the open responses were coded and entered into appropriate software for analysis. Both qualitative and quantitative methods of data analysis were used to generate descriptive statistics and econometric results. Qualitative data was analysed using N-VIVO software, while quantitative data was analysed using Statistical Package for Social Scientists (SPSS) to obtain the descriptive statistics and econometric estimation of the Logit model.

3.3.5 Reliability and Validity measure

The validity and reliability of the constructs are tested to ensure that the measurement was accurate. Validity refers to how accurately the construct reflects what it intends to measure, and reliability refers to the consistency of the results obtained. According to Ghauri et al. (2002), several criteria can be used to judge construct validity: face validity, convergent validity and divergent validity. In our study face validity was ensured by consulting experts in the field and pilot testing of the questionnaires with 40 SMEs` owners/mangers before carrying out the main study. This ensured correcting any ambiguities in measurements as well as capturing correctly the concepts used in this study. Moreover, construct validity is ensured by taking into account the usage principle (Babbie 2007). The operational measures used in this study were taken from previous work in the field that was published in reputable academic journals. Reliability of the

construct was assessed using Cronbach (Rousson et al., 2002). The items that scored below 0.7 (only 14% of the total) were excluded based on the list wise deletion criteria (Nunnally, 1978 ;). Reliability was also ensured using face-to-face interviews where interviewer ensures that each respondent is answering the same questions.

To identify the potential actors in the value chain, value chain analysis was used. There are two choices available for the SMEs to make concerning investment in the oil sector: - to invest or not to invest. The decision to invest or not to invest by the SMEs is the major question to be addressed (the dependent variable) and this depends on several factors (independent/exogenous factors). Since to invest or not is dichotomous, discrete choice econometric models are best suited for this analysis (Guerre and Moon, 2005). The Logit and Probit models particularly cater for dichotomous and categorical variables (Payne *et al.*, 2003). The models focus on association of categorical or grouped data, looking at all levels of positive interaction effects (Goodwin and Schroeder, 1994). Generally results from both models are similar unless the samples are very large and many observations fall in the tails (Nzomoi *et al.*, 2007).

The Logit model is however preferred because it does not assume equal variance–covariance matrices across groups and multivariate normality of the variables (Hair et al. 1998). Moreover, the output from the analysis is very similar to regression and is therefore easier to draw inferences. Logit uses a binomial probability function for the dichotomous dependent variable and estimates whether it is one way or the other using an odds ratio. Unlike regression, where we try to minimize the squared deviations, in logit we maximize the likelihood of a firm’s willingness to invest (Judge *et al.*, 1980). The Logit is as well suited for observational data whereas the Probit is well suited for experimental data (Mburu *et al.*, 2007). The Logit model was therefore used in this research study. In this case, the study focused on SMEs/actors that were doing business in other sectors but would be willing to invest in the oil sector because of the emerging investment opportunities.

A reduced form of a Logit model can be expressed as:

$$Y = \alpha + \beta_i X_i + \varepsilon$$

where Y is dependent variable (Willingness of SMEs To invest the oil and gas sector =1, or not =0); α is a constant;

X_i are the explanatory variables; β_i are a vector of explanatory variable coefficients; and ε is error term.

For this study, independent variables entered in the model and their hypothesised signs are shown in Table 3. The variables include a set of SMEs characteristics such as capital base (value of fixed assets), volumes purchased, sales, price trends, current size of customers (number of customers), potential size of customers (no. of big customers) and business stability (age of the business). Others are external factors such as access to credit, cost of capital (interest rates), quality standards (UNBS, NEMA, PPDA and NDA Certifications) physical infrastructure, (distance to the main road), reliability and availability of power (availability/distance to power/meter lines). Availability of supportive government policies and regulations (petroleum regulations, taxation policy and incentive regime) on oil operations, procurement regulations and contracts were also considered as key variables that could affect a company's willingness to invest in the oil and gas sector.

Table 3: Description of the variables and proxies used to measure willingness to invest in logit model

Variable label	Variable description	Variable Data form	Hypothesised effect
Dependent	Willingness to invest or not	Dichotomous Dummy for Non willingness(0), 1=willingness	
Independent			
Cap	Capital base (value of fixed assets owned by the company (in Uganda shillings)	Categorical	+
VS.	Sales volumes	Categorical	+
Info.	Access to information about contracts and procedure	Dichotomous	+
Cred.	Access to credit	Dichotomous	+
Cost.	Cost of credit and capital (interest rate)	Categorical	-
Cust.	Size of customers (number of regular customers for the company's goods)	Categorical	+
Pol.	Policy awareness	Dichotomous	+
Infr,	Available supporting physical infrastructure	Categorical	+
Bus	Business stability(number of years of business operation)	Categorical	+
Reinv.	Percent of profit re-invested annually	Categorical	+

The coefficients in the logistic regression were estimated using the maximum likelihood estimation method (Judge *et al.*, 1980) using SPSS. The estimated coefficients (β s) do not directly indicate the effect of change in the corresponding explanatory variables on probability of the outcome occurring but they reflect the effect of individual explanatory variables on its Log of odds. To this end, a positive coefficient means that the log of odds increases as the corresponding independent variable increases. It is also right to say that bigger the coefficient regardless of whether its positive or negative, the bigger the effect of the independent variable on the dependent.

Prior to running a logit model, a Chi-square test was carried out to examine factors (internal and external) that were associated to SME willingness to invest in the Oil and Gas value chain which in this case was treated as the dependent variable. The chi-square test results were then used for the first level testing of our hypothesis that SME willingness to invest would depend on some of these factors. Furthermore, the X^2 associations helped in selecting the explanatory variables that were not correlated to enter into the Logit model. For confirmation of significant association between the covariate factors and the dependent variable, the Cramer's V static and $p < 0.05$ level of confidence was used.

3.4 Study Limitations

The generalisation of the study findings are restricted by a number of limitations in the design, methods used and geographical coverage. In this study we chose the survey design which is a one-point kind of measurement meaning it did not consider the time line changes in preferences and perceptions. Probably longitudinal approaches would have been more covering especially considering that this study has been carried out prior to full participation by the enterprises. Secondly, the study was restricted to only enterprises in the Albertine Graben and Kampala District therefore due to enterprise diversity elsewhere in Uganda; the findings are only interpretable with generalisation valid for only the sample areas.

4. Presentation and discussion of findings

4.1 Introduction

In this section we report findings of the study based on the collected data through interviews, focus group discussions and field observations. The presentation of the report is based on the objectives and major study themes or research questions laid out in the report namely: to find out present actors in the Oil and Gas sector value chain; to determine factors likely to influence SME decisions and willingness to invest in the Oil and Gas value chain; to find out business partnerships that would be created between SMEs, Trans National Oil Corporations and other actors in the Oil and Gas sector; and to propose actions to address the constraints hindering SMEs from exploiting the identified opportunities in the Oil and Gas Sector.

4.2 Actors in the Oil and Gas sector Value Chain

The first objective of the study was to identify the current actors in the oil and gas sector. The findings of the study revealed that several actors played a key role at different levels of the value chain. Some of the actors include Government Ministries, departments, agencies, district local authorities, political and administrative leadership, media and the private sectors as illustrated in Figure 4 below.

4.2.1 Role of Government

The Government of Uganda is the major player whose role is to provide the required regulatory and institutional framework that promotes and facilitates exploration, refinement, transportation, storage and investment in the sector. Government has through the respective arms drafted legislations and policies such as the National Oil and Gas Policy, the Petroleum (Exploration, Development, Production and Value Addition) Bill, Refinery Bill and the Revenue Management Bill to facilitate proper Oil and Gas exploration activities. Other roles played by the Government include strategic planning and management for the oil and Gas Sector, licensing of oil exploration and prospecting companies, infrastructure development, provision of security, revenue collection and management, managing local content aspects and environmental management.

The Government actors include Parliament, Cabinet, Ministries such as the Ministry of Energy and Mineral Development, Ministry of Finance, Planning and Economic Development, Ministry of Works and Transport, Ministry of Lands, Housing and Urban Development, Ministry of Justice and Constitutional Affairs, Ministry for Local Governments, Ministry of Water and Environment, Ministry of Trade, Industry and Cooperatives, Ministry of Tourism and Wildlife, Ministry of Gender, Labor and Social Development, Ministry of Education and Sports, Ministry of Foreign Affairs, Ministry of Security, Ministry of Information and Communication Technology, Ministry of Foreign Affairs and Ministry of the East African Affairs. Government agencies include Bank of Uganda, Uganda Revenue Authority, National Planning Authority, Uganda Investment Authority, National Environment Management Authority, Uganda Wildlife Authority and Auditor General.

4.2.2 Private Sector

The private sector is another important player in the Oil and Gas value chain whose major function is to explore, develop and produce Uganda's oil and gas resource (Ministry of Energy and Mineral Development, 2008). The private sector includes Trans-national Oil Companies, large scale enterprises as well as the Small and Medium Sized Enterprises.

4.2.2.1 Trans-national Oil Companies

The private sector is dominated by the Transnational Oil Corporations (TNCs) such as Neptune Petroleum Uganda, Tullow Oil, Dominion, Total E and P and; China North Offshore Oil Company. These companies are directly involved in the provision of specialized activities namely oil appraisals, exploration, seismic surveys and well drilling.

4.2.2.2 Large scale Enterprises

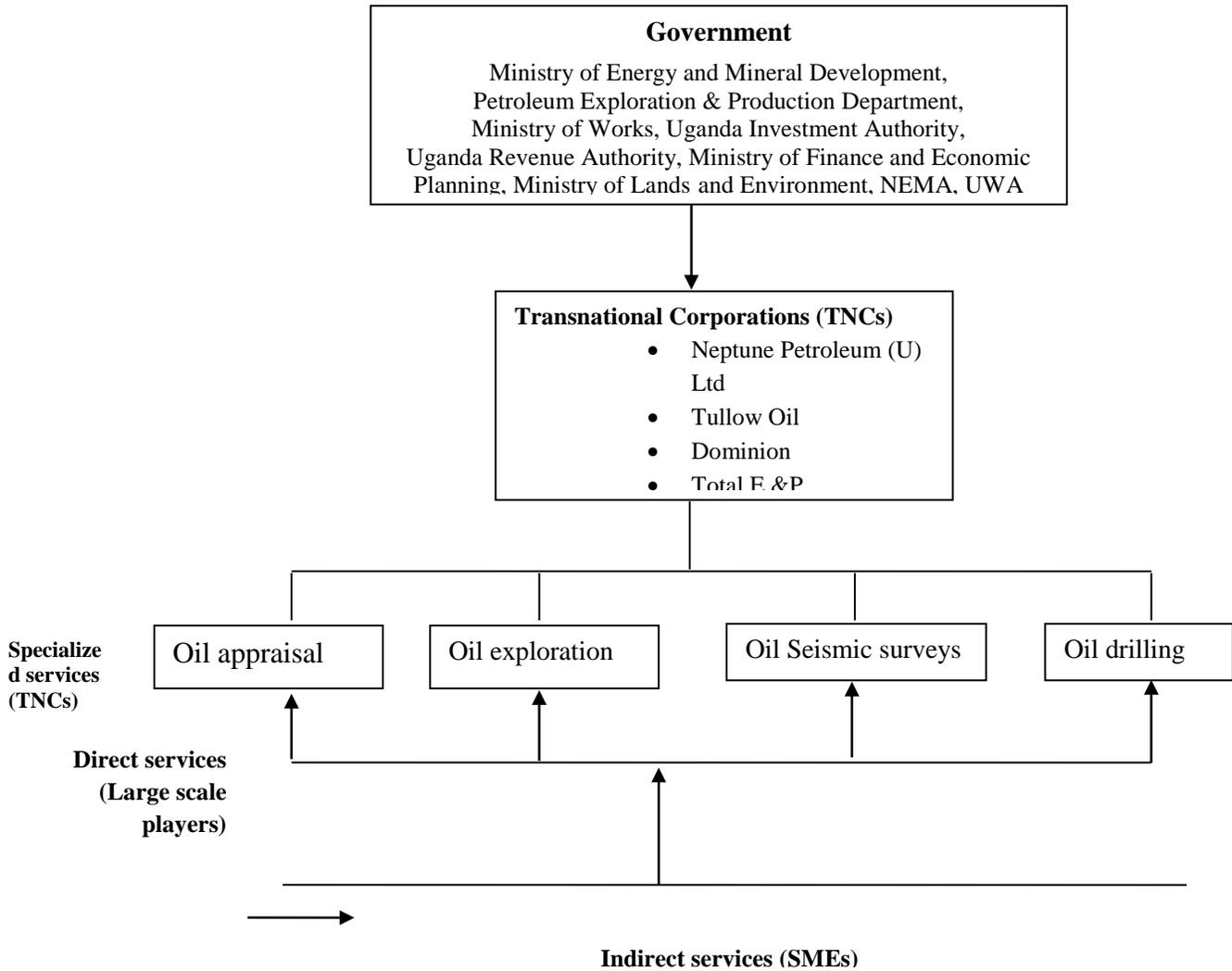
Within the private sector are large scale domestic and foreign enterprises such as Transami, Eagle Air, MBW consulting, Pearl Engineering, Kasese Nile and Wood, Air Water and Earth, Bemuga Clearing and Forwarding, Kamu Kamu drilling experts and DHL among others providing direct services such as equipment supplies, civil and engineering works, environment services, professional consulting services, international freight services as well as clearing and forwarding services.

4.2.2.3 Small and Medium Sized Enterprises

The SMEs are also important actors within the private sector and although majority (90%) did not have formal contracts with Oil companies and their subcontractors, the 10% involved in the sector were supplying indirect services such as agricultural produce, lodging and conference facilities, plumbing, vehicle spare parts, fuel, event management services, medical services, transportation of guests to oil exploration and camping sites, supplying building materials, electrical services, furniture, construction materials, training local personnel and casual labor. These among others included MSL Logistics, QMS Events, Riviera Hotel, Nyankidwa Restaurant, Masindi Junior Transporters, Kisembo Electronic Engineers and Kasangaki enterprises. Several reasons were established as to why there was limited involvement of SMEs in the value chain. These include;

1. The current oil and gas value chain for Uganda (upstream) is not open to offer many opportunities given that actual production is yet to start. Additionally main activities such as exploration, construction, surveying, and preliminary drilling etcetera are knowledge based and capacity was lacking for professional service and skill provision among the local SME firms.
2. General lack of awareness and information about oil developments, how to usurp investment opportunities, how to get into contract agreements and the required legislation. We note, however, that some efforts had been made by TNCs such as Tullow Oil and Neptune as well as district authorities to create awareness through radio programs and media prints but still a wide audience was uninformed.
3. SMEs still appear fragmented majority being sole proprietorships and thus lack ability to supply in bulk quantity, and the desired quality based on international standards. Many SMEs do not qualify in the main stream procurement criteria and were therefore not prequalified suppliers or service providers.

Figure 4: Current actors in the Uganda oil and gas value chain and their interlinked relationships



Source: Researchers

4.2.3 Role played by Other Actors

4.2.3.1 Credit institutions

The study findings shed light on the role played by other actors among which are credit institutions, that is, commercial banks, SACCOs and MDIs. These control access to credit and thus have potential to enhance or limit the investment capital available for investors. In particular, the cost of borrowing which is by far in the region of 15-25% is perceived as high by the target clients. In fact, responding to the question whether the SMEs could choose an option of

acquiring a loan to boost their investment capital, the majority SMEs reported high interest rates as a deterring factor. In the same way the high collateral qualification that is reported to be over 150% of the amount accessible as a loan was also another deterring factor from borrowing. There was need to make credit access more affordable. This could be through long term leasing and bonds issuance such that SMEs willing to invest over long periods can be helped.

4.2.3.2 Local media houses

By local media houses we mean local air waves radios and municipal public address systems. In some areas these are missing and where they exist, a lot still has to be done to improve audience coverage and awareness creation. The findings highlight lack of information about the existing opportunities and benefits as one of the major factors that has slowed SMEs participation in the value chain. The study results revealed however that the media was the most effective source of Oil and Gas information estimated at 66.8 percent compared with the business associates (4.1 percent), District Authorities (1 percent) and Ministry of Energy and Mineral Development (0.5 percent)

4.2.3.3 Administrative and Political institutions

Usually, the administration and political institutions of the area are expected to be at the centre of awareness creation. However, the study findings revealed that these units have not yet done enough to create awareness through education and spreading information to the communities. This probably can also explain the lagging behind of many entrepreneurs. Likewise, the Local Government of the regions were pointed out as not proactive enough in lobbying for government funding to support infrastructure development with Buliisa district being in the worst situation where a lot of basic infrastructure is missing, an aspect that is hindering settlement of many entrepreneurs in the area.

4.2.3.4 Civil Society Organisations (CSOs)

The CSOs are indirect actors in the value chain whose role is to dialogue and sensitise the local communities about the ongoing oil resource and its impact on their livelihoods. The CSOs are currently sensitising the local communities about environment issues, land management and promoting peace, and social development in the oil rich areas.

4.3 Factors that affect SMEs decisions and willingness to invest in oil and gas value chain

The second objective of the study was to identify factors that affect SME decisions and willingness to invest in the sector. In order to understand the willingness to invest concept, the study undertook an analysis of the SME distribution in the studied districts, their distribution by sector, nature of business ownership and economic profiles as a basis for understanding their preparedness to invest in the industry.

4.3.1 SMEs Distribution and Economic Profiles

4.3.1.1 SME Distribution

Table 4 gives a summary of the distribution of SMEs in the study districts. From Table 4 below, majority (30.6 %) of the SMEs were located in Hoima followed by Gulu and Kampala districts at 26% and 25.9% respectively. While only 13% and 4.1% were located in Masindi and Buliisa respectively. The findings implied that there was more business opportunities in Hoima, Gulu and Kampala districts and therefore the SMEs in the areas were more likely to benefit from the opportunities in the sector. The findings further reveal that the four districts possibly had more concentration of SMEs compared to Buliisa because of the availability of infrastructure facilities such as water, electricity and roads. Another fact noted was that Buliisa was a newly created district which had not yet attracted many investors.

Table 4: Enterprise distribution per District

District	Frequency	Percent
Hoima	59	30.6
Masindi	25	13.0
Buliisa	8	4.10
Gulu	51	26.0
Kampala	50	25.9
Total	193	100.0

Source: Primary data

4.3.1.2 Business Classification of the Studied SMEs -What are they currently doing?

Table 5 gives a summary of the SME distribution per industry. The categorization was based on *International Standard Industrial Classification* of economic activities.

Table 5: Distribution of SMEs by Industry

Sector		Frequency	Percent
1	Agric, Forestry and fisheries	14	7.3
2	Accommodation and food services	20	10.4
3	Information and communication	4	2.1
4	Finance and insurance	6	3.1
5	Real estates	1	.5
6	Administrative and support services	3	1.6
7	Education	4	2.1
8	Petrol and Oil Business	11	5.7
9	Human Health and social work services	15	7.8
10	Mining and quarrying	1	.5
11	Agro inputs and vet facilities	2	1.0
12	Distribution business	1	.5
13	Animal production	5	2.6
14	Furniture and other wood fittings	2	1.0
15	Office and Stationary supply	7	3.6
16	Hardware supplies	4	2.1
17	Dry Cleaning	1	.5
18	Manufacture and repair of machinery and equipment	2	1.0
19	Civil engineering	3	1.6
20	Manufacturing	15	7.8
21	Warehousing	1	.5
22	Fire Fighting	1	.5
23	Consultancy	5	2.6
24	Waste Management	1	.5
25	Clearing and forwarding	1	.5
26	Advertising and Market Research	1	.5
27	Repair and installation of machines and equipment	2	1.0
28	Electricity, gas and air conditioning supply	3	1.6
29	Water supply and sewage management	2	1.0
30	Construction	8	4.1
31	Wholesale and retail	21	10.9
32	Repairs of motor vehicles and bikes	10	5.2
33	Transport and storage	15	7.8
Total		192	100

Source: Primary data

From Table 5 above, the Wholesale and Retail sector reported the highest presence (10.9%), followed by Accommodation and Food services (10.4%), followed by the Manufacturing Sector (7.8%), Transport and Storage sector (7.8%), and the Human Health and Social Work Sector (7.8%). The implication of the findings is that Wholesale and Retail Trade, Accommodation and Food services, Human Health and Social Work as well as the Transport and Storage and;

Manufacturing sectors are among the promising avenues through which the SMEs can partner with the TNCs/Large Oil companies. However, the agricultural sector though a primary sector of Uganda is not well represented (7.3%) because majority of the enterprises were found to be operating on a micro scale. This finding is similar to the UBOS Census of Business Enterprises (2010/2011) which out of 458,106 establishments indicated that 61 percent of the businesses were in the Trade Sector, followed by Accommodation Services (14 percent) while businesses in Agriculture only accounted for 2 percent.

4.3.2 Economic Profiles of the Studied SMEs

We operationally⁸ defined SMEs as any legally registered business entity that has a permanent physical address, owning fixed assets at least worth 50 million Uganda shillings (UGX) and total capital investment (fixed assets and liquidity) worth UGX 100 million to 1billion. A summary of the profile is presented in Table 6.

⁸ The Uganda Investment Authority criteria for defining SMEs states that a Small Scale Enterprise is one that employs a maximum of 50 people, with maximum annual sales turnover of UGX 360 million and Maximum value in Total Assets of UGX 360 Million where as a Medium scale Enterprise is one that employs a more than 50 people, with minimum annual sales turnover of UGX 360 million and Minimum value in Total Assets of UGX 360 Million. On reaching the field, the qualification with this criteria caused mixed results with some entities qualifying on the number of employees, but not fixed assets, while some that qualified on fixed assets and sales turn over did not employ up to 50 persons. To sort the case, the research team resolved to adopt an operational definition such that many entities would qualify. The most affected places were Hoima, Gulu, Masindi and Buliisa.

Table 6: Profiles of the sampled SMEs

Variable	Frequency	Percent (n=193)
Business registration Status		
• Registered	193	100.0
• Unregistered	0	0
Business ownership		
• Partnership	66	34.2
• Sole Proprietorship	112	58.0
• Limited Company	10	5.2
• Communal ownership	1	0.5
• Owned by the church diocese	3	1.6
Business age*		
• 1-10 years	96	49.7
• >10-20 years	58	30.0
• > 20 years	39	20.2
Value of Fixed Assets^b (UGX)		
• None	136	70.5
• <10 million	7	3.6
• 10-100 million	20	10.4
• >100-500 million	22	11.4
• >500-1000,000,000 million	4	2.1
• > 1000,000,000 million	4	2.1
Investment Capital^c (UGX)		
• <100 million	43	22.5
• 100-200 million	66	34.6
• >200-300 million	13	6.8
• >300-600million	31	16.2
• >600-1000,000,000	21	11
• > 1000,000,000 million	17	8.9

Source: Primary data

*Business age refers to the period of business survival from first registration

^bValue of fixed refers to summated value of owned land, buildings, machinery, vehicles and furniture

^cInvestment capital refers to Total fixed assets + liquidity

Table 6 illustrates that all of the studied SMEs were legally registered with permanent (or semi-permanent) physical addresses. However, the majority (70.5%) had no fixed assets, which could be a sign of economic instability of the enterprise. Majority (34.6 percent) investment capital

between 100 to 200 million Uganda shillings, 22.5 percent: had Investment capital less than 100 million UGX; and only 8.9 percent Investment Capital of more than Uganda shillings 1 billion. This is an indication that investment capital is a major challenge for SMEs which affects their ability and willingness to invest in the Oil sector.

Fifty eight percent of the SMEs were managed as sole proprietorships while 34.2% were partnerships and only 5.2% were private limited companies. The findings are also consistent with the 2010/2011 census of business enterprises where majority (94%) of businesses were sole proprietorships. This is therefore a common characteristic of SMEs in Uganda, and it explains the meagre worth of their fixed assets, investment capital, limited expansion into regional markets and ages in business. This ultimately explains the limited capacity for SMEs to invest in large ventures and highly capitalised sectors.

4.3.3 Factors that determine SMEs willingness to invest

Results from the Chi-square test (Table 7) show a number of factors that were positively associated with SME willingness to invest in the oil and gas sector in Uganda. From Table 3.5, it is shown that the size of investment capital, owning fixed assets, having knowledge of the oil business; time spent in business and receiving information are strongly associated (or affect) the willingness of SMEs to invest in the oil and gas sector. Other factors strongly associated were access to power, access to other infrastructure such as roads, water and financial institutions, access to credit and cost of capital (interest charge for credit acquisition). The direction of association and contribution of each to the dependent variable were measured by the logit model.

Table 7: Association between Willingness to Invest and hypothesized internal and external factors Sector (n=193)

Factor	^o Chi square(X^2) value	Df	P value
Investment Capital	19.57	6	0.003*
Fixed Assets	14.50	5	0.013*
Age of the business	12.27	2	0.043*
Knowledge of oil business	28.17	4	0.000*
Information Flow	15.18	1	0.000*
Access to Power	6.56	2	0.038*
Access to other Infrastructure	8.801	6	0.0185*
Policy awareness	4.78	1	0.779
Cost of Capital	10.856	5	0.054**
Access to credit	7.122	1	0.009*
Quality standards	9.953	8	0.268
Price trends	4.59	2	0.101
Volume of sales	8.87	5	0.114
Number of customers	4.80	4	0.308

Source: Primary data ^obased on Pearson test for association *significant at 95% ($p=0.05$) **significant at 90 % ($p=0.1$)

4.3.3.1 The Logistic Regression Model results

The data used was collected from 220 SMEs with “willingness to invest (trade) in oil and gas as the dependent variable. This was regressed against 10 variables shown in Table 3. The dependent variable was treated as a dichotomous variable taking on values 1= willingness to invest and 0 = none willingness. The explanatory variables were mostly categorical. The backward stepwise elimination method was used to enter candidate variable into the model and iterations run at a specified <ENTER> value first of < 0.05 and removal 0.01. This criterion qualified just four variables namely; Investment capital, Access to credit, Information flow and owning fixed assets. To add to the list of qualifying candidates model adjustments (selection strictness) was made whereby the <ENTER> criteria was changed to >0.05 and removal at 0.1. This modification meant that the significance level for variable qualification was lowered to 90%. The modifications qualified two more candidates, that is, knowledge of oil business (0.06) and age of business enterprise (0.054). The rest of the variables never qualified. The ability to screen and partition variations in the dependent variables among the covariates make logit models different from other regression analysis models. The advantage is clarity on what variables contribute more to the observed variation in the dependent variable. The disadvantage,

however, is that the best explanatory variables are retained. This causes a bias in interpretation of model results because usually non model variables or parameters are considered less useful which may not be necessarily true in every case (Judge *et al.*, 1980). For this every reason, especially when mixed methods are used like in our case, some non-qualifying variables could still have good implications; that is why we chose to retain them in the results table.

The explanatory model was specified in the form:

$$\text{Logit}(\pi) = \beta_0 + \beta_1x_1 + \beta_2x_2 + \beta_3x_3 \dots \dots \beta_nx_n + \varepsilon \dots \dots \text{Eqn. (i)}$$

Where; π – is the probability that the dependent variable (SME willing to invest in Oil and Gas) will be predicted by the selected (hypothesized) variables; β_1, \dots, β_n are the coefficients for each variable entered in the model; x_1, \dots, x_n are the selected predictor (independent) variables and ε is the error term.

The final estimated model is;

$$\mathbf{WTI} = 10.7 + 0.42 \text{ Fixed Assets} + 0.383 \text{ Investment capital} + 0.33 \text{ Information Flow} + 0.274 \text{ Knowledge of oil business} + 0.271 \text{ Access to credit} \dots \dots \dots \text{Eqn. (ii)}$$

From the equation (ii) above, the coefficients mark the contribution of each predictor variable in explaining the probability (log odds) of its occurrence. The significance of the regression coefficients is validated by the *Wald* Statistic. Details are given in Table 8.

Table 8: Estimation of determinants of SME willingness to invest in Oil and Gas sector in Uganda

Parameter	β	SE	Wald	P value
Investment Capital	0.383	0.109	5.404	0.020**
Access to Credit	0.271	0.03	4.56	0.046**
Information Flow	0.33	0.04	5.201	0.026**
Knowledge of oil business	0.274	0.021	4.39	0.06*
Owning Fixed Assets	0.42	0.075	6.312	0.011**
Age of business	0.123	0.015	4.87	0.054*
Access to Power	0.11	0.010	4.01	0.088
Access to other Infrastructure	0.103	0.034	4.04	0.09
Policy awareness	0.07	0.01	3.89	0.67
Cost of Capital	-0.034	0.053	3.81	0.63
Volume of sales	0.023	0.056	3.77	0.74
Number of customers	0.016	0.081	3.66	0.81
Model Fit statistics				
-2loglikelihood(Initial model)	166.31**			
-2loglikelihood(Final model)	79.93**			
X ² (df) Final Model	64.54**			
X ² (df) Hosmer and Lemeshow Test	23.57*			
Cox and Snell R ²	0.62			
Nagelkerke R ²	0.81			

*Source: Primary data **significant at 5% and * significant at 10%*

Table 8 illustrates the logit analysis' results, which indicate that the goodness of fit of the overall model is very good. Nagelkerke R² and Cox & Snell R² are also measures of the goodness of fit (Hair et al., 1998). The current model Nagelkerke R² is (0.61) whereas Cox & Snell R² is 0.51 which is fairly high suggesting a good fit for the model. The predictive power of the model is very good with an overall accuracy of 61.2 percent.

4.3.3.2 Factors that affect willingness to invest as interpreted from the model

From Table 8 it can be noted that the strongest predictors of SME willingness to Invest (WTI) were having investment capital, access to credit, information and owning fixed asset. In this case, the fixed assets considered included sitting land, machinery, equipment, structures and automobiles and having substantial investment capital (fixed assets + liquidity). The positive coefficients imply a positive direction. As the fixed asset value and invest capital of an enterprise (SME) increases so does its willingness to invest. This is in agreement to previous researches

(e.g Manu, 1998; Grunsvan, 1999; Humphrey, 2003; Abuka et al., 2006; Biggs and Manju, 2006; , 2007) done on a similar topic. Asset accumulation which in most times is associated with enterprise liquidity raises the enterprise equity that drives desire to venture in different business options or consolidate its dominance in a particular business line. In our study, a large majority of SMEs sample lacked substantial investment in fixed assets (see Table 6) and this may deter them from investing in the capital intensive oil and gas value chain.

Secondly, WTI has been shown to depend on access to credit ($\beta = 0.271$). The relationship is such that enterprises that have ready access to credit show a higher willingness to invest than those who do not. This is because credit facilities once readily accessible can be used to acquire assets, boost up invest capital and reduce risk averseness of a given enterprise. As put by Manu (1998), for most SMEs in Sub-Saharan Africa, access to credit is the central key that drives investment and business development. The effect of credit on firm investment in Uganda is reported in a similar way by Abuka et al. (2006).

Information flow about investment opportunities that exist in the oil and gas sector has also been shown as a good predictor ($\beta = 0.33$) of SME investment. The finding has good implication to the role of information dissemination channels in stimulating SME willingness to invest in the sector. Not receiving information about available opportunities was also reported among the complaints. A big percent of the sampled SMEs agreed to the fact that they never receive information about the existing opportunities and this hinders their involvement in the value chain. Since the model shows this variable as a strong predictor our recommendation should be that more information is published and distributed to SMEs in the region so as to stimulate interest to invest. This also implies or draws on the Local Content policy, which when developed needs to be disseminated to provide information and enhance local community participation.

Age of the business is also depicted as a good predictor of WTI for SMEs. In our study age of the business was measured as the number of years the SME has existed since its initial registration. The model prediction asserts the high correlation (see Chi-square Table) between number of years spent in business and WTI. The positive coefficient ($\beta = 0.123$), suggests that WTI increases with the number of years spent in business. This result can be interpreted in terms of business stability and capital stock growth, with old businesses appearing more stable and with fixed assets as a driver to venture in oil and gas value chain. This result provides insight

especially on where government can intervene or make partnerships. In this case, the old stable SMEs would be a good target group. Elsewhere, the effect of business age is reported in similar manner by Abuka *et al.* (2006) and Biggs and Manju (2006). These authors concur that in Africa, capital accumulation and investment growth is a function of time with most developments coming from year or quarterly re-investments. Likewise, Humphrey (2003) suggested that with time business enterprises tend to discover themselves, and develop long term survival strategies and advance from their capital developments over time. The aspect of maturity reduces tendencies of risk averseness and crafting of risk mitigation procedures.

Worth noting too is the contribution of the cost of capital ($\beta = -0.034$). Although not significant, the negative coefficient implies that the cost of capital (interest on credit) negatively affects SME willingness to invest. The negative coefficient implies that as the cost of borrowing increases, the willingness to invest decreases. A reasonable number of respondents mentioned the interest rate as a deterring factor from accessing credit in addition to high collateral requirements (see Table 9). This finding is important if government is to intervene into providing venture capital and increasing access to credit.

Additional factors apart from the hypothesized were solicited from the Focus Group Discussions using open ended guiding question “*In your opinion what are the factors that may hinder you from active participation in the oil and gas value chain?*”. Table 9 gives a summary of the responses.

Table 9: SME responses on perceived investment hindering factors

Factor	Frequency	Percent (n=256)
Competition from foreign companies	61	23.8
Lack of awareness and information	49	19.1
Corruption among officials	38	14.9
Lack of Capital to invest competitively	45	17.6
Lack of capacity especially training and skills	63	24.6

Source: Primary data *n>193 due to Multiple Response

Table 9 shows the main perceived hindering factors as lack of capacity especially skills and competition from foreign companies. This implies, providing relevant training that offers the necessary skills would be the immediate intervention to promote the SMEs investment in the sector.

4.4 Current Partnerships between SMEs and TNCs

The third objective of the study was to assess the strength of vertical partnerships, that is, supplier-buyer and horizontal relations between the participating SMEs. In addition the objective also sought to identify the potential investment opportunities and understand whether the SMEs were willing to partner (vertically) with the Oil companies or form vertical business partnerships with the large domestic and foreign companies that were directly providing services to the Oil exploration companies. The perceived benefits of the Oil resource were also captured in this objective.

The dimensions used for vertical relationships were whether there were formal agreements (contracts and MoUs) between the suppliers (SMEs) and the TNCs. Likewise, for horizontal relations the study sought mutual understanding in form of partnerships to trade and formation of associations, cooperatives, consortiums and clusters amongst participating SMEs. The findings show that majority (90%) of the participating SMEs were not in permanent contractual terms to supply neither had they signed Memoranda of Understanding (MoUs). The solitary nature of operations explains why majority are sole proprietorships and few partnerships.

4.4.1 Business Partnership Areas

Table 10 below illustrates the SME responses on willingness to partner with Oil companies both vertically and horizontally. According to the findings, 92.7 percent of the SMEs were willing to undertake business partnerships with the Oil companies if investment opportunities were made available. Only 13 percent were not willing to partner with Oil companies due to several factors such as those highlighted in Table 9. The majority SMEs however were willing to form partnerships by providing technical services (21.2 percent), general trade in goods (14.5 percent), provision of transport services (13.0 percent) and; lodging, hotel and catering services (9.8 percent). Other preferred partnership areas are illustrated in Table 11 below.

Table 10: SME responses on willingness to partners with Oil Companies

	Frequency	Percent
No	13	6.7
Yes	179	92.7

Source: Primary data

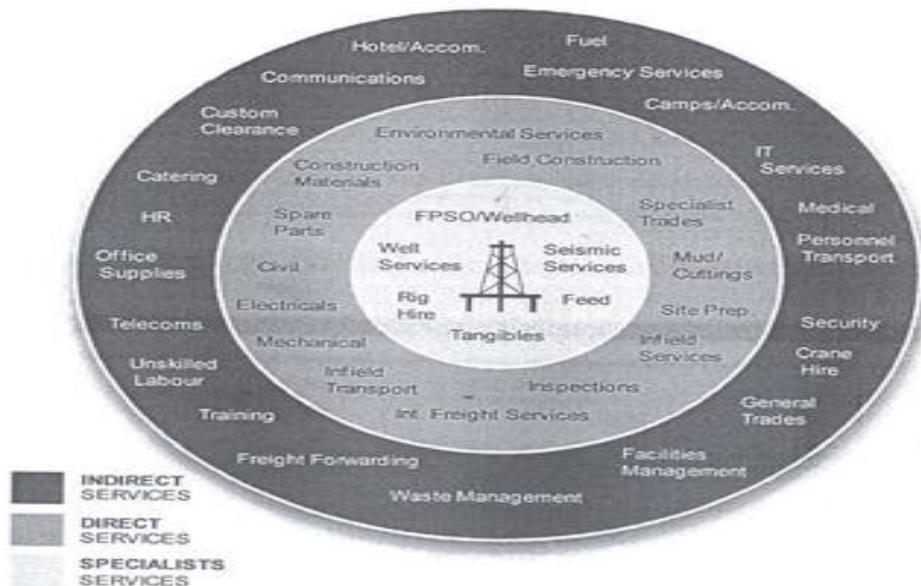
Table 11: Proposed SME Partnership Area by Industry

Sector	Frequency	Percent
Technical services	41	21.2
Trade in Goods	28	14.5
Transport Services	25	13
Lodging, Hotel and Catering Services	19	9.8
Logistics Services	17	8.8
None	13	6.7
Community and Social Services	11	5.7
Office supplies	10	5.2
Consultancy Services	6	3.1
Labor contracting	4	2.1
Microfinance	4	2.1
Supply Food stuff	3	1.6
Security	2	1
Warehousing and Facilities management	2	1
Supply of spare parts and mechanics	2	1
Waste Management	2	1
Fuel Supply	1	0.5

Source: Primary data

4.4.2 Potential investment opportunities for SMEs in the Oil and Gas Value Chain

Figure 5: Services demanded in the Upstream Petroleum activities. Source: Tullow Oil Ltd, 2009



From the findings shown in 4.4.1 the study further used the literature compiled by Tullow Oil Limited which is one of the most engaged TNC in the oil exploration activities in Uganda. Figure 4 is an illustration of various activities and services which at the same time present investment and business opportunities demanded in the Oil industry. These services are broadly classified into three namely; specialized/ core/ professional services, direct services and indirect services. The specialized services occupying the innermost circle include Seismic surveys and well drilling. These require sophisticated technology and are therefore high knowledge based skills most of which are currently provided by large international oil companies. These specialized services are complemented by direct services which are also relatively specialized such as infield services, inspections, international freight services, civil, electrical and mechanical engineering, environmental services, infield transport and specialist trades. The specialized and direct services are further supported by a wider range of indirect services which include catering, human resource, custom clearance, training, hotel/accommodation, emergency services, information and communication technology services, medical services, security, crane hire, waste management, office supplies and freight forwarding. Since Uganda is still in the exploration stage where the demand for core and specialized services is intense, it possibly explains the minimal involvement of SMEs who lack the technology, skilled manpower and required level of finance to provide the relevant services. The sector, however, provides more indirect and less specialized opportunities especially during field development and oil production stages implying that Uganda whose Oil was discovered about 5 years ago needs to develop a targeted and comprehensive policy approach to ensure that the SMEs are prepared to usurp these opportunities.

4.5 Perceived expected benefits from Oil Trade in the studied districts

The findings of the study indicate that the respondents generally thought that the oil discovery would bring in benefits to their communities and the country as a whole (Table 12). The majority (26.1%) thought that employment opportunities would be generated, while, 22.8% and 20.1%, respectively, expected improvement in the infrastructure and service/utility extensions services to the local population.

Table 12: Local People’s Perceived Benefits from oil discovery and trade

Perceived benefit		Frequency	Percent (n=333)*
1	Employment opportunity	87	26.1
2	Improvement in infrastructure	76	22.8
3	Growth of other sectors	57	17.1
4	Increase in revenue for local government	46	13.9
5	Service extension to people	67	20.1

*n > 193 due to multiple responses

5. Conclusions and recommendations

Section 5 of the report summarizes the conclusions and recommendations of the study findings.

5.1 Conclusions

In conclusion, the main actors in the Petroleum Value Chain are Government, Trans National Oil companies, large scale direct service providers with minimal involvement of the local SMEs. Most SMEs operating in the oil and gas sector were located in Kampala and few were identified in Buliisa, Hoima, Masindi and Gulu Districts. The SMEs were supplying support services such as casual labor, food stuffs and utility merchandise and according to Tullow Oil some had provided services since 2007. An official from Tullow Oil informed the research team that between 95 to 98 percent of the laborers were obtained from the local communities. The SMEs located in Kampala had a comparative advantage over their up country counterparts since the former had easier access to information about the oil industry. Business partnerships/linkages could be created at the vertical and horizontal levels between the TNCs and SMEs and amongst the SMEs, respectively. Vertical linkages could also be created with the foreign and domestic large enterprises that have been subcontracted by the Oil companies. It is evident that a vibrant industrial structure is achievable where SMEs and large enterprises not only co-exist but also function in a symbiotic relationship (Uganda Investment Authority, 2011). Several factors were positively associated with SME willingness to invest in the oil and gas sector. Key among them was the size of investment capital, owning fixed assets, having knowledge of the oil business; time spent in business/age of the business, receiving information, access to power, access to other infrastructure such as roads, water and financial institutions, access to credit and cost of capital. The legislative framework to enhance investment was drafted but had not been enacted into law. Although the Petroleum Bill provided for national content and prioritized Ugandan legal entities in the supply of Goods and Services, provisions with respect to financial resources

and investment incentives to SMEs should be considered and a further study in this aspect was recommended. SMEs remain challenged by lack of substantial operating and fixed capital to engage in several business activities on a large scale and yet they are considered a major source of employment in many developing countries. The lack of finance impacts on their ability to advance their technology and employ skilled manpower. Procurement of services required by oil companies in certain sectors such as Transport and Logistics were deemed complex. SMEs lack international quality certifications and some are not aware of them and yet they are required by the Oil Companies. For instance in the transport sector, drivers of trucks require specific qualifications and certifications. The aviation sector also requires fulfillment of specific standards and certification some of which could not be met by the SMEs in the aviation industry. Other internal factors such as high costs of production affect SMEs and impact on their ability to supply in bulk quantity and as a result some have lost business to more competitive large companies.

5.2 Recommendations

From the findings and conclusions of the study the following actions are recommended for implementation by relevant government institutions in partnership with the private sector and development partners. These recommendations could be implemented in the short term, medium term and long term.

5.2.1 Short term Recommendations

- a) With the help of the existing Communication Strategy, awareness and sensitization programmes for SMEs should be undertaken using the existing district systems/structures and through private associations such as Enterprise Uganda, Uganda Small Scale Industry Association, private associations at the Districts and Uganda Women Entrepreneurs Association. Such programmes should clearly provide information on developments, future plans and business opportunities.
- b) Government in collaboration with Oil companies should document procedures, policies and certifications demanded by oil companies to enable SMEs understand their contract needs/requirements. This will facilitate SME investment and reduce the lead time spent in preparing tender documents for various services such as transport, medical, air services, insurance, logistics, environment, etc. Such guidelines should be published on websites of

institutions such as Uganda Investment Authority, Uganda National Chamber of Mines and Petroleum and other private sector associations to ensure that such information is provided on demand.

- c) In line with (c) above, a training programme for SMEs on contract management and tendering should be created with the Oil companies. This will assist SMEs to understand the demands of the oil companies and enable oil companies understand the local SME sector and the environment in which they operate.
- d) SMEs operating in similar sectors such as agriculture, metal fabrication and those within the same localities should be assisted and encouraged to form strategic partnerships such as cooperatives, clusters, consortiums and joint ventures with large contractors to improve their ability to supply quality products, improve their skills, technology and ease access to financial services. In addition SMEs should be encouraged to obtain membership in private sector associations and chambers of commerce so as to improve their access to information,
- e) Uganda Investment Authority in close collaboration with Transnational Corporations in Oil and Gas should develop a comprehensive Business Linkage Programme to consolidate the TNCs business relations with SMEs. A database/business register profiling potential SME service providers in various industries should be developed. The profile should indicate the internal and external capacity of the existing SMEs in terms of skills /technology, cash flow, growth patterns, age of business and access to capital.
- f) Government should undertake a study that identifies and profiles specific services for SME investment. These should be incorporated in the Local Content Policy and Act.
- g) Provide Investment incentives to the following:
 - SMEs willing to invest upcountry or in rural areas to redistribute wealth and development in upcountry districts that are challenged with lack of infrastructure (Transport, Energy, ICT, Water, etc).
 - Large domestic companies that are already doing business with Oil companies to encourage them to sub contract SMEs in the provision and supply of goods and services – especially those that are not directly linked with their current business operations.

5.2.2 Medium Term Recommendations

- a) Oil companies should review their pre-qualification requirements and systems for contracts that can be supplied by SMEs.
- b) A study on preparedness of SMEs to usurp opportunities in the sector, reviewing the current legislative and policy framework in the industry and how it affects SME investment as well as a study guiding Government on priority sectors for SME investment should be considered.

5.2.3 Long Term Recommendation

- a) Develop an SME Investment Plan for the Oil Industry to guide government in the development of strategic interventions and policies that will enhance future SME investment in the Oil sector.
- b) Ministry of Finance, Planning and Economic Development together with Development partners establish an SME fund or credit facility that will provide long term venture capital and trade finance at competitive interest rates as low as 5% to create financial confidentiality and ease access to finance.
- c) Expedite the development of the Local Content Policy and Act to provide the enabling legal and institutional framework for investment. The Policy needs to provide for SME participation in the sector, for instance 10 percent of products sourced locally should be supplied by SMEs. Such services can include welding and fabrication services, laundry services, supply of casual labour, transport and vehicle hire, supply of agricultural produce, accommodation/lodging services and logistics. Private sector associations catering for the needs of SMEs should be involved in the development of the policy.

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